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Swedish trade during the Scandinavian Monetary Union

by

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The effects of monetary union on the trade of member countries have been debated. Economists have suggested that monetary unions can significantly increase trade with other member countries in the monetary union and even outside it. This thesis investigates the Swedish membership in the Scandinavian Monetary Union (SMU) from 1875-1910. Using collected data and a tailor made data set on the bilateral trade of the most traded products. Sweden's bilateral trade between members of the monetary union is compared to non-members. Firstly, on a product level with specialisation indexes, followed by calculations of Revealed Comparative Advantage over time. Finally, a gravity model is applied to quantify any potential SMU effect. The results of this thesis are that the SMU did not have a significant impact on Swedish bilateral trade compared to non-members. Moreover, the thesis illustrates the changes of Swedish exports and imports during this period, confirming previous works on Swedish trade.

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1 Introduction

The Scandinavian Monetary Union (henceforth abbreviated to SMU) was a monetary union between Sweden, Denmark (1873-1914) and Norway from 1875. It meant that a common currency bound to the gold standard was used in these countries, this common currency was called the Krona. Economists Frankel and Rose have shown that a common currency can promote trade to partnering countries especially, but also in general (Frankel and Rose, 2002). The role of trade has also been discussed in the debate on Swedish industrialisation, with two models being central (Ljungberg and Schön, 2013). The two models are the *Export Model* and the *Domestic Market Model*, where the first has a focus trade (Ljungberg and Schön, 2013). Therefore, this thesis aims to study Swedish exports during this period to gain an understanding of how the trade developed and if it was different for the SMU members. The effects of a common currency have most recently been discussed in the light of the European Monetary Union today. The discussion about the European Monetary Union brings to light that there is an ongoing debate on the role of monetary integration. Economist as Krugman predicted the EMU, to lead to increased divisions caused by specialisation. Others suggest that the EMU is unlike historical monetary unions, this is argued by Bordo, who more or less finds the EMU to resemble a national currency (Bordo, 2004). Whilst Fendel and Maurer argue that the historical monetary unions differ to the EMU in that they were bound to metal (Fendel and Maurer, 2015). The SMU followed the gold standard, although the authors argue that today's monetary unions can learn from those of the past (Fendel and Maurer, 2015).

Frankel and Rose find that the common currency increases trade, but this thesis also investigates the products being traded. In order to investigate that for this thesis, a tailor made dataset of the value of exports and imports of specific products has been collected and constructed. To make comparisons over time, the products are categorised according to a standardised system for trade data. This allows for analysis on the trade over time with different countries in the different trading categories.

1.1 Aim and Scope

The role of trade and how it changes is a fundamental part of economic growth. Different authors have highlighted a range of effects and features particular to trade and development in different countries and time periods. This thesis aligns to the previous research along the lines

of (1) monetary integration and trade, and (2) industrialisation and trade. The thesis utilises Sweden as an example to these relations. Further, the thesis limits the time period of interest to 1873-1914, (which corresponds to the durance of the Scandinavian Monetary Union). The following passages serve to answer three fundamental questions; (1) why study trade and economic development, (2) what we can learn from the effects of monetary unions as well as industrialisation, and (3) why is Sweden (and the Scandinavian Monetary Union) a relevant example?

Firstly, trade and economic growth is of importance because of its firm roots in economic theory. Previous theorists have highlighted this by declaring trade as fundamental to economic growth and a means of increasing productivity (Baldwin and Gu, 2004, Frankel and Rose, 2002). Thus, trade has become central in understanding how states develop and the possibilities in increasing welfare. Further studying trade allows methodological benefits, giving the possibility of detailed quantitative study. Secondly, the effects of a monetary union are of interest as these represent a subset of the wider debate on monetary integration. Monetary integration has been argued to have both positive and negative effects on the nations involved. The more sceptical see this as a cause of concern, leading to greater divisions caused by specialisation. However, other authors argue that increased monetary integration leads to increased trade and thereby enhanced economic growth (Flandreau and Maurel, 2005). Moreover, industrialisation is relevant for this thesis as it can be seen as both the cause and the product of trade. This as trade can allow for the transfer of technology and knowledge leading to development of the economy (Schön, 2006). With economic development, new products become part of the trade and can promote innovation (Baldwin and Gu, 2004). Industrialisation and trade are found to have a significant input on the factors of production in the economy (Schön, 2006). Therefore, under the period of interest industrialisation and trade is a key in understanding Swedish development. Thirdly, Sweden is a suitable example for this thesis as Sweden's participation in the Scandinavian Monetary Union can be seen as a model example of a country choosing to participate in project of monetary integration. Further, the monetary integration debate today has had a focus on the EMU in which Sweden has chosen not to participate. Thus, performing this historic analysis allows supplementary insight into the effects of monetary integration for Sweden and, in a broader perspective, the effects of monetary unions and the gold standard in general.

To address trade and monetary integration as well as industrialisation, this thesis uses indexes and econometrics. Firstly, descriptive statistics of the collected data is presented, but in order to give a more in-depth understanding of the changes on the exports and imports of Sweden, the Herfindahl index is used. This illustrates the changes in value between different products and addresses the concerns of specialisation caused by monetary integration. Furthermore, based on the same data and products, the Revealed Comparative Advantage (RCA) is calculated, bi-laterally for Sweden, and a group of countries and the SMU. The RCA created by Balassa utilises trade data to highlight comparative advantages based on the trade between countries, assuming that the trade data reveal a countries advantages in production (Balassa, 1965). Moreover, this measure also reveals the product categories being traded, and the countries involved, giving away information about the industrialisation and the development

taking place in different countries in Europe compared to Sweden. Finally, to address the direct effect of the SMU and monetary integration on trade, a gravity model is applied for the trade of Sweden. Targeting to estimate the effect of the SMU and the gold standard, in order to measure their impact on Swedish trade.

The data used for the Herfindahl and RCA indexes in this thesis are constructed using data from statistical yearbooks, made available through Statistics Sweden. To further analyse the trade, the data is categorised according to the SITC classification system created by the United Nations. Which provides the thesis the possibility to display changes of products for export and import over time. The results are displayed and discussed on the backdrop of the discussion of industrialisation and internationalisation of Sweden through a comprehensive results section. Covering the impact of the monetary union and the gold standard. Further a comprehensive set of appendixes provide the reader with all results that were not actively commented on.

1.2 Scandinavian Monetary Union

In brief, the Scandinavian Monetary Union was created in 1873 and lasted until the first world war after which it was gradually deconstructed. Its members were, Norway, Sweden and Denmark (Øksendal, 2007). The monetary union was created with the ambition of increasing regional integration and, in the spirit of the time, an increased liberalisation in trade (Øksendal, 2007). The union continued to develop and a pivotal year is that of 1885, in which the union was expanded with an additional agreement, which had the result of decreasing the gold flow between the members (ibid). Compared to monetary unions today[1] it can be seen that the SMU was decentralised, with no common central bank or institution jointly governing it (ibid). Øksendal argues that the impact of the monetary union is under ongoing discussion (Øksendal, 2007). Therefore this theis aims to study that impact and points to the necessity of this study in the research. The following passages explain in detail the founding of the monetary union and research of its impact that have previously been done.

During the 19th century Europe, monetary integration, (both within countries and across larger monetary unions) became a common practice. Similarly, Sweden during this period was considering joining the bimetallic (silver and gold) Latin Monetary Union (henceforth LMU) (Bergman and Jonung, 2011). However, the changing circumstances caused by Franco-Prussian war is argued to have brought the discussion onto a Scandinavian Monetary Union (ibid). The

[1] The name Scandinavian Monetary Union, is itself questionable according to Flandreau and Maurel who argue that calling it a monetary union is misleading, as it lacked a central bank and rested upon the using a common coinage that was legal tender across its member countries Flandreau, M. & Maurel, M. 2005. Monetary union, trade integration, and business cycles in 19th century Europe. *Open economies review,* 16**,** 135-152..

Scandinavian Monetary union can be seen to come into discussion, through Germany moving onto the gold standard in 1871 (Talia, 2001). This meant that the Scandinavian countries had to respond, deciding to move onto the gold standard, as a consequence of Germany selling its silver on the markets decreasing the value of other currencies that were bimetallic or using silver (ibid). The Scandinavian reaction to this began with talks, discussing how to change the currencies of the Danish and Swedish monetary system. The idea that there ought to be a common Scandinavian currency was underpinned by the argument that its effects would be an increased trade between the Scandinavian countries (p. 74, Talia, 2001). There followed discussion if any other larger currency system could be used in the case of Scandinavia, however finding flaws in the systems of France and Great Britain, it was decided to pursue a new monetary system (ibid). The French system of the LMU, was bi-metallic and politically unsuitable after the Franco-Prussian war (ibid). Whereas the British system was based on gold, however it did not follow the decimal system (p. 75, Talia, 2001).

The talks lead to voting in the national parliaments, were both Sweden and Denmark voted in favour of the proposal of the monetary union, leaving Norway to vote for it in parliament at last (p. 81-86, Talia, 2001). In the Norwegian Parliament the reform of the monetary union was did not pass the vote in parliament, leaving Sweden and Denmark to initiate the monetary union. The Norwegians did join two years later in 1875 (ibid). Talia argues that the creation of the monetary union was hinged upon the need to switch towards the gold standard. The currency created was called the Krona and was created equal to that of the previous Swedish Riksdaler (Bergman, 1999). After the creation of the monetary union, the members still kept the central banks separate allowing for separate monetary policy (ibid). The monetary union was created on the basis of coinage, however what can be seen is that during its existence, notes where treated equally and allowed for acceptance within the entire union. In 1901 the notes was accepted in the members central banks on par with the national currency (Bergman, 1999).

The role of the cooperation between the central banks in the Scandinavian monetary union is highlighted by Rongved. The author argues that the monetary union did not have the mechanisms in place to handle any political or economic crisis (Rongved, 2017). Further, the agreement on the monetary union focused solely on the creation of a common currency and there were no any common trade agreements (Bergman, 1999). Therefore, the SMU did not cause a deeper integration or trade agreement, however as Frankel and Rose stated, a common currency ought to have a significant effect on trade (Frankel and Rose, 2002). The ending of the cooperation in the monetary union began in 1905, caused by Norway abandoning the union with Sweden, leading to the revocation of agreements (Bergman et al., 1993). This as the union between Norway and Sweden ended during the year 1905. After 1905, it was no longer necessary to accept the notes at par (ibid). The union continued to function until 1920, however the dissolutions can be seen to have begun during the beginning of the first world war when gold convertibility ceased (ibid). Thus, this thesis uses data from the year 1875, after Norway was a member, until the year 1910. Thereby, the scope of this thesis is delimited to exclusively involve the years 1875-1910.

1.3 Previous Research

This thesis examines the patterns of trade of Sweden during the Scandinavian monetary union. With the use exports and imports over time for specific products, the thesis allows for an estimation of the monetary integration's effect on trade. The paper uses multiple techniques to uncover, specialisation in production and Sweden's Revealed Comparative Advantages during this period. Below the theoretical background and previous research on the history of the SMU and its impact, as well as methodology and theories of trade and monetary unions are reviewed.

The reasons to study monetary unions and their effects is because of their relation to trade. As argued by Frankel and Rose a common currency yields a positive effect on the members involved (Frankel and Rose, 2002). This as the cost of transacting is reduced, creating more trade, providing countries with a higher income. It is also mentioned that some authors find that the monetary union creates an environment of low-inflation, however as Frankel and Rose points out, there is also costs associated with keeping inflation low (bid). Frankel and Rose quantify their estimates of what the dollar and euro, have meant to the world economy and world trade. The authors find that common currencies do indeed have a positive effect on the observed trade. These findings sparked the interest on case of Sweden, and the SMU, below research more specific to the SMU is presented.

1.3.1 SMU and monetary integration

The monetary unions and their arrangements have previously been studied in the light of business cycle correlation, which is inherently connected to trade within the monetary union and an important for the suitability of a monetary union. Business cycle correlation between Denmark, Norway and Sweden is illustrated by Bergman and Jonung, showing that there was large independence in their business cycles and during the union they did not decline (Bergman and Jonung, 2011). The results are compared to the EU today where it can be seen that the economies are in more similar business cycles today interestingly, any effect on business cycle caused by the monetary union could not be found, however it is argued by Bergman and Jonung that the cause of this is increased trade with Germany and Great Britain. The reason for leaving any trade agreement outside the agreement is argued to be because of the lack of importance of the intra-Scandinavian trade (Bergman and Jonung, 2011). Thereby, arguing that the trade in Scandinavia was not of a particular importance. Further, the question if the SMU was an Optimum Currency Area (OCA) is addressed by Bergman, who finds that the SMU, often referred to as a very successful currency union was not an optimal currency area (Bergman, 1999). The OCA is a concept were the having a common currency is fruitful for its members. This usually means that the members of the OCA share similar attributes in trade, business cycles, movement of labour and possibility to control crisis through some central agency

(Frankel and Rose, 1998). Bergman choses to focus on the business cycle part of the criteria, where the hypothesis is tested through shocks to the economy (Bergman, 1999). The country shock symmetry in the SMU was found not to be high, suggesting that the linkages between the countries were weak. It is also found that the gold standard, provided a macroeconomic setting, which a common currency could not have any major impact upon (ibid). Thus, the SMU does not uphold the necessary criteria to be an OCA, meaning some of the effects associated with an OCA can be argued not to be observed. Although this in itself can be questioned as found by Frankel and Rose who suggest an endogeneity of the criteria caused by the increase in trade (Frankel and Rose, 1998). This would in the case of the SMU mean that even if the SMU is not an OCA according to Bergman, the increase in trade caused by common currency, could cause it to become an OCA. Therefore, the endogenous causality of the criteria is something that can be created by the increasing trade among the members, causing a higher correlation of business cycles. Frankel and Rose argue that because of the entrance to the monetary union the members involved will have substantial changes to their business cycle, meaning that domestic fluctuations will change (Frankel and Rose, 1998).

Flandreau examines the trade in both the Latin Monetary union (LMU) and the SMU using a gravity model (Flandreau, 2000). Finding that the monetary unions, did not exhibit any bias in the monetary union dummy variables. In the case of the LMU, the monetary union was possibly the cause of already an increase in integration that had been occurring. The results are based on three years, 1860, 1870 and 1880, this can be seen to allow room for improvements in the estimation of the effect of the monetary union. In the more recent study of the topic with a similar method, Flandreau and Maurel find that the effects of monetary union was significant (Flandreau and Maurel, 2005).The fluctuating exchange rates can be seen as one of the main causes for monetary integration and was the reasoning behind the creation of the Latin Monetary Union in 1865, with the member countries France, Belgium, Italy and Switzerland (p. 76, Schön, 2012). The LMU was bimetallic whilst Great Britain used gold standard to control the fluctuation of exchange rates. Moreover, it can be seen that the key problem that was attempted to be solved through monetary integration were the fluctuating exchange rates. Schön argues that the importance of the non-volatile exchange rate made it easier to lend and raise the capital needed for industrialisation (p. 77, Schön, 2012).

Øksendal contributes to the debate, highlighting that previous studies could be flawed in the sense that the effect of the SMU and the effects of the gold standard can not be separated (Øksendal, 2007). Øksendal further argues that the differences in trade, the loss of shares within the monetary union, is caused by Swedish development of manufacturing, increasing those exports to neighbouring countries. Thereby causing this shift in trade away from SMU. In summary, Øksendal argues that the SMU, holds little relevance or lessons for today and that the effects of it are misinterpreted, instead being caused by the gold standard. This thesis on the other hand investigates if the effects on trade are similar to those Frankel and Rose find in for countries having a common currency (Frankel and Rose, 2002). The integration, is argued to mainly have been within the financial sector, where the SMU had very little effect on trade flows. The importance of gold is also emphasized by Bergman et al. who find that the compliance to the gold standard was what held the union together (Bergman et al., 1993). Thus,

the gold standard can be interpreted as being the key reason of why the monetary union functioned. The SMU requires further research, because it was during this period that the convergence between Sweden, America and Great Britain as argued by O'Rourke and Williamson was taking place (O'rourke and Williamson, 1995). Therefore, it is necessary to consider the role of common currency and trade for Sweden.

Another theoretical argument of why common currency ought to support the creation of trade, is provided by Micco et al. arguing that that not just the reduced exchange rate (Micco et al., 2003). However, that the actual cost of the companies functioning in the economy decreases because of no longer having the necessity of holding multiple currencies (ibid). Further the use of the common currency in the union provides incentives of increased trade with non-members as the cost of protecting against the volatility risk decreases as the common currency is more liquid (ibid). Micco et al. raise important questions with regard to the EMU of how common currency could affect trade, if the effects on trade are instant, gradual or lagged. These questions are also relevant to the SMU, as it is not known if there is an effect caused by the SMU and how this effect is timed (ibid).

The industrialisation of Scandinavia can according to Ljungberg and Schön be divided into two interpretations. One arguing that the industrialisation and economic growth was caused by the expanding trade driven on by demand (*Export Model*) (Ljungberg and Schön, 2013). Finding for example that the difference in products exported where the cause behind the growth. With foods from Denmark and fish from Norway and in the case of Norway reaching its height in 1840 (Ljungberg and Schön, 2013). According to the export model, foreign demand, created an environment of high prices, therefore creating profits in Scandinavia, supporting the countries growth (ibid). The second interpretation the *Domestic Market Model* is the one the importance of the domestic market. This model finds exports still to be of importance, however find important explanatory variables within Swedish agriculture, society and demographic factors. Ljungberg and Schön show high export to GDP ratio in the Nordics begins early on, thus questioning the causality of the export industry and the start of the economic growth. Therefore, this thesis will look more into is the evolution of products being exported during this period. Further, Ljungberg and Schön finds that the technological change and investment come from the imports of capital, making it possible to industrialise (Ljungberg and Schön, 2013).

Looking more specifically at Sweden it can be seen that up until the 1890s can be characterised with high growth and market integration (Schön, 2006). The growth was supported by technologies that provided the possibility for increased growth (ibid). Furthermore, the growth of the economies is seen to diverge (north and south) after the 1890s, Schön describes the introduction of different factors of production in the economy, namely human capital. The story of Scandinavian growth during the industrialisation, can be seen to have been caused by the trade with the rest of the world, but also contributed to by the inflow of capital and outflow of people (Schön, 2006). Whilst the industry evolved, Schön finds that the exports from Sweden still constituted the traditional industry, not really reflecting the technological progress in Sweden (ibid). The technological progress was created through an internal demand created by the traditional industries in Sweden. Furthermore, Schön shows that the exports stayed the equal

during this period and that the export products remained static. However, there are very different interpretations of the cause of Swedish growth one is suggested by Wicksell, who finds that the decreasing the labour-force caused by out-migration was the cause of the growth in Sweden compared to Great Britain. O'Rourke and Williamson tests this hypothesis given by Wicksell, finding that labour migration was a cause accounting for the convergence in wage, but by approximately 10% (O'rourke and Williamson, 1995). Thus, labour migration is not the whole story as Wicksell believed[2]. This also leaves possible explanations in the area to trade and monetary integration as supportable causes behind Swedish development.

The classification of what the SMU is was is not clear, as it lacks features commonly associated with those, for example a central bank or any authority over the issuing banks in the union. Being on the gold standard, the acceptance coins is a given, but what the issuance of notes being converted at par at the central banks in 1901 is more interest (Bergman, 1999). This as the issuance of notes constitutes the risk of over-issuance and the deterioration of value, the exchange of currency at par creates a competition-like measure. The effect of having a common currency ought to have a positive effect on trade as found by Frankel and Rose, the exact debate whether to consider it a monetary union or not becomes of lesser importance (Frankel and Rose, 2002). Thus, this essay investigates if a common currency regardless of having a central banking authority over the currency has an effect on trade on its members.

