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FROM SALT TO NAVAL STORES
Swedish Trade with Southern Europe 1700–1815

Master's Thesis in Economic History

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Title From Salt to Naval Stores: Swedish Trade with Southern Europe 1700–1815	
Subject Economic history	**Level** Master's thesis
Month and year November 2020	**Number of pages** 84+34

Abstract

This thesis examines the amount and structure of bilateral trade between Sweden and Southern Europe in the eighteenth and early nineteenth century. By using Danish Sound Toll Registers and the Swedish Board of Trade datasets, trade amounts were measured in metric tons and value.

This study shows that the volume of bilateral trade between Sweden and Southern Europe increased substantially in the eighteenth century. In Southern Europe, Portugal and Italy were the most important trade destinations, and Spain and the Mediterranean ports of France played a lesser role. When measured in terms of value, about ten percent of Swedish foreign trade was conducted with Southern Europe, thus, Southern Europe cannot be considered a major bilateral trade partner for Sweden at that time.

The role of Southern Europe for direct salt imports to Sweden was significant. The structure of import volume proved to be very concentrated with salt comprising over 95 percent of import volume. In terms of cargo value, import structure was more diversified, as 56 percent of import value comprised salt, 11 percent wines and beverages, and the rest consisted of luxury goods, such as spices and fruits. Timber cargoes comprised 54 percent of the export volume, iron 31 percent, and tar 11 percent. In value terms, the share of iron was prominent, at 69 percent.

Regarding the linkage between trade growth and trade structure, this thesis shows that as imports increased, the import structure became more concentrated, since the share of the main bulk cargo, salt, increased. The increasing direct long-distance trade between Sweden and Southern Europe was thus not associated with the increasing demand for luxury goods, indicating no consumer revolution and being in line with previous findings concerning the GDP stagnation and strong mercantilism in Sweden. The somewhat fixed structure of exports indicates a steady demand on Swedish naval stores in the eighteenth century.

Keywords: merchant shipping, history of shipping, economic history, maritime history, international trade, trade statistics, Sound Toll Registers, long-distance trade, Sweden, Portugal, Spain, Mediterranean, Levant, eighteenth century, iron, salt, naval stores, timber, tar, luxury goods, trade structure

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Additional information

JYVÄSKYLÄN YLIOPISTO

Tiedekunta Humanistis-yhteiskuntatieteellinen tiedekunta	**Laitos** Historian ja etnologian laitos
Tekijä Lauri Karvonen	
Työn nimi From Salt to Naval Stores: Swedish Trade with Southern Europe 1700–1815	
Oppiaine – Subject Taloushistoria	**Työn laji** Pro gradu -tutkielma
Aika marraskuu 2020	**Sivumäärä** 84+34

Tiivistelmä

Tutkimuksen tavoitteena oli tarkastella Ruotsin ja Etelä-Euroopan välisen kaupan määrää ja rakennetta 1700-luvulla ja 1800-luvun alussa. Kaupan määrää tarkasteltiin sekä tonneina että rahallisina arvoina hyödyntämällä tanskalaisia Juutinrauman tullitilejä ja Ruotsin kauppakollegion ulkomaankauppatilastoja.

Tutkimus osoitti, että kahdenvälinen kauppa Ruotsin ja Etelä-Euroopan välillä kasvoi voimakkaasti 1700-luvun aikana. Etelä-Euroopan maista Portugali ja Italia olivat Ruotsin tärkeimmät kauppakumppanit, ja Espanjan ja Ranskan Välimeren rannikon merkitys oli pienempi. Mitattaessa kaupan arvoa havaittiin, että Etelä-Euroopan osuus Ruotsin ulkomaankaupasta oli noin 10 prosenttia, eikä kahdenvälinen kauppa tällä mittarilla tarkasteltuna ollut erityisen merkittävää.

Kuitenkin Etelä-Euroopan merkitys Ruotsin suoralle suolantuonnille oli olennainen. Tuonnin rakenne tonneina mitattuna osoittautui hyvin yksipuoliseksi, sillä suola muodosti 95 prosenttia tuonnin määrästä. Tuonnin arvoa tarkasteltaessa tuonnin rakenne oli paljon monipuolisempi, sillä suolan osuus oli tällöin 56 prosenttia, viinien 11 prosenttia, ja loput tuonista koostui erilaisista luksustuotteista kuten mausteista ja hedelmistä. Puutavaralastit muodostivat 54 prosenttia, rauta 31 prosenttia ja terva 11 prosenttia viennin määrästä tonneina mitattuna. Viennin arvosta raudan osuus oli merkittävä, 69 prosenttia.

Kaupan määrän ja kaupan rakenteen yhteydestä havaittiin, että tuonnin kasvaessa tuonti muuttui yksipuolisemmaksi, koska tärkeimmän bulkkituotteen, suolan, osuus tuonnista kasvoi kaupan määrän kasvaessa. Kasvanutta kaukokauppaa Ruotsin ja Etelä-Euroopan välillä ei voida siis yhdistää kasvaneeseen luksustuotteiden kysyntään tai muutoksiin kulutustottumuksissa. Tätä voidaan pitää yhteneväisenä aiempien tutkimusten kanssa, jotka ovat osoittaneet talouskasvun olleen pysähdyksissä merkantilismin ajan Ruotsissa. Viennin muuttomaton rakenne kertoo jatkuvasta ja tasaisesta kysynnästä ruotsalaisille laivanrakennusmateriaaleille 1700-luvulla.

Asiasanat: ulkomaankauppa, taloushistoria, merenkulun historia, kansainvälinen kauppa, kauppatilastot, Juutinrauman tullitilastot, kaukokauppa, 1700-luku**,** kaupan rakenne, suola, laivanrakennusmateriaalit, terva, luksustuotteet, rauta, puutavara, Ruotsi, Portugali, Espanja, Välimeri, Levantti

Säilytyspaikka: Jyväskylän yliopiston kirjasto JYX-julkaisuarkisto

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Terminology

Cif (Cost, insurance and freight)	Trade values include the cost of freight and insurance. During the eighteenth century, Swedish trade statistics reported both exports and imports in fob-prices.[1]
Fob (free on boards)	Trade values do not include the charges for transportation.
Import/Export	These terms are used from Swedish perspective. Import: Cargoes arriving from Southern Europe to Sweden. Export: Cargoes departing from Sweden to Southern Europe
Kammarkontoret	Chamber Office (Sweden)[2]
Kommerskollegium	National Board of Trade (Sweden)
Krammerie or kram waror	Various small wares, unspecified small manufactured goods, mercery, haberdashery.[3]
Last or ship-last	In Swedish *läst* or *skeppsläst,* in Danish *læst*, unit for the ship's cargo capacity. Last was a volume and weight unit, 2,448 kg.[4]
Miscellaneous cargoes	Refers to all products, other than the main product categories (timber, metals, and tar for exports; salt, fruits, sugar, wines and beverages for imports) in this research.
Miscellaneous goods	Refers to a product category of "*allehanda waror*" in Swedish datasets.
Passage ID	In the Sound Toll Registers Online database, each passage through the Sound has an individual record ID number. By entering this ID number in the STR Online, a picture of the original passage document, as well as cargo and passage information in digitized form can be found.
Skippund or skeppund	Ship pound, 136 kg.

[1] Häggqvist 2015, 72–74.

[2] In the research literature kammarkontor is rarely translated. Therefore, several translations for this authority exist: "accounts office" Ågren 2017, 79; "fiscal office" – in the nineteenth-century context, Kaukiainen 1971, 125. For instance, translation "chamber office" – in the nineteenth- and twentieth-century context has been used by Hallenberg & Linnarsson 2017.

[3] In Danish STR "krammerie", in Swedish BoT statistics "kram waror" (in Dutch "kramerij").

[4] See Appendix 1: Last.

Abbreviations

BoT Board of Trade Sweden; *Kommerskollegii, Kammarkontoret*.[5] Refers to both of following Swedish datasets used in this research.

BoT2 *Kommerskollegii Kammarkontoret Årsberättelser Utrikes Handel Serie 2*

= Import and export schedules (Sw. *generalpersedelextrakt*)

BoT3 *Kommerskollegii Kammarkontoret Årsberättelser Utrikes Handel Serie 3*

= Balance of trade accounts (Sw. *handelsbalansutrakningar*)[6]

SAO Svenska Akademiens ordbok

SCB Statistiska centralbyrån

STRO Sound Toll Registers Online (database)

Swedish currencies

dsm daler silvermynt[7]

rdr riksdaler[8]

rds riksdaler specie

sk. skilling

Danish currencies

Rd. rigsdaler

[5] Some literature also uses a translation "the Royal Board of Commerce". See e.g. Högberg 1969, 238–243. Also a translation "Royal Board of Customs" have been used, see Boëthius 1953, 175. However, "Board of Trade" is more established translation.

[6] Source for translations of BoT2 and BoT3: SCB 1972, 66. In comparison, for instance Högberg (1969) uses a translation "trade balance statements" for BoT3.

[7] In the research literature, there are several abbreviations for daler silvermynt. For example, in Edvinsson et al. (2010) both abbreviations (dsm and d.s.m) are used, while Edvinsson et al. (2014) uses abbreviation dsm.

[8] In the research literature, there are several abbreviations for riksdaler (Rd., Rdr., Rdlr, R:dr). This abbreviation (rdr) has been widely used, for instance by Edvinsson et al. (2010).

Acknowledgements

I would especially like to thank Jari Ojala, Jari Eloranta, Christina Moreira and Jaime Reis for comments, guidance, and suggestions. Also, I want to thank the Department of History and Ethnology for a few months research funding for this topic.

1. Introduction

1.1. Research setting

The significant growth in international trade in the early modern period has been found to be an essential factor in creating conditions for globalization, economic growth, and industrialization.[9] The expanding trade between Northern and Southern Europe during the eighteenth century is one example of this process. The objective of this research was to evaluate the amount and structure of trade between Sweden and Southern Europe during this period. A database from 1700 to 1815 measuring trade amounts was constructed by using Danish Sound Toll Registers and the Swedish Board of Trade datasets. To conduct a quantitative analysis of direct imports and exports between Sweden and Southern Europe, trade amounts were measured in metric tons and in value.

Traditionally, the Baltic and the North Sea regions were important areas for Swedish trade and seafaring. During the eighteenth century, the increase in Sweden's international trade was significant, as was the trade to Southern Europe. The increase in trade between Sweden and Southern Europe was a consequence of several institutional changes and increased demand for salt in Sweden and iron and timber in Southern Europe.[10] The 1724 Swedish Navigation Act – a measure to protect the domestic shipping industry – increased direct trade between Sweden and Southern Europe in Swedish vessels, while the Dutch and British intermediary trade in Swedish foreign trade decreased significantly.[11] To promote trade, Sweden established a comprehensive consular network in Southern Europe, signed peace treaties with North African corsairs, and implemented the practice of convoying in Southern Europe.[12]

The salt imports from Southern Europe to Sweden formed the foundation of the trade. Even though Southern Europe was not a major trading area for Sweden, the economic relations between the two areas were extensive. To preserve food, mainly fish, salt was consumed in large amounts, and after grain, salt was the second-largest import necessity in Sweden. Since the commercial fishing catches of herring increased substantially in the second half of the eighteenth century, this increased the

[9] The literature of this topic is extensive, see e.g. Allen 2003; O'Brien 1982; O'Rourke & Williamson 2002. The timing and the extent of, for instance, globalization has been widely debated.
[10] See, for instance, Müller 2008; Müller 2004; Lindberg 2005; Carlén 1997.
[11] Israel 1998, 1002. About mercantilism in Sweden, see Heckscher 1953; see also Magnusson 1999.
[12] About consular network, Müller 2004; also Müller 2006; Müller & Ojala 2002. About convoying, see also Carlson 1971.

trade volume between Sweden and Southern Europe.[13] Moreover, large amounts of timber, iron, and tar were exported from Sweden to the ports in Southern Europe. Furthermore, as salt cargoes required high shipping capacity, the ships used in trade were large.

Most of the goods were carried by Swedish ships, and Portugal was the most important destination for ships carrying goods between Sweden and Southern Europe. Yearly, the ships also visited Spanish, Italian, and French ports in the Mediterranean, and occasionally, some ships found their way to ports in Northern Africa and Levant. An important incentive for trade with Southern Europe was profitable, but especially during war times risky, tramp shipping in the Mediterranean. A high proportion of Swedish ships engaged in tramp shipping, especially during winter, when the Baltic Sea was frozen.[14]

Southern Europe had unfavorable preconditions for Swedish shipping, as there was a lack of established trade networks and the threat by North African corsairs, compared to major trading areas, namely the Baltic, Britain, the Dutch Republic, and the Atlantic coast of France.[15] The establishment of new institutions, such as the Convoy Office and convoying, the consular network, and the peace treaties with the North African states, decreased the direct transaction costs and enabled the increase in Swedish shipping in the Mediterranean. Increasing long-distance trade in Southern Europe expanded the Swedish trade networks and commercial relations in that area. Moreover, Southern Europe also provided a connection to a much larger market area, which included the Portuguese, Spanish, and French colonies, and via the Levant area, a link to Western Asia.

Customs accounts provide comprehensive data for the analysis of the trade structure and trade patterns. In this research, three original sources: the Danish Sound Toll Registers (STR), the Swedish Board of Trade Statistics import and export schedules (BoT2), and the balance of trade accounts (BoT3), are used in a complementary manner. The customs accounts are a valuable source material; first because they offer a huge amount of data that has been collected over a long period in a

[13] About the Swedish trade and shipping during the eighteenth century and about the Mediterranean shipping, see especially Högberg 1969, Müller 2004, and Carlson 1971. About salt and salt trade, see especially Carlén 1997. See also Lindberg 2005.

[14] For a comprehensive summary of Swedish trade with Southern Europe see especially Ojala 2019, 184–186.

[15] About the classification in big trading areas, see SCB 1972, 101 and also Högberg 1969, 57–63. Not only the physical but also the psychic distance, meaning the differences in the business environment, the cultural and political matters and level of the economic development, relating to the established institutional manners surely disrupted Swedish to step into new markets in Southern Europe. About the psychic distance, see Johanson & Vahlne 1977, 24; also Johanson & Wiedersheim-Paul 1975.

relatively uniform manner, and second, because few merchant archives have been preserved.[16] While customs material cannot provide information about some of the fundamentals of economics, such as profitability, they are of significant benefit when analyzing the major trends of the trade.

Picture 1. Swedish shipping in Southern Europe during the eighteenth century

In the late eighteenth century, yearly, over a hundred Swedish ships sailed to the Mediterranean ports. Ships mainly exported timber, iron and tar; and imported large quantities of salt but also numerous exotic goods such as wines, fruits or dyestuff.[17]

1.2. Research questions and research structure

The point of interest in this research is in the trade structure and in the trade patterns. In analyzing the trade structure, this research tries to answer the following questions. What was the cargo structure measured from trade volume and value? What were the most dominant import and export cargoes?

The amount of trade between Sweden and Southern Europe increased during the eighteenth century. Earlier research has not yet analyzed the linkage between trade growth and trade

[16] Regarding the merchant houses, Samuelsson 1951; Müller 1998; from Finnish perspective, Ojala 1999.
[17] A detail of a painting *Marine et paysage sur les bords de la Méditerranée*. By Joseph Vernet 1773. Louvre, Paris. Photograph by author.

structure. This research also tries to analyze the question of structural changes, namely, did the cargo structure of imports or exports change during the eighteenth century?

In this research, the question of trade patterns tries to answer the questions such as: what were the most important import and export destinations in Southern Europe, and how did the ship cargoes differ between particular trade destinations? Earlier research has underlined the importance of Portugal as a trade destination for Sweden in Southern Europe. One aim of this research was to understand the significance of all countries in Southern Europe, and Southern Europe as a whole, for the Swedish foreign trade during the eighteenth century. Additionally, what are the differences between different trade destinations when trade is measured by value or by volume?

Examination of the trade patterns between two countries or regions can attempt to answer more general questions as well. As shown by O'Rourke and Williamson (2002), on a global level, during the early modern period, long-distance trade increased significantly but was limited to non-competing goods. This research can enlighten whether this was also the case within European long-distance trade by portraying and analyzing the changes in the trade structure during the eighteenth century.[18] In addition, the changes or stability in cargo structure can improve the analysis of consumer habits.

Chapter 2 and Chapter 3 provide a background for the topic by describing previous research and the framework of Swedish shipping in the eighteenth century. In Chapter 4, the statistical materials used in this research are described.

Müller mentioned how Swedish shipping increased substantially during the eighteenth century and the crucial role Southern Europe played in that increase.[19] Shipping in this context also includes Swedish tramp shipping between Mediterranean ports. In this research, the development of the share of Swedish trade with Southern Europe, in terms of value, will be analyzed in order to examine the role of Southern Europe as a bilateral trade partner. This question and the question of trade amount, will be analyzed in Chapter 5.

The question of trade composition and the traded goods are analyzed in Chapter 6. What kinds of products were imported and exported? What was the trade structure? Did the trade composition change over time? Is there any evidence about the shift towards high-value per volume goods? How

[18] There were no radically different consumer habits in the Baltic area and in the Western Europe. See, Rönnbäck 2010. About consumption also Ryckbosch 2015.
[19] Müller 2004, 144.

did the traded items vary among different destinations? This study examines the trade structure in different levels: trade structure between Sweden and Southern Europe as whole as well as the trade structure between Sweden and the selected countries. When examining the changes in trade structure as a whole, this study does not analyze if possible changes are explained with the fact that trade with certain destinations expanded faster.

Previous research has mainly measured trade amounts of different cargoes in original units, by measuring, for example, the timber trade in dozens and salt trade in barrels. Thus, the early modern cargo structures have been rarely evaluated at this level of detail in metric tons, along with trade values. This research has measured different cargoes in metric tons, which enables the evaluation of the total trade and the trade structure. Appendixes 1–5 describe the methodology used when converting different cargoes and units in metric tons and also lists different conversions used in this process.

2. Previous research

Previous research on eighteenth-century Swedish foreign trade cargoes has focused either on individual products or on a few main bulk cargoes over a long period of time. As Högberg (1969) notes, eighteenth-century Swedish trade statistics included a vast number of different export and import items and a great variety of different units and measures. This makes detailed analysis of the trade structure in the early modern period challenging.[20] A comprehensive study of the trade structure of the Swedish trade with Southern Europe has not been done previously. Müller, for example, has outlined the composition of a few key export and import commodities during aggregated time periods.[21] Yet since the original units are kept as such, and trade amounts are described, in ten-year averages, differences or changes in cargo composition are not discussed in detail in Müller's research. In the current research, by measuring the amounts of different cargoes in uniform units as well as total trade volume over an extended period of time, the relationship between the development of trade structure and long-distance shipping can be accurately assessed.[22]

[20] Högberg 1969, 21. For instance, SCB 1972, measures trade by using original units before 1860 and after that in metric system.
[21] Müller 2004, 134–141.
[22] Measuring early modern trade consistently in metric equivalents is relatively new phenomenon. For methods of converting commodities in metric units, see e.g. Scheltjens 2009, 2015.

Previous research has approached Southern European trade from different viewpoints. The most significant studies related to eighteenth-century Swedish trade with Southern Europe include, Leos Müller's (2004), *Consuls, Corsairs and Commerce;* Stefan Carlén's (1997), *Staten som marknadens salt*; and Staffan Högberg's (1969), *Utrikeshandel och sjöfart på 1700-talet*. In addition, several works by Eli Heckscher discuss the development of Swedish foreign trade and shipping, in general, during the same period.[23] These studies share a focus on trade growth and institutional changes. Another key area of interest in international trade between Sweden and Southern Europe has been the Napoleonic Wars – for example, Högberg (1964)[24] and Carlson (1971)[25]. Trade between small states, particularly between Sweden and Portugal, has also been explored in several recent studies, such as Müller (2008), Lindberg (2005), Moreira et al. (2015), Eloranta et al. (2015), and Ojala et al. (2018), Müller (2019).

The major focus on institutional changes in eighteenth-century Swedish foreign trade has been trade protectionism and the 1724 Navigation Act. According to Heckscher (1922), protectionism had a negative economic impact – import prices increased, export prices decreased – although Heckscher has also argued that the Navigation Act itself did not directly affect trade development.[26] In contrast, Högberg (1969) does not accept strong criticism of protectionist trade policy; his study shows a significant increase in trade volumes for Sweden in the long run during the eighteenth century.[27] However, he also notes that foreign trade value did not show any clear tendency to increase or decrease during the eighteenth century.[28] Both Högberg and Carlén (1997) claim that there is no empirical evidence of import price increases caused by the Navigation Act. The recent research by Ojala and Räihä (2017) agrees with the criticism of the Navigation Act and suggests that the deregulation caused trade growth.[29]

The two most voluminous import commodities during the eighteenth century were salt and grain. Högberg states that from Swedish perspective markets for grain, for instance, were rather

[23] Heckscher 1922; Heckscher 1953.
[24] Högberg, Staffan (1964). Svensk medelhavsfart och Sveriges handel med Portugal under Napoleontiden. Forum Navale, 19–20: 16–42.
[25] Carlson, Bengt: Sveriges handel och sjöfart på Medelhavet 1797–1803. In Handel och sjöfart under gustaviansk tid. 1971.
[26] Heckscher 1922, Chapter VI Produktplakatet 164–256; especially 226–227. Heckscher 1949, 663. See also Häggqvist 2015, 19–21.
[27] Högberg 1969, 238–243.
[28] Högberg 1969, 238.
[29] Ojala & Räihä 2017, also Ojala, Räihä & Karonen 2019.

efficient.[30] Carlén demonstrates that, after the passage of the Navigation Act, salt prices decreased in Sweden when measured both in absolute price and in terms of other commodities, and also in terms of market price in Holland.[31]

Müller (2004) focuses on eighteenth-century institutions, particularly the consular agencies in the Mediterranean and also in the West Indies and the United States. Müller claims that the consular network as an intermediary agency, along with the peace treaties with the Barbary States and the convoying, played an important role by decreasing transaction costs for Swedish shipping in the Mediterranean, thus anchoring and regularizing trade in Southern Europe.[32]

Earlier research related to Swedish foreign trade, but also to European trade in general, has focused primarily on quantities of major bulk cargoes. For instance, Högberg (1969) extensively measured and analyzed trade volumes and the development of major export products (iron, timber, tar, and fish). Regarding import cargoes, Högberg's analysis included only salt and grain.[33] Thus, certain export products and several import goods are not included in his research. Quite recently, the digitalization of the STR has enabled more detailed analysis of trade structure and development. For instance, Rössner (2010) mentions two interests – the reliability of early modern trade statistics and monitoring the structural changes of trade – that the new STR digitization project will highlight.[34] Scheltjens (2015), for instance, has covered the conversions of very different cargo measurements into metric equivalents, and the structural changes in trade volumes of different product categories when analyzing French imports to the Baltic from 1670 to 1850.[35]

Foreign trade and maritime histories tend to focus on countries' periods of greatness.[36] This is also prevalent in Swedish research: there have been numerous studies related to the country's eighteenth-century trade and shipping, and most of these focus on the second half of the eighteenth century or the early nineteenth century.[37] The sources also define the research and, for instance, research concerning Swedish merchant houses mainly begins with the period of the revolutionary

[30] Högberg 1969, 241–242.
[31] Carlén 1997, Chapter 7, especially 247.
[32] Müller 2004.
[33] Högberg 1969.
[34] Rössner 2010. He talked about these research interests more as his personal interest, but they can also be generalized considering the context where he mentioned those.
[35] Scheltjens 2015b. Also Scheltjens 2009. See also Theodoridis, Rönnbäck & Scheltjens 2019.
[36] Ojala & Tenold 2013.
[37] Compare to Müller 2004, 23. As Müller claims, the economic history focus in Sweden has quite strongly been on other subjects such as protoindustrialization and agriculture. However, recently there has been various research related to Swedish international trade during the Napoleonic Wars.

wars. Recently, however, the focus of Swedish maritime history has started to shift from national historical narratives to more global topics, such as small states and neutrality, to counterbalance the overstressed importance of the traditional maritime power's golden age of shipping.[38]

Research focusing on Swedish trade with Southern Europe has addressed trade, particularly in the context of salt or institutions, or trade during the period of the Napoleonic Wars.[39] Lindberg (2005) studied the early eighteenth-century Swedish salt trade with Setúbal before 1738.[40] Lindberg's analyses show not only extensive trade relations between the two countries but also high speculation in the markets. During 1713–1715, when Denmark blockaded the Sound from Swedish trade, a salt shortage occurred in the Baltic area of Sweden, although salt was delivered to Sweden from Setúbal via Amsterdam. At that time, Dutch merchants tried to monopolize the salt trade by buying everything on the market, but this attempt failed.[41] Müller (2008) stated that mercantilist policy established an institutional framework for Swedish trade in Southern Europe, which enabled Swedish commercial activity. In addition, his study suggests that Swedish merchants acquired salt cargoes from the Mediterranean when the price in Portugal was high, and vice versa. This implied that the salt market was effective.[42] In addition to these topics, slave trade, for example, the Swedish seamen in captivity in North Africa, and the Swedish colonies have been studied recently.[43]

3. Research frame

Since the political changes and wars significantly influenced economic activity and shipping, they outline the time frame of this research as well. From the Swedish point of view, the beginning of this study, the year 1700, is characterized as a starting point of the Great Northern War and the research continues until the end of the Napoleonic Wars in 1815.

The time frame of 1700–1815 was a period of increasing shipping between the Baltic and the rest of Europe. The beginning of the period, years 1699–1700, represents the typical years for the late seventeenth-century ship traffic.[44] However, the first decades of the eighteenth century showed a

[38] Eloranta et al. 2018.
[39] Regarding Napoleonic Wars and small states, see Eloranta et al. 2018, and Marzagalli & Müller 2016.
[40] Lindberg 2005.
[41] Lindberg 2005.
[42] Müller 2008.
[43] About the Swedish slave trade and colony, see Weiss 2016. For Swedish seamen as slaves in the Barbary States, see Östlund 2014.
[44] Degn 2010, 377.

decrease in European trade, and for the Swedish economic life, this period was especially disastrous. Due to great political uncertainty caused by major European wars, The Great Northern War (1700–1719) and the War of the Spanish Succession (1701–1714), economic performance was low in the early eighteenth century. From the 1720s until the Napoleonic Wars, the growth of Swedish and European shipping was clear. This period also saw several European Wars, but their influence on Swedish trade was limited. In fact, wars increased the demand for many Baltic naval store products and Swedish merchant fleet could often benefit the neutrality. However, the Revolutionary and Napoleonic Wars disturbed the European economic performance with the turn of the nineteenth century.[45]

The year 1815 has been the typical landmark that has framed research concerning the economic history of Sweden.[46] Politically and economically, the first few decades of the nineteenth century saw several notable changes in Sweden. In 1809, Sweden lost Finland to Russia, and the same year, the politically weak country saw a revolution. Territorial loss decreased one-fourth of the realm's population. In total, this impact was limited to Swedish foreign trade, although for particular products it was more severe. In the late eighteenth and early nineteenth century, 24 percent of tar exports and 16 percent of forestry exports came from Finland.[47]

However, the state strengthened politically after 1814 when Norway was forced into a union with Sweden. From an economic perspective, Sweden faced a notable challenge in its most important export sector, iron production, in the early nineteenth century. After the substitution of puddled iron in England, Sweden started to lose its former market share to the British.[48] According to Müller (2004), the end of the Napoleonic Wars also notably changed the Swedish trade to the south, when the whole Iberian Peninsula lost much of its importance in Sweden's shipping and trade.[49] In maritime history in general, the end of the Napoleonic Wars in 1815 also represents a notable turn for Sweden since the importance of its neutrality decreased significantly.[50] According to Müller (2004), neutrality was not a competitive advantage for Sweden after 1815.[51]

[45] O'Rourke 2006. Regarding Napoleonic Wars and small states, see Eloranta et al. 2018, and Marzagalli & Müller 2016.
[46] For instance, Heckscher 1949a and Heckscher 1949b, covers the period of 1720–1815. About "landmarks" concerning the research of the economic history of Sweden in the early nineteenth century, see e.g. Boëthius 1953, 146.
[47] Häggqvist 2015, 76.
[48] About the march of new British iron industry and its' impact on Swedish iron markets, see Eklund 2001.
[49] Müller 2004, 17–20. Also the STRO.
[50] About the periodization in maritime history overview books, see, for instance, Rinman & Brodefors 1983.
[51] Müller 2004, 228–229.

Geographically, this research includes all trade to and from Sweden proper (Sweden and Finland) and thus excludes the dominions and possessions of Sweden (Swedish Pomerania is considered the most important). However, it should be noted that an important part for Swedish merchant fleet was registered to Pomerania.[52] The trade of different geographic or administrative regions, for example, Finland, has not been examined separately in this research. From juridical, administrative, and political perspectives, Finland was a solid part of the Swedish empire. Since the perspective in this research is institutionally solely in Swedish trade, trade to and from the southeast parts (so-called old Finland) has been excluded in this research, although Vyborg was by far the most important Finnish port for timber exports during the eighteenth century.[53]

In Sweden, shipping was centralized around a few of the country's largest harbors, including Stockholm and Gothenburg. It is worth noting that when STR is used in this research, the goods shipped to and from Halland and Bohuslän (Gothenburg being the most important port) are not represented in the dataset.[54] Similarly, in this research, the export areas and countries of Southern Europe were reported on like they are registered in the original sources. No analysis has been undertaken to determine where the product originally came from (e.g., from the Portuguese colonies or Portugal). Hence, the focus of this research is to examine direct bilateral trade between Sweden and Southern Europe.

Over the eighteenth century, Sweden lost territorial control over the Baltic region. Large territories in Sweden proper were ceded to Russia in 1721 (Vyborg), 1743 (Hamina), and, in 1809, the whole of Finland. After the Great Northern War, Sweden lost other territories, including in 1719 (Bremen-Verden), 1720 (Western Pomerania), and 1721 (Livonia, Estonia, Ingria, and Karelia). In 1803, the Baltic port town of Wismar was pledged to Mecklenburg. At the end of the research period, in 1814, the two kingdoms of Sweden and Norway established a personal union.

The original sources imposed two specific limitations: firstly, on the period of analysis; and secondly, on trade area classification. Details of time frames in the statistical material used in the research, as

[52] Ressel 2012, gives a comprehensive description of Pomeranian shipping, particularly regarding the trade with Mediterranean.
[53] Ojala & Räihä 2017. Ojala, Räihä & Karonen 2019. In this research the STR should have included cargoes to and from Vyborg before 1721; and accordingly to and from Hamina until 1743. However, there was no data of ships between Southern Europe and these ports. Hamina was included in Swedish BoT data during 1738–1742.
[54] There are a few exceptions for this. See, for example, Passage ID: 330721;364120; 380368; 342207; 397312; 181565; 596691.

well as the issue of how trade areas are classified in those sources, are given in Chapter 4 Sources and Data.

3.1. Swedish economy and economic policy in the eighteenth century

Iron played a major role in Sweden's rise in the world economy, and it was the most important Swedish export in the eighteenth century.[55] In Sweden, the main export sectors of copper, high-quality iron, and tar, were all connected to the state. The Crown, for instance, encouraged the production of iron ore and various iron manufactures and was also a major customer for iron products, using them for military equipment.[56] Unlike in the European copper market, Sweden never had a quasi-monopolist position on iron exports; and, since the 1740s, Russian iron started to challenge Swedish iron manufacturing.[57]

In the previous research literature on early modern trade, there is wide discussion of the level of market integration and the timing of globalization, which are connected to even broader debates on the origins of capitalism and the economic growth.[58] According to Magnusson (2010), from the seventeenth century onwards, Sweden slowly became a part of the so-called "capitalist world" and capitalist growth, mainly due to growth in foreign trade. Magnusson used the term "capitalist world" as opposed to a term market economy, which means that the Swedish economy was strictly regulated, especially when it came to foreign trade and shipping and also in certain industrial sectors such as iron production. Magnusson also claimed that this type of regulation was necessary for new capitalist players, especially on a national level.[59] For example, the main reason Sweden had to introduce protective mercantilist policies, was the similar existing doctrines of many other seagoing nations, including Britain and the Dutch Republic, together with the fact that Swedish shipping was not always as competitive as, for example, the Dutch. Consequently, in order to gain market share in the Baltic trade, Sweden had to build its own "mercantilist box".[60]

The idea of necessary regulation and protectionist restrictions on trade in the early modern period, is somewhat in line with an old theoretical explanation by van der Kooy (1931), claiming that before

[55] Wallerstein 1980, 101. Based on BoT3 data, 85 percent of exports to Britain was iron.
[56] Wallerstein 1980, 209–210.
[57] Davis 2012, 209–210.
[58] See, for example, Allen 2011; O'Rourke & Williamson 2002.
[59] Magnusson 2000, Introduction.
[60] The concept "mercantilist box" was first introduced by de Vries. See, de Vries 2005, 9. See also de Vries 2001, 123. Rönnbäck used and discussed the concept of mercantilist box widely in the Swedish context. See, Rönnbäck 2006.

industrialization, the rise of a distributive trade network needed a ”general world emporium” such as the Dutch Republic at the European level. Van der Kooy's idea was that because there were many risks and hazards involved in the international trade, and while the economic integration was low, it was crucial to centralize trade and stockpile actions in the staple market. The Dutch Republic was, for example, according to van der Kooy, one big entrepôt: a distribution center. Based on this theory, the Dutch role as a hub and dealer between Sweden and Southern Europe in the seventeenth century could be seen as a contemporary necessity, that made trade more predictable.[61]

Despite different trade barriers, further research has shown that markets were well integrated in the early modern period. The eighteenth-century trade patterns were dynamic and complex, and despite mercantilism, the foreign trade can be described as non-linear and even open.[62] As Lindberg (2005) mentions, the European markets were well functioning in the early modern period.[63] In general, after the age of discovery, world trade patterns became more complex, and this complexity restricts analysis of bilateral trade. For example, after the end of the seventeenth century, the re-export of products in Europe clearly increased, and this phenomenon intensified during the next century.[64] However, for example, O'Rourke and Williamson claim that market integration and the most notable shift to real globalization only began in the early nineteenth century.[65] The nineteenth century witnessed major changes in price convergence and the integration of sea and land transport.[66]

One example of centralization is the role of merchant houses in terms of capital accumulation, and thus, in trade growth.[67] In Swedish cities, many merchant houses participated in foreign trade. For example, in Stockholm, about 150 merchants attended to wholesale export trade yearly, while in wholesale import trade the number of merchants was much higher, about 450 merchants each year. However, particularly the largest merchant houses dominated the export activities. In Stockholm,

[61] About Dutch linking Sweden to world markets, see e.g. Israel 1989. Anders Chydenius, one of the first liberalists, was in general against trade centralization to few largest ports. However, in certain circumstances, if amount of certain export goods was insufficient, he accepted the sale of those goods to domestic staple ports. Chydenius 1929.
[62] In market integration, there are various levels. The integration of exchange rates and the level of cashless payment system are good concepts and indicators of market integration in the early modern world. See Denzel 2010. Regarding the major trends in the early modern period, see also Unger 1997; Harley 1988.
[63] Lindberg 2005, 184.
[64] Åström 1963, 56.
[65] O'Rourke & Williamson 2002. About the merchant networks in Europe, see e.g. Ojala 1997.
[66] Müller 2004, 2 ff.
[67] Magnusson 2000, 91–105.

the ten biggest merchant houses conducted half of the city's export trade during the eighteenth century.[68]

A long-term debate in Swedish economic history writing concerns the role and impact of regulation in the early modern period. For example, in the 1950s, history writing portrayed the privileged Stockholm merchants as a necessity for economic growth.[69] On the contrary, more recent research, for example, Lindberg (2007), holds the opposite viewpoint. He claims that mercantilist regulation did not cause economic growth, nor did it generate dynamic changes in the economy. According to Lindberg, the economic regulations led to increasing urban inequalities, and also did not result in GDP growth.[70] Accordingly, Ojala and Räihä (2019) argue that in Finland deregulation resulted in overall trade growth.[71]

During the early modern period, the increase in GDP per capita came largely from non-agricultural activities.[72] European eighteenth-century commerce, especially distant shipping, expanded much faster than income or GDP.[73] For example, GDP per capita increased 33 percent in Great Britain and 20 percent in Holland during the eighteenth century.[74] During the same period, British tonnage expanded from 320,000 tonnes in the year 1702 to 1,856,000 tonnes in 1800.[75] Increasing commercial activity between countries, despite restrictive mercantilist policies, made the world more open, not only to the exchange of new products but also to new influences.[76]

Although the significance of foreign trade expanded, it is important to put the proportion of foreign trade and its importance into perspective and remember the structure of contemporary society. Before industrialization, the share of foreign trade of the aggregate demand and GDP, especially in Sweden, was small. However, the production chains of different traded goods played a determining role in the economic activity of many European people. In the eighteenth century, most of the

[68] Nyberg 2006, 27–30. About the Stockholm merchants, see also Nyberg 2010, 186–187.
[69] Samuelsson 1951.
[70] Lindberg 2007. About the Swedish economy in the eighteenth century, see especially Heckscher 1949a; Heckscher 1949b; Heckscher 1949c; Magnusson 2000.
[71] Ojala & Räihä 2017.
[72] van Zanden 2001, 82–84.
[73] About the increase in distance shipping, see Rinman & Brodefors 1983. About the nominal wages see Allen 2001. About the GDP, see Maddison 2007; Maddison 2010. See also Van den Berg & Lewer 2007, 21–28. About Swedish GDP in the early modern period, see Edvinsson 2013.
[74] For the GDP growth rates, Maddison 2010 database has been used. Note also, that there were several European countries such as Sweden, where GDP growth stagnated or even declined during the eighteenth century. About Swedish GDP estimates see a Edvinsson, 2013.
[75] Unger 2011, 11; Davis 2012, 24–26.
[76] Rinman & Brodefors 1983.

population in Sweden lived in autarky and had little direct contact with international commerce or the market economy.[77] Although the importance and population in port cities increased during the eighteenth century, the proportion of urban population hardly changed.[78] In Sweden, economic development, in general, was slow and even negative during the same period, while foreign trade and shipping increased significantly. Since the foreign trade trends reflect consumption changes rather well, this is a good reason to research international trade in the early modern period.

