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The Formation of a Nation's Leading Industry: An examination of the impacts of mercantile policy on Swedish iron exports during the 18th century

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Abstract

There is a wide array of literature on the particular manifestation of mercantilism in Sweden during the “Age of Liberty” and there is an even wider selection of literature on the success of the Swedish iron industry. However, there is very little literature on the combination of the two, and it suffers from issues with lack of adequate data. Therefore, this paper aims to fill that gap by studying the impact of the Swedish Commodity Act of 1724, the largest piece of Swedish mercantile legislation and an adaptation of the British Navigation Acts, on Sweden's leading industry - iron - and its exports to its largest foreign market in England. This investigation of the relationship between mercantilism and Swedish iron trade is based on the Sound Toll Registers, one of the most detailed sources on maritime trade history. The time series regression results indicate that the implementation of the commodity act successfully increased the total tonnage of iron shipped from Sweden to England.¹

1. Introduction

During the early modern period the horizon and scope of world trade had greatly expanded with outposts reaching both India and the Americas. The possession of spice colonies and gold and silver mines promised immeasurable wealth to those states who understood how to seize and retain a strong presence on the international stage of world trade through the creation and endorsement of powerful fleets in tandem with great trading companies or similar state enterprises. On the domestic scene, changes of great importance occurred which reduced transaction costs and prompted better economic integration of markets. This was largely due to new communications systems, bills of exchange and new

¹ This paper is dedicated to the memory of my grandfather, Håkan Gäbel M.D., PhD, who constantly inspired and encouraged me to wholeheartedly pursue my academic interests. Moreover, I would like to extend my special thanks to Professor Oliver Volckart, for his excellent and encouraging supervision.

financial systems which could supply a far greater amount of credit. Together, these forces converged to instil the beginnings of a modern society in Europe through a broad economic reorganisation of society with the promotion of national states accompanied by corresponding national economic policy. Economic bodies were spreading and increasing their influence through interlinkages with political systems: new state systems of economy and finance were emerging across Europe and the West.² This story of early mercantile mindsets is most characteristic of England, France or the Dutch Republic, however, other countries such as Sweden went through similar processes of economic reorganisation during the early modern period.

The death of King Charles XII (*Karl XII*) in 1718 and the subsequent peace treaties after the Great Northern War brought the beginnings of extraordinary changes in Swedish society, particularly reforms within the military and civil structures. The time period up until the death of Charles XII was known as ‘The Era of Great Power’ (*Stormaktstiden*) in which Sweden had been a large empire with territory in parts of present-day Estonia, Germany and Poland but with it came costly wars. Following the Great Northern War, which had left Sweden a weakened state, a new age and a new ideal began to characterise Sweden and the 18th century became known as ‘The Age of Liberty’ (*Frihetstiden*). This time period can be described as one of freedom, particularly from the never-ending wars that had previously tied Sweden to offensive foreign policy. The 1720s onwards saw the opening up of a lively political and scientific debate which included numerous proposals and suggestions regarding economic improvement and the overall modernisation of Swedish society. The main aim was to establish Sweden as a great power but without the constant use of military force abroad but instead through the implementation of mercantile policy. Economic life and activity was put under sharp regulation by the ruling elite whose goal was to promote the increased sales of goods and services, especially in the sense of

² Gustav Von Schmoller, *The Mercantile System, and Its Historical Significance : Illustrated Chiefly from Prussian History, Being a Chapter from the Studien Ueber Die Wirthschaftliche Die Friedrichs Des Grossen, 1884*, Classic Reprint Series (Forgotten Books (Firm)), 2015, p 13.

decreasing imports and simultaneously increasing exports.³ Despite a considerable effort, change and state intervention was rather limited, except in Sweden's largest export industry: iron.⁴

During the 18th century, bar iron was Sweden's most important export. The average quantity exported between 1730 and 1799 was above 43,000 tonnes per year, and over half of that amount usually was sent to Great Britain.⁵ In the beginning of the 17th century, Swedish iron arrived in England via intermediate ports in the Hanseatic League or the Dutch Republic. From the 1650s onward, iron directly exported from Sweden became the main vehicle of expanding trade relations between Sweden and England.⁶ A majority of this Swedish iron was produced in the central parts of Sweden and then transported to Stockholm for export via the Baltic, then through *Öresund* – the sound between Scania (*Skåne*) in southern Sweden and northern Zealand (*Sjælland*) in Denmark.⁷ Where the body of water reaches its narrowest section, both countries have corresponding cities, Helsingborg in Sweden and Elsinore (*Helsingør*) in Denmark. Elsinore is most known for two things: firstly, as the intended home of Shakespeare's Hamlet and secondly, as the home of the Sound Toll. The toll was introduced in 1429 by the Danish King Erik VII as a duty paid by all vessels that wished to pass through *Öresund*.⁸

The combination of these three historical events: (1) the spread of international trade through the implementation of mercantile policy, (2) the expansion of the Swedish iron industry and (3) the establishment of the Sound Toll all come

³ E. F. Heckscher, *Sveriges ekonomiska historia från Gustav Vasa: Det moderna Sveriges grundläggning* (Vol. 2:2) [The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]. (Stockholm: Albert Bonniers Förlag 1949b), p. 649.

⁴ Chris Evans, and Göran Rydén, *Baltic Iron in the Atlantic World in the Eighteenth Century*, Vol. 13. *The Atlantic World*, Boston: BRILL, 2007.

⁵ Karl-Gustaf Hildebrand, "Foreign Markets for Swedish Iron in the 18th Century," *Scandinavian Economic History Review*, Volume 6, No. 1 (1958): 3.

⁶ Sven-Erik Åström, "Swedish Iron and the English Iron Industry about 1700: Some Neglected Aspects." *Scandinavian Economic History Review*, Volume 30, No. 6 (1982): 129.

⁷ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2), p. 649.

⁸ Erik Gøbel, "The Sound Toll Registers Online Project, 1497–1857," *International Journal of Maritime History* 22, no. 2 (2010): 306.

together to form an investigative trinity. This dissertation aims to examine how the creation of retaliatory mercantile policies implemented in Sweden during the 18th century, namely the Commodity Act of 1724 (*Produktplakatet av 1724*), impacted the trade relationship with its greatest partner of the time – England – and in the key industry of iron. This examination will be conducted through an investigation of the Sound Toll Registers. The exploration of this topic will proceed as follows: first by an examination of the current literature with four key components: (1) the spread of mercantilism and its manifestation in Sweden’s ‘Age of Liberty’, (2) the characteristics of the iron industry in Sweden, (3) shipping through *Öresund* and (4) literature on how these components link together. Second, this will be followed by a description and discussion regarding the primary source used – the Sound Toll Registers – including an investigation of its limitations and strengths. Third, a discussion of the methodology employed, largely reliant on various descriptive statistics and a time series regression. Fourth, a presentation of the results with an analysis and discussion regarding the implications of the results in the context of 18th century trade relations. Finally, concluding remarks with areas of potential further research.

2. Literature Review

2.1. Background

As an introduction to the topic, it is beneficial to consider background information regarding the state of the Swedish population, economy, and political system. During the 18th century poverty was widespread and a substantial part of the Swedish population lived barely at subsistence level.⁹ Edvinsson and Tarek Gad find that throughout the 18th century Sweden experienced stagnation in terms of per capita incomes which persisted until the

⁹ S. Koblik, “Introduction,” in *Sweden’s development from poverty to affluence 1750–1970*, ed. S. Koblik (Minneapolis: University of Minnesota Press, 1975), pp.8-9.

mid-19th century.^{10 11} They attribute the lack of growth to the dominance of the agricultural sector which demonstrated long-term stagnation.^{12 13} Moreover, Schön and Krantz have constructed new estimates of Swedish economic performance from the mid-16th century until the 19th century. They conclude that Sweden broadly fits the established continental pattern championed by Van Zanden which was characterised by long run stagnation in GDP per capita levels until the end of the 19th century.^{14 15} However, Schön and Krantz also argue that despite consistent stagnation, there were several structural changes that occurred in the Swedish economy and political system during the 18th century that allowed for a breakthrough in the mid-19th century.¹⁶ Schön and Krantz emphasise the reorganisation of the Swedish economy through which administration and industry were modernised with easier technological transfers and movement of skilled workers. Furthermore, they underline the promotion of exports of industrial goods as crucial steps in bringing about economic change as it increased the level of industrial output, but also allowed for greater variety of imports and facilitated capital imports.¹⁷

Following the end of the Great Northern Wars in 1721, Sweden shifted focus and turned energies inwards – towards domestic change. As a dethroned Baltic power, Sweden had little use for absolutism. The absolutism that had characterised the rules of Charles XI and Charles XII was replaced with a new form of constitutionalism before the peace with Russia at Nystad in 1721.¹⁸ The

¹⁰ Rodney Benjamin Edvinsson, "Swedish GDP 1620–1800: Stagnation or Growth?" *Cliometrica* 7, no. 1 (2012): 45.

¹¹ Rodney Edvinsson, and Christoffer Tarek Gad, "Assessing Trade in the Mercantilist Era: Evidence from a New Database on Foreign Trade of Sweden - Finland, 1738-1805," *Scandinavian Economic History Review* 66, no. 3 (2018): 228.

¹² Edvinsson and Tarek Gad, "Assessing Trade in the Mercantilist Era," pp. 228-229

¹³ Edvinsson, "Swedish GDP 1620–1800: Stagnation or Growth?" p. 57.

¹⁴ Lennart Schön, and Olle Krantz, "The Swedish Economy in the Early Modern Period: Constructing Historical National Accounts," *European Review of Economic History* 16, no. 4 (2012): 530.

¹⁵ Jan Luiten Van Zanden, "Early Modern Economic Growth: A Survey of the European Economy, 1500-1800," In *Early Modern Capitalism: Economic and Social Change in Europe 1400-1800* (2005), p.84.

¹⁶ Schön and Krantz, "The Swedish Economy in the Early Modern Period," p. 530.

¹⁷ Schön and Krantz, "The Swedish Economy in the Early Modern Period," p. 542.

¹⁸ Lars Magnusson, "Mercantilism and "Reform" Mercantilism: The Rise of Economic Discourse in Sweden During the Eighteenth Century," *History of Political Economy* 19, no. 3 (1987): 417.

reformers' arguments, derived from contractual theory and jurisprudence, were employed to argue against absolutism and enforce a new system under which the King of Sweden was to rule with the consent of a diet which included representatives from the four estates; nobility, clergy, burghers, and peasantry.¹⁹ The promotion of economic growth and modernisation was pushed to the forefront of official policy through an increasingly lively debate on the role of trade and mercantile policies in the Swedish economy.^{20 21} Through the aid of an almost complete freedom of press, several new suggestions for economic improvement were put forward in a variety of books, pamphlets and articles.²² All with the aim of establishing Sweden as a great power, but with an educated and political approach in contrast to the 'Era of Great Power' with its never ending, brutal wars that had ravaged the Swedish population for decades.

2.2. The Age of Mercantilism in Sweden

In *The Wealth of Nations*, Adam Smith paints a coherent image of commercial regulations and describes the mercantile system as characterised by monopolism through close conspiracy between merchants and politicians. This resulted in a deep set of confusion of the true definition of the nature of wealth. According to Smith, the implementation of mercantile policies led to the retardation of commerce, the hindrance of true economic specialisation, decrease in state revenue and a blatant disregard for the welfare of the poor in favour of filling the purses of the rich and the powerful.^{23 24} Some economic historians believe that this phase of mercantilism was a necessary process in preparation for the Industrial Revolution.²⁵ Schmoller argues that most European nations experienced "a great historical process by which local sentiment and tradition

¹⁹ L. Thanner, *Revolutionen i Sverige efter Karl XII:s dod* (Uppsala, 1953).

²⁰ Magnusson, "Mercantilism and "Reform" Mercantilism," p.417.

²¹ Magnusson, "Mercantilism and "Reform" Mercantilism," p.416.

²² Magnusson, "Mercantilism and "Reform" Mercantilism," p.418.

²³ Adam Smith, and Hector Macpherson, *Wealth of Nations*. New and Condensed Edition / Adam Smith ; with Preface and Introduction by Hector Macpherson. ed. Edinburgh, 1903.

²⁴ Philip J. Stern, and Carl Wennerlind, and UPSO. *Mercantilism Reimagined : Political Economy in Early Modern Britain and Its Empire*. 2014, p. 4.

²⁵ Steve Pincus, "Rethinking Mercantilism: Political Economy, the British Empire, and the Atlantic World in the Seventeenth and Eighteenth Centuries," *The William and Mary Quarterly* 69, no. 1 (2012): 4-5.

were strengthened, the social and economic forces of the whole territory consolidated, important legal and economic institutions created.”²⁶ The Swedish free trade advocate, Eli F Heckscher, argues that mercantilism was “a phase in the history of economic policy”²⁷ and was one that came “between the Middle Ages and the age of laissez-faire.”^{28 29}

Mercantilism underpinned Swedish economic policy. Successful economic development was contingent on an economy that was carefully planned and controlled by the state. National profit was defined as the net difference between the value of exports and imports meaning that the state's primary aim should be to constantly generate a trade surplus.³⁰ In order to accomplish this, tariffs and other protectionist measures were implemented, and export subsidies were promoted. Foreign raw materials had lower import duties whilst foreign manufactured goods had higher duties.³¹ This system of protectionism had two predominant purposes; (1) supporting domestic manufacturers in turn providing improvements to the trade balance and (2) generating government revenue.^{32 33}

Foreign trade was prohibited in the inland towns (*Uppstäder*) and only allowed in a few select staple towns (*Stapelstäder*) with most of the activity concentrated in either Stockholm or Gothenburg. The Swedish Commodity Act of 1724, a response to, and adaptation of, the British Navigation Acts, aimed at expanding domestic shipping capacity. This mercantilist legislation prohibited foreign vessels from transporting goods into Swedish ports unless the cargo was from the

²⁶ Schmoller, “*The Mercantile System, and Its Historical Significance*,” p 44.

²⁷ Heckscher, Eli F., and Magnusson, Lars. *Mercantilism*. Routledge ed. 1994, p. 19

²⁸ Heckscher, “*Mercantilism*,” p. 20

²⁹ Pincus, “Rethinking Mercantilism”p. 5.

³⁰ Robert B Ekelund, and Robert D. Tollison, *Mercantilism as a Rent-seeking Society : Economic Regulation in Historical Perspective*. 1st ed. Texas A & M University Economics Series; No. 5. College Station, Tex.: Texas A&M University Press, 1981.