1.3.2 Specialisation and trade

The role of moving away from primary products and diversifying trade has been debated with regard to development (Cadot et al., 2013). With Cadot et. al. showing that the diversification of products seems to follow a U-shape in relation to the PPP of the economy, where previous research has found a correlation between increased diversification and economic growth. The work of Cadot et al. shows that the study of exports and export diversification is of importance, both as the role of diversification is under the debate, but studies of descriptive nature can be used to draw conclusions (Cadot et al., 2011). To uncover the path of diversification or specialisation, Cadot et al. utilize, three measures of indexes, the Gini, Herfindahl and the Theil index. These indices in relation to GDP are used to see when exports occur, what diversification-causing sources are and at what GDP level inflections of specialisation and diversification happen. Thereby, the products that are being exported can be effected by the economic growth of the country, not only monetary changes or changes in the cost of trading. Two important terms are used here, firstly the extensive margin, this is refers to the number of different products being exported (new products being introduced) (Cadot et al., 2013). Secondly, the intensive margin refers to the inequality between the sizes of the products being exported (Cadot et al., 2013). This sought after policy effect of diversification is also affected by monetary policy, as argued by (Flam and Nordström, 2006). Using the EMU they find that

[2] The out-migration from Great Britain was almost equal to that of Sweden (O'rourke and Williamson 1995)

common currency increases trade, as well as both the extensive and intensive margin for exports (Flam and Nordström, 2006). Therefore, this thesis aims to explore whether these effects are present for the SMU as well. Using the methods suggested by Cadot et al. with the expectations given by Flam and Nordström, the SMU's impact on Swedish trade is very relevant.

1.3.3 The Gold Standard

The gold standard is an essential part in what the function the SMU played for Sweden and the trade. This section provides a theoretical background of what the gold standard is and its historical applications. Firstly, one of the most important aspects that the gold standard filled was the role in balancing payments and to choosing a standard can depend on the extent the country wants to globalize (p. 95, Eichengreen and Flandreau, 2005). In regard to the functioning of the gold standard there are different theories of its workings and why it ought to function. Further, it can be seen that movements of capital play a large role, in the case of developing countries it has been argued that the possibility of running a deficit provided the necessary growth (p. 104, Eichengreen and Flandreau, 2005).

Effects of exports and imports are also created through the movement of the capital and foreign lending, with interpretations saying it can either create or reduce demand on goods. This is represented in the Ford-model of the movement of capital by Eichengreen, who finds that it was the promise of staying on the gold standard, the commitment by the government and the wide use of the gold standard that made it function (p. 144-148, Eichengreen and Flandreau, 2005). In our sample of countries and in the discussions of creating the SMU, bimetallism is mentioned as being an option.

It can be seen that a majority of the countries during the period of the SMU or became gold standard countries in the beginning. The times at which the gold standard was adopted can vary depending on author (Mollick, 2016). Further, it was common for countries not to be able to hold the up the gold standards during periods of crisis which results in countries going, on and off the gold standard (Mollick, 2016). For the countries that are examined in this thesis, the earliest adoption date will be chosen. This is because Eichengreen mentions that it is the commitment towards the gold standard that matters (p. 148, Eichengreen and Flandreau, 2005). Moreover, Kee-Hong and Warren describe the situation of LMU, with suspension of the minting of silver in some countries, essentially meaning that the currency was on gold (Kee-Hong and Warren, 2011). In the table below the years which this thesis will use as the year of adoption for the gold standard are presented:

Table 1 Year of adoption for the gold standard

Country	Gold Standard from Year	Reference
France	1873 [3]	(Mollick, 2016, Kee-Hong and Warren, 2011)
USA	1879	(Mollick, 2016)
Great Britain	1870	(Mollick, 2016)
Germany	1872	(Mollick, 2016)
Denmark	1873 (SMU)	(Talia, 2001)
Norway	1875 (SMU)	(Talia, 2001)
Finland	1877	(Pipping, 1955)
Russia	1897	(Mollick, 2016)
Belgium	1872	(Kee-Hong and Warren, 2011)
Netherlands	1873	(Kee-Hong and Warren, 2011)
Sweden	1873(SMU)	(Øksendal, 2007)

The earliest dates are taken for the time adoption as seen in the table above, as the countries began to commit towards the gold standard. Showing that most of the countries in the sample used in this thesis are gold standard countries, making it unnecessary to control for this variable and allows for the identification of possible trade-bias towards the SMU. Øksendal illustrate the problem of making a distinction between the gold standard and the SMU major problem, this problem is approached by this thesis by taking a sample of countries all abiding the gold standard (Øksendal, 2007). One must also notice that in this thesis the SMU countries were on the gold standard during the entire period, thus the gold standard effect a constant effect. Were the gold standard can have lowered the exchange rate volatility of Krona, however using a common currency is the aspect that this thesis is concerned with.

In terms of analysing causes of trade and the use of the measure of comparative advantage, Deb and Hauk account the usage of traditional trade models of Ricardo and Hecksher-Ohlin (Deb and Hauk, 2017). Analysing the usage of several indexes of trade, finding that the Logarithmic-Balassa index provided consistently strong results, furthermore the use of these are supported by the theoretical assumptions of the Ricardo model. Showing that there are theoretical consistencies in the usage of RCA indexes, further strengthening the relevance of the method use in this paper presented below.

[3] The year 1878 can be found in Mollick 2016 to illustrate the differences in the given years

1.3.4 Research Problem

Based previous research this essay lifts forwards these unanswered questions:

How did Swedish exports and imports in the SMU change over time?

This question is necessary in order to illustrate the changes that Swedish imports and exports undertook during this period, especially if there are any effects particular to the SMU. With Flam and Nordström showing that common currency does have an effect on the type of products being traded (Flam and Nordström, 2006). This is a central part of the essay, displaying the products being traded over time. This leads to the question:

How did the SMU affect the revealed comparative advantage of Sweden?

This would allow to gain a better understanding of bilateral trade flows. With the RCA being able to show how the comparative advantage changes over time. Also showing where advantages of trade are and if these are affected by any type of specialisation.

Was there a bias towards the SMU in the trade for Sweden?

The role of monetary integration and trade is a central question for this essay. Based upon the work of Frankel and Rose, who find an extremely positive response to countries using a common currency (Frankel and Rose, 2002). This essay examines if their findings hold true for the SMU and if a common currency had similar effects during the gold standard.

1.4 Theory and Trade models

Below relevant trade models are presented. Starting with the classical trade models, Ricardo and Hecksher-Ohlin. Further, specialisation and differentiation in trade is discussed. Followed by theory on networks and how they can influence trade.

1.4.1 Classical trade models

The trade model given by Ricardo is central to the arguments of trade and specialisation, as well as assumptions commonly used in understanding trade. The model is based on two countries, with two goods, observed in autarky. The model then shows that engaging in trade, the country which is more productive in producing one good compared to the other country (i.e. depended on price), will export that good and import the other good (Deb and Hauk, 2017). Showing that one gains from specialising in production of goods and thereby gaining the

possibility to consume more. One obvious limitation of this model is the impossibility to observe prices in autarky. Furthermore, the two goods, two countries and one factor of production is a cause for concern. However, it can be seen that this model and its assumptions has been widely used in analysing specialization and trade. This model essentially argues that trade is created through the existence of comparative advantages labour. The Hecksher-Ohlin model is taking the assumptions of trade and specialization further, introducing two factors of production to the model. Introducing the concept of factor endowments being the cause of specialisation in trade, the factor endowments can be labour and capital (Deb and Hauk, 2017). The resulting trade would therefore be maximized between the countries according to their endowments, thus creating specialisation in trade. The Hecksher-Ohlin model itself was based on the experience of Sweden during the period of the SMU, where they found that the trade between Europe and the United States really showed the convergence of factor prices (Schön, 2006). Moreover as O'Rourke and Williamson points out that authors (Hecksher/Wicksell) during the end of the 19th century and the beginning of the 20th century interpreted the growth of Sweden to globalisation (O'rourke and Williamson, 1995). O'Rourke and Williamson point out, the role of open markets and attribute the growth in Sweden to these. Therefore, trade as described above is a manifestation of different factor endowments between countries. Frankel and Rose argue that the classical theories of trade show that the trade causes an increase in income for the trading partners, which is also found empirically (Frankel and Rose, 2002). Thus, boosting trade through the entrance of a monetary union ought to lead to a growth in income for the country. The classical models are although found to be flawed according to Frankel and Rose, as they fail to account for technology and substitutions of products (Frankel and Rose, 2002). Frankel and Rose find that the increase of trade and the openness to trade both result in an increase in income.

1.4.2 Trade differentiation and specialisation

The above classical models lead to a complete specialisation in trade. However, looking at trade statistics available, the world consists of two-way flows in some products. According to Lafay be caused by the categorisation of trade data, adding together products under one category (Lafay, 1992). Finding that that the products that are being imported and exported are similar although not identical, thus still allowing for product differentiation (Lafay, 1992). Lafay finds four causes of differentiation that may arise being, (1) natural resources, (2) lower relative costs in production, (3) lower relative costs in innovation and (4) monopolies. These differentiations decrease the effect of specialisation that is observed in trade data, as similar products can be created however still being different. What can be seen here by Lafay is an extended interpretation beyond relative factors of production being observed through the measure and that the results must be interpreted with detail. Further, in relation to the monetary integration, Frankel and Rose finds that common currency dramatically increases trade among its members, but also non-members (Frankel and Rose, 2002). Would that cause a greater specialisation overall? Flam and Nordström answers that question for the EMU by instead seeing an increasing trade of products, but also parts or unfinished products being traded (Flam and

Nordström, 2006). Consequently, this means that the overall increase in trade also causes the creation of trade in products that were not previously traded. Therefore, it can be the above theories of trade hold true, however more products will be traded (increasing extensive margin). Furthermore, Cadot et. al. finds that export diversification is also today being used as a part of industrial policy (Cadot et al., 2013). The authors find that the relationship of diversification of products, finding that trade liberalisation results in increased diversification (Cadot et al., 2013). However, also highlighting that problem of the measure of diversification, that there is a focus on the products being produced in the methods and the measure. This thesis examines the intensive margin for goods, the specialisation across the existing products.

1.4.3 Networks

The above trade models assume that trade flows ought to be sufficiently modelled using the costs and relative prices. However proposed by Greif and shown in the paper by Rauch and Trindade, who in the case of Chinese trade find a strong bias based on ethnic networks (Rauch and Trindade, 2002). The network functions so that they provide validations of contracts. Being a network makes it possible to punish those that do not follow the rules, giving an advantage to those that do (ibid). Further, the network allows for the sharing of information (Rauch and Trindade, 2002). This results in that trade, is not only created through the factors previously mentioned, but can be heavily influenced by people living in a country having an ethnic connection to people in another. Thereby, creating a positive network effect, something that is difficult to control for in the aggregated data and something that has to be kept in mind as a possible cause for error. In this thesis no-network related effect is controlled for and this could potentially affect the trade between SMU countries and the rest.

2 Method

In the following parts, three methods used in this thesis are introduced. Firstly, the specialisation indexes, that can help to reveal changes in the relative size of countries and products in the trade data. The specialisation indexes used in this thesis are the Herfindahl and the Theil index. This is followed by an introduction to the Balassa Index used to calculated the Revealed Comparative Advantage. Further, followed by a brief introduction to the gravity model and uses of it.

2.1 Specialisation in trade

The thesis aims to understand the pattern of Swedish trade during the period, one of the effects that on trade is that of specialisation. However, trade liberalisation according to Cadot et. al. can cause increased diversity. Monetary integration is also found to a cause of decreased specialisation in trade, found by Flam and Nordström (Flam and Nordström, 2006). The previous research discusses the role of trade diversion which is the decrease of specialisation on the product side. To illustrate the change, The Herfindahl index is used to both display the change and to give it measure. The indexes shown below have been used by Beine and Coulombe and Cadot et al., showing the effects of diversification or specialisation in trade. The authors argue that the Herfindahl and Theil index provides the most satisfactory results (Beine and Coulombe, 2007, Cadot et al., 2013). Beine and Coulombe composed their index entirely through the use of export data, arguing for a decreased effect in measurement error (ibid). The Herfindahl index as given by Cadot et. al. (Cadot et al., 2013):

Equation 1 Herfidahl index

$$S_t = \sum_{k=1}^{n} \left(S_t^k\right)^2$$

The subscript *t* stands for the time, *k* is the industry sector from which is being calculated, where S^k is the total share in trade of a specific industry. These are then squared and summed to create an index that ranges from 1/n (number of industries) to 1. The result of S can be interpreted as a number closer to 1/n indicates trade sectors that are equally weighted, showing diversity in trade whilst an increasing S shows increased specialisation. Therefore, the closer the index value comes to 1 the more specialised the mix of products become. Further, this index is used

to highlight changes in trade over time in different products giving a descriptive statistic of the trade.

The Theil entropy measure is given by the specification used in (Cadot et al., 2013).

Equation 2 Theil Index

$$\mathrm{T} = \frac{1}{n}\sum_{k=1}^{n}\left(\frac{x_k}{\mu}\right) ln\left(\frac{x_k}{\mu}\right) \qquad where\ \ \mu = \frac{\sum_{k=1}^{n} x_k}{n}$$

Here the μ becomes the average of the total exports as x_k embodies the trade in the product k and n the number of exported goods. Thus this index gives an insight into the diversity of products that a country exports that has been argued to be an important variable in understanding growth and development of nations. Although as seen above the $ln\left(\frac{x_k}{\mu}\right)$ can lead to having to take ln of zero when export of certain products do not exist. Consequently, becoming an unsuitable measurement when there are trade flows with zero value, between the countries in a product.

2.2 Revealed Comparative Advantage

The method used is the Revealed Comparative Advantage (RCA). The RCA was introduced by Balassa and is the most widely used index to measure RCA (De Benedictis and Tamberi, 2001). What is often discussed is the use of the index to measure the countries trade compared total world trade, however it can also be applied for bilateral trade. Where it has been used to find comparative advantages in trade in service between US, India and China seen below (Nath et al., 2015). In this case it is assumed that the entire world trade is between these two countries. The X_{ij} shows the export of country i in sector j, which is then divided by the total of all sectors. The thesis use for j, is the SITC categories 0 through 8. The M_{ij} it that of the total trade of the product, in this case, if Norway is the exporting country X_{ij}, Sweden becomes sectoral output in the rest of the world. The range of the index, is between 0 and an infinite number, where 0 is a complete disadvantage in the trade of the good. The index values larger than 1 is showing an advantage in the sector to the country (De Benedictis and Tamberi, 2001). This index from here on be referred to as the BI index.

Equation 3 RCA –Balassa Index

$$BI_{ij} = \frac{\left((X_{ij})/\sum_{j=1}^{n} X_{ij}\right)}{\left((X_{ij}+M_{ij})/\left(\sum_{j=1}^{n} X_{ij}+\sum_{j=1}^{n} M_{ij}\right)\right)}$$

An issue that can be seen with the use of this index is that it is asymmetric, meaning that it is not normally distributed. It is also highlighted that the index might not only show competitiveness but specialisation, relatively to other export (De Benedictis and Tamberi, 2001). Thereby, problems arise when the index is used for comparison, however standardisations are suggested, although at the expense of losing characteristics of the index (ibid). Furthermore country and product specific tariffs can have a distorting effect on the trade, also the assumption of this index lies in uniformity of taste and in the countries (Balassa, 1965).

It can be seen that the measurement of a comparative advantage is in itself a problem, as it relies on the assumption of a two factor and two country world (Ballance et al., 1987). Here it assumed that the prices we observed are created from economic conditions, which in turn create comparative advantages. These comparative advantages are illustrated through trade and consumption, thus revealed by the calculated RCA (ibid). Other measures that have been used are labour productivity in different sectors, however the problem is that there is a lack of data, showing productivity in these sectors (Balassa, 1965). It can be seen by Lafay, that the RCA can change because the ratios of exports and imports can be effected not by internal changes in the economy and not actually in the comparative advantage (Lafay, 1992). The relative trade balance of the country in relation to the GDP allows for the control of the macroeconomic changes of the country.

2.3 Trade

The choice of using a gravity model can be found among the reasons that Frankel and Rose argue for its suitability, being the most effective model for explaining trade (Frankel and Rose, 2002). A gravity model, shows that trade can be depicted using the notion of gravity, that large and the closer countries are attracting more trade to one another. The size of a country in the case of Flandreau is created through the use of total trade of that country, however as mentioned this can also be created using GDP measure (Flandreau, 2000). The specification of the gravity model according to that of Flandreau can be seen below.

Equation 4.

$$T_{ij} = Distance_{ij} + GDP_i + control\ variable$$

Flandreau uses the distance between capitals to represent this variable. This variable together with the weight variable constitutes the size of the economy. However authors have also found other determinants, language and proximity (Frankel et al., 1995). The guide by Yotov et al. shows that policy with tariff-like effects can be investigated using this specification (Yotov et al.).

The different methods that are discussed in this part is addressing the patterns of trade. What can be seen is that, although possible to create a picture of how the trade developed, the issue of narrowing down the causes of trade is difficult. That there could be effects caused by historical linkages, language, tariffs, politics and further aspects that are not under consideration in this thesis (Frankel and Rose, 2002). This as the historic data that is standardised and applicable for all countries in the sample are limited. Further geographical variables can be added, however there is no landlocked country in the sample. The only applicable case is bordering countries, which ought to have a positive effect on the trade. The works of Flandreau and Maurel uses the gravity model to address business cycle correlation and trade in Europe during the 19th century, finding potential effects of both monetary unions and gold standard countries (Flandreau and Maurel, 2005). However, the use of my specification above will allow for a more in-depth approach on the effects of monetary union and gold standard with Swedish trade. Frankel and Rose use the gravity model in order to find and illustrate the effect of a common currency for trade (Frankel and Rose, 2002). The gravity model can be considered a considered a common method in order to investigate different effects on trade.

It can also be seen that gravity model lends itself to the estimation of potential trade, allowing the prediction of what trade ought to be taking place based on distance and size. It can be seen that the prediction itself becomes limited by the sample of bilateral countries being used. One problem in this thesis is that the data used is limited to a set of 9 countries, further the amount of potential effects other than distance and GDP and monetary integration is not controlled for.

3 Data

The data is published by Statistics Sweden, shows the trade between Sweden and the countries of importance for its trade. From which the work *Historisk Statistik för Sverige, Del 3. Utrikeshandel 1732-1970* is used for aggregate trade in exports and imports for Sweden. Further data on specific products and their countries to where exports were sent and from where they were imported are recorded. Limits to historic trade data used, can be found as countries measured it differently, resulting in different values for exports and imports depending on the country, however using aggregates can avoid this problem (Federico and Tena, 1991). Further to avoid any problems regarding different country classifications the data used is limited to the Swedish trade data and not combined with other data from different countries for that time period. For the data on trade for specific products is found in the collection of statistics *Sveriges officiella statistik i sammandrag* through the years 1877-1913. These are digitalised copied made available by Statistics Sweden (SCB) and contain data for trades in goods from 1875-1910 with their destination and origin countries. This allows to arrange the data in cross-country format over time. The specified goods with country information does not contain the entire trade with that country, thus leaving out data and trade on less common products. Moreover, the amount of products that are presented are not consistent, with products being added then removed a decade late. Therefore, it is problematic working with this data, because as soon as it was considered irrelevant or small it is completely removed. The literature discusses capital flows, however this thesis focuses on the products and the commodities being traded between countries.