3.2. Swedish international trade during the eighteenth century

Högberg (1969) estimated the growth of major import (salt and grain) and export (iron, steel, boards, and tar) commodities in tons. Högberg showed that by the year 1800, shipping volume between Sweden–Finland and the rest of the world was almost twice as much as the mid-1730s. During the eighteenth century, exports increased faster than imports. The average export volume of those main cargoes was 33,000 ship-lasts in the 1740s, which increased to 67,000 lasts in 1801–1805. In the same period, imports of salt and grain increased from 27,000 lasts to 35,000 lasts.[79] During the eighteenth century, Great Britain was the most important trade partner of Sweden.[80]

Högberg calculated that iron exports increased from the 1740s to the 1760s but then stabilized; the growth rates of the export volume of timber and tar were higher than those of metals. The herring exports increased tremendously during the eighteenth century. Before the 1750s, Sweden imported fish, while in the 1790s, herring exports were 14,000 ship-lasts.[81] The volume of import cargoes fluctuated significantly because the grain imports were dependent on the domestic harvest situation.

These export estimates for iron, which was the most important export product for Sweden in the eighteenth century, are in line with the research of Heckscher (1922) and Hildebrand (1957). In the first half of the eighteenth century, Swedish iron dominated the European market as one-third of the total iron was manufactured in Sweden.[82] Although Sweden played a vital role in that market, it

[77] See, for instance, Evans & Rydén 2007, 20.
[78] Gadd 2000, 185 ff. Lilja 2007, 37–38.
[79] Högberg 1969, 19–33.
[80] BoT3.
[81] Högberg 1969, 19–33.
[82] Heckscher 1922, 146–63.

was not significant enough to give them control over prices or enjoy a monopoly.[83] From the mid-eighteenth century, Swedish significance in the European iron market started diminishing.[84]

The survey of the balance of trade accounts shows a very different picture of trade than the volume of trade in metric tons. Although the trade volume doubled in the eighteenth century, import or export value does not show any tendency upwards or downwards. Högberg (1969) states that the import and export value increased in the 1780s and export in the 1790s, but by 1800, trade values decreased to a similar level as before the mid-eighteenth century.[85] For example, Edvinsson (2009), has evaluated that the Swedish trade balance was negative from the second half of the seventeenth century to the late eighteenth century; while during the early nineteenth century, the trade balance was positive again. However, the quite recent debate whether Swedish trade balance was positive or negative in the late eighteenth and early nineteenth century, shows the ambiguity of trade balance statements in general and how much effect the methodology has when evaluating trade balance.[86]

During the eighteenth century, foreign trade, especially the long-distance trade of Sweden, increased significantly.[87] Even though only a small percentage of the population directly took part or were influenced by foreign trade, for example, a small percentage of the population lived in cities, however, in port cities and regionally, foreign trade had a major economic impact. Furthermore, the growth of foreign trade also contributed to proto-industrialization (household handicraft production). Thus, peasants were also a part of the European and global commercial networks. To generalize, in Finland, peasants often had a secondary occupation in forestry goods, producing tar and manually sawn timber, while in Sweden, peasant households could work in the iron industry, fishing, or manufacturing occupations.[88]

In the seventeenth century, most of the Swedish trade was carried in Dutch (or British) ships through the economic centers of the North Sea region, London, and Amsterdam. For example, still in the

[83] Hildebrand 1957, 108.
[84] Högberg 1969, 76–83; Heckscher 1922, 146–63.
[85] Högberg 1969, 238–243.
[86] Edvinsson 2009. For the early nineteenth century, Häggqvist has an opposite view, claiming that the trade balance was negative. See Häggqvist 2015, 77. Actually the discussion of positive or negative trade balance has a long tradition. Häggqvist mentions, for example, how Heckscher evaluated Swedish trade balance positive, while according to contemporaries, trade balance was actually negative.
[87] Müller 2004. For the Finnish ports, the increase in long-distance trade to the Mediterranean was distinctive in the eighteenth century. See Jutikkala, Kaukiainen & Åström 1980, 273–274.
[88] About Sweden connecting to trading networks, see, for example, Evans & Rydén 2007, 20.

first part of the seventeenth century, Dutch shippers regularly participated in Swedish domestic shipping, but due to Swedish mercantilist statutes in the 1650s and 1660s this activity ceased. In foreign trade, Sweden's strong dependency on the Dutch carrying the trade between Sweden and Southern Europe continued until 1720s.[89] As mentioned by Åström (1962), already in the seventeenth century, a dominant idea in Swedish commercial policy was to ensure the direct maritime lifeline with the salt harbors of the south, and in the late eighteenth century some 20 Swedish ships sailed annually to Portugal.[90]

Especially after the passage of the Swedish Navigation Act in 1724 onwards, tightening mercantilism, however, decreased Dutch commerce in the Baltic, and the foreign trade became quite fast under Swedish hands.[91] However, the process was not immediate. After the vastly disastrous Great Northern War, in the 1720s at worst the Swedish commercial fleet included only 19 ships available for the foreign trade.[92] Thus, after 1724, some of the Dutch ships were out-flagged to the Swedish flag, however, in the long run, Swedish ships replaced the Dutch in bilateral trade between Sweden and Southern Europe.[93] As shown by Eloranta et al. (2015), for example, over 90 percent of trade between Sweden to Portugal during 1700–1800, was carried by Swedish ships.[94]

One theoretical approach, the World System Theory by Immanuel Wallerstein, describes the eighteenth-century world as solid and stationary regions, led by London and Amsterdam. As the development of Baltic trade in the eighteenth century shows, the Dutch and British commercial and economic influence in the Baltic decreased while Swedish and Russian increased.[95] Also, the growth of direct Swedish shipping to the Mediterranean is one example of how large and fixed commercial centers in Holland and Britain were replaced, creating European trade that was more multi-centered.[96]

[89] Israel 1989, 216–217.
[90] Åström 1962, 29.
[91] Israel 1998, 1002.
[92] Eriksson 1987, 7.
[93] Müller 2004, 62. On out-flagging, see also Ahonen 1988.
[94] Eloranta et al. 2015.
[95] Regarding the major trends in the Baltic trade, in the nineteenth century, after the Napoleonic Wars, Prussia ascended as the largest player in the commercial traffic through the Sound. In previous centuries, Hanseatic cities (in the Middle Ages) and Dutch (in the sixteenth and seventeenth century) were the most important players in the Baltic commerce.
[96] This phenomenon can also be seen in a smaller scale as well. In Sweden, the role of Stockholm diminished during the eighteenth century, while the importance of other old and new ports increased. See e.g. Högberg 1969, 36–46.

3.3. The Baltic and Mediterranean as trade areas

In the eighteenth century, Sweden (and the Baltic) and also the Mediterranean region were, in Wallersteinian terms, peripheral or semi-peripheral regions.[97] Compared to the Dutch Republic or Britain, the Baltic region was more trade terminus than intermediary entrepôt by nature. Due to the relatively straightforward business environment, for instance, no complicated financial methods or reshipping were needed on a similar scale as in the rest of Europe.[98] During the eighteenth century, although the trade institutions and trade security were stabilized, the Baltic Sea was not the hot spot of the maritime trade, and the commercial ships sailing in the Baltic were not very large.[99] For example, for the maritime powers, Holland and England, their colonies in America and the East Indies played a significant role in their total trade. The Baltic, however, provided several crucial raw materials and naval stores for European seagoing nations, such as iron, timber, tar, flax, and hemp. As the need for those materials increased, the eighteenth century saw a steady growth in shipping through the Danish Sound, only occasionally interrupted by the wars. The number of ships passing through the Sound rose substantially from 2,000–3,000 ships in the early eighteenth century to 10,000 ships in the late eighteenth century.[100]

Materials that were needed to build the war and trade ships were in constant demand during the age of sail.[101] The wooden ships needed constant maintenance, and the Baltic products enabled the southern trade of the colonial countries. As the empire building and ocean-going cargo transportation increased, this enhanced naval forces and increased the demand and trade in Baltic naval stores. The demand was so high that in the eighteenth century, England and Holland strove fiercely with each other to dominate the Baltic trade. At the beginning of the century, the Dutch presence was prevailing, but at the end of the century, England reached dominance in the Baltic trade.[102]

[97] Periphery and semi-periphery are relative terms and should be viewed in relation to the hotspot – or so-called core – of trade; the Atlantic coast of Europe: the Dutch Republic, England and France. See Wallerstein 1976. See also Lilja 2007, especially 30–31, 46.
[98] Harding 1999, 18–19.
[99] Ahlström 2000, 12.
[100] For instance, Kaukiainen 2008, 110–111; also the STRO; also Degn 2010, 377. These figures do not take into account the development in ship sizes. See, e.g., the discussion in Scheltjens 2009, 86.
[101] Pihkala 2001, 49–53.
[102] Ahlström 2000, 8–11.

Southern Europe had certain peculiarities for shipping, compared to other major trading areas for Sweden (the Baltic, Britain, and the Dutch Republic).[103] First of all, shipping was unsafe, because of the piracy threat from the Barbary States of North Africa. This threat could also reach the Atlantic waters of Portugal, but it was most obvious when crossing Gibraltar.[104] Since the trade was long-distance, and also because salt cargoes required much capacity, the ships used in southern waters were large, so-called Spanish clippers (Sw. *spanienfarare*[105]).[106] Quite often, these ships sailed not only between the Swedish and the Mediterranean ports, but ships were often used also in tramp shipping between southern European ports, mainly during wintertime when the Baltic was frozen. Shipping activities in the Mediterranean were particularly important for all Scandinavian ships during major European wars.[107] Tramp shipping meant that shipmasters and crews stayed away from home for long periods, and due to the longer distances than the trade in the Baltic or the North Sea and more complex trade routes caused by tramp shipping, the information flows into the Swedish merchant houses was often harder and thus shipmasters could act more independently.[108]

Swedish trade with the Mediterranean differed clearly from the trade within the Baltic area or to the North Sea region. Mediterranean trade was carried by large vessels that were more suitable for high seas and had a larger cargo capacity, and thus trade required some larger capital investments.

When talking about the trade to and from the Mediterranean or Southern Europe, it should be specified what those terms mean. During the eighteenth century, the concept of the Mediterranean as a trading area involved all the European, African, and Levant countries bordering the Mediterranean Sea in the Swedish trade statistics.[109] Meanwhile, the term Southern Europe signified a larger area. In the literature of eighteenth-century Swedish foreign trade, areas are typically classified into four main geographical entities (the Baltic area, Great Britain, the Dutch Republic, and Southern Europe), where Southern Europe covered France, the Mediterranean, Portugal, and Spain.[110] Thus, the main difference between earlier research and this study is that,

[103] About this kind of geographical classification, see SCB 1972, 101, 104; and Högberg 1969, 57–63.
[104] Müller 2004, 139.
[105] Högberg 1969, 216. For English translation, see SCB 1972, 104. See more in Eriksson 2014, 135–138. See also SAO, "spanienfarare".
[106] The ship sizes varied quite a lot. About the ship sizes, especially in the Mediterranean context, see Söderberg 2010, 15.
[107] Johansen 1992, 482.
[108] Also, Danish ships operating as carriers in Mediterranean tramp shipping promoted Danish foreign trade in the Mediterranean. See Andersen & Voth 2000.
[109] SCB 1972, 101, 104.
[110] SCB 1972, 101. Also, for instance, Högberg 1969.

here, the Atlantic coast of France is completely excluded, but the trade of the Mediterranean coast of France is included when using STR data. This issue is discussed in greater depth in Chapter 4.2. Geographical areas.

3.4. Trade policy, mercantilism

During the Age of Liberty, the Navigation Act (Sw. *Produktplakat),* was the fundamental basis for Swedish international trade. The Navigation Act was constituted in 1724, and it prohibited foreign vessels from importing other than a country's or its colony's own goods. One of the main aims was to restrict British and Dutch vessels from participating in import trade of the two most voluminous commodities; salt and grain. Since the import was unprofitable due to high customs or prohibited, foreign vessels had no economic incentive to sail to Swedish ports in ballast. Thus, the export trade also firmly shifted to be carried by the Swedish merchant fleet.[111] The second initiative, which boosted the economic activity, was the national manufacturing policy (Sw. *manufakturpolitik*). The shared ideology behind these regulations was mercantilism: an ideology underlining the accumulation of national wealth and comprehending the nation's wealth as a constant. It was seen that by controlling the international trade flows, national prosperity and monetary reserves could be accumulated by maintaining the positive balance of trade.[112]

Historians have tried to approach, and they have given several explanations for the mercantilism. For example, according to Adam Smith and, much later, Jacob Viner, mercantilists were bullionists, meaning they strongly believed in the concept of positive trade balance that could be achieved when a country exported more than it imported.[113] Heckscher (1953) also agreed, claiming that the basic doctrine or ideology of mercantilism emphasized the positive balance of trade, fear of goods, and the love of money. In addition, he claimed that mercantilist ideology was related to the endemic shift from an exchange economy to monetary economics in the early modern period. In the political aspect, mercantilist actions such as tariffs, navigation acts, and the harmonization of measurements were about a broader process of nation-making progress.[114]

[111] For example, Ojala & Räihä 2017; Ojala, Räihä & Karonen 2019.
[112] In the eighteenth century, besides the balance of trade, the state was also interested in currency flows and the balance of payments. An earlier balance of trade was about the comparison between the value of imports and exports. In the context of the latter half of eighteenth-century Sweden, trade balance often refers to the modern concept of balance of payments. See Vallerö 1969, 9, 19, 46 ff. Also SCB 1972, 66.
[113] Magnusson 2009.
[114] Heckscher 1953.

Several researchers have criticized the post-mercantilist time attempt to present mercantilism as a somewhat coherent and unambiguous doctrine or paradigm.[115] Mercantilism was not one doctrine and in Sweden, for example, mercantilists can be called those who supported the official economic policy, especially in the first part of the eighteenth century.[116] A major argument for the mercantilist policies was the ”national advantage”. However, in early modern Europe, the national advantage was closely linked to the interests of the ruling classes. For instance, Sweden did not have similar trade connections nor traditions such as the Dutch; in this perspective, protectionism was necessary for the rise of Swedish merchant houses.[117]

Mercantilism strongly centralized trade in major port cities, in the interest of their merchant groups. For example, in Sweden, in 1723 there were 24 port cities with permission for foreign trade and shipping. All other cities were not allowed to receive any goods directly from abroad. As in practice, the northernmost staple city in Sweden was Gävle, and in Finland, Turku, most of the coastline and their hinterland had to lean on Stockholm to receive foreign goods or to ship domestic goods abroad. These restrictions were loosened in 1765 when certain cities on both sides of the Gulf of Bothnia received staple rights.[118]

From the foreign trade aspect, the period from 1500 until 1800 can be referred to as a period of aggressive mercantilism. During the age of mercantilism, naval power was crucial to control colonial empires and international trade. The economies of European empires, however, saw differential patterns of development. The divergence was apparent already in the eighteenth century, as the trade was centralized in the United Kingdom and the Dutch Republic, while economies of France, Spain, and Portugal grew more slowly. According to Acemoglu et al. (2005), those countries accessing Atlantic trade together with weak monarchy, namely Britain and the Dutch Republic, gained the largest profits. This combination enriched merchants, and led to developed institutions (financial markets and property rights) favorable to economic growth. Countries with a strong monarchy and central government controlled trade monopolies retained royal power.[119] Also, Costa et al. (2013) pointed that, although the colonial trade had a positive impact on Portuguese economic

[115] Magnusson 2009 gives an informal and yet very compact presentation of the history and interpretations of mercantilism. He mentions how initially the physiocrats intended to describe mercantilism as a doctrine. Later, researchers who have criticized such an approach have been, inter alia: A.V. Judges and D.C. Coleman, as described in an extensive description of this topic by Magnusson 2015.
[116] Magnusson 1999, 250–259
[117] E.g. Eloranta et al. 2015, 16. Wallerstein 1980.
[118] Högberg 1969, 34. See also SCB 1972, 107.
[119] Acemoglu, Johnson & Robinson 2005.

growth, the domestic institutions were the reason why the country had weaker macroeconomic growth than Britain or the Dutch Republic.[120]

3.5. Swedish trade in Southern Europe

Direct trade relations between Sweden and Southern Europe were strongly related to salt imports. Additionally, tramp shipping between Southern European ports was a lucrative business for many Swedish shipowners. According to Högberg (1969), 90–95 percent of Swedish salt imports between 1738 and 1808 were directly shipped from Southern Europe.[121] One major factor behind the increase in salt imports was the increase in herring catches after the 1750s and the increase in herring exports from Sweden, which required a significant amount of salt for preservation.[122]

Although Southern Europe was an important region for salt production, why did the Swedish merchants send their ships from Europe's northeast corner to the most southwest part of the continent, even though salt was available at closer ports? One explanation for this trade pattern lies in Swedish commercial policy. In Sweden, both the politicians (particularly a political party hats) and the commercial operators (actors in the East India Company) had a strong interest in expanding Swedish trade with the Mediterranean and Levant, particularly in the 1730s.[123] Regarding salt, for instance, in 1731 a government act was established that notably restricted the salt imports from other salt ports, for instance, from Lübeck, Danzig, and the Dutch ports.[124] Additionally, in 1733 a tariff reduction was given to Swedish vessels trading with Mediterranean countries.[125]

Contemporaries such as Chydenius (1765) and later researchers, such as Heckscher, criticized the protectionist policy as causing salt shortages.[126] However, Carlén (1997) investigated the eighteenth-century salt trade, and his result was that the salt shortages in Sweden were not related to protectionism. Additionally, protectionism helped increase Swedish shipping, and, thus, Sweden

[120] Costa, Palma, Reis 2013; in addition, Costa, Palma Reis (2015) conclude that "the explanation for Portugal's long-term backwardness must be sought primarily in domestic conditions".
[121] Högberg 1969, 222.
[122] About this topic in general, see Carlén 1997, Högberg 1969, Müller 2004.
[123] Schuchard 2012, 233, 293.
[124] Kaukiainen 2008, 128–129. In the research literature, this act is not mentioned often.
[125] Aldman 2008. Heckscher 1922, 217, mentioned that the motive for this tariff reduction was not to hinder the salt export from ports closer to Sweden but rather to ease the lack of salt in general.
[126] The criticism of Heckscher, see Carlén 1997, Chapter 7. In Finland, there was rather eager and harsh criticism for the salt trade policy and foreign trade policy in general. According to Chydenius (1765), the Swedish shipping abroad, in general, was large enough to secure salt imports. He mentioned that the lack of salt in certain remote areas, such as Westrobothnia, Ostrobothnia, and inner parts of the kingdom in Sweden, was related to Swedish restrictive mercantilist trade policy that highly focused trade in Stockholm and Gothenburg. Jonasson & Hyttinen 2012, 108–111.

was not dependent on foreign merchant fleets as had been the situation in the previous century. Carlén analyzed that there was a shortage of salt, but this was local, occasional, and not related to total exports. The research revealed that the main causes of the salt shortage were related to transportation, slow flow of information, and the sudden need for large amounts of salt for food preservation. In 1774 the state tried to secure the salt supply by an institution, the System of State Salt Stores, which was formed in every staple city.[127]

The salt trade, in general, has been studied quite a lot in Sweden. Although Carlén analyzed the efficiency of the salt markets in Sweden; the specific aspects of how efficient the salt markets were in Southern Europe have not been widely discussed. Even though historians agree that salt was a fundamental import necessity for Sweden, the importance of the export of naval stores has not fully been answered. This study will examine the extent of Southern Europe as related to total Swedish exports and the structure of export cargoes.

The structure of the bilateral trade between Sweden and Southern Europe has been analyzed only at a very superficial level. Müller (2004) illustrated the trade value during certain years.[128] A large share of both import and export cargoes were bulky commodities, and the average value per cargo was low. For instance, iron comprised between 50 to 70 percent of Swedish exports to Southern Europe by value.[129] In contrast, Müller underlined how the Dutch and English trade with Southern Europe were dominated by luxury commodities.[130] Previous studies by, for example, Moreira et al. (2015) and Eloranta et al. (2015) analyzed the trade between Sweden and Portugal during the eighteenth century. They suggested that trade depended only on few key commodities, namely iron and timber from Sweden and salt from Portugal. Their results suggested that, for Sweden, it was easier to compensate with salt imports from other areas in Southern Europe, while Portugal was marginally more dependent on the iron and timber imported from Sweden.[131]

As shown by Eloranta et al. (2015) and several studies by Müller, several institutional improvements were necessary and tended to increase trade between Sweden and Southern Europe. Besides the Navigation Act, there were other policies encouraging direct salt trade in Swedish vessels.

[127] Carlén 1997.
[128] Müller 2004, e.g. 134, 139–140, also 158.
[129] Müller 2004, 134–135.
[130] Müller 2004, 140.
[131] Moreira et al. 2015, Eloranta et al. 2015.

Although the focus of this research is not on the profitability of shipping, this is a fundamental aspect of trade. Swedish export cargoes were "coarse", bulk commodities with a rather low value per ton relationship. Moreover, the shipowners could not rely on profits from the salt trade. Due to low freight rates in bilateral trade with Southern Europe, Högberg (1969) implied that the profits of this trade were gained largely from tramp shipping in the Mediterranean or from certain import articles.[132] Accordingly, Müller claimed that the commodity exchange between Southern Europe and Sweden was less profitable than the shipping activities in the Mediterranean.[133]

4. Sources and data

In the early modern period, the Crown's revenues largely rested on customs revenues. Therefore, the foreign trade statistics used in this research are based on the fiscal authority's task of collecting and reporting customs duties. Foreign trade statistics are the first comprehensive macroeconomic data series available for historians.[134] The three sources used in this research are the following.

Denmark

- The Sound Toll Registers (STR). Its online database is called Sound Toll Registers Online (STRO): www.soundtoll.nl

Sweden

- *Kommerskollegium Kammarkontoret Årsberättelser Utrikes handel, Serie 2*
  Board of Trade: Foreign Trade Series 2 (BoT2)
- *Kommerskollegium Kammarkontoret Årsberättelser Utrikes handel, Serie 3*
  Board of Trade: Foreign Trade Series 3 (BoT3)

There are several differences between these sources concerning, for example, the time frame, geographical areas, and units and measurements. Each source has its own strengths and weaknesses, which are used to supplement each other. The main differences between these datasets are the following. The STR and BoT2 measure trade mainly in volume units, such as barrels or ship pounds (Dn. *skippund*), which are often convertible into metric tons. The BoT3 is a series of trade balances and announces trade flows to and from Sweden in monetary values. Geographically,

[132] Högberg 1969, 216–217. Regarding general changes in productivity of Swedish and Finnish shipping during the eighteenth century see, Ojala 2011.
[133] Müller 2004.
[134] Regarding the flow of goods, the most useful and used are the Swedish Board of Trade statistics and the Sound Toll Registers. In addition, there are several sources for studying eighteenth-century Swedish trade in more detail. To obtain a detailed picture of trade, different consular reports and Algerian passport registers provide an excellent source. See, Müller 2004, 245 (sources). See also Ojala 1999, 45.

STR does not cover the trade between the North Sea ports of Sweden and Southern Europe, while the BoT datasets include the whole of Sweden.

Principally, the methods used by fiscal authorities collecting the STR and BoT2 statistics remained rather immutable during the research period, which makes those datasets very constant over time. On the other hand, different institutions with varying methods compiled the BoT3 statistics. There are also several years missing from the BoT3 dataset, which makes the evaluation of trade value debatable.[135]

4.1. Data periods

4.1.1. The Sound Toll Registers (STR)

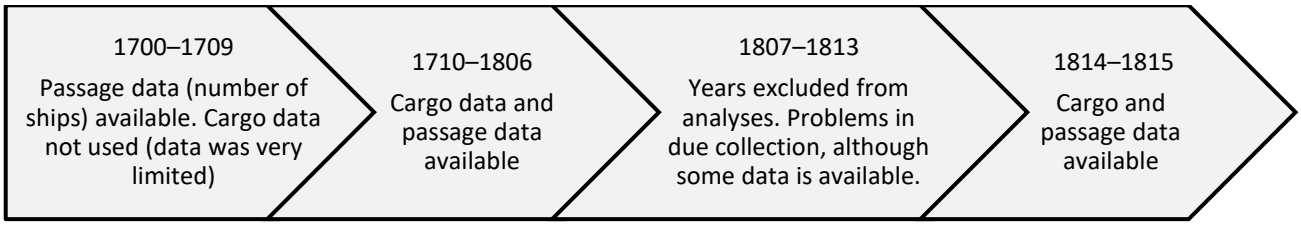
The Sound Toll data uniformly covers almost the whole research period. The years 1807–1813 were excluded in this research because, according to previous research, there were problems in the collection of dues, and some vessel-specific data is missing. Ahonen (2005) and Rasch (1965) mentioned how the period 1808–1812 was problematic for dues collection because Denmark entered the Napoleonic Wars.[136] Additionally, according to Ahonen (2005), the data from 1807 is also incomplete.[137] The year 1813 was also excluded because STR did not reveal any bilateral trade between Sweden and Southern Europe during that year, while the BoT3 presents data on trade to and from Southern Europe.[138]

The STR gives cargo data for the years 1700–1709 very sporadically, and therefore those years are not included when analyzing ship cargoes.[139] However, passage data does reveal the number of ships sailing between Sweden and Southern Europe during those years. STR does not mention any trade in 1718 between Sweden and Southern Europe, and no imports are mentioned in 1711 and

[135] SCB 1972, 66. Regarding Swedish trade statistics in the eighteenth century, see also Vallerö 1969.
[136] Ahonen 2005, 24–25. See also Rasch 1965.
[137] Ahonen 2005, 24–25.
[138] However, there are few ships registered in STR in 1807–1813 to have sailed between Sweden and Southern Europe. In 1807 there are 37 ships in 1812 seven ships mentioned sailing from Sweden to Southern Europe. The amounts for arriving ships from Southern Europe to Sweden were: 1807: 60; 1810: 11; 1811: 2; 1812: 5.
[139] The main reason is that until the 1710s, Swedish ships were relieved from paying the customs duty in Elsinore. This practice was in force since a peace agreement with Denmark in 1645. Rönnbäck 2006, 6. There were a total of 333 ships arriving from Southern Europe to Sweden in 1700–1709. Only 11 of those ships reported some cargo. It should be considered that three of those shipmasters (who paid customs duty of the cargo) had a home port in England; and eight of those shipmasters had the home port in Sweden. STRO.

no exports in 1712 and 1716. The assumption is that there was no trade during those years due to the Great Northern War.[140]

Picture 2. Periods of the Sound Toll Registers' data



4.1.2. Board of Trade Sweden, Series 2 (BoT2), Import and export schedules

The Board of Trade's Series 2 starts in 1738 and ends in 1812 and forms a very uniform dataset.[141] The units in this source were mostly non-monetary. However, during the last years of this series, the share of cargoes reported in monetary units increased distinctly. In this research, when analyzing the cargo amounts of BoT2, very different units of measurement were systematically converted into metric tons. When the share of the monetary units of all cargoes increased, this caused uncertainty when estimating the import and export volume.[142]

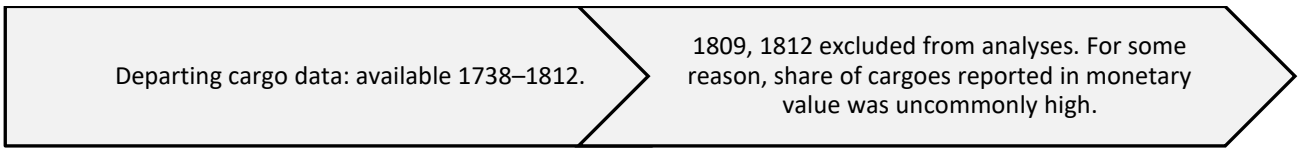
Consequently, the final two years (1811, 1812) of the import cargo data and the years (1809, 1812) of the export cargo data were excluded from analyses. In those years, the share of BoT2 cargoes announced in *riksdaler* was high with respect to the BoT3 value. The proportion of the BoT2 import cargoes announced in monetary values were 19 and 32 percent of the BoT3 value, and the proportion of exports 34 and 12 percent of the BoT3 value.[143]

The export goods category of bonded goods (Sw. *nederlags och andre åter utskeppade utrikes waror*) was problematic and thus excluded from analyses.[144] Many cargoes of that category were

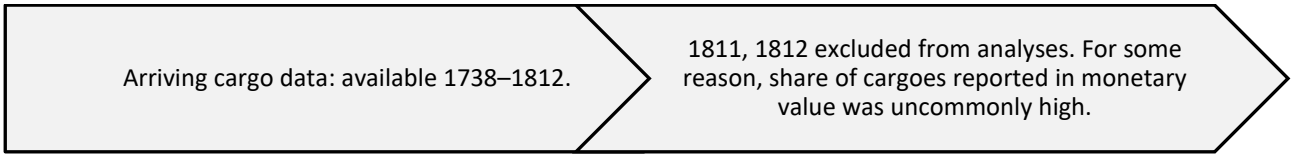
[140] See also e.g. Müller 2004, 234 and also 233.
[141] Although the series is very coherent, there are small changes in product categories. The one single year, when some data was missing, was 1790 for salt quality called "Portuguese and Spanish salt". However, the total export amount was given for that year, but import quantities from each country were missing. The import amount from Portugal was estimated to be 91 percent of the total import quantity and 8 percent from Spain (this estimate was based on data of previous years).
[142] There are few studies describing Series 2, Import and export schedules (generalpersedelextrakt). Regarding the overview of how data was collected, see Edvinsson & Gad 2018; Högberg 1969; Vallerö 1969.
[143] These shares are measured from trade value with Southern Europe (Portugal, Spain, and Italy and the Mediterranean).
[144] In this research, term bonded goods is a synonym with re-exports (in some research literature also transshipped goods).

announced in monetary units, and during certain years, monetary amounts were very high. Since measuring the metric tons from such cargoes is rather uncertain, this category was excluded from the BoT2 export data. For example, in 1778–1783 the amounts of East Indian products in that category exported to Southern Europe were notably high (377,578–1,052,893 rds), and significantly higher than export values reported in the BoT3 from East India to Sweden. When the values of *nederlagswaror* in the BoT2 and BoT3 are compared, values were occasionally much higher in the BoT2 than in the BoT3.

Picture 3. Periods of the Board of Trade Sweden, Series 2 export data



Picture 4. Periods of the Board of Trade Sweden, Series 2 import data



4.1.3. Board of Trade Sweden, Series 3 (BoT3), Balance of trade accounts

The BoT3 data include yearly figures of trade balance, together with the number and size of vessels, from 1739 to 1813. However, several gaps exist in the trade balance data, especially in the 1760s and 1780s. The specific years missing are: 1754–1755, 1760–1762, 1764–1768, 1772–1773, 1783–1786, and 1789.[145]

The data of arriving and departing ship-lasts (size of tonnages cleared) cover the period from 1739 to 1813, and data on the number of ships arriving and departing begin in 1769 and end in 1813. Unfortunately, even more years are missing in this data than in the trade balance data. The specific years missing are 1754–1768, 1772–1773, 1783–1786, and 1789.[146]

[145] In addition, the years 1771 (departing and arriving), 1805 (departing and arriving), and 1807 (departing) were excluded in this research because some pictures taken from archive material failed.
[146] In addition, the year 1811 was excluded in this research because the picture taken from archive material was failed.

Picture 5. Periods of the Board of Trade Sweden, Series 3 data

Cargo data	•1739–1753 •1756–1759 •1763 •1769–1771* •1774–1782 •1787–1788 •1790–1813*
Ship-lasts (carrying capacity)	•1739–1753 •1769–1771 •1774–1782 •1787–1788 •1790–1813*
Number of ships	•1769–1771 •1774–1782 •1787–1788 •1790–1813*

* Cargo data and passage data was available for these years. However, few pictures taken from the archive material failed, and a couple years are excluded in this research (cargo data for, 1769–1771, 1805 departing + arriving, 1807 departing are excluded; same applies to year 1811, on data of ship-lasts and number of ships).

4.2. Geographical areas

As previously mentioned, the research focuses on direct trade between Sweden and Southern Europe. However, the original bookkeeping methods of the geographical areas in the customs accounts affect this analyses. One important point to note is that shipmasters did not always know the final destination of a journey when informing the customs officials in the Sound or Swedish port. The ship's destination could be decided during the voyage, depending on weather and wind conditions and price information.[147] Nevertheless, some destinations were registered for all cargo and passages in the Swedish ports as well as in the Sound.

In Swedish statistics, trade balances and import and export schedules, cargo volumes, and values are arranged by country or geographical area. However, in the data upon which the Swedish BoT is based – the outward-clearance certificates – very vague destinations such as "the Western Sea"

[147] About the speed of information flow, e.g. Ojala & Müller 2007.

(*Västersjö*) were accepted by customs officials relatively often. Cargoes destined for *Västersjö* were afterwards documented in BoT as being allocated to the geographical category of France.[148]

Most of the geographical areas in the BoT data, however, are specific countries.[149] The most imprecise geographical entity is the Mediterranean (*Medelhafvet*). In the BoT2, this was referred to as "the Mediterranean" and in the BoT3 "Mediterranean" until 1763, and after that "Italy and several places in the Mediterranean" (*Italien med flera orter i Medelhavet*).[150] Although those are intended to illustrate mainly trade with Italy – since there are separate areas for Spain, Portugal, France, and the Levant – this geographical area in particular contains elements of uncertainty.[151]

Because the export statistics cannot accurately reveal the ships' destinations, Högberg (1969), for instance, recommends examining the geographical division of trade by combining several countries into larger geographical areas. He recommends choosing France, Portugal, Spain, and Italy and the Mediterranean from the Swedish statistics and examining these together.[152] This is one reason why this research includes the data for all Southern European countries and analyzes trade both as an entity and by country separately.

Original STR statistics include the port of departure and destination. If the shipmaster was uncertain of the destination, he could report a vague destination, such as the Mediterranean, instead of a specific port city.[153] However, the STR reveals that shipmasters who sailed from Sweden to Southern Europe only occasionally reported a vague destination in about 9 percent of the ships.[154] In the digitization process of the STR, different spellings of geographical names were standardized. Based on systematized geographical names, the Sound Toll Registers Online STRO has different

[148] Högberg 1969, 57–63; also, SCB 1972, 101. According to Högberg (1969), *Västersjö* had different meanings in different eras. It could mean all areas "far away" from the Sound. Until the 1780s, *Västersjö* was rarely mentioned in certificates, but later, for instance in 1784–1789, 16 percent of all departing tonnage reported *Västersjö* as a destination; in addition, ca. 25 percent of iron exports were reported to be heading into *Västersjö.* See Högberg 1969, 60–61.

[149] Denmark, Danzig, Great Britain, France, Holland, Holstein, Königsberg, Lübeck, the Mediterranean, Pomerania, Portugal, Russia, Spain, German towns, the East Indies, the West Indies, St. Barthélemy. SCB 1972, 101. In addition, BoT2 included the Levant and Canary Islands during certain time periods. Moreover, in BoT3 data, the geographical classification of Northern Germany changed over time and was slightly more precise before the 1760s.

[150] BoT2, BoT3.

[151] See Vallerö 1969, 51. Also Högberg 1969, 60. About vague destinations, in the STR context, see also Tiainen 2018, 43, 44–46, 65, also 73.

[152] Högberg 1969, 60–61.

[153] See, for instance, Kaukiainen 2008, 128; See also Högberg 1969, 60–61. Kaukiainen described several reasons why the reported and actual destination do not always match (ships could, for example, sail to a port to pick up their most recent instructions or to cash a bill of exchange).

