

The Effects of Currency Depreciation on the Exporting Industry

A Comparative Study between Swedish and Finnish Forest Industry Exports

Abstract

In autumn 2008 the SEK depreciated heavily against the euro at the same time as a divergence of export patterns between Sweden and Finland occurred, particularly in the forest industry. Sweden was hit less by the concurrent recession than Finland and since the nations are structurally similar in everything except that Sweden is not part of the EMU the depreciation has been believed to be the cause.

This paper aims to explore *the consequences of the depreciation for the Swedish forest industry relative to the Finnish* by looking at the links between them: the cost competitiveness and the pass-through of the depreciation to importers' prices. It uses a qualitative method, investigating if changed competitiveness caused the lesser fall for Swedish exports, if exchange rate pass-through was present and if there are any grounds to the beggar-thy-neighbour argument.

We conclude that Sweden's competitiveness increased compared to Finland but it is not clear if this caused the divergence in exports or the production shift.

Keywords: Relative Unit Labour Cost, EMU, Depreciation, Trade, Exports, Forest Industry

STOCKHOLM SCHOOL OF ECONOMICS
Master Thesis in International Economics 5210
September 1, 2010

Authors: Anna Conneryd[€]
Emelie Norin*
Friendship is a sheltering tree

Examiner: Örjan Sjöberg
Supervisor: Hans Tson Söderström
Discussants: XXX

We would like to thank our supervisor, Hans Tson Söderström, for all his help during this process.
If supervisors were flowers, we would pick you.

[€] 20706@student.hhs.se
^{*} 20717@student.hhs.se

Table of Contents

1. Introduction	1
1.1 Research Question	2
1.2 Limitation of Scope	3
1.3 Organisation of the Paper	4
2. Methodology	4
3. Background	7
3.1 The Depreciation and Its Consequences	8
3.2 Sweden, Finland and the EMU	10
3.3 The Forest Industry	13
4. Literature Review	15
4.1 Competitiveness and Trade	16
4.2. Exchange Rates and Prices	17
4.3 Sweden's Previous Experience	19
5. Theoretical Propositions	20
6. Data	22
7. Empirical Evaluation of Propositions	26
8. Conclusion	31
Bibliography	34
Appendices	38
Appendix 1 – Macroeconomic Variables for Sweden and Finland	38
Appendix 2 – Company List	42
Appendix 3 – Evolution of Exports	43
Appendix 4 – Questionnaire	44
 Figure 1 – The EUR/SEK Exchange Rate	 9
Figure 2 – Evolution of Forest Exports to Euro Area	10
Figure 3 – The World's Leading Forest Industry Exporters	14
Figure 4 – RULC for Sweden and Finland	23
Figure 5 - Price Development in Wood Products for Sweden and Finland	24
Figure 6 – Price Development in Pulp and Paper for Sweden and Finland	24
Figure 7 – EBITDA Margins for Sweden	25

Figure 8 – EBITDA Margins for Finland.....	26
Figure 9 – Unweighted EBITDA Margins for Sweden and Finland.....	29
Figure 10 – Real GDP Growth for Sweden and Finland.....	38
Figure 11 – GDP per Capita for Sweden and Finland.....	38
Figure 12 – Share of Trade in GDP for Sweden and Finland	39
Figure 13 – CPI for Sweden and Finland	39
Figure 14 – Labour productivity for Sweden and Finland	40
Figure 15 – Real Effective Exchange Rates for Sweden and Finland.....	40
Figure 16 – Unemployment for Sweden and Finland	41
 Table 1 - Correlations of Prices and the Exchange Rate	 28
Table 2 – Company Information	42
Table 3 – Evolution of Exports	43

1. Introduction

Money doesn't grow on trees

When the euro was first introduced it benefitted from the economic conditions prevailing at the time. With global growth and stability the new currency experienced little difficulties. The financial crisis and the following recession have however put the euro in a new situation. This presents an opportunity to observe the functioning of the common currency under changed circumstances. Are the recent events affecting members and non-members of the European Monetary Union (EMU) in different ways? Did the financial crisis affect the cost and benefits of EMU membership?

The question if whether or not it was better for Sweden to be inside or outside the EMU was posed in connection to the financial crisis in a recent study carried out by Gylfason et al. (2010), as well as in another study by Hietala (2009). The question, however, is not a new one but dates back to the beginning of the EMU cooperation when the question if to join the EMU or not was raised for the very first time. Increased trade was brought forward as one of the main reasons for joining but up until now little effect has been seen (see for example Gylfason et al. (2010) and Bun & Klaassen (2004)), whereas the costs, in terms of transition costs and loss of independence, from forming the EMU have been large. So, if the benefits were limited before the crisis, did they continue to be marginal during the crisis? In autumn 2008 the SEK depreciated 16 percent against the euro leading to changed relative prices between Sweden and the Euro area. Did Sweden benefit from being outside during the financial turmoil and came through at less of a cost because of this? Did Sweden gain a cost advantage against the Euro zone countries as a consequence of the weakening of the SEK?

A simple example can illustrate the point. Take two pulp producers, one Finnish and one Swedish, both exporting to a third market within the Euro area. If the SEK were to be weakened in comparison to the euro, which happened in the second half of 2008, this would imply an increased profit margin for the Swedish producer in comparison to the Finnish, assuming that the Swedish cost level was not raised correspondingly and customer prices in euro kept constant. This could in turn lead to a shift in production from Finland to Sweden and a better development of production and employment for Sweden than Finland. This is what is known as beggar-thy-neighbour policies and something Sweden has been accused of

by the Finnish since Sweden has chosen not to participate in the EMU and thus has kept the possibility to depreciate. But is it true? What were the actual effects of the exchange rate depreciation?

1.1 Research Question

Sweden and Finland are very similar in terms of economic structure, level of GDP per capita, social conditions and political institutions but have however chosen different approaches to the EMU.¹ Finland is a full-fledged member whereas Sweden has chosen to let its currency float unmanaged. As Gylfason et al. (2010) put it: “Differences in the economic fortunes of Finland as compared to Sweden might therefore be informative about the genuine significance of the euro” (p. 172). What will such a comparison tell us? The answer depends on the conditions prevailing when the question is posed and as the boom years already have been studied extensively time has come to look at the financial crisis 2008. One way of studying the difference between Sweden and Finland is by the impact of the depreciation of the SEK in 2008 on the evolution of their exports, since both nations are trade dependant. On other occasions the roles could be reversed and Sweden could experience an appreciation, this is not the point but what is important is to study the relative developments of Sweden and Finland. However, looking at exports as a whole will provide little useful information as a consequence of being too broad, and on an aggregate level there are differences in the structure of exports from Sweden and Finland. Therefore this paper will focus on an industry of great importance for exports in the two countries that has also proven alike to a large extent, namely the forest industry^{2,3}. This leads to the research question, which the remainder of this paper will try to answer:

What were the consequences of the depreciation of the SEK in 2008 for the Swedish forest industry relative to the Finnish?

A word of caution on the use of consequences in this context: the consequences of an event imply a causal relationship. When formulating the research question the cause and

¹ The similarities of the two countries are discussed in more detail in section 3.2 (Sweden, Finland and the EMU)

² In accordance with the forest industry organisation in Sweden this paper by forest industry refers to the pulp and paper industry, sawn woods, wood based panels, manufacturing of packages of wood, paper and paperboard as well as the carpenter industry. The single largest sector is the paper industry.

³ For an elaboration on the forest industry in the two countries see section 3.3 (The Forest Industry)

consequences with regards to the depreciation of the SEK have not yet been established and it is our purpose with this paper to investigate the connection between the depreciation and the consequences. If the academic literature reviewed fails to find links between the depreciation and the lesser fall in Swedish forest exports we will conclude that either there are none or there were other events present blurring the picture.

1.2 Limitation of Scope

This paper studies the potential consequences of the depreciation of the SEK under the financial crisis in the autumn of 2008 rather than the way in which the crisis unfolded, because any number of events could have lead to the depreciation, but the actual outcome in different environments is what is of interest here. The paper will therefore only to a limited extent deal with the crisis as such, as to put the paper into a context.

The exchange rate SEK-euro was essentially changed in two dimensions in autumn 2008: the SEK depreciated and the exchange rate volatility increased, but only the depreciation will be dealt with within the scope of this paper. Although the consequences of the increased volatility are an interesting area of study it has already been treated extensively in other research papers and their general conclusion is that exchange rate volatility has little bearing on trade.⁴

The thesis is furthermore focused mainly on the export side and not as much on production and/or employment. This limitation has been made because of the data available being very aggregated and time lags severe.

Furthermore, in order to be able to obtain relevant results a narrow focus was found more suitable than a broad one and hence the investigation is focused solely on the development of the forest industry. The investigation will, due to this restriction, not be able to draw conclusions regarding the impact on other industries or any effects the events in autumn 2008 may have had on the welfare of the Swedish society as a whole.

⁴ See for example Baron (1976), Baxter and Stockman (1989), Bahmani -Oskooee and Ltaifa (1992), Sercu and Uppal (2003), de Vita and Abbott (2004) and Backman (2006).

The depreciation of the SEK is also a recent event and hence any long term consequences cannot be observed. This also limits the number of data points available and hence prohibits a quantitative analysis of the consequences. Instead a qualitative hypothesis testing will be carried out, which limits the ability to control for variables other than the exchange rate that could influence the state of the export industry.⁵ Trade data is furthermore produced with a certain lag, since it needs to be highly aggregated to be comparable across industries and countries, and therefore we cannot with certainty present comparable and relevant trade data for both Sweden and Finland beyond April 2009.

1.3 Organisation of the Paper

After having outlined the scope and purpose of the thesis in section one the remainder of the paper is organised as follows. Section two outlines the methodology used in order to obtain results. Thereafter, in section three, a description both of the depreciation and its potential consequences, and a more general background is provided to facilitate the readers understanding of the topic. Section four gives the theoretical framework on which the propositions presented in section five are based. In section six the empirical data needed to discuss the theoretical propositions is presented. Section seven presents the qualitative discussion of the propositions and the results obtained, after which conclusions and areas for further research wrap up the paper in section eight.