Using all this manually collected and processed data, a tailor made dataset for exports and imports is constructed. For the exports the number of observations ranges from 140 observations in 1875, to 319 observations in year 1910. In the year 1910, the exports are shown in 38 different products. These are the products that are categorised according to the SITC classification. Thus, resulting in a total 684 observations for exported products from 1875-1910 across all countries and categories. For imports the data collected and used was similar, with 316 observations (34 products) in year 1910 and 157 in 1875 (29 products). Resulting in a total of 630 observations for the categorised data on imports.

For data on GDP and Population, the Maddison database version 2018, the multiple benchmark GDP was choosing, this being as it is the suggested measure for cross-country comparison, which is the intended use of the GDP data in this case (Jutta et al., 2018). This dataset provides population by thousands and GDP year over year through 1875-1910, for all countries for which trade data exists, except for Russia.

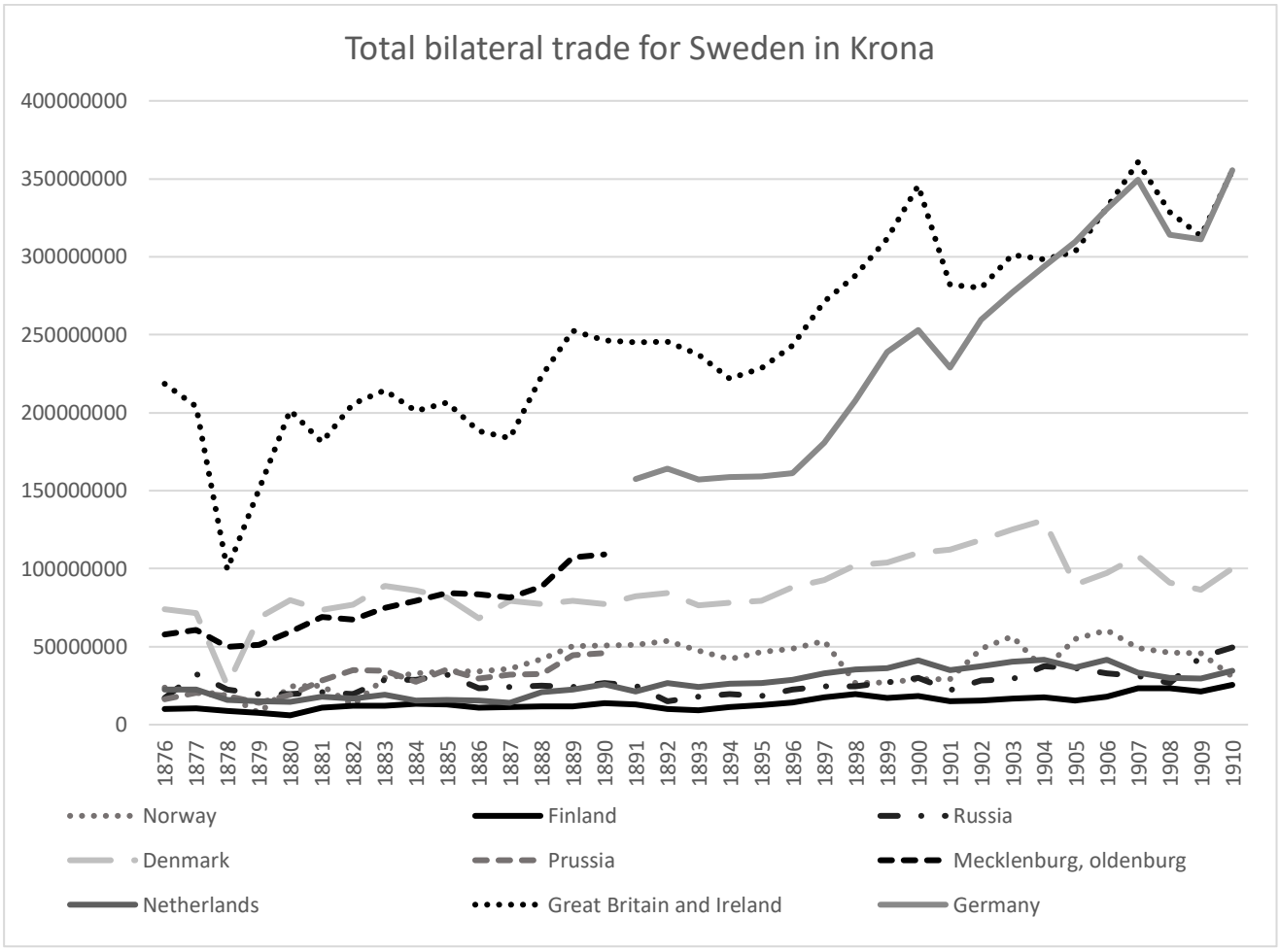
For the distance variable the CEPII GeoDist is referenced, this dataset provides bilateral distance data and geographical information for the cross-country comparison (Mayer and Zignago, 2011). The distance is an indicator for the remoteness of a trading partner, reasoning that the more remote a trading-partner is, the higher the cost of trading with it.

The categorisation of the traded products that are used in exports can be ordered according to the SITC method of categorising products. Historically useful and a common method to reporting trade and allows for comparison and standardisation of these data (Un, 2006). Based on the searchable guide provided, the products seen in in the national accounts are categorised according to the SITC categories. The categorisation of the products found in Sweden and the values given are seen in Appendix 1. The method of categorising was done by translating the line in the trade statistic to English, then using a searchable excel document to find a match, if no direct match was found it was put in a category with similar goods. The SITC classifications can only with its 10 categories be used in illustrating specialization and as a measure of RCA, which can be seen in Dimelis and Gatsios on the integration of the Greek economy (Dimelis and Gatsios, 1994). In this thesis the 9^{th} category is removed, this as it contains movement of gold and capital, not related to the trade and production of goods and comparative advantage. Furthermore, the movement of gold between nations was something that was aimed at reducing gold flow, by making notes legal tender in the SMU(Øksendal, 2007).

4 Descriptive data

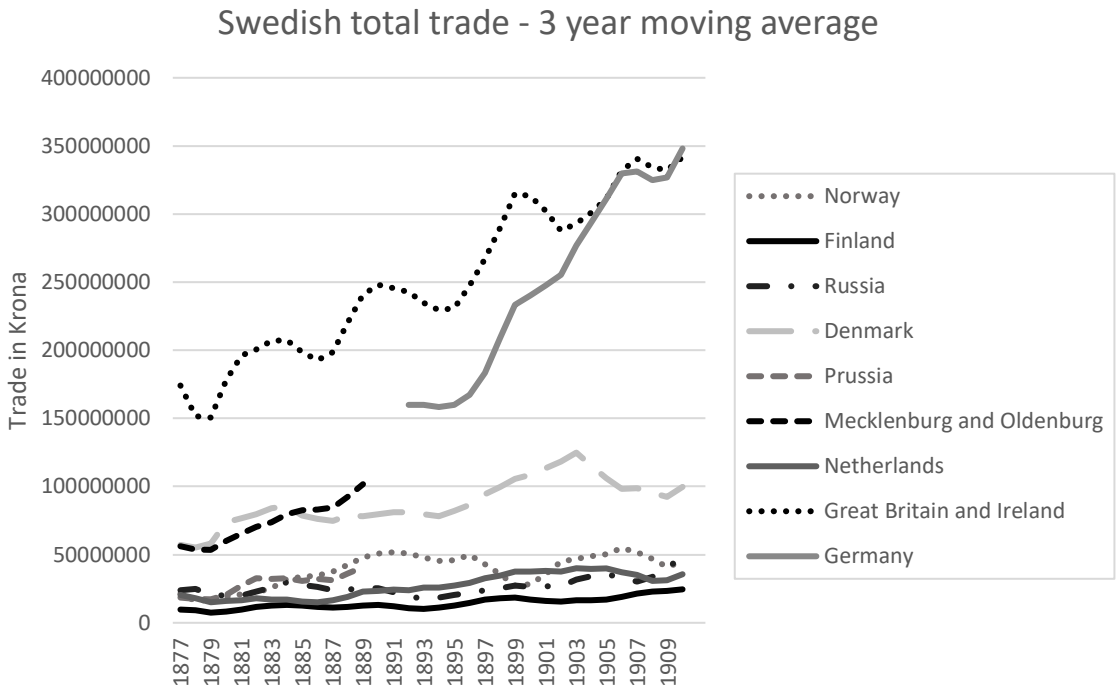
The data in Figure 1. shows the total trade with Sweden in the krona, the currency of the SMU. It can be seen that the data for a unified Germany, is available from 1891, before that regions of Mecklenburg, Oldenburg and Prussia are used. The data shows the increase of both German and English trade during the period, with Germany surpassing Great Britain in 1910. The SMU country Denmark can be seen to be the second largest trading partner initially, later the third largest. Danish-Swedish trade can be seen to reach its peak in the year 1904, after which it continued declining. The other SMU member, Norway shows increasing trade up until 1888, after which it can be seen that the trade fluctuates around 50 million Krona. It can also be noticed that the data does show plenty of fluctuations taking place. Furthermore, below Figure 2 shows the 3 year moving average of the same trade data.

Figure 1 Total trade with Sweden



Source: compiled from Sveriges officiella statistik i sammandrag1873-1912

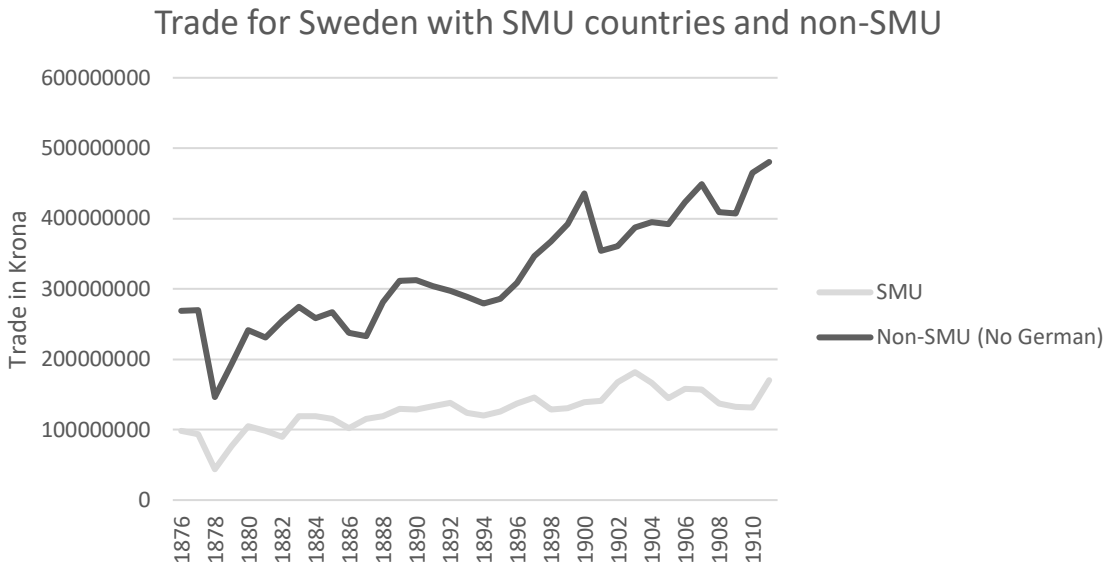
Figure 2 Total trade with Sweden, 3 year moving averages



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The three year moving average is used to show the previous figure but with some smoothing, reducing the year on year variation of the trade. Finding the growth of Great Britain and Germany to be the leaders in trade within Sweden. There are fluctuations in the trade, looking at Great Britain the fluctuations can be seen to be large, accounting for trade than some entire countries. Furthermore, that Denmark shows to be the third largest trading partner, however unlike the Germany and Great Britain, reaches its peak in 1904 and decreases after that. Thus, there are aspects of the Swedish trade were the SMU countries are set apart, not showing the increase that other countries did. This aspect can be related to the several crises internationally, which ought to have had an effect on Swedish exports from the mid-1900s, causing a decrease in Swedish production (p. 363, Magnusson, 2002). Moreover, below Figure 3 shows the comparison of the total bilateral trade between non-SMU and SMU countries.

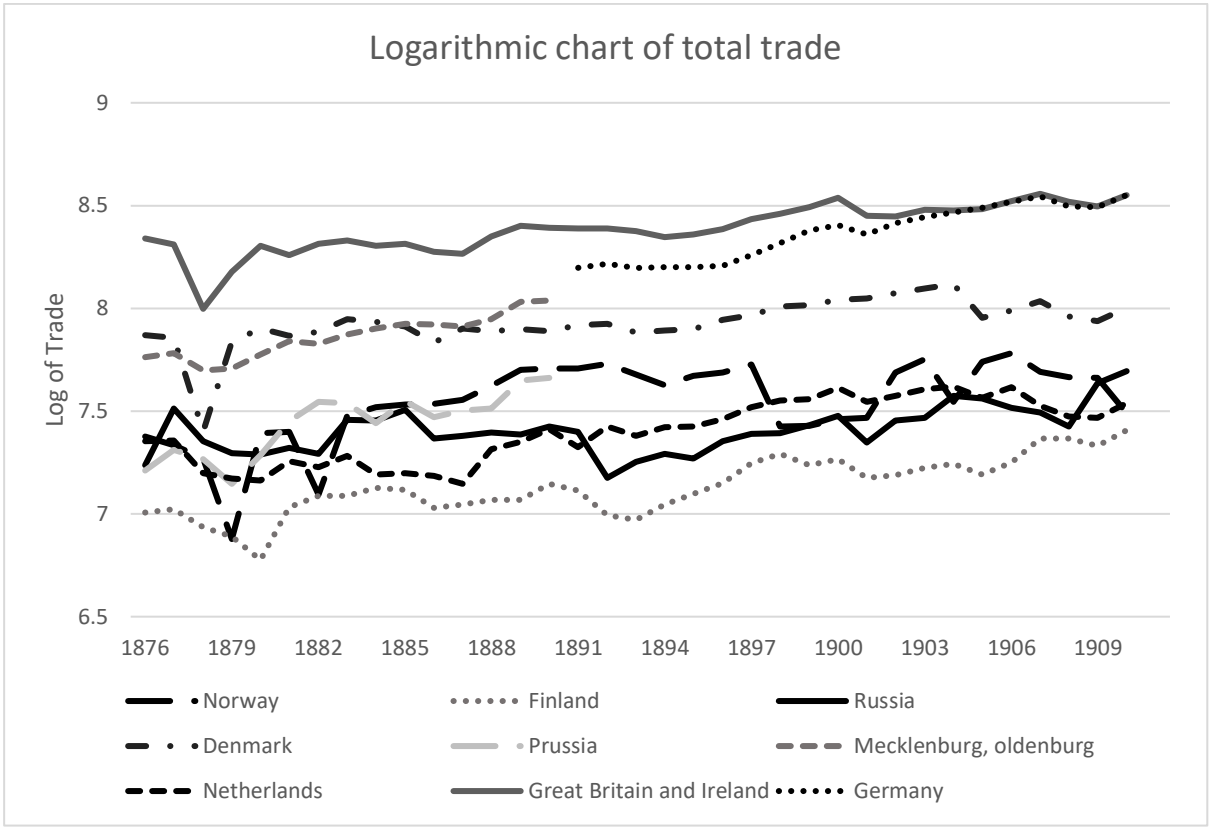
Figure 3 Trade with SMU and non-SMU countries



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

This graph shows the trade for Sweden, with its SMU counterparts and those not in the union, except Germany. This shows for both cases an increase in the total trade during the years, where the absolute trade with the non-SMU countries compared to the SMU countries increases. The above graphs do confirm what Magnusson describes as the crisis of the 1870s, showing the decline of Swedish trade for both SMU and the non SMU countries, in the mid-1870s, a period with several crisis and low growth (p. 350, Magnusson, 2002). After the crisis the period after the 1870s was seen to lead to the increase in efficiency in Swedish manufacturing industry to compete with falling international prices in iron and steel (ibid). Furthermore, Magnusson argues that it was during the 1890s that Sweden once again underwent transformation and the second industrial revolution, thus meaning the increased efficiency of Swedish industry and success in export industry (p. 359, Magnusson, 2002). This is also reflected in the trade data, showing an increase from the 1890s onward. This means that the trade data on an aggregate level reflects the changes in Sweden and for Swedish industry and illustrate the development block of Swedish industrialisation. Further, below Figure 4. Illustrates the changes of trade, the logarithmic scale allows compare the growth of the trade between the countries better. Figure 4. Shows German growth to be remarkable, surpassing Great Britain.

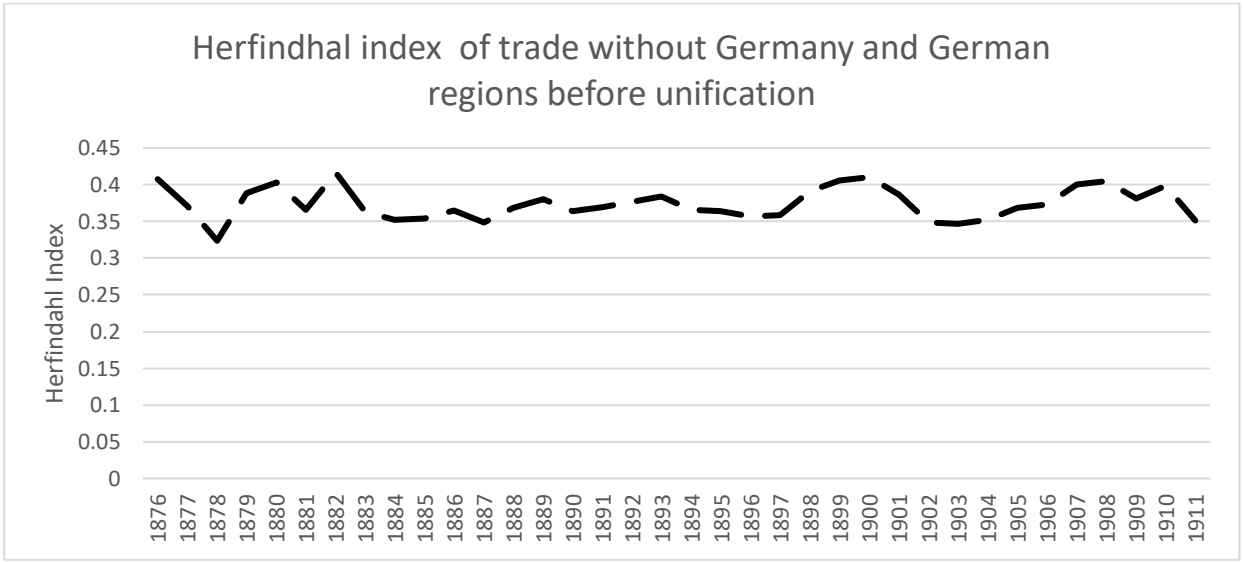
Figure 4 Log of total trade for Sweden



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The logged figure of total trade, highlights the changes of the trade. In the figure it can be seen that the graph highlights the changes. It can be seen that the drop in trade during the late 1870s is large and affects all countries. Moreover, it can be seen that all countries in the sample grow, below the Herfindahl index in Figure 5. Is utilised to asses if the trade becomes more concentrated.

Figure 5 Herfindahl index for trade partners



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

Analysis of the data presented in figure one, shows that the index does among the countries, Norway, Finland, Russia, Denmark, Netherland and Great Britain show any particular pattern if changes in trade pattern. For the total-trade of Sweden and its partners any increased concentration of trade does not shown. What is not seen however, relative to its size is the increase of specialized trade with Great Britain – which previous authors have suggested. However, it is also not equally weighted as this would be S=1/n, for six observations this would be 0.16. This sample does not include German regions or Germany, thus it could mean that there is trade diverted to Germany during this period, however with this data it is not possible to say.