[154] STR.

geographical areas that were used when the data was downloaded.[155] The export data was downloaded from the STRO by choosing Sweden as a departure and the "small regions"[156] (Portugal, Spain, France – Mediterranean coast, Italy, African Mediterranean ports, Mediterranean – unspecified) as a destination and vice versa for import data.[157]

As described above, the BoT2 and BoT3 include all trade to and from Sweden proper. Because the trade between Southern Europe and the Swedish North Sea ports naturally did not pass through the Sound, that trade is not included in the STR. For some reason, there are a few exceptions to this: the STR also contains a few entries for vessels from Southern Europe to the Western coast of Sweden, for example to Marstrand, Halmstad, Uddevalla, and Karlstad.[158]

Considering Swedish Pomerania or Marstrand (a Swedish free port from 1775 to 1794), it is worth noting that in the BoT3 and BoT2 this trade was registered as foreign trade from a Swedish perspective.[159] Meanwhile, in the trade balances of Portugal, trade to and from Sweden very likely included cargoes from Swedish Pomerania as well, because Swedish exports to Portugal included rather large quantities of grain in those statistics.[160]

Another difference between the STR and BoT is that the STR data allowed selecting trade to and from French Mediterranean ports. In the BoT2 and BoT3 data, this is not possible, since the category "France" includes all trade with France.[161]

In previous research, when BoT2 data has been used (for example, Müller 2004; Högberg 1969), the area of "Southern Europe" has covered France, Portugal, Spain, Italy and the Mediterranean. However, geographically, the Atlantic coast of France was a very different environment than the Mediterranean, and it was not long-distance shipping for Sweden.[162] Therefore, and also because

[155] One port could have multiple spellings, for instance Naples: *Neaplis*, *Neaples*, *Neapolis*, *Neapel*, etc. In the STRO, these were standardized and classified into different geographical areas. About the process of STRO standardization of ports, see Gøbel 2010b. Data was downloaded in June 2017, and at that time almost all geographical names were standardized. However, there is a faint possibility that a few individual passages were not downloaded because the particular spelling of the port of departure or destination was not standardized under the categories used here.
[156] Small regions = the menu in the STRO database.
[157] The problems with the STRO geographical names has been discussed at length in Tiainen 2018, 47–68.
[158] For ships sailing from Southern Europe to these ports, it is very unpractical to sail via the Sound. See Passage ID: 330721; 364120; 380368; 342207; 397312; 181565; 596691. In addition, the STR contains some ships with cargo loaded both from Southern Europe and from the North Sea coast of Sweden.
[159] BoT2 and BoT3.
[160] Ojala et al. 2018, 165–168. For the list of Portuguese trade statistics in the eighteenth century (Portugal's Balance of Trade with Portuguese Colonies and Foreign Nations), see Ojala et al. 2018, 157.
[161] Högberg 1969, 60–61 discusses exclusively the geographical category "France" regarding Swedish trade statistics.
[162] Åström 1962, 12–13. He also mentions that from Portuguese perspective, Baltic was seen as a single trade area.

the French salt was different from the Mediterranean and Portuguese salt, imports and exports from the BoT area of France were excluded in this research. The reason why previous studies included France in the "Southern Europe" trading area originates in trade statistics.

Table 1. Geographical areas selected from the Sound Toll Registers Online and Swedish Board of Trade 2 and 3 statistics

STRO[163]	**BoT2 and BoT3**[164]
Portugal	Portugal
Spain	Spain[166]
Italy	Italy and the Mediterranean[167]
Mediterranean – unspecified[165]	Levant
France – Mediterranean coast	
African Mediterranean ports	

Sources: The Sound Toll Registers; Board of Trade Sweden, Series 2; Board of Trade Sweden, Series 3.

4.3. Product groups

The BoT2 classifies various import and export products into different product groups. In the BoT3, individual products are not mentioned but import and export values are listed in similar product categories as in the BoT2. In the BoT2, product categorization remained rather immutable during the research period.[168] Changes occurred mainly in some import categories, such as clothes and raw materials. For instance, cotton (*bomull*) was listed in three different categories in different eras: in linen and cotton textiles (*linne och bomulls wahror*), in raw materials (*rudimaterier*), as well as in general store goods (*kryddkräm waror*). Changes similar to this one were mainly related to cargoes traded in smaller quantities. In this research, the quantities of smaller product groups were summarized under a category called "miscellaneous cargoes" (see Table 2 and Table 3). Therefore, changes among those categories did not affect the analysis. In the BoT3, it can be seen that the compilation of statistics varied during the century because there were more changes in product groupings in different years. Again, this concerns smaller product groups.[169] These differences were

[163] The data was downloaded from the STRO for these geographical areas (to and from Sweden).
[164] These statistics do not include any port of departure or destination in Southern Europe.
[165] This category was only for exports (ships departing the Baltic). When ships arrived in the Baltic and Sweden from the Mediterranean, they reported port of departure more accurately.
[166] BoT2 mentions some cargoes (based on the cargo amounts, very likely two ships in total), sailing from the Canary Islands in 1749 and 1751. Those cargoes are in the category "Spain".
[167] In the BoT3, Mediterranean was *Medelhafvet* until 1763, from 1769 onwards *Italien och flere Orter uti Medelhafvet*. In the BoT2, the category was *Medelhafvet*.
[168] In general, the product categories are similar in the BoT2 and the BoT3. The categories of the major import and export cargoes match especially well. However, when comparing the two datasets, it appears that the product categories in the BoT3 changed more frequently than in the BoT2.
[169] The BoT3 includes only the product groups and not any individual products. In addition, the compilation method for the BoT3 data varied, and therefore, the dataset is not uniform over time. The following categories of arriving cargoes

not crucial and those issues were solved in this study by combining different categories. Mostly, the product group names in the BoT3 were the same as in the BoT2, and it is assumed here that the major import and export categories remained constant over time.

In the STR, cargoes are not sorted under any product groups and the classification used in this research was made by the author. The categorization method used for STR products was to classify the most common STR products (such as metals, timber, tar, salt, fruits, wines, and beverages) in a similar manner as the main product groups in the BoT2. Other miscellaneous STR products were categorized under a category called "miscellaneous cargoes".

Table 2. Product groups for exports from the Swedish Board of Trade Series 2 and 3, and the Sound Toll Registers

BoT3 and BoT2 export categories[170]	The main product groups of BoT3 and BoT2 used in this research	STR export categories[171]
Copper and brass (*Koppar och messing*) Iron and steel (*Jern och ståhl*) Timber (*Trä waror*) Stone (*Allehanda sten*) Fur and hides (*Allehanda skin-waror*) Grain (S*pannmål*) Victuals (*Victualier*) Fish (*Fisk waror*) Live animals (*Lefvande creatur*) Linen textiles (*Linne waror*) Miscellaneous goods (*Allehanda waror*) Bonded goods (*Nederlags och andre utrikes utgångne waror*)	Timber Iron and steel Copper and brass Stone Tar and pitch (part of the BoT category miscellaneous goods)[172] Miscellaneous cargoes (includes all other categories)	Timber Iron Steel Copper and brass Stone Tar and pitch Miscellaneous cargoes

Sources: The Sound Toll Registers; Board of Trade Sweden, Series 2; Board of Trade Sweden, Series 3; SCB 1972.

were not listed in the following time periods: clothes 1756–1771; sugar 1739–1740; animals 1739–1753; raw materials 1739–1740. Also, the category *strandade waror* was mentioned in only two years, 1775 and 1776, and the category gold, silver, and coins was listed only during the years 1756–1763. The category of gold, silver, and coins was excluded in the analysis of this research.

In the departing cargoes, the following categories were not listed in the following time periods: grain (*spannmål)* 1745–1753, 1771; clothes 1756–1771; animals 1739–1753; raw materials 1739–1740. Also, the category *uplags-waror* was listed for Spain only during the year 1810, the category *commiss gods* is mentioned only in 1791, and *åtskillige slags waror* was mentioned only in 1745–1753.

[170] Translations are from SCB 1972, 157; except *trä waror*, *allehanda skin waror*, *victualier, lefwande creatur, linne waror,* and *allehanda waror* are by the author.

[171] The categorization of various STR commodities was made by the author.

[172] Notice, that in this research, in the BoT2 it was possible to separate tar and pitch into own a separate group (because all products were also listed separately), apart from other cargoes in this category. In the case of the BoT3 category miscellaneous goods (a*llehanda waror*), this was not possible. When assessing the export value of tar in BoT3, it was assumed that the majority of *allehanda waror* consisted of tar exports.

Table 3. Product groups for imports from the Swedish Board of Trade Series 2 and 3, and the Sound Toll Registers

BoT2 and BoT3 import categories[173]	The main product groups of BoT3 and BoT2 categories used in this research	STR[174]
Silk textiles (*Siden waror*) Linen and cotton textiles (*Linne och bomuls waror*) Broadcloth (*Kläden*) Haberdashery (*Kram waror*) Medicines and drugs (*Drogerier*) Tobacco (*Tobak*) Dyestuff (*Färgor*) General store goods (*Kryddkräm waror*)[175] Groceries and spices (*Specerier*)[176] Sugar (Såcker) Salt (*Salt*) Grain (S*pannmål*) Live animals (*Lefvande creatur*) Victuals (*Victualier*) Fish (*Fisk waror*) Fruits (*Frugt*) Miscellaneous goods (*Allehanda waror*) Wines and beverages (*Främmande drycker*) Raw materials (*Rudimaterier*) East Indian commodities (*Ost Indiske waror*)	Salt Fruits Sugar Wines and beverages Miscellaneous cargoes (includes all other categories)	Salt Fruits Sugar Wines and beverages Miscellaneous cargoes

Sources: The Sound Toll Registers; Board of Trade Sweden, Series 2; Board of Trade Sweden, Series 3; SCB 1972.

4.4. The Sound Toll Registers

The Sound (Øresund) was a very notable trade route during the early modern period. Since the Danish officials recorded all the vessels and their cargo passing through the Sound in the Sound Toll

[173] Translations are from SCB 1972, 156; except: *siden waror, linne och bomuls waror, kryddkräm waror, specerier, lefvande creatur, victualier, allehanda waror,* and *främmande drycker* by the author.
[174] The categorization of various STR commodities was made by the author.
[175] *Kryddkräm waror* = literally spices. This category included a very wide range of products, such as paper, pencils, soap, corks, groats, coffee, rice. The term used here is general store goods.
[176] *Specerier* = literally groceries. This category included a wide range of different groceries: spices, raisins, Corinth raisins, figs, almonds, anise, olive, caper, etc. In SCB 1972, 156: *Kryddkramvaror* and *specerier* are combined under the same translation "groceries".

Registers (STR)[177] for several hundred years in a quite uniform way, these registers are a central source for researching social, economic, and maritime history at global, national, and local levels.[178]

The Sound Toll Registers covers an almost unbroken series of all trade between the Baltic and the North Sea from 1574 until 1857.[179] The Sound was the main fairway, and two other straits, the Greater and Lesser Belts, played only a minor role in the sea traffic. In the Belt straits, there was a similar arrangement for the collection of customs duties as in the Sound. However, the Belt Toll Registers have mostly not survived.[180] The STR includes approximately a total of 1.8 million passages. Due to the payment of transit duties, all ships entering or leaving the Baltic had to be declared in Elsinore, where the information of the ship passage, cargo, and the customs payment were recorded.

The STR, which contains 60 shelf meters, is one part and about half of the archive collection of the Sound Customs House[181]. In addition to customs books, the Sound Customs House archive compilation also contains a great variety of other documentation, including correspondence, notes on smuggling, and instructions for calculation of customs.[182] The current customs books are not the original versions, but are copies of the original customs accounts.[183] The registers are written in very large books, that are mainly organized in chronological order. For instance, there are two volumes for each year in the late eighteenth century, and sometimes there might be one extra volume if the trade was intense. Each volume is organized geographically and divided into sections separating, for example, English, Swedish, and French vessels, because the manner of the dues collection was mainly based on where the ship was registered.[184]

[177] *Øresundstoldregnskaber* in Danish.
[178] Veluwenkamp 2011, has described the importance and extent of the STR. Because of the size of the archive material, it has "enormous potential for research in maritime history" and it has been chosen as part of the UNESCO "Memory of the World Register" Gøbel 2010b.
[179] From 1574 the series is almost without gaps. Before that, the years included are 1497, 1503, 1528, 1536–48, 1557–58, 1560, and 1562–69. See Degn Ole, 2010. See also Gøbel 2010b or Gøbel & Hansen 2007; Ahlström 1997, 49; Ahlström 2000, 14. Although customs material exists in those years, it is known that dues have been collected in Sound since 1429, but very likely the tradition has even longer roots.
[180] Rasch 1965, 35–36.
[181] In Danish Øresunds Toldkammarets Arkiv (ØTA) Gøbel 2010a, or Øresundstoldregnskaper (Sound Toll Administration) Gøbel & Hansen 2007. This collection is kept in the Danish National Archives.
[182] There is a very good explanation about the Sound documents archive collections in *Tolden i Sundet*, 2010, by Erik Gøbel in Chapter *Øresundstoldens arkivalier 1497–1858* in Danish. In English, there is a clear presentation of all Sound Customs House Records Gøbel & Hansen 2007, 67–82.
[183] Johansen 1983. Also, Gøbel 2010b.
[184] About the system how the Sound Toll Accounts is organized, see e.g. Rasch 1965, 32 and Ahonen 2005, 23.

For a long time during the twentieth century, research using the Sound data operated widely by using the Sound Toll Tables, which are summaries of the STR published by Bang and Korst from 1906 until 1953.[185] This significant compilation by Bang and Korst covered the Sound data during the years 1497–1783, and their work was continued by Hans Christian Johansen, who entered data of Sound Toll Registers from 1784 to 1795 into electronic form and provided that on microfiche as an appendix of his 1983 book titled "*Shipping and Trade between the Baltic Area and Western Europe*".[186] Since 2009, an online tool, the Sound Toll Registers Online (STRO), has provided all the information the original STR provides in a database form and as a digital image.[187]

The original purpose of writing the toll accounts was to document the collection of duties. In the toll accounts, all the ships, required to pay the duty were listed. In the customs office, *toldkammer,* the officials listed the following information about the passage: the date of passage, name of the shipmaster and his town of residence, port or ports of departure and destination[188], home port and the name of the ship[189], the cargo products and their amounts, and the customs duties paid.[190] In the Sound, ships had to pay two different dues: "cargo dues" and "shipping dues". The first was set according to the cargo and the latter according to the size of the vessel.[191] The payment of duty was based on various agreements and numerous regulations. In the customs office, the names of the foreign articles were translated into Danish, but no translation or standardization of the foreign units was done. However, the original unit was retained.[192]

If the ship was carrying only the ballast, it had to pay only a light duty. For example, in the 1740s, duty was only 2 *rigsdaler.* A ship with an average cargo on the way from Sweden to Portugal, however, would have had to pay some 75 *rigsdaler*. The rate of the duty tariffs in the Sound was set at a reasonable level for the entire eighteenth century, at about 1 percent of the cargo's value. [193]

[185] Bang, Nina & Korst, Knud. Tabeller over Skibsfartog Vare transport gennem Øresund, 1497–1660 (3 vols., Copenhagen, 1906–1933); and Bang and Korst, Tabeller over Skibsfartog Varetransport gennem Øresund, 1661–1783 og gennem Storebælt, 1701–1748 (4 vols., Copenhagen, 1930–1953).
[186] Johansen 1983; Gøbel 2010b, 322.
[187] www.soundtoll.nl.
[188] The port of destination is mentioned starting in the mid-1660s. Gøbel & Hansen 2007. During the eighteenth century, sometimes only a coarse estimate about the point of departure is mentioned, for example the Baltic or Mediterranean.
[189] The ship's tonnage and the name of the ship are missing most often. Instead, the name of the agent is often mentioned. In the early nineteenth century, the name of the ship is mentioned quite often. See Ahlström 1997, 50. Ahonen 2005, 23.
[190] Ahlström 2000, 16. Rössner 2010, 1.
[191] Ahonen 2005, 107.
[192] Scheltjens 2009, 79.
[193] Danish had a distinction between the vessels of privileged and non-privileged based on the vessel's countries of origin. In reality, the difference was only 0.25 percentage points. For example, in the late eighteenth century, Prussia,

It is worth noting that the rate of customs payments for each product changed very rarely, although the commodity prices varied significantly during the eighteenth century. The customs payments were specific-rate duties, and as the ratio of customs payment to cargo volume for a specific commodity remained unchanged during the research period, the comparison and evaluation of the volumes of similar cargoes, based on the customs payments, is practical.[194] Generally speaking, the itemization was careful and meticulous, and the accuracy of the registration became more accurate over time.[195]

4.4.1. The Customs Process

The city of Elsinore was mainly built around the customs process. Kronborg castle and warships controlled the ship traffic entering or leaving the Baltic, and they were able to sink ships trying to pass the Sound without customs control.[196] In the city, numerous brokerage firms and agencies operated in commercial activities, and ship chandlers sold various products related to sailing and supplying voyages. The agents especially played an important role in dealing information, because ashore they had the most recent knowledge, and they also used to sell victuals for the crew.[197]

The shipowner or captain always carried the freight letters in the vessel.[198] Based on the 1729 regulations, the captain (or the supercargo or at least the first mate)[199] was disposed to go to customs house right after mooring the ship.[200] In practice, ship captains mainly contacted a broker who lodged the ship's papers for toll authorities and took care of the toll formalities.[201] Because the documents were not written in Danish and not all the skippers understood Danish, in the customs office, translators translated the manifests, copied all of the products to the customs book, and

Portugal, the USA, and the small coastal states in the Baltic and the North Sea, such as Lübeck, Danzig, Emden, and Bremen belonged to the non-privileged group, and thereafter they had to pay higher duties. Ahonen 2005, 25. According to Ahonen, the countries of origin were divided into six groups in total.

[194] Note that ad valorem duty was not implemented because the market prices of products fluctuated so notably that it would have been laborious to carry out that practice. The specific-rate duty benefited both the shipmasters and customs officials, and thus arguing about the product's value was not necessary.

[195] Ahonen 2005, 23. However, for example, Koopmans (2010) supposed that over time accuracy of bookkeeping declined in the case of shipmaster's home port.

[196] The only exceptions, when the Danish could not control the maritime traffic in the straits were the war years when Denmark was threatened. According to Ahlström 2000, 14; Danish king, Christian IV, personally fired at an English vessel which refused to stop in Elsinore. Of course, these incidents were rare.

[197] About the Sound Toll's role as an information exchange, see Ojala 2010. On the importance of the agents, see Ojala 1999, 316.

[198] In Danish "*autoriseret general laddnings angivelse*". See Degn 2010, 400–402.

[199] Koopmans 2010, 12.

[200] Degn 2010, 400–402.

[201] For example, in the year 1788, all formalities of Swedish vessels were run by the Swedish consul Isaac Glöerfelt (Glf shortening in the customs books) See Ojala 1999, 316.

computed the customs payment for each of the products and finally for the whole passage.[202] The contemporaries found the customs process mainly simple and clear; it was seen as a compulsory task, not as a thorny problem.[203] Only in the cases when customs officials found some ambiguity in the lists considering weights or products or when they wanted to search the vessel and were scrupulous, this delayed the sailing.[204]

To pay the customs, there were two options, payment in cash or credit. Some vessels were allowed to pay the fee when they returned, and the officials would offer this option more easily for certain flags.[205] To ensure the shipmasters' cooperation, a reward of 4 percent of the customs payment was personally given to the captain.[206]

4.5. The Swedish Board of Trade Statistics

Customs statistics are the most fundamental source for analyses of trade flows in the early modern period. Knowledge of foreign trade commodity flows is largely based on the information gathered from the customs process. In Sweden, when entering or leaving a port, the shipmaster visited a toll chamber, where he presented a manifest (Sw. *märkrulla*).[207] This document mentioned ship cargo, ship size (last), ship type, and home port. In addition, customs officials documented the ship's destination information, which was essential when calculating fees and duty tariffs. The customs information was compiled into customs journals (Sw. *tulljournal*).

This information from each port was later compiled in the National Board of Trade (Sw. *Kommerskollegium*) in different series (Sw. *årsberättelser)*. Those documents summarize the trade to and from Sweden and measure the trade balance.[208] Two of those series are used in this research: Series 3 (the trade balance) announces the trade value and Series 2, reports the trade volume.[209]

[202] Scheltjens 2009, 79.
[203] Ahonen 2005, 107. There are different ways to describe the general attitude towards Sound dues. For example, Ahonen described the attitude to have been quite neutral. Nevertheless, Kiaer 1893 described the attitude as: Sound dues "gave much displeasure to the foreign traders, and occasionally to serious conflicts".
[204] However, for example, the Dutch Republic benefited from the so-called "most favoured nation" status, meaning that their vessels were not allowed to be searched. This was based on the seventeenth century agreement between the Dutch Republic and Denmark that was written after the war between the two countries.
[205] Ahonen 2005, 107. For example, the officials gave permission for the British ships to use credit more willingly than for Americans.
[206] In Danish, this reward was called *føring*. About this practice, see Degn 2010, 400–402; also Ahlström 2000.
[207] In English terms, cargo manifest and bill of lading are often used as a synonym for the term manifest. This translation of *märkrulla* is from Wetterlund 1914, 530.
[208] Högberg 1969, 9–10. The eighteenth-century Swedish customs journals have mainly been lost.
[209] In addition, Series 1 illustrates the trade of each port each year. There are also Series 4 and 5, which are similar to Series 1 but from a later time period.

The first time the government collected statistics about foreign trade in Sweden was in 1637. However, the statistics remained sporadic until 1738.[210] Because of the mercantilist idea of controlling trade and the efficiency of collecting the customs duties, the compilation of trade statistics and trade measurement was developed in Sweden during the eighteenth century. In the early 1700s, there were shortages in the compilation of Swedish statistics, but as administrative officials were ordered to improve the yearly reporting for estates, the statistics improved significantly.[211]

The most crucial improvement in foreign trade statistics happened in the year 1738 when the Board of Trade started to gather the foreign trade materials into import and export schedules (BoT2), which were yearly summary tables. These tables were based on customs reports collected from all Swedish ports, and the tables were able to present all foreign trade data extensively in a condensed form. The reporting convention remained very uniform until 1812.[212] Moreover, between 1739 to 1813, the Board of Trade gathered the balance of trade accounts (Sw. *handelsbalansutrakningar*), but data in this series is sporadic and more incoherent.[213]

In this research, as recommended, for example, in the book *Historisk statistisk för Sverige*, the trade balance was used to measure the relative distribution of trade during different years and periods. Meanwhile, the quantities provided in the BoT2 were used to measure trade development over long time periods.[214]

4.5.1. Board of Trade Sweden, Series 3 (BoT3), Balance of trade accounts

The BoT3, balance of trade accounts (Sw. *handelsbalansutrakningar*), reports the value of imports and exports of different product groups. In these tables, each year constitutes a separate entity, in which the value of imports and exports of different product groups to and from different countries

[210] SCB 1972, 19. About the statistics of Swedish foreign trade from 1637 to 1737, see Boëthius & Heckscher 1938. See also Vallerö 1969. Regarding late seventeenth-century customs statistics in Northern Europe, see also Åström 1965.
[211] Alanen 1964, 123. The most important studies about the Swedish foreign trade statistics were written at the turn of the 1960s and 1970s. Rolf Vallerö (1969) Svensk handels- och sjöfartsstatistik 1637–1813. Staffan Högberg (1969) Utrikeshandel och sjöfart på 1700–talet. See also SCB (1972).
[212] SCB 1972, 66–68.
[213] During the eighteenth century, there were many kinds of criticism regarding the balance of trade accounts. In 1776, the compilation of statistics was taken off from the Board of Trade, and, after that, the trade balance statistics were compiled by other bodies. SCB 1972, 66–68; see also Vallerö 1969, 97–99.
[214] SCB 1972, 5. In SCB 1972, it is mentioned how BoT3 can be used to "illuminate the trend in respect of values relating to, for instance, the balance of payment". However, it primarily recommends using trade volume data for long time series. See SCB 1972, 5.

is reported. In addition to trade balances by each country, there is a summary of the total value of imports and exports per year.[215]

In this research, BoT3 is not used to measure trade changes over time.[216] The BoT3 data was used when measuring the share of different product groups and the share of Swedish trade with Southern Europe regarding other countries. The reasons why it is not recommended to measure the changes in trade over time (at least before careful evaluation and certain deflation/inflation adjustments), are the challenges related to the balance of trade statistics. Firstly, several years and periods are missing. Secondly, the methods for calculating the trade value changed over time.[217]

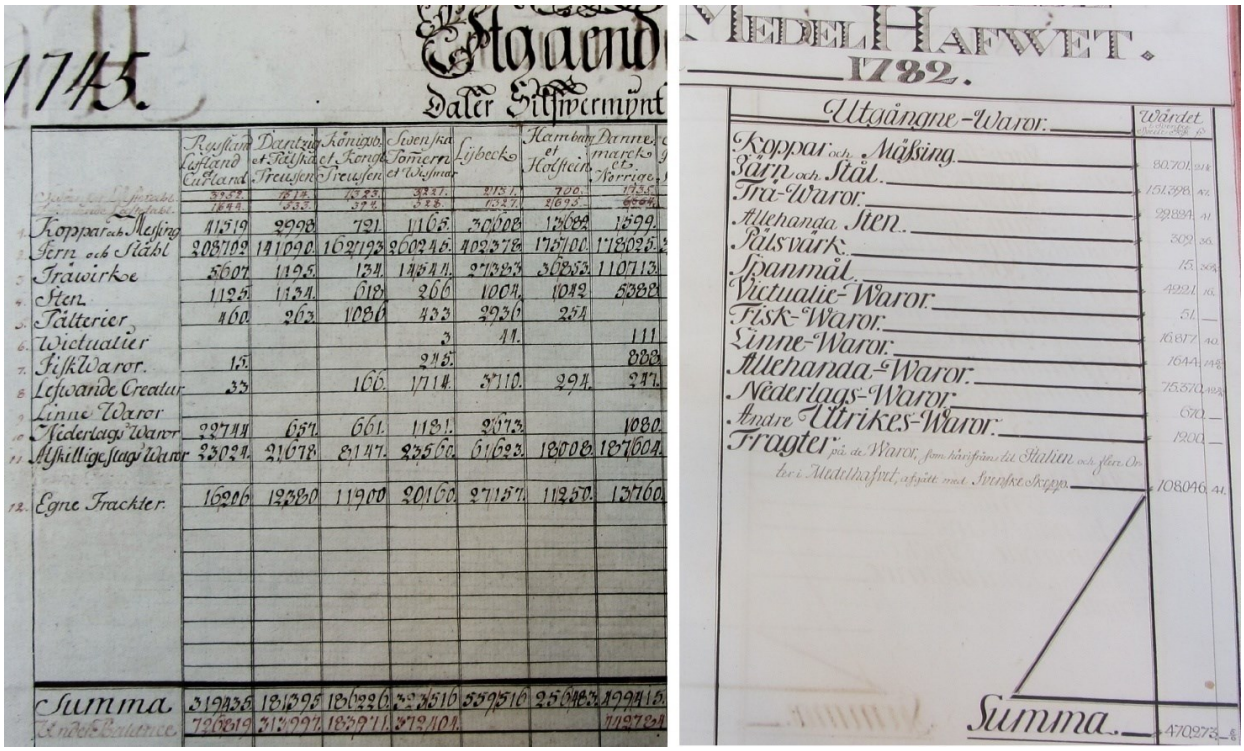
Also, it should be considered that BoT3 values are nominal values. Thus, it is practical to measure the changes in relative shares of different countries or regions. However, evaluating the increase or decrease of trade, in terms of trade value, is a more complex issue.[218]

In the early modern period, several obscurities are related to the trade statistics reported in monetary values.[219] The main method of trade valuation in Sweden was the fob-price. However, contemporaries criticized the methods for calculating trade balances, and historians have debated how trade balances were collected.[220] For instance, the publication *Historical Statistics of Sweden, Part 3* informs how ”figures were intended to illuminate the value of imports in a foreign port and the value of exports in Swedish ports”. For Swedish exports, the principle of export trade valuation as "the sales price at home" remained mainly during the research period. For import goods up to 1782, price quotations from places in foreign countries and the merchants’ invoices were used. From 1783 up to 1807, import cargoes were valued by “average price” which was based on 1782 computations. As the prices rose, this became a very unreliable method.[221] Because the import

[215] Utrikeshandel Series 1–3 (microfilms).
[216] See SCB 1972, 79.
[217] Högberg 1969. Häggqvist 2015, 66 ff.
[218] See especially Edvinsson & Gad 2018.
[219] See, for example, Edvinsson & Gad 2018, 243; SCB 1972, 80; Högberg 1969, 12–13. Rising prices were characteristic of Sweden in the eighteenth century. This upward trend was interrupted for only a few short periods. Inflation escalated during times of war, as occurred in about 1740, 1760, and during the end of eighteenth-century wars, first due to war between Russia and Sweden in about 1790 and then due to the French Revolutionary Wars in Europe. See Jörberg 1972b.
[220] SCB 1972, 79. For example, when it comes to eighteenth-century statistics, Vallerö (1969) and Högberg (1969) argued that statistics present values in Fob for imports and exports. About the discussion of the Fob vs. Cif, see also, e.g., Häggqvist 2015, 72–74. Häggqvist cites to Högberg (1969), 9–10; Heckscher (1949b), 655; and Vallerö (1969), 44.
[221] SCB 1972, 80. Also Högberg 1969, 9ff. Additionally, see Vallerö 1969, 56, 114, 128.

prices did not take the freight cost into account, import values were not as close to the market prices in Sweden as were export values. Additionally, BoT3 underestimates the value of imports.[222]

Picture 6. Example of Board of Trade Sweden, Series 3 statistics



The Swedish balance of trade accounts presents the value of trade at an aggregate level. The left picture shows an example of data registration during 1739–1763, and the right picture illustrates the manner of data registration from 1769 until 1813.

Source: Board of Trade Sweden, Series 3.

4.5.2. Board of Trade Sweden, Series 2 (BoT2), Import and export schedules

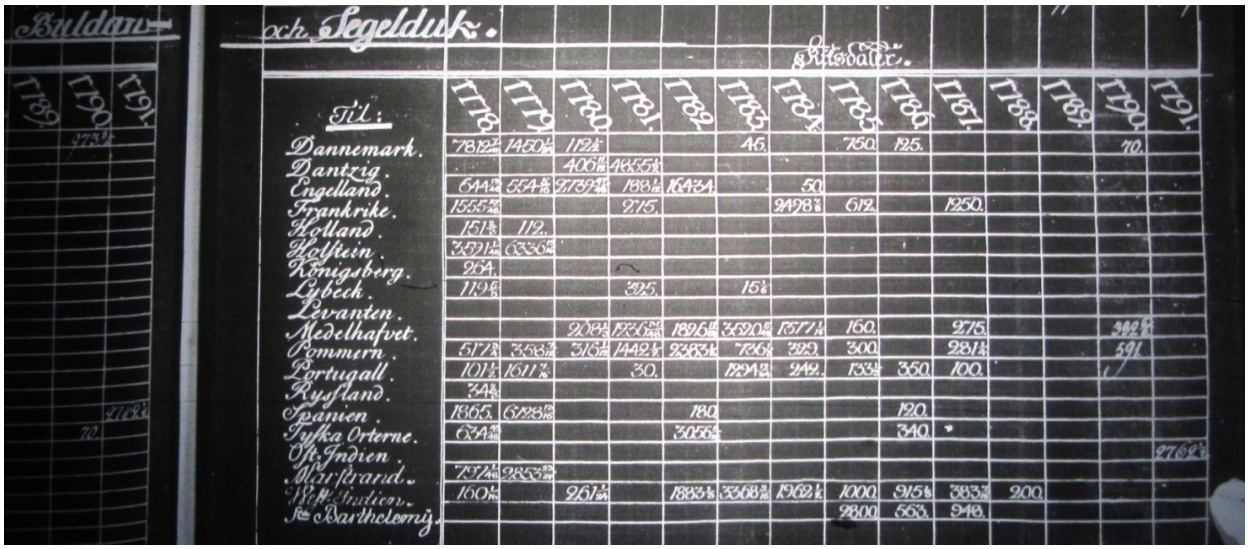
The BoT2 import and export schedules are tables in which the import and export amounts of each product are reported. The table portrays how large amounts of a certain product were imported and exported from each Swedish port city, and how much of this product ended up or was received from each foreign country.[223]

For example, in the case of exports, one table contains the name of the product (and product category), the unit of measurement, and the yearly amounts of export to each country (for a period of 10–15 years). Similarly, on the same page, another table reports the export amounts of that same product from each Swedish port. The total import or export amounts are summarized at the bottom

[222] Häggqvist 2015, e.g. 72–73; 85.
[223] SCB 1972, 66.

of the table. It is not possible to examine, for instance, how much iron was exported from a specific port to a certain area.[224]

Picture 7. Example of the Board of Trade Sweden, Series 2 statistics



The Swedish import and export schedules report the quantities of different goods between 1738–1812. Source: Board of Trade Sweden, Series 2.

4.6. Data collection and processing

Before analyzing the STR and Swedish BoT data, all data was first standardized, and different errors were corrected. From the STRO, two datasets (passage and cargo data) were downloaded from the classified geographical areas, as mentioned in Chapter 4.2. Geographical areas. From the passage data, all years and dates were copied to the cargo data using passage IDs. The process of fixing errors and standardizing the raw data had several phases. Double entries from the original data were removed, and the numerous spellings of various cargoes, geographical areas, or measures were standardized. Also, some export cargoes contained, for instance, salt, indicating a wrong entry in the port of departure or destination. In the downloaded data, there were 147 passages in total, in which the port of departure and destination were checked from the original documents and fixed.[225]

In addition, all outliers from each dataset, STR, BoT2, and BoT3 data, for example a deviantly low or high amount of cargo or unusual measure for a specific cargo, were checked in the original

[224] Only if amounts are small and targeted to one area and exported from one port, it is possible to cross-check the data and conclude this. For example, in Picture 7, in the year 1791 all sailcloth was imported to the East Indies from one port.
[225] About the errors of STRO raw data, see especially Tiainen 2018. About standardizing STRO cargoes, measures, or ports, see e.g., Scheltjens 2015b.

documents and fixed if needed. Appendixes 1–4 discusses the methods and problems of converting STR and BoT2 cargoes into metric tons.[226]

5. Trade amount

The amount of trade can be approached in several different ways. Measures such as the number of ships and ship capacity[227] as well as cargo volume and cargo value indicate the extent of imports and exports in different ways. According to STR statistics, Portugal was the most important export and import destination in Southern Europe in terms of cargo volumes. In individual years, the amount of trade with other countries, such as Italy or Spain, could exceed the amount of trade with Portugal (Table 4 and Table 5). Also, the BoT2 data of cargo volumes denote that Portugal was the most important destination for Swedish exports in Southern Europe. However, for import cargoes, the BoT2 volumes indicate similar metric tons imported from Italy and the Mediterranean and from Portugal, although the amounts from Italy and the Mediterranean are slightly higher (Table 6 and Table 7). Also, in terms of the BoT3 trade value, Portugal was the most important destination for exports in Southern Europe. When the import values are assessed, Italy and the Mediterranean clearly exceeds Portuguese imports. It is, however, likely that BoT2 and BoT3 imports from the area "Mediterranean" mainly include cargo from Italy but also some goods from the Mediterranean ports of Spain and France (Tables 8 and 9).

Trade amounts with Levant and North African Barbary States were small. Trade with the Levant region was carried out by the Swedish Levant Company, which was a rather short-term project. The Levant Company was founded in 1738 and ceased in 1756. During those years, a total of 14 ships sailed to Smyrna.[228] There were different vessels of different sizes participating in the Levant trade, but the typical size of a vessel was 130 lasts.[229] Trade amounts with the North African Corsair States were small and were largely comprised of tributes to the Corsair States.[230] For instance, STR

[226] The comparison of BoT2 and STR data in Ojala et al. (2018) suggest that data on main bulk cargoes correspond very accurately and that those datasets provide quite reliable information on trade.
[227] Measured in last.
[228] Müller 2004, 71. Meanwhile, BoT2 and BoT3 statistics indicate that trade occurred in a 16-year period from 1739 to 1755. BoT2 and BoT3 statistics also show that there were no exports to the Levant in 1741, 1745, 1750–1751, and 1755. Similarly, imports did not occur in 1744, 1746, 1751, and 1753. For these years, BoT3 does not report the number of vessels.
[229] BoT3.
[230] Müller (2004) discusses the Swedish tributes to the Barbary States extensively.

mentions 45 vessels sailing from Sweden to North Africa and five vessels from North Africa to Sweden. From Swedish statistics, however, cargoes to and from North Africa cannot be specified.[231]

Table 4. Number of ships and the total volume of exports of ships sailing from Sweden to Southern Europe via the Sound 1700–1815 (metric tons, 1,000 kg)

Number of ships			Export volume (metric tons)		
Portugal	3,730	55.1 %	Portugal	765,461	52.3 %
Italy	935	13.8 %	Spain	226,150	15.5 %
Spain	917	13.6 %	Italy	198,497	13.6 %
Mediterranean (unspecified)	582	8.6 %	France, Mediterranean coast	133,082	9.1 %
France, Mediterranean coast	560	8.3 %	Mediterranean (unspecified)	131,978	9.0 %
North Africa	43	0.6 %	North Africa	7,847	0.5 %
Total	6,767	100 %	Total	1,463,016	100 %

Source: The Sound Toll Registers.