³¹ Göran Ahlström, "Swedish Economic Thought in the Eighteenth Century," in *Swedish Economic Thought - Explorations and Advances*, 1-15. 1993, pp. 3-7.

³² H. Häggqvist, “On the ocean of protectionism: The structure of Swedish tariffs and trade 1780–1830,” PhD Dissertation. Uppsala Studies in Economic History 103, (Acta Universitatis Upsaliensis, University of Uppsala, 2015), p.p. 124-125.

³³ Kenneth Pomeranz, and Steven Topik, *The World That Trade Created: Society, Culture, and the World Economy, 1400 to the Present*, London: Routledge, 2013, p.82

country of origin or any corresponding colonial possessions. Foreign ships were allowed to export Swedish goods but only if they entered Sweden laden with ballast.³⁴ A primary aim was to block English and Dutch vessels from carrying salt into Swedish ports.³⁵ According to Heckscher, the Commodity Act led to Swedish exports becoming less competitive on international markets. He also argued that the restrictions on imports and the state-backed shipping privileges meant that key goods such as grain and salt became more expensive thus harming people living close to subsistence levels.³⁶ On the other hand, Carlén's research highlights that the commodity act produced a powerful stimulus for the shipping industry. The protectionist policies in combination with a shipping monopoly should stimulate the home country's shipbuilding and navigation sectors. Figures show a dramatic increase in the Swedish merchant fleet following the ship-owners changing expectations in anticipation of the commodity act. This translated into a rise in the number of ships from 228 to 248 between 1723 and 1724. By late 1726 it reached more than 480 vessels.^{37 38} The literature is divided, with some arguing that the acts were successful if measured in terms of the size of the Swedish Shipping industry, while others question its impacts on the overall population.

2.3. The Sound Tolls and Swedish Iron Trade

The Sound Toll was introduced by Danish King Erik VII as a duty paid by all vessels passing through *Öresund*. Despite initial protests from foreign shipowners the subsequent kings succeeded in enforcing the toll.³⁹ In 1548 the Danish King increased the price of passing through *Öresund* with the introduction of the 'Hundred-Money' – a duty of one percent on the value of all commodities to be paid by unprivileged nations in addition to the regular ship toll. The cargo toll became an increasingly important source of revenue for the

³⁴ Edvinsson and Tarek Gad, "Assessing Trade in the Mercantilist Era," pp. 229-230.

³⁵ Stefan Carlén, "An Institutional Analysis of the Swedish Salt Market, 1720-1862," *Scandinavian Economic History Review*, Volume 42, No. 1 (1994): 7-8.

³⁶ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2), p. 670-71.

³⁷ Carlén, "An Institutional Analysis of the Swedish Salt Market, 1720-1862," p.9.

³⁸ Carlén, "An Institutional Analysis of the Swedish Salt Market, 1720-1862," p.10.

³⁹ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 305.

Danish king.⁴⁰ Between 1497 and 1857, 1.8 million ships passed through *Öresund* and paid a total of 86 million Danish Rigsdaler.⁴¹ During the 18th century the Sound Toll comprised eight percent of the Danish state's total income.⁴² The transport of Swedish iron and manufactured iron goods, mainly guns and canons, through *Öresund* rose after the mid-17th century. In the 1720s export of iron from Sweden was 4 times as high as the previous decade and for the first time the volume exceeded a million skippunds.⁴³ In the decade between 1741 and 1750 the volume reached two million skippunds, then three million in 1761-70 and almost four million in the 1790s.⁴⁴ According to Åström, the competitiveness of Swedish iron should be seen predominantly as a question of cost, while the ability to retain its place on the market was a question of price. Ultimately, the low Swedish production costs gave the Swedish iron the opportunity to secure a permanent place in the set of English imports.⁴⁵ Furthermore, Åström also argues that Swedish iron had a price determining effect on the English markets. Following the outbreak of the Great Northern War in 1700, the prices of iron went up in England. For example, according to the London prices in November of 1702 the prices of Spanish iron from Bilbao had risen to 17-18 skillings⁴⁶ per hundredweight and Swedish iron of best quality was priced at 16-17 skillings.⁴⁷ ⁴⁸ Over two thirds of the iron brought through *Öresund* during the 18th century had its origins in Sweden. However, Sweden

⁴⁰ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 306.

⁴¹ The currency Danish Rigsdaler is sometimes seen in its anglicised form: Danish Rixdollar, for example, in Erik Gøbel's literature regarding the Sound Tolls.

⁴² Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 307.

⁴³ The Danish Skippund is an Early Modern European measurement often used to measure the weights of cargo. 1 skippund is equal to 320 pund (another Danish measurement) which in turn is equal to 0.498 kilos. 1 skippund is equal to 158.72 kilos. More information can be found in: Krüger, Johann Friedrich. *Vollständiges Handbuch der Münzen, Masse und Gewichte aller Länder der Erde*. Quedlinburg, Leipzig: Gottfried Basse, 1830.

⁴⁴ W. S. Unger, "Trade Through The Sound In The Seventeenth And Eighteenth Centuries," *The Economic History Review* 12, no. 2 (1959): 216.

⁴⁵ Åström, "Swedish Iron and the English Iron Industry about 1700: Some Neglected Aspects," p. 129.

⁴⁶ A Danish coin sometimes referred to as shilling and frequently used in tandem with the above-mentioned rigsdaler. 1 rigsdaler equals 96 skillings.

⁴⁷ Åström, "Swedish Iron and the English Iron Industry about 1700: Some Neglected Aspects," p. 130.

⁴⁸ Åström, "Swedish Iron and the English Iron Industry about 1700: Some Neglected Aspects," p. 141.

began to lose the near monopoly it had grown accustomed to. Following the end of the Great Northern War, Sweden was weakened with its enemy Russia emerging victorious which strengthened her position in the Baltic and England became a viable purchaser of Russian iron.⁴⁹

2.4. The Impact of Mercantilism on Swedish Trade

The politicians in the Swedish diet (*Riksdag*) were divided with regards to the implementation of mercantilist policies. The Hat party (*Hattarna*) acted mainly in the interest of the wealthy merchant capitalists that benefited from increased state intervention. The Caps (*Mössorna*) represented smaller businesses and opposed the spread of mercantile policies. Anders Chydenius (1729-1803), a protagonist of the Cap party, was a devoted supporter of laissez-faire. During the 'Age of Liberty' with its high level of public debate Chydenius often expressed his opposition towards the Swedish Commodity Act, as seen in his pamphlet titled 'The Source of Nations Weakness' (*Källan till Rikets Vanmakt*) published in 1765. His fervent opposition came from the conviction that the commodity act monopolised trade and only benefited the select towns that were allowed to import and export goods to foreign states. He believed that mercantile policy benefited the wealthy urban merchants at the expense of small enterprise and economic activity in smaller regions. The cornerstone of his argument against the intervention rested on the idea that the monopoly enforced by the Commodity Act in favour of Swedish shipping and merchant activity restricted trade and increased freight costs. Subsequently, this would lead to upward pressure on the price of exports and imports. He argued that the Swedish export market shrank which lowered the incentives for ironworks to consistently develop and expand.^{50 51}

⁴⁹ W. S. Unger, "Trade Through The Sound In The Seventeenth And Eighteenth Centuries," p. 217.

⁵⁰ A. Chydenius, "Politiska skrifter med en historisk inledning ånyo av E.G. Palmén," Helsingfors: G.W. Edlunds Förlag (1880), pp. 113, 130, 430.

⁵¹ J. Lönnroth, "Before economics," in *The History of Swedish Economic Thought*, ed. B. Sandelin, (London: Routledge, 1991), pp. 34-36.

Apart from his primary profession as an ironmaster (*Brukspatron*)⁵², manufacturer, technician, and inventor, C. Polhem (1661-1751) wrote and expressed his opinion on a wide array of subjects. His general attitude to mercantile policies can be summarised with a quote: “Monopolies are as beneficial to a country as gangrene is to a human being.”^{53 54} He strongly attacked the whole system of staple towns, preferential trading towns, and the ‘conspiratorial societies’ that were supported by state intervention which in his opinion limited the right to export goods to a few select towns. This is demonstrated by the quote seen below.⁵⁵

“Just as Stockholm, Gothenburg, and several other towns are all free to conduct the country’s foreign trade, no monopolistic grouping should be able to profit at the country’s expense. Instead, the more that are allowed to participate in the country’s foreign trade, the better it is for the country as a whole. And since towns should exist for the sake of the country and not the country for the sake of the towns, so reason itself dictates that such monopolistic groups are not as beneficial to the country as they are to their own members.”⁵⁶

Chydenius and Polhem’s opinions demonstrate the contemporary opposition towards the implementation of the Commodity Act. The following section highlights more recent literature on Swedish mercantilism.

Eli F. Heckscher, who was extremely critical of mercantile policies, represents a relatively traditional view on the subject matter. He argues that Sweden-Finland experienced long term stagnation in trade throughout the 18th century.

Furthermore, Heckscher suggests that the regulation of the ironworks with the implementation of the production ceilings negatively impacted the amount of

⁵² The term ironmaster (or *Brukspatron* in Swedish) usually refers to the manager, and owner, of a forge or blast furnace for the processing of iron

⁵³ Polhem, C. *Twenne betankanden, Det forra angdende Economien och Commercen uti Sverige; Det senare Ofwer Segelfartens Inrattande Emellan Stockholm och Giotheborg* (Stockholm, 1720).

⁵⁴ Magnusson, "Mercantilism and "Reform" Mercantilism," p.416.

⁵⁵ C. Polhem, *Atskillige allmanne Hushdlds Forslag* (Abo, 1726), p. 7.

⁵⁶ Polhem, C. *Twenne betankanden, Det forra angdende Economien och Commercen uti Sverige; Det senare Ofwer Segelfartens Inrattande Emellan Stockholm och Giotheborg* (Stockholm, 1720), p. 25

iron exported. However, there are some issues with Heckscher's argument as he fails to explain some key discrepancies. The purpose of the production ceilings was to increase the international market price of bar iron produced in Sweden. The total tonnage increased by almost two and half times during the 18th-century but Heckscher does not explain why there is a large discrepancy between his data and the value of the foreign trade.^{57 58 59} Högberg attempted to arrive at more accurate figures with regards to the tonnage. His results demonstrate that the expansion of tonnage was more moderate compared to Heckscher's ambitious results. But the overall trend remains in Högberg's analysis, with iron tonnage nearly doubling in the 18th century.^{60 61} Furthermore, Edvinsson and Tarek Gad show that in conjunction with large-scale increases in the domestic population, total trade levels increased almost twofold throughout the 18th century. However, they find that there was a small decrease in the value of Swedish exports in relation to GDP which they mainly attribute to the substantial drop in the relative price of bar iron. Overall, they reach the conclusion that Swedish exports saw a declining tendency in this period.⁶²

2.5. Outlining a Gap Within the Literature

There are several issues with the data from these previous investigations on the effects of mercantile policies on Swedish iron trade. Heckscher states the statistics on Swedish trade from the 18th century have a high level of accuracy and in turn argued that it would be beneficial to publish them for a wider audience.⁶³ On the other hand, Söderlind argues that the export data is

⁵⁷ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2), p. 675.

⁵⁸ Heckscher, E. F. . Sveriges ekonomiska historia från Gustav Vasa: Det moderna Sveriges grundläggning (Vol. 2:1) [The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]. (Stockholm: Albert Bonniers Förlag 1949a), pp. 386–400.

⁵⁹ Edvinsson and Tarek Gad, "Assessing Trade in the Mercantilist Era," p. 227.

⁶⁰ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2), p. 670-675.

⁶¹ S. Högberg, *Utrikeshandel och sjöfart på 1700-talet: Stapelvaror i svensk export och import 1738–1808* [Foreign trade and shipping during the eighteenth century: Staple goods in Swedish export and import]. (Lund: Bonniers, 1969), pp. 24–25, 238–239.

⁶² Edvinsson and Tarek Gad, "Assessing Trade in the Mercantilist Era," p. 226.

⁶³ Statistics Sweden. *Historisk statistik för Sverige: Del 3, utrikeshandel 1732–1970* [Swedish historical statistics: Part 3, foreign trade] (1972), p. 7. Retrieved from

unreliable, particularly in the case of the values of imports.⁶⁴ Furthermore, Vallerö argues that there is a degree of uncertainty in the process of how the data was constructed, largely because the recalculations of export prices were made on the basis of a combination of price schedules of goods in Stockholm and Gothenburg.⁶⁵ It would have been more desirable to use import prices from foreign ports.⁶⁶

Moreover, the yearly data on Swedish iron exports only start in 1738, which is 14 years after the implementation of the Swedish Commodity Act of 1724. The wide array of secondary literature has helped me to define a gap within the literature within which to situate my own research. My examination of the Sound Toll Registers with the aim of reconstructing Swedish iron exports shipped through Öresund from the late 17th century onwards will hopefully fill that gap. Additionally, the literature has demonstrated there is little consensus and certainty on the actual value of the iron shipped through the Baltic. There is an issue regarding the lack of acknowledgement of the role of the rapidly industrialising society in England which continuously required more iron inputs throughout the 18th century. This paper hopes to address these issues.

3. Research Question and Hypothesis

The paper aims to address the subjects of mercantilism and trade policy specifically in relation to countries bolstering their leading industry, thus addressing a wider question of to what extent mercantile and protectionist trade policies either aid or constrict a country's primary leading industry? Conclusions regarding this broader question will be extrapolated from the results provided through the lens of the main narrow research question. The narrow question is

https://www.scb.se/Grupp/Hitta_statistik/Historisk_statistik/_Dokument/Utrikeshandel-1732-1970.pdf

⁶⁴ Högberg, "Utrikeshandel och sjöfart på 1700-talet," p. 20.

⁶⁵ Rolf Vallerö, and Sweden. Statistiska Centralbyrån. *Svensk Handels- Och Sjöfartsstatistik, 1637-1813 : En Tillkomsthistorisk Undersökning = The Swedish Foreign Trade and Shipping Statistics, 1637-1813*. Urval; No.1. Stockholm, 1969, p. 121-124.

⁶⁶ Edvinsson and Tarek Gad, "Assessing Trade in the Mercantilist Era," p. 230.

as follows: To what extent did the implementation of the Swedish Commodity Act of 1724 (*Produktplakatet av 1724*) impact the exports of Swedish iron through *Öresund* to England? This paper hypothesises that the Swedish Commodity Act of 1724 effectively helped to increase the export of iron in Sweden to England, both in terms of value and volume, during the 18th century.