4.1 Exports

This section below summarises the exports from Sweden. Starting with Table 2 below, which shows the percentage share of exports during the years 1875-1880. Continuing with showing the share of the products in being exported.

Table 2 Share of exports 1875-1880 from Sweden

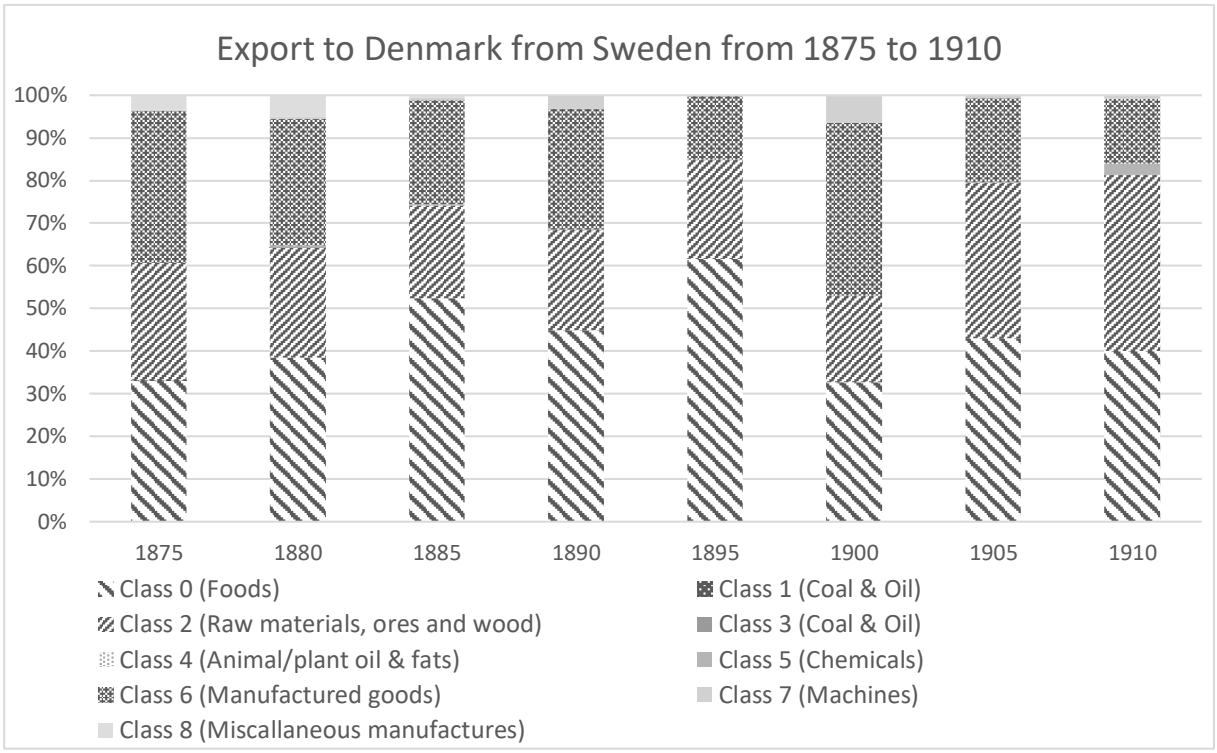
Year	Norway	Denmark	Finland	Netherlands	Great Britain	Belgium	France	USA
1875	3,82%	13,29%	2,26%	2,65%	58,90%	5,17%	13,31%	0,59%
1876	3,46%	11,72%	1,54%	5,79%	59,72%	4,78%	12,58%	0,40%
1877	3,46%	11,52%	1,67%	5,49%	60,39%	4,19%	12,92%	0,37%
1878	4,31%	12,74%	1,88%	3,08%	56,55%	5,36%	15,79%	0,29%
1879	3,88%	12,42%	1,60%	3,46%	55,32%	5,84%	16,80%	0,68%
1880	3,77%	11,36%	2,41%	2,91%	58,75%	5,82%	13,62%	1,36%

Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The table above shows the relative size of exports from Sweden from the years of 1875 to 1880. Being the period directly after the creation of the SMU. If there is a noticeable change caused by the introduction of common currency. It ought to be expected if there is a monetary effect

on the exports of Sweden it should be a positive growth on the share of exports towards the SMU countries. What the table shows are the shares of the trade, it can be seen that the Great Britain having the largest part of the export share with approximately 60% of the share. Norway and Denmark make up around 15% of the export share, with Norway being much smaller with shares ranging from 3.46%-4.31%. Denmark's share ranges from 11.36% to 13.29% showing that that there are not any particularly large changes in shares. To gain

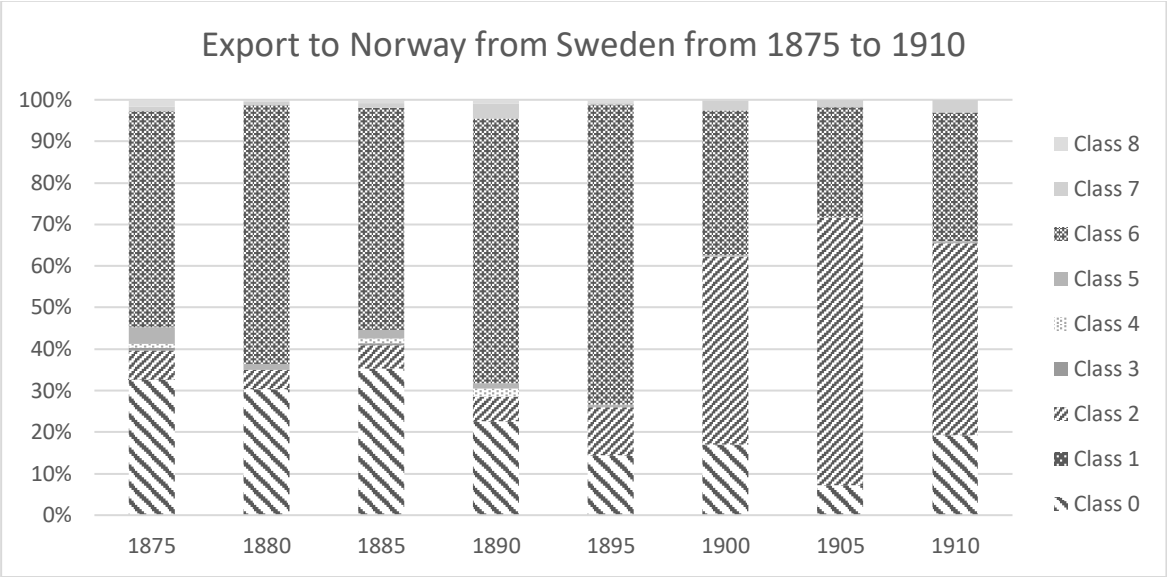
Figure 6 Swedish exports with Denmark according to SITC



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

These bar-charts show the relative size in value of the goods exported from Sweden. Showing clearly that the category of most value was during a large part during the end of the 19th century split between goods of class 0 and class 6. Whilst in the 20th century having goods from class 2 take a larger part of the exports. This means that foods in Class 0 was a growing portion of the exported goods up until 1885, however still in 1910 foods remained one of the most important exports to Denmark, making up 41% of value of exported goods. Below Figure 7. Shows the exports from Sweden to Norway, the other SMU member.

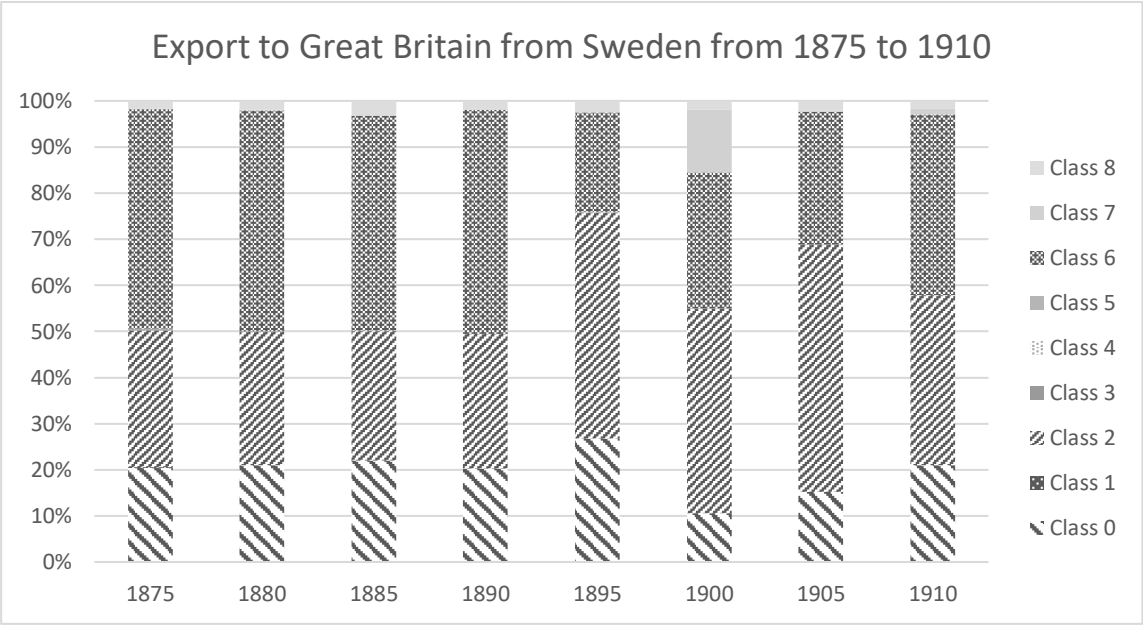
Figure 7 Swedish Exports with Norway according to SITC categories



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The exports to Norway can be seen to follow a similar pattern to that of Denmark, with exports dominated by class 0 and class 6 during the end of the 19th century. Then towards the turn of the 20th century, the class 2 becomes the dominant export of Sweden. With a decreasing amount of value being exported in class 0 (foods). It can also be seen that the export of manufactured goods (class 6) decrease over time making up 31% of the exported value in 1910. Further, Figure 8 below, shows the exports from Sweden to Great Britain.

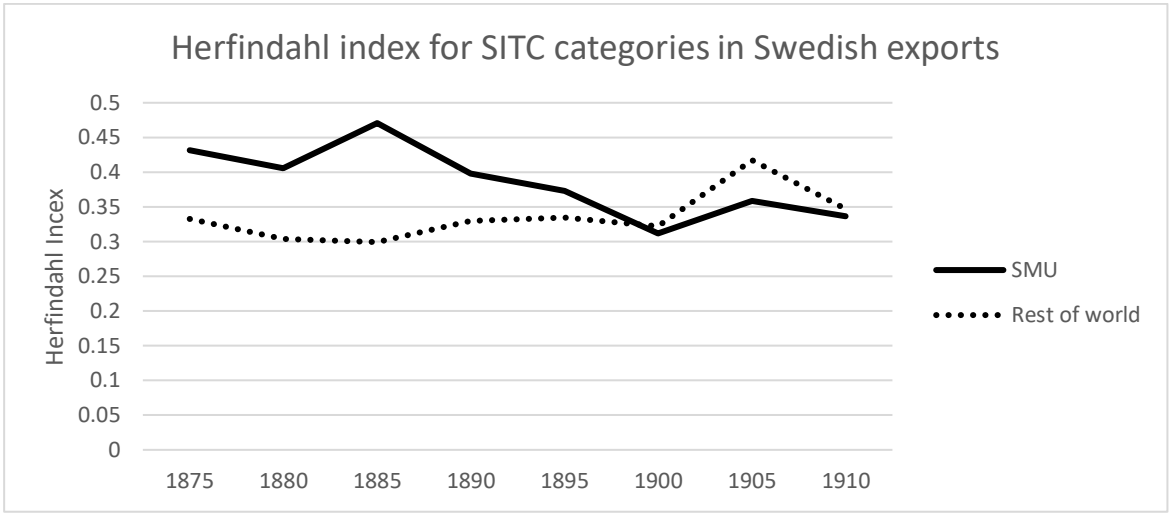
Figure 8 Swedish Exports to Great Britain



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The above table illustrates the value of products exported from Sweden to Britain follow a similar pattern to that of the SMU countries, with large portions of the exports being Class 0 and Class 6 in the up until the end of the 19th century. Then with a growing size of exports of class 2 goods. It must also be noted that other Classes, 8, 7, 1, 5 and 3 make up a very small portion of the value of exports. Therefore, it can be seen that the exports from Sweden are dominated by a few large categories. To show illustrate the changes in products, Figure 9. below compares the SMU with the rest of the world.

Figure 9 Herfindahl index for SITC categories



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The above graph shows the Herfindahl index to show the specialisation across 9 SITC categories. Over time it can be seen that the exports to the SMU countries diversifies and become less specialized. Whilst the rest of the world remains within 0.3-0.35 from 1875-1900, whilst it increases to 0.4 in 1905. What is interesting here is that the exported products where seen to change drastically, however it can be seen that in the specialisation index the changes where not as drastic. Suggesting that the distribution and size of the categories were not affected, whereas the products changed. Suggesting that a common currency as Flam and Nordström argues can cause increased diversity in trade (Flam and Nordström, 2006). As here it can be seen that the SMU initially had a greater specialisation in goods, but decreased to a level below that of the rest of the world. Whilst it can be seen that the exports towards the rest of the world are stagnant until 1900, then an increase can be seen. This increase is also visible in the SMU, however not as drastic. Therefore, this can show that the monetary integration could be the source of the decreasing specialisation in Swedish exports.

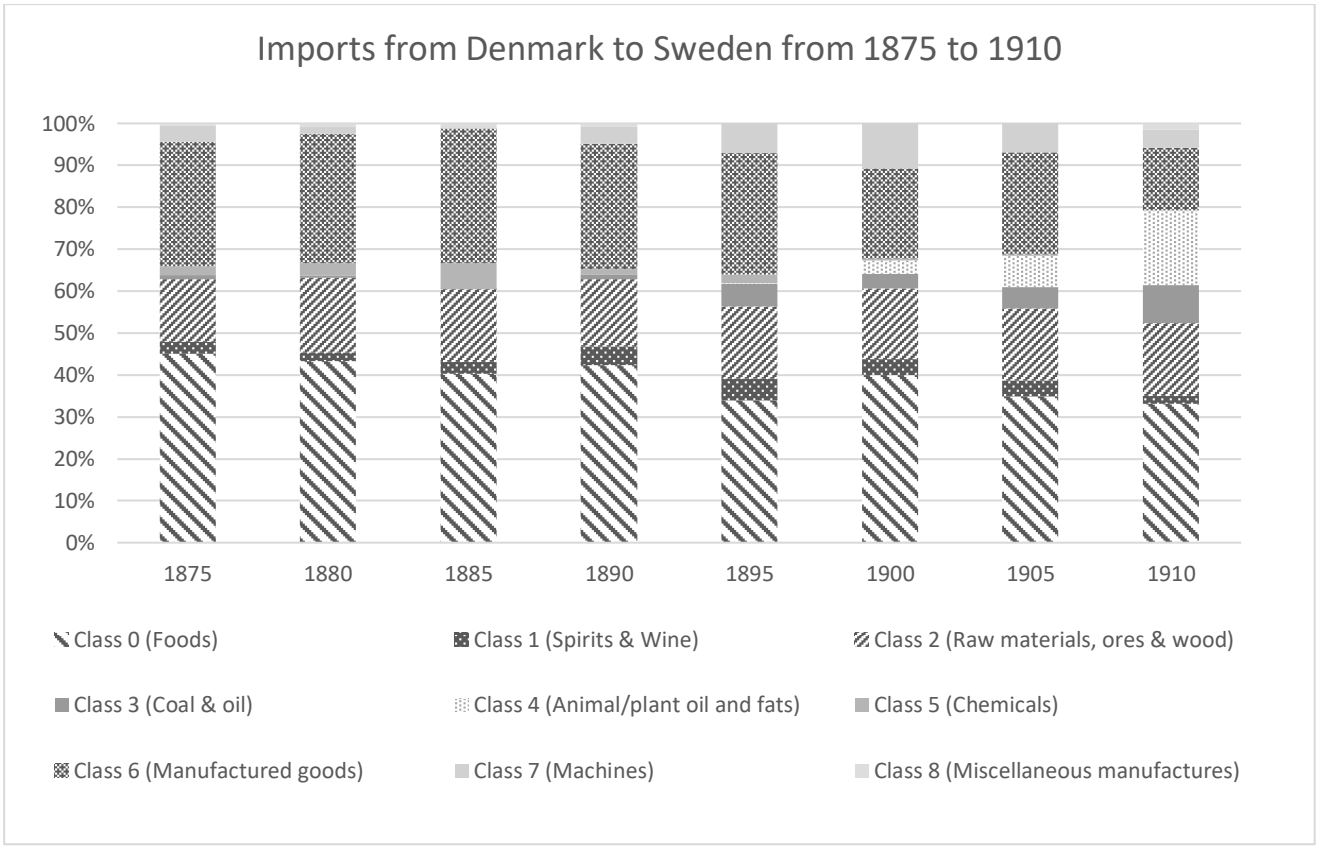
4.1.1 Summary of Exports

Based on these charts of exports from Sweden is that there are some similarities in the classes of what is being exported. It can be seen that there are a number of export classes that dominate, these being Class 0 and Class 6 with the emergence of Class 2. Similarly, as found with total trade and described by Magnusson on the development blocks in Sweden, it can be seen that the 1890's mark a change in Swedish exports. These being especially class 2, containing ores and metals. This being part of the second industrialisation, where in particular the efficiencies of iron and steel producers are described to be caused by the introduction of electricity (p. 360, Magnusson, 2002). One differences that can be noted between the exports to Great Britain and the SMU countries, is that the SMU exports contain a larger ratio of agricultural goods and foods. This can illustrate differences in the trade caused by the SMU, however this can also be caused by different stages of development. This as the exports to Great Britain are raw materials being ores and wood, demanded by a more industrial country.

4.2 Imports

The previous section covered the exports from Sweden, the part below is covering the imports. Firstly, illustrating the changes in the products being imported over time for different countries. Followed by a comparison of between the SMU-countries and the non-SMU countries. However, first the imports from Denmark to Sweden can be seen below in Figure 10.