Table 5. Number of ships and the total volume of imports of ships sailing from Southern Europe to Sweden via the Sound 1700–1815 (metric tons, 1,000 kg)

Number of ships			Import volume (metric tons)		
Portugal	3,952	54.7 %	Portugal	984,491	47.3 %
Italy	1,657	22.9 %	Italy	691,968	33.3 %
Spain	1,314	18.2 %	Spain	351,439	16.9 %
France, Mediterranean coast	301	4.2 %	France, Mediterranean coast	52,042	2.5 %
North Africa	5	0.1 %	North Africa	855	0.0 %
Total	7,229	100 %	Total	2,080,795	100 %

Source: The Sound Toll Registers.

Table 6. Total volume of exports from Sweden to Southern Europe 1738–1811 (metric tons, 1,000 kg)

Portugal	760,258	48.2 %
Italy and the Mediterranean	610,342	38.7 %
Spain	203,999	12.9 %
Levant	3,798	0.2 %
Southern Europe (total)	1,578,398	100 %

Source: Board of Trade Sweden, Series 2.

[231] It is possible that trade with North Africa was included in the category Italy and the Mediterranean in BoT2 and BoT3.

Table 7. Total volume of imports from Southern Europe to Sweden 1738–1810 (metric tons, 1,000 kg)

Italy and the Mediterranean	1,073,494	47.97 %
Portugal	1,057,590	47.26 %
Spain	105,107	4.70 %
Levant	1,513	0.07 %
Southern Europe (total)	2,237,703	100 %

Source: Board of Trade Sweden, Series 2.

Table 8. Value of exports from Sweden to Southern Europe 1739–1813 (riksdaler)

Italy and the Mediterranean	11,161,778	38.3 %
Portugal	14,681,056	50.4 %
Spain	3,070,663	10.5 %
Levant	225,791	0.8 %
Southern Europe (total)	29,139,288	100 %

Source: Board of Trade Sweden, Series 3.

Table 9. Value of imports from Southern Europe to Sweden 1739–1813 (riksdaler)

Italy and the Mediterranean	8,276,735	43.8 %
Portugal	7,545,999	39.9 %
Spain	2,722,304	14.4 %
Levant	346,231	1.8 %
Southern Europe (total)	18,891,270	100 %

Source: Board of Trade Sweden, Series 3.

During the years 1700–1815, 6,767 ships in total sailed via the Sound from Sweden to Southern Europe.[232] Over the same period, 7,229 ships sailed via the Sound from Southern Europe to Sweden (Table 25).[233] The development of ship traffic clearly indicates that imports and exports increased in a parallel manner (Figure 1), indicating the strong bilateral nature of the trade. According to the STR, the number of arriving ships was 6.8 percent higher than the number of departing ships.[234] The higher amount of arriving ships is even more unambiguous in the BoT3 statistics (54 percent higher). This is the result of high salt demand in Gothenburg and Bohuslän, data for which cannot be found in the STR. From 1769 to 1813, BoT3 mentions 6,555 ships arriving from Southern Europe and 4,257 ships departing for Southern Europe.[235] The number of arriving ships from Southern Europe was 54

[232] If years 1807–1813 are included, the number of ships is 6,811.
[233] If years 1807–1813 are included, the number of ships is 7,307.
[234] STR.
[235] On BoT3 data, nine years of data is missing for departing ships in this time period and eight years of data for arriving ships in this time period. In this same time period (all years are included), STR reports 4,046 arriving ships and 4,366 departing ships.

percent higher than the amount of departing ships in the late eighteenth and early nineteenth centuries.

When Swedish trade with Southern Europe is put into a perspective against total trade, the number of ships and ship-lasts are an indicative measurement of trade volume. For instance, during 1769–1813, an average of 7.3 percent of all arriving ships and 21.4 percent of all arriving ship-lasts came from Southern Europe.[236] In the same time period, 4.7 percent of all ships departing Sweden and 10.8 percent of export ship-lasts were directed to Southern Europe (Table 10 and Table 11).[237] This indicates that the ships participating in trade with Southern Europe were, on average, much larger than those sailing to closer destinations. These calculations confirm that trade with Southern Europe required a large amount of cargo space, as has been mentioned in previous research literature.[238] For example, the STR data shows that ships with the largest salt cargoes carried 400–450 ship-lasts of salt, and additionally, one vessel of 580 ship-lasts is also mentioned in STR.[239]

The trade statistics reveal how the trade amounts fluctuated distinctly. For example, during the Napoleonic Wars, Swedish exports to Southern Europe were very limited in terms of total exports. From 1808 to 1812, less than 1 percent of all departing ships (8–31 ships yearly) headed to Southern Europe each year. Similarly, the importance of ships arriving from Southern Europe clearly diminished in 1808–1813. In 1774, the share of ships departing from Sweden to Southern Europe was at its highest at 9.1 percent (166 ships). This was 22.8 percent (18,144 lasts) of all departing ship-lasts. The number of ships from Southern Europe to Sweden peaked in 1797; in that year, a total of 328 ships (30,068 ship-lasts) sailed from Sweden to Portugal, Spain, and Italy and the Mediterranean. This was 11.5 percent of all departing ships and 26.6 percent of all departing ship-lasts.[240]

Trade distribution between Southern European countries varies when different indicators (the number of ships, trade volume, and value) are used. When measured by the number of ships,

[236] BoT3.
[237] BoT3.
[238] As can be seen in the STR cargo lists of each ship, the ship sizes varied quite a lot. The sizes of the ships and especially the man-tonnage relation, which partially indicates productivity, have been widely discussed in the literature. In the context of Mediterranean shipping, see Müller 2004, 155–166. See also Söderberg 2010, especially page 15, where Söderberg describes the contemporary merchant discussion about the optimal vessel sizes in Mediterranean trade.
[239] Passage ID 429605.
[240] BoT3. For arriving ships, if the share of ship-lasts from Southern Europe in relation to total imports was an indicator for the highest trade amount arriving, the peak year would have been 1792, when 27.2 percent (27,837 lasts) of freight capacity arriving in Sweden came from Southern Europe.

Portugal was clearly the most important trade partner. Based on the STR, 55 percent of ships sailing to Southern Europe headed to Portugal. Regarding vessels arriving from Southern Europe, the share of vessels sailing from Portugal was also 55 percent. Approximately 25 percent of the ships arriving from Southern Europe or departing to Southern Europe sailed from or to Italy (Tables 4 and 5).[241] In the BoT3 data, the number of departing and arriving ships was only documented from 1769 to 1813, and shows that 45 percent of the ships headed to Portugal, 42 percent to Italy and the Mediterranean, and 14 percent to Spain. The proportions of arriving ships were as follows: 50 percent arrived from Portugal, 41 percent were from Italy and the Mediterranean, and 9 percent were from Spain.[242]

However, the number of ships only partially indicates the amount of trade. When the question of trade distribution is assessed by import and export volume in tonnes, Portugal was still the most important destination, but Italy clearly played a more important role, especially when it came to imports. This indicates that the vessels sailing from Italy to Sweden were larger than those arriving from Portugal. The same phenomenon can be seen in carrying capacity measured from the STR and BoT2 data and in the BoT3 data of vessel sizes (*läster*).[243] Although 50 percent of ships arriving from Southern Europe came from Portugal, the share of the ships' cargo capacity was only 45 percent. Meanwhile, ships arriving from Italy were larger, as the share of vessels was 41 percent and the share of cargo capacity was 47 percent.[244]

Table 10. Number of ships and the amount of carrying capacity (in ship-lasts) of exports from Sweden to Southern Europe 1769–1813

	Number of ships (average per year)	Ship-lasts (average per year)	Share of vessels of all Swedish exports	Share of vessels of exports to Southern Europe	Share of ship-lasts of all Swedish exports	Share of ship-lasts of exports to Southern Europe
Portugal	53	4,943	2.1 %	44.7 %	4.6 %	42.2 %
Italy and the Mediterranean	49	5,172	2.0 %	41.5 %	4.8 %	44.2 %
Spain	16	1,595	0.7 %	13.8 %	1.5 %	13.6 %
Southern Europe (total)	118	11,711	4.7 %	100 %	10.8 %	100 %

Source: Board of Trade Sweden, Series 3.[245]

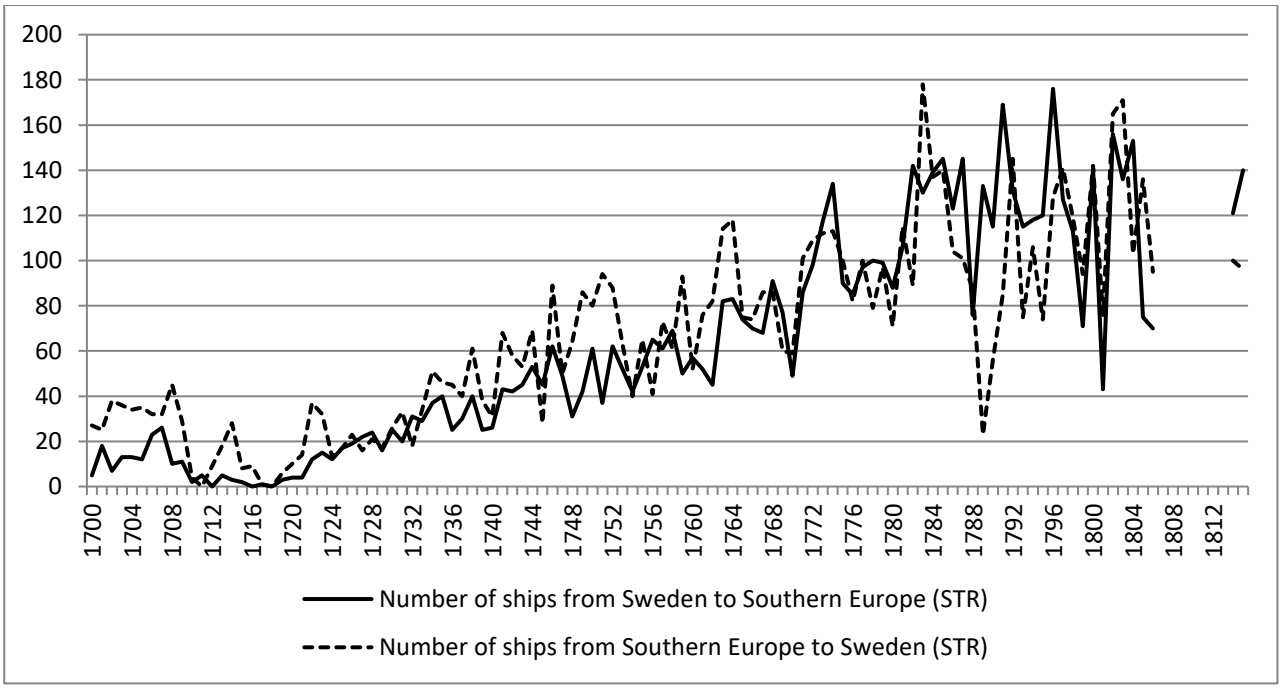
[241] STR.
[242] BoT3. Similarly, during 1769–1813, STR data indicates that the share of ships to and from Portugal were lower than in the entire research period: 45 percent for arriving ships and 47 percent for departing ships. STR.
[243] BoT3 announces the total number of arriving and departing ships and the sums of cargo-carrying capacity in lasts. Using these numbers, it is possible to calculate the average lasts per ship.
[244] BoT3.
[245] Regarding the data periods and certain years missing, see Chapter 4.1. Data periods.

Table 11. Number of ships and the amount of carrying capacity (in ship-lasts) of imports from Southern Europe to Sweden 1769–1813

	Number of ships (average per year)	Ship-lasts (average per year)	Share of vessels of all Swedish imports	Share of vessels imports from Southern Europe	Share of ship-lasts of all Swedish imports	Share of ship-lasts of imports from Southern Europe
Portugal	88	7,906	3.7 %	49.8 %	9.5 %	44.5 %
Italy and the Mediterranean	72	8,371	3.0 %	40.9 %	10.1 %	47.3 %
Spain	16	1,639	0.7 %	9.4 %	1.7 %	7.9 %
Southern Europe (total)	177	17,917	7.3 %	100 %	21.4 %	100 %

Source: Board of Trade Sweden, Series 3.[246]

Figure 1. Number of ships per year sailing between Sweden and Southern Europe via the Sound 1700–1815



Source: The Sound Toll Registers.

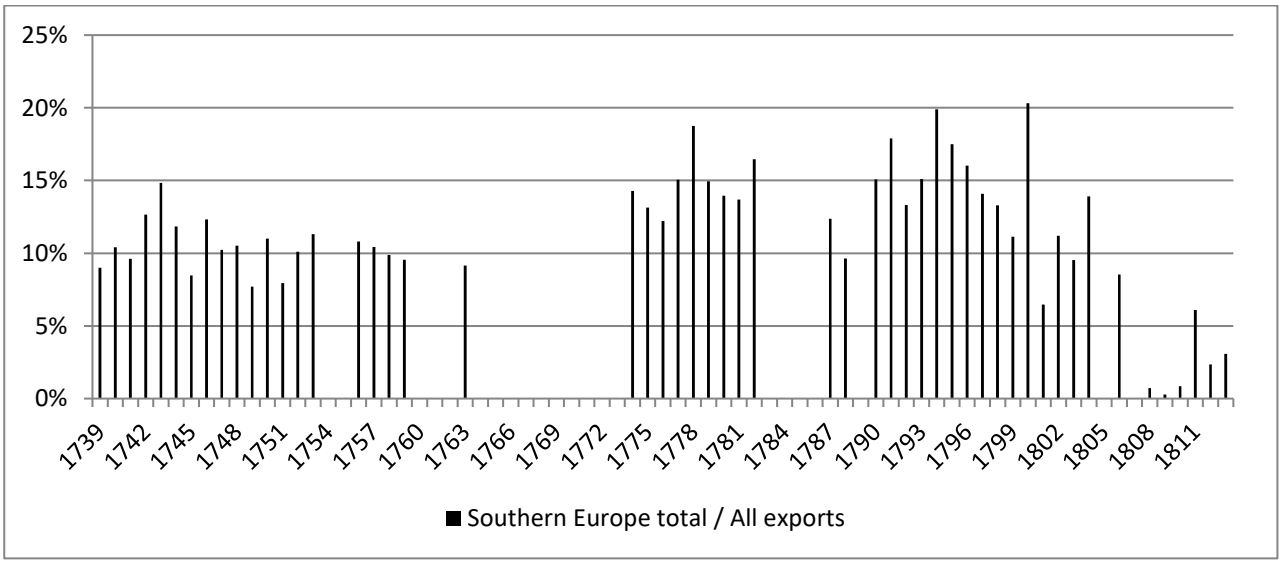
When the development of total trade volume is assessed, STR data is not very suitable, especially when it comes to imports. The main reason for this is that salt imports to the North Sea coast of Sweden, which were not included in the STR statistics, increased more than the salt imports to the Baltic ports of Sweden. In 1738–1749, only 8.8 percent of Mediterranean, Spanish, and Portuguese salt was imported to Swedish ports in the North Sea, whereas the share was as high as 47.7 percent

[246] Regarding the data periods and certain years missing, see Chapter 4.1. Data periods.

in the 1790s.[247] Thus, the STR data does not reliably reveal the growth of imports from Southern Europe. For Swedish exports, STR data is more applicable because, when the export destinations of Gothenburg and Stockholm are compared, Britain was an important destination for Gothenburg merchants, while a great share of Stockholm's timber exports was destined for Southern Europe.[248]

When measured in terms of value, an average of 10.5 percent of Swedish exports headed to Southern Europe (1739–1813). In that same period, in terms of value, 7.6 percent of Swedish imports arrived from Southern Europe. The share of Southern Europe in all Swedish imports and exports increased during the eighteenth century, especially from the mid-eighteenth century to the 1770s. This timing is relatively similar to the herring boom and thus the increase in salt demand in Gothenburg and Bohus County.[249] The importance of Southern Europe for Swedish imports and exports decreased considerably in the turn of the nineteenth century due to the Napoleonic wars (Figures 2 and 3).[250]

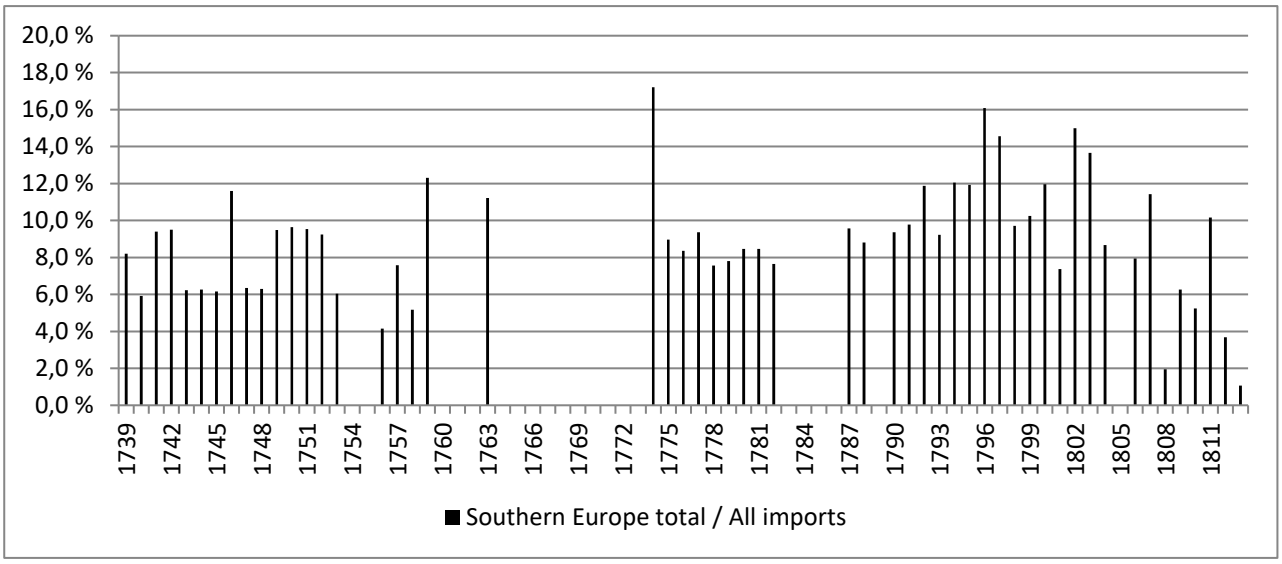
Figure 2. Southern Europe's share of Swedish exports value 1739–1713



Source: Board of Trade Sweden, Series 3.

[247] BoT2. Practically, almost all of these salt qualities were directly imported from Italy and the Mediterranean, Portugal, and Spain, especially during these years.
[248] Müller 2004, 136. Högberg 1969, 138.
[249] Högberg 1969, 165–183
[250] BoT3.

Figure 3. Southern Europe's share of Swedish imports value 1739–1813



Source: Board of Trade Sweden, Series 3.

The role of Southern Europe in Swedish salt imports was essential. On average, direct imports from Southern Europe comprised 83.1 percent of the value of all salt imports to Sweden. In addition, the role of Southern Europe in direct wine and fruit imports to Sweden was also rather high. In terms of trade value, 14.3 percent of imported wines and beverages and 27.2 percent of fruits were shipped directly from Southern Europe. For many other commodity groups, the role of direct imports from Southern Europe was rather low.[251] The only exception was groceries and spices (Sw. s*pecerier*), where direct imports from Southern Europe comprised 30.3 percent of all imports to Sweden.[252]

On the export side, Southern Europe was an important destination for Swedish timber exports. In terms of value, 16.1 percent of Swedish timber exports were shipped to Southern Europe. This share was at its highest in the 1750s, when 29 percent of timber exports headed to Southern Europe. Regarding the value of Swedish iron and steel exports, an average of 13.7 percent was shipped to Southern Europe. For instance, Müller (2004) mentioned how Southern Europe was the most important market for Swedish timber. Export values calculated for this research show how this is only partly true, thus suggesting that the role of Southern Europe, to some degree, for total Swedish

[251] For instance, a preliminary analysis of BoT data indicates that quite a large share of spice imports originated from Britain or the Dutch Republic. A more detailed analysis would be fruitful for understanding the trade patterns.
[252] This category contains spices and different groceries. The preliminary analysis of Swedish spice imports based on BoT2 reveals that many spices arrived in Sweden from Britain or the Dutch Republic. Reasonable amounts of anis, dried plums, almonds, olives, raisins, and figs were imported directly from Southern Europe.

timber exports has been found to be too high in early research literature.[253] If the value of timber exports to Southern Europe includes exports to France (both Atlantic and Mediterranean ports) and Portugal, Spain, and Italy, and this amount is compared to Swedish timber exports to the North Sea (Britain and the Dutch Republic), then the value of exports to Southern Europe exceeded the value of exports to the North Sea area only during just a few years. During the time period of 1739–1813, Britain was by far the most important market for Swedish timber exports. The value of Swedish timber exports to Portugal, Spain, Italy, and the Levant was 3.1 million rds, to Britain 6.6 million rds, and, for comparison, to France 2.0 million rds (majority to Atlantic ports). However, a major share (4.3 million rds) of these imports to Britain occurred in the early nineteenth century.[254]

The comparison between the STR and the BoT indicates how the STR geographical classification where ships' port of departure and estimated port of destination are reported as such, seems to be more accurate than the geographical classification in the Swedish statistics. The categories used in BoT2 (Mediterranean) and BoT3 (Mediterranean or Italy and the Mediterranean) seems to be a complex issue. When BoT2 and STR, as well as BoT2 and BoT3, are compared, apparently the category Mediterranean includes cargoes mainly to and from Italy. However, cargo volumes and cargo structure strongly indicate that this category also includes some cargoes to and from Spain, France (Mediterranean ports), and other Mediterranean areas.

6. Trade structure

6.1. Exports

Many of the Swedish exports to Southern Europe were so-called naval stores, materials that directly or indirectly were related to shipbuilding and the maintenance of navies. Cargoes primarily consisted of timber (such as boards, spars, and masts), metals (semi-finished casting products, for example, wrought iron and manufactured products like cannons or nails), tar, and also to some

[253] Müller 2004, 136. Lindberg 2005 underlined the importance of Portugal for Swedish board exports. Högberg 1969, 101–142, describes how the timber exported from Stockholm, was destined particularly to Southern Europe, while the timber exported from Göteborg especially destined to Britain.

[254] As Ojala & Tiainen (accepted manuscript 2020) showed, in the eighteenth century, the Finnish trade with France was dominated by the French Atlantic ports, while the Mediterranean harbors of France had a minor role. This was also the case for Swedish trade during the same period.

extent other naval stores such as sailcloth, linen, and gunpowder. In addition, customs statistics also mention the export of several other cargoes, for instance, stones, hides, grain, and salted fish.[255]

6.1.1. Export volume

When the volume of Swedish exports to Southern Europe is measured, approximately 95 percent (STR: 96.3 percent; BoT2: 95.2 percent) of the cargo volume consisted of three product groups: timber, iron, and tar and pitch. Over half of the cargo volume, 54 percent, was timber. Similarly, the share of iron cargo was one-third, at 31 percent, and tar and pitch comprised 11 percent.[256] The trade volumes of other product groups (steel, stone, copper and brass and other products) were small, totaling approximately 4 percent (STR 3.7 percent; BoT2 4.8 percent) of all export volumes (Table 12 and Table 13).

Slight differences in trade structure between the STR and BoT2 are explained almost solely by two factors. Firstly, Stockholm and Gothenburg had different export structures in that Southern Europe was particularly important for Stockholm's sawn timber exports, while Gothenburg exported mainly to Britain.[257] Secondly, STR also covers the earlier phase of the eighteenth century when Portugal's significance in the total volume of exports and imports to and from Southern Europe was larger than in the second half of the century.

The structure of Swedish export cargoes was quite different for different destination areas in Southern Europe. The exports to Portugal and the French Mediterranean ports particularly consisted of iron. Additionally, the demand for steel was higher in Portugal than in other Southern European countries. The shares of iron cargoes on ships sailing to Spain as well as Italy were also smaller. Comparably, the share of timber was higher than average in the export cargoes to Spain.[258] The share of tar cargoes was particularly high for vessels sailing to Italy, and the ships sailing to Portugal or Spain carried smaller amounts of tar than other ships (Table 15).[259] Largely, these findings are in line with earlier studies. Müller (2004) mentioned the manner in which buyers in the Mediterranean area (Italy and Spain) were familiar with the purchase of Austrian steel.[260] In

[255] Regarding the structure of Swedish exports in general and to all countries, see Högberg 1969.
[256] STR and BoT2. For these cargoes, there are very slight differences in cargo volume proportions between the STR and BoT2, because, when rounded to the nearest integer, the percentages remain the same.
[257] Müller 2004, 136; also SCB 1972, 96.
[258] Müller 2004, 136 correctly supposed how the share of sawn timber cargoes was more important for ships sailing to Spain (Cadiz) than those sailing to Lisbon. However, his evaluation that sawn timber cargoes were also more important for ships sailing to Marseille than those sailing to Lisbon seems to be contradictory in light of STR.
[259] STR, BoT2.
[260] Müller 2004, 121.

Portugal, the market situation for Swedish steel was more favorable, although the Portuguese steel market was dominated by steel from Corinthia.[261]

The lower share of iron cargoes to Spain, in comparison to Portugal, Italy, or the Mediterranean ports of France, is explained by domestic bar-iron production in the Basque Countries and Catalonia. It is noteworthy that Spain protected domestic iron production and restricted imports of bar-iron. By 1719, Swedish consuls in Spain already had the correct viewpoint on the high demand for timber and naval stores in Spain.[262]

Marseille was an important entrepôt in the Western Mediterranean. In 1730s, the Swedish consul Butini reported from Marseille as to how the city was not a good market for Swedish iron exports. Moreover, the STR data illustrates how the total trade amounts to Marseille were very limited until in the 1770s and 1780s, when there was a significant increase in export volumes.[263] Similarly, Müller mentioned how Marseille became an important market for Swedish products at that time; unfortunately, though, the consular reports offer negligible or no information about cargo or shipping data.[264] Additionally, other remarks by Müller (2004), for example, the good market situation for tar in Marseille, are in line with the STR statistics.[265]

Exports to North Africa were different from those made to other destination countries. Although timber and iron dominated the export trade, the share of the category miscellaneous cargoes was especially high, at approximately 10 percent, while it was usually about 1 percent for other countries. The main explanatory factor is the high amounts of cargoes such as gunpowder, ropes, krammerie, and red dyes.

One interesting observation about Swedish exports in the STR is the exports to the unspecified area – Mediterranean. Apparently, the entry "Mediterranean" did not refer to any specific geographic location in the Mediterranean, per se. However, the structure of exports to Italy and the Mediterranean were actually very similar. This, in turn, indicates that probably a very high share of

[261] Müller 2004, 103.
[262] Müller 2004, 107, 121.
[263] Müller 2004, 115–118.
[264] After 1763, there is very little information about trade and shipping data from consular reports in Marseille; in addition, all reports between 1783–1803 were not preserved. This is very unfortunate, because Swedish exports to Marseille increased notably at that time. See Müller 2004, 118. Regarding the Finnish trade with Marseille, see the story of the voyage from Kokkola (Sw. *Gamlakarleby*) to Marseille in 1766. Ojala 2019.
[265] Additionally, Müller 2004, 117 mentions how the market situation for Swedish iron and naval stores in Marseille and western Mediterranean "worsened over the course of time, due to quantities of Russian iron and naval stores reaching the western Mediterranean on Dutch ships." This is difficult to verify from the STR data used in this research.

STR cargoes to the Mediterranean was attributed to Italy and not to other destinations in Southern Europe.

When the BoT2 trade area Mediterranean is compared to the STR, a higher share of exports (BoT2 38.7 percent and STR 24.2 percent of cargo volume to Southern Europe[266]) to BoT2 geographical area the Mediterranean strongly indicates that this category also includes many vessels sailing to Mediterranean ports other than Italy – probably to Spain, France, or perhaps even to Portugal. Furthermore, the fact that the trade structure of Italy and the Mediterranean in the STR differs from that of the BoT2 Italy and the Mediterranean (the share of tar cargoes is lower in the BoT2) implies that this geographical category in the BoT2 also includes exports to destinations other than Italy.

Table 12. Amounts and structure of Swedish exports to Southern Europe 1710–1815 (metric tons 1,000 kg)

	Total	Timber	Iron	Tar and pitch	Steel	Stone	Others	Copper and brass
Portugal	765,461	407,306	289,108	36,446	15,683	10,806	4,941	1,172
	52.3 %	53.2 %	37.8 %	4.8 %	2.0 %	1.4 %	0.6 %	0.2 %
Spain	226,150	176,731	32,399	11,585	926	2,358	1,722	429
	15.5 %	78.1 %	14.3 %	5.1 %	0.4 %	1.0 %	0.8 %	0.2 %
Italy	198,497	85,439	50,556	54,668	661	2,570	4,244	358
	13.6 %	43.0 %	25.5 %	27.5 %	0.3 %	1.3 %	2.1 %	0.2 %
France,	133,082	60,127	50,173	18,247	686	1,860	1,706	283
Mediterranean coast	9.1 %	45.2 %	37.7 %	13.7 %	0.5 %	1.4 %	1.3 %	0.2 %
Mediterranean	131,978	61,594	31,887	35,860	481	685	1,386	84
	9.0 %	46.7 %	24.2 %	27.2 %	0.4 %	0.5 %	1.1 %	0.1 %
North Africa	7,847	3,740	2,588	620	36	39	817	7
	0.5 %	47.7 %	33.0 %	7.9 %	0.5 %	0.5 %	10.4 %	0.1 %
Southern Europe (total)	1,463,016	794,938	456,710	157,426	18,473	18,317	14,818	2,333
	100 %	54.3 %	31.2 %	10.8 %	1.3 %	1.3 %	1.0 %	0.2 %

Source: The Sound Toll Registers.

[266] Here, STR time frame 1738–1806; Italy + Mediterranean (unspecified).

Table 13. Amounts and structure of Swedish exports to Southern Europe 1738–1812 (metric tons 1,000 kg)

	Total	Timber	Iron and steel	Copper and brass	Stone	Tar and pitch	Miscellaneous cargoes
Portugal	760,258	426,39	278,906	1,202	7,938	35,739	10,083
	48.2 %	56.1 %	36.7 %	0.2 %	1.0 %	4.7 %	1.3 %
Mediterranean	610,342	282,272	162,843	679	2,536	125,178	36,835
and Italy	38.7 %	46.2 %	26.7 %	0.1 %	0.4 %	20.5 %	6.0 %
Spain	203,999	137,82	40,617	401	1,251	8,515	15,395
	12.9 %	67.6 %	19.9 %	0.2 %	0.6 %	4.2 %	7.5 %
Levant	3,798	198	3,405	21	0	5	169
	0.2 %	5.2 %	89.6 %	0.5 %	0.0 %	0.1 %	4.4 %
Southern Europe (total)	1,578,398	846,68	485,77	2,302	11,724	169,438	62,482
	100 %	53.6 %	30.8 %	0.1 %	0.7 %	10.7 %	4.0 %

Source: Board of Trade Sweden, Series 2.

6.1.2. Export value

The following remarks can be made when the value of trade structure is measured. Iron was the most important export cargo to all destinations in Southern Europe. In total, 71 percent of the export value to Southern Europe consisted of iron. On the other hand, tar covered approximately 11 percent of the export value.[267] Despite being the most voluminous cargo, timber accounted for about 10 percent of the value of Swedish exports to Southern Europe (Table 14).

The differences in export trade structure, when measured in value between different destinations, are similar than when measured from the trade volume. Iron and steel were exported especially to Portugal, while tar exports were particularly significant for ships sailing to Italy. With respect to the structure of Swedish exports to Spain, the value of timber cargoes was above average.[268]

[267] Note that there is no product category for tar and pitch in the BoT3. Therefore, a value for those cargoes cannot be determined from the BoT3 data. Tar was included in the export category miscellaneous goods (*allehanda waror*), which comprised 12.7 percent of the value of Swedish exports to Southern Europe. The BoT2 reveals that tar was a dominant cargo in this product group. The author's estimate is that tar and pitch accounted for about 90 percent of the value of *allehanda waror* to Southern Europe. Other important cargoes in this category included alum, potash, and lime, which were not largely exported to Southern Europe (see BoT2 data). SCB 1972 pointed out that of the total export value of miscellaneous goods (*allehanda waror*), alum, potash, and lime comprised one-third and tar and pitch two thirds. SCB 1972, 157.

[268] BoT3.

Table 14. Value and structure of Swedish exports to Southern Europe 1739–1813 (riksdaler)

	Total	Iron and steel	Miscellaneous goods (mostly tar and pitch)	Timber	Miscellaneous cargoes	Copper and brass	Stone
Portugal	14,681,056	11,381,347	757,503	1,531,508	520,14	462,291	28,268
	50.4 %	77.5 %	5.2 %	10.4 %	3.5 %	3.1 %	0.2 %
Italy and	11,161,778	6,681,942	2,512,393	1,052,652	678,78	230,489	5,522
Mediterranean	38.3 %	59.9 %	22.5 %	9.4 %	6.1 %	2.1 %	0.0 %
Spain	3,070,663	1,733,304	325,47	492,537	478,158	38,714	2,48
	10.5 %	56.4 %	10.6 %	16.0 %	15.6 %	1.3 %	0.1 %
Levant	225,791	184,165	17,55	593	19,903	3,527	52
	0.8 %	81.6 %	7.8 %	0.3 %	8.8 %	1.6 %	0.0 %
Southern Europe	29,139,288	19,980,758	3,612,917	3,077,290	1,696,981	735,02	36,322
(total)	100 %	68.6 %	12.4 %	10.6 %	5.8 %	2.5 %	0.1 %
Southern Europe / All Swedish exports	10.5 %	13.7 %	9.1 %	16.1 %	3.1 %	4.4 %	5.9 %

Source: Board of Trade Sweden, Series 3.[269]

6.1.3. Changes in the export structure

During the eighteenth century, the changes observed in the structure of exports were not as clear as the changes for the main import cargoes. When measured from export volume, the share of timber exports was found to increase during the first half of the eighteenth century until the late 1750s, while the share of iron cargoes somewhat decreased. From the 1760s until the early nineteenth century, the importance of iron cargoes slowly increased, while the share of timber cargoes decreased slightly in the same period. From trade values, the same trend can be seen for timber exports. However, with regard to the development of the share of iron cargoes (measured in value), there is a slight decreasing trend during the eighteenth century. Thus, to summarize, the changes to export structure for the main cargoes of iron and timber were not distinct.

Demand for copper and brass fluctuated strongly during the whole research period. In terms of the share of tar exports, there was a clear upward trend during the eighteenth century (when measured in tonnes). This growth stabilized in the late eighteenth century.

An examination of the changes in trade structure (measured in value terms) shows that the main changes occurred at the end of the research period when the trade structure diversified. For

[269] The shares were calculated for the entire period in rds. Regarding the currencies, see Appendix 5.

example, during the years of 1793–1795, the share of the product group miscellaneous cargoes was especially high at over 10 percent in terms of export value, while during previous decades, the share was 4 percent and under 2 percent until the 1750s. In the early nineteenth century, the share of miscellaneous cargoes was occasionally exceptionally high. For instance, in 1810, it was over half of the export value. The main explanatory factor in the 1790s was the export of grain. In addition, in 1794, for instance, a great amount of fish was exported to Italy. In the early nineteenth century, the export of grain and also bonded goods (Sw. *nederlagswaror*) was occasionally very high, which caused changes in the trade structure.[270] This indicates that the trade patterns for exports fluctuated distinctly during the Napoleonic Wars.