4. Primary Source Discussion

The famous Sound Toll Registers are composed of more than 700 volumes which are preserved at the Danish National Archives. The records are of great value to scholars due to the detailed descriptions of shipping and trade along one of the Early Modern world's most important trade routes. The source contains information about every vessel that sailed in or out of the Baltic from 1497 to 1857, which totals to over 1.8 million. They are an exceptional source which present an entirely unique opportunity for research in maritime history, shipping trends, and trade in the Baltic. UNESCO has included the Sound Toll Registers in its collection of 'Memory of the World' register which is a unique collection of documents, archives and library collections that exhibit remarkable importance for world history.^{67 68} The registers were created at the customs house in Elsinore which was tasked with documenting the taxes levied on vessels and cargoes that passed through *Öresund*. The registers are preserved for the years 1497, 1503, 1528, 1536, 1548, 1557-1558, 1560 and 1562-1569 and then an almost constant series from 1574 to 1857. In this nearly unbroken series of 300 years there are only notable gaps in 1632 and 1634. During these years conditions at the customs house were temporarily disturbed. There was a similar disruption between 1658 and 1660 due to a prolonged war with Sweden.^{69 70} However, this is not of great importance to this investigation since the years of interest centre around the implementation of the 1724 Commodity Act and the

⁶⁷ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 305.

⁶⁸ Werner Scheltjens, and Jan Willem Veluwenkamp, "Sound Toll Registers Online: Introduction and First Research Examples," *International Journal of Maritime History* 24, no. 1 (2012): 301.

⁶⁹ Scheltjens and Veluwenkamp, "Sound Toll Registers Online: Introduction and First Research Examples," p. 303.

⁷⁰ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 306.

data set for this project begins in 1674. The source is one of the main measuring points of commodity transport in Early Modern Europe due to the invaluable content on trade, transport, production, consumption and the origins, and economic activities of shipmasters from a wide variety of countries. It is a key source regarding social, economic and maritime history on several different levels: global, regional and local.⁷¹

Cities and nations were treated differently by the Danish state with countries moving from exempt to not on particular types of taxes. The Swedish cargoes were exempt from some types of cargo tax up until the year 1720. The present-day Swedish county of Scania (*Skåne*) passed back and forth from Danish to Swedish control before eventually becoming Swedish in 1658 and has remained so until the present day. Despite Scania shifting to Swedish control, the Danish state successfully captured all the revenue from the tolls. Each nation, including the Danish king's own subjects and ships, had to pay the modest light duty, related to the service of lighthouses and similar navigational tools, which means that all vessels that passed through *Öresund* were recorded in the Sound Toll Register regardless of country of origin.⁷²

The strengths of the source are varied and many-sided. Firstly, it is the only available source that can provide yearly and monthly details on the shipping of iron from Sweden to England through *Öresund*. All the other sources used in previous examination of the exports of Swedish iron either use the official data set published by the Swedish bureau of statistics, which only begins in 1738 thus it does not allow one to observe any immediate breaks or changes following the implementation of the Commodity Act of 1724. Additionally, any of the other data is not on a yearly basis but rather is based on estimated averages over several years. Furthermore, the source is incredibly detailed with a great variety

⁷¹ Scheltjens and Veluwenkamp, "Sound Toll Registers Online: Introduction and First Research Examples," p. 303.

⁷² Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 310.

of information which includes the tax levied of the cargo, the composition of the cargo, the origins of the shipmaster, and the ports of origin and destination.⁷³

It was practically impossible to pass Elsinore Castle and the royal guard ship placed in the middle of *Öresund* without being noted by the Danish shipping authorities. If a shipmaster succeeded against all odds, he would most likely be exposed when he passed through *Öresund* while going back in the opposite direction. One might point to the existence of other routes such as the Great Belt or the Little Belt. However, the conditions in these Danish straits were difficult to navigate, had adverse weather conditions or only allowed for a certain size of ships. The few ships that did pass through these alternative trade routes were almost entirely of Danish origin and did not carry Swedish Iron on the way to England.⁷⁴

There are some limitations to the source. Firstly, there is the possibility that the shipmasters engaged in fraud with regards to the cargo. The customs officers did not always search the vessels, with the clearance being based on the official ship documents and cargo manifests. However, customs officials were aware of the possibility of fraud and if they were suspicious, they had the authority to board and search ships. Records indicate that a third of the 1442 vessels that passed through *Öresund* in 1753 were inspected. For example, an English shipmaster, anchored at Elsinore in 1738 on his way from London to Riga and declared that his ship only contained ballast. The customs officials suspected fraud, boarded the ship and found 82 ship pounds of vitriol, 13 ship pounds of tin, a case of window glass, a barrel of beer and diverse small wares valued at 104 Danish Rigsdaler. The customs officer entered the amount of 23 Danish Rigsdaler and 12 shillings into the ledger as the tax that the Englishman was due to pay.^{75 76} Moreover, the Danish Crown had a special system of enforcing accurate declaration of cargo value based on the Crown's reserved right to purchase the

⁷³ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 320.

⁷⁴ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 321.

⁷⁵ Tresoar, *Sound Toll Registers Online*, 24 June 1738, <http://dietrich.soundtoll.nl/public/>

⁷⁶ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 320.

cargo at the value that had been declared by the shipmaster. Through a game-theoretic treatment of this rule, Haan et al. show that it allowed the authorities to raise the desired tax revenue with the corresponding expected value.⁷⁷

A second issue is the problem of standardisation. In order for researchers to use the large amount of data it is necessary to standardise the contents of the ledgers. In the source, customs officers had several different ways of spelling cities, for example the Swedish city of Kalmar was frequently spelt in four different ways. Different geographical places may have the exact same names; for example, there is a Norwegian port city called Bergen, however there are four other places in the Netherlands and Germany that are also called Bergen.⁷⁸ Furthermore, there are some old names or misspelt names which means that the creators of the digital registers do not know what type of cargo the customs officials are referring to.

Due to the location of the Sound Toll, it does not capture any of the Swedish iron exported from Gothenburg. Previous studies of the Swedish iron industry indicate that the percentage of iron shipped from Gothenburg remained constant at 28 percent throughout the entire 17th and 18th centuries. Studies with larger scopes may wish to reconstruct the data from Gothenburg, however, this study uses the iron shipped through *Öresund* proxy for total Swedish iron exports.

Despite the above-mentioned flaws embedded in the primary source, the nature and scale of these imperfections do not prevent the use of the Sound Toll Registers as a means of studying the effects of mercantilism on iron trade.

⁷⁷ Haan, Marco A, Pim Heijnen, Lambert Schoonbeek, and Linda A Toolsema. "Sound Taxation? On the Use of Self-declared Value." *European Economic Review* 56, no. 2 (2012): 205-15.

⁷⁸ Gøbel, "The Sound Toll Registers Online Project, 1497–1857," p. 323.

5. Research Design and Methodology

This investigation restricts the scope of inquiry to a time period of 100 years, between 1674 and 1773. This timespan was chosen because the Swedish Commodity Act was implemented in 1724, thus placing it exactly in the middle. A long-term approach is particularly useful as the implementation of mercantile policy may be drawn out with substantial changes to key patterns in volumes and value taking even longer to properly materialise. This analysis of mercantile policy will be split into two sections: the first section will present a variety of results obtained from descriptive statistics and the second section will present the results of a time series regression.

This paper relies on data from the Sound Toll Registers and the first step was the creation of an overarching data set. The Sound Toll Registers online database has advanced search functions which allows for the combination of several commands into one search, and then one can download the corresponding data. In order to access the relevant data for this paper, the search combined criteria such as the transport of iron, departing from ports in Sweden and Finland, arriving to ports in England and Wales, and limited to the time period between 1674 and 1773. The search allows the user to download four different sets of data. Each data set contains a passage ID, a number unique to each passage through *Öresund* which allows for linkages between data sets. The first dataset contains one entry per passage with information regarding the date, the name of the Shipmaster, the shipmasters domicile, and the total tax paid. The second data set contains information on the cargoes shipped through *Öresund*. This set has a different structure with several entries per passage in order to account for the different goods transported by the ship. The data set also includes information on the weight of the goods, the tax paid per good and the port of origin and destination. The third set contains information regarding the several different taxes levied per passage, once again linked through the passage ID.

In order to combine these different data sets, this study firstly filtered to only include data on iron while still in the long data format, and ignoring the other goods transported on the same ships as the iron. Then, the data was reshaped from the long format, with several entries per passage, to the wide format with only one entry per passage, but with more data columns rather than rows. This allowed the combination of several different data sets and the creation of an overarching time series data with the selected key variables including weight of iron per shipment, tax levied on iron per shipment, the date, port of origin, port of destination, shipmaster's domicile, and the unique passage ID. In turn, key calculations could be made. Firstly, the average weight of iron per shipment during each year of the selected time period; secondly, the average tax levied per passage during each year; thirdly, the sum of all iron transported through *Öresund*; fourthly, the sum of all taxes levied on iron goods throughout the entire time period; and finally an estimated total value based on the reversed percentages of taxes levied on the cargo, a method employed by Kumar to estimate the volume and value of Baltic timber products exported through *Öresund* to Portugal.⁷⁹ These calculations allow for the presentation of key descriptive statistics, useful in giving an introduction and an overall picture of Swedish iron exports.

One area of critique is the inability to control for the changing values of coins with several series of debasements. For example, the Great Northern War (1700-1721) generated heavy damages in all Scandinavian countries which meant that the currency was devalued several times and eventually paper money was introduced in both Denmark and Sweden. Future studies with larger scopes, or on similar topics may wish to include supplementary data on changing values of Scandinavian coins to control for these debasements.

⁷⁹ Kumar, Manish. "A Method for Estimating the Volume of Baltic Timber Products Exported through the Sound and Its Application to Portugal, 1669-1815." *The Scandinavian Economic History Review* 66, no. 3 (2018): 246-63.

In order to conduct a time series regression to study the impact of mercantile policies, a number of covariates had to be selected. The first step included the construction of several dummy variables. Most importantly, this study has a dummy variable to indicate the implementation of the Swedish Commodity act of 1724, with 0 marking the period without influence of state sanctioned mercantile policy and 1 marking the time in which Swedish shipping was subject to government regulation. Furthermore, there were several different wars being waged in Europe during this project's scope of inquiry including the Franco Dutch War (1672-1678), the Nine Years War (1688-1697), the Great Northern War (1700-1721), The war of Spanish Succession (1701-1714), The War of Austrian Succession (1740-1748), the Seven Years War (1756-63). Dummy variables were created to account for the influence of war on iron trade. Sweden was not individually involved in these wars for the full duration of the wars, so separate dummy variables were created for Swedish involvement. It is important to consider all the wars that its greatest trading partner, England and later Britain, was involved in as this may have altered the demand for iron. Therefore, this study includes a conflict in the colonies: the Tuscarora War (1711-1715).

Secondly, in order to control the growing demand for iron at the onset of the Industrial Revolution in England, this investigation has been supplemented with data on both population and GDP statistics provided by Broadberry.⁸⁰ There are some issues with this data since the Kingdom of Great Britain was officially formed on May 1st, 1707, which is in the middle of this investigation.

Broadberry's data is based on English data in pre-1700 and then includes the entirety of Great Britain post-1700. In order to create a measure of continuous rates on values such as GDP and population, Broadberry indexed the different series to their respective values in 1700. On the other hand, the GDP output values have all been estimated with constant prices which is particularly useful. Furthermore, data on Swedish population and GDP levels, provided by Edvinsson, have been included in the regression as the early beginnings of

⁸⁰ Stephen, Broadberry, *British Economic Growth, 1270-1870*, West Nyack: Cambridge University Press, 2014.

industrialization in Sweden may have increased the supply of iron available for export.⁸¹ However, during the time period of interest, present day Finland was still part of Sweden, but the statistics on GDP and population only include Sweden. Finland was almost entirely agricultural and as demonstrated by the Sound Toll Registers only very small percentages of iron came from present day Finland.⁸²

This study regressed the lagged total weight of iron shipped through *Öresund*, over the independent variables mentioned above which include dummy variables for the implementation of the Commodity Act of 1724, wars in which Sweden was involved, and wars which England was a part of. Lags are useful in time series analysis as they can correct for issues with autocorrelation, which is the tendency for values within a time series to be correlated with previous copies of itself. The model also includes the indexes of British GDP and population statistics in combination with the statistics on population and GDP in Sweden during between 1674 and 1773. The regression also includes controls for trends in the data through the use of a T variable.

6. Results and Analysis

6.1. Descriptive Statistics

The literature on Swedish and English iron trade establishes the importance of the relationship, but as above mentioned there is a gap in the literature regarding the influence of the implementation of the Swedish mercantile policy known as the Commodity Act of 1724. Furthermore, the official Swedish export statistics begin in 1738, whilst the study of Swedish mercantilism requires earlier data which justifies the use of the Sound Toll Registers.⁸³

⁸¹ Edvinsson, Rodney, Jacobson, Tor, Waldenström, Daniel, and Sveriges Riksbank, Issuing Body. *House Prices, Stock Returns, National Accounts and the Riksbank Balance Sheet, 1620-2012*. Historical Monetary and Financial Statistics for Sweden ; Volume II. 2014.

⁸² E. F. Heckscher, “[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]” (Vol. 2:2), p. 670-675.

⁸³ Åström, “Swedish Iron and the English Iron Industry about 1700: Some Neglected Aspects,” p. 129.