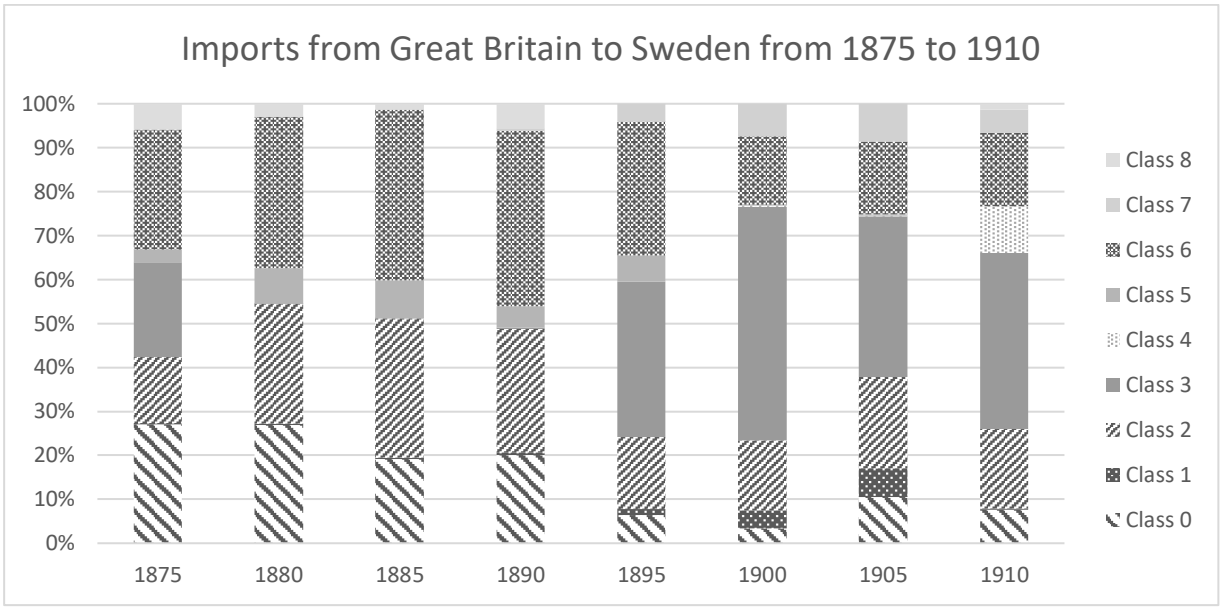
Figure 10 Imports from Denmark



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The imports from Demark seen in Figure 10 can be seen to be given by Class 6, Class 0 and Class 2 goods. Also showing the value of Class 4 products growing, from1900 to 1910 eventually reaching a relative size of 17.7% of the imports. It can also be seen that the Class 0 being the largest portion, which is agricultural goods decreases from 45% to 33% of the imports from Denmark. It can also be seen that Class 3 emerges as an import, this being the classification for energy, can be seen as a cause of increased industrialisation, driving the need for energy. Moreover, Class 4, can also be seen to increase from 1900 onward and by 1910 making up more than 17% of the value of imported good. Figure 10. contains the information on what type of products the classes contain. Further, a similar figure but for Great Britain can be seen below in Figure 11.

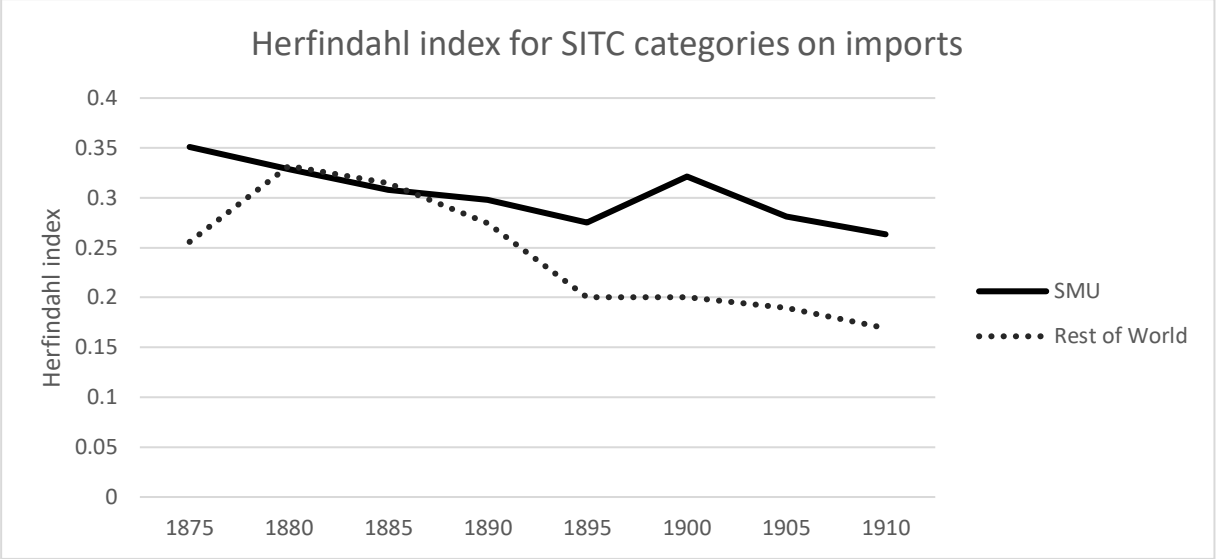
Figure 11 Imports from Great Britain



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

For imports from Great Britain can be seen to be more homogenous among the classes, showing Class 0, 2, 3 and 6 having large portion of the value of goods imported. The Class 3 column growing and ending to become the largest portion of imports by 1910. Its rising value can be seen to become very popular, this being a class 3 containing imports of coal and coke. These goods would naturally have been more sought after as the growth of the industrialisation in Sweden picked up pace with a need for energy. This sudden variation and increase of the coal also comes down to the statistics, as it was not part of the yearbook previously. In the figures above it can be seen that there were changes in the composition of imports, this is further examined using a specification index in Figure 12 below.

Figure 12 Herfindahl index of imports



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The Herfindahl index on the imports to Sweden based on SITC categories for both the SMU and the rest of the world shows the decreasing specialisation in imports. With the rest of the world also displaying the lowest on the Herfindahl index, meaning that the products imported were diverse. However similarly as argued with the exports, this is caused by a larger number of countries. It is interesting to see however that the specialisation of the trade is decreasing, at the same time as the total trade is increasing.

4.2.1 Summary of imports

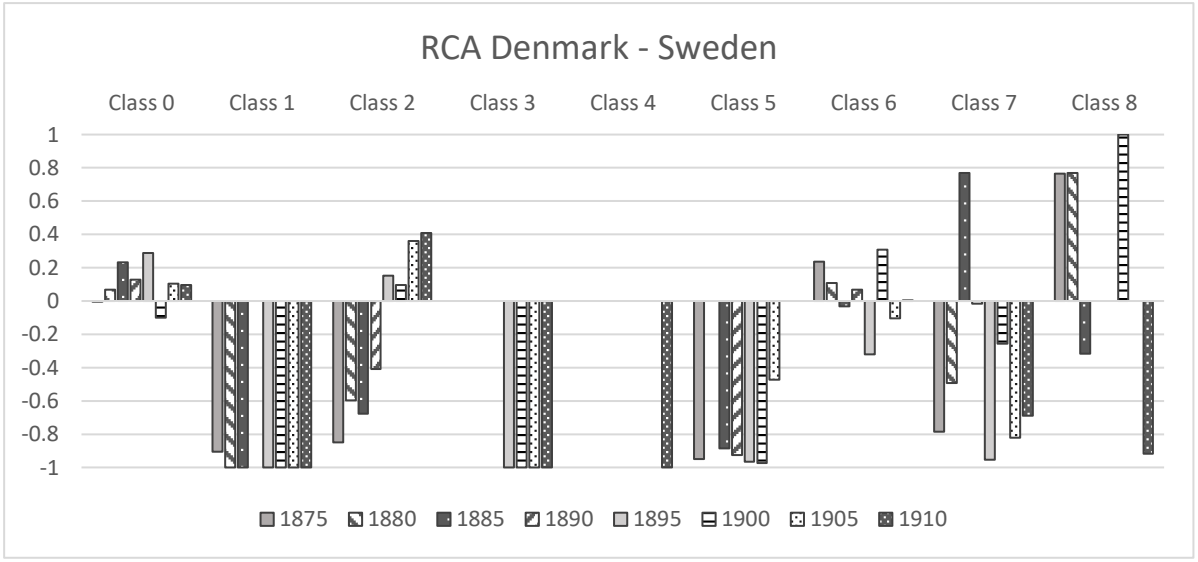
It can be seen that there are similarly to exports some classes that contain more products and more value. From looking at these charts it can be seen that the imports show more variation than the exports. Thus this is something that can be looked into further, if it is the changes in imports that vary under this development and becoming more or less specialised. Magnusson describes the industry in Sweden as being dominated by oligopoly's and monopolies in some branches, thus making it difficult for foreign entities to have a large role on the domestic market in Sweden (p. 363, Magnusson, 2002). The development of electricity during the mid 1890s for the use in Swedish industry can possibly be the cause of the coal imports from Great Britain peaking during 1900 being 53% of the relative import then decreasing. The role of common currency ought to drive the diversity of the products being traded, with more unfinished products being traded (Flam and Nordström, 2006). In comparison with the exports it could be seen that SMU became much lower in specialisation than the rest of the world. However, the

imports do show a higher specialisation for SMU, than the rest of the world. With the imports from the rest of the worlds becoming more diversified each year from 1880 onwards. This means that in regard to there being an effect caused by the SMU in imports is not visible.

4.3 Revealed Comparative Advantage

For the countries used the RCA can be calculated bilaterally, comparing the trade across two countries, but also pooled against a group of countries. The range of the RCA is from -1 to 1 and in this case they are all compared with Sweden, meaning that a positive sign means that the revealed advantage is towards Sweden. The first RCA figure, Figure 13 below shows the index calculated bilaterally between Sweden and Denmark.

Figure 13 RCA index Denmark and Sweden

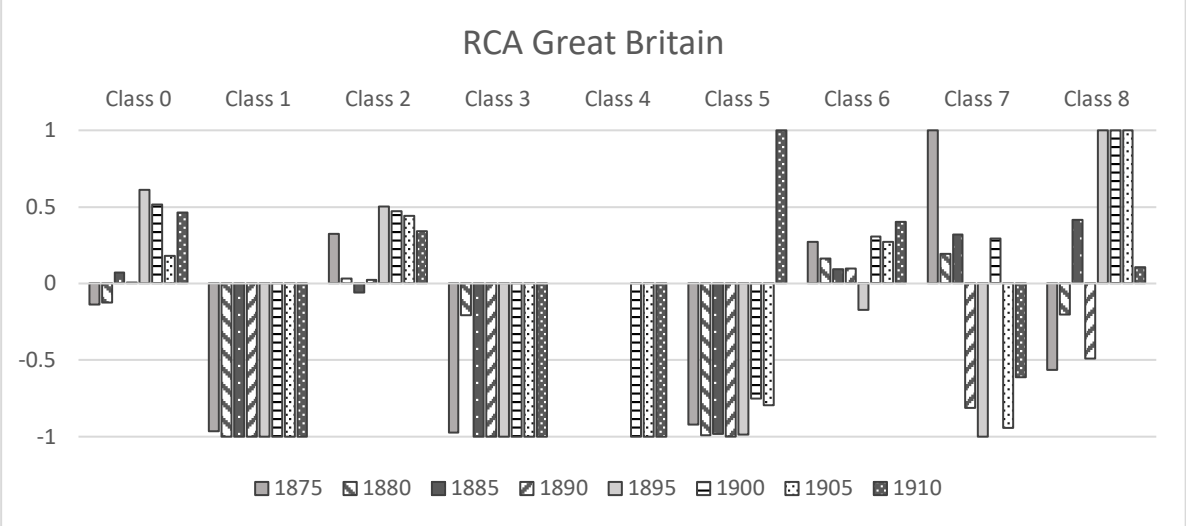


Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The calculations show the following years over the different classes, for Class 0 it one can read out the values from 1875 to 1910. Showing for Class 0 that there is positive values for the years 1875 to 1910, except for year 1900. The positive value means the Sweden displays an advantage in that category of good. However as can be seen for instance for the category of class 1 for the year 1885 to 1910, the value is -1. This is caused by Denmark having a trade in goods within Class 1, whilst Sweden dies not, meaning that the Denmark holds the complete advantage in this product. Also for Class 3 and 4, no results are obtainable as there is a complete lack of trade in the goods belonging to these categories. Sweden's advantage in goods belonging to Class 2 develop over time, starting negatively at -0.85 and becoming by year 1900, then growing to +0.4 by 1910. This shows a change in trading pattern where the Class 2 becomes an advantage for Sweden. This can be seen explanatory due to the growth of the mining industry, with the Class 2 including ores and woods, something that can be considered important foundations of

Swedish industry. Class 6 being manufactured goods can be seen to follow a more interesting path, where it can be seen that the advantage varies. It can be compared with the RCA for the non-SMU member Great Britain illustrated in Figure 14. below.

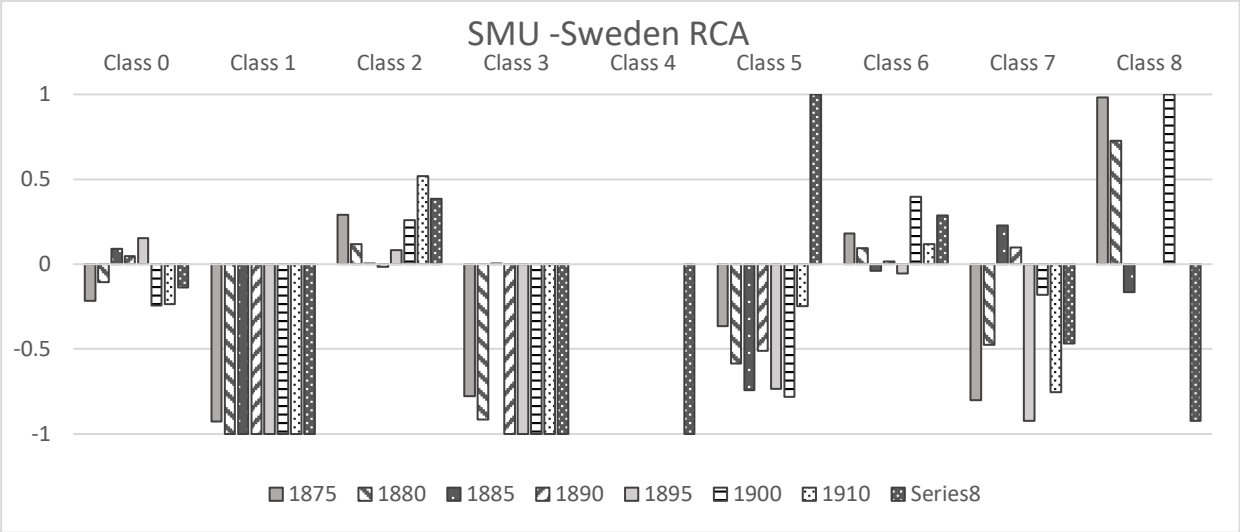
Figure 14 RCA index Great Britain and Sweden



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

For the RCA for Sweden with Great Britain it can be seen to produce quite a similar pattern to that of the trade with Denmark. It can be seen that Class 0 exhibits only an advantage for Sweden. Class 0 being agricultural goods meaning that Sweden was displaying an advantage in agricultural goods compared to Great Britain. It can be seen that Class 1, being tobacco and spirits, wine to a complete advantage towards Great Britain. However, similarly to the results for Denmark with Class 2 increasing substantially after the year of 1895. Further moving to Class 6 it can be seen that the advantage in manufactured good being Class 6 is positive. This is also something that is different to Denmark, where the competitive advantages were mixed over the years The comparison of the trade between SMU members and non-SMU members is of interest for this thesis. Moreover, the RCA results for entire SMU are displayed in Figure 15 below.

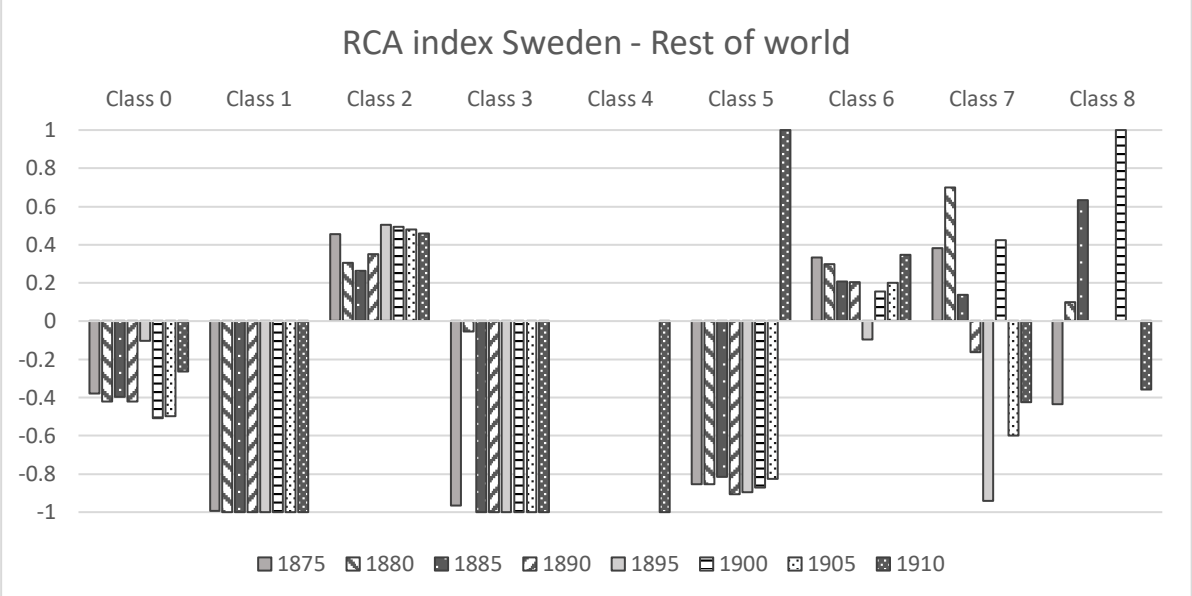
Figure 15 RCA index SMU and Sweden



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

The chart above shows the RCA for the SMU compared to Sweden, so Norway and Denmark are combined in the SMU. It can be seen that the pooling of results creates more goods being traded in each category, thus resulting in less missing variables. A similar pattern can be seen as previously RCA charts, showing the growth of Class 2 in Swedish exports and its change to an advantage for Sweden. Class 7 shows a stronger disadvantage towards Sweden, this being a class containing boats and machinery. It can be seen that there is plenty of fluctuations in the RCA results of Class 0. It can also be seen that the manufactured goods in Class 6 can be seen to be the positive for Sweden. Therefore, these results will be compared to those that are not from SMU countries, examining the RCA to the rest of the world can be seen in Figure 16 below.

Figure 16 RCA index Rest of world and Sweden



Source: calculated from Sveriges officiella statistik i sammandrag1873-1912

When removing the SMU and comparing to the rest of the world, these being Finland, Russia, Belgium, Netherlands, France, USA, Great Britain and Germany. It can be seen that there are differences now, between the components, where the rest of the world shows a disadvantage in the agricultural goods of Class 0 and wines and spirits of Class 1. The ores and unworked metals of Class 2 are strictly to an advantage to Sweden. Whilst energy in form of coal and coke is negative after 1875. The values for Class 4 and 5 show to for all years except one a disadvantage toward Sweden. Whilst Class 6 shows an advantage, except for year 1895, thus meaning that Sweden showed an advantage in the production of manufactured goods. Class 7 is mixed, showing both disadvantages and advantages, however also no strong values, except in the year 1905 where the highest value is a disadvantage of -0.71. Class 8 shows an advantage through the year 1875-1885 and 1900-1905.

4.3.1 Summary of RCA results

It can be seen that there some general patterns seen across the RCA results, that also corroborate the changes that that could be seen in the export data. The RCA measures reveals to constant advantage through the entire period in Class 2, showing that ores and woods were an extremely important part of Swedish trade. Further, on these RCA results it can be seen that the classes where Sweden has an observed comparative advantage are Class 2, Class 6 and Class 8. Meaning that the advantage of Swedish exports towards the rest of the world was in those products, being ores, manufactured goods, clothing and matches. The advantage becomes more significant during the 1890s. This change can be argued to be caused by the effectiveness of Swedish industry increasing during this period. As described by Magnusson, the efficiency of the industry increasing with the introduction of cheaper energy and more mechanisation. Thus, the positive RCA during this period can be seen to be evidence of this development and second industrialisation in Sweden. In Appendix 4 similar results can be seen, that the advantage in class 2 increases over time. The results for Germany one of the larger trading partners for Sweden shows an advantage in the raw material trade for Sweden.
The RCA toward the SMU countries shows a similar pattern to the rest of the world, however more unclear. I would argue that this can be caused by two reasons, that there are fewer countries in the SMU reducing the data or that the SMU countries are more similar, meaning that they trade goods in similar categories. Making the RCA measure less accurate when two different goods within the same category are different, but still count as equal, an example would be Fish imports from Norway and oats exports from Sweden. In conclusion it can be seen that based on the RCA, it can be seen that the Scandinavian monetary union does not display any differences or different developments compared to the other countries. Whilst, it can be seen that the RCA values for Denmark are much smaller, which suggest that there is bilateral trade in products within the same category. Flam and Nordström find that monetary unions generates intra-industrial trade (Flam and Nordström, 2006).This can suggest that the monetary union induced intra-industrial trade causing the low RCA values found in Danish-Swedish trade.