2. Methodology

Easy as falling off a log

This section serves the purpose of elaborating on how the research question will be tackled. It begins with an outline of the approaches chosen and thereafter describes the way in which data will be collected and treated.

The two approaches that today are discussed when it comes to analysing current events based on theories are the deductive and the inductive method. In the deductive method a hypothesis built on theory is tested using empirical evidence. This implies that it is existing theory that

⁵ See section 2. (Methodology) for further elaboration on the qualitative approach used.

sets the framework for the data that is to be gathered and the way in which it can be interpreted. Using the inductive method, on the other hand, implies the creation of a theory based on actual research results. In this case conclusions of a more general nature are drawn based on observations of events. A combination of these two approaches is also possible. As the purpose of the thesis is to evaluate the consequences of the fall of the SEK a deductive method will be used. Therefore, theoretical propositions based on existing literature will be put together and tested to investigate if the actual outcome corresponds to the theoretical predictions, or if the financial crisis was a too exceptional event for previous research to apply.

When testing a hypothesis you can once again use two different approaches. The qualitative and quantitative approaches are two different ways in which data is processed and analysed. They however serve the same purpose, namely to create a better understanding of society and how people, groups and institutions interact and affect each other. In order to achieve this understanding the information gathering can be carried out either on a broad or a deep base. In a qualitative approach the focus is on in depth studies, using a few units and a rich amount of data concerning these. This approach is used when one is interested in obtaining an overview of contexts and structures to describe and *understand* the investigated. A quantitative approach will instead yield less information about a large number of units and is best used when several variables are of interest and the aim is to describe and *explain* a phenomenon. The limited amount of data available and a desire to rather understand structures and contexts than to explain a phenomenon motivates the use of a qualitative approach in this thesis.

The choice to base the investigation on the comparison of Sweden to Finland is, as already mentioned in the introductory section, founded on their great similarities, making it possible to conduct almost an economic laboratory experiment. The backgrounds of Sweden and Finland are discussed at greater detail in section 3.2 (Sweden, Finland and the EMU). It is important to note that this paper aims at understanding the consequences of choosing not to participate in the EMU during the financial crisis, thus the focus is on Sweden, and Finland serves as a party for comparison. In section 3.3 (The Forest Industry) the importance of the forest industry for the two countries' exports is also elaborated on, motivating the choice of industrial sector. It could be argued that for example the telecom industry is also an industry of great importance and similarity, but because of the different structures of this industry in the two countries, it was decided against.

The companies chosen as part of this study are Swedish and Finnish companies within the forest industry sector that were selected based on lists provided by the Swedish and Finnish forest industry organisations⁶ respectively, and all but one are publicly listed⁷. All companies on the forest industry organisations' lists were reviewed to determine relevance, as some members were for example energy companies, as well as availability. Companies selected were furthermore required to have a significant turnover and a large percentage of exports so to be able to observe effects of the recent events.⁸ The stock listing of companies was required to facilitate the access to annual reports and other data. We are aware that this implies that potentially some important export companies might have been excluded, but the observed effect on the participating companies is believed to be representative for the industry as a whole. Furthermore, as for the Finnish firms of study, listed companies were found to be more likely to provide an annual report in a language other than Finnish, hence reducing the language barrier of the research.

The dramatic fall of the SEK took place in October 2008. In order to include both so called normal years as well as the years after the fall company specific data from 2005 and onwards is used. Furthermore, the IFRS accounting standards were implemented in Sweden in 2005, which makes comparability more difficult when using data from earlier years. The company specific data includes EBITDA margins and is used to evaluate the impact on companies of the depreciation. When the purpose is to compare Sweden and Finland, economic indicators have been collected from 1994 onwards to be able to identify any potential effects of EU and later on EMU membership, or from the earliest date possible.

Regarding data used all statistics regarding export, trade, inflation, and so forth have been collected mainly using the OECD database. Such data serves a two folded purpose. It is both used to outline the background to the events and to describe the actual consequences of the depreciation. The choice of databases has been made primarily on the basis of comparability. By using the same database for figures both from Sweden and Finland any inconsistencies between figures should have been eliminated and corrected for, hence more accurate

⁶ For Sweden *Skogsindustrierna* (www.skogsindustrierna.se) and for Finland *Finnish Forest Industries Federation* (www.forestindustries.fi).

⁷ Korsnäs was judged suitable to participate in the study, since its parent company, Kinnevik, is listed.

⁸ A complete list of companies that are part of the study, their turnover, export percentages and other relevant variables can be found in appendix 2

conclusions can be drawn. However, this of course compromises the amount of detailed data available for analysis, but as sufficient data was available this was found to be a minor concern. Based on the same reasoning the Beureau van Dijk Orbis database was used for the collection of company data.

The collected information was complemented with information from the selected companies annual reports and a number of interviews to further enhance the validity of results and to gain a qualitative insight into the reasoning behind the actions taken by the Swedish and Finnish forest companies during the recent financial turmoil. All companies judged to be relevant as described above were contacted and the companies that chose to participate in the in-depth analysis did so on a voluntary and anonymous basis. To be able to preserve the anonymity of the companies, while still being able to identify and contrast different responses in the evaluation, each interview was numbered.

The data collected as presented above can be divided into three categories and will be analysed at different stages. First data describing the depreciation and its consequences will be presented. Then background data will be presented. This data sets the context, and together with the reviewed literature it will lead up to three *theoretical propositions*. These propositions are rather tentative suggestions to what can have caused the consequences of the depreciation than actual explanations. To establish whether they actually manage to explain the consequences the third category of data is used. The third category is comprised of data needed to be able to empirically discuss the theoretically based propositions of the consequences of the SEK depreciation. Based on this the qualitative hypothesis testing will enable us to draw some first conclusions regarding the effects of the dramatic fall of the SEK.

3. Background

In order to put this paper into context, this section will introduce the reader to the dramatic fall of the SEK during the recent financial crisis, and development of the forest industry in connection to the depreciation. Thereafter it will elaborate on the similarity of the economic developments of Sweden and Finland, making them excellent parties for comparison, at the same time as differences in their developments will not be ignored. This section will also serve as an introduction to the forest industry and its peculiarities.

3.1 The Depreciation and Its Consequences

Little strokes fell great oaks

During 2008 the world economy entered into a financial crisis that had begun in the USA with the subprime lending and spread globally. The initial financial crisis was followed by a global economic recession. The insecurity on the financial markets dried out the available credit and affected the real economy, causing a fall in demand of goods and services. Central banks and governments around the globe put in measures to stabilise the financial systems and stimulate the economies, but they could not hinder the approaching downturn. The crisis that hit the world was considered symmetric, at least on a European level, as it hit all markets in the same time period and with the same magnitude.

From 2008 to 2009 global GDP contracted by 0.8 percent, the corresponding figure for the European Union, Sweden and Finland being, 4.0, 4.4 and 7.6 percent, respectively. The relatively large difference between Sweden and Finland already on this very aggregate level speaks in favour of the topic for investigation of this paper: although they are historically similar Sweden and Finland have been affected to a different extent by the crisis. International trade decreased even more than GDP, globally by 22 percent.

During the crisis the SEK fell significantly in relation to the euro as illustrated in figure 1. According to optimal currency area theory a symmetric shock, such as the financial crisis can be claimed to be, should not have any major impact on exchange rates.⁹ Why did it then change to that extent? Gylfason et al. (2010) outline a couple of possible explanations. First of all they mention the fact that in times of crisis one key feature is higher risk premium making investors shift out risky assets, which includes assets in relatively small currencies such as the SEK. Second of all, Swedish exports are dominated by investment goods and consumer durables, the demand for which was especially depressed during the crisis. Hence it can be argued that the crisis in fact was asymmetric in its impact. Whatever the causes, fact remains that the exchange rate dropped sharply for a period of time and it is the effects of this on the tradable sector that this paper intends to investigate.

⁹ The theory of optimal currency areas was first outlined in Mundell (1961) and for a summary of the more recently added aspects please refer to Tavlas (1993).

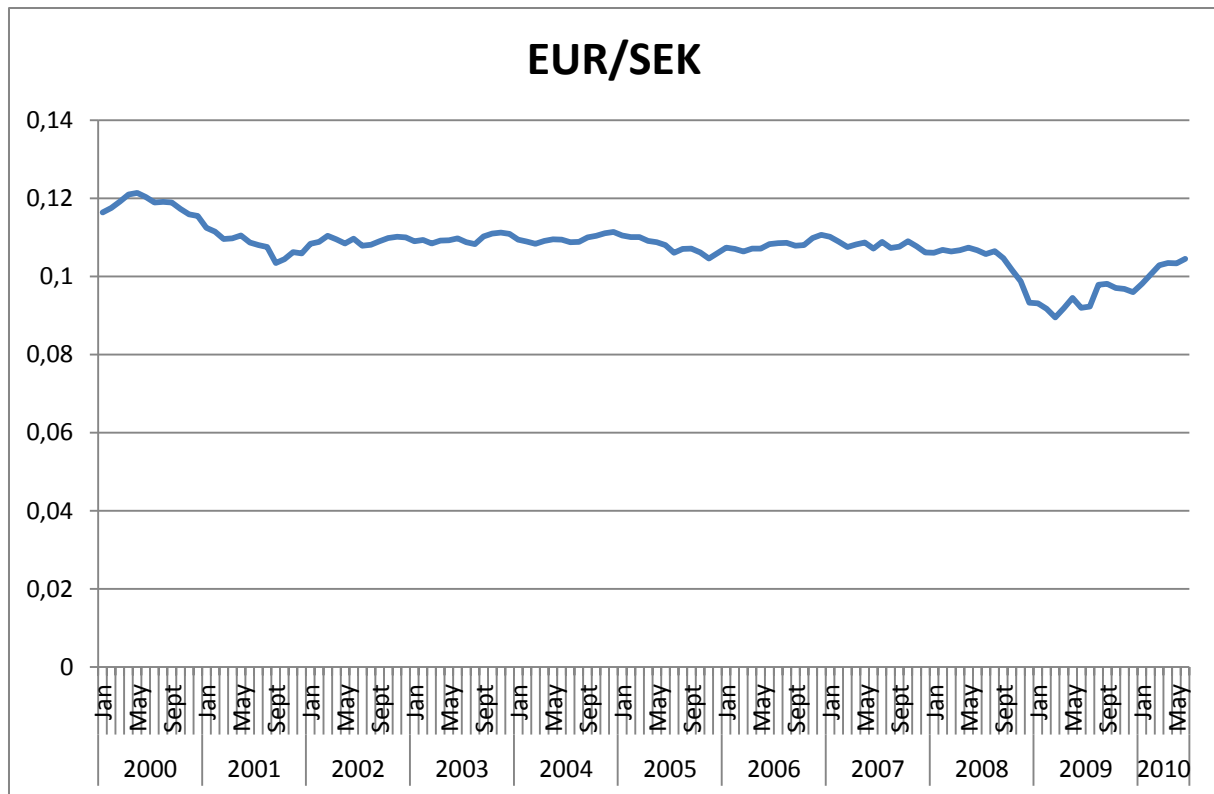


Figure 1 – The EUR/SEK Exchange Rate

Source: (NASDAQ OMX Stockholm AB)