Figure 1.1 Number of Passages Carrying Iron Goods, from Sweden to England, Though *Öresund* per Year, 1674-1773⁸⁴

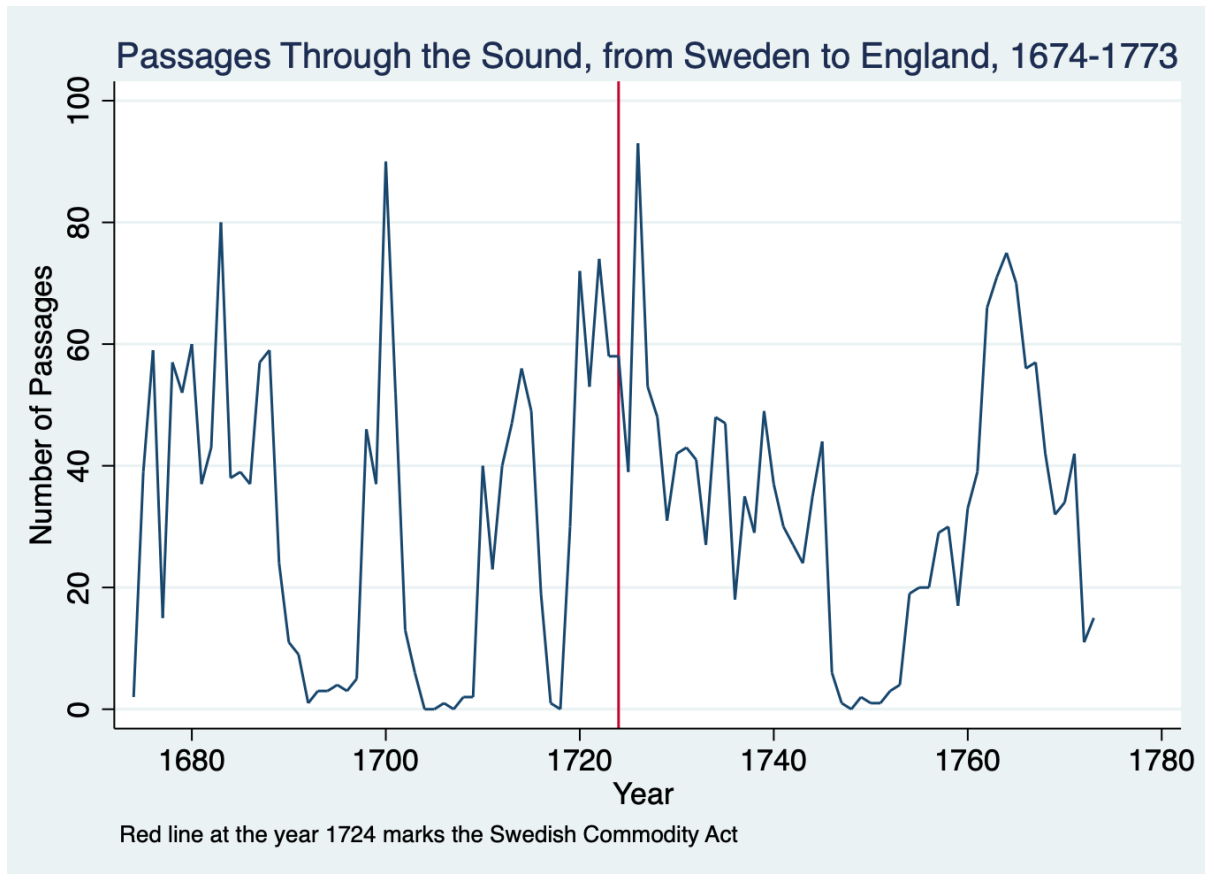


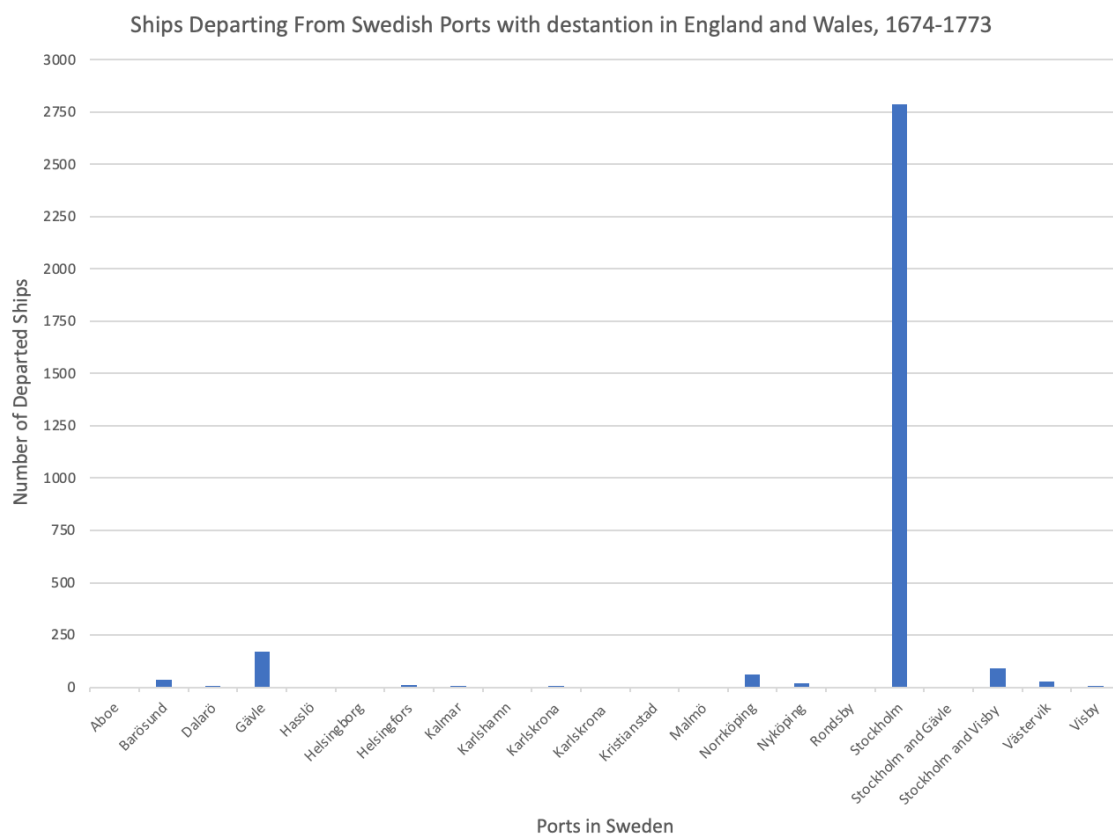
Figure 1.1 above demonstrates the number of passages through *Öresund* per year, which transported iron goods in any form. The red line in the year 1724 marks the implementation of the Swedish Commodity Act. The pattern is indistinct, with only a slight rise in the number of passages per year following the implementation of Swedish mercantile policy. King argues that many years of gradual growth in shipping levels between Sweden and England rapidly increased, leading up until the late 1710s before coming to a rapid end following a series of coincidences in the 1720s. King points to the presence of the South Sea Bubble of the 1710s as a mechanism for increasing iron imports in England in the 1710s and its subsequent burst which strongly curtailed the ability of British investors to continue their rapid expansion.⁸⁵ He also underlines the

⁸⁴ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

⁸⁵ King, Peter. "The Production and Consumption of Bar Iron in Early Modern England and Wales." *The Economic History Review* 59, no. 1 (2006): 8.

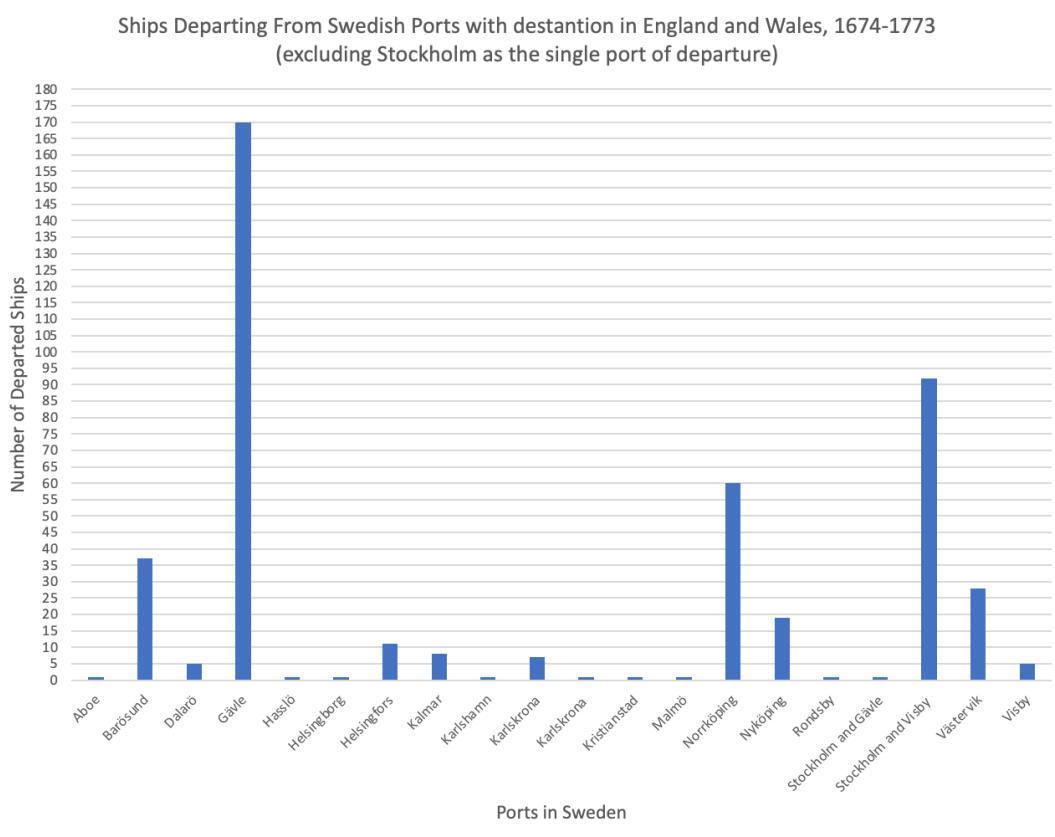
presence of the embargo on Swedish trade in the late 1710s as a part of war tactics of the Great Northern War and the War of Spanish Succession which entangled all of the European powers in a webs of alliances. This theory should be reflected by a dramatic fall in English iron imports from Sweden in the 1720s, but the data indicates that the decrease in the number of passages began in the mid-1690s. The effects of the embargo on Swedish trade can be seen with dramatic falls in the number of passages in the mid to late 1710s. The pattern following the implementation of the Commodity Act is somewhat more stable, but this might be due to the resolution of the two largest wars of the 17th century, rather than solely the effects of mercantile policy. Furthermore, there is a rather large dip in the number of passages during the 1750s, indicating that there are several forces affecting patterns of trade between Sweden and England.

Figure 2.1 Number of Ships Departing from Swedish Ports with Destinations in England and Wales, between 1674 and 1773⁸⁶



⁸⁶ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

Figure 2.2 Number of Ships Departing from Swedish Ports (excluding Stockholm as the Single port of Departure)⁸⁷

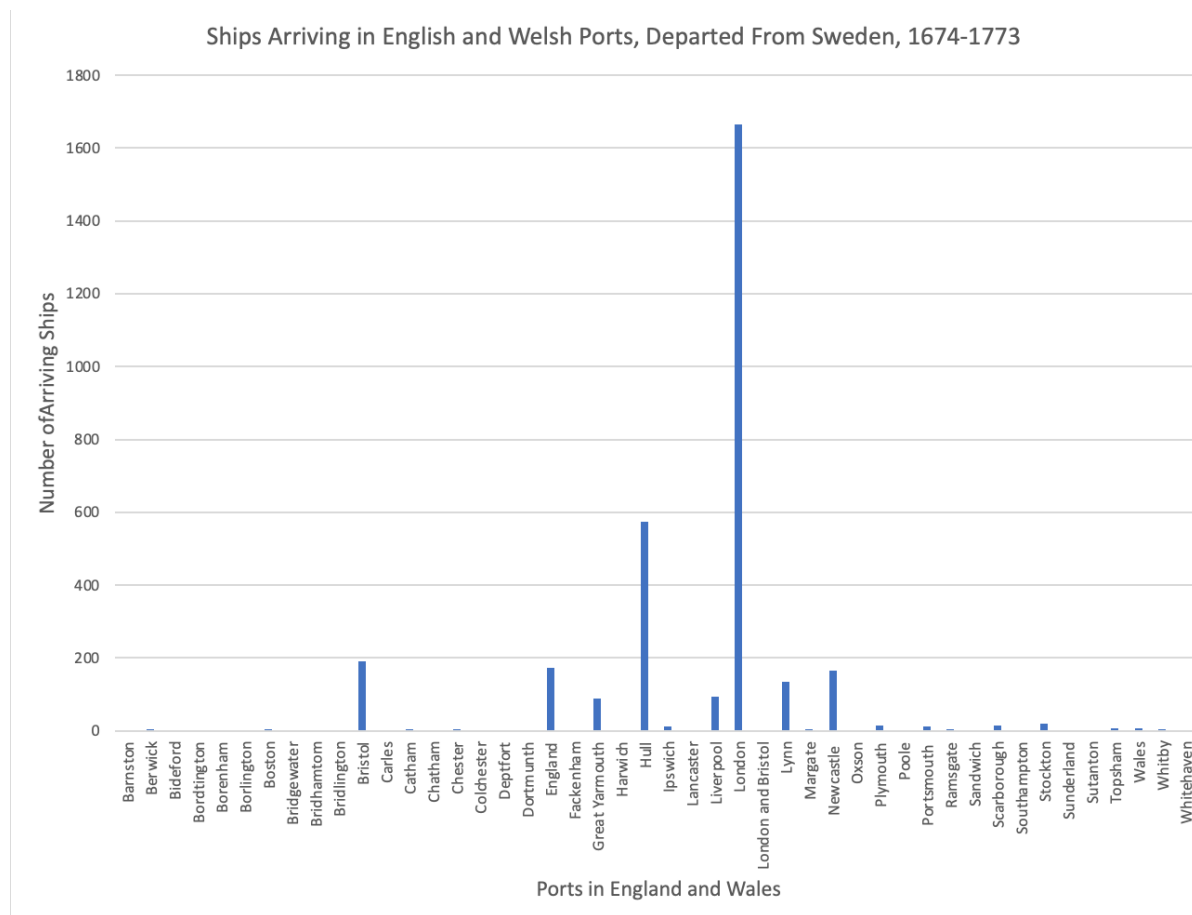


Figures 2.1 and 2.1 as seen above, showcase the distribution of Swedish ports of departure for iron goods with destinations in England. Figure 2.1 includes all cities, which amount to 21 ports in total. It is clear that Stockholm is the dominant port of departure with more than 2750 departing ships between 1674 and 1773. Figure 2.2 excludes Stockholm as the single port of departure thus giving a clearer view of the distribution of the less frequently used ports of departure. There are some cases in which a ship has loaded goods from more than one location and therefore notes two ports of departure such as the combinations of Gävle and Stockholm or Stockholm and Visby. Gävle is clearly in second place with approximately 170 departing ships. Visby as the single port of departure was of little significance, however Stockholm and Visby combined reached above 90 departing ships in the 100-year time period. The concentration

⁸⁷ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

of exports departing from single towns was enforced with the implementation of mercantile policy. Foreign trade was prohibited in inland towns (*Uppstäder*) and only permitted in a select group of staple towns (*Stapelstäder*) with most of the activity concentrated in either Stockholm or Gothenburg.⁸⁸