5 Quantifying effects of SMU

In order to quantify the effects of the SMU, the previously introduced gravity model is applied. However, first the different variables used to measure the effects are presented. Following the descriptive data, the models are presented and tables containing the results. Finally, the results from the regressions are briefly summarized.

5.1 Descriptive data of Variables

The data that is being used is Sweden's trade with Norway, Finland, Denmark, Netherlands, Great Britain, Belgium, USA and France. This is a small sample as Russia was removed for the lack of GDP data, whereas Germany has to be removed for the full time span 1875-1910, as it did not exist earlier. Thus for the complete period 8 countries are used to model the data of Swedish trade. To begin the one of the central assumptions in the model used is that distance matters for the size of trade with nations. To illustrate this the correlation of between distance and trade was tabulated, showing a negative correlation of -0.14 and significant at 95%. The size of GDP of trade partner is also assumed to be of significance, this is shown to be true with a positive correlation of 0.25 and 95%. The data is therefore categorised into 9 different countries over 36 years (1875-1910) meaning that there are 308 observations that are used in the data. Dummy variables for SMU-membership and bordering countries are added as well, with two SMU members and three bordering countries being in the sample. In Table 3. below further information about each variable can be seen. Including, the average value, the range and the standard deviation.

Table 3 Descriptive Variables 1875-1910

Variable	Mean	Standard Deviation	Min	Max	Number of observations
Distance	1636.497	1872.932	397.892	6644.253	308
SMU	0.2337	0.4239	0	1	308
Ln Export	16.566	1.666	4.317	19.065	306
Ln Trade	17.509	1.080	15.090	19.703	308
Ln GDP Sweden	16.525	0.2516	16.1734	16.977	36
Bordering	0.350	0.477	0	1	308
Ln Distance	6.987	0.836	5.986	8.801	308

5.2 Results

The models:

$$\ln(trade_{is}) = C + GDP_{is} + GDP_{ie} + Dist_{is} + SMU + \varepsilon_i$$

and: $ln(export_{is}) = C + GDP_{is} + GDP_{ie} + Dist_{is} + SMU + \varepsilon_i$

For the using the model, the aim is to see these countries as having advantages and characteristics that cause the trade. This at it does not allow for the important variables distance and SMU to be run in the regression. The results below are regressed using clusters, where the clustering takes place on the country pair level making 8 clusters each containing 36 years of observations. The of fixed effects models in regard to the gravity model are highlighted in Prehn et al, who argue that important explanatory variables are omitted, this as they are time-invariant something that is not allowed in the fixed effects model (Prehn et al., 2016) . Moreover, below in Table 4. the results from the first three regressions can be seen, all estimating total trade.

Table 4 Results Table 1875-1910 for total trade

	R(1)	**R(2)**	**R(3)**
Ln trade	=	=	=
Ln GDPi	0.9861*	1.0025*	1.0882*
Ln GDPs	0.1222	-	-
Ln Distance	-1.7021*	-1.7196*	-1.6423*
SMU	0.9692	0.9604	0.6494
Bordering	-0.6804*	-0.6583 *	-
Clusters	9	9	9
R^2	0.7687	0.768	0.7523
Number of Observations	308	308	308

*- significance at 95%

For regression 3 the results can be interpreted in the following way, the increase of 10 in distance, would in decrease trade by 16 percent. Furthermore, a 10% increase in the trading partners GDP would increase bilateral trade with a value of 10.8%. These results hold true to the assumptions of the gravity model. Furthermore, the SMU variable is to be interpreted as relative to the non-SMU countries, being in the SMU yield an average increase on the trade of 0.64 %. However, one must not that the SMU variable was not statistically significant at 95%. Further, results on the same data however set into three-year period is presented in Table 5. below. Looking at the total trade data in Figure 1, shows that there is a lot of volatility in the

trade, this can be reduced by creating averages of the paired data. Therefore, as seen in Figure 2. This greatly reduces the year-to-year volatility. This does reduce the available years; the 36 observations can be reduced to 12 periods containing three year means.

Table 5 Results Table 1975-1910 for total trade 3 year averages under 12 periods

3 year average	**R(4)**	**R(5)**
Ln trade	=	=
Ln GDPi	1.1087 *	1.0746*
Ln Distance	-1.6382 *	-1.7430*
SMU	0.6542	-
Bordering	-	0.1343
Clusters	9	9
R^2	0.7576	0.7121
Number of Observation	102	102

*- significance at 95%

The results for the averaged data is presented in Table 5. illustrating the effect on trade. Regression 4 includes the SMU, showing a positive effect of 0.65 % on trade compared to non-SMU members. However, the SMU coefficient lacks significance. Regression 5. utilises the border variable, to control for trade with adjacent countries, however it is also insignificant. Further regressions are carried out on the year 1891-1910, this allows the data for Germany to be a part of the regression. The year 1891 onwards also marks the year of a further agreements in the SMU, aimed at reducing gold-flows across the countries and accepting notes in the SMU countries. Therefore, it can be argued that from 1885 onwards the monetary integration in the SMU countries can be argued to have been the deepest. If there is an effect on trade associated with membership in the SMU it is expected to find it in the years from 1885 onward. However, to include data from Germany limits the scope to 1891-1910 and are presented in Table 6. below.Table 6 Total trade from 1891-1910

	R(6)
Ln trade	=
Ln GDPi	1.0803 *
Ln Distance	-1.6003 *
SMU	0.6376
Bordering	-
Clusters	9
R^2	0.7451
Number of Observation	180

*- significance at 95%

Regression 6 uses the years 1891 to 1910, here again similar estimates are made as previously. Showing the positive effect of increasing GDP, where 1 % increase in trading-partners GDP

increases by 1.08 %. Also in this case the SMU remained insignificant. The charts on exports show that exports are more constant and exports can also be used in the gravity model. Thus below the exports are used instead of the total trade and are presented in Table 7.

Table 7 Exports from Sweden 1875-1910

	R(7)
Ln Export	=
Ln GDPi	1.2674 *
Ln Distance	-2.6889 *
SMU	-0.0611
Bordering	-
Clusters	9
R2	0.5531
Number of Observation	306

*- significance at 95%

The significance of the results above showed that the use of total trade yielded better results for the model. Further, when looking at the residuals of those regressions, they were closer to being normally distributed. It can also be seen that the fundament of the gravity model is upheld, with growth in GDP resulting in more trade and with distance having a negative effect on the trade. In this final R(7) specification it must also be noted that the effect of the distance is much stronger with a 1% increase in distance causing an estimated decline of 2.6% in Swedish exports, ceteris paribus. Although the estimate of R(7) also sets apart from the other regressions as the SMU, effect is negative, although very small. Being a part of the SMU relative to the non-SMU causes a negative effect on exports by 0.06%. However, also in this case the SMU variable remained insignificant. To summarise the results from the regressions above, the gravity model holds, with a negative effect on trade with increasing distance. The variable, border and SMU have a strong correlation, resulting in the removal of one important control variable.

6 Discussion

The thesis with its foundation on the claim made by Frankel and Rose, who state that the introduction of a common currency increases trade between members and supports the creation of trade (Frankel and Rose, 2002). The thesis chooses to examine this statement using the Scandinavian Monetary Union. To begin with the results in this thesis illustrate the growth of Swedish trade from 1875-1910, showing the doubling of trade between Great Britain and Germany during the period. Furthermore, it can be seen that all countries trading with Sweden experienced an increase in trade. Moreover, this thesis also displays the products being traded according to the SITC categorisation that is done on the trade data, giving the possibility to see changes in the trade for Sweden. What can be seen is that there are changes, however based on the many factors affecting trade, it is difficult to determine what, causes what change. For instance, some changes in the data are caused by technological advances, one good example for this is tar. Tar was being used on wooden boats, however due to technological changes towards the end of the 19th century was becoming obsolete because large wooden ships were becoming less common (Skogsverige, 2018). The role of commodities can also be seen in the charts, where Great Britain is exporting coal and coke to Sweden, this is can be seen to be both caused by Great Britain having this commodity.

Further it can be seen that agricultural goods were a significant portion of the trade and remained that although decreasing in relative value. It can be seen that the imports of agricultural goods also remained important, with grain being imported from Russia being a major contributor. Previous authors for example Schön, have pointed out the in Sweden underwent a structural transformation during the 1890s which was necessary for later Swedish development (Schön, 2006). Schön points out that the exports from Sweden remain similar even though there is some industrialisation. This can be confirmed in this case too, however from the RCA data, Class 0, being the food category, does not show Sweden being more advantageous compared to the rest of the world and towards the SMU. Thus even though this category is significant, it does not show to yield any comparative advantage to Sweden. Except with the Class 0 trade with Great Britain, where the revealed comparative advantage in food production is positive increasing over time. This could either mean that Sweden was exporting more foods, however it can also show that Great Britain was reducing their exports of foods in relation to their total exports. For the RCA comparison towards the rest of the world, it can be seen that relative to the trade in other goods, the foods were a disadvantage for Sweden. Suggesting that even if the exports consisted of foods, they did not display any comparative advantage. Steel and ores is also recognized by Schön to be crucial for Swedish exports, in the SITC classification it falls under Class 2. It can be seen that its exports are show a somewhat different pattern, growing under the period. What sets it apart is that for the SMU it can be seen that the RCA for Class 2, was at a negative but gradually becoming decreasing. The pivotal

year being 1890 when the advantage becomes positive. This happens both for SMU countries and the rest of the world, showing that it was in after 1890 when the sales of ores and steel display a comparative advantage for Sweden. The development block in Sweden from the 1870s is caused by the development of the railway that allowed for the transportation steel, at the same time allowing for the creation of faster transportation methods (p. 74, Schön, 2012). Further, the role as well as revealed comparative advantage in primary products does not diminish in the case of Sweden. According to Schön and Ljungberg who describe the export model, the model expects the exporting of primary goods to diminish (Ljungberg and Schön, 2013). In the results of this thesis finds that primary goods, even increased in relative size to the rest of exports. Therefore, this thesis finds evidence against the *export model* of Swedish industrialisation and finds support in the *domestic market model.*

The imports of machined and manufactured goods (Class 6) shows its relative size in imports decreasing. Further the RCA of the imports can be seen to be in the favour for Sweden compared to the rest of the world, however in the SMU the result is more ambiguous. Further, Magnusson describes companies in the manufacturing sector to have formed oligopolies, monopolies on the Swedish market (Magnusson, 2002). Making it difficult for international companies to enter the domestic market in Sweden. Therefore, the advantage of Sweden in manufacturing goods can be a representation of the arising difficulties for foreign companies in Sweden. Moreover, O'Rourke and Williamson argue that Sweden was protecting its manufacturing industry after the 1880s (O'rourke and Williamson, 1995).

Looking at the years 1875 to 1880 in the table presented, it can be seen that it does not follow any pattern for a growth in the share of export for Sweden. Further it can be seen that this does not result in any growth in shares the years immediately after the creation of the SMU. It can be seen that shares of both Norway and Denmark decrease during this period. For the total trade the results are more mixed, with high differences year to year caused by changes in imports. This can be a results driven by financial crisis in Sweden during the 1870s, resulting in the drastic changes in demand giving the fluctuations in total trade (p. 350, Magnusson, 2002).

Frankel and Rose use a gravity model to estimate the effect of a common currency, finding that it has a very strong effect (Frankel and Rose, 2002). Similar results were found by Maurel and Flandreau, also using a gravity model for their estimations. In this thesis the results of the gravity model regression can be seen to have followed the specification of trade being negatively affected by distance and positively by the size of GDP of the trading partners. The results show that when using total trade, showed the most successful results. It can however be seen that the controlling variables for borders, do not yield the expected of having a positive effect on trade. It can also be seen that the similarity between the SMU and the bordering countries is a cause of multicollinearity. Thus the border variable was removed from the some of the regressions, so focus could be set on the SMU variable. For regression three (R(3)) it can be seen to be a quite successful at explaining the trade, with distance being negative and size of GDP positive. The result of the SMU variable is insignificant, whereas the other variables are not. This is contrary to the results found by Flandreau and Maurel who finds that the SMU

ought to be having a positive effect (Flandreau and Maurel, 2005). The estimations in this thesis also differ from Flandreau and Maurel in that it is found that Swedish GDP (i.e. exporter GDP) was insignificant in these estimations. Flandreau and Maurel's gravity model covers the years 1880-1913, however for the years 1891-1910 and 1875-1910, this thesis finds no bias in the trade towards SMU countries. Further, this thesis as previously discussed does not compare the SMU and the gold standard as previously discussed, the countries in this sample were on the gold standard. Therefore, this thesis does not give any evidence to that monetary integration in the SMU had a positive effect on trade. The use of the Herfindahl index in Figure 7. shows the distribution of SITC categories, for both SMU and Non-SMU countries. Whereas it can be seen in the exports, that there are dominating export categories. The use of the index instead shows that there was a continuous decline in the specialisation among the categories. This can also show some evidence against the concern that monetary integration increases specialisation in production.

7 Conclusion

In conclusion, this thesis has illustrated the growth in trade and the change in the goods being exported and imported. This thesis illustrates the relative comparative advantage (RCA) for Sweden. It can be confirmed similar to previous research by Schön and Magnusson that the exports from Sweden were during the 19th century were to a large extent based upon foods, ores and woods. The thesis also finds that the products exported are similar both for SMU countries and the rest of the world. To answer one of the questions posed in the beginning of the essay it can be seen that the specialisation of Swedish exports during the period is found to decrease in both the SMU countries and the non-SMU countries. It is also found that the bilateral trade between Sweden and other countries did not give any bias towards the SMU. It can also be seen that the SMU variable remained insignificant through a number of estimations, suggesting that the SMU did not lead to a significant increase in the trade between the member countries. Using the measure of Revealed Comparative Advantage, the thesis finds that Sweden displayed a comparative advantage based on its trade in the Class 2 goods. Being woods and ores and it can be seen that this advantages gains during the period. Suggesting that it was this type of industry that Sweden was advantages in during the 19th century.

To briefly answer the questions set in the beginning. Firstly, *how did Swedish exports and imports in the SMU change over time?* It can be seen that that the products being exported, did not differ much between countries. A significant portions of the value of Swedish exports remained in foods, with continuous growth in ores and wood. Further, there was decreasing specialisation among the products in the trade, both for imports and exports. With the products traded between the SMU becoming more diversified than with the rest of the world. Secondly, *did the SMU affect the revealed comparative advantage of Sweden?* The RCA between countries could be seen to be similar. Where the Swedish advantage in the ores and wood remained gained during the period. Foods were an important export from Sweden, however the RCA, displayed that the comparative advantages was negative. The lower numbers in the RCA index between SMU countries can suggest more intra-industry trade. Thirdly, *was there a bias towards the SMU in the trade for Sweden?* Using the gravity model on bilateral trade, this thesis does not find any significant effect for the SMU on trade.

Finally, the thesis confirms the overall narrative given by Schön and Ljungberg on the importance of foods, wood pulp and ores in the Swedish industry. Moreover, can be seen that the growth in trade was dominated by Germany and Great Britain. On a final note this thesis does not find any significant difference between SMU countries and non-SMU countries in bilateral trade.

8 Appendix

8.1 Appendix 1. SITC Definition

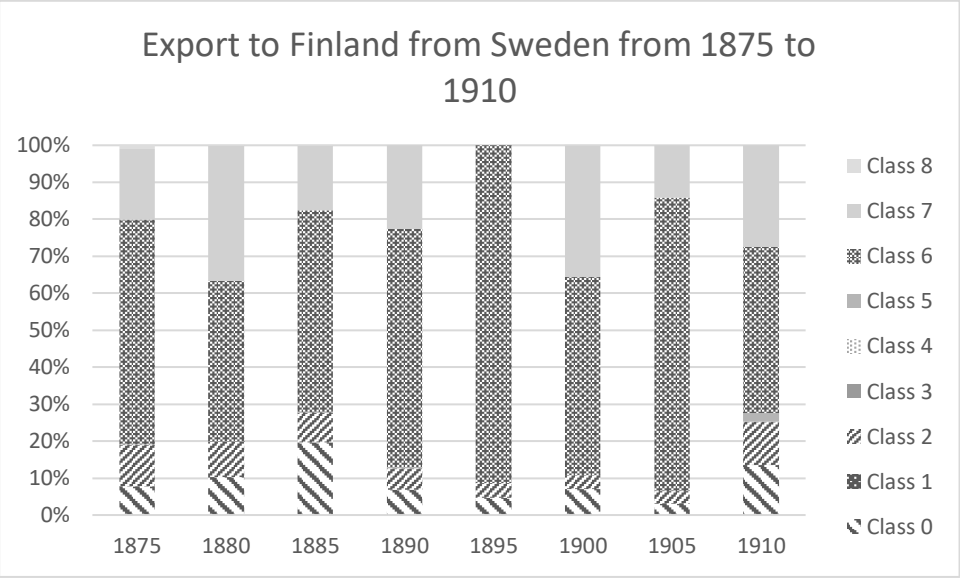
SITC Category	Swedish line in yearbook	English Translation
0	Kreatur	Animals
	Smör	Butter
	Spanmål, omalen o. malen, samt majs	Oats, milled and corn
	Fisk	Fish
	Frö	Seeds
	Fläsk	Pork
	Ägg	Eggs
	Kreatur, nötkreatur	Animals, beef
	Kreatur, hästar	Animals, horse
	Margarin	Margarine
	Kli	Bran
	Socker	Sugar
	Kaffe	Coffee
1	Dricka	Drinks
	Brännvin	Brandy
	Maltdrycker	Malt drinks
	Sprit	Spirits
	Tobak, arbetad	Tobacco,worked
	Tobak, oarbetad	Tobacco unworked
	Vin	Wine
2	Malm	Ore
	Zinkblende	Zink
	Sten	Stone
	Järnskrot	Iron scrap
	Trämassa	Wood pulp
	Trävaror, oarbetade	Wood, unworked
	Koppar utan betäckning	Copper, unworked
	Järnmalm	Iron ore
	Trävaror sågade	Wood, sawed
	Trävaror, brädor	Wood, planks