As a part of the tradable sector, the forest industry has of course been affected by the economic downturn as well. With a reduction in industry production and construction work the demand for paper, pulp and sawn woods fell. For example, paper production in Sweden decreased 2 percent in 2008 and 6 percent in 2009. In Finland the fall was more exceptional: 22 percent in 2009. The production of sawnwood decreased 11 percent in Sweden, Finland, Germany and Austria. Overall, the reduced demand led to a reduction in output of forest industry products and there was a large overcapacity, leaving machines idle. (Skogsindustrierna, 2009; Skogsindustrierna, 2010)

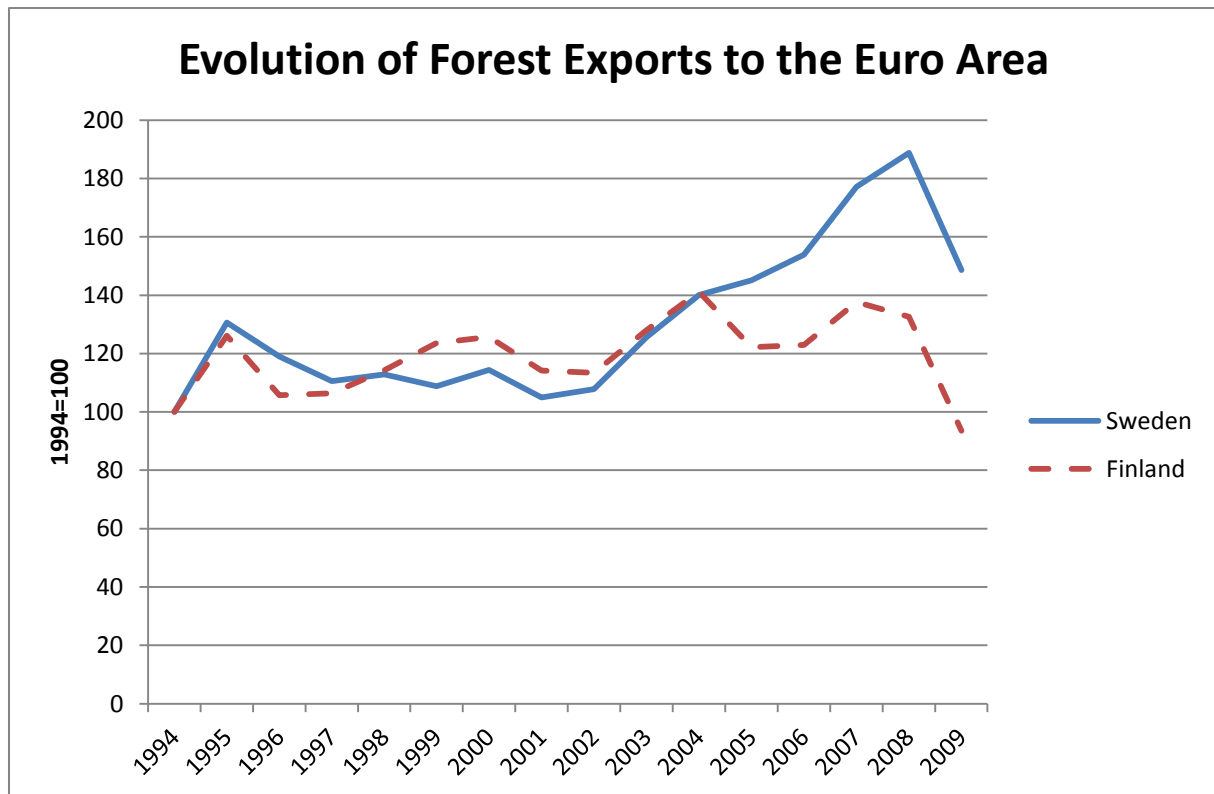


Figure 2 – Evolution of Forest Exports to Euro Area

Source: (OECD)

The exports of forest products fell along with production (see figure 2 and appendix 3 for the evolution of exports). Euro area exports fell with 21 percent in Sweden and 30 percent in Finland between 2008-2009. Euro area exports of all commodities fell even more, by 31 and 34 percent respectively in the same time span. What is striking is that exports from Sweden were less affected than exports from Finland by the fall in demand caused by the recession.

3.2 Sweden, Finland and the EMU

Like two trees in a forest

Sweden and Finland have had a very similar economic development, both before and after their differing choices regarding EMU participation. This fact makes them extraordinary suitable for comparison, a fact widely recognised (see for example Jonung, Söderström and Stymne (1996); Toivonen, Toppinen and Tilli (2002); Jonung and Sjöhom (1998) and Jonung, Schuknecht, & Tujula (2006)). The development of different macroeconomic variables over time will therefore not be discussed in detail here. Instead the reader is referred to appendix 1

for an overview of some key important macroeconomic factors. Here, a brief overview of the two countries' political and economic development will be provided to set the paper into a context.

Sweden and Finland have not only had astonishingly similar economic developments, but also conducted similar economic policies, with minor exceptions. In response to terms-of-trade losses and domestic wage inflation numerous adjustments to the exchange rate were conducted during the 1970s and 1980s. The price Sweden and Finland paid for their accommodation policies was one of high inflation and low credibility of their pegged exchange rates. Sweden and Finland both had heavily regulated financial markets in the beginning of the 1980s and were among the last developed countries to ease regulations. When the regulations were gradually lifted between 1983-1990 lending increased dramatically and the magnitude of the increase in relation to the base was similar in Sweden and Finland. With the increased free capital movements it was difficult to contain demand pressures and in order to deal with this Finland and Sweden eventually chose different paths. Finland re-valued the FIM already in 1989 whereas Sweden chose to keep the exchange rate fixed until 1992. Sweden announced a unilateral peg to the European Currency Unit (ECU) in May 1991 and Finland followed Sweden's example only a few weeks later. However, at this point the two economies were already contracting and suffering from rising unemployment and unfavourable development of the relative unit labour cost (RULC). The ECU peg of Finland was maintained for only five months and then the FIM was allowed to float on September 8 1992, making the SEK exceptional as still pegged. As a consequence it was put under a number of speculative attacks and unable to defend it, it was floated in November 1992. During the crises of the 1990s rapidly falling investment demand was followed by a contraction in private consumption. This was countered by strong net exports in the following years. (Jonung, et al., 1996)

It was in the wake of this crisis that the two countries were to decide regarding EU and EMU participation, and astonishingly enough, based on the similarity of events, the lessons they had learnt made them reach completely different conclusions regarding how to best move forward. Sweden and Finland both became members of the European Union in 1995, but since then their approaches to the union have differed substantially. Of the two countries Finland is today the only full fledged member as it adopted the euro in 1999. Sweden's distanced approach to the EMU originally came in the wake of the financial crisis of the 1990s, where

the so called Calmforsrapporten concluded that it for Sweden would be better to wait and possibly join at a later stage (SOU1996:158). This was thereafter followed by a referendum in 2003 where, despite that a parliamentary majority was in favour of entering the EMU, the public voted against entry. The Finnish government on the other hand already early on adopted a positive stance towards the EMU. The reasons for this were multiple and among them can be found a desire for increased macroeconomic stability after a history of mixed returns of monetary policy and a wish to geographically be part of the European economy rather than the Russian (Gylfason, et al., 2010).

One of the major reasons for the initiation of the EMU was the widespread belief that the introduction of a common currency would increase trade. Factors brought forward as explanations for this increase usually include lower transaction costs, reduced exchange rate uncertainty and enhanced competition through greater transparency. Before the introduction of the euro, numerous studies on the effect of a reduction in exchange rate volatility as a consequence of having a currency union were carried out in order to anticipate future results (see McKenzie (1999) for an overview of these studies). Their results were however ambiguous.

In hindsight, the trade effect has not been as large as expected. Initial studies did indeed find a positive effect on trade by the introduction of the EMU (see for example Bun & Klaassen (2004)). This effect is not caused by a reduction in the volatility of the real exchange rates, perhaps because the volatility of the exchange rates between the countries was low already before entering. Instead the effect is caused by other consequences from joining the EMU, such as perfect credibility of the nominal exchange rate fix, the reduction of transaction costs and the capital market integration. When looking specifically at the trade effects of becoming an EU member for Finland and Sweden, and also EMU member in the case of Finland, a reduction in the trade share with other EU members is found, contrary to theoretical predictions. Instead the share of trade with the eastern European countries has increased. Overall the trade effects found are very small and instead the benefits arising from membership are related to FDI and R&D (Breuss, 2005). The specific case of EMU has also been investigated for the participating countries and although the overall result show positive figures on trade gains, EMU participation has actually had a negative effect in the case of Finland (Faruquee, 2004). It can hence be concluded that trade gains from the currency union are not evenly dispersed.

Since the introduction of the common European currency it may be noted that the comparable “outs” (Sweden, Denmark and the UK) have been more successful than the insiders in terms of growth, employment and the state of public finances. However, Sweden and Finland have continued to have a very similar economic development, even after Finland entered into the EMU. Productivity has been on the same level for the two countries and they both entered into the recent financial crisis with about the same rate of unemployment. Unit labour costs have also developed in a parallel way, and Finland and Sweden have both improved their competitiveness significantly compared to the euro area average. Overall, the developments in the two countries have been beneficial and similar. (Gylfason, et al., 2010) In fact, Sweden and Finland are so much alike and interdependent that Jonung and Sjöholm (1998) conclude that it would be better for them to form their own currency union than to join the EMU.