6.1.4. Metals: Iron, steel, copper and brass

Sweden was a significant player in European metal markets and had two advantages. In the European copper market, Sweden had a monopolist position. The Swedish iron industry, which relied strongly on exports, was well-known for its high-quality iron.[271] Compared to Russian or British iron, which were Sweden's main competitors in iron exports, Swedish iron was harder and more appropriate for gunsmiths.[272] Moreover, Swedish iron was cheaper than that of the English, who had to protect their iron manufacturing from the Swedish through customs regulations.[273] Southern Europe was not the main destination for Swedish iron exports. For example, in the mid-eighteenth century, Sweden produced approximately 40 percent of European iron, and 60–70 percent of this was shipped to Britain. The major turn in Swedish iron exports occurred when the puddling system was invented in Britain, and the country started to export iron, causing crises in Swedish iron production.[274]

The Swedish iron shipped to Southern Europe was mainly unprocessed bar iron. For example, Portugal, which was the main destination for Swedish bar iron in Southern Europe, imported high amounts of iron from Russia and Spain as well.[275] Exported metals were used for various purposes, such as building and maintaining military and naval forces. Eighteenth-century warships contained

[270] BoT3.
[271] Vilkuna 1994, 21. About copper, see, for example, Wallerstein 1980, 205–206.
[272] Vilkuna 1994, 1.
[273] Harley 2004, 188.
[274] Ahvenainen, Pihkala & Rasila 1982, 297; Fleisher 1953, 78–180; Boëthius 1953, 165.
[275] Wallerstein 1980, 101, 208; also, Davis 2012, 209–210. Also, influenced by autarkic ideas, Portugal tried to start its own iron manufacturing (even in Angola) during the eighteenth century, but this attempt remained a fully marginal position. About Portuguese attempts to produce iron, see Birmingham 2005, 95.

large amounts of iron and copper, including for items such as anchors, cannons, nails, ammunition, and copper hoops. Particularly Swedish cannons, which were considered the finest in Europe, were in high demand in Southern Europe.[276]

According to STR data, 95.7 percent of the metal exports from Sweden to Southern Europe was iron, 3.9 percent steel, and 0.5 percent copper and brass. Iron formed the main foundation for metal exports; for example, from 1730 to 1815 the share of iron of metal exports was always over 90 percent.[277]

The amount of copper and brass exports fluctuated greatly because the exported amounts were rather small. For example, between 1730 to 1750, there were 12 years when copper and brass were exported, and nine years when those cargoes were not mentioned in the STR.

In the second half of the eighteenth century, when exports to Southern Europe increased, exports of copper and brass were more frequent. The export of copper and brass was high in 1750 when 4.2 percent of all metal exports were copper and brass. This copper was exported on one ship from Stockholm to Lisbon by Captain Berend Holtfretter.[278]

Cargo products indicate that in terms of volume, metal cargoes were mainly raw materials, and only a small share of metal cargoes were further processed goods. For instance, cargoes such as iron (*jern*), iron plates (*jern plader*), bar iron (*stang jern*), and ordinary iron (*ord. jern*) accounted for approximately 97 percent of iron exports.[279] Commonly exported processed items such as cannons, anchors, and cannonballs formed only approximately 1.4 percent of the volume of iron exports.[280] However, during certain years, the importance of export amounts of iron cannons was rather high; for instance, in 1774, cannons formed 13.1 percent of all iron export volume. The STR shows that in that year, cannons were exported especially to Italy and Marseille.[281]

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[276] About metals in warships see, for example, Hickox 2005, 24–25. About the high quality of Swedish cannons, Evans & Rydén 2007,178.

[277] STR. In the early eighteenth century, shipping amounts were rather small and therefore shares of product groups fluctuated more.

[278] This voyage was untypical because iron was not exported. Passage ID: 458070. Berend Holtfretter sailed regularly to Southern Europe; he made seven voyages to Portugal and the Mediterranean from 1745 to 1755. Passage ID: 488746; 569188; 458070; 462467; 427603; 453563; 527955. Based on STR data, he did not specialize in copper exports, since copper was only mentioned on this one voyage.

[279] These products had various spellings – *jern* obviously meant the same cargo as *stang jern*.

[280] There was a great variety of different cargo names, and thus, these shares are directional. Different spellings were standardized before analyzing the cargo data. However, in the original data, there were certain cargoes for which several products were combined, such as “thick and thin bar iron, iron balls etc.” (*stang og knip jern, jern kugler etc*).

[281] STR. Several ships sailing to Southern Europe had cannons as their heaviest cargo in 1774. See e.g., Passage ID: 210727; 206701; 213527.

Swedish exports of steel to Southern Europe were composed almost entirely of semi-finished casting products.[282] For three years, the export of small amounts of steel wire was mentioned, comprising 1.9 percent of the total volume of steel exports.[283] In the category of copper and brass, copper (87 percent of export volume in that category) was the main commodity, and brass cargoes were exported less (comprising 13 percent of export volume in that category). Exported copper and brass cargoes contained a higher share of processed goods than, iron cargoes, because approximately 6 percent of the volume of copper and brass cargoes was the brass wire.[284]

6.1.5. Timber

Based on the STR data, the most commonly exported timber dimensions were boards (*breder* or *bræder: ord. breder, 7 al. breder, 6 a 7 all. breder, 6 al. breder*), deals (*dehler*), planks (*skudeplanker* or *planker*), and balks or spruce balks (*bielker* or *fyrre bielker*). Altogether, these wood products accounted for 94 percent of the timber export volume. Most of the exported volume consisted of boards, which were typically 6 or 7 ell long (approximately 3.6–4.2 meters).[285] These boards accounted for approximately 83 percent of all timber export volume.[286]

The weight of the boards was approximately 30 kilograms, while the weight of smaller timber dimensions, such as deals, was approximately 20 kilograms, and handspikes (*haandspiger*) were approximately 10 kilograms. The largest exported timber cargoes were balks and masts, which were several hundreds of kilograms in weight.[287] Timber cargoes also consisted of very small dimensions such as laths (*lægter*) and cask staves.[288] As the timber exports played a significant role throughout the eighteenth century, this shows the constant demand for Swedish timber products in Southern Europe. Particularly, the mast wood from Scandinavia was well known for its top quality.[289] Since

[282] STR mentions *staal*, BoT2 *ståhl*.
[283] Regarding all steel exports, 96.5 percent was *staal*; 1.5 percent *staal og søm*; 1.9 percent *staal traad*; 0.1 percent *staal saage*. The other years, according to STR, when the export of cannons was notable, were 1773 and 1807.
[284] STR.
[285] Swedish ell = 59.38 cm.
[286] STR. There were also shorter (boards of 4 and 5 ell long in length) and longer (boards of even 16 ell long in length) dimensions. However, these dimensions covered only about 1 percent of the exported timber volume. STR.
[287] In the eighteenth century, Finland and northern parts of Sweden were areas where 250–300-year-old sturdy timber, used especially for masts in shipbuilding, was available.
[288] STR. About the size of different timber dimensions from the Baltic, see Gallagher 2016. About the Swedish dimensions, see Högberg 1969, 104–107.
[289] Wallerstein 1980, 100.

the Scandinavian softwood, as opposed to hardwood such as oak, was not the best kind of timber for ships, and so it is likely that timber was used for different purposes, such as a building material.[290]

The timber exports from Sweden to different destinations in Southern Europe were rather similar. However, there was a higher demand for deals in the Iberian Peninsula than in Italy or the Mediterranean ports of France. In addition, in Portugal, the demand for planks was smaller than elsewhere in Southern Europe.[291]

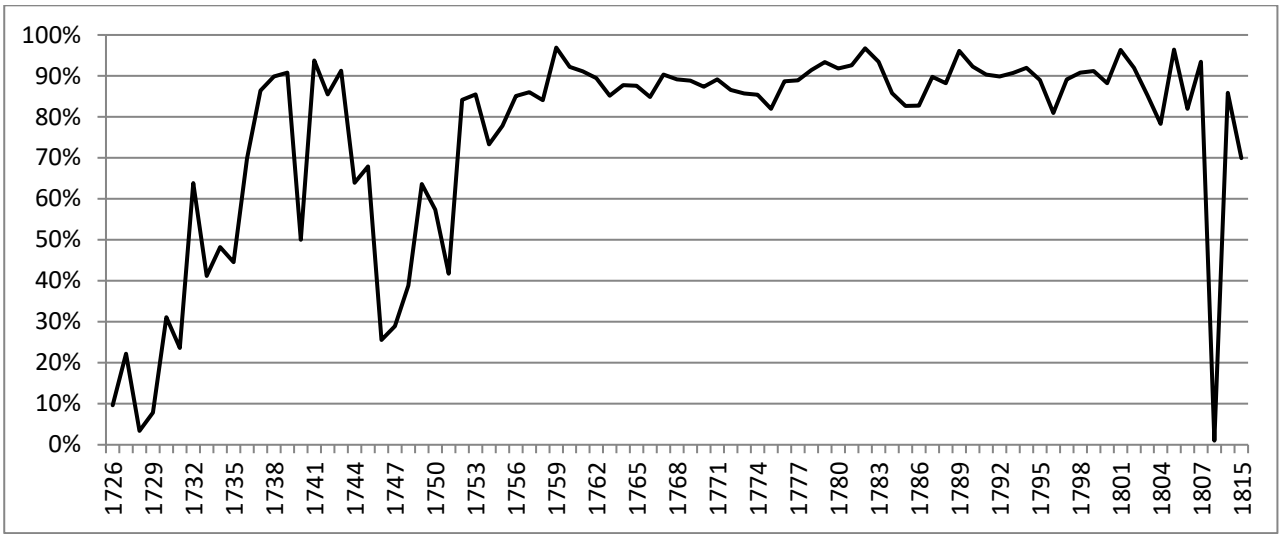
When the Swedish timber exports to Southern Europe increased, the structure of timber exports became less diversified.[292] From the 1720s to the 1750s, the proportion of boards within the total timber exports to Southern Europe clearly increased. In the 1720s, boards covered only approximately 6 percent of all timber exports to Southern Europe, whereas in the 1730s and 1740s, the share was over 60 percent and over 80 percent in the 1750s.[293] After the 1750s, no significant changes occurred in the structure of timber exports, and the proportion of boards in timber exports remained at a constantly high level (Figure 4). Comparably, timber exports consisted of a higher share of deals before the 1740s. STR reveals that the import share of deals and spars (*spirer*) clearly decreased later in the eighteenth century. Although the export volume of masts and oars was small compared to total timber exports, STR shows a clear increase in those exports, especially for masts.[294]

Norway was the biggest producer in the European sawn timber market. Since the Norwegian timber production was ten times bigger compared to Sweden, this country was the major challenger for Swedish timber exports.[295] The profits on timber exports were poor; according to Alanen (1964), timber exports were only profitable if there were not too many intermediaries in the export chain. Often, timber exporters also owned sawmills and exported their own sawn timber. In the European timber markets, different countries and regions had different demand for specific types and

[290] About the Baltic timber trade, see Johansen 1983; Johansen 1991.
[291] STR.
[292] Based on the STR data, since the 1750s, a timber grade *breder 6/7 al.*, strongly dominated Swedish timber exports to Southern Europe. In the first half of the eighteenth century, timber exports contained larger share of other dimensions as well.
[293] There were single years when the share was clearly lower. However, from mid-1750s onwards, the share of boards was almost constantly over 80 percent – except the year 1812. STR.
[294] STR. Typically, the export amount of oars was a couple of dozen per ship. However, for instance, 5,333 pieces of oars were exported on one ship to Lisbon in 1797. See Passage ID: 414025.
[295] Kaukiainen 1970, 441.

qualities of timber. Based on earlier research, the worst quality of timber from Sweden was exported to France, while the better quality of timber was shipped to other countries.[296]

Figure 4. The share of boards of all timber exports from Sweden to Southern Europe[297]



Source: The Sound Toll Registers.

6.1.6. Tar and pitch

From 1738 to 1812, about one million barrels (approximately 138 million liters) of tar and pitch were exported from Sweden to Southern Europe. The average yearly export amount was about 14,000 barrels. The STR and BoT data shows that tar exports increased steadily throughout the eighteenth century. In the 1740s, the yearly export to Southern Europe was about 7,000 barrels. By the 1790s, the figure had escalated to about 28,000 barrels. The majority of the tar and pitch exports consisted of tar (75 percent), while 25 percent of those loads were made up of pitch and pitch oil.[298] Pitch is a more solid and processed version of tar. Tar was not only used to preserve wooden ships against rot but also to preserve the cordage of the ships.[299]

The STR and BoT data show that the share of tar exports of all Swedish export cargoes to Southern Europe increased during the eighteenth century. The share of tar exports to Southern Europe was at its highest in the 1780s and 1790s, accounting for 13 to 14 percent of the total export volume. The main reason behind this increase seems to have been the increase in export activity to Italy. The share of tar cargoes on vessels heading to Italy was approximately 30 percent, while the

[296] Alanen 1964, 132.
[297] Boards = *ord. breeder*, 6 *al breeder*, 7 *al. breeder*, 6–7 *all. breeder*.
[298] BoT2. The shares are based on the number of barrels.
[299] Concerning tar in the eighteenth-century, see, e.g. Åström 1963, 42; Åström 1988; Hautala 1963; Alanen 1957. About tar history in Finland in general, see Turpeinen 2010. Another product used to preserve ropes was linseed oil.

proportion of tar in loads of ships heading to Portugal was only 5 percent of their cargo volume. It should be realized, however, that the share of tar cargoes of the ships sailing to Portugal was higher in the early nineteenth century than in the first half of the eighteenth century. The proportion of tar consignments on ships sailing to Spain did not increase or decrease.

Most of the Swedish tar (77–89 percent) was produced in Finland and some in Norrland. However, the tar trade was highly concentrated in the hands of Stockholm merchants.[300] Stockholm exported three-quarters, and sometimes even four-fifths, of all tar, although the Tar Company, a monopolized enterprise, was abolished in 1717. The main reason was that, until the 1760s, tar was inspected in Stockholm by special tar inspectors (Sw. *vräkare*). Tar prices increased throughout the eighteenth century, which benefited peasants in tar producing areas.[301]

Table 15. The share of tar cargoes of the export volume

	Southern Europe (all areas)	France, Mediterranean coast	Italy	Mediterranean	North Africa	Portugal	Spain
1710–1719	4 %					3 %	25 %
1720–1729	2 %		70 %			2 %	3 %
1730–1739	4 %	0 %	37 %	6 %		3 %	7 %
1740–1749	7 %	27 %	22 %	14 %	5 %	5 %	1 %
1750–1759	7 %	10 %	38 %	16 %	29 %	2 %	7 %
1760–1769	10 %	26 %	17 %	29 %		3 %	3 %
1770–1779	12 %	12 %	25 %	28 %		5 %	4 %
1780–1789	13 %	13 %	30 %	30 %		6 %	7 %
1790–1799	14 %	13 %	28 %	25 %	12 %	5 %	9 %
1800–1815	11 %	17 %	32 %	42 %	4 %	7 %	3 %

Source: The Sound Toll Registers.

6.1.7. Miscellaneous cargoes

The importance of miscellaneous cargoes (goods other than metals, timber, and tar) for Swedish exports to Southern Europe was rather limited in terms of both cargo volume and value. When measured in terms of export volume, the proportion of miscellaneous cargoes was less than 5 percent of the export cargo volume (STR 2.3 percent; BoT2 4.0 percent). In terms of cargo value, it is not possible to determine the proportion of these goods precisely, because the product group miscellaneous goods (*allehanda waror*) contained a large amount of tar, and numerous other goods

[300] Boëthius 1953, 162. Alanen 1964, 124.
[301] Pihkala 2001, 49–53; Alanen 1964, 120.

as well. Based on BoT3 data, the proportion of these goods was at least 5.95 percent (this proportion contains other miscellaneous cargo categories, except *allehanda waror*). Most likely, the proportion of miscellaneous cargoes was less than 10 percent.[302]

According to BoT3 and BoT2 data, the proportion of miscellaneous cargoes appears to be more important for exports to Spain and Italy than to Portugal. Over the whole research period, 15.7 percent of the value of exports to Spain, 6.1 percent to Italy, and 3.7 percent to Portugal consisted of miscellaneous cargoes. Based on the cargo volume (BoT2), the proportions of miscellaneous cargoes were: Spain at 8.1 percent, Italy and the Mediterranean at 6.4 percent, with the lowest proportion for Portugal at 2.3 percent. In contrast, in the STR, the differences between different destinations are much smaller: Spain at 1.8 percent, Portugal at 2.0 percent, Italy at 3.3 percent, and the Mediterranean at 1.6 percent.

In terms of cargo value, the majority of miscellaneous cargoes consisted of bonded goods (Sw. *nederlagswaror*), grain, and fish. Before the 1770s, the importance of miscellaneous cargoes was very limited. The exported amounts of these goods increased, especially in the 1790s and in the early nineteenth century. It is hard to argue that the importance of miscellaneous cargoes was systematically more significant among the exports to certain destinations in Southern Europe, because the export amounts of grain and bonded goods fluctuated greatly.

There are several reasons why the proportion of miscellaneous cargoes, measured in terms of trade value, was not especially high compared to other exports. For instance, a high share of goods belonging to this category, such as fish, grain, or linen, were rather bulky in nature, whereas the export amounts of luxury goods, such as furs, rifles, and tobacco pipes, were not particularly high. Moreover, some of the metal cargoes, especially copper and brass, were quite valuable. In the calculations used for this research, the various metal products, whether more or less processed, were all included in the metal cargo categories.

Despite the rather limited economic importance of these miscellaneous cargoes and their irrelevance concerning the required cargo space, the wide variety of different products describes the composition of exports in more detail. Export cargoes regularly contained fish, stones, red dyes,

[302] BoT3. The 5.95 percentage is calculated based on BoT3 data by summarizing the values of the following categories: *allehanda sten*, *allehanda skin-waror*, *spannmål*, *victualier*, *fisk waror*, *lefvande creatur*, *linne waror*, *and nederlags och andre utrikes utgångne waror*. The proportion of *allehanda waror* was 12.40 percent. If tar and pitch exports consisted of 70 percent of that category, the total share of miscellaneous goods was less than 9.67 percent (5.95 percent + 3.72 percent).

alum, gunpowder, linen, and East Indian goods as re-exports.[303] The export amounts of gunpowder to Southern Europe were rather high compared to total gunpowder exports from Sweden.[304] In addition to these, exports contained hundreds of different types of merchandise. For instance, vitriol (sulfates), books, furniture, carpentry products, as well as furs and skins were common in export cargo lists.

The export of foodstuffs consisted mainly of grain and fish, although, small amounts of butter, meat, and peas are also mentioned in export statistics.[305] The majority of the exported fish was salted herring, which was mainly exported to Italy and the Mediterranean (195,047 barrels of salted herring and 40,912 barrels of smoked herring) and Spain (72,855 barrels salted and 1,682 smoked herring). For some reason, less herring was exported to Portugal (4,181 barrels salted and 358 smoked).[306] Other fish species were exported as well, for example, salted common ling (*molva molva*), codfish, and salmon, but those export amounts were small.[307]

In the eighteenth century, Sweden imported a significant amount of grain, though from time to time, the export of grain was forbidden.[308] In general, exported amounts of grain from Sweden were low. In the BoT2 data, a total of 107,865 barrels were registered to have been shipped to Southern Europe.[309] Grain (mostly wheat and rye, occasionally some barley, flour, hulled grains, or peas) was mainly exported to Portugal, Spain, and Marseille, while the amounts exported to Italy were small.[310] The export of Swedish grain to Southern Europe occurred mainly and peaked in the 1790s.[311] These sudden changes in grain exports can indicate the effectiveness of the international grain trade between the Baltic and Southern Europe. Sometimes grain was exported along with

[303] These cargoes were exported on a yearly or almost yearly basis. For some cargoes (fish and alum), there were almost no exports in the first half of the eighteenth century, but these exports became very regular later on. During the whole research period, gunpowder was exported almost yearly, but between 1777 and 1791, its export halted completely. BoT2.
[304] BoT2.
[305] BoT2.
[306] Export amount of BoT2 1738–1812.
[307] BoT2. In the STR, salmon and salted common ling are also mentioned, but only a few times. Therefore, fish were mainly exported from the North Sea coast of Sweden. The amounts of fish exported fluctuated strongly. For instance, there were long periods with no mention of codfish or salmon exports, whereas in a certain year, the export amount could have been 200 barrels.
[308] What is not included in the statistical data used in this study is the export of grain from Swedish Pomerania to Southern Europe.
[309] The amount of grain includes all "*spannmål*" export to Portugal, Spain, Italy and the Mediterranean, and the Levant from 1738 to 1812. About the grain imports to Sweden, see Högberg 1969, 184–215. According to Ahlström 2000, 174, the only cases when grain was exported are probably for army provisions.
[310] BoT2, STR.
[311] BoT2 and BoT3. STR shows that the export of grain occurred mainly in the 1780s and the 1790s.

other cargo, but the majority of grain exports occurred in large quantities, and therefore there were also ships with wheat or rye as the main cargo.[312] In general, the Baltic was an important grain exporting area, and the big cities in Southern Europe received Baltic grain either directly or via Amsterdam.[313]

As previously mentioned, the exports contained numerous valuable goods, exported occasionally and in rather small amounts. For instance, hides and furs or clothing materials represent this kind of export. The average annual amount of exported hides and furs to Southern Europe was 227 kg, typically of reindeer, vair (squirrel), fox, ermine, pine marten, and occasionally bear, lynx, and calfskin.[314]

To put the hide and fur trade into perspective, for instance, in total 107 reindeer hides were exported to Portugal and 818 pieces to Italy and the Mediterranean during the whole research period.[315] These hides were typically not exported in large quantities, with the normal amount being under 20 hides per ship.[316] Also, the export of smaller furs did not occur yearly, but sometimes those exported amounts were high: in 1787, a total of 6,000 pieces of vair, and in 1738 a total of 1,022 pieces of pine marten hides were exported to Italy and the Mediterranean. The export of hides and furs was more common to Italy and the Mediterranean and Levant than to Portugal or Spain.[317] The value and quantity of exported clothing materials were larger than furs. The cloth material exported consisted mainly of linen-based products like duck and sailcloth, linen weave (Sw. *lärft*), drill (Sw. *dräll*), and lockram (Sw. *blagarn*[318]).[319]

Among the miscellaneous export products, the largest individual items sold from Sweden to Southern Europe were ships. Normally, when shipmasters started their journey into Southern Europe, they did not plan to sell their ships in advance. Therefore, the export of ships was not always recorded in the customs records. The decision to sell a whole ship was made mostly in the target

[312] STR. For example, Hans J. Tiæder (home port Turku) sailed from Norrkiöping to Barcelona in 1793, carrying 105 ship-lasts of wheat, with no other cargo listed in STR. See Passage ID: 355279. Typically, Tiæder was exporting timber from Turku to different ports in Southern Europe. In 1784, Jonas Aspgren (home port Stockholm) exported 1502 barrels of rye from Stockholm to Lisbon. Passage ID: 109471. Other STR Passage IDs with high amounts of grain: 1649605; 10000153; 350874; 68521; 294809; 133799.
[313] Högberg 1969, 186. O'Flanagan 2008, 137.
[314] BoT2.
[315] BoT2.
[316] BoT2, STR.
[317] BoT2.
[318] Serenius 1757, lockram.
[319] BoT2.

port after hearing about the current market situation and price levels. The final decision also rested upon what the changes for freight shipping were and what kind of return cargo was available to purchase.[320] There are two mentions in the years 1782 and 1796 in the BoT2 data of exporting a new ship to Portugal. In 1782, new ship(s) worth 6,111 5/48 riksdaler, and in 1796 ship worth 3,200 riksdaler were sold to Portugal.[321]

6.2. Imports

6.2.1. Import volume

When the trade is measured in tonnes, salt took up almost the entire cargo capacity. Calculations based on the STR show that 95.7 percent of import volume contained salt. Accordingly, the calculations based on the BoT2 show a slightly higher share of 97.4 percent. Cargoes other than salt represented only a small share of the total import volume. For instance, wines and other beverages required an average of 2.33 percent (STR) or 1.16 percent (BoT2) of the cargo volume. Although Southern Europe was an important supplier of fruits for Sweden, the share of fruit cargoes was low: 0.26 percent (STR) or 0.08 percent (BoT2).

In terms of trade volume, import cargoes from Portugal and Italy were very similar, with salt comprising the majority of the cargo volume. According to the STR, 98.5 percent of the cargo volume from Portugal and 98.7 percent from Italy was salt (Table 16). Based on the BoT2, the same shares were: 99.0 percent for Portugal and 97.1 percent for Italy and the Mediterranean (Table 17).[322] Regarding the Spanish imports, salt again dominated, although the share of salt cargoes was somewhat lower: 95.2 percent (STR) or 85.2 percent (BoT2).[323] This slightly lower share of salt cargoes has been typical of ships sailing from Spain to Sweden compared to those sailing from Italy or Portugal, not only during individual years, but also over the long-term during the eighteenth century. This difference seemed to diminish momentarily in the early nineteenth century.[324]

[320] Alanen 1964, 128. See also, Ojala 2019, 186.
[321] BoT2. The research literature regarding selling the ship in the second-hand markets is relatively limited.
[322] For instance, Müller 2004, 99, describes the dominance of salt in terms of cargo space for Portuguese imports to have been almost total. The recent estimates in Ojala et al. 2018, are very close to those in this paper.
[323] STR.
[324] This was estimated from charts of five-year moving averages of the share of salt cargoes for Portugal, Italy, and Spain (STR). It was clear that over a long period the share of salt cargoes was lower for imports from Spain.

The STR reveals the lower share of salt cargoes among Spanish imports in another way. The main cargo (the highest customs payment) of the vessel was typically recorded first in the STR cargo list.[325] In total, 146 (11 percent) of those ships sailing from Spain had a product other than salt as the main cargo, most of which (134 ships) sailed from Spain to Sweden without any mention of salt cargo in the STR.[326] For ships sailing from Portugal, the share of ships without salt cargo was 1.5 percent (59 ships) and from Italy it was 2.6 percent (44 ships).[327] Additionally, the BoT3 supports the observation that Spanish cargoes included less salt (on average 19 percent of import value) – and therefore more of the other commodities – than those sailing from Portugal (an average of 72 percent) or Italy (48 percent).

In addition to salt, imports from Portugal, Spain, and Italy and the Mediterranean contained various other commodities. Some of the main imports, in terms of cargo volume, were also wines, fruits (figs, lemons, oranges, and sour oranges), raisins, olive oil, coffee, almonds, cotton, potassium bitartrate, and Venetian soap.[328]

Import cargoes from French Mediterranean ports, mainly Marseille and Sète, were the very opposite to Portuguese, Italian, and Spanish imports.[329] Salt cargoes are rarely mentioned and, if salt was imported, it very likely originated from Cagliari, Málaga, or Trapani, not from France.[330] Wine cargoes were typical of the imports from the French Mediterranean coast. Furthermore, imports consisted of fruits such as lemons, figs, and prunes, and various goods such as raisins, almonds, olive oil, cotton, saffron, and krammerie, to name a few.[331]

The structure of import cargoes from North Africa (Tripoli and Alger) should be considered indicative, since there are only five ships mentioned in the STR. It is probable that some of those

[325] Practically always, at least in the trade between Sweden and Southern Europe in this research period, the highest custom payment – and thus the main cargo on that measurement – was listed first. However, there were a few exceptions to this; see, for instance, Passage ID 137790.
[326] STR.
[327] These ships rarely sailed in ballast. It is possible that some of these ships had salt cargo unloaded in Gothenburg because they carried herring cargo along with, for instance, wine and fruits. However, certain ships were sailing from Southern Europe to Sweden which carried a large shipment of, for example, almonds, raisins, sugar, or pozzolana (volcanic ash used for cement) as the main cargo.
[328] BoT2. The list includes cargoes over 185,000 kg imports from Portugal, Spain, and Italy and Mediterranean.
[329] Sète = Cette in the STR.
[330] In the case of STR salt cargoes from Mediterranean ports of France to Sweden, it was quite typical that the port of origin was not "Marseille", but ship cargo came from "Marseille og Cagliarie". This indicates that wines, etc., were loaded in Marseille, while salt originates to Cagliari. For salt in cargoes from French Mediterranean ports, see Passage ID: 77835, 166041, 205332, 224881, 241791, 249542, 448352, 471051, 504402, 560064, 4181277.
[331] STR.

cargoes, especially salt, were loaded in other ports.[332] Other documented cargoes were very varied and contained items such as dates, raisins, dyestuff, krammerie, wax, coffee, cotton, and olive oil. Some of those articles imported were specialty items. In the previous literature, for instance, Müller (2004) mentioned "two lions, three hyenas, and a wild cat" as a gift from the Algerian ruler.[333] Although cargoes contained exceptional goods, the import quantities from North Africa were, only around 5,100 kg per ship.[334] Therefore, the imports from North Africa cannot be referred to as "rich trades" like in the Levant trade.

The major import cargoes from the Levant – in terms of cargo volume – were raisins, Corinth raisins, figs, and cotton. However, cargoes were diverse and comprised a significant number of luxury goods such as various spices (anis, gall nuts, coffee), leather, silk, colored yarn, sekt from Syria[335], and envelopes. Imports from the Levant had a significantly higher value per ton ratio, compared to imports from Italy, Portugal, and Spain.[336]

Table 16. Amounts and structure of Swedish imports from Southern Europe 1710–1815 (metric tons 1,000 kg)

	Total	Wines and beverages	Fruits	Miscellaneous cargoes	Salt	Sugar
Portugal	961,396	3,289	2,068	6,881	946,621	2,536
	46.7 %	0.34 %	0.22 %	0.72 %	98.5 %	0.26 %
Italy	691,968	1,364	811	6,884	682,864	46
	33.6 %	0.20 %	0.12 %	0.99 %	98.7 %	0.01 %
Spain	350,609	4,105	1,238	11,605	333,600	60
	17.1 %	1.2 %	0.35 %	3.3 %	95.2 %	0.02 %
France,	52,042	39,073	1,230	7,525	4,210	3.4
Mediterranean coast	2.5 %	75.1 %	2.4 %	14.5 %	8.1 %	0.01 %
North Africa	855	0.0	5.3	67	783	0.0
	0.04 %	0.00 %	0.61 %	7.8 %	91.6 %	0.00 %
Southern Europe (total)	2,056,870	47,831	5,353	32,961	1,968,078	2,646
	100 %	2.3 %	0.26 %	1.6 %	95.7 %	0.13 %

Source: The Sound Toll Registers.

[332] This estimation is based on fact that those cargoes also included salt.
[333] Müller 2004, 124.
[334] These amounts include cargoes other than salt and herring, which were also listed in the STR as departing from North Africa.
[335] Sekt from Syria was sparkling wine.
[336] A preliminary comparison between imports from Italy and imports from the Levant for the same period indicated a notable difference in terms of the import value per tonnes. BoT2 and BoT3. In Sweden, goods imported by Levant company had to be sold in an open auction. Olán 1921, 40 – 44.

Table 17. Amounts and structure of Swedish imports from Southern Europe 1738–1810 (metric tons 1,000 kg)

	Total	Salt	Fruits	Sugar	Wines and beverages	Miscellaneous cargoes
Portugal	1,057,590	1,046,968	1,109	3,158	4,334	2,021
	47.3 %	99.0 %	0.10 %	0.30 %	0.41 %	0.19 %
Italy and the Mediterranean	1,073,494	1,042,133	439	581	18,015	12,325
	48 %	97.1 %	0.04 %	0.05 %	1.68 %	1.15 %
Spain	105,107	89,549	143	996	3,544	10,874
	4.7 %	85.2 %	0.14 %	0.95 %	3.37 %	10.4 %
Levant	1,513	0.14	0.9	0	11	1,501
	0.07 %	0.01 %	0.06 %	0.00 %	0.70 %	99.2 %
Southern Europe (total)	2,237,703	2,178,650	1,693	4,735	25,904	26,721
		97.4 %	0.08 %	0.21 %	1.16 %	1.19 %

Source: Board of Trade Sweden, Series 2.

6.2.2. Import value

When the structure of trade value is evaluated rather than trade volume, the share of salt cargoes was not significantly high – on average, 55.7 percent of all imports from Southern Europe (Table 18). The most imported cargoes, after salt, were wines (11.2 percent), raw materials (9.3 percent), groceries and spices (Sw. *specerier*) (8.2 percent), sugar (3.9 percent), and general store goods (Sw. *kryddkräm waror)* (4.2 percent). In the trade balance data, the differences in import cargo structure between Southern European countries appear more distinctly compared to volume data. Consequently, this enables a closer examination of the trade structure. Compared to Spain or Italy, imports from Portugal contained higher amounts of fruits. For Spanish imports, wines (21.2 percent of import value) and the product group groceries and spices, such as raisins, figs, almonds, pepper and olives (28.7 percent of import value), played a prominent role. The share of salt cargo value was only 19 percent.[337]

[337] BoT3.

Table 18. Value and structure of imports from Southern Europe to Sweden 1739–1813 (riksdaler)

	Total	Salt	Wines and beverages	Miscellaneous cargoes	Fruits	Sugar
Italy and the Mediterranean	8,276,735	4,515,714	918,032	2,689,754	31,415	121,82
	43.8 %	54.6 %	11.1 %	32.5 %	0.4 %	1.5 %
Portugal	7,545,999	5,491,197	611,752	895,447	96,476	451,127
	39.9 %	72.8 %	8.1 %	11.9 %	1.3 %	6.0 %
Spain	2,722,304	517,647	577,645	1,441,442	24,279	161,291
	14.4 %	19.0 %	21.2 %	52.9 %	0.9 %	5.9 %
Levant	346,231	0	2,286	343,872	72	0
	1.8 %	0.0 %	0.7 %	99.3 %	0.0 %	0.0 %
Southern Europe (total)	18,891,270	10,524,559	2,109,715	5,370,515	152,242	734,238
	100 %	55.7 %	11.2 %	28.4 %	0.8 %	3.9 %
Southern Europe / All Swedish exports	7.6 %	83.1 %	14.3 %	2.6 %	27.2 %	4.0 %

Source: Board of Trade Sweden, Series 3.[338]

6.2.3. Changes in the import structure

During the eighteenth century, import amounts increased, and this had some impact on trade structure. When the total amount of imports (in terms of volume or value) increased, the share of salt cargoes increased.[339] During the period 1739–1749, salt formed 50 percent of import value from Portugal, Spain and Italy, while during 1774–1799 the share was 73 percent.

In the early nineteenth century, when the volume of salt imports decreased, the share of salt cargoes decreased as well. During 1800–1813, salt accounted for 45 percent of the import value from Southern Europe.[340] As the Napoleonic Wars disturbed the trade patterns in the early eighteenth century, large quantities of salt was imported as re-exports from Britain.[341]

During the eighteenth century, the share of salt cargoes of total import volume increased. This increase occurred especially in the late 1750s. Between 1738 and 1759, 96.1 percent of import tonnes from Portugal, Spain, and Italy and the Mediterranean were salt, while from 1760 to 1799 salt formed 98.1 percent of imported tonnes.[342]

[338] The shares were calculated for the entire period in rds. Regarding the currencies, see Appendix 5.
[339] STR, BoT2, BoT3.
[340] BoT3.
[341] Högberg 1969, 222–224. Due to salt shortage, the Navigation Act was abolished between 1799–1802. Müller 2004, 139.
[342] BoT2.

The increasing amounts of trade resulted in an undiversified trade structure. The measure of a number of different import products per year also indicates that trade did not become more diverse over time. On average, imports from Southern Europe included 119 different cargo items per year (minimum: 54, maximum: 239). By using this measure, trade was the least diverse in the 1760s and 1770s – although, in the long run, the number of different cargoes did not increase or decrease.[343]

6.2.4. Differences between statistics

When the trade structure of different countries is measured and evaluated both in volume and value, it may be concluded that the BoT3 data of the geographical category Italy and the Mediterranean is deviant. Comparisons between BoT2 or STR and BoT3 show how Italy and the Mediterranean (in the BoT3) include probably some imports from Mediterranean ports of France, although not all imports from that area, because the share of salt is rather low when compared to Portugal or Spain.

6.2.5. Salt

Sweden imported various forms of salt. According to Swedish statistics, the three most imported salt types were Portuguese salt[344], Mediterranean salt[345] and French salt[346].[347] The majority of salt imports (93.9 percent when measured in metric tons) were Southern European in origin (salt type: Portuguese or Mediterranean salt), while French salt comprised only 5.8 percent of salt imports.[348]

From 1738 until 1812, 86.4 percent of all Sweden's salt imports were direct imports from Southern Europe.[349] In the eighteenth century, especially after the passage of the Navigation Act, almost all Portuguese or Mediterranean salt was shipped directly to Sweden.