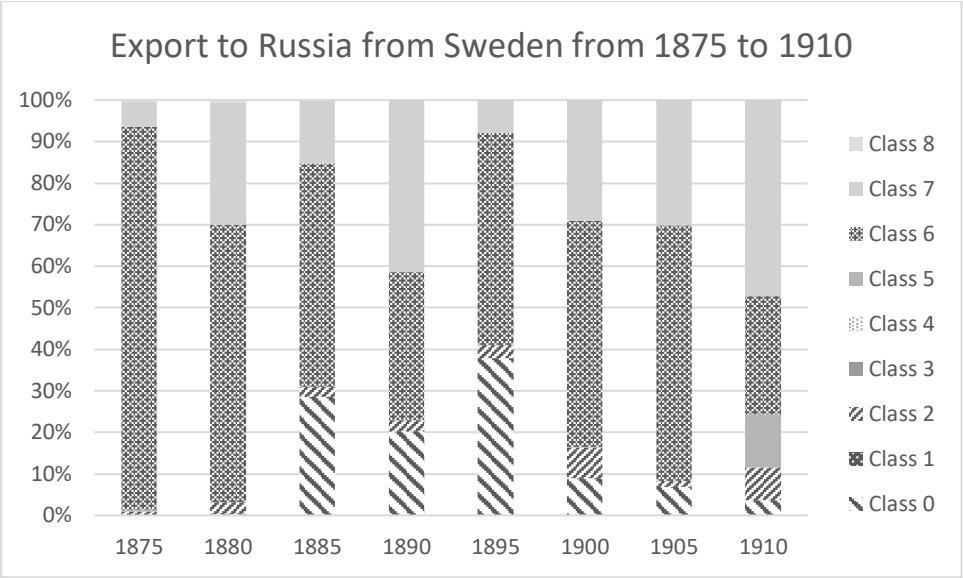
	Metaller, koppar, oarbetade och skrot	Metals, copper, unworked and scrap
	Kautschuck, oarbetad	Natural rubber, unworked
	Hudar och skinn, oarbetade	Hides and skins, unworked
	Salt (kok-)	Salt
3	Mineral-oljor	Mineral oils
	Stenkol	Coal
	Koks	Coke
	Oljor, fossila	Oil
4	Oljekakor	Oil-cakes
	Oljor, fett	Oils and Fats
5	Tjära	Tar
	Superfosfat	Phosphate
	Färger och färgämnen	Colors and pigments
6	Hudar och skinn	Hides and skin
	Vävnade	Woven textiles
	Papper	Paper
	Stål	Steel
	Järn	Iron
	Koppar	Kopper
	Tegel	Brick
	Järn och ståltråd	Iron and Steel wire
	Glas	Glass
	Slöjdvaror	Handicrafts
	Papperstapeter & bårder	Wallpaper
	Papp	Paperboards
	Garn av bomull och ull	Yarn, wool and cotton
	Cement	Cement
	Metaller, kopparlegering	Metals, copper alloys
	Sten, arbetad	Stone, worked
	Metaller, valsade och smidda stänger	Metals, rods
	Metaller, tubämnen	Metals, billets
	Metaller, göten råstänger	Metals, coils
	Metaller, tack barlastjärn	Metals, ingots
	Kautschuck, arbetad	Rubber, worked
7	Redskap och maskiner	Tools and machines
	Fartyg och båtar	Ships and boats
	Maskiner, mejeri	Dairy machines

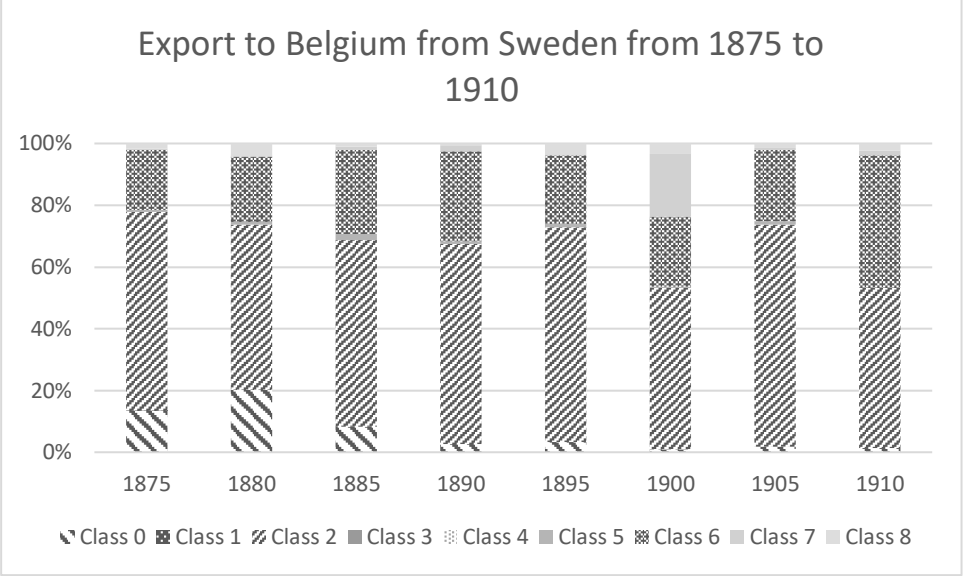
	Instruments, telefonapparater	Instruments & Telephones
8	Tändstickor	Matches
	Kläder	Clothing
	Silver (ej mynt)	Silver no coins
	Guld (ej mynt)	Gold no coins
9	-	-

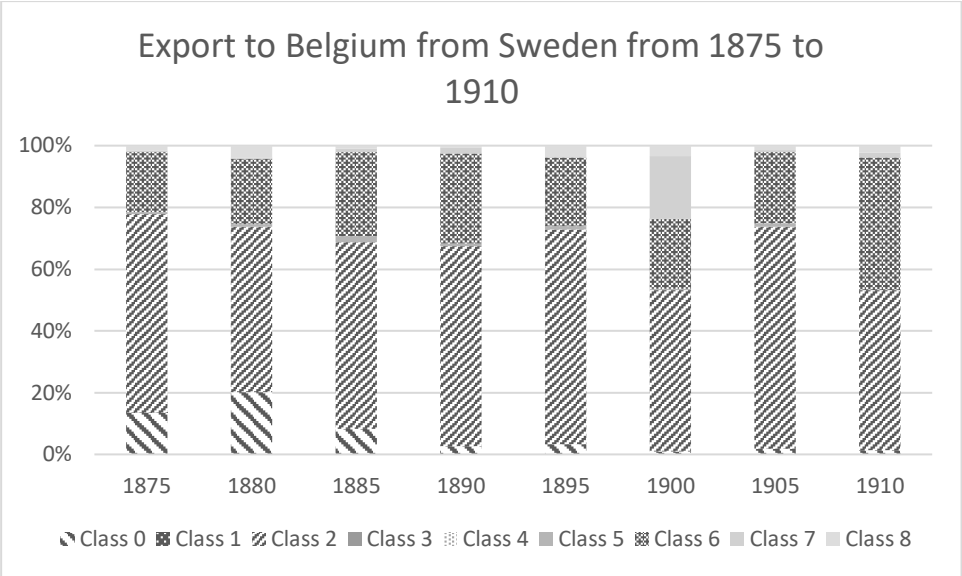
8.2 Appendix 2

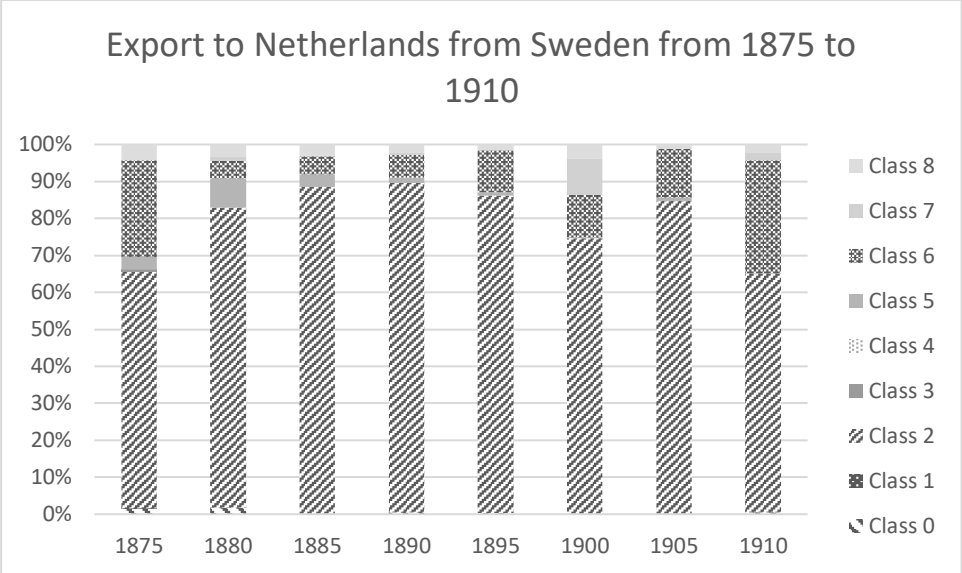
Exports of products according to SITC

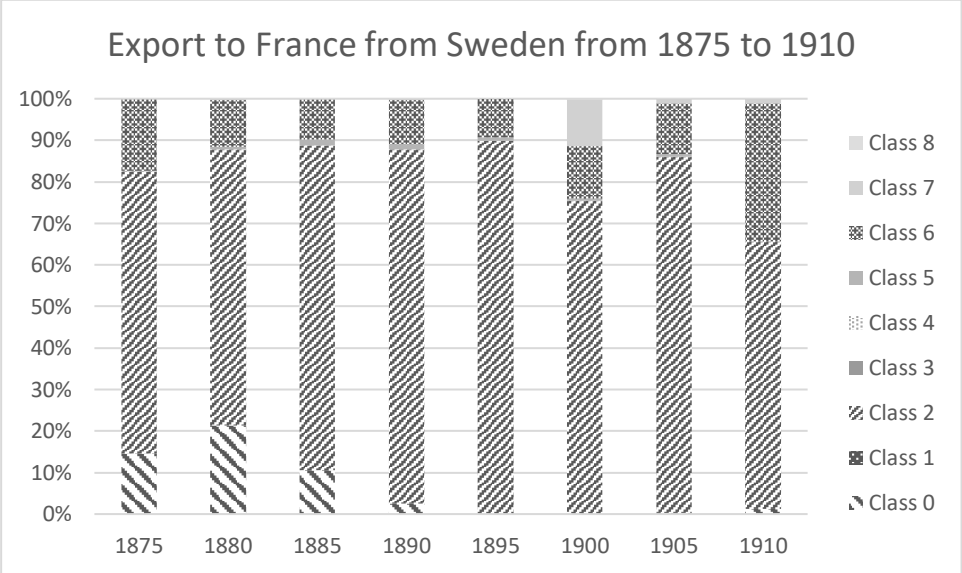


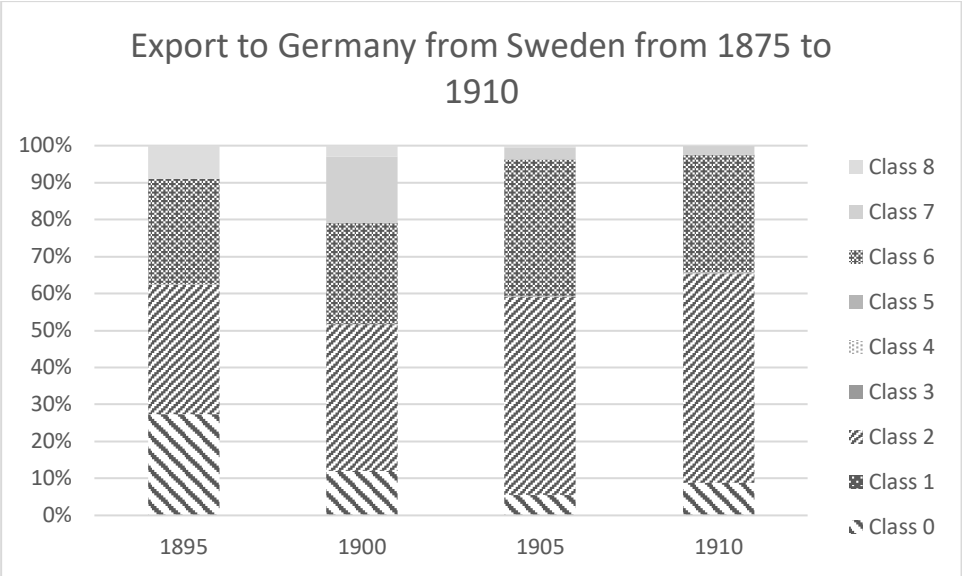

Export to Russia from Sweden from 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

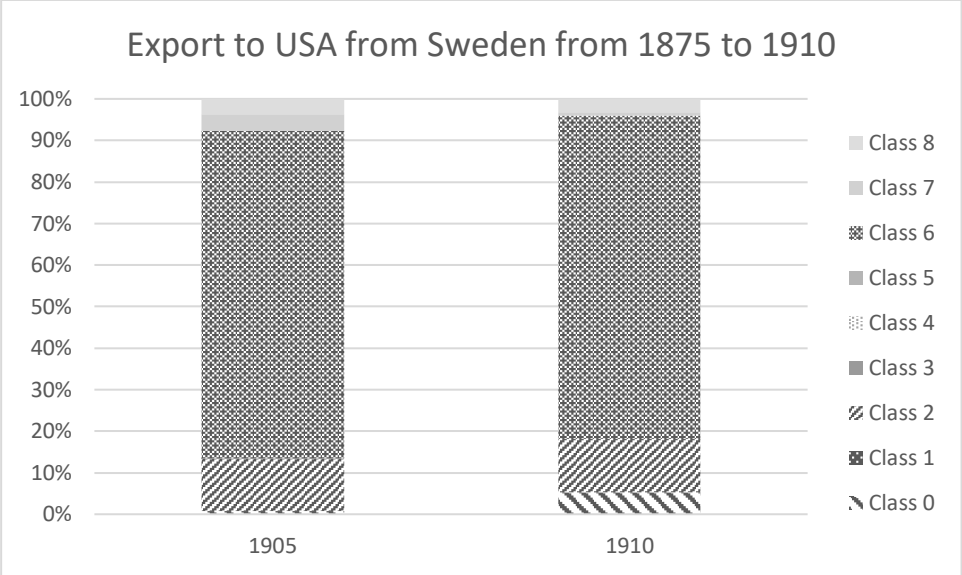

Export to Belgium from Sweden from 1875 to 1910
100%
80%
60%
40%
20%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 0
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8


Export to Belgium from Sweden from 1875 to 1910
100%
80%
60%
40%
20%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 0
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8


Export to Netherlands from Sweden from 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

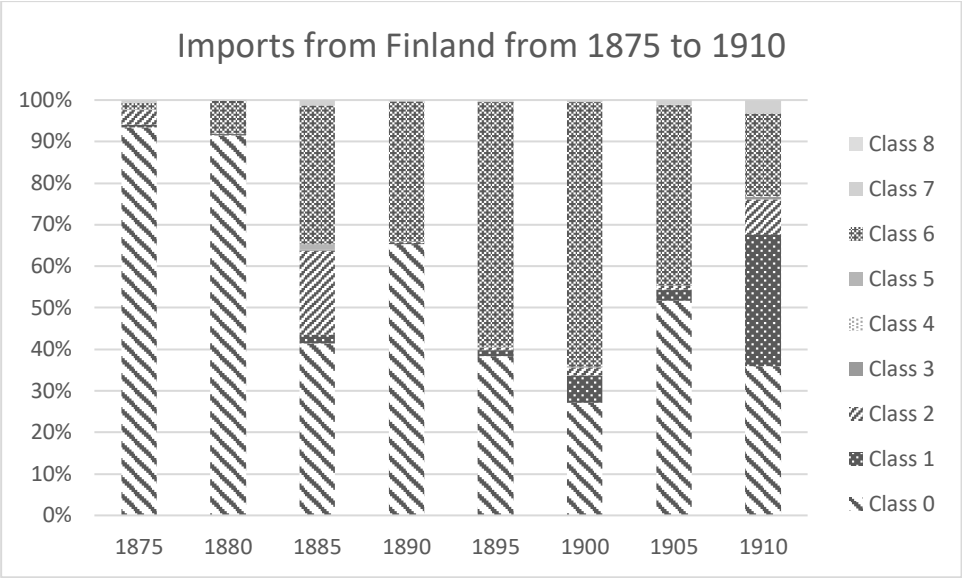

Export to France from Sweden from 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