3.3 The Forest Industry

A tree is a tree - how many more do you need to see?

The forest industry is an industry where the market is not as much global as it is continental (Skogssällskapet, 2005). This implies that, although the world’s largest exporter of forest products is Canada, it mainly exports to the USA, making Finland and Sweden the largest exporters to the European market. Furthermore, the value of forest industry exports compared to total exports is the largest for Finland followed by Sweden, making forest products especially important exports for these two nations (Forestindustries, 2010).

The world's leading exporters of pulp, paper and sawn wood 2008

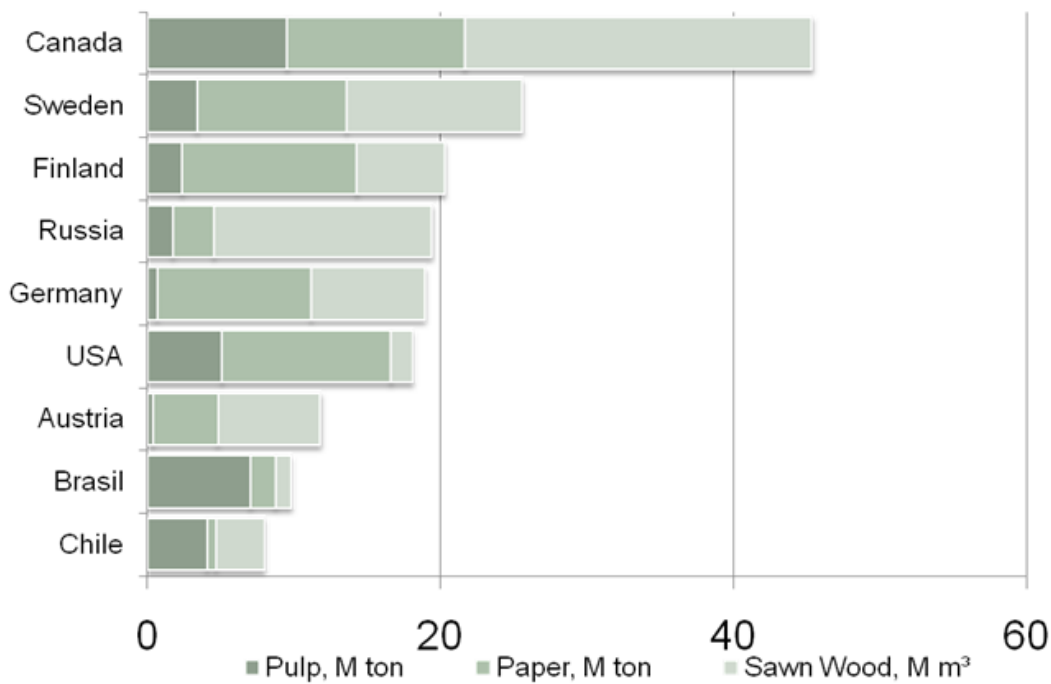


Figure 3 – The World's Leading Forest Industry Exporters

Source: Skogsindustierna (2009)

The forest industry plays a relatively larger role in the Swedish economy than what is the case for most other EU countries, the only exception being Finland. Of the occupation, turnover and value added of Swedish manufacturing industry the forest industry is responsible for 10-12 percent. The forest industry's share of Swedish exports amounts to 11 percent. The forest industry is strongly directed towards exports. Of the paper and pulp production over 85 percent is exported and the corresponding figure for sawn wood is 70 percent. Of the exports 25 and 35 percent respectively are exported to countries outside the European Union. (Skogsindustrierna, 2009)

The forest industry in Finland is also heavily directed towards exports and the sector is responsible for approximately 20 percent of total Finnish exports. Of the production of paper and paperboard in Finland approximately 90 percent is exported. The corresponding figure for sawn wood is 60 percent. Of all forest industry products 75 percent is exported to countries within the European Union. (Forestindustries, 2010)

The European forest market is furthermore highly integrated. When Toivonen, Toppinen and Tilli (2002) investigated the integration of the European wood products markets they found that the EU general policy aim of more integrated competitive commodity markets may have been realised already before the introduction of the euro (the study stretches from 1980 to 1997), at least with respect to the roundwood markets in northern Europe, i.e. Sweden and Finland.

A further proof of market integration, is the use of a common currency for price setting and invoicing. In an empirical study conducted by Friberg and Wilander (2008) on Swedish export firms they found that in the paper and wood sector the firms in 80% of the cases use the customer's currency, 10% use SEK and 6.67% use a vehicle currency. The currency choice was also established to be the same for all stages of the trade process, i.e. price setting, invoicing and settlement. The expected development of exchange rate matters little for currency choices and is not a central concern for most firms. (Friberg, et al., 2008)

The forest structure and climate in the two countries are not exactly homogenous despite their close proximity, but from a layman's point of view they appear similar. Both countries have a relatively mild climate considering their latitude, with a semi-maritime character. Sweden is dominated by spruce followed by pine, whereas Finland is dominated by pine followed by spruce. In both countries there is a great variance in climate and thus in the structure of the forest from south to north. The industry structure is very similar with a mix of larger and smaller players present, but the ownership structure is different. The forest industry companies themselves own more forest land in Sweden than in Finland, where small scale forest owners sell the raw material to the industries.¹⁰

4. Literature Review

Nothing new under the trees

Before the effects on exports of the exchange rate depreciation can be understood it is crucial to review theory and previous studies made on similar situations. This section will first deal with trade as such and how it is influenced by international competitiveness. In its second half, companies' thoughts and actions with respect to the exchange rate will be reviewed

¹⁰ For a thorough review of the Swedish and Finnish forests refer to Yrjölä (2002)

when it comes to price setting. Finally the section presents evaluations of the previous SEK depreciations, to see what consequences that can be expected.

4.1 Competitiveness and Trade

What affects the internationally traded quantity and the patterns of trade? It is hardly questionable that real variables have significant effects but the significance of nominal variables is more debated. In this section follows an overview of the literature focusing on the most important nominal variable affecting international trade and hence exports, namely the exchange rate. Thereby a framework for analysing the effects of the depreciation on the forest industry exports is provided.

Relative international competitiveness should be what ultimately decides the export volumes for a certain industry and country. There are two aspects of competitiveness: terms of trade (t-o-t)¹¹ focus on the relative purchasing power, whereas relative unit labour cost (RULC) emphasise the relative cost competitiveness. In case of a devaluation the t-o-t have traditionally been said to worsen, i.e. a loss of competitiveness since the price of exports in foreign currency will be lowered relative to the price of imports, but when looking at studies, both with an empirical and a theoretical approach there seems to be a growing consensus that devaluations or choice of exchange rate system has no bearing on the t-o-t (Alse, et al., 1995).

RULC is, on the other hand, a good measure of competitiveness as it represents a direct link between productivity, the cost of labour and effective nominal exchange rates. It is a measure of the relative labour cost of producing an identical product between two countries. To calculate the RULC one must first obtain the unit labour cost (ULC). For a calculation of ULC at a national level it is possible to use several different methods. The method presented here is the one used by the majority of foreign institutions, including OECD, and hence also the one used in this paper.

- $ULC = \text{total nominal costs per employee} / \text{real labour productivity}$

ULC calculated according to this method highlights the price development in the field of wages. The ULC calculated can be used for assessing an economy's competitiveness, but only when it is comparable to another country, i.e. with harmonised data. Although institutions use

¹¹ Terms of trade=price of exports/price of imports

the same definition of ULC there might still be differences in the obtained results based on the source of input, something crucial to keep in mind when making comparisons. (Lipská, et al., 2005)

Relative unit labour cost is in turn not only influenced by nominal wages and productivity but also the nominal exchange rate. This implies that a country can lower its RULC in comparison to another country by having a lower increase in hourly wage costs, by having a higher increase in productivity or by lowering its nominal exchange rate. Hence, a devaluation can increase competitiveness as it lowers RULC, making the country more cost competitive.

4.2. Exchange Rates and Prices

Going one level below the general effects of exchange rates on trade, it is now time to turn to the effect of exchange rates on an industry level. The choices made by companies with respect to price setting and currencies have an obvious bearing on the effects of a depreciation on their exports. In this section the prices of goods are discussed and how changes in exchange rates are carried through to affect changes in prices.

According to standard economic theory any homogenous tradable good should have the same price in two countries when expressed in the same currency, something that has become known as the law of one price (LOOP) (Salvatore, Cop. 2011). There are different versions of the LOOP, but for all at least profit maximising firms and homogenous goods are required (Goldberg, et al., 1996).

If the conditions for LOOP are not fulfilled, one can study the exchange rate pass-through. The level of exchange rate pass-through is defined as the percentage change in local currency import prices resulting from a one percent change in the exchange rate between the exporting and importing countries. Exchange rate pass-through can be said to be either complete ($ERPT=1$), non-existing ($ERPT=0$) or incomplete ($0<ERPT<1$), measuring the effect on export prices denominated in the importing country's currency from exchange rate changes. $ERPT\approx 1$ implies that most of the exchange rate change is passed through to the importing country expressed prices, whereas $ERPT\approx 0$ means that export prices remain unchanged in the importing country's currency. For complete pass-through the assumptions of constant

markups and constant marginal costs must hold, i.e. the exporters are price takers in a perfectly competitive setting. (Goldberg, et al., 1996)

The level of ERPT matters since it in the end decides how much of a depreciation that will be carried through to improved competitiveness. Since it in numerous studies appears that the exchange rate pass-through is less than one there is a variable mark-up that is not equal to marginal cost, and thus the perfect competition assumption above does not hold. (Goldberg, et al., 1996)

Hänninen, Laaksonen-Craig and Toppinen (2000) have studied exchange rate pass-through in the newspaper and pulp markets in the UK and Germany from 1986-1997 for Finnish exports. They find that the pass-through for the investigated forest products is low (not even significantly different from zero) and that the producers chose a variable mark-up over domestic prices instead. It is concluded that this results from high competition in the European market and Hänninen, Laaksonen-Craig and Toppinen (2000) did not expect the introduction of the euro to have any major impact on international trade flows in newspaper and pulp.