Based on Swedish statistics, between 1738–1749, 91 percent of this salt was imported directly. During 1750–1804, the share of direct imports was even higher, at 98 percent. Conversely, in the

[343] BoT2.
[344] In the BoT2: *portugis salt* (1738–1763) and *portugiser och spanskt salt* (1764–1812).
[345] In the BoT2: *la matta salt eller från andra orter i medelländska hafver* (1738–1763) and *medelländskt salt* (1764–1812).
[346] In the BoT2: *franskt salt* (1738–1763) and *franskt och skotskt salt* (1764–1812).
[347] In addition, there were imports, such as, salt from Kolberg (Sw. C*ollberger salt)*, salt from Lüneburg (Sw. *Luneburger salt*) and Norwegian salt (Sw. *Norskt salt*). The imported amount of these types of salt was insignificant, i.e. less than one percent of all salt imports in 1738–1812. BoT2.
[348] BoT2.
[349] BoT2. Compare to Högberg 1969, 222; where even higher estimation of 90–95 percent is presented.

period 1805–1812, only half of salt cargoes were imported directly. When salt from Portugal, Spain or Italy did not arrive directly, it was shipped via the Dutch Republic, or occasionally, from Britain.[350]

The volume of total salt imports increased significantly during the eighteenth century. The essential reason, from the 1750s onwards, was the increasing demand for salt in the herring fisheries. Nonetheless, the development was different for various types of salt. Müller (2008) shows that, earlier in the eighteenth century, the imported quantities of French salt had a limited significance, but by 1800, amounts were negligible. Meanwhile, salt imports from different areas in Southern Europe increased in parallel, over the long term. Notably, Müller's data reveal the highly effective price competition in the market for Southern Europe's salt exports, at least from Sweden's perspective. When the price in Portugal was high, Swedish vessels headed to the Mediterranean and vice versa. Correspondingly, Högberg (1969) mentions the strong negative correlation in demand of Portuguese and Mediterranean salt.[351]

These findings indicate that Portuguese, Spanish and Mediterranean salt were substitute goods. The quality of Southern Europe's salt, however, whether it was Portuguese, Spanish or Italian in origin, was considered higher than French salt. Salt from Southern Europe was very white, had larger crystals and contained fewer dissolved contaminants than the French equivalent. The latter, because of clay contamination, had a gray color.[352]

In fact, the greater popularity of Southern European versus French salt has various explanations. Both Högberg and Pourchasse mention the fact that consumers in Sweden preferred Southern European salt, which was whiter.[353] In addition, according to Högberg (1969), the salt from Southern Europe was preferred in the herring industry. A further factor, according to Pourchasse (2011), was the inability of ships of more than 150 lasts to gain entry to French salt ports.[354] Conversely, Müller (2008) provides another explanation. He argues that neither price nor quality is an explanatory factor for the Swedish preference for Southern European salt. Rather, he mentions three other causes, namely path dependency, political circumstance and custom. In the seventeenth century, the Dutch had exported Portuguese salt to Sweden (while exporting grain from the Baltic), and Swedes became accustomed to that form of salt. Moreover, after the passage of the Swedish

[350] BoT2.
[351] Müller 2008, especially 101–102. Högberg 1969, 228–229. There are remarks in Eloranta et al. 2015.
[352] Högberg 1969, 228, 243. Pourchasse 2011, 97–98.
[353] Högberg 1969, 242–243. Pourchasse 2011, 98. As early as 1725, French documents mention the Swedish preference for salt from, "the Iberian Peninsula or the Mediterranean". See Pourchasse 2006, 327.
[354] Högberg 1969, 242–243. Compare with Pourchasse 2011, 97–98; or Pourchasse 2006, 327.

Navigation Act in 1724, political and commercial relations between Sweden and the Iberian Peninsula were strengthened.[355]

Since Sweden did not have any domestic salt resources, salt was a strategically important necessity.[356] Salt was mostly used to cure fish, as well as meat and other foodstuffs; after grain, it was the second most voluminous import cargo.[357] Salt was a solid part of everyday life, and it was especially necessary for the herring industry in the North Sea coast of Sweden.[358] In the eighteenth century, salt consumption was extremely vast in Sweden. It has been estimated that the yearly import of salt to Sweden was 15–20 kg per person.[359] The combination of rich herring waters and lack of domestic salt resources obligated Sweden to secure a salt supply. Fish preservation required salt, but besides salt, other methods to cure fish were used as well. Traditionally, air-drying (suitable for low-fat fish species) and smoking were used to preserve fish, and, at least from the sixteenth century onwards, fermentation was also used to preserve herring (Sw. *surströmming)*.[360]

6.2.6. Luxury goods

Although most of the cargo space for imports was used for salt, there were also several other import goods, such as wines, fruits, sugar, coffee, dyestuffs, and spices, just to name a few. According to Wallerstein (1989), the distinction between luxury goods on the one hand and bulk goods on the other is a modern expression of the historical terms "*rich trades*" and trade in "*coarse*" or "*gruff"* goods.[361]

The term luxury goods has always been a sociological issue. It refers to evaluating what is normative and the number of people who use those products. The rarity, price, and especially the pound-to-value ratio, have been important when defining luxury. Based on these aspects, after salt, the rest of the imports from Southern Europe can be counted as luxury goods. Nearly all imports other than salt and a few raw materials, such as cotton, hemp, and wool, were luxury goods. An ordinary

[355] Müller 2008, 94.
[356] In Sweden, the importance of salt was so significant that the country bought the island of Saint-Barthélemy (located in the Caribbean) from France, in order to start its own salt production there. Unfortunately, in the end, salt imports from that island proved completely trivial. Kurlansky 2007, 111, 115.
[357] Högberg, 1969, 216–217; also 23–24. Also Müller 2008, 94.
[358] Jonasson & Hyttinen 2012, 108–111. There are several references to the strategic importance of salt in an eighteenth-century context. As Pihkala puts it, "although foreign trade did not play an important part in aggregate demand before industrialization, salt was an essential part of livelihood" Pihkala 2007, 48. Compare with Findlay & O'Rourke 2007, 191.
[359] Kaukiainen 2008, 120. Meanwhile, in the rest of Europe, one person used even in an average 25 kilos of salt in a year. Kurlansky 2007, 110.
[360] Likely surströmming was invented when too little salt was used when preserving fish. Kurlansky 2007.
[361] For more about the definition of luxury goods, see Wallerstein 1989, 131–132.

Swedish peasant was rarely able to purchase most of these merchandises, although many of the luxury goods, for instance, lemons, reached the most remote inland parts of the Swedish kingdom, such as Savonia.[362]

6.2.7. Fruits

Citrus fruits were an essential part of the trade between European countries during the eighteenth century. Compared to the seventeenth century, European trade in foodstuffs and fruits increased distinctly during the eighteenth century. Portugal and Spain were the major exporters of citrus fruits consumed in the central and northern parts of Europe.[363]

There were differences in fruit imports between ports of departure. Imports from Portugal consisted mainly of citrus fruits, especially lemons, but also oranges and bitter oranges. Moreover, ships sailing from Italy and the Mediterranean ports of France imported mainly lemons, but also several other fruits such as figs, bitter oranges, oranges, dried cherries, prunes, and pomegranates. Spanish fruit imports were different because imports included principally figs and also small amounts of lemons (Table 19 and Table 20).[364] The amount of figs imported was also rather high from the Levant in the 1740s and early 1750s.[365]

The BoT2 data illustrates different fruit species fairly accurately, while in the STR, the imprecise entry fruits (*frugt*) was commonly used. The comparison of different fruit units in the STR indicates how *frugt* refers mainly to lemons or other citrus fruits, but obviously not to figs. The strength of the STR is again more precise entries of ports of departure.[366]

Because citrus fruits did not spoil easily, it was possible to transport those over long distances. Other fruits, such as pears or cherries, could not be preserved fresh during long sea voyages, and thus, those were imported in dried form to Sweden.[367] A preliminary examination of whole Swedish fruit imports in light of the BoT2 shows pretty large amounts of lemon imports from Denmark and

[362] About the lemons and other luxury items in remote parts of Sweden, e.g. Savonia, see, e.g. Suolahti 1991. About the consumption and luxury in eighteenth-century Sweden, see Ilmakunnas 2011, especially 366–384.
[363] Thompson 2003, 103. Although the fruit trade expanded notably in eighteenth-century Europe, the major increase in food trade occurred after the 1870s when a cooling system for ship cargoes was first developed. In these systems, ice, together with fans, were used to cool the meat cargoes from the US to Britain. Thompson 2003, 103.
[364] STR, BoT2.
[365] BoT2.
[366] BoT2, also STR.
[367] As for the spoilage of food in a historical context, see, for example, Aldridge 1964, 4.

Northern Germany (as re-exports), while most of the oranges were imported directly from Southern Europe.[368] The reason behind this phenomenon is not yet clear.

Fruit imports from Portugal and Italy did not increase during the eighteenth century. However, imports from Spain increased, especially when it came to fig imports.[369]

Table 19. Fruit imports from Southern Europe to Sweden 1710–1815, STR (kilograms)

Portugal			**Spain**		
Fruits	1,012,955	48.6 %	Figs	958,369	76.3 %
Lemons	935,525	44.9 %	Lemons	181,539	14.5 %
Grapes	89,300	4.3 %	Fruits	114,190	9.1 %
Figs	17,900	0.9 %	Other fruits	1,418	0.1 %
Prunes	12,771	0.6 %			
Other fruits	14,319	0.7 %			
Total fruit imports	2,082,770		Total fruit imports	1,255,516	
Share of total fruit imports from Southern Europe	39 %		Share of total fruit imports from Southern Europe	24 %	
France Mediterranean coast			**Italy**		
Fruits	505,391	44.1 %	Lemons	345,535	43.9 %
Lemons	457,367	39.9 %	Fruits	318,159	40.5 %
Figs	90,244	7.9 %	Figs	63,032	8.0 %
Prunes	63,415	5.5 %	Plums	42,417	5.4 %
Plums	20,128	1.8 %	Dried oranges	6,000	0.8 %
Pomegranates	10,000	0.9 %	Dried bitter oranges	5,600	0.7 %
			Prunes	4,623	0.6 %
			Oranges	844	0.1 %
Total fruit imports	1,146,544		Total fruit imports	786,21	
Share of total fruit imports from Southern Europe	22 %		Share of total fruit imports from Southern Europe	15 %	
North Africa			**Southern Europe (total)**		
Dates	5,258	100 %	Fruits	1,950,695	37.0 %
			Lemons	1,919,965	36.4 %
			Figs	1,129,546	21.4 %
			Grapes	89,300	1.7 %
			Prunes	81,959	1.6 %
			Plums	62,808	1.2 %
			Other fruits	42,025	0.8 %
Total fruit imports	5,258		Total fruit imports	5,276,297	
Share of total fruit imports from Southern Europe	0.10 %				

Source: The Sound Toll Registers.

[368] BoT2.
[369] BoT2, also STR.

Table 20. Fruit imports from Southern Europe to Sweden 1738–1810, BoT2 (kilograms)

Portugal			**Spain**		
Oranges	157,719	14.2 %	Oranges	4,385	3.1 %
Lemons	645,457	58.2 %	Lemons	57,466	40.1 %
Fruits, unspecified	78,407	7.1 %	Fruits, unspecified	65,896	46.0 %
Bitter oranges	209,497	18.9 %	Bitter oranges	14,04	9.8 %
Other fruits	18,289	1.6 %	Other fruits	1,619	1.1 %
Total fruit imports	1,109,369		Total fruit imports	143,405	
Share of total fruit imports from Southern Europe	65.5 %		Share of total fruit imports from Southern Europe	8.5 %	
Italy and the Mediterranean			**Levant**		
Oranges	21,063	4.8 %	Lemons	820	89.6 %
Lemons	350,052	79.7 %	Fruits, unspecified	48	5.3 %
Fruits, unspecified	10,511	2.4 %	Turkish beans	47	5.1 %
Bitter oranges	28,868	6.6 %			
Dried cherries	24,299	5.5 %			
Other fruits	4,401	1.0 %			
Total fruit imports	439,194		Total fruit imports	915	
Share of total fruit imports from Southern Europe	25.9 %		Share of total fruit imports from Southern Europe	0.1 %	
Southern Europe (total)					
Oranges	183,167	10.8 %			
Lemons	1,053,794	62.2 %			
Fruits, unspecified	154,861	9.1 %			
Bitter oranges	252,405	14.9 %			
Dried cherries	24,847	1.5 %			
Other fruits	23,808	1.4 %			
Total fruit imports	1,692,883				

Source: Board of Trade Sweden, Series 2.

6.2.8. Wines and beverages

In Sweden, wine was a luxury consumed by a small group of higher estates, nobility, and royal court. Wines reached the lower stratum only in the Eucharist. Wine was also available in taverns, but de facto the usage of it was limited to the upper class.[370] Most of the alcohol consumed by peasants in Sweden was locally produced beer and spirits.[371]

Practically all alcohol imports from Southern Europe consisted of wines. To put wine imports into perspective, the average yearly import of wines (and other beverages) from Southern Europe was

[370] Kuparinen 1985, 159. However, also among the highest estates, some people refused to drink wine because it was so sophisticated. The best known example is claimed to have been Charles XII, a "warrior king", who wanted to act more as a soldier than a courtier and consumed wine only rarely. See Grauers 1975.
[371] Swedish beer was sometimes exported to Southern Europe, although amounts were small. STR, BoT2.

approximately 350,000 liters (BoT2 1738–1812) or approximately 630,000 liters (STR same time frame). The BoT2 calculation does not or should not include imports from France, while the STR includes wines imported from French Mediterranean ports.[372]

The majority of wine imports from Southern Europe to Sweden were shipped from the Mediterranean ports of France. Based on the STR data, during the years 1710–1815, the import amount from the French Mediterranean coast was about 39 million liters, from Spain about 4 million liters, from Portugal about 3 million liters, and from Italy about 1 million liters (Table 21).[373] Compared to STR, in the BoT2 data (which includes imports from Portugal, Spain, and Italy and the Mediterranean), the distribution of wine import amounts appears very different. Imported amounts from Italy and the Mediterranean were about 17 million liters, from Spain about 4.4 million liters, and from Portugal about 4.3 million liters (Table 22). A comparison of the STR and BoT2 wine qualities along with the imported amounts suggests that the BoT2 category Italy and the Mediterranean includes a large amount, but not all, of imports from French Mediterranean ports (Marseille). The BoT2 Italy and the Mediterranean imports appear to include only a part of Marseilles imports because the import amounts in the STR for French Mediterranean ports were about 39 million liters and for Italy about 1.4 million liters, while the BoT2 amount for Italy and the Mediterranean was about 17 million liters.[374] Because the STR shows that vessels sailing from Italy imported fairly small amounts of wine and, as in the BoT2, the total imported amounts of wine called Italian wine are very low (from 1755 to 1812 only 1,185 liters),[375] it can be concluded that wine imports from Italy were marginal.[376]

The imported types of wine varied depending on from which port ship sailed to Sweden. Although the descriptions of wine types are quite imprecise in the statistics, some differences and characteristics can be detected in the product range between different countries of origin.[377] The

[372] However, as speculated later, the BoT2 geographical area "Italy and the Mediterranean" may also include imports from the Mediterranean ports of France.
[373] STR.
[374] For this comparison, the same time frame 1738–1806 was selected.
[375] Includes only those imports from the Italy and the Mediterranean.
[376] STR, BoT2.
[377] For the imprecise descriptions of types of wines, Scheltjens suggested "that may be due to a large extent to the technique of mixing, sweeting or strengthening wines (*tirer, soutirer, mutter ou frelater les vins*)." See more, Scheltjens 2015b, 154.

French imports consisted of high amounts of Picardan (white wine from the Languedoc) or French wine (*Franskt viin*), but also liquor (*brännvin*).[378]

Both the STR and BoT2 reveal how wine imports from Italy and Spain were very diverse compared to imports from Portugal.[379] This is almost the only similarity between the STR and BoT2 wine type entries. According to STR, imports from Spain and Italy included mainly Picardan, Sekt (*secq viin*), and *Hoglandsviin*. In addition, in Spanish imports, unspecified wine (*viin)* was often mentioned, and the imports from Italy often contained Italian wine (*Italiensk viin*) and Malaga wine (*Malaga viin)*. STR figures also showed some imports of lemon juice.[380] Beverage imports from Portugal consisted mostly of Portuguese wine (*Portugis viin*), which accounted for about 90 percent of the beverage imports from Portugal.[381] Based on the BoT2 data, the beverage imports from Spain, and Italy and the Mediterranean contained a high share of spirits (*brännvin*), at approximately 46 percent from Spanish and approximately 20 percent from the wine and beverage imports from Italy and the Mediterranean.[382]

Although wine production in Portugal was substantial, compared to Spanish and French wines, the quality of Portuguese wines was, in general, somewhat lower.[383] This might be one reason behind the concentrated trade structure of wine imports from Portugal compared to imports from Italy, Spain, or Mediterranean France. As the BoT2 data especially shows (Table 22), imports from Spain, and Italy and Mediterranean comprised more wine types than Portuguese imports.

A preliminary examination of all Swedish wine imports in light of BoT2 shows that the main wine types imported from Southern Europe were mainly imported directly. The imported amounts of Portuguese, Spanish, Italian, and Malaga wine from, for instance, the Dutch Republic or another presumably re-exporting country were small.

In addition to wines, small amounts of hard alcohol beverages were imported from Southern Europe to Sweden. Spanish and French liquor (*brännvin*) were imported regularly; imports in 1738–1812 totaled 5.6 million liters. The rest of the hard liquor imports consisted almost entirely of rum.

[378] About Picardan, see Robinson 2015, 557. In the STR, a significant number of wines imported from France were simply designated as wine (*viin*). In the BoT2, the product name was French wine red and white (*Fransk win rödt och hwitt*).
[379] BoT, STR.
[380] STR. Lemon juice was not mentioned in the BoT2 data. Concerning the lemon juice imports, the STR unit for lemon juice, *rigsdaler*, made it problematic to analyze the imported volume.
[381] STR.
[382] BoT2.
[383] Birmingham 2005, 93.

Imports of rum from Southern Europe (mainly from Spain and Italy and the Mediterranean) started in the 1790s, and totalled 482,524 liters (22 liters per ship). Also, small amounts of arrack (7,161 liters) and champagne (10,109 liters) were imported.[384]

Table 21. Shares of imported wines and beverages by country of origin 1710–1815

France, Mediterranean coast		**Spain**	
Picardan	54.5 %	Picardan	38.6 %
Wine	29.8 %	Wine	21.8 %
Brännvin	11.0 %	Sekt	10.3 %
Hoglandsviin**	2.8 %	Hoglandsviin	6.7 %
Others	1.9 %	Brännvin	5.8 %
		Malaga wine	3.0 %
		Lemon juice	2.8 %
		Spanish wine	2.2 %
		Muscat	2.1 %
		Others	6.8 %
Total imports, liters	39,073,446	Total imports, liters	4,142,346
Portugal		**Italy**	
Portuguese wine *	46.8 %	Picardan	35.6 %
Wine *	28.9 %	Hoglandsviin	12.5 %
Port wine *	10.1 %	Sekt	10.6 %
Spanish wine	4.7 %	Italian wine	7.1 %
Stadsvin	3.0 %	Malaga wine	5.7 %
Wine from Canary islands	2.1 %	Wine	4.7 %
Others	4.3 %	Spanish wine	4.7 %
		Brännvin	4.1 %
		Corsica wine	3.5 %
		Stadsvin	3.1 %
		Others	8.3 %
Total imports, liters	3,292,971	Total imports, liters	1,363,678

Source: The Sound Toll Registers.

* Portuguese wine: In the STR, the wine type called Portuguese wine had a great variety of spellings. Therefore, it is not certain whether *Port viin* was sometimes just an abbreviation of Portuguese wine or whether it also means port wine. For comparison, in the BoT2, there is no mention of port wine, although numerous wines are listed. The product *viin* is likely a synonym for Portuguese wine among Portuguese imports, and a synonym for Spanish wine among Spanish imports.

** Hoglandsviin: "The term 'Hoglands vin' (pays haut) is used to describe French wines coming from further inland than the Sénéchaussée, such as Agenais or Bergerac. In both cases, it is white wines that are produced mostly in these areas."[385]

*** Stadsvin: "Wine produced in the Sénéchaussée de Bordeaux, a kind of administrative unit surrounding Bordeaux, which stretched from Bordeaux to Saint-Macaire (on the Garonne and Castillon (on the Dordogne)."[386]

[384] BoT2. Arrack and champagne were imported from Portugal, Spain, and Italy and the Mediterranean.
[385] Scheltjens 2015b, 154.
[386] Scheltjens 2015b, 154.

Table 22. Shares of imported wines and beverages by country of origin 1738–1812

Portugal		Spain		Italy and the Mediterranean	
Portuguese wine	90.9 %	Brännvin	45.7 %	Picardan	49.5 %
Spanish wine	3.6 %	Spanish wine	19.4 %	Brännvin (Spanish and French)	20.2 %
Others	5.4 %	Malaga wine	14.9 %	Spanish wine	12.2 %
		Rum	5.2 %	French wine (red and white)	7.4 %
		French wine (red and white)	4.0 %	Malaga wine	3.9 %
		Others	10.9 %	Others	6.8 %

Source: Board of Trade Sweden, Series 2.

When the development of wine imports is assessed by the imported amount of wine per ship, several clear changes and trends in wine imports from Southern Europe can be noticed. Imported amounts from Italy decreased dramatically in the mid-eighteenth century. For instance, the average ship from Italy carried 4,260 liters of wines and beverages from 1730 to 1749, while in the second half of the eighteenth century the amount was only 470 liters. The same phenomenon occurred for wine imports from Spain, which decreased significantly from the 1760s. An average vessel from Spain carried approximately 16,000 liters of wine (1730–1760), and subsequent amounts were only 2,000 liters (1761–1806). During the research period, the amount of wine imports from Portugal to Sweden varied quite a bit. From the mid-eighteenth century, the importance of wine imports decreased. During 1712–1749, average imported amounts per vessel were approximately 3,500 liters; whereas, in 1750–1806, the amount per ship was only 411 liters.[387] As in the case of any luxury good, the fashion trends reflected strongly on the demand and import of expensive foreign wines and spirits. Rasch (1965) mentions that it was almost impossible to sell rum in the Baltic area before the late eighteenth century because it was not seen as fashionable.[388] This phenomenon can also be seen in the case of rum imports from Southern Europe to Sweden.[389] Decreasing alcohol imports from Southern Europe could be the result of the increasing domestic alcohol production of brännvin in the eighteenth century, which gained market share from foreign imports.[390]

[387] STR. These changes are probably related to changes in customs tariffs.
[388] Rasch 1965, 47. In Copenhagen, for example, the state tried to encourage people to drink rum by decreasing customs payments for this alcoholic drink. This was a weird act and opposite to mercantilist ideology. In the end, the act did not work.
[389] BoT2.
[390] Jutikkala, Kaukiainen & Åström 1980, 273–274.

6.2.9. Miscellaneous cargoes

In terms of cargo volume, the share of cargoes other than salt, wines, or fruits was diminutive, at only 1.4 percent. When measured in terms of cargo value, the share of these same miscellaneous cargoes was much higher at 32 percent. Some of the miscellaneous cargoes were bulky, such as cotton or camel hair. Miscellaneous cargoes contained a great variety of goods, many of which were luxury products. When looking only at the imports of Southern Europe, the data does not provide an overall picture of Swedish imports of luxury goods, since many products were also imported from several other areas in Europe. However, regarding the imports from Southern Europe, it can be concluded that the importance of luxury goods did not increase during the eighteenth century. Although the share of miscellaneous cargoes increased during the Napoleonic Wars, this was more likely due to sudden shifts in trade patterns during certain years.[391] However, when studying Swedish sugar imports, Rönnbäck (2006) noticed that the Napoleonic wars seemed to mark a lasting change in the trade patterns of Swedish imports.[392]

One of the most voluminous goods among the miscellaneous imports from Southern Europe was sugar. For example, the import volumes of sugar were higher than the import volumes of fruits.[393] However, in terms of total sugar imports to Sweden, imports from Southern Europe did not play a significant role and originated mainly in Portugal.[394] Imported sugar qualities were mainly *tetes & terres* or muscovado (*mascovade*) and occurred mostly before the 1760s and in the late eighteenth and early nineteenth centuries.[395] Most of the Portuguese sugar was produced in Brazil, but the country also had some production on the island of Madeira.[396]

During the eighteenth century, the import of many luxury goods (for instance, coffee or expensive clothes) was seen negatively, particularly if the consumption was not limited among the highest estates but was spread among lower estates as well. According to mercantilist doctrine, when consumption shifted from higher estates to lower, it was viewed as diminishing the monetary base

[391] To compare this in the British eighteenth-century context, see Harley 2004, 176. He mentions that the most dramatic change in imports was the rise of distant markets and the imports of oriental goods, such as spices and tropical and semitropical products such as sugar, tea, and tobacco.
[392] Rönnbäck 2006, 8.
[393] BoT2. In the STR, the volume of fruit imports was larger than the volume of sugar imports.
[394] BoT2. Rönnbäck 2006.
[395] BoT2. *Terre* = clayed sugar; *tetes* = (no direct translation) cleaned, but not refined sugar, somewhat lower quality than *terre*. The muscovado was the lowest quality and could not be used directly before further purification. For more about the different sugar qualities in the eighteenth century, see Tomich 2016, 255–276; Wimmler 2017, 25; Gliech 2011, 76; also, Synnerberg 1815b, 110.
[396] Harding 1999, 26.

of the state. The main methods for restricting consumption were higher import customs duty rates, favoring domestic production, and prohibitions of use. There were several periods in the eighteenth century when it was prohibited to buy or consume certain luxury goods, but still, Swedish statistics indicate that many of those goods were imported to the country. For example, in 1767, imports of several luxurious products such as coffee, chocolates, arrack, punch, most of the wines, panniers, and hat feathers were prohibited, but mostly these prohibitions were only temporary. The coffee prohibition, for example, ceased in 1770, but again during 1794–1796 several prohibitions of luxury goods remained in effect.[397]

Regarding tobacco imports from Southern Europe, in general, imported amounts were small, in typical years being a few hundred kilograms. However, in 1809–1811, imports from Southern Europe, especially from Spain, increased significantly. During that period, the average annual import amounts were 389 thousand *skålpund* (165 thousand kilograms). These kinds of sudden shifts indicate that trade patterns were not fixed. Practically all tobacco imports from Southern Europe consisted of leaf tobacco. In total, there were seven different forms or varieties of tobacco, including Spanish snus, cut-tobacco (Sw. c*ardus tobak*), twist tobacco (Sw. *spunnen tobak*), and Spanish tobacco (Sw. *knaster tobak*).[398]

Typically imported spices, groceries, and other foodstuffs from Southern Europe were saffron, pepper, chocolate, anise, dried plums, coriander, capers, and olives. Imports also contained, for example, 34 different chemical products, of which the most commonly imported was sallet oil or olive oil (Sw. *bom olja*). Other typical chemical imports were mineral water, turpentine, and white and yellow wax.[399] In addition to regularly imported luxury goods, import statistics mention numerous goods, such as glasses, ivory, marble, seeds, bottles, musical instruments, hand carders, pencils, and coral.[400]

Many imported products were exotic, but in the case of dyestuffs, timber, live animals, and foodstuffs, for example, somewhat similar goods were also available in Sweden. From Southern Europe, the most commonly imported dyestuffs were potassium bitartrate, sumac, lead white,

[397] Kuparinen 1985, 154–155.
[398] Translation of *cardus tobak*, Widegren 1788, 108; and *knaster tobak*, Bailey & Klausing 1783, 247. Twist tobacco was chewing tobacco, also known as rope tobacco, see Nemnich 1825, 1268; and Holtrop 1824, 838. It could also be smoked; see Bergman Carter 2013, 9.
[399] BoT2. Consumption of domestic or expensive foreign mineral waters and bathing in health springs was part of high estates social life. Koskimies 1956, 115–122.
[400] BoT2.

Spanish white, verdigris, and indigo.[401] The import of live animals was, in general, more common from the areas closer to Sweden. Imported animals from Southern Europe consisted primarily of sheep, with 2,094 in total. Most of the sheep imports from Southern Europe were carried from Portugal mainly in the 1740s and 1750s.[402] In addition, imports from different destinations in Southern Europe contained 530 birds, 28 pigs, 20 chicken, nine horses, and two turkeys.[403] Although traded quantities were not large, this indicates that certain cargoes were recorded precisely.

The import of, for instance, timber, books, fish, and various other goods indicates small-scale intra-industry trade and the need for quality merchandise – since those goods were exported and imported. The imported hard timber was mostly used for fine carpentry and contained mostly Brazilwood or small amounts of walnut timber.[404] The book trade increased notably in Sweden during the whole eighteenth century, and priests encouraged people to read.[405] Swedish trade statistics show that the book imports from Southern Europe were very regular after the 1760s and that almost all imported books were unbound, with only a small proportion bound.[406] Although certain import and export goods can be found somewhat corresponding, in general trade contained non-competing goods, indicating that imports from Southern Europe had no impact on domestic production in Sweden.

7. Conclusion

The long-distance trade plays a key role in economic development, although the interdependence between them is complex. By measuring Swedish trade with Southern Europe during 1710–1815 in volume – standardized as metric tons – together with value terms, it was possible to analyze the

[401] Potassium bitartrate (Sw. *winsten*), sumac (Sw. *smack*), lead white (Sw. *blyhwit*), Spanish white (Sw. *hvit krita*), verdigris (Sw. *spanskgröna*). Verdigis was green color. Regarding dyes, there is a very informative description of sumac and verdigis in a contemporary source, Kauffman 1815, 302, 373. About Spanish white, (*hwit krit* = literally chalk white), see Gray 1828, 254; Dalin 1842, 126; also Eastaugh et al. 2008, 65.

[402] The same time period for live animal trade can also be seen in the STR. The only years when sheep are mentioned in the STR data were 1746 and 1751.

[403] BoT2.

[404] BoT2. Ahlström 2000, 174. O'Flanagan (2008), 139, describes the trade in Brazilwood quite extensively. He mentions that the term Brazilwood could also refer to different types of dyes. For Portuguese merchants, the trade of Brazilwood from Amazon to Portugal was important and occurred in significant quantities. However, trade in Brazilwood was an extraordinarily risky business, because it was very difficult to maintain the quality from the raw material to the European market.

[405] In eighteenth-century Sweden, priests created libraries and compiled book lists where parishioners could order mainly postils and occasionally secular items, and also created study circles. In general, the range of books was very pan-European. Bergström 1991; Laine & af Forselles 2008.

[406] BoT2.

amount and structure of the trade. When exploring the trade structure in the early modern period, the question of how trade and economic development interacted can also be assessed.[407]

7.1. Trade amount and trade patterns

Regarding the trade amount, this research aimed to analyze the question of trade patterns, namely, what were the most important import and export destinations in Southern Europe. This question was evaluated in terms of both cargo volume and value. Accordingly, the question of what the role of bilateral trade was between Southern Europe and Sweden as related to total Swedish trade, was estimated from trade value data.

This study showed that the volume of bilateral trade between Sweden and Southern Europe increased substantially during the eighteenth century. As shown in earlier research, increasing salt imports from Southern Europe was closely linked to the herring boom in the North Sea coast of Sweden. For instance, by the 1790s, as much as one-third of the Swedish salt imports were used in the herring industry. The major decline in herring fishing after the 1790s caused a reducing demand for salt and thus a decrease in salt imports from Southern Europe.[408]

On average, when measured in value, 11 percent of Swedish exports headed to Southern Europe, and 8 percent of imports arrived from Southern Europe during the research period. Thus, in value terms, Southern Europe (Portugal, Italy, Spain, and the Mediterranean ports of France) did not account for a large share as a bilateral trade partner for Sweden.

Earlier research has marked Southern Europe as an important market for Swedish timber exports. This research showed that 18 percent of the value of Swedish timber exports went to Southern Europe. As mentioned in previous studies, the role of Southern Europe in direct salt imports to Sweden was significant. The analysis in this research shows that 86 percent of salt imports arrived directly in Sweden from Southern Europe when measured by trade volume during 1738–1812.

Trade with Southern Europe increased faster than trade with other destinations. In the 1740s, Southern Europe represented 11 percent of Swedish exports, and in the 1790s, this share was approximately 15 percent. Imports increased similarly, because in the 1740s, Southern Europe corresponded to 8 percent of imports, while in the 1790s, the share was 12 percent. As shown in this research, in the early nineteenth century, Southern Europe's role as a bilateral trade partner for

[407] The long-distance trade and evolution of the world's economy, see Helpman 2011, 1–9,
[408] Müller 2019, 460. Högberg 1969, 165–183.

Sweden diminished. These shares indicate that there was no apparent shift in Swedish foreign trade toward Southern Europe, at least in terms of trade value. However, the growth of shipping capacity was higher because salt required a larger shipping capacity. For imports, 21 percent of the carrying capacity arrived from Southern Europe.

The export data showed that Portugal was the most important destination for Swedish exports in Southern Europe. On the import side, both Portuguese and Italian ports had a significant role. Trade with Spain and France was somewhat lower, and trade amounts with North Africa and the Levant were negligible. Regarding the trade patterns, Italy was a particularly important destination for tar exports, while iron and steel were exported particularly to Portugal and timber to Spain. However, the major challenge when evaluating the proportion and the importance of different destinations is that, when using different metrics, such as the number of ships, cargo tonnes, and trade value, they might give very different results.

7.2. Trade structure

The issue of trade structure was analyzed by measuring cargoes by trade volume and value. Earlier research has shown that, on a global scale, the long-distance trade between Europe and Asia largely comprised non-competing products during the early modern period.[409] The findings of this study show that this also applies to long-distance trade within Europe. According to the analysis, both import and export trade comprised almost entirely of basic goods. Sweden mainly imported salt and exported metals, mainly iron, timber, and tar. However, the import and export structure appeared very differently when measured in terms of volume or value. The structure of import volume was very concentrated because salt comprised over 95 percent of the import cargo volume. In terms of cargo value, import structure was well-diversified, as 56 percent of the import value comprised salt, 11 percent wines and beverages, and the remaining share comprised various goods, such as spices, raw materials, sugar, fruits, and luxury items. The structure of exports showed how timber cargoes comprised 54 percent of the export volume, 31 percent iron, and 11 percent tar. When the value of export trade was measured, the share of iron cargoes was prominent at 69 percent, 11 percent tar, and 11 percent timber.

[409] O'Rourke & Williamson 2002.

Regarding Swedish trade with Southern Europe, it can be concluded that, in general, the exports were more diversified than salt-dominated imports. This result appears to be opposite to total Swedish foreign trade, as Edvinsson and Gad (2018) showed that exports were more concentrated.

The composition of cargoes did not change significantly in the eighteenth century, as the bulk cargoes – salt among the imports, timber and iron in exports – dominated trade. The previous research literature concerning the relation between trade structure and trade growth in the early modern period is rather limited. A recent paper by Edvinsson and Gad (2018) showed that in Sweden, export specialization decreased over time, meaning a more diversified trade structure, while in imports no notable changes occurred.

According to the analysis in this research, the results concerning changes in trade structure are as follows. As the import amounts increased, the cargo structure became more concentrated, since the share of salt cargoes increased. For instance, in 1739–1749, 50 percent of the import value from Portugal, Spain, and Italy was salt, while in the late eighteenth century (1774–1779) the share was 73 percent. Regarding the export structure, changes among proportions of main cargoes, timber, and iron were not distinct, although the main trend was the increase in the proportion of tar cargoes. The significant changes in the cargo structure occurred in the early nineteenth century when trade was highly volatile due to Napoleonic Wars.

Trade growth can be explained either by decreasing trade barriers or transaction costs, increasing domestic demand, or increasing GDP. The mercantilist institutions, such as consular network, convoying, and peace treaties with North African states, indeed enabled the growth of direct trade between Sweden and Southern Europe by reducing transaction costs as shown by Müller (2004). However, the findings of the import structure indicate that although the profitability of bulk commodities was low, the demand for high-value imports did not increase. The increasing direct long-distance trade between Sweden and Southern Europe was not associated with the growing demand for luxury goods, giving no evidence of consumer revolution. The reasons for concentrating import structure can be traced to the Swedish GDP stagnation in the eighteenth century, along with the mercantilist institutions hindering the import of high-value goods. Comparably, the results of a somewhat immutable nature of export structure showed the constant and steady demand for Swedish export goods in Southern Europe during the age of sail.

Appendix 1. Weights and measures

Note on units of measurement: Volume, weight, and money

In this research, all STR and BoT2 cargoes were converted into kilograms. When standardizing and converting eighteenth-century units into metric equivalents, kilograms, some level of uncertainty remains. Because some units are more easily converted into metric tons than the others, several estimates and guesstimates were made. There are some differences in units between the STR and BoT2 datasets. For example, *skippund* (Dn.) is near equal to *skeppund* (Sw.), but those, and many others differ in size. However, according to Scheltjens (2015), the original units were not converted into Danish equivalents in the STR but used as such.[410] Thus, for Swedish exports, these STR conversions are similar to the conversions for BoT2. For imports from Southern Europe, this is not as straightforward. The metric equivalent of certain units could vary based on the port of origin, especially for liquid units. For example, Scheltjens (2009) mentions how the amount of *oksehovede* varied from 197.57 to 304.92 liters based on port of origin.[411] In this research, however, for imports from Southern Europe, one of the main sources for conversions used was a Danish book, Poul Thestrup's (1991) *Pund og Alen*, which typically mentions only one metric equivalent for each unit.