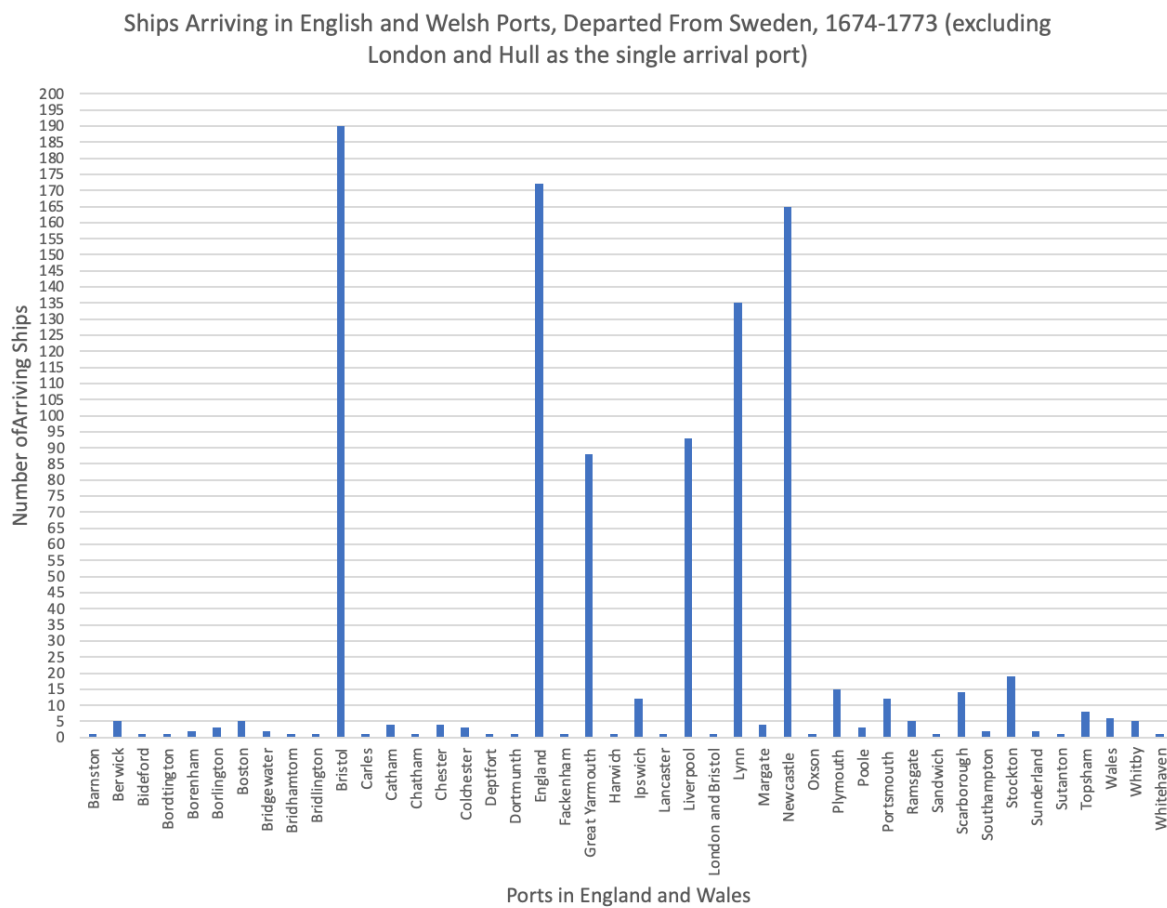
Figure 3.1 Number of Ships Arriving in Welsh and English Ports, between 1674 and 1773⁸⁹



⁸⁸ Edvinsson and Tarek Gad, “Assessing Trade in the Mercantilist Era,” pp. 229-230.

⁸⁹ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

Figure 3.2 Number of Ships Arriving In English and Welsh Ports, Excluding London and Hull⁹⁰



Figures 3.1 and 3.2 demonstrate the distribution of ships that arrived in English and Welsh ports between 1674 and 1773. Once again, the capital city dominates the distribution, with London encompassing above 1600 ships arriving from Sweden. Hull takes second place with nearly 600 arriving ships. Figure 3.2 excludes these two biggest ports to provide a clearer image of the distribution among the less frequented ports. This reveals that other significant ports include Bristol, Great Yarmouth, Liverpool, Lynn, and Newcastle. Moreover, it is important to note that some destinations in the registers did not specify a port but rather just the country of destination. The unspecified ships arriving to England amount to over 170 and 5 ships arriving to unspecified ports in Wales.

⁹⁰ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

Figure 4.1 Number of Shipmasters from each Domicile Location, Below 30 per Location⁹¹

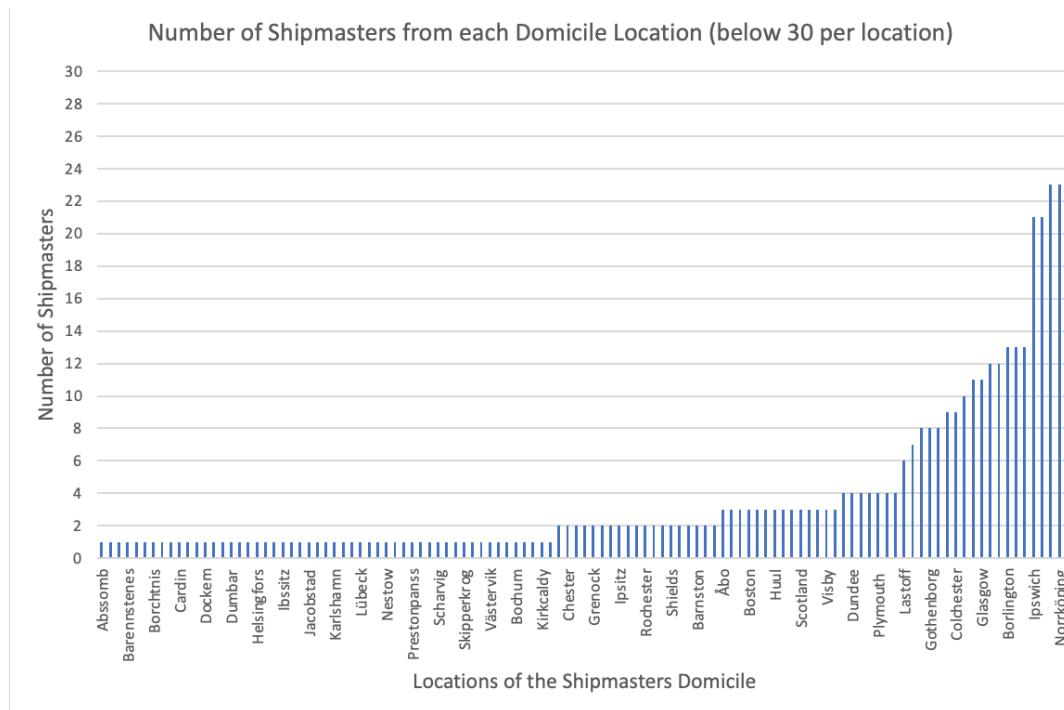
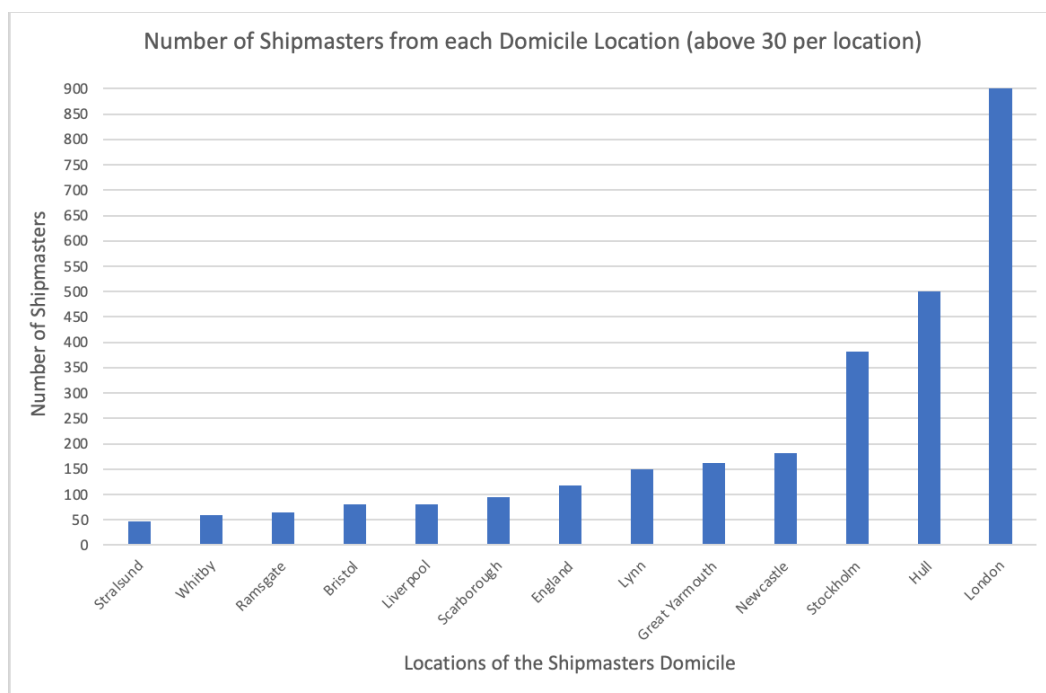


Figure 4.2 Number of Shipmasters from each Domicile Location, Above 30 per Location⁹²



⁹¹ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

⁹² Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

The figures 4.1 and 4.2 above illustrate the number of shipmasters from each domicile. The data has been split into two separate graphs for easier interpretation. The first graph shows domiciles from which fewer than 30 shipmasters originated and demonstrates a variety of cities in England, Germany, Scotland, Wales and Sweden. The second graph demonstrates the domicile from which more than 30 shipmasters originated. In figure 4.2 the only Swedish city is Stockholm with approximately 375 shipmasters thus taking the third spot. The English city of Hull takes second place with 500 shipmasters and London takes first place with 900 shipmasters. The Sound Toll Registers do not note which country flag a ship sails under, instead the origin of the ship master may act as an indicator. However, this is not very accurate since merchants may hire foreign shipmasters to sail their ships thus this does not demonstrate whether the implementation of the Commodity Act increased the number of Swedish ships passing through *Öresund*. On the other hand, Heckscher's empirical evidence indicates that Swedish mercantilism bolstered Swedish shipping. Heckscher argues that the implementation of protectionist policy in combination with shipping monopolies should have stimulated the domestic shipbuilding industry and navigation sector.^{93 94}

⁹³ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2), p. 670-675.

⁹⁴ Carlén, "An Institutional Analysis of the Swedish Salt Market, 1720-1862," p.9.

Figure 5.1 Average Weight of Iron Transported per Passage, between 1674 and 1773⁹⁵

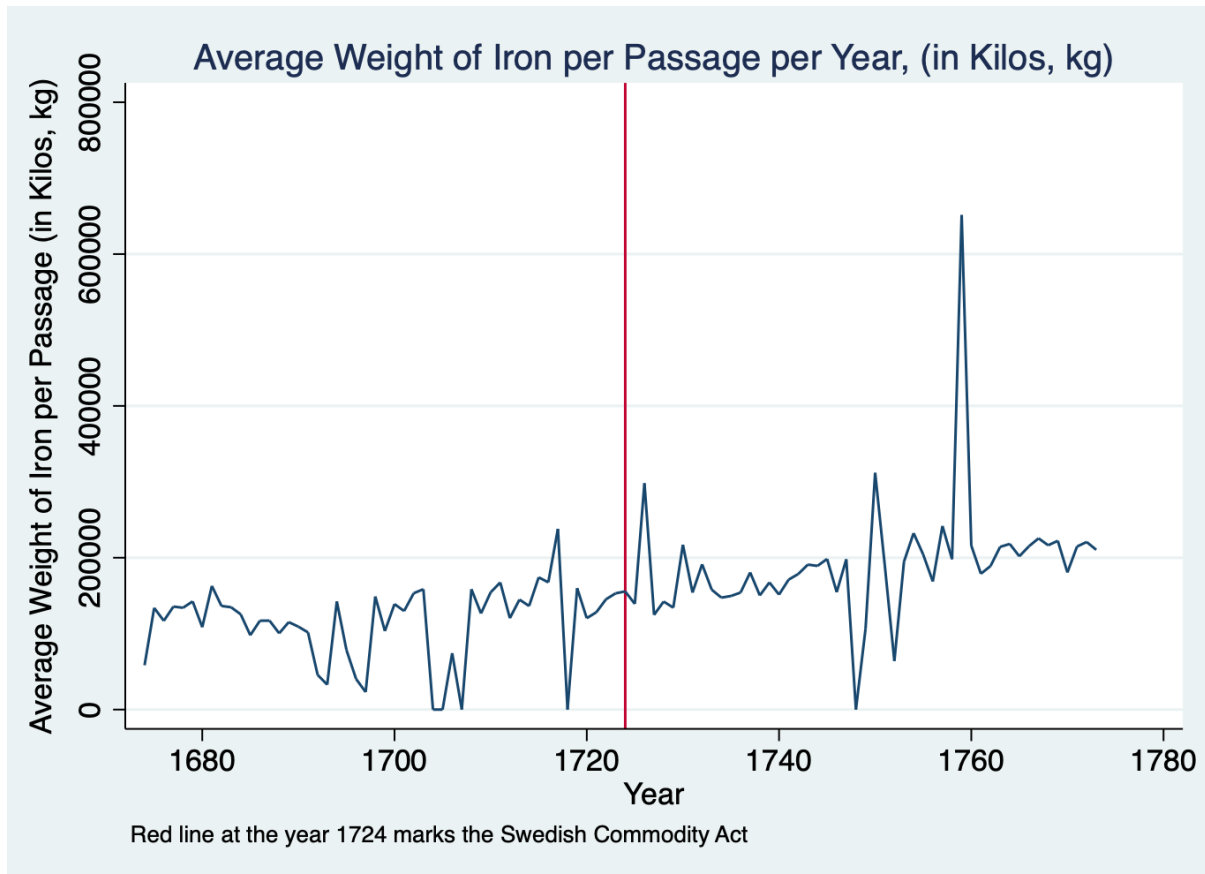


Figure 5.1 shows the average weight of iron transported per ship that passed through *Öresund*. The average weight of iron per passage has a slight increase over time with some significant variations. The dips in average weight in the early and late 1710s correspond with the lower numbers of passages per year as described in figure 1.1 above. The late 1710s saw the embargo of Swedish trade in England. Moreover, the new ships might also have been able to transport larger volumes of iron. Carlén argues that the vessels built in Sweden during the 18th century were built for larger tonnages which also meant that cargo space increased faster than the number of ships. He underlines the idea that the proportion of larger ships increased in between 1726 and 1776 and that long distance navigation grew and improved.⁹⁶

⁹⁵ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

⁹⁶ Carlén, "An Institutional Analysis of the Swedish Salt Market, 1720-1862," pp. 9-10.