It has thus been established that import prices in the importer's currency do not change one to one (if at all) with the exchange rate. This incomplete pass-through is not even corrected for in the long run. However, it has been argued that the long run pass-through may have been underestimated and in order to better understand the incomplete pass-through one has to differ between permanent and transitory exchange rate changes. Taking this into account is found to increase the degree of pass-through in both the short and long run (Meurers, 2003). The problem of differing between permanent and transitory changes remains (Goldberg, et al., 1996).

Furthermore, once prices are set for the buyer they have a tendency to be sticky and not easily changed. On average prices of exports are adjusted once a year (Friberg, et al., 2008). This implies that it is difficult to directly incorporate exchange change movements into the prices set in the importers currency. Gottfries (2002) studies aggregate data for Swedish export goods and finds that their prices are incompletely adjusted to exchange rate changes. There is strong evidence that firms are imperfectly informed about the exchange rate when they set their prices and that they thereafter also do not adjust them completely as information is

obtained (Gottfries, 2002). Another important reason for sluggishly adjusting prices is the currency choice of price setting. There is a cost involved in constantly changing prices as the currency fluctuates, and therefore if the price is set in euro it will not adjust immediately even if the seller is Swedish.

In a recent study, similar to our own, Hietala (2009) has investigated the effects of joining the EMU on Finnish sawnwood exports, but rather than focusing on the short run effects of appreciations of the euro in relation to the SEK he studied the long term firm behaviour and the exchange rate pass-through. EMU is found not to have had a large effect on Finnish sawnwood exports' competitiveness and "[t]his would further suggest that the rather heavy depreciation of the krone against the euro has not affected negatively Finnish exports to Germany, at least not by the full amount. Still, Swedish producers have been able to achieve higher profits, which appears to have been the main consideration behind some recent shifts of production from Finland to Sweden." (Hietala, 2009 p. 87)

4.3 Sweden's Previous Experience

The dramatic fall in the value of the SEK that occurred during the recent financial crisis is not the first in the history of Sweden. In order to be able to understand the outcomes of the current depreciation it is useful to review the outcomes and analyses of the most recent ones. These include the devaluations occurring in 1981-1982 and the depreciation that occurred in 1992 as the Swedish exchange rate was set free to float.

The primary goal of the devaluations carried out in the beginning of the 1980s was to initiate an export led expansion (Henrekson, 1990). The magnitude of the 1982 devaluation, 16%, was unprecedented in size and theoretically, such a devaluation, as any devaluation, should increase exports as the relative price of Swedish goods is lowered. Erungor (2007) found that the devaluations temporarily did revitalise the Swedish export industry, but that the effects were not permanent.

Henrekson (1990) investigated if a structural change occurred in the Swedish economy because of the devaluations. By dividing the Swedish economy into traded and non-traded sectors he found that the devaluations did not bring about any lasting increase in the tradable

sector's share of either employment or production, although a certain limited increase occurred immediately after the devaluation. The reason for the limited effect of the devaluation, Henrekson argued, was that there never was a real devaluation. A development of the nominal exchange rate says very little about a country's change in competitiveness. Lybeck (1985) therefore proposed that in order to assess the actual gain in competitiveness from a devaluation, the exchange rate development must be compared to the development of inflation measured in consumer prices, export prices or wage costs. For Sweden inflation was pushed up by rapidly increasing wage costs.

Important to remember is that the goal of companies differs from the goal of the state, as their profit maximisation does not automatically lead to social utility maximisation. Bearing this in mind, the responses of the companies in connection to the devaluation in 1982 come as less of a surprise. In connection with a devaluation exporting companies can basically choose between an increase in the volume sold or an increase in the margins of the goods sold. Firms know that in the short run the price elasticity of demand is low but in the long run it is high, hence a mixed strategy becomes optimal. However, the optimal strategy is dependant on how long the cost advantage is expected to be maintained: the longer the more there is to gain by lowering the prices immediately to gain market share. (Henrekson, 1985) This relates to the customer market model where it is established that exports respond slowly to price changes but quickly to changes in demand, due to the fact that it takes time for buyers to discover price changes and it is costly to change suppliers. (Gottfries, 2002)

Not much is written about the effects of the dramatic fall of the SEK in 1992. Kiander and Vartia (2009) note that the post crisis output growth has been export led and that the currency depreciation helped Sweden gain market shares and presented a sustained improvement in the competitive position of the country. The same was found to be true for the contemporary depreciation in Finland.

5. Theoretical Propositions

Can't see the forest for the trees

Understanding the effects of a certain event is never easy, and a simple conclusion to draw based on the literature review presented above, is that the effects of a depreciation on exports

are multifaceted. Still, a number of potential reasons for the outcomes of the situation in autumn 2008 can be deducted and are presented in the following text. Three propositions will be presented, each covering a different effect that should be able to be detected in the forest industry, if the theory reviewed in section 4 (Literature Review) is applicable.

We can expect a lowered relative unit labour cost as a consequence of the new exchange rate level. This implies that the Swedish forest industry gained competitiveness in comparison to the Finnish and could explain why Swedish forest exports declined less than the Finnish. But, as previously mentioned, a fall in the nominal exchange rates does not automatically generate a lower RULC: labour costs (inflation) and productivity must also be taken into account. The inflation level has been very similar in the case of Sweden and Finland, and so has their labour productivity development (see appendix 1) and should hence have affected the two countries' competitiveness in a similar fashion. This leaves the exchange rate the only significantly different variable.

Proposition 1: The development of RULC caused a relatively smaller fall in exports for Sweden.

Nevertheless, a change in RULC does not automatically affect the prices in the importing currency. The importer's prices are affected by an exchange rate change if there is exchange rate pass-through present, which is not certain. As the goods are not completely homogenous the LOOP cannot be applied. Instead other research must be searched for an indication of what level of ERPT that can be expected. Such research suggests that the prices in the importing currency should not have adopted completely to the exchange rate change, both since it was not clear if the change was permanent or transitory, since the pricing of goods include sticky prices and there is incomplete information in the price setting phase. Furthermore, industry specific research on the forest industry suggests a low level of pass-through for forestry products. Low levels of pass-through still do not mean no pass-through, ERPT can still be different from zero. That ERPT is low at the same time as RULC decreases also has implications for profitability, and the Swedish profit margins should have improved since firms according to the customer market model realise that demand is price inelastic in the short run.

Proposition 2: A low ERPT led to no systematic changes in importers' prices in their domestic currency, and therefore to increased profit margins for Swedish exporters

Following the beggar-thy-neighbour argument, increasing margins for Swedish production units should have caused a shift in production sites from Finland to Sweden when possible within this short time span.

Proposition 3: Larger profit margins for Swedish firms led to a shift in production sites from Finland to Sweden.

On a micro level, the strategy employed by the firms is expected to have been mixed: both price changes and margin improvement should have been present. On the macro level, RULC should have changed, exchange rate pass-through should have been partial and production should have moved from Finland to Sweden.

6. Data

To evaluate the propositions from theory data needs to be gathered, and it will be presented in this section, together with some short comments.

First, to confirm or decline proposition 1 the relative unit labour cost, i.e. the indicator of competitiveness, must be analysed. It is found in figure 4 below. Compared to the rest of the Euro area Finnish RULC increased 8 percent, whereas Swedish RULC decreased 5 percent compared to the Euro area. That Swedish competitiveness compared to the Euro zone did not improve more is surprising considering the large depreciation but could be due to either adverse productivity changes or unfavourable wage development. However, what is important for the upcoming analysis is that the relationship between Swedish and Finnish RULC evolved as predicted.

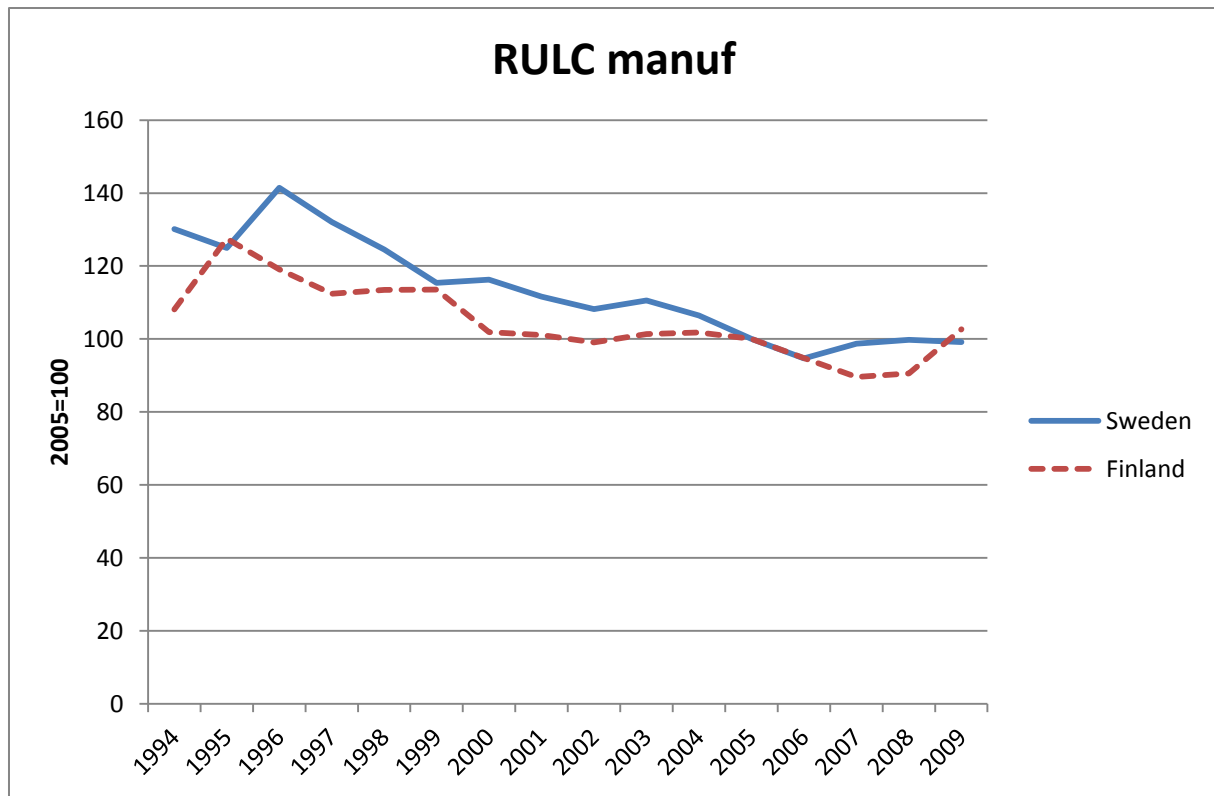


Figure 4 – RULC for Sweden and Finland

Source: (OECD)

For proposition 2, regarding exchange rate pass-through, to be tested prices and exchange rates should be investigated. The exchange rate development was presented in figure 1 (see section 3.1, The Depreciation and Its Consequences), and the price developments on the pulp and paper, and wood market are presented below (figures 5-6). They are average export prices on a monthly basis and indexed, starting from 1994 and based on prices in SEK for Sweden and FIM/euro for Finland. Since the Swedish prices are denominated in SEK, but the most common pricing currency for exports to the Euro area, at least for the last years, has been the euro, the Swedish price fluctuates if the price in euro remains constant but the exchange rate changes.