Furthermore, the inspection of STR amount in relation to customs payment did not give any hint of differences in the volume of import units from different geographical areas. The relationship between amount and customs payment, for example, different units of liquids – reveals the relationship of these units. These calculations did not indicate any differences in the volumes for the same unit between different ports of origin.[412]

Overall, the conversion of various early modern units and cargoes into kilograms is not straightforward. For example, it was typical that in liters the quantity of the same unit of liquid and dry substances differed. Additionally, for some units, such as caskets and containers, no precise metric equivalent exists.[413] The conversions of cargo groups, where weight or volume units have been used, are the most reliable. Accordingly, the margin of error is likely larger for cargo groups such as miscellaneous goods (*allehanda waror*) or haberdashery (*kram waror*) because there are

[410] Scheltjens 2015a, 21. Also Scheltjens 2009, 88.
[411] Scheltjens 2009, 79.
[412] Kumar 2018, 249, also noticed that the toll rates for timber did not change significantly from the late seventeenth to the early nineteenth century.
[413] Even the contemporaries had difficulty agreeing on the relative content of domestic and foreign units. See, for example, Kelly 1821, 212 (footnote).

many guesstimate conversions or conversions of monetary units. To translate numerous products of the STR and Swedish statistics, several contemporary dictionaries were exploited. This was essential to conduct the product categorizations of the STR and also in the process to convert all measures into metric tons.[414]

At the beginning of this appendix, the ship-last is presented. Next, the rather complex units of measurement for the essential timber and salt cargoes are presented in detail. The Appendixes of units of measurement for the Sound Toll Register's departing and arriving cargoes and for the Swedish Board of Trade's Series 2 departing and arriving cargoes follow.[415]

Last

Last or ship-last (Dn. *læst*, Sw. *läst*) was a measurement of a ship's cargo capacity or weight of the cargo.[416] In Sweden, the so-called 'heavy last' was 2,448 kg during the research period.[417] In 1725 heavy last was defined as 24 barrels of wheat, 18 barrels of salt, or 18 ship pounds of iron. In 1778 heavy last was defined more precisely, but still, the basic unit, 18 ship pounds of iron remained.[418]

In Denmark, last was defined quite similarly as it was in Sweden (for light items it described capacity, for heavier items weight). For iron, *læst* was 12 *skippund* which was equal to 1,905 kg. In barrels, *læst* may have been 12, 18, 22 or 24 barrels. For rye, it was 24 barrels (5,200 *pund*) and for example, for Lüneburg's salt (Sw. *Luneburger salt*) it was 12 barrels, while for Spanish salt last was 18 barrels.

Timber units

STR units of measure for timber[419]

Stk. = Piece
Par = 2 Stk. (for example oars)
Tylter (also Tolfter, Dosin) = 12 Stk.
Schock = 60 Stk.
Ring = 240 Stk.

BoT2 units of measure for timber[420]

[414] Baudeau 1784, Bay 1824; Blangstrup 1915–1930; Croker, Williams & Clark 1765; Doursther 1840; Harboe 1839; Hyckert 1825; Kelly 1821; Rietz 1862–1867; Röding 1796–1798; Synnerberg 1815a, Synnerberg 1815b; Wolff 1779.
[415] Only the in the chapters concerning monetary units, the data of Board of Trade's Series 3 is discussed.
[416] Högberg 1969, 230–231.
[417] In Swedish svår läst or skeppsläst.
[418] See Högberg 1969, 230–231; see also Ojala 1999, 369.
[419] About the timber measurements see, for example, Troili 1843, 253.
[420] In BoT2 timber exports there were also units *famn* for firewood; and monetary units for *allehanda träwaror* and *ekewirke*. See Appendix 3. Units of measurement for the Board of Trade Sweden, Series 2 (BoT2), Import and export schedules.

Stycke = Piece
Tolft = Dozen

There are several factors that influence timber volume: the original timber dimensions, the tree species, and the moisture content of the sawn timber. In addition, the estimation method affects the calculated tonnes. The main method used to assess the volume of timber cargoes was to convert the measure of all main timber grades into meters and cubic meters, then convert those into metric tons.

The sizes (length, thickness, and width), and thus the volume of the most important timber dimensions were estimated based on the name of the timber grade listed on STR or BoT2, together with the measures mentioned in Högberg (1969) and the data provided by Gallagher (2016). Gallagher evaluated the volume of Baltic timber exports to Spain in detail.[421] Recently, Kumar (2018) introduced a new method to estimate the volume of the STRO timber.[422] This research uses a very similar methodology to Gallagher's and Kumar's when estimating the volume of the timber trade.

Gallagher used different densities for different timber dimensions: 575–700 kg/m^3. In this research, a lower ton per cubic meter was assumed. It was estimated that most of the timber was pine or spruce, and one cubic meter of timber weighed 500 kg/m^3.[423]

Converting STR timber into metric tons

The database collected from STR contained about 700 different spellings of timber products. Those were standardized to about 180 products, of which the 18 most common dimensions contained approximately 95 percent of exports.

The most common types of timber in the STR exported from Sweden to Southern Europe were *ord. breder* and *7 aln. breder* (En. boards). The Swedish BoT2 reveals how these timber grades were very likely equivalent to Swedish *enkla bräder a 7 alnar* and/or *halvbottenbräder a 7 alnar*, because these were two of the most common timber grades exported to Southern Europe.[424] BoT2 does not reveal

[421] Gallagher 2016.
[422] Kumar 2018.
[423] The most commonly exported timber was either pinewood or spruce. Pine (*Pinus sylvestris)* is heavier, approximately 550 kg/$m^{3,}$ and spruce (*Picea abies*) is lighter, approximately 405 kg/m^3. See, Meier, Eric: The Wood Database. In this research, an average of 500 kg/m^3 has been used for dry sawn timber. Pine was mentioned more often than spruce in the STR and BoT2.
[424] BoT2.

timber measurements (width or height), but sometimes the length is mentioned. Similarly, the STR very rarely lists thickness, but sometimes the length of timber is mentioned.[425]

The most common timber measurements were converted to cubic meters in the following manner. It was estimated, that *bräder* (BoT2) were similar to *breder* in the STR. According to Högberg (1969), the width and thickness of different Swedish timber grades are as follows.[426] In addition, the length was estimated to have been, as mentioned in BoT2, seven ells (4.16 meters).

enkla bräder 12" × 1 ½"	29.69 cm × 3.71 cm × 4.16 m = 45.79 dm^3 (22.90 kg)
halvbottenbräder 13" × 1 ¾"	32.16 cm × 4.33 cm × 4.16 m = 57.87 dm^3 (28.94 kg)
helbottenbräder 15" × 3"	37.11 cm × 7.42 cm × 4.16 m = 114.48 dm^3 (57.24 kg)

When calculated in pieces, the export shares from Sweden to Southern Europe were as follows: *enkla bräder* 37 percent, *halvbottenbräder* 58 percent, and *helbottenbräder* 4 percent.[427] Those shares and the estimated weights for these boards were used to evaluate the size of an average *breder,* which was estimated to weigh 27.54 kilograms.[428]

For example, Gallagher (2016) evaluated the mass of the boards from the Baltics as ranging from 21.275 kg (boards, unspecified or ordinary) to 25.30 kg (boards, specified).[429] The main difference between the measurements of ordinary boards of Gallagher (2016), and the Swedish *halvbottenbräder* or *enkla bräder* by Högberg (1969), was thickness. Gallagher used a thickness of 2.6 cm, while Högberg (1969) mentions 1 ¾ inch (4.3 cm) for Swedish *halvbottenbräder*.

The sizes for other typical STR timber qualities were taken from Gallagher's paper (2016). Gallagher estimated eighteenth-century STR timber dimensions by using several sources when calculating timber exports from the Baltics to Spain. As the dimensions could vary between countries, when possible, Gallagher's results were compared to STR measurements. When STR mentioned the length of Swedish timber exports to Southern Europe, the result was that those lengths of balks, planks, and deals were very close to those used by Gallagher. In order to convert all timber trade into metric tons, all timber products were converted into pieces. Those amounts were multiplied into metric tons by using the following Table 23.

[425] STR.
[426] Högberg 1969, 104. Högberg remarks that dimensions were defined in the 1683 statute. These three categories were the most common timber grades, but there was a great variety of other dimensions as well.
[427] BoT2.
[428] Compare this to Scheltjens 2015b: "tylt bræder is approximately 144 kg and tylt dehler is 216 kg." Those estimates are smaller than 12 × 27.54 kg = 330.48 kg.
[429] Gallagher 2016, 773.

Table 23. Estimates of the Sound Toll Registers timber dimensions, volumes and weights exported from Sweden to Southern Europe via the Sound

Timber dimension (STR)	Number of times mentioned	Timber dimension, in English	Volume (m^3), estimated from measures by Högberg (1969) *	Volume (m^3), by Gallagher (2016) m^3	Mass, kg per piece (timber volume × 500 kg/m^3)	
Ord. Breder	3,256	Boards	0.055		27.54	*
7 Al. Breder	1,795	Boards	0.055		27.54	*
Bielker / Fyrre bielker	832	Balks		0.528	264.00	
Skudeplanker/Planker	734	Ship's planks and planks		0.114	57.00	
Spirer	457	Spars		0.520	260.00	
Dehler	451	Deals		0.037	18.50	
Sparrer/Bomsparrer	366	Rafters / wooden rafters		0.137	68.50	
Haandspiger	338	Handspikes		0.020	10.00	
6 Al. Breder	331	Boards. 6 ell			25.00	**
6 a 7 all. Breder	304	Boards. 6 7 ell			27.00	**
Aarer	293	Oars		0.044	22.00	
Baadsmaster/Masts	257	Boat masts / masts		1.040	520.00	
Staver / Pibe- / Tønde- / Oxehoved staver	294	Staves (cask staves)		0.004	2.00	
Bonde	100				4.2	***
7 Al. Deehler	92	Deals. 7 ell		0.037	18.50	
6 Tomme sparrer	70	Rafters. 6 inch		0.137	68.50	
Lægter	46	Laths		0.002	1.00	
Træskuffer	38	Wooden shovels			3.00	****
All others	558				27.54	*****

Sources: The Sound Toll Registers; Board of Trade Sweden, Series 2; Högberg (1969); Gallagher (2016); Meier, Eric. The Wood Database.

* Estimate combines measurements of three *bräder*: *helbottenbräder* 4 percent 114.49 dm^3; *halvbottenbräder* 58 percent 57.88 dm^3; *enkla bräder* 37 percent 45.79 dm^3. All are estimated to be 4.16 meters (7 *ell*). Percentage shares are estimated from BoT2 timber exports to Southern Europe.
** Estimated to be slightly lighter than *ord. breder*.
*** Estimate was based on STR amount – customs payment relationship. This estimate indicated that the size of *bonde* was, for example, 0.15 × *breder* or 2.1 × *staver*. Both of those estimates gave very similar results to 4.2 kg per piece.[430]
**** Estimate was based on STR amount – customs payment relationship. This estimate indicates that the size of *træskuffer* was, for example, 0.11 × *breder* or 1.67 × *staver*. Those gave very similar results, approximately 3 kg.
***** 27.54 kg as an estimate (the size of most typical and most common size of boards) was used.

[430] *Bonde* as "peasant boards", See Gallagher 2016, 773.

Converting BoT2 timber into metric tons

The volumes of the main timber exports, boards, mentioned in the BoT2 were estimated using the length mentioned in the original source and the thickness and width, taken from Högberg (1969). The size of other timber grades was mainly taken from Gallagher (2016), and for the infrequently exported timber dimensions an estimate of 27.54 kg was used.[431]

Table 24. Estimates of the Swedish Board of Trade Series 2 timber dimensions, volumes and weights exported from Sweden to Southern Europe

Timber dimension (BoT2)[432]	Timber dimension, in English	Volume (m^3), estimated from measures by Högberg (1969) *	Volume (m^3), by Gallagher (2016)	Mass (kg), per piece (timber volume × 500 kg /m^3)	Mass (kg), per dozen
Enkla bräder a 7 alnar		0.046		22.90	274.76
Enkla bräder a 9 alnar		0.059		29.44	353.27
Enkla bräder a 12 alnar		0.079		39.25	471.03
Halvbottenbräder a 7 alnar		0.058		28.94	347.27
Halvbottenbräder a 9 alnar		0.074		37.21	446.49
Halvbottenbräder till 10 alnar		0.083		41.34	496.10
Halvbottenbräder a 12 alnar		0.099		49.61	595.32
Halvbottenbräder a 15 alnar		0.124		62.01	744.16
Helbottenbräder a 7 alnar		0.114		57.24	686.91
Helbottenbräder a 9 alnar		0.147		73.60	883.17
Helbottenbräder a 10 alnar		0.164		81.78	981.30
Helbottenbräder till 11 alnar		0.180		89.95	1079.43
Helbottenbräder a 12 alnar		0.196		98.13	1177.56
Helbottenbräder a 15 alnar	Boards	0.245		122.66	1471.96
Masteträd	Boat masts / masts		1.04	520.00	
Lecter	Laths		0.002	1.00	
Tunne bottnar	Staves (cask staves)		0.004	2.00	
Tunne Stafvar	Staves (cask staves)		0.004	2.00	
Furu Bielckar / Furu Bielckar a 12 & 16 alnar / Furu Bielckar a 20 alnar	Balks (beams)		0.528	264.00	
Spiror Ringare / Spiror a 7 Palm / Spiror a 10 Palm	Spars		0.52	260.00	

[431] Gallagher 2016.

[432] Note that there were very different spellings for the same timber grades in different periods of time; for instance, *enkla bräder till 7 aln*/ *enkla bräder a 7 alnar*; *tunne stafvar*/ *tunne stäfver af bok*. When several products are mentioned in one row, these are different products in BoT2, but the same estimates of weight was used for all of these dimensions.

Furu Planckor	Ship's planks and planks		0.114	57.00	
Bom Sparrar / Furu Sparrar / Gran Sparrar	Rafters / wooden rafters		0.137	68.50	822.00
Bäckerhult **				2.00	24.00
All others: Axel- Åre- och Stege Trän; Furu Stolpar; Furu Timmer; Gran Timber; Grun Bord och Bordwek; Juster; Krum holtz; Kullter; Raster. ***				27.54	

Sources: The Sound Toll Registers; Board of Trade Sweden, Series 2; Högberg (1969); Gallagher (2016); Meier, Eric. The Wood Database.

* Högberg, Staffan (1969) Utrikeshandel och sjöfart, p. 104.
** Estimate: same size than cask staves. SAO: "Böcker-Holt: för tunnbindare afsedt (klufvet, icke sågadt) virke."
*** 27.54 kg as an estimate (the size of most typical and most common size of boards) was used.[433]

Salt units

There were only a few units used for salt in the original sources. In the STR data main unit was *læst* (ship-last) and in the BoT2 *tunna* (barrel). Although there were not many different units, it was not straightforward to assess the weight of these units, because there are very different amounts and conversions in earlier research literature. Because the weight of the salt barrel or ship-last has a significant effect when assessing the trade and cargo structures, these weights were evaluated carefully. Based on different estimates of volumes and weights presented in contemporary sources and research literature, the following estimates were selected for this research.[434]

For the BoT2 salt cargoes, it was estimated that

barrel of salt = 136 kg

For the Sound Toll Registers salt cargoes, it was estimated that

ship-last of salt = 2,448 kg

Previous literature has used very different liter amounts for the salt barrel. One reason is that, based on regulations, both the barrel for dry goods (*tunna för torra varor*) and the barrel for liquid goods (*tunna för flytande varor*) could have been used for salt. In the year 1739, *tunna för packat salt* was 125.6 liters and *tunna för opackat salt* 155.7 liters.[435] In this research, the commonly used

[433] For this calculation, see previous chapter: Converting STR timber into metric tons.
[434] About the salt units and measuring salt in different parts of Europe, see especially Croker, Williams & Clark 1765, Measure: Measures of capacity for Things dry. See also Thaarup & Martensen 1821.
[435] About the discussion of salt barrel volume, see especially Carlén 1997, 349–350.

conversion, in Sweden, one barrel of salt was 59.5 *kanna*, which is equal to a total of 155.72 liters, was applied for conversions.[436]

Salt density (weight per volume) varies quite a lot, depending on the type of salt. Fine salt weighs approximately 125 grams per one deciliter, and the coarse sea salt weighs from 80 to 100 grams per one deciliter.[437] For instance, Lopes (2000), mentions an estimate of 0.95 kg per liter for the Portuguese salt in the early modern period.[438] Accordingly, Heckscher (1922) mentions the weight of 0.97 kg per liter.[439] From a contemporary source, Troili (1843), one can conclude that imported salt from the Mediterranean and Portugal was quite coarse, approximately 87 grams per one deciliter.[440]

Troili, Uno (1843), Europeiska Staternes Mått- och Vigtordningar:

> "1 Tunna salt [en sådan tunna håller 59 ½ kanna] väger circa 16 Lispund v. v. [victualie vigt] eller 1 Skeppund st. v. [stapelstadt vigt]"[441]
>
> [In Sweden] One barrel of salt [which holds 59 ½ *kanna*] weighs approximately 16 *Lispund* [of provisions weight] or 1 *Skeppund* [of weight applied for exportation in staple-right-cities].[442]

This estimate equals a salt barrel of 155.7 liters and 136 kg**.**

In the STR, the most common unit for salt was *læst* (over 98 percent of salt was determined as *læst*). Other units were, for example, *tønder* (barrel) (mentioned 8 times)*, moyer* (mentioned 38 times)*, modin* (mentioned 14 times) and *pund* (mentioned 4 times), *salm* (mentioned 15 times), and *ladning* (mentioned 40 times).[443] The relationship between different units was mainly straightforward.

Conversions and relationship used for other salt units

1 læst = 18 tønder[444]

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[436] SCB 1972, 63; Heckscher 1922, 230: "156 liter". From contemporary sources, see also Kongl. Vetenskaps-Academien 1823, 11. See also Troili 1843, 370. See also Hyckert 1825, 54: "Sverige 1 Tunna Salt, Kalk a 34 Svenska kappar = 155.676 Franska liters". Compare this to the Danish salt barrel; Thestrup (1991): Salttønde equals 173.88 liters (1698–1829). Compare also to Lindberg 2005.

[437] According to Sääksjärvi & Reinivuo 2004: coarse salt 100 grams per 1 deciliter; fine salt 125 grams per 1 deciliter. See also Aqua-Calc website.

[438] Lopes 2000, 70.

[439] Heckscher 1922, 230: "97 kg per hectoliter".

[440] Troili 1843, 370.

[441] Troili 1843, 370. Note that the volume of salt barrel is given in several sources. However, the weight (and density of salt) barrel was found only from one source.

[442] Translation by author.

[443] For some reason, no customs payments were mentioned when the unit used was salm or ladning.

[444] STR (the relation between customs payment and cargo amount) reveals that *læst was either 12 or 18 tønder. Tønder* is mentioned rarely as a unit for salt. See Passage ID: 38351, 280300, 558837, 558837, 593526, 593526. For Spanish salt,

1 læst = 3.5 moyer[445]
1 læst = 2 modin[446]
1 læst= 4 salm[447]
1 ladning = 125 læst[448] (estimate)
1 læst = 266 pund[449] (estimate)

The research literature suggests several amounts for salt *læst*. Last could contain a different number of salt barrels, and different volume of salt in liters depending on where the salt cargo originated. For instance, in a recent research paper, Scheltjens (2015) uses 2,325 kg as an amount for one salt *læst* from France to the Baltic.[450] For all other products, Scheltjens uses *ancien last of Amsterdam*: 2,918 liters.[451] The contemporary sources of the early modern units and measurements explain the salt measurement and the ship-last of salt in the Sound as follows.

Thaarup, Frederik and Martensen Hans Andersen (1821), The latest revis'd Sound-tariff, a manual for merchants and masters of vessels, wrought from the best sources:[452]

> "From Spanish, Portuguese and Italian ports as:
> * Cadix, Lisbon, St. Lucar, Setubal: Seven Moys the same as two Lasts
> ** Alicante, Cagliari, La Mata, Trepani, Yvica: Two Moys or four Salmis the same as one Last
> *** Sardinia: 200 Sardes d'Aurea the same as 5 Lasts"

* 1 *moyo* = 60 *alquiros*[453]. 1 *alquiro* = 13.5 liters[454]. Thus, *moyo* = 810 liters and 1 *last* = 2,835 liters

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the STR relationship was 12 barrels for one *læst* (however, the sample is very small). For Portuguese salt it was 18 or 12 barrels (the sample is also small). The literature reveals that for Spanish and Portuguese salt *læst* was 18 barrels.

[445] Thaarup & Martensen 1821, 58. STR: the calculation of amount – customs payment relation reveals also that *læst* is 3.5 *moyo*. Also, the comparison of STRO data column *hulp* (help) and *aantaal* (amount) of Passage IDs: 556525, 528765, 494249, 79126, reveals, that *læst* is 3.5 *moyo*.

[446] Thaarup & Martensen 1821, 58 (see "Moy" of Spanish areas). STR: (amount – customs payment relation) also reveals that 1 *læst* is 2 *modin*. See Passage ID: 425940.

[447] Thaarup & Martensen 1821, 58. The same relationship is also mentioned in the STR. Passage ID 37952 mentions that 550 ¾ *salm* of salt equals 137 11/16 *læst* of salt.

[448] The unit *ladning* does not specify the amount of cargo, it can be translated simply as a load or cargo. Here it was assumed that the average ship (*ladning*) carried 125 *læst.* There were also 8 ships (Passage ID: 198168, 379864, 393776, 394239, 419251, 430865, 478382, 506337) in salt cargo with no mention of cargo amount. For these ships the same assumption; cargo was 125 *læst* of salt, was made and then added on the database.

[449] This ratio was estimated from the amount per customs payment. Passage ID: 249542, 77835, 150404.

[450] Scheltjens 2015b, 173.

[451] Scheltjens 2015b, footnote 8. In addition, see Doursther 1840, 194.

[452] Thaarup & Martensen 1821. This book also describes what amount of French salt is equal to one last. However, because salt imports from the French Mediterranean coast were not significant for Sweden and because there are so many different ways to measure French salt, these units are not presented here. The other eighteenth-century books, such as Ricard, Laveaux & Moutardier 1799, 103; or Baudeau 1784, 130; announce the same (or quite the same) numbers for these salt units.

[453] Lopes 2003, 148, 155.

[454] The amount of Alquiro in liters is from Lopes 2000, 60–61. For example, Lindberg 2005 uses the amount of 13.5 liters for alquiro. The capacity of alquiro could be slightly different in different regions, (also in different centuries volume of alquiro was different). See Lopes 2000, 60–61; Lopes 2003, 154–155.

** In Spain, *moy* was called *modin. 1 modin* ≈ 1,387 kg [455]. Thus 1,387 kg × 2 = 2,774 kg

Harboe, Carl Leopold Ludvig (1839), Dansk Marine-Ordbog:

> "In Denmark for Spanish and Portuguese Salt:
>
> *Læst* = (18 barrels (*Tønde*)) Also in Sweden *Läst* consisted of 18 barrels (*Tunna*) of salt."[456]

It is worth noting that in liters (or in kilograms) this was, however, a different amount in Denmark and in Sweden. Swedish *tunna* and Danish *tønde* were different in size: Spanish salt 1 t*ønde* = 1.17701 *tunna*.[457] Thestrup (1991) mentions how *tønde* of Spanish salt was 176 *potter* which is a total of 170.016 liters. Thus, one *læst* is 3060.29 liters.[458]

de Boisgelin de Kerdu (1810), Travels through Denmark:

> [When last is used for salt in cargo manifest] "A last of salt, whatever may be the country from whence it comes, is reckoned the same (whether heavier or lighter) as the Amsterdam last; that is, if the last is not specified."[459]

However, for Amsterdam last, there are several conversions in contemporary literature.

> Amsterdam last of salt weighs 4,000 lb (= 1816 kg)[460]
>
> Amsterdam last = 2,917 French liters (year 1825)[461]
>
> The Amsterdam last = 85.248 bushels U.S. [462] U.S. bushel = 35.2391 liters, thus Amsterdam last = 3,004.06 liter (year 1839)

[455] "At Alamat and Ivica it is sold by modin which weighs from 27 1/2 to 28 hundred weight English." Croker, Williams & Clark 1765, Measure: Measures of capacity for Things dry.
[456] About the Danish *læst*, for Spanish and Portuguese salt 18 barrels, see Harboe 1839, 157, 272 "Salthandel." 1 Læst Seasalt is 18 Tönder (barrels). 1 Læst Lünebug Salt is 12 Tönder (barrels). For French salt, one Læst is 12 barrels (Tönder). Compare to Thestrup 1991, 24. According to Thestrup (1991), in Denmark: Last/Læst: 1 læst of salt of Lüneburg salt, as well as Danish and Norwegian salt, consists of 12 barrels; but one læst of salt of Spanish, French and Scottish salt consists of 18 barrels. de Boisgelin de Kerdu 1810, 219 mentions that: "A last of Spanish salt and one of coal stone are eighteen barrels each of which is 176 pottes. A Last of French salt and one of lime are eighteen barrels, each of 144 pottes." Thestrup (1991): "Pot 1/32 kubikfod svarade 0.966 liters." About the Swedish *läst* see, for example, Ojala 1999, 369. During the nineteenth century, the definition of last became more precise. For example, Troili 1843, 372, mentions how one last of salt is 13 barrels of Cagliari salt and 16 ½ barrels of St. Ubes salt.
[457] Troili 1843, 78.
[458] Thestrup 1991.
[459] de Boisgelin de Kerdu 1810, 221. Also, Thaarup & Martensen 1821, 58–59 mentions the very same thing.
[460] Croker, Williams & Clark 1765, Measure: Measures of capacity for Things dry. 4,000 × 0.454 kg = 1,816 kg.
[461] Hyckert 1825, 49.
[462] Freeman 1839, 263.

Appendix 2. Units of measurement for the Sound Toll Registers

The Sound Toll Registers contain a wide number of different units of measurement. It is worth noticing that in Elsinore, cargo amounts and units were not converted to Danish equivalents. Customs officials registered the units and amounts in the STR as documented in the freight letter, which was recorded at the point of departure.[463]

Scheltjens (2015) mentions: "On the contrary, the 1645 Treaty of Christianapolis/Kristianopel and its confirmation in 1701 stated that the weight of measures of goods upon which customs payments are due is that of the place where the good had been loaded."[464] In this research, for Swedish exports, conversions mentioned in Swedish literature were used. For imports from Southern Europe, research literature considering the STR units, as well as certain conversions mentioned in the STR data, were used. Thus, regarding import cargoes, Danish equivalents were used in metric conversions, for example, for fruits containers or wine barrels.[465]

Most of the previous research has mainly used these STR units as such and measured, for instance, the timber trade in dozens, salt trade in *læster* or tar trade in barrels. One aim of this research was first to standardize different units and then convert them into tonnes.

In eighteenth-century Europe, there was a great variety of units of measurement, and while very similar units were used in different countries, their size could still differ. In addition, the same unit of measure, for a different item, could give a very different amount in kilograms when being converted into metric tons.

The only way to measure the trade amounts by using solely the STR data, is to measure the trade volume. In this research, the data of the customs payments – which are highly uniform and are easily summarized – were used when calculating volumes for miscellaneous cargoes with complicated units of measurement. To calculate rough amounts of cargo volume in tonnes, Scheltjens (2009) evaluated a useful estimator for the STR. This converter is quite suitable for a large number of vessels in eighteenth-century context. By comparing customs payments to tonnes, Scheltjens evaluated that 56.8 kg of cargo was valued for one *skilling* at taxes (or 2727.7 kg per *rigsdaler*). Although the ratio between cargo tonnes and customs payment varied for each individual product, this evaluation is appropriate for the correspondent of one *rigsdaler* as one ship-last when handling

[463] Scheltjens 2009, 2015.
[464] Scheltjens 2015a, 21.
[465] Particularly for wine imports originating from various ports, this is not the most precise method. Scheltjens 2009.

large amounts of data.[466] The ratio between customs payment and tonnes used in this research was modified from this estimate. This is due to the fact that the cargoes, which the estimate was used for, were significantly more expensive than average freights. In this research, conversion of one *skilling* of customs payment equals to 5 kilograms (imports) or 15 kilograms (exports) of cargo were used.

Sound Toll Registers: Units of measurement for exports

Iron, Copper, Steel [467]

Skippund = 20 lispund or 320 pund (En. ship pound)
136.02 kg
Lispund 16 pund
6.80 kg
Pund
0.425 kg

Tar and Pitch

Læst = 12 tønder
Tønde (barrel)
125.63 liters

For tar: 151 kg (1.2 kg/liter × 125.63 liters = 151 kg); for pitch: 163 kg (1.3 kg/liter × 125.63 liters = 163 kg); and for "tar and pitch / pitch and tar" = 157 kg.[468]

Miscellaneous cargoes

For most of the products in this category (approximately 78 percent), it was possible to estimate a conversion from the original unit of measurement to metric tons. All other products, mainly krammerie and monetary unit Rd. (*rigsdaler*), were converted to metric tons by using an estimate of customs payment – tonnes relationship.

Tønde (barrel)
125 kg. Estimate for different types of cargo: (red dyes, grain, fish, train oil, etc.)

Centner

[466] Scheltjens 2009, 94.
[467] The amounts used here are Swedish equivalents. In Denmark, the quantities of these three units were slightly larger than in Sweden: skippund: 158.72 kg, lispund: 7.936 kg and pund: 0.496 kg. See Thestrup 1991. For some reason, Thaarup & Martensen 1821, 63 estimates ship pound of metals as follows: "12 shippound is reckoned to be a Last (=1797 ½ frch. Kilogr.)".
[468] Size of a tar barrel in liters, see e.g. Högberg 1969, 255, or Kostet 2005. Last = 12 barrels, see STR (tar barrel and tar *læst* relationship to customs payments) or Kostet 2005, "tynnyri". The density of tar and pitch has been estimated by using several sources, primarily, Aqua-Calc website "tar" and "pitch". That source gives a same density for tar and pitch, but here it was evaluated that density of pitch was higher than density of tar.

42.5 kg. Used for nails (*søm*) and gunpowder.[469]

Skippund
136.02 kg, used for alum (*alun*), nails (*søm*), lead (*bly*), stone (*sten*), etc.

Lispund
6.8 kg, used for alum, nails, lead, stone etc.

Pund
0.425 kg, used for alum, nails, gunpowder etc.

Ahm/Fad[470]
154.56 liters/(kg)

Anker
38.64 liters/(kg)

Oxehuvud
231.84 liters/(kg)

Kiste
51 ¾ kg, a Estimate for porcelain, glass, etc.

Stk.
Estimate 15 kg for sailcloth (measurement unit for sailcloth was also *ruller*)[471]
Estimate: muskets (*musquetter*): 8 kg/stk; pistols (*pistohler*) 3 kg/(*par*)
Estimation for different stones (*ølands steen, polered steen, trappesteen*, etc.) Stk./Aln = 24 kg.
Explanation for stone weight calculation, see "Stycke (Pieces)" in Appendix 3. Units of measurement for the Board of Trade Sweden, Series 2.

For all other units
A following indirect conversion was used: 1 *skilling* of customs payment = 15 kg or 720 kg per *rigsdaler*. Conversion was mainly used for krammerie, fur and hides, etc.

[469] Kostet 2005.
[470] Note that here *fad* (used for beer) has been estimated to be similar to Swedish *fat (=åhm)* 157 liters, not 927.36 liters as for imports from Southern Europe.
[471] Based on a sailcloth amount relationship to customs payments of stk. and *rulla*, it was possible to conclude that stk. was equal to *rulla*.

Sound Toll Registers: Units of measurement for imports

Units for fruits

The most common units for fruits were *kiste* (=a box) and also *kasser*.[472] Based on the amount – customs payment relationship, *kiste* and *kasse* are likely an equal amount.[473]

Units, such as; *kurv*, *læst*, *pund, tønder*, and *rigsdaler* were also used when measuring fruit cargoes. Only one or two times *oxehuvud, pibe*, and *potter* were also used, and they were converted to tonnes in the same way as *kiste*.

Kurv
Kurv = a basket, for raisins a frail.[474] Was used to measure figs and raisins (raisins are in a product group "miscellaneous cargoes").
Because the amount of figs was mentioned in both *pund* and *kurv*, it is possible to conclude (by comparing the amount – customs payment relation) that *kurv* is approximately 44 *pund*[475], which is equal to approximately 21.8 kg.
In Sweden, a basket (*bänne, bende*) was 2 ½ *lispund* which is equal to 21.25 kg.
In this study, *kurv* of fruits was 21.5 kg.[476]

Kiste
Was a unit for lemons and fruits.[477] *Kiste* = "for figner 51 ¾ kg."[478]
When a unit for fruits or lemons was *kiste*, a coefficient of 51 ¾ kg was used.

Tønder
For fruits 139.1 liters.[479] A rough estimate is that it was 100 kg.

Rigsdaler
Grapes were announced as *rigsdaler*. The rough estimate based on the amount – customs payment relationship is that 1 *rigsdaler* of grapes is 1 *tønder*, 100 kg.

Pund
0.496 kg[480]

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[472] Also these units had various spellings, for example, *casser* and *kister* (a plural of *kiste*).
[473] Even though Blangstrup (1915–1930), "Kiste", mentions that *kasse* is a small *kiste*; the relationship of customs payment and fruit amount was the same for both units.
[474] Bay 1824. See also Zupko 1985, 157.
[475] In Denmark *pund* or *skålpund* was 496 grams.
[476] Kostet 2005.
[477] Scheltjens 2015b used 40 kg for *kiste*, *kasse* and *kurv*, which is very close to these estimates.
[478] See Blangstrup 1915–1930, "Kiste". It is not sure whether this amount was relevant in the eighteenth century, so this is so far the best estimate. For instance, SAO mentions only that the size of *kiste* varied. However, since the relationship between customs payment and fruit amount did not vary, *kiste* was likely a quite standard amount.
[479] Thestrup 1991.
[480] Thestrup 1991.

Units for wines and beverages

Relationship between different liquid units [481]

Anker
Ahm = 4 Anker
Oxehovede = 6 Anker
Pibe = 12 Anker or 2 Oxehovede
Booth = Pibe
Stk. = 2 Oxehovede or 1 Pibe
Fad = 24 Anker or 6 Ahm or 4 × Oxehovede

Anker
38.64 liters/(kg)[482]

Ahmer/Tierce, (a semantic equivalent with Ahmer)[483]
154.56 liters/(kg)[484]

Oxehovede
231.84 liters/(kg)[485]

Fad[*486*]
927.36 liters/(kg)

Piber/Booth/Stk.[487]
463.68 liters/(kg)

Halve booter
231.84 liters/(kg)

Halve Oxehovede
115.92 liters/(kg)

[481] These relationships can be seen from STR relationships of amount and customs payments (STR Online). See also Thaarup & Martensen 1821, 59. The relationship between different units is very exact and is explained similarly in different sources. However, the number of different units in liters is slightly different in different sources. The main source for these volumes has been Thestrup (1991), Pund og alen. Danske mål- og vægtenheder fra 1683–reformen til idag. Thaarup & Martensen 1821, gives quite similar amounts for these units in liters, differences are approximately two percent. Scheltjens 2015b explains how the conversion of some units to liters depends on which wine or spirit unit has been used. For example, Scheltjens 2015b, uses 377 to 608.77 liters for *pibe*, 412.25 liters for *booth* and 197.57 to 304.92 liters for *oxehoved*, depending on what type of beverage was declared.
[482] Thestrup 1991. Compare to Scheltjens 2015b, 171: Anker = 38.09 liter.
[483] Tierce = Ahme. See Scheltjens 2015b or Thaarup & Martensen 1821, 59.
[484] Thestrup 1991. Compare to Scheltjens 2015b, 173: In Bordeaux 150.8 liters.
[485] Thestrup 1991.
[486] Thestrup 1991. Note, Danish *fad* should not be confused with Swedish *fat* (also known as *åmar*), which is a different unit and amount for liquids.
[487] In the STR, *both* and *pibe* had quite often similar customs payment for the same wine quality. Thaarup & Martensen 1821, 59, also mentions that "1 Booth = 1 Pibe". In the STR *stk.* was 2 × *oxehoved*, (derived from the amount – customs relationship). In addition, Thaarup & Martensen 1821, 60 mentions that for liquid goods "Piece [Stk.] of brandy is 2 Hogsheads or 1 Pibe".

Other products

The majority of this category was converted into metric tons in the same manner as other categories. However, approximately 1/3 of this category's units were unknown, or those conversions were made by using an estimate 1 *skilling* of customs payment = 15 kg.[488]

Main units were converted as mentioned previously: *pund* (for sugar, raisins, almonds, pepper, indigo, silk, etc.); *lispund* (for cotton, etc.); *ahm*, *oxehuvud*, etc. (for olive oil and other liquids); *kiste* (for window glass, apples, cannons, fish, liqueurs, etc.); *kurv* (for raisins); *tønder* (for fish, raisins, etc.); *skippund* (for alum, lead, cotton, Potassium bitartrate etc.).

Esstimate *sække* = 80 kg (for coffee beans, chestnuts, etc.)

For the rest of the products, mainly krammerie and commercial items (*kiøbmandskaber*) and a few other rarely mentioned goods, a rough estimate based on customs payments has been used. Units for these products were mainly in *rigsdaler*, also in *stycke, deger, wohler*, etc.