Figure 5.2 Average Taxes Levied per Passage Per Year (in Skilling), between 1674 and 1774⁹⁷

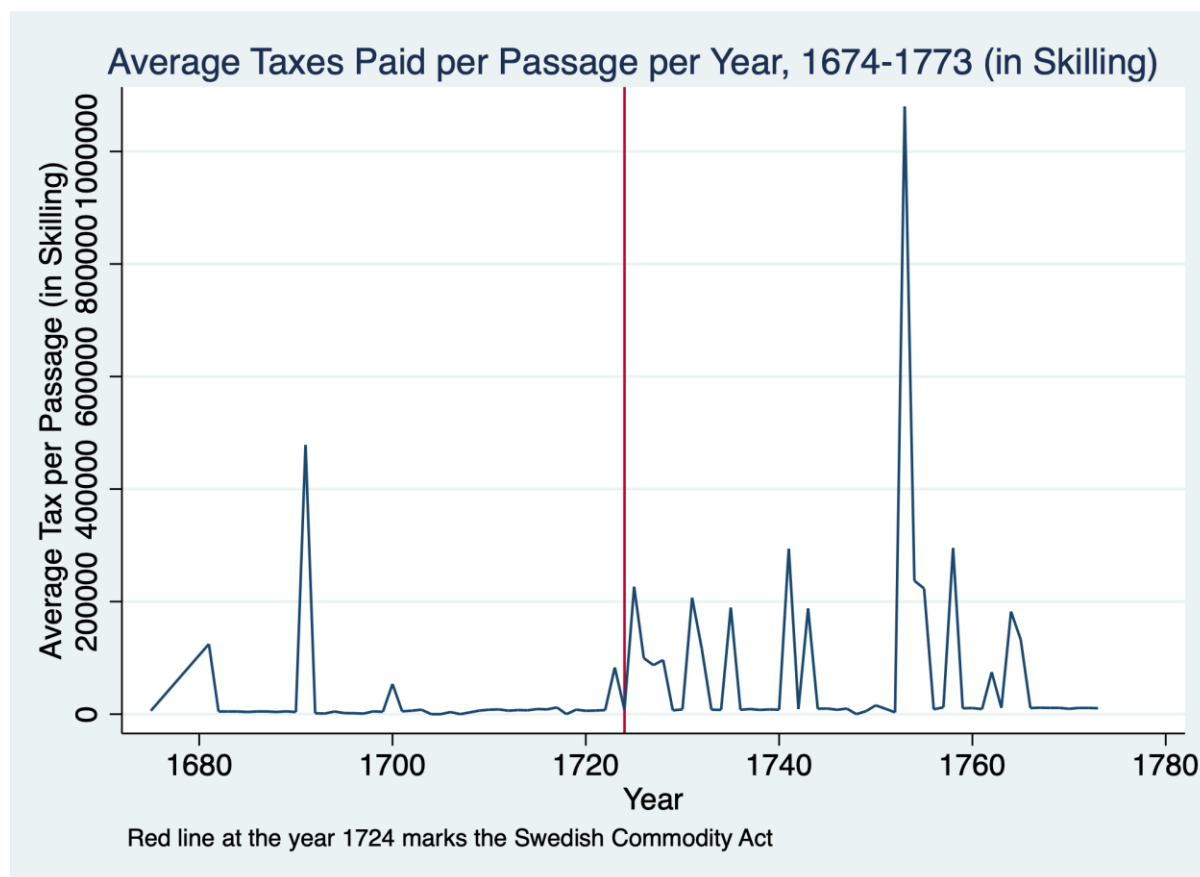


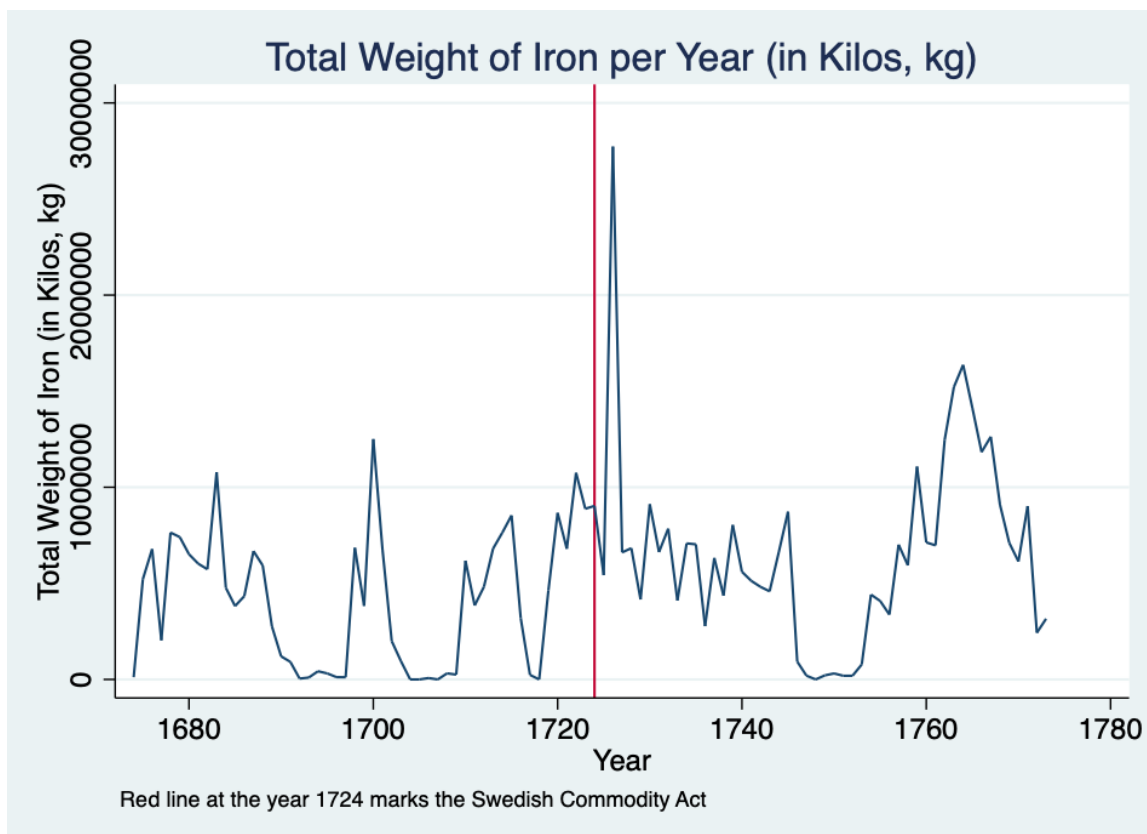
Figure 5.2 shows the average taxes levied per passage between 1674 and 1774. The tax data from the Sound Toll Registers, especially regarding Sweden, is a bit misleading. The graph demonstrates that the taxes levied between the late 1660s and the 1720s was close to zero. This is because Sweden was exempt from the tax levied on cargoes under the terms of the Treaty of Copenhagen, signed in May of 1660. This exemption for Swedish ships was withdrawn after Sweden's defeat in the Great Northern War after the signing of the treaty of Frederiksborg in 1720.⁹⁸ Foreign ships carrying Swedish cargo could still be taxed, which likely accounts for small amounts of tax levied before 1720. This indicates that the portion of Swedish ships transporting iron to England was already high without the implementation of the commodity act which was aimed at limiting foreign

⁹⁷ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

⁹⁸ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2).

ships' ability to transport Swedish goods. The taxes levied following the end of the exemption were still relatively volatile with prolonged periods of values close to zero in the 1740s and 1750s. The overall increase in taxes levied after 1724 cannot be attributed solely to the implementation of the commodity act since the time period before which it needs to be compared with does not accurately indicate the value of the goods.

Figure 6.1 Total Weight of Iron (in Kilos, KG) Shipped Through Öresund per Year, between 1674 and 1773⁹⁹

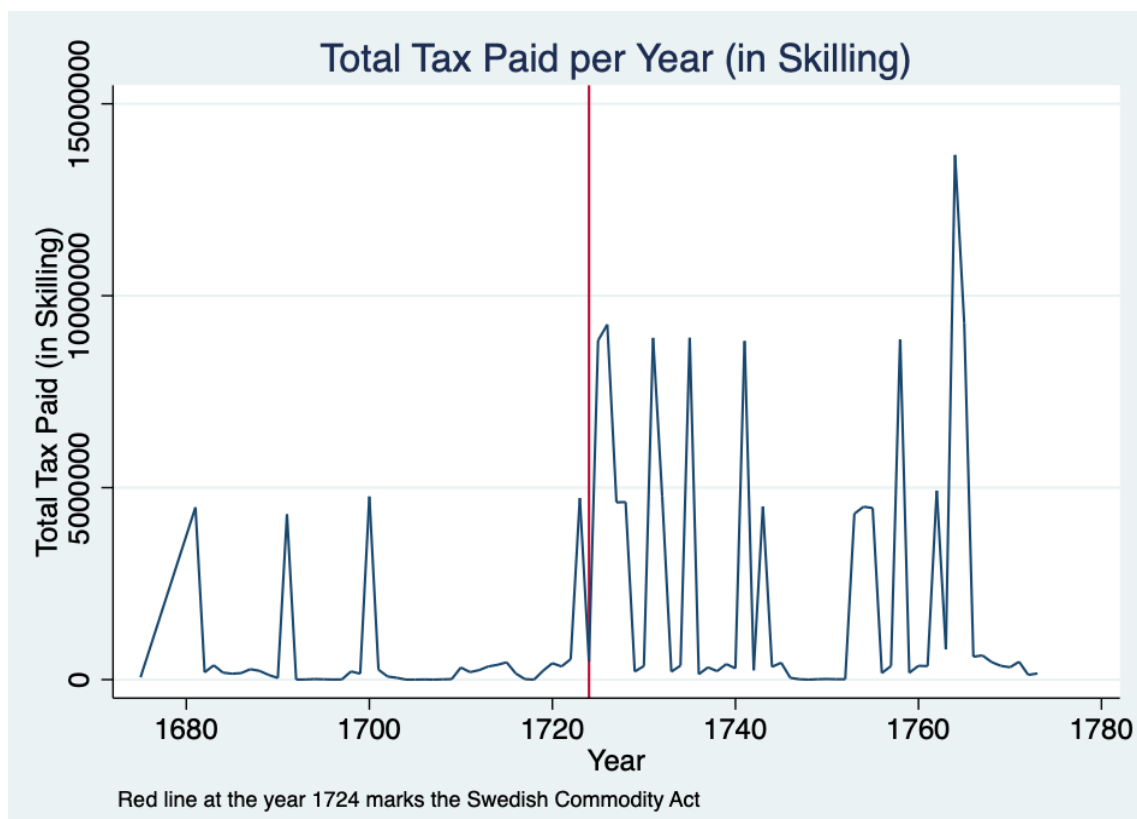


The graph above, figure 6.1, shows the total weight of iron transported from Sweden to England through Öresund between 1674 and 1773. There is no clear overall increasing trend in the total weight of iron per year. However, the highest point of the weight of iron is clearly higher following the implementation of the Commodity Act of 1724. Additionally, the periods of low to no iron trade

⁹⁹ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

between the two countries are considerably shorter in the post implementation of the Commodity Act. The influence of war seems to be a determining factor in the fluctuations of iron trade. The first decrease of iron shipments in the late 1600s corresponds with the timing of the Nine Years War which raged between 1688 and 1697 and engaged several European powers. Sweden fought in the war until 1691 on the side of the Dutch Republic, the Holy Roman Empire, Spain and England, all of which remained engaged in battle throughout the entire duration of the war. The second dip in the 1710s corresponds with the ramifications of Swedish activities during the Great Northern War, fought between 1700 and 1721, and the War of Spanish Succession, fought between 1700 and 1714, in the form of the English embargo on Swedish Trade. The large dip that occurred after the implementation of the commodity act in 1724 seems to correspond with the end of the Austrian War of Succession, which was fought between 1740 and 1748 and included both Sweden and England, together with several other countries such as Austria, France, Prussia, and the Dutch Republic. This elementary interpretation of the connection between low points of iron trade and the occurrence of large-scale wars in Europe motivates the creation of a set of dummy variables in the time series regression conducted and described below.

Figure 6.2 Total Tax Levied (in Skilling) on Cargo Transported Through *Öresund* per Year, Between 1674 and 1774 ¹⁰⁰



The graph above, figure 6.2, shows the total tax levied each year on cargo transported through *Öresund*. The same issues with the exemption from the tax for Swedish ships as mentioned above is demonstrated in this graph. While the average per passage tax per year did not increase a lot as demonstrated in figure 5.2. The Total value of taxes levied is higher. Taken together with the slight increasing trend in the number of ships transporting iron through *Öresund*, this may indicate that the average volume of iron carried per ship did not increase thus not changing the average tax per passage, but instead slight increases in the number of passages per year contributing to higher levels or taxes collected per year. This goes against the evidence presented by Carlén and Heckscher. However, once again, it is not clear whether it was due to the implementation of the Commodity Act.