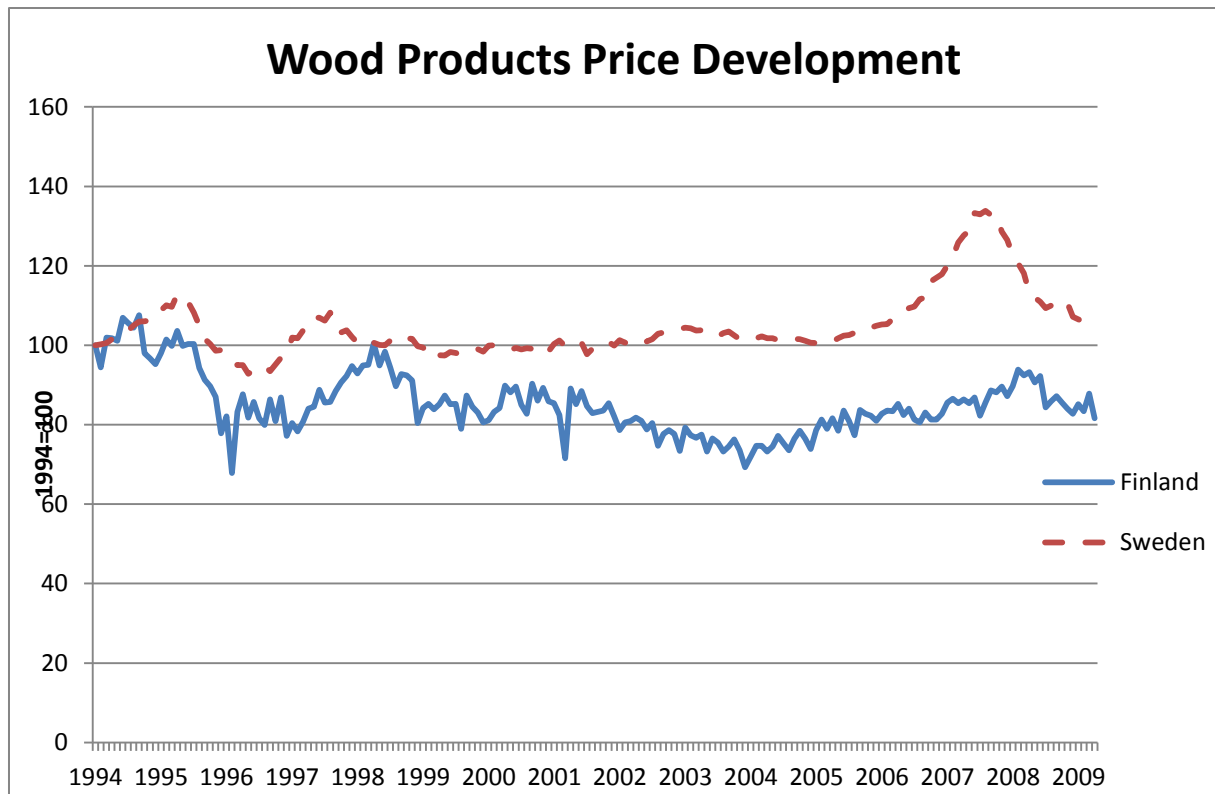


Figure 5 - Price Development in Wood Products for Sweden and Finland

Source: (Metla, 2010) and (Skogsstyrelsen, 2009)

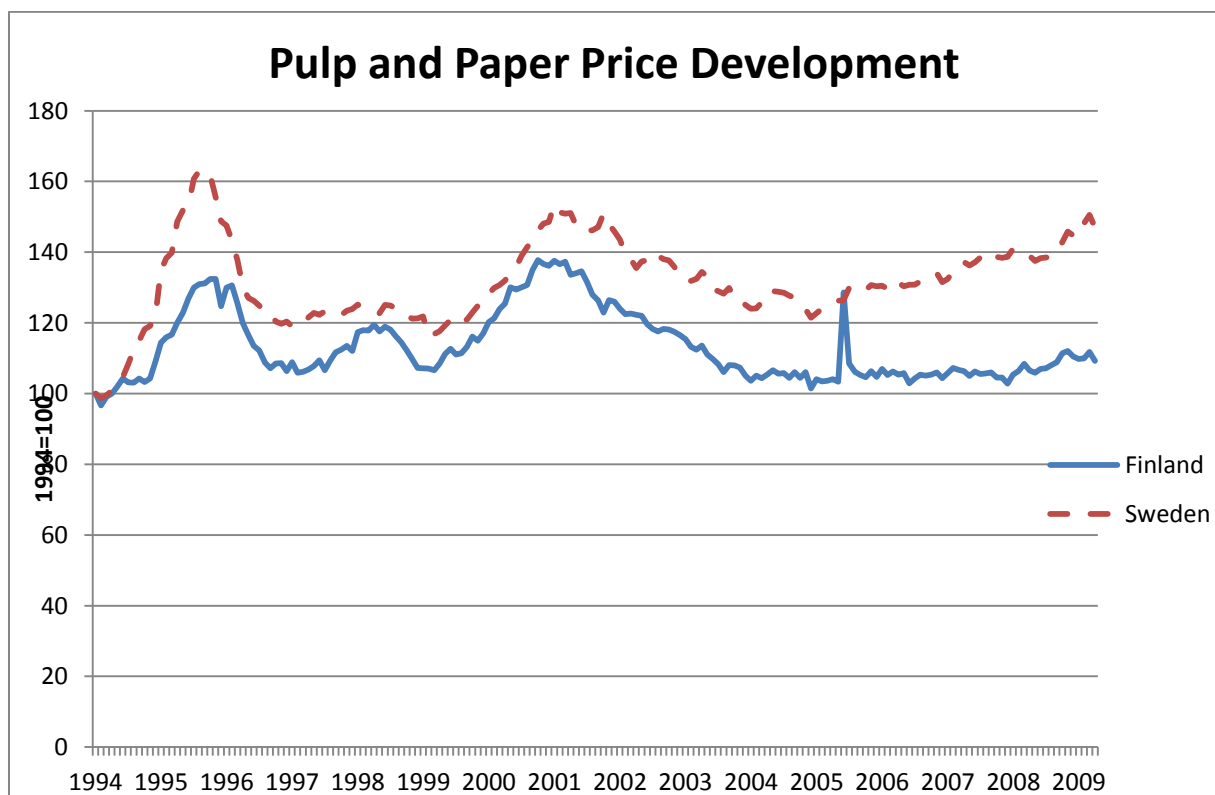


Figure 6 – Price Development in Pulp and Paper for Sweden and Finland

Source: (Metla, 2010) and (Skogsstyrelsen, 2009)

For proposition 2 as well as proposition 3 the development of the harmonised profit margins for the companies participating in the study are relevant. They are presented below (figures 7-8). There seems to be an overall downwards trend in the Finnish margins starting from 2006 whereas the Swedish margins experienced a sharp peak in 2007 before dropping dramatically in 2008 to the same level as the Finnish companies. The better margins in 2007 for Sweden can be explained by the historically low input price for Swedish producers (Falk, 2007). Another explanation offered in the annual reports is exceptionally high demand, especially for pine timber (Bergs, 2006-2007; SCA, 2007) but this is both contradicted by other firms (Holmen, 2007) and by the fact that exceptionally high demand should have affected Finnish producers in a similar way. The lower input prices possibly meant that Swedish producers could lower prices and thus keep up demand longer than the Finnish. For 2008 and 2009, the margins for the Swedish and Finnish companies aligned again. The consequences of proposition 3, that production should have moved from Sweden to Finland was investigated in the interviews as well as from annual reports. The questionnaire used can be found in appendix 4 and the answers gathered will be used in the discussion in the next section, the empirical evaluation.