The estimate here was: 1 *skilling* = 5 kg or 240 kg per *rigsdaler*.

Scheltjens (2009) evaluated that 56.8 kg of cargo was valued for 1 *skilling* at customs payments. This is roughly a correspondent of 1 *rigsdaler* of customs payments as 1 ship-last for large amounts of data.[489] The reason why the smaller estimate is used here is that the products in the category "miscellaneous cargoes" had much lower ton per value relationship than average bulky cargoes.

[488] The approximated amount of 1/3 of unknown units is based on number of individual cargoes on STR (rows on the STR data). Very likely, when measured in metric tons, the amount is lower.
[489] Scheltjens 2009, 94.

Appendix 3. Units of measurement for the Board of Trade Sweden, Series 2 (BoT2), Import and export schedules

Board of Trade Sweden, Series 2 (BoT2), Import and export schedules: Non-monetary units of measurement for exports

At the beginning of this section, all of the measurement units with typically only one rather straightforward conversion are listed. Estimated conversions for goods reported in pieces or monetary units are reported at the end of this section.

Alnar
59.38 cm
The unit was used for linen clothing and some stone.
Estimate for clothing: 1 *aln* = 0.15 kg.
Estimate for stone: 1 *aln* = 24 kg. (For stone (*hnd dwarn stenar*), there was one unclear unit of measurement *par*. It was also estimated to have been 24 kg.)

Bushel
Unit was used only once for *säckar.* Unknown, whether it was U.S. bushel or imperial bushel. Estimated to have been 36.0 kg.

Wåhl (Wål)
Unit was used for fish salted common ling (lat. *molva molva*).
Includes 10 pieces of this fish.
Guesstimate 40 kg (10 × 4 kg). For smaller fish, it was approximately 80 pieces.[490]

Centner
42.5 kg
Unit was used for gunpowder.

Dussin
A dozen, 12 pieces.
Unit was used for gloves and socking.
Estimate for gloves and socking: 0.20 kg

Famn
4 × 3 alnar[491]
Unit was used for firewood.
237 cm × 178 cm. Estimate: 1600 kg.[492]

Kanna
2.6172 liters/(kg)
Unit was used for spirits.

Kista
Unit was used for window glass.
Estimate: 250 kg.
Estimation: 60 pieces of glass, size: approximately 74 cm × 74 cm, thickness 3 mm.[493]

Lispund
8.50152 kg

[490] Kongl. Maj:ts Nådige Allmänne (1766), 1 Cap. §4: "Torr fisk kan, jemwäl stycketals försäljas, eller uti wåla, bestående af Tio Fiskar, eller Wahl af åttatio stycken, som for vanligit varit." Another source: Rietz 1862–1867, 822 mentions: "Våla 1. fisknippa, knippa af tio stycken torkade fiskar. 2) Val af sill eller storfisk (Gadus Molva)". Kostet (2005) mentions: "Val (val): 80 or 81 pieces of herring".
[491] Kostet 2005, 104 "Syli".
[492] Estimated to be about 4 m^3 of firewood, 400 kg/m^3.
[493] Measurements for this estimate are guesses by the author. The number of window glasses in Kista varied, depending on the size of the glass. If the glasses were large, the amount was smaller. Likely, the weight of Kista was about 100 to 200 kg. See more in Troili 1843, 371. For comparison, in Denmark, for instance, Kiste contained 120 window glasses. See Thestrup 1991. About window glass measurements, see also Kostet 2005, 76, "Centen(er) (centener)".

Unit was used for different victuals, fish, hemp, linen, etc.

Läst
Unit was used for white lime and calcium oxide.
Estimate: 2,448 kg.

Pund
Unit was considered as *skålpund*: 0.425076 kg
Unit was used for coal.

Ring/Ringar
240 pieces[494]
Unit was used for certain timber qualities, for example, cask staver (*tunne stäfwer*) in the cargo category of bonded goods (*nederlagswaror*).
Estimation: 480 kg.[495]

Fat
See: Åm.

Skeppund (En. ship pound)
136.02 kg
Unit was used metals and also for some other goods such as ash.

Skålpund
0.425076 kg
Unit was used for different goods such as gunpowder, tobacco, sugar, etc.

Timmer
40 pieces of fur.[496]
Unit was used for fur of small animals: ermine, hare and vair (= squirrel's winter coat).
Estimates: hare 12 kg, ermine and squirrels 1 kg.

Tolft 12 Pieces
Unit was used for timber.

Åm/Åhm (fat)
157.02 liters/(kg)
Unit was used for train oil and beer, also used for bonded goods (Sw. *nederlags och åter utskeppade utrikes waror*) such as spirits and wines.

[494] Kostet 2005, 50.
[495] Gallagher 2016, estimated these timber dimensions as 2 kg per pieces, therefore 240 × 2 kg = 480 kg.
[496] Kostet 2005.

Tunna (Barrel)
Unit was used for very different products: grain, tar, fish, meat, dyestuff, soap, etc.

Tunna of fish
119 kg[497] (14 *lispund*)

Tunna of tar
151 kg (1.2 kg/liter × 125.63 liters)

Tunna of pitch and pitch oil
163 kg (1.3 kg/liter × 125.63 liters = 163 kg)[498]

Tunna of wheat
116 kg (79 kg/100 liters)

Tunna of rye
104 kg (71 kg/100 liters)

Tunna of barley
95 kg (65 kg/100 liters)

Tunna of oat
87 kg (55 kg/100 liters)[499]

Tunna of groats
125 kg (85 kg/100 liters)[500]

Tunna for flour
81 kg (55 kg/100 liters) [501]

Tunna of peas
125 kg (85 kg/100 liters)[502]

Tunna of victuals
(1 kg/liter × 146.6 liters).
Estimate is that the barrel size was 146.6 liters.
Tunna of salted meat:
146.6 kg per barrel

Tunna for juniper berries (*enebär*)
103 kg (0.7 kg/liter × 146.6 liters)

Tunna of dyestuff:
Estimate is that the barrel size was 146.6 liters.
Tunna of falun red (*röd färga*)
117 kg (0.8 kg/liter × 146.6 liters)

Tunna of soap (*såpa*)
Estimate 117 kg (0.8 kg/liter × 146.6 liters)

Tunna of salt
136 kg

[497] Vilkuna 1975, 358. ”Barrel of salmon was an official measurement, such as the Baltic barrel of herring; 14 *lispund* (119 kg)”. Originally in Finnish, translation by author.
[498] Size of a tar barrel in liters, see e.g. Högberg 1969, 255, or Kostet 2005, “tynnyri”. The density of tar and pitch has been estimated by using several sources, primarily, Aqua-Calc website “tar” and “pitch”. That source gives a same density for tar and pitch, but here it was evaluated that density of pitch was higher than density of tar.
[499] Source for kilograms per liters: Evira, Tilastot viljan laadusta 1995–2016.
[500] Sääksjärvi & Reinivuo 2004.
[501] Sääksjärvi & Reinivuo 2004.
[502] Sääksjärvi & Reinivuo 2004.

Stycke (Pieces)
Unit was used numerous products different timber, stone, hide and fur and fish qualities.

Stycke for Fish
Salted salmon 6 kg

Stycke for Hides and fur
(estimates) reindeer hides, calfskin, ox hides: 2.5 kg; bear hides: 9 kg; red fox 0.4 kg; Eurasian lynx 0.8 kg; gråwärke 0.025 kg; pine marten skins: 0.1 kg

Stycke for Miscellaneous goods
bricks (*mur tegel*): 5.6 kg[503]
hats: 0.15 kg
bayonets: 0.4 kg
muskets: 8 kg
roof tiles (*täckpannor*): 4 kg[504]

Stycke for linen textiles (*linne waror*):
sailcloth of 60 ell per piece (*buldan, 60 aln/stycke*): 9 kg

Stycke for Stone:
The most commonly exported stone qualities were: red floor stones (*röd golf sten*); polished floor stones (*polerad golfsten*) and all kinds of stone (*allehanda sten*). Also, some smaller amounts of stone steps (*trappsten*) and tombstones (*liksten*) were exported as well. Mainly, the stone exports were measured in pieces, for some stone qualities also in *aln*. Here it was estimated that *stycke* and *aln* were the same amount in tonnes. STR supports this estimate. STR reveals that for stone *aln* and *stycke* had the same ratio of amount – customs payment. This indicates clearly that those amounts were quite similar in metric tons.

Estimates:
tombstones (*liksten*): 100 kg.
stone table tops (*disk sten*): 100 kg
grindstones (*slip sten*): 20 kg
sharpening stone (*små slipsten*): 0.3 kg
red floor stones (*röd golf sten*) 24 kg
Öland stone (*Ölands sten*): 24 kg

[503] Size of the wall bricks could naturally vary, but Troili 1843, 371 gives an example of bricks (*murtegel*) size: "11 1/8 tum × 5 5/8 tum × 3 tum"; 27.5 cm × 13.9 cm × 7.4 cm = 2.83 dm^3. If the nominal weight of bricks (*murtegel*) is e.g. 2,000 kg/m^3, then the weight of one wall brick is 5.6 kg.
[504] Size of the roof tiles could of course vary, but Troili 1843, 371 gives an example of roof tile (*taktegel*) size: 13 ½ tum (32.4 cm) × 10 tum (24.74 cm) × 1 tum (2.474 cm) = 1.98 dm^3. Nominal weight of pantile e.g. 2,000 kg/m^3, weight is 3.97 kg.

Based on Linné (1741) "*Öländska Resa",* Eva Wilson (1996), has explained the standardized sizes of floor stones (*golv sten*) as follows:[505]
aln-sten: 45 × 45 cm
kronalsten: 60 × 60 cm
finnalsten: 30 × 30 cm
sexhuggare: 90 × 45 cm

The thickness of the stones was not explained in this source.[506] The guesstimate is that it was 3.5 cm. By using these measurements, the average size of one stone is 9.253 dm^3.[507] If limestone from Öland weighs 2,600 kg/m^3, weight of an average stone is 24 kg.[508]

[505] Wilson 1996, 100–101.
[506] For more about stone production in Sweden in the early modern period, see Friberg & Sundnér 1996.
[507] *Aln-sten* 7,087.5 cm^3; *kronalsten* 12,600 cm^3; *finnalsten* 3,150 cm^3; *sexhuggare* 14,175 cm^3. Average: 9,253 cm^3.
[508] In statistics, there was also one stone quality, *luanste stenar (8 quarter och strörre)*, with unknown stone unit *bac*. That was exported only in one year, and the amount was small. The same coefficient, 24 kg, was used for this stone product as well.

Board of Trade Sweden, Series 2 (BoT2), Import and export schedules: Non-monetary units of measurement for imports

Alnar
59.38 cm
Unit was used for different clothes.
Estimate: one *aln* = 0.15 kg.

Bundt (also *bundt af 50 st.*) (En. bundle).[509]
Unit was used for fish and violin strings.
Estimates:
Bundt for dried and salted European flounder (*torr flundror och salta*) = 30 kg [510]
Bundt for merlangius (*hvittling*) = 10 kg [511]
one bundt for violin strings = 0.01 kg

Dussin
12 pieces
Unit was used for envelopes, gloves, leather, etc.
Estimate: for envelopes = 0.08 kg, for gloves and stockings = 0.20 kg; for leather and shoe upper leather (*skoblad*), white leather (*hvitt läder*) = 0.5 kg

Kanna
2.6172 liters/(kg)
Unit was used mainly for olives and honey.

Kista
Unit was used for imported window glass.
Estimate: 250 kg.
Estimation: 60 pieces of glass, size: approximately 74 cm × 74 cm, thickness 3 mm.

Korg (En. basket)
Unit was used for raisins and once also for window glass
Estimate: 21.25 kg

Lispund
8.5 kg
Lispund was 20 *skålpund*. Unit was used for various products (victuals, raw materials, grain, etc.)[512]

Lod
0.0139 kg[513]
Unit was used for corals.

Oxhuvud
235.5 liters/(kg)
Unit was used for vinegar and salted-lemons.
Depending on the product, it was 70–90 *kanna*.[514] In this research, 90 *kanna* has been used.

Par (En. pair)
Unit was used for clothing
Estimates: silk stockings: 0.016 kg, shoes (*skor)*: 0.4 kg, boards for writing (*taflar*): 2 kg.
Estimate: *zwarn stenar*: 10 kg

Ris
500 sheets of paper (En. ream)
Unit was used for paper.
Estimate: 2.5 kg.

Skeppund
136.02 kg
Unit was used for lead (*bly*), block tin (*blåck tenn/block tenn eller gammalt brukt tenn*), calamine (*gallmeija*)

Skålpund

[509] See Kostet 2005, dictionary: "Kimppu (knippor, knippen)", "Vårda" and "Tukuttain (bundt)". Those reveal that for fish "Kimppu (knippor, knippen)", was "earlier 10 and later 12 pieces".
[510] BoT2 announces that for European flounder one *bundt* contained 50 pieces.
[511] Estimated to contain 10 or 12 pieces.
[512] Kostet 2005. See also SAO: "Lispund".
[513] For victuals 13.2836 grams. For precious metals, it was 13.93 grams.
[514] SAO: "Oxhuvud". In this context, it was not found whether oxhuvud was a different amount for different products, and thus the same amount in liters was used.

0.425076 kg or 0.35628 kg
Unit was used for dyestuff, spices, silk, tobacco, medicines, etc.
For victuals and others 0.425076 kg[515]
For medicines and drugs = 0.35628 kg[516]

Snöre
Unit was used for the sponge.[517]
Estimate: *Snöre* = 1 kg. Utrikeshandel Series 2 announced that one *snöre* contained 40 pieces. If one *snöre* weighs one kilogram, the weight of one sponge is 25 grams.

Åm/Åhm (fat)
157 liters/(kg)
Measurement unit was used for liquids: wines, liqueur, and oils.

Tunna (En. barrel)
The measurement unit used for: salt, grain, beer, fish, fruits, etc.
Estimates:

Liquid goods (wines, spirits):
48 *kanna* = 125.63 liters/(kg)[518]

Fish
119 kg (=14 *lispund*)[519]

Groceries
honey 176 kg (1.4 × 125.63) [520]

General store goods
mustard 138 kg (1.1 × 125.63)

Dry goods (grain, etc.): 146.6 liters[521]
wheat 116 kg (79 kg/100 liters)
rye 104 kg (71 kg/100 liters)
barley 95 kg (65 kg/100 liters)
oat 87 kg (55 kg/100 liters)[522]
groats 125 kg (85 kg/100 liters)[523]
flour 81 kg (55 kg/100 liters)[524]
peas 125 kg (85 kg/100 liters)[525]
bran 44 kg (30 kg/100 liters)[526]
malt 103 kg (70 kg/100 liters)

Fruits and peanuts:
An estimate is, that the barrel size was same than for dry goods (146.6 liters). Weight of the barrel was:
81 kg for walnuts (0.55 kg/liter × 146.6 liters), hazelnuts 95 kg (0.65 × 146.6), dried apples and dried pears 51 kg (0.35 × 146.6), pears 103 kg (0.7 × 146.6), apples 89 kg (0.61 × 146.6)

Victuals
An estimate is that the barrel size was 146.6 liters:

[515] SAO: ”Skålpund”. See also Kostet 2005.
[516] SAO: “Apotekare-skålpund”. Also Berg 2016, 298. Also Kostet 2005, “naula (skålpund)”.
[517] See also, Kostet 2005, ”Nauha (snören)”.
[518] Kostet 2005.
[519] Vilkuna 1975, 358: ”A barrel of salmon was an official measurement, as well as a barrel of Baltic herring; 14 *lispund* (119 kg)”. Originally in Finnish, translation by author.
[520] Sääksjärvi & Reinivuo 2004.
[521] Kostet 2005. Also Morell 1988, 40.
[522] Source for kilograms per liters: Evira, Tilastot viljan laadusta 1995–2016.
[523] Sääksjärvi & Reinivuo 2004.
[524] Sääksjärvi & Reinivuo 2004.
[525] Sääksjärvi & Reinivuo 2004.
[526] Sääksjärvi & Reinivuo 2004. Different brans have different weight per volume.

hardtack/cracker made of rye (*råg skorpor*) 29 kg (0.2 kg/liter × 146.6 liter), salted meat: 146.6 kg per barrel (1 × 146.6).

Dyestuff
An estimate is that the barrel size was 146.6 liters: *hvit krita* 117 kg (0.8 kg/liter × 146.6 liters)

Kryddkräm Waror
Seeds: 95 kg (0.65 kg/liter × 146.6 liters)

Gypsum (*gips*)
146.6 liters, 191 kg (1.3 kg/liter × 146.6 liters)

Coal
146.6 liters, 161 kg (1.1 kg/liter × 146.6 liters)

Stycke (En. Pieces)
Very different cargo items, such as fruits, animals and bottles, were reported in pieces.

Estimates:

Stycke for Live animals:
horse (häst), (*fiäss*?) = 450 kg, chicken = 2 kg, turkey = 5 kg, birds = 0.15 kg, pigs = 140 kg, sheep = 55 kg

Stycke for Miscellaneous goods
pantile = 4 kg[527], Morocco leather (*Persian saffian, Ryskt saffian)* = 0.3 kg

Stycke for Victuals
ham = 4.5 kg, mettwurst = 1 kg; half goose = 2 kg

Stycke for Fruits
lemon = 0.08 kg, orange = 0.18 kg, pomegranate = 0.16 kg, bitter orange = 0.15 kg

Stycke for General store goods
empty bottles = 0.6 kg, tobacco pipes[528] = 0.02 kg

Stycke for Linen and cotton goods
bed blanket (*cattuns sång täcken*)= 2 kg

[527] Size of the rooftiles could naturally vary, but Troili 1843, 371 gives an example of roof tile (*taktegel*) size: "13 ½ tum × 10 tum × klack af 1 tum tjocklek och 2 tums bredd"; 32.4 cm × 24.74 cm × 2.474 cm = 1.984 m^3. If the nominal weight of pantile is e.g. 2,000 kg/m^3, the weight of one pantile is 3.97 kg.
[528] For this item, no unit was announced. Therefore, this unit (pieces) was just a guess.

Appendix 4. Monetary units: Board of Trade Sweden, Series 2 (BoT2), Import and export schedules

Daler Silvermynt (dsm)
In the BoT2, during the years 1738–1777, export amounts of some products were reported in *daler silvermynt.*
1 *daler silvermynt* = 32 *öre*

Riksdaler (rdr), Riksdaler specie (rds)
In the BoT2, during the years 1778–1812, export amounts of very different products were reported in *riksdaler.*
In the BoT2, during the years 1738–1812, import amounts of very different products were reported in *riksdaler*.
1 *riksdaler* = 48 *skilling*

1 *riksdaler* = 3 dsm[529]

Most units in the BoT2 were amounts of weight, volume, length, or pieces. However, for exports, some 20–30 percent of the units were reported in monetary value (during 1738–1777 in *daler silvermynt*, 1778–1812 in *riksdaler*). For import cargoes, approximately 20 percent of cargoes were recorded in the monetary unit (for the whole period in *riksdaler*).

Typically, the commodities that were expressed in monetary units were traded less frequently, and the amounts were often small compared to those goods with a volume unit. For example, for imports, the total volume of cargoes measured in *riksdaler* is very low, likely less than 1 percent of all import volume. Thus, even though there is inaccuracy when converting monetary amounts into metric tons, this does not affect much in the big picture.

For many products, the BoT2 also announced the value of cargo per weight, piece, et cetera (for example: "*Beck: 1 Läst Dahl 32 Öre 16*"). These values were reported only in the earlier phase of these statistics. The reported values should be regarded as nominal values or customs values.[530] Real values and relative prices changed during the decades, and these conversions (values to tonnes) are very rough estimates for the entire period.

In this research, if the amount was reported in value for a certain product, and the value – amount relationship was also given, this information was used to convert values into metric tons. When that was not given, a very rough, indicative estimate of how many kilograms was one *riksdaler* was made

[529] About this conversion, in light of 1776 monetary reform, see Appendix 5.
[530] SCB 1972, 80.

for different product categories, based on data available on that category. This estimate was used for the rest of the products on that product group. The main source for volume per value ratio was data in the BoT2 tables. In addition, some values were crosschecked from Jörberg (1972). For instance, fish values were taken from Jörberg (1972) data.[531]

Conversions of BoT2 export data announced in monetary values into metric tons

Stone (*Allehanda sten*)
1 dsm = 40 kg (estimate)
1 rdr = 120 kg[532]

Iron and steel (*Jern och ståhl*)
Large spikes (*grof spik*), large hand forged iron products (*järn smide grof*):
1 *skeppund* = 10 dsm
1 dsm = 13.6 kg/1 rdr = 40.8 kg[533]

All other iron and steel products
1 *skeppund* = 10 dsm
1 dsm = 13.6 kg
1 rdr = 40.8 kg[534]

Copper and brass (*Koppar och messing*)
Copper in coined plates (*myntade plåtar*):
1 *skeppund* = 180 dsm
1 dsm = 0.76 kg
1 rdr = 2.28 kg

For other copper and brass products:
1 *skeppund* = 100 dsm
1 dsm = 1.36 kg
1 rdr = 4.08 kg[535]

Timber (*Träwaror*)
The estimation of timber was problematic. For example, 1 mast was 24 dsm (if a mast was 520 kg, 1 dsm = 21 kg of timber). Boards were, for instance, 1 *tolft* = 2 dsm (if *tolft* weighs 330 kg, 1 dsm = 165 kg). Timber grades reported in a value unit were as follows: *trä wirke förarbetat, ekewirke,*

[531] Jörberg 1972a; Jörberg 1972b; Jörberg 1972 dataset.
[532] Estimate is based on following data from the BoT2: *liksten* 1 dsm = 16 kg / 1 rdr = 100 kg, *golv sten* 1 dsm = 400 kg / 1 rdr = 2,400 kg, *röd golfsten* 1 dsm = 960 kg / 1 rdr = 5,760 kg
[533] Jörberg 1972a, 584 gives the price for nails as follows: "100 pieces approximately 9/48 rds" (early nineteenth century).
[534] In BoT2 price per volume for different iron and steel cargoes was: 1 skeppund 10, 12 or 15 dsm. Thus, the value per quantity of different iron and steel product did not differ widely in this data. Accordingly, Högberg 1969, 232–233, Bilaga 2, shows how price of iron was circa 40–45 daler kopparmynt per *skeppund* in early 1740s. This equals 13–15 dsm per *skeppund*.
[535] The value of copper was 1 skeppund 80–180 dsm. BoT2.

allehanda träwahror ej specificerade. Very likely those timbers were higher value per volume than, for instance, boards.

Estimate for timber products:
1 dsm = 40 kg
1 rdr = 120 kg[536]

Hides and Fur
Estimate for hides and fur:
1 dsm = 0.5 kg
1 rdr = 1.5 kg[537]

Fish
Estimate for fish:
1 dsm = 7.4 kg
1 rdr = 22.3 kg[538]

Linen textiles (*Linne Waror*)
Sailcloth (*buldan och segelduk*):
1 aln = 3 öre
1 dsm = 10.7 aln (1.6 kg)/1 rdr = 64 aln (4.68kg)

Other linen textiles:
Estimate 1 dsm = 10.7 aln (1.6 kg)
1 rdr = 64 aln (4.8 kg)

Grain
Estimate for all kinds of grain:
1 dsm = 27.5 kg
1 rdr = 82.5 kg[539]

Victuals (Sw. *Victuals*)
Estimate for all kinds of victuals:
1 dsm = 6.8 kg

[536] In this estimation, values of the two most common timber dimensions were used. *Enkla bräder* tolft (an estimate: 274 kg) = 1.5 dsm / 1 dsm = 183 kg. *Halvbotten bräder tolft* (estimate: 347 kg) = 3 dsm / 1 dsm = 116 kg. The mean is 150 kg. However, as the price of timber rose during the century, lower kg per value was estimated. The value per kg was lower for larger dimensions, such as masts or spars (1 dsm = about 20–50 kg). About the timber prices, see Jörberg 1972a, 490–516; 523–549. Jörberg price data gives even higher volumes for some timber qualities.

[537] Here, values and the estimated weight of commonly traded vair [squirrel's winter coat] (*gråwärck*) which was valued as (1 *timmer* [1 kg] = 2 dsm) and red fox hides (*röd räfskin*) (1 Stk. [0.4 kg] = 1 dsm) were used. Some other furs were more expensive, such as ermine (1 *timmer* = 8 dsm), others such as reindeer (1 Stk. = 2.5 dsm) were cheaper.

[538] BoT2 announced the value for herring: "1 barrel = 2 dsm." This was very different from the fish value – tonnes relationship of the imported fish. Because of this and the fact that most of the fish exports occurred during the second half of the eighteenth century when prices were different, this was not used. Jörberg's (1972a) data announces herring price: 1738 approximately 8 dsm; 1775 approximately 16 dsm; 1776 2 rds per barrel. Value 16 dsm per barrel was used in this conversion.

[539] Most commonly exported grains wheat and rye were used in this estimation. For wheat (1 tunna = 5 dsm) for rye (1 tunna = 3 dsm). Average 4 dsm/*tunna* (110 kg).

1 rdr = 40 kg

Bonded goods (*Nederlags och andre åter utskeppade utrikes waror*)
Same conversion than for in the in the estimated category "small goods" from the product group miscellaneous goods (allehanda waror):
1 rdr = 0.2 kg
1 dsm = 0.066 kg

Live animals (*Lefvande creatur*)
Estimate: 1 dsm = 10 kg[540]

Miscellaneous goods (*Allehanda waror*)
There were a wide range and number of different miscellaneous goods (*allehanda waror)*. For those with value unit, a rough division into three categories was made: heavy, medium-size, and small goods. When making this division and estimation, the information about the arriving cargo value – volume estimate, which was made previously, was used.

Heavy goods: 1 rdr = 50 kg / 1 dsm 8.33 kg
New ships (*nya-skepp*)

Medium-size goods: 1 rdr = 5 kg / 1 dsm = 1.66 kg
furniture and other carpentry works (*diverse meubler och snickare arbete*), ropes (*tågwerke*), rifles (*gewär*), snus (*snus tobak*), tobacco (*tobak*), cut tobacco (*cardus tobak*), all kinds of glass (*allehanda glas*), plater products (*bleckslagare arbete*), charts (*kort*), all kinds of manufactured goods (*manufactori wahror allehanda*), victuals (*victualie wahror*), all kinds of grain (*spannmål allehanda*), wagons and sleighs (*wagnar och slädar*), all kinds of unspecified linen textiles (*ej specifirecade linne waror allehanda*)

Small goods 1 rdr = 0.2 kg / 1 dsm = 0.066 kg
bottles (*bouteiller*), unbound books and copies (*böcker inbundne och exemplarer*), polished rifle pipes (*bösse pipor, polerade*), beaver gloves and lambskin gloves (*castor och klippings handskar*), portraits and engraved copper plates (*contrefait, portraiter och kopparstycken*), globes and mathematical instruments (*glober och matematiske instrument*), hand carders (*kardor och skrubblor*), carbon black (*kimrök*), medicines (*medicamenter*), porcelain (*porcellain*), morocco leather, beaver leather and white skin (*saffians, castor och hwita skinn*), wall clocks and pocket watches (*wägg och fick uhr*), mirrors (*spegla*), clothes (*kläden*), silk textiles (*siden tyger*), linen and cotton goods (*linne och cattuns waror*), unspecified miscellaneous goods (*ej specificerade allehanda wahror*),

Gun powder (*Krut*)
1 *skålpund* = 9 *öre*
1 dsm = 1.5 kg
1 rdr = 4.5 kg[541]

[540] This rough estimate is based on Jörberg (1972a), the values of sheep and oxen. For an electronic source of Jörberg data, see also Jörberg (1972 dataset).
[541] The reason why a separate estimate for gunpowder was calculated is that during certain years, the exported amount announced in *riksdaler* was particularly high.

Conversions of BoT2 import data announced in monetary values into metric tons

Wines and beverages (*Främmande drycker*)
1 *åhm* = 15 rdr
1 rdr = 10.47 liters/kg

Fruits (*Frugt*)
1 rdr = 8 kg[542]

Victuals (Victualier)
Ox tongue (*Oxe tungor*)
1 tunna = 10 rdr
1 rdr = 14.66 kg

Other victuals (*Victualie Waror Allehanda*):
1 rdr = 10 kg

Dyestuff (*Färgor*)
1 *skålpund* = 1.5 rdr
1 rdr = 0.66 *skålpund*
1 rdr = 0.28 kg[543]

Broadcloth (*Kläden*)
1 *aln* = 1 rdr 36 sk.
1 rdr = 0.57 aln
1 rdr = 0.086 kg

Haberdashery (*Kram waror*)
1 *aln* = 0.5 rdr
1 rdr = 2 *aln*
1 rdr = 0.3 kg

General store goods (*Kryddkräm waror*)
Fishbones (*Fiskeben*)
1 *skålpund* = 16 sk.
1 rdr = 3 *skålpund*
1 rdr = 1.28 kg

Corks (*Korckar*)
1 *skålpund* = 1 rdr
1 rdr = 1 *skålpund*
1 rdr = 0.425 kg

Cacao (*Cacau*)
1 *skålpund*: sk. 16
1 rdr = 3 *skålpund*
1 rdr = 1.28 kg

Other general store goods (*kryddkräm waror*)
1 rdr = 1 kg[544] (guesstimate)

Groceries and spices (*Specerier*)
Guesstimate for *Ej Specificerade Specerier Allehanda*:
1 rdr = 0.5 kg[545]

Tobacco (*Tobak*)
1 *skålpund* = 4 sk.
1 rdr = 12 *skålpund*
1 rdr = 5.1 kg

Grain (*Spannmål*)
1 tunna = 3 rdr
1 rdr = 1/3 tunna (1 rdr = 26 kg)

Raw materials (*Rudimaterier*)
Linen string (*lingarn*)
1 *skålpund* = 6 sk.
1 rdr = 8 *skålpund*
1 rdr = 3.4 kg
Same conversion used for other raw materials as well.

Fish (Fisk waror)
1 *tunna* = 4 rdr
1 rdr = ¼ tunna
1 rdr = 31 kg

[542] There were fruits of very different value per kilogram. For example, one barrel of apples was 1 rdr, while 100 pieces of lemons were valued 2.5 rdr. This relation is a rough estimate of various fruit values and weights.
[543] The price range of dyestuff was wide. In this research, the price of a commonly traded item, indigo, was used.
[544] This is a very rough estimate and is based on the general evaluation of other *kryddkräm waror* value and weight relation.
[545] The price range of groceries and spices was wide. For example, 1 *skålpund* of saffron was 4 rdr, while 100 *skålpund* of figs was 4 rdr.

Animals (*Lefvande creatur*)
1 rdr = 10 kg (guesstimate)

Miscellaneous goods (*Allehanda waror*)
Gypsum (*gips*)
1 *tunna* = 24 sk.
1 rdr = 2 *tunna*
1 rdr = 381 kg

Tanned hides and skins (*barkade hudar och skin*)
1 *skålpund* = 5 sk.
1 rdr = 9,6 *skålpund*
1 rdr = 4.08 kg

Guesstimate for timber items
All kinds of unworked timber (a*llehanda oarbetadt träd),* all kinds of timber (*allehanda träwahror*), brazilwood (*brisilje träd*), oak (*ekevärcke*), green timber (*friska trän*), lignum vitae (p*ocken holtz*), walnut timber (*wahlnöteträd*)
1 rdr = 5 kg

Guesstimate for heavy cargo
Soil and clay (*jord och leer*), prepared marble (*förarbetad marmor)*
1 rdr = 20 kg

Guesstimate for different leather
All kinds of hair (*allehanda hår*), wool (*ull*), upper leather (*öfwer läder*), rawhide (*rå hudar*), untanned hides (*oberedda hudar och skin*)
1 rdr = 3 kg

Guesstimate for miscellaneous products
All kinds of goods (*allehanda waror*), unspecified all kinds of goods (*ej specificerade allehandawahror*), unworked ivory (*elphenben oarbetad*), bound books (*inbundna böker*); unbound books (*oinbundna böker*); paintings (*målningar och schilderier*); grindstones (*slip stenar*); mirror glass (*spegelglas*); box tree, *Buxus sempervirens* (*box bom*)
1 rdr = 0.2 kg

Linen and cotton goods (*Linne och bomuls waror*)
Fine Dutch yarn (*Hollands tråd fin*)
1 *skålpund* = 4 rdr
1 rdr = ¼ *skålpund*
1 rdr = 0.106269 kg

Linen string (*lingarn*)
1 *skålpund* = 6 sk.
1 rdr = 8 *skålpund*
1 rdr = 3.4 kg

Linen string colored (*lingarn färgat*)
1 *skålpund* = 6 sk.
1 rdr = 8 *skålpund*
1 rdr = 3.4 kg

For other linen and cotton goods:
1 rdr = 1 kg

Salt
1 *tunna* = 1 rdr
1 rdr = 136 kg

Silk textiles *(Siden waror)*
1 *aln* = 1.5 rdr
1 rdr = 0.66 *aln*
1 rdr = 0.1 kg

Medicines and drugs (*Drogerier*)
1 *skålpund* = 16 sk.
1 rdr = 3.00 *skålpund*
1 rdr = 1.3 kg

Appendix 5. Monetary units: Board of Trade Sweden, Series 3 (BoT3), Balance of trade accounts

Daler Silvermynt (dsm)
Daler silvermynt was used during the years 1739–1764
1 *daler silvermynt* = 32 *öre*

Riksdaler (rdr), Riksdaler specie (rds)
Riksdaler specie was used during 1769–1813.
1 *riksdaler* = 48 *skilling*

1 *riksdaler* = 3 dsm

In Sweden, there was a monetary reform in 1776, when then conversion rate for riksdaler and *daler silvermynt* changed to 1 riksdaler = 6 dsm.[546] However, the BoT2 and BoT3 data shows that in these foreign trade datasets, the conversion rate for *riksdaler* and daler silvermynt remained as 1 *riksdaler* = 3 *daler silvermynt* for the whole research period. This was confirmed by comparing the import or export value per import or export volume of each product group (dsm or rds per kg) during 1739–1764 and 1769–1813.[547]

[546] Edvinsson et al. 2010, 176, 182–183. Also Edvinsson, Rodney: Prisomräknare från medeltiden till 2100.
[547] Accordingly, when comparing BoT3 total import or export value per import or export amounts in ship-lasts (during 1739–1764 dsm and 1769 rds), this calculation also shows that 1 rds = 3 dsm during the whole research period.

Table 25. Number of ships sailing between Sweden and Southern Europe 1700–1815 according to the Sound Toll Registers

	Number of ships from Sweden to Southern Europe	Number of ships from Southern Europe to Sweden
1700	5	27
1701	18	25
1702	7	38
1703	13	36
1704	13	34
1705	12	35
1706	23	32
1707	26	32
1708	10	45
1709	11	29
1710	2	4
1711	5	0
1712	0	9
1713	5	18
1714	3	28
1715	2	8
1716	0	9
1717	1	1
1718	0	0
1719	3	6
1720	4	10
1721	4	14
1722	12	37
1723	15	32
1724	12	13
1725	17	17
1726	19	23
1727	22	16
1728	24	21
1729	16	17
1730	25	26
1731	20	33
1732	31	18
1733	29	34
1734	37	51
1735	40	46
1736	25	45
1737	30	40
1738	40	61
1739	25	38
1740	26	31
1741	43	68
1742	42	58
1743	45	53

1744	53	69
1745	45	28
1746	62	89
1747	49	50
1748	31	64
1749	42	86
1750	61	80
1751	37	94
1752	62	88
1753	52	63
1754	42	40
1755	53	65
1756	65	41
1757	61	73
1758	69	61
1759	50	93
1760	57	52
1761	52	76
1762	45	82
1763	82	114
1764	83	118
1765	74	75
1766	70	74
1767	68	86
1768	91	86
1769	77	60
1770	49	59
1771	86	101
1772	98	109
1773	117	112
1774	134	113
1775	90	100
1776	85	82
1777	97	100
1778	100	79
1779	99	97
1780	88	71
1781	106	115
1782	142	89
1783	130	178
1784	139	137
1785	145	140
1786	123	104
1787	145	101
1788	76	87
1789	133	23
1790	115	56
1791	169	85
1792	131	145

1793	115	75
1794	118	106
1795	120	74
1796	176	128
1797	127	141
1798	113	119
1799	71	94
1800	141	142
1801	43	76
1802	156	165
1803	136	171
1804	153	103
1805	75	136
1806	70	95
1807	37*	60*
1808	0*	0*
1809	0*	0*
1810	0*	11*
1811	0*	2*
1812	7*	5*
1813	0*	0*
1814	121	100
1815	140	96
Total	**6811**	**7307**

Source: The Sound Toll Registers.

*Problems in dues collection in Sound.

Sources

Primary Sources

Archival Sources

Riksarkivet (Sverige) (RA)

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