¹⁰⁰ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

Figure 7.1 Estimated Total Value of Iron Cargo if Taxed at 1%, 1,5% or 2%, Between 1674 and 1773 in Skilling¹⁰¹

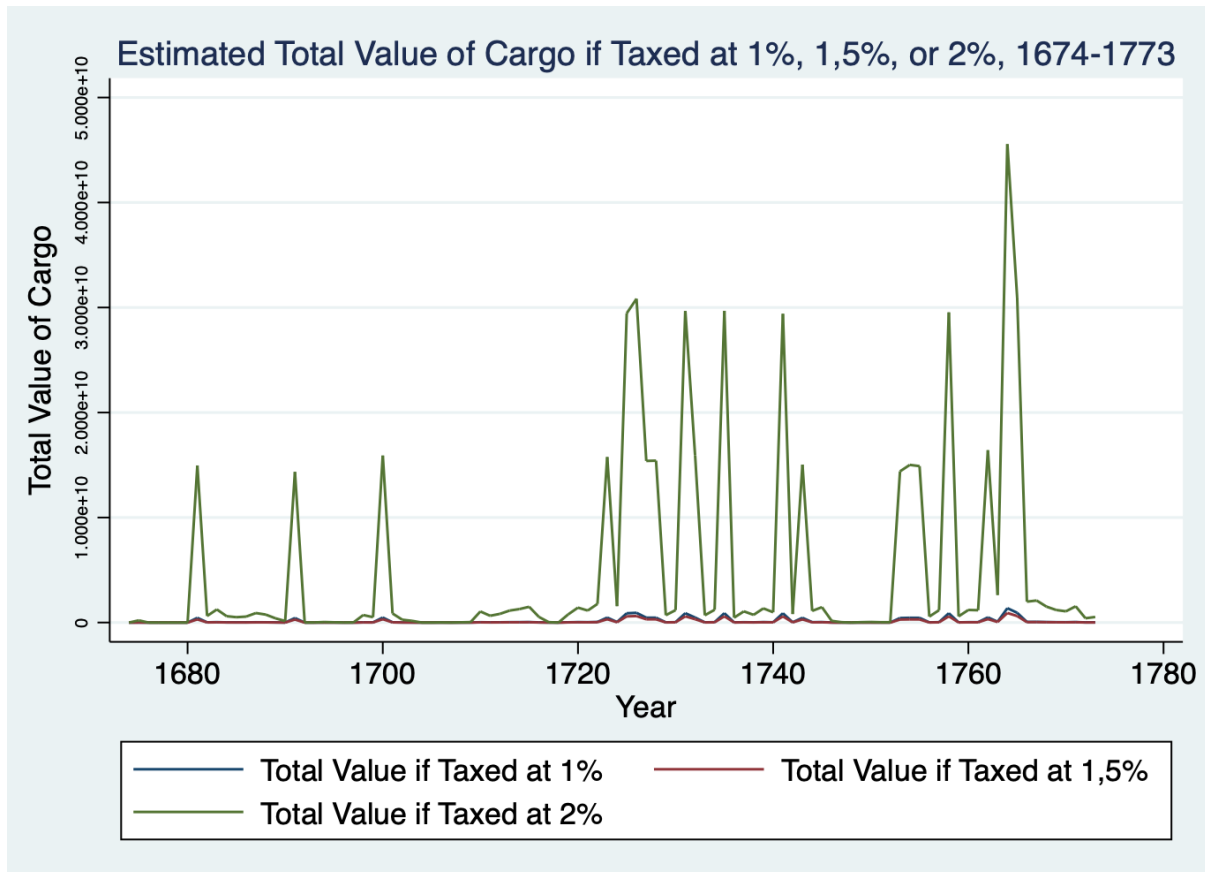


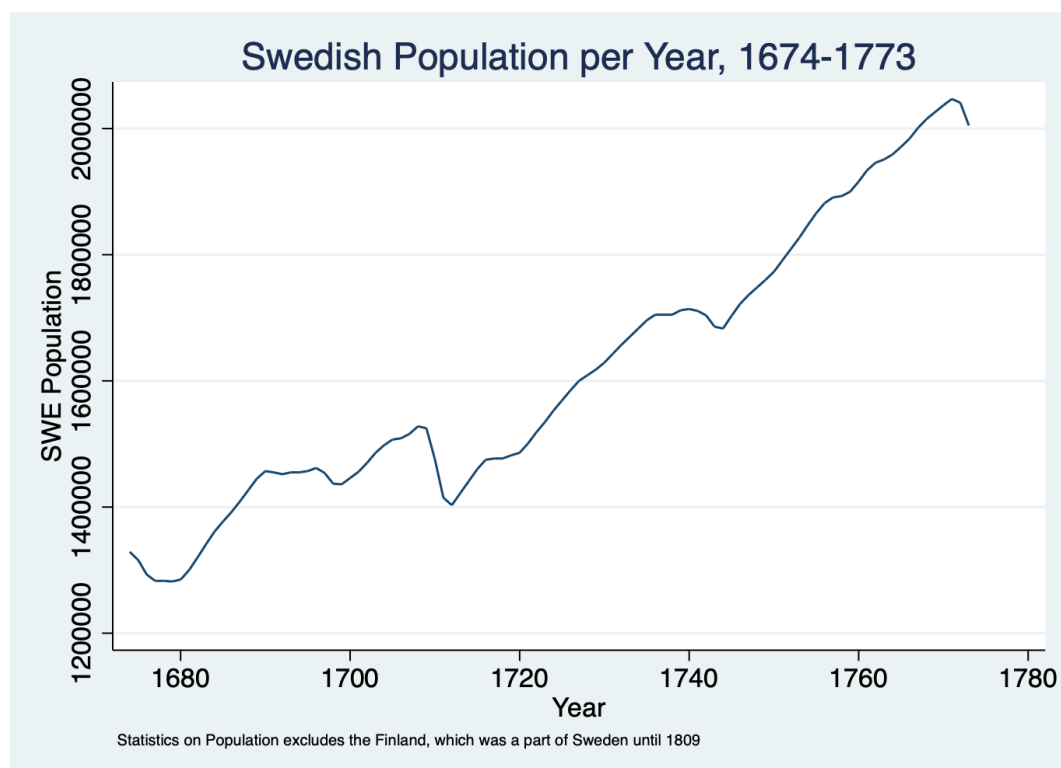
Figure 7.1 demonstrates the estimated value of the iron cargo shipped through *Öresund* per year at three different levels of taxation. Most sources indicate that the iron was taxed at one to two percent of its total value. This estimate is based on the reversed percentages of the tax levied at: 1%, 1,5% and 2%. As mentioned above a similar methodology was employed by Kumar in estimating the volume and value of Baltic timber products exported through *Öresund* to Portugal.¹⁰² If the tax levied was most often at approximately 2% then the value of Iron passing through *Öresund* was high. However, little can be said about the overall pattern and any differences before and after the implementation of the Commodity Act of 1724 due to the aforementioned issues with the tax exemptions before 1720.

¹⁰¹ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

¹⁰² Kumar, "A Method for Estimating the Volume of Baltic Timber Products Exported through the Sound and Its Application to Portugal, 1669-1815," pp. 246-63.

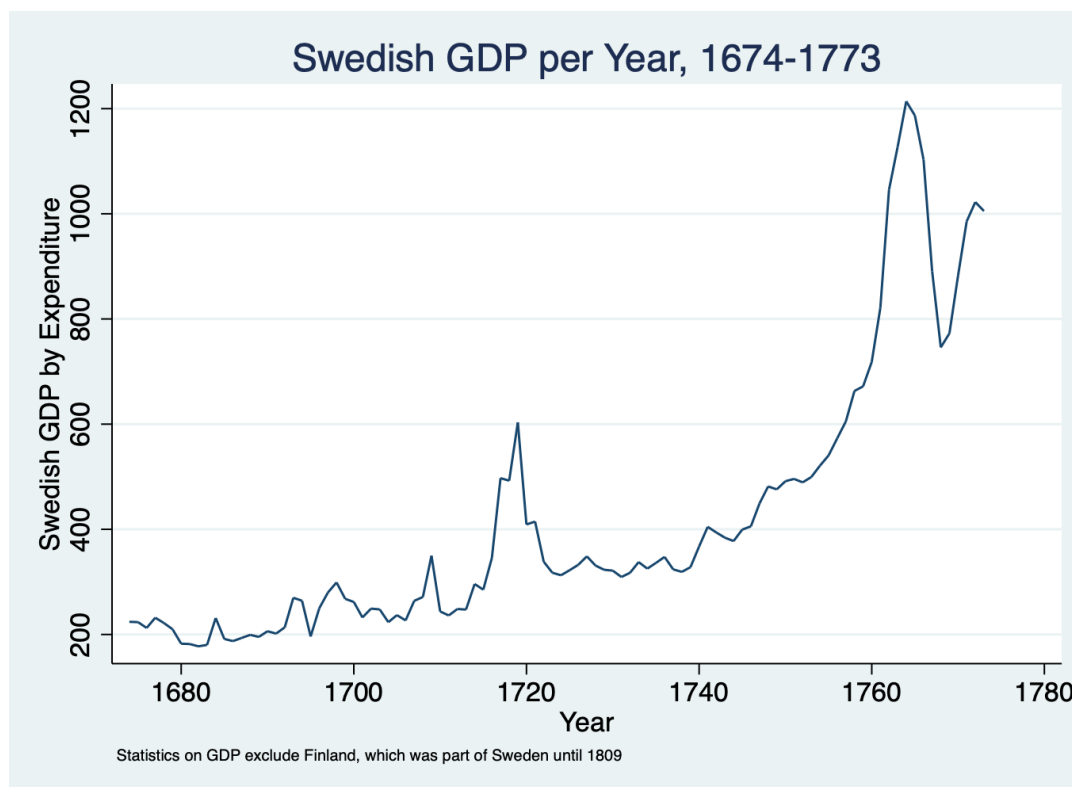
The relatively unclear results of the descriptive statistics warrant the use of a time series regression. As seen in the figures examined and described above there is only a slight difference in the volume and value of iron before and after the implementation of the 1724 Commodity Act. The time series regression includes a dummy variable to capture the time under which Swedish trade was subject to mercantile policy. The regression also includes a number of covariates, such as the dummies for large scale wars raging across Europe, but also includes both Swedish and English GDP statistics. Before examining the results of the regression, it is useful to briefly study the general trends of Swedish and English economic growth during the 17th and 18th centuries.

Figure 8.1 Swedish Population per Year, Between 1674 and 1773¹⁰³



¹⁰³ Rodney Edvinsson, Tor Jacobson, Daniel Waldenström, and Sveriges Riksbank, Issuing Body. *House Prices, Stock Returns, National Accounts and the Riksbank Balance Sheet, 1620-2012*, Historical Monetary and Financial Statistics for Sweden ; Volume II. 2014.

Figure 8.2 Swedish GDP per Year (in millions SEK), Between 1674 and 1773¹⁰⁴



The first graph above, figure 8.1, shows the Swedish population levels between 1674 and 1773. However, this graph excludes the Finish population which were officially a part of Sweden until 1809.¹⁰⁵ The second graph demonstrates the development of Swedish GDP throughout the 18th century. As mentioned in the literature review, Schön and Krantz suggest that there was almost complete stagnation in Swedish GDP levels during the 17th century.¹⁰⁶ This supplementary data of Swedish GDP provided by Edvinsson, confirms this idea with very low levels of growth in the first quarter as seen in figure 8.2.¹⁰⁷ GDP increased after the 1720s which coincided with the end of the Great Northern War, the implementation of the Commodity Act, and the careful start of large

¹⁰⁴ Edvinsson, "House Prices, Stock Returns, National Accounts and the Riksbank Balance Sheet, 1620-2012."

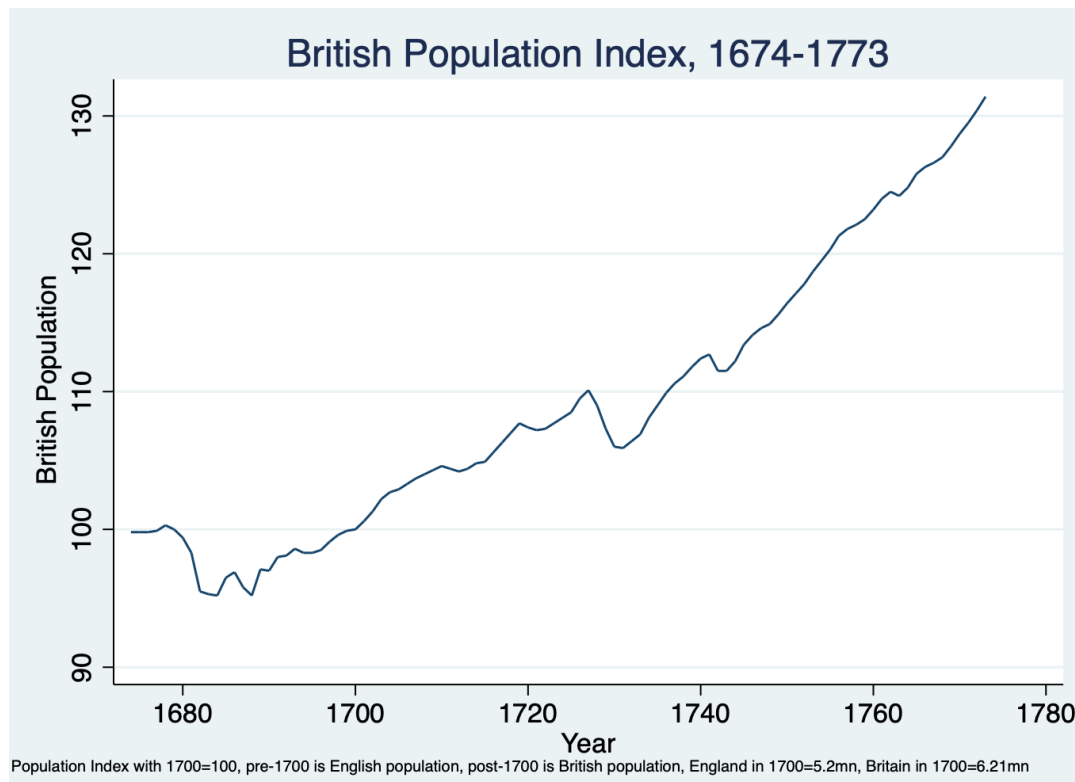
¹⁰⁵ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2).

¹⁰⁶ Schön and Krantz, "The Swedish Economy in the Early Modern Period," p. 530.