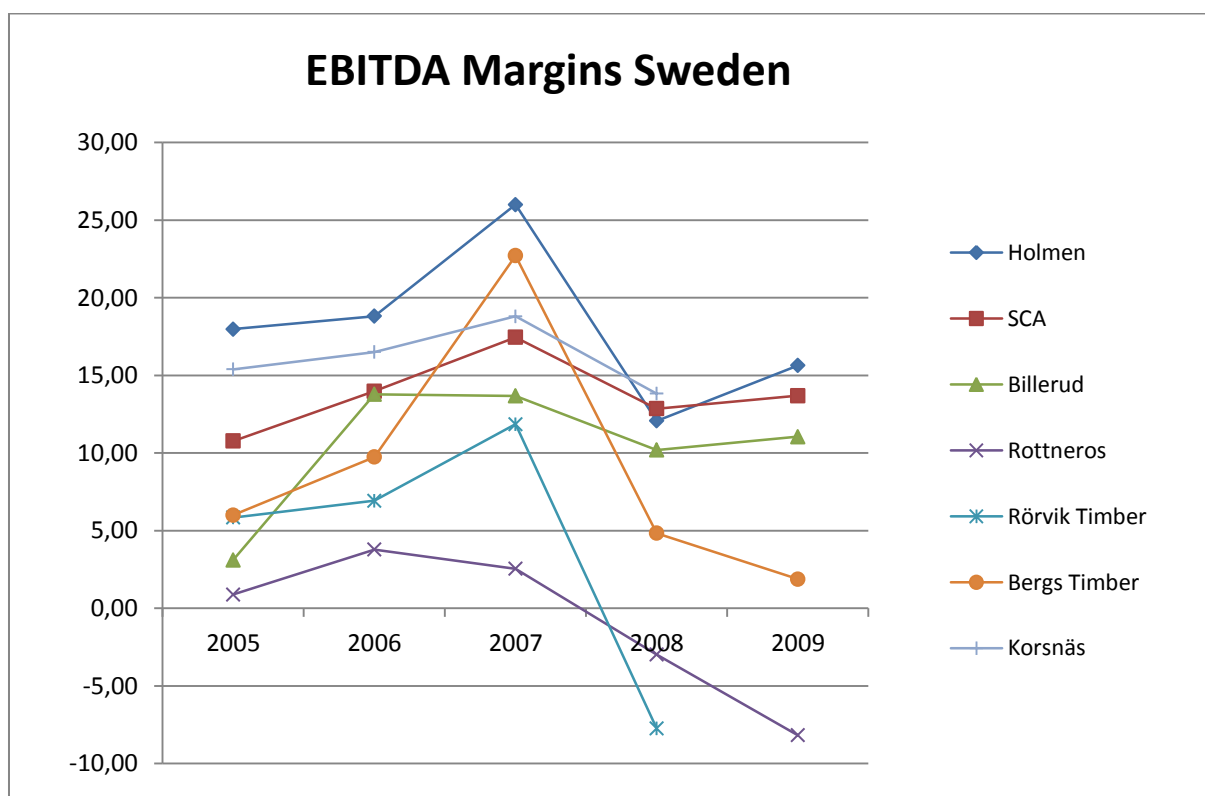


Figure 7 – EBITDA Margins for Sweden

Source: (Beureau van Dijk, 2010)

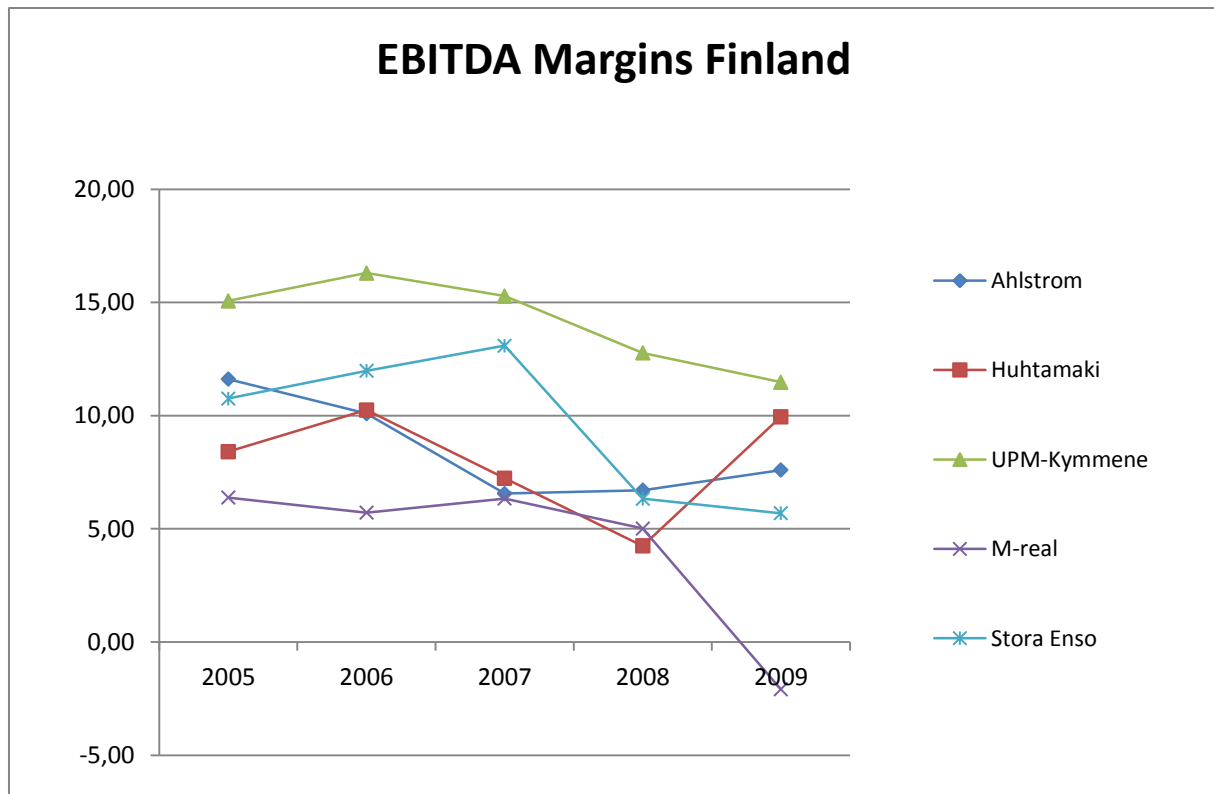


Figure 8 – EBITDA Margins for Finland

Source: (Beureau van Dijk, 2010)

7. Empirical Evaluation of Propositions

Pippin: – It's talking, Merry. The tree is talking.

To be able to answer the general research question regarding the consequences of the depreciation of the SEK on the forest industry, the propositions presented in the previous section have to be discussed. In line with the reasoning presented in section 2 (Methodology) the discussion will rather be qualitative and reasoning than quantitative and conclusive. Any information in this section comes from the annual reports of 2008-2009 for companies listed in appendix 2, unless otherwise specifically stated¹².

Proposition 1, the relation between RULC and the fall in forestry exports from Sweden and Finland will be discussed first. The relative unit labour cost for Finland increased 8 percent relative to the Euro zone average from 2008 to 2009, meanwhile Sweden's RULC decreased 5

¹² Please note that the annual report of for example Ahlstrom for the fiscal year 2008 is referred to as (Ahlstrom, 2008) although it was actually published week 12 2009, to avoid confusion.

percent compared to the Euro zone (figure 4). The difference between the RULC of Finland and Sweden is less than the SEK depreciation (16 percent).

As the depreciation was larger than the divergence of RULC there must have been other events affecting the RULC. We know that, besides exchange rates, RULC is directly influenced by changes in productivity and inflation. However, as outlined in section 3.2 (Sweden, Finland and the EMU) these are so similar for the two countries that the single directly influential factor must be the exchange rate. Having excluded productivity changes and differences in inflation levels as possible explanations for the development of the RULC one reason for the small change can very well be technical: RULC is gathered on a more aggregate level than the exports that it should explain, so it cannot be said with certainty that the competitiveness for Swedish forestry did not improve to a larger extent. However, it still confirms the theoretical proposition that Sweden's RULC was lowered and that the Swedish forest industry thereby gained competitiveness compared to Finland, but it does not present the entire picture. The gained competitiveness could have contributed to the lesser fall in exports for Sweden through either the possibility to lower prices and attract more Euro zone customers or through the shift in production from Sweden to Finland. These two possible explanations will be evaluated through propositions 2 and 3.

Turning to look at proposition 2 regarding the exchange rate's effect on the prices of the forest industry exports at first it seems as if the prices have been moving similarly in Sweden and Finland, but the correlations for Swedish and Finnish forest products are surprisingly low when the entire period is considered (see table 1 below for all correlation coefficients). The reasons for this can be multiple and are outside the scope of this paper. The patterns noted during and after the financial crisis are more of interest. During the crisis pulp and paper prices diverged from wood prices in both Sweden and Finland, and at the same time they grew more correlated between the markets. After the depreciation (limited to data up to April 2009) Finnish pulp and paper prices, and wood prices have shown remarkable correlation, but the opposite case is true for Sweden. Wood prices have diverged whereas pulp and paper prices have continued to move together between the markets. When turning to the correlation with the exchange rate, Swedish pulp and paper prices have had a high positive correlation

with the exchange rate (written as SEK/EUR¹³) but Swedish wood prices have been strongly negatively correlated with the exchange rate. The Finnish prices show the same signs but are correlated to the exchange rate to a lesser degree.

	Correlation 1994/01- 2009/04	Crisis correlation 2008/08- 2008/12	Post-crisis correlation 2009/01-2009/04	Correlation w. SEK/EUR 2008/08-2009/04	
Finland	0.04	-0.57	0.92	Fin wood	-0.36
Sweden	0.22	-0.25	-0.49	Fin p&p	0.37
Wood	0.17	0.67	-0.32	Swe wood	-0.91
Pulp and paper	0.65	0.91	0.97	Swe p&p	0.94

Table 1 - Correlations of Prices and the Exchange Rate

Sources: (Metla, 2010; Skogsstyrelsen, 2009)

Judging from the correlation of prices between the markets proposition 2 seems to be supported as they have moved in a way contrary to what could be expected in the case of full ERPT. However, when turning to the correlation between the prices and exchange rate movement the conclusions that can be drawn differ between pulp and paper, and wood, where pulp and paper prices moved as if there was a large ERPT, but wood prices have not. The fact that the Finnish prices are correlated to the Swedish prices suggests that the Swedish producers have some level of market power on the European market so that they can affect the European market price. The wood prices tell a different story, which rather shows signs of negative ERPT and following the previous line of argument, Swedish wood product producers do not seem to be large enough on a continental scale to affect the market price and instead there have been other things to consider in the price negotiations.