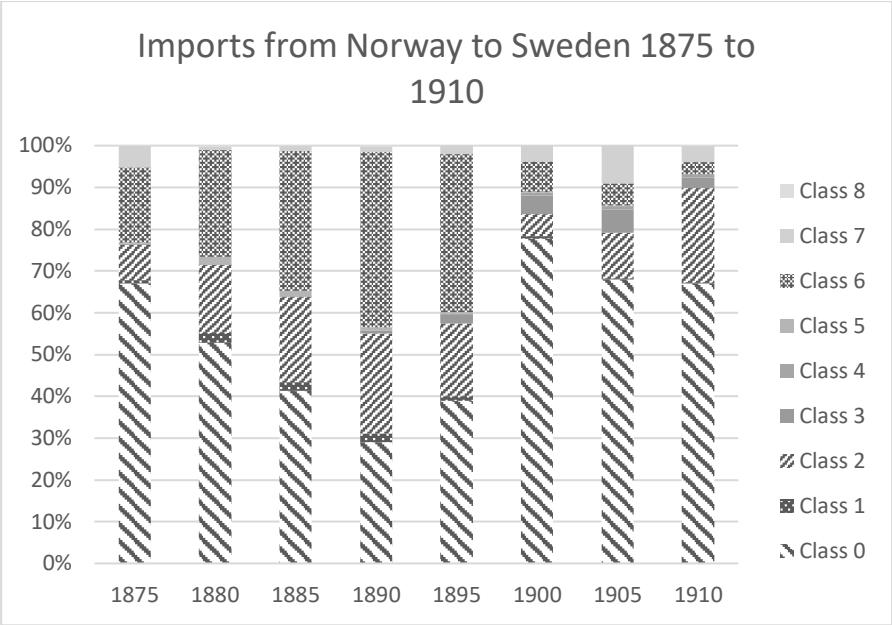


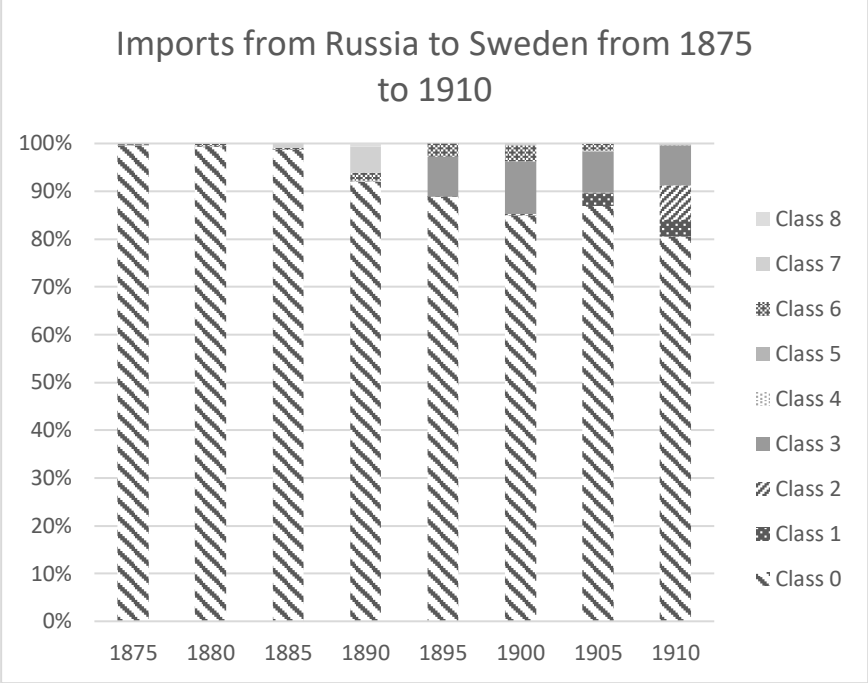


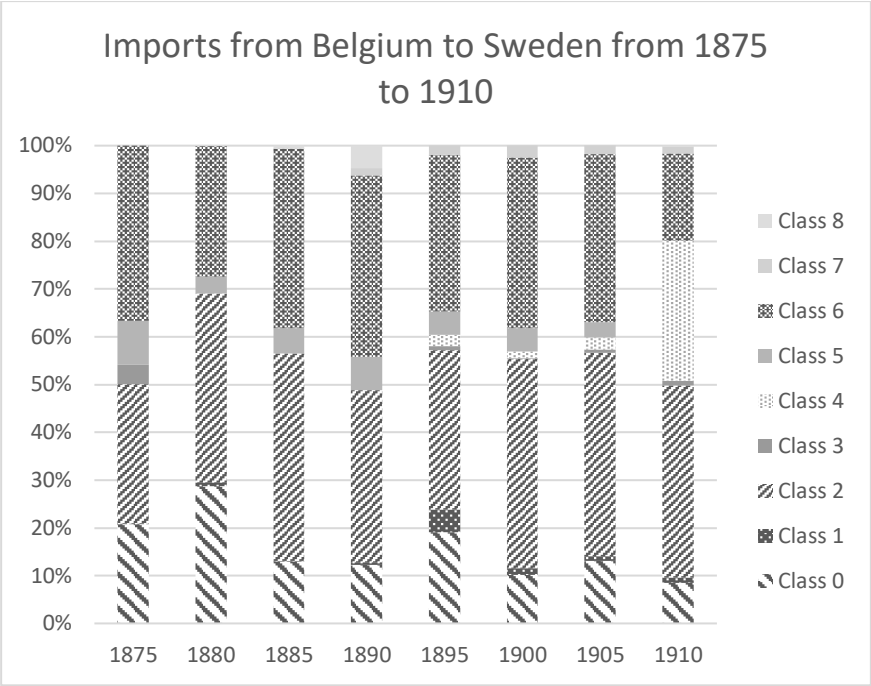
8.3 Appendix 3

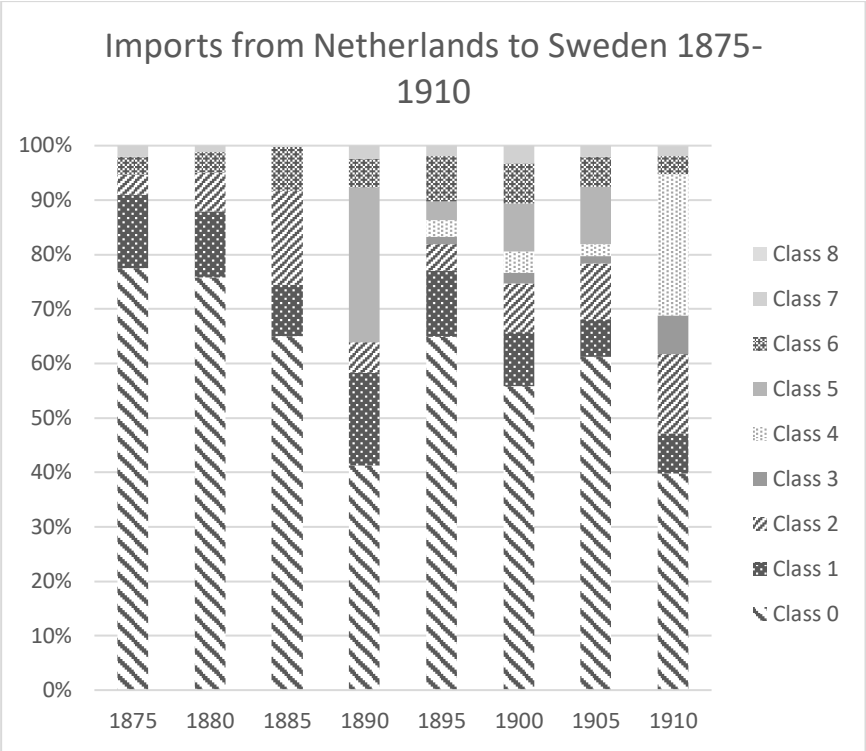
Imports to Sweden according to SITC classification

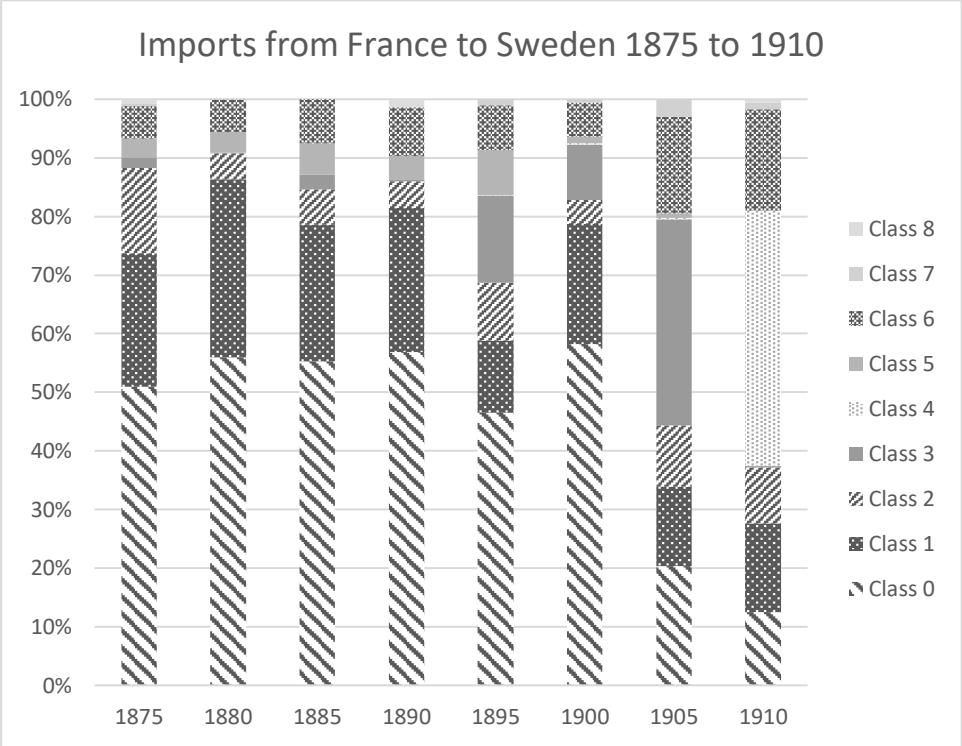

Imports from Finland from 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

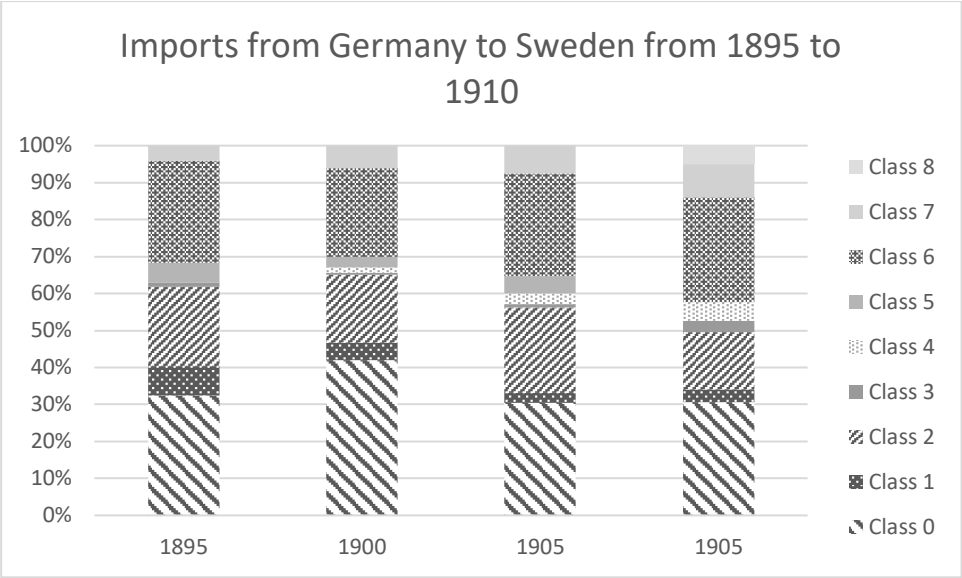

Imports from Norway to Sweden 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

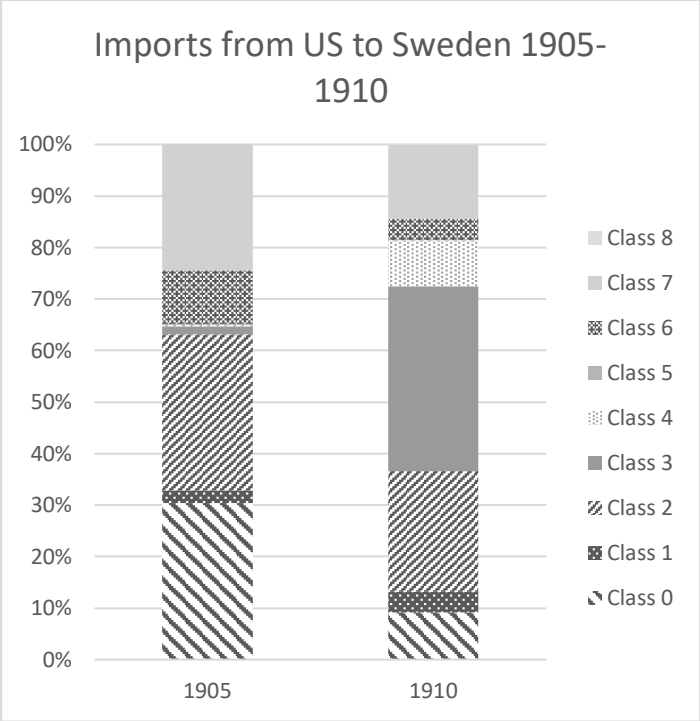

Imports from Russia to Sweden from 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0


Imports from Belgium to Sweden from 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0


Imports from Netherlands to Sweden 1875-1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

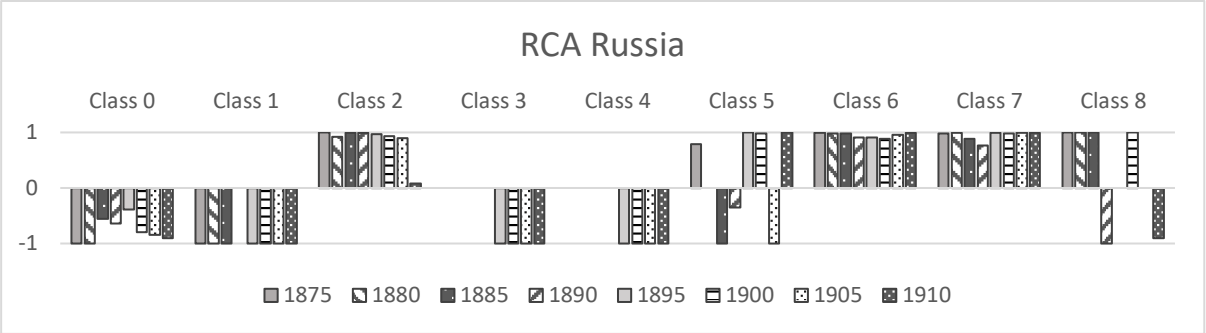

Imports from France to Sweden 1875 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1875
1880
1885
1890
1895
1900
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

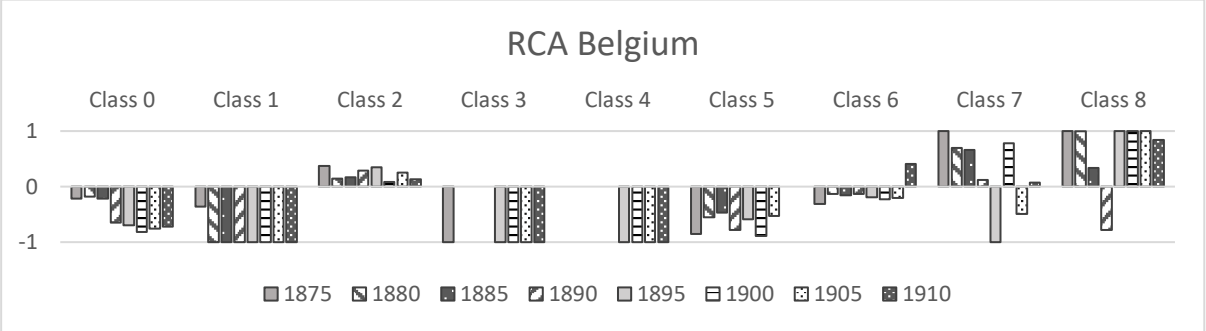

Imports from Germany to Sweden from 1895 to 1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1895
1900
1905
1905
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

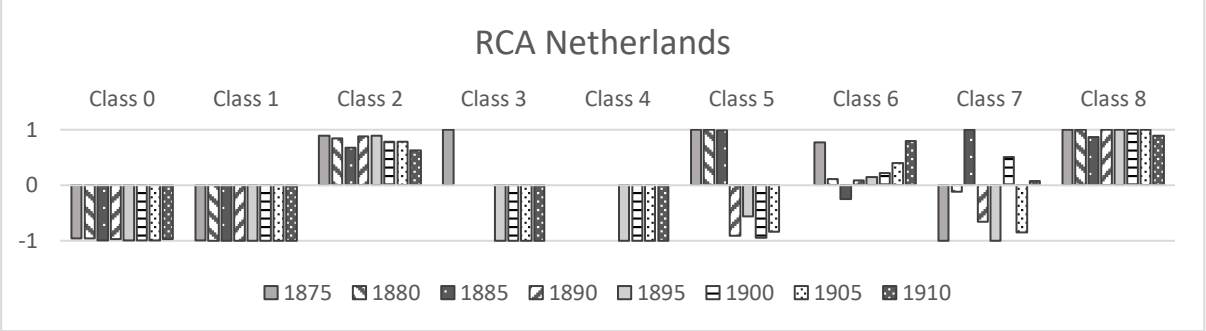

Imports from US to Sweden 1905-1910
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1905
1910
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
Class 0

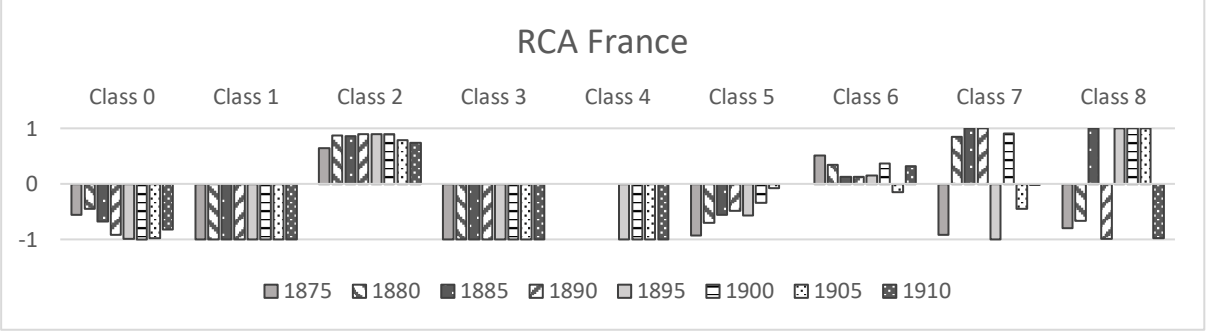
8.4 Appendix 4

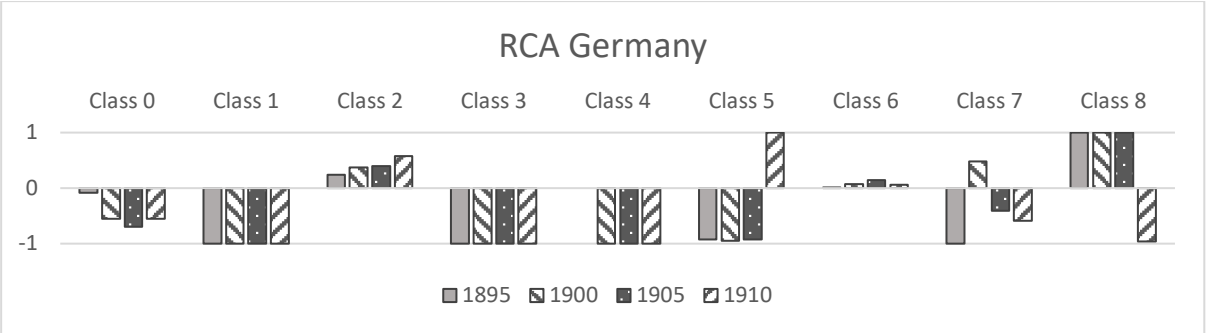
RCA Indexes not commented on in the thesis.

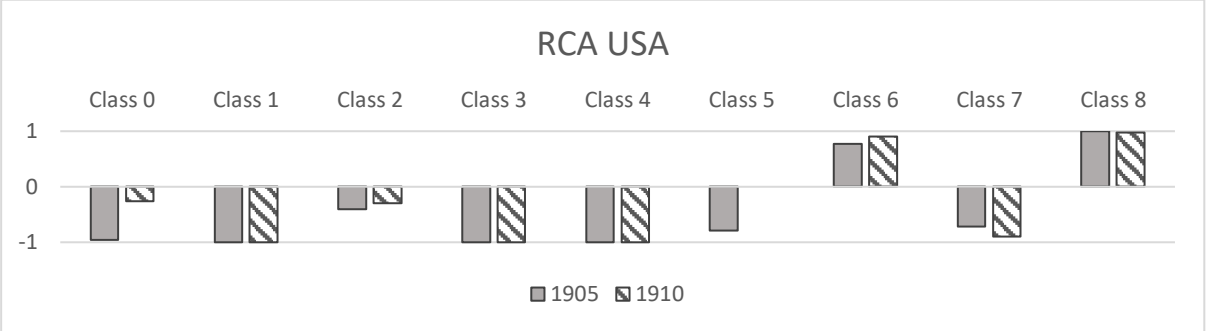


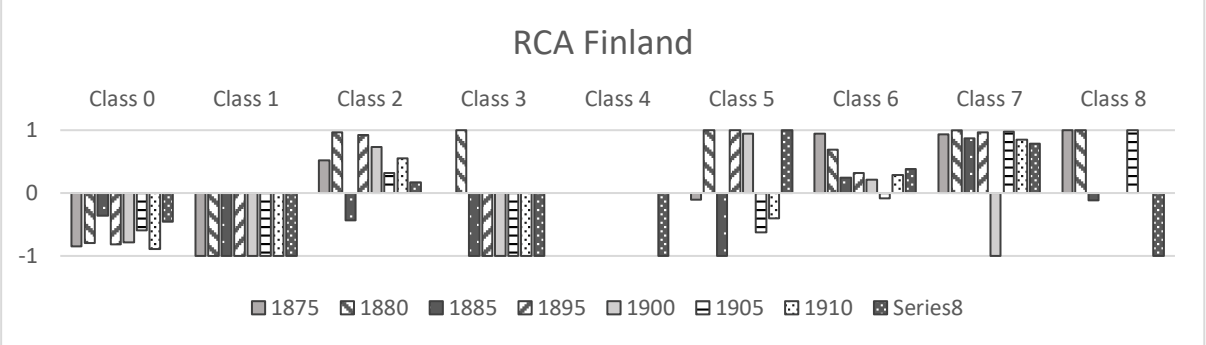







RCA Germany
Class 0
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8
1
0
-1
1895
1900
1905
1910


RCA USA
Class 0
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8
1
0
-1
1905
1910


RCA Finland
Class 0
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8
1
0
-1
1875
1880
1885
1895
1900
1905
1910
Series8

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