¹⁰⁷ Rodney Edvinsson, Tor Jacobson, Daniel Waldenström, and Sveriges Riksbank, Issuing Body. *House Prices, Stock Returns, National Accounts and the Riksbank Balance Sheet, 1620-2012*, Historical Monetary and Financial Statistics for Sweden ; Volume II. 2014.

scale manufacturing in Sweden. However, as seen in figure 8.1 population levels also increased rapidly meaning that GDP per capita levels remained stationary. The inclusion of the GDP and population statistics are important as they might be drivers of increased iron exports with the slow starts of industrialisation. Furthermore, Schön and Krantz argue that the basis for increased growth in the 17th and early 18th century was the restructuring of the economy through modernisation schemes in both industry and administration. Moreover, increased export of industrial goods was important for overall economic growth as it increased industrial output, enabled a greater variety of imports and brought about higher levels of capital import. Overall, the government's promotion of increased exports seems to have been of benefit to the health of the wider Swedish economy.¹⁰⁸

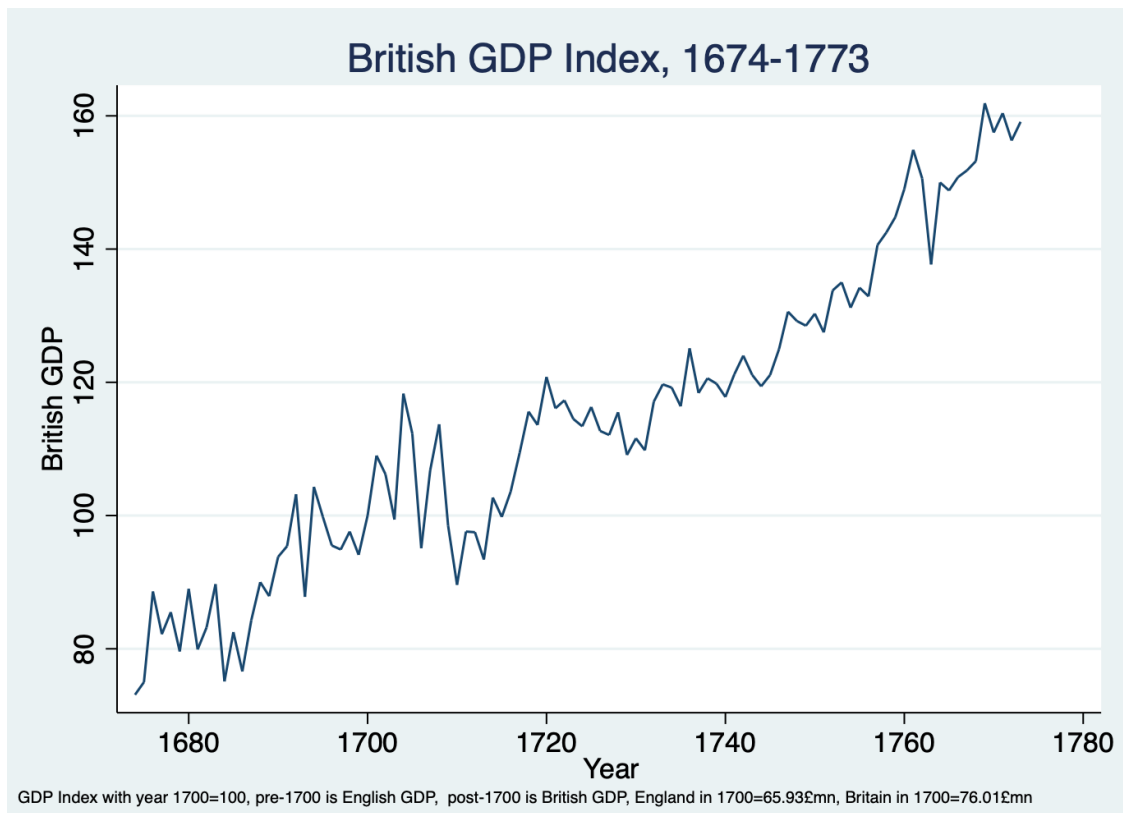
Figure 9.1 British Population Index, between 1674 and 1773¹⁰⁹



¹⁰⁸ Schön and Krantz, "The Swedish Economy in the Early Modern Period," p. 539.

¹⁰⁹ Stephen, Broadberry, *British Economic Growth, 1270-1870*, West Nyack: Cambridge University Press, 2014.

Figure 9.2 British GDP Index, Between 1674 and 1773¹¹⁰



The same rationale of including the Swedish GDP and population statistics applies to the inclusion of British GDP and population statistics but instead of increasing the supply available for export in Sweden, rather in terms of raising the demand for Swedish iron in their largest foreign market. As mentioned above, these figures are indices used to obtain continuous figures. Both figures show relatively sharp increasing trends starting in the 1680s and consistently rising throughout the entire time period. This aligns with the transition from the commercial revolution to the beginnings of industrialisation in Great Britain which is likely to translate into greater demands of iron for manufactured goods.

The above-described statistics do not give a clear answer on whether the implementation of the Commodity Act of 1724 increased the value or volume of iron shipped from Sweden to England through *Öresund*. This motivates the

¹¹⁰ Stephen, Broadberry, *British Economic Growth, 1270-1870*, West Nyack: Cambridge University Press, 2014.

construction of the time series regression; the results of which are presented in the following part.

6.2 Time Series Regression

Table 1 Time Series OLS Regression: Lagged Total Weight of Iron¹¹¹

Table 1: Time Series OLS Regression: Lagged Total Weight of Iron	
Dependent Variable: Lag Weight of Total Iron Shipped Through <i>Öresund</i>	
	(1)
Commodity Act	4345155* (2444600)
Franco Dutch War	-3795711 (2623728)
Nine Years War	-5478851** (2235550)
Sweden in the Nine Years War	4383078* (2609786)
Great Northern War	-3200555 (2032503)
Spanish War of Succession	568277.5 (1996676)
Tuscarora War	3220523 (2327982)
Austrian War of Succession	-1398763 (1822911)
Sweden in the Austrian War of Succession	62778.85 (2838698)
Seven Years War	82204.05 3077671
Sweden in the Seven Years War	-594028 (3429666)
Swedish Population	-19.60074 (12.57133)
Swedish GDP	16084.6*** (4445.375)
British Population	-209853.7 (262025.4)
British GDP	65081.93 (82303.53)
Observations	99
R-Squared	0.3326
Adjusted R-Squared	0.2119
Prob > F	0.0017

Note: Sig on 10 percent level * - 0.1, Sig on 5 percent level ** - 0.05, Sig on 1 percent level ***- 0.01, standard errors in paratheses.

¹¹¹ Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

Table 1 demonstrates the results of an OLS time series regression with the lagged total weight of iron, in kilos (kg) shipped through *Öresund* per year as the dependent variable and a dummy variable for the establishment of the Commodity Act. Furthermore, there are an additional 14 covariates. These include dummy variables for the Franco Dutch War, the Nine Years War, Great Northern War, the Spanish War of Succession, the Tuscarora War, the Austrian War of Succession, and the Seven Years War. These have separate dummy variables to measure Swedish involvement as Sweden was not involved in all wars and if they fought, they were usually not involved for the entire duration of the war. The final set of independent variables include the population and GDP statistics for both Sweden and Great Britain.

The time series regression has an R-Squared variable, which is the proportion of variance in the dependent variable that can be predicted by the independent variables, of 0.3326 which is a relatively low explanatory power. Moreover, the adjusted R-Squared, which controls for chance variation in the sample, is even lower at 0.2119. The Prob > F variable is at 0.0017 which means that the independent variables reliably predict the dependent variables by means of statistical significance at the 1 percent level.

The coefficients demonstrate rather interesting results. As indicated by the coefficient for the dummy variable for the implementation of the 1724 Commodity Act, it translates to an increase of 4,345,155 kilos, or approximately 4345 tonnes, of iron shipped through *Öresund*. This variable is significant at the 10 percent level. It is therefore possible to argue that the introduction of mercantile policy on Swedish iron trade had a statistically significant positive effect on the volume of iron passing through *Öresund*. The dummy variable for the occurrence of the Franco Dutch War translates into a decrease of 3,795,711 kilos in the weight of iron shipped from Sweden to England but is not statistically significant with a P-value of 0.152. On the other hand, the dummy variable for the Nine Years War translates into a decrease of 5478851 kilos with a statistical significance at the 5 percent level. However, Sweden's involvement

in the Nine Years War translates into an increase of iron weight shipped through *Öresund* with statistical significance at the 10 percent level. The dummy variable for the Great Northern War translates to a decrease in iron but is not statistically significant, despite the occurrence of a three-year embargo of Swedish Trade during the 20-year duration of the war. Wars that Sweden is not involved in, such as the Spanish War of Succession and Tuscarora War, translate into increases in iron weights shipped through *Öresund* to England but do not display satisfactory levels of statistical significance. This might be because war may increase the English demand for iron to be used in the manufacturing of military and warfare related goods. The remaining dummy variables for European wars do not have satisfactory levels of significance.

Only one of the independent variables on Swedish and English population and GDP statistics is significant. A one unit increase in Swedish GDP translates into an increase of 16084 kilos in iron, with statistical significance at the 1 percent level. This is in line with the idea presented above, with regards to overall economic growth at the beginning of industrialisation contributing to greater efforts on industry and in turn larger levels of exports.

Table 2 Time Series OLS Regression: Lagged Total Weight of Iron with Trend Variable¹¹²

Table 2: Time Series OLS Regression: Lagged Total Weight of Iron with Trend Variable
Dependent Variable: Lag Weight of Total Iron Shipped Through Öresund

	(1)
Commodity Act	6184798** (2988417)
Franco Dutch War	-5223250* (2942357)
Nine Years War	-5696109** (2242884)
Sweden in the Nine Years War	4060535 (2624981)
Great Northern War	-1786222 (2424128)
Spanish War of Succession	-491858.8 (2228114)
Tuscarora War	4486737* (2610520)
Austrian War of Succession	-728376.3 (1926409)
Sweden in the Austrian War of Succession	18840.23 (2836579)
Seven Years War	248105 (3078968)
Sweden in the Seven Years War	-997903.9 (3447533)
Swedish Population	-11.93374 (14.466)
Swedish GDP	15017.94*** (4552.409)
British Population	-73126.77 (291405.5)
British GDP	89690.6 (85398.21)
Trend (t)	-143939.6 (134722.6)
Observations	99
R-Squared	0.3417
Adjusted R-Squared	0.2133
Prob > F	0.0021

Note: Sig on 10 percent level * - 0.1, Sig on 5 percent level ** - 0.05, Sig on 1 percent level ***- 0.01, standard errors in paratheses.

¹¹² Tresoar. *Sound Toll Registers Online*. <http://dietrich.soundtoll.nl/public/>

The second regression table, as seen above, uses the same dependent and independent variables but includes a trend variable T in order to control for any inherent time trends within the data. This increases the R-Squared from 0.3326 to 0.3417, which is still not a high explanatory power. On the other hand, the significance decreases slightly with the new P-value at 0.0021. The coefficient for the Commodity Act dummy variable increases, reaching 6184798 kilos of iron, which means that the weight of iron shipped from Sweden to England increased, with a greater statistical significance at the 5 percent level. Once again, this suggests that the implementation of the Commodity Act had significant positive effects on the total weight of iron shipped through *Öresund*. The Inclusion of the T variable further strengthens the results as it indicates that it is not simply inherent trends that have informed the results. Furthermore, the T variable on its own is not statistically significant.

The dummy variables for the Franco Dutch War and the Nine years War increase their levels of statistical significance and the weight of iron decreases even further. In the second regression the dummy variable for the Tuscarora War is statistically significant at the 10 percent level and translates into an increase in iron weight of 3,220,523 kilos. The variable for Swedish GDP remains significant at the 1 percent level.

Ultimately, the combination of the regressions results, and the descriptive statistics provide empirical support for the hypothesis that the implementation of the Commodity Act of 1724 increased the volume of iron that passed through *Öresund*. However, due to the tax exemption on Swedish ships before the end of the Great Northern War it is not possible to draw any conclusions regarding if the value of iron passing through the *Öresund* increased.

7. Conclusion

This paper has aimed to investigate the relationship between the implementation of far-reaching mercantile policy and a country's leading

industry. Following the end of the Great Northern Wars in 1721, Sweden had lost its position as military power and no longer had use for absolutist rule. Focus shifted inwards, and the absolutist regimes led by Charles XI and Charles XII were replaced with a new form of constitutionalism before the peace with Russia at Nystad in 1721. The never-ending wars that had characterised the large European military powers were replaced by a constant striving towards domestic economic growth and modernisation of the Swedish Society which was to be achieved through the implementation of new mercantile policy.^{113 114} The implementation of the Swedish Commodity Act of 1724 aimed at bolstering domestic industry, navigation, shipping and Swedish Trade. Historians argue that the large-scale societal change that the new Swedish state dreamed of was rather limited, except in the leading industry: iron. This dissertation has posed the question whether the implementation of the Commodity Act of 1724 was able to increase the volume and value of iron exported from Sweden.

The results, as presented in section six, indicate that Swedish mercantilism was somewhat successful in bolstering the leading industry – iron. The descriptive statistics demonstrate that the total weight of iron passing through *Öresund* slightly increased following the implementation of the Commodity Act. Moreover, the results contradict the Hecksher and Carlén’s findings on the size and average weight of cargo carried per ship. They suggest that mercantile policy induced the construction and use of larger ships that could transport heavier cargo, thus increasing average weight of cargo per shipment increased the total tonnage without increasing the number of shipments. The results provided above indicate that this was not the case, but rather that the slight increase in number of shipments following the implementation of the Commodity Act helped to bolster the total tonnage since average weight of iron per shipment remained relatively constant throughout. However, the descriptive statistics alone do not formally solidify the supposed success of the Commodity Act in the bolstering of the iron trade. The results of the time series OLS regression indicate that the

¹¹³ Magnusson, "Mercantilism and "Reform" Mercantilism," p.415.

¹¹⁴ Magnusson, "Mercantilism and "Reform" Mercantilism," p.416.

implementation of the Commodity Act increased iron tonnage by 6,184,798 kilos with a statistical significance at the 5 percent level. Both the descriptive statistics and the regression results indicate that the occurrence of different major European wars had a statistically significant impact on the weight of iron shipped through *Öresund*.

The long run success and stability of the Swedish iron industry is evident. Even today, economic activities related to iron manufacturing remain among Sweden's most successful and leading industries, a position it has held for the past five centuries. Scholars often attribute the success of Swedish iron to the high levels of human capital available within the industry but also point to the ability to adapt in the face of adverse shocks.¹¹⁵

As mentioned above, two key contemporaries, Chydenius and Polhem, vehemently opposed any imposition of the mercantile policy as it restricted foreign trade to a few select towns and limited the opportunities for economic growth in smaller regions. Additionally, Heckscher argues that the restrictions on imports and the state-backed shipping privileges meant that key goods such as grain and salt became more expensive thus harming the people living close to subsistence levels.¹¹⁶ Together these arguments form critique on mercantilism regarding its impact on the Swedish population, however, this is beyond the scope of this investigation. Future studies on mercantilism in Sweden may want to expand the evaluation of mercantile policy and its impact on the iron industry through a domestic lens which could account for domestic price changes. With regards to the foreign trade lens established in this paper, the commodity act was successful in bolstering the country's leading industry.

¹¹⁵ Kerstin Enflo, and Joan Ramón Rosés, "Coping with Regional Inequality in Sweden: Structural Change, Migrations, and Policy, 1860-2000," *The Economic History Review*. 68, no. 1 (2015): 191-217.

¹¹⁶ E. F. Heckscher, "[The economic history of Sweden from Gustav Vasa: The foundation of modern Sweden]" (Vol. 2:2), p. 670.

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