That pass-through is present in the pulp and paper market is not supported by interviews conducted with some of the companies listed in appendix 2 stating that expected exchange rate changes are not taken into account when setting prices (Company1; Company2; Company4; Company5, 2010). Only one company states that exchange rates matter, but then only in the long run as it changes world aggregate demand (Company3, 2010). Prices are, however, set mainly in negotiations with the customer and hence can be changed relatively frequently (the usual duration for a price is dependant on segment and can vary from one

¹³ The SEK/EUR ratio increased as the SEK depreciated, and in the case of full ERPT prices set in euro but denominated in SEK (as the Swedish prices) should have increased proportionally, thus have a positive correlation of 1.

week to one year), thereby allowing adjustment for exchange rate movements but the companies choose not to do so. A reason brought forward for this in the interviews was that it is much more difficult to raise prices again if the exchange rate were to move in a different direction (Company2, 2010). However, there is recognition that there over time is a correlation between exchange rate movements and price (Company4, 2010). The widespread use of hedging by companies (see appendix 2) also helps explaining why exchange rates' effects on prices in SEK in the short run are not noticed by the companies.

As for the development of margins, also outlined in proposition 2, had there not been a ERPT, we should see some effects in the difference in profit margins between Swedish and Finnish firms, as their costs in local currency have remained constant, but their relative costs changed. When comparing the average of the margins presented in figures 7-8 (section 6, Data) as is done in figure 9 below, no major difference can be detected between the two countries at the time of the depreciation. The similar profit margins in 2008 and 2009 support that there actually was ERPT and diverging prices between Sweden and Finland.

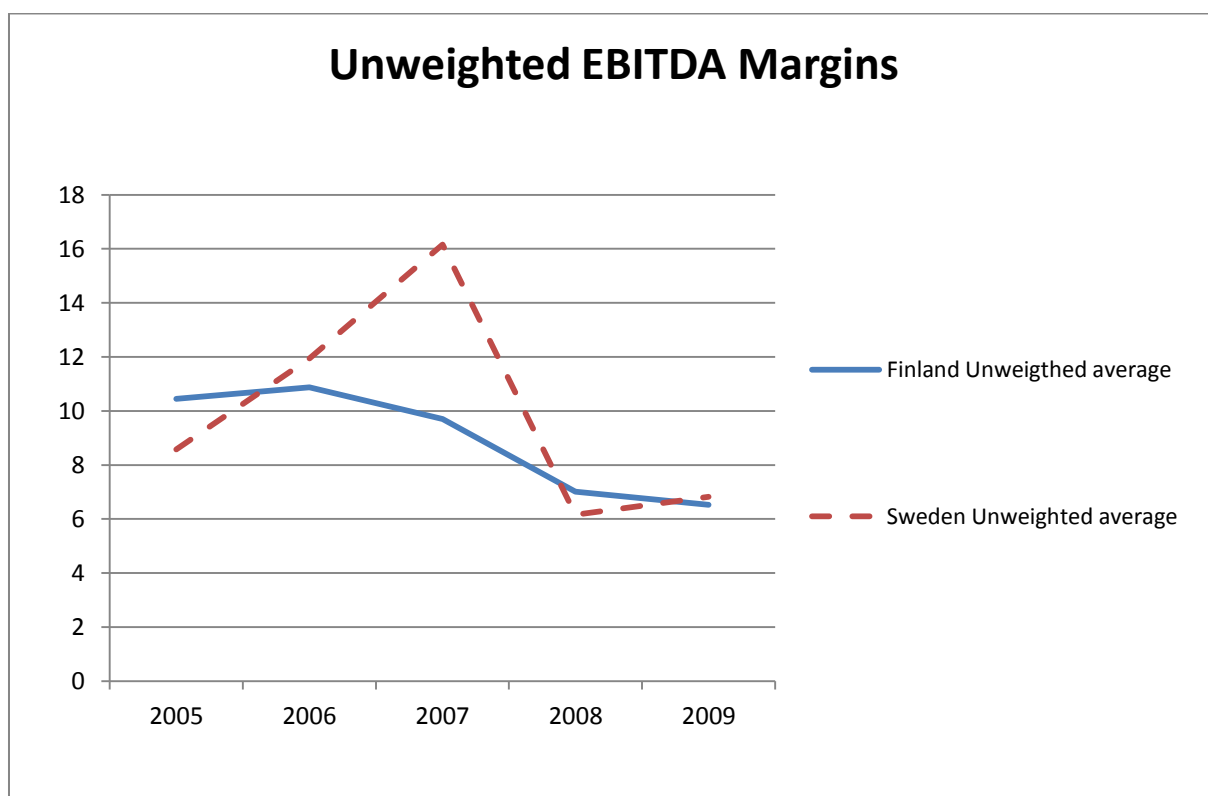


Figure 9 – Unweighted EBITDA Margins for Sweden and Finland

Source: (Beureau van Dijk, 2010)

Hedging provides an alternative explanation to why we do not see the expected development in margins presented in proposition 2. It seems to be common to use hedging as a way to avoid any major effects of exchange rate changes. Companies secure their currency flows to different degrees, the usual level of hedging ranges from 50 to 100 percent and of the companies participating in the investigation only one was found not to use currency hedging (see appendix 2). They instead try to match costs and sales in their two predominant currencies euro and SEK (Korsnäs, 2008). The hedges are usually in place for three to twelve months, hence prohibiting us to see any effects of the exchange rate movement in the annual reports reviewed, however it is possible that an effect can be observed in the reports for 2010.

To further illuminate the small difference in margins, the company interviews provide more details. Only one Swedish company claimed to have conducted a strategy based on lowering euro export prices to gain market shares in the depreciation in 2008, in line with the small difference in margins between Swedish and Finnish firms above (Company1, 2010). All other interviews state that they do not have volume or market share as a target, but profits (Company2; Company3; Company4, 2010). This contradicts the profit margin development. It can instead be explained by that the difference in cost and revenue currencies might not be all that different between Swedish and Finnish forestry. Finnish companies with production in Sweden also benefited from the change in exchange rates, as they have more costs than revenues in SEK (Company3; Company5, 2010). The annual reports, in line with Friberg and Wilander (2008), show that both Swedish and Finnish forest exporters use the euro when trading in the European market. In general there seems to be a trend for Swedish companies to use other currencies than SEK when setting prices and invoicing their sales. The most important currencies used are euro, USD and GBP (see appendix 2 for a company list with operational currencies specified).

Looking at the choice of production sites, the beggar-thy-neighbour argument and hence our proposition 3 suggests that cut downs in production should have occurred mainly in Finland because of higher profit margins in Sweden. Despite the fact that no higher margins have been found for Swedish companies the interviews and annual reports still seem to support a change in production sites. The exchange rate has had an effect on production decisions as its influence on costs and revenues is taken into account when evaluating the profitability of production sites (Company3; Company5, 2010). But a cautionary stance is necessary: although evidence from interviews (Company1, 2010) supports the that closings in Finland

occurred due to the unfavourable exchange rate and a majority of the closing down of production sites has occurred in Finland according to the annual reports, it is still dangerous to draw the conclusion that this choice was solely made based on the prevailing exchange rate conditions. Already in 2007 i.e. before the SEK depreciation took place, cut downs in production were planned in Finland (Falk, 2007).

The evaluation of propositions 2 and 3 lead us to the choice of every company in situations when the exchange rate depreciates, namely the choice between increased volumes and increased margins. First of all it is important to note that in order for there to be a choice in the first place the firms must be price setters and not price takers. For the pulp and paper market Sweden could be considered to have market power, because of the price evolution in connection to the depreciation. We have heard both accounts of lowered prices to gain market share (Company1, 2010) and accounts of market share not being a business target (Company3, 2010). On a micro level individual companies do not see exchange rate changes as a decision variable in the short run, implying a profit margin approach, but in the long run it affects the price negotiations, i.e. a volume approach. There is a contradiction between the profit margins observed, that aligned between Sweden and Finland, and the company interviews that claim that export prices are not lowered in a devaluation.

8. Conclusion

Barking up the wrong tree?

Returning to the research question of *what the consequences of the depreciation of the SEK in 2008 for the Swedish forest industry relative to the Finnish were*, we can sum up our evidence and conclude that there is some evidence supporting the beggar-thy neighbour accusation from the Finnish. RULC did decrease for the Swedish producers, Swedish forest exports fell less than the Finnish, and production was moved from Finland to Sweden. But this evidence is not solid enough to be anything more than suspicions since a causal relationship has not been established, and the accusations will not lead to a judgement.

Sweden's competitiveness increased compared to Finland allowing for either price changes or increased profitability but it is not clear if this caused the divergence in exports. When these two possible channels were investigated it was found that pulp and paper prices denominated in euro reacted more strongly in Sweden than in Finland to the depreciation, thus explaining

why European importers chose to favour Swedish producers and leading to a lesser fall in exports. Consistent with the price changes in pulp and paper profit margins for Swedish firms were not better than those for Finnish firms. Production was moved to Sweden for profitability reasons since Sweden became more cost competitive.

There are two issues that complicate the conclusion. First, the company interview responses are not entirely consistent with the results. The companies in the study claim to not adjust importers' prices to exchange rates, but for pulp and paper at least a correlation can be detected, although this of course does not automatically imply causation. The companies that had the possibility also moved production to Sweden for profitability reasons, but still no improved profitability can be noted. The currency risk hedging used almost across the board could possibly explain the discrepancies between results and interviews. This would explain why the experiences of prices and the price development differ and why the Swedish margins were affected as badly by the recession and demand fall as the Finnish. Furthermore, the move of production from Finland to Sweden actually started before the depreciation.

The second complication is that not all results are consistent with the conclusions. Wood prices do not evolve in the same way as the pulp and paper prices and if they would have been more important than pulp and paper other conclusions would have been drawn.

It has been claimed by Gylfason et al. (2010) that differences in the economic fortunes of Sweden and Finland may help shed light on the on the impact of being a part of the EMU or to stand outside. If this is true, the implications of this paper seems to be that it could in fact have been beneficial for Sweden to stand outside the Euro area during the financial crisis. Sweden seems to have come through at less of a cost. However this is a conclusion far stretched to draw based solely on the development of the forest industry exports and is heavily dependent on the depreciation being concurrent with the crisis. Although the paper may provide an indication, the validity of this implication needs to be proven by other research. For instance, the research provided here only studies the effects of a depreciation. Had the situation been the opposite, i.e. the SEK would have appreciated, it is not possible to say what the consequences would have been based on this research. Another area of further research could also be to study the development of employment and productivity as the SEK depreciated in 2008 and not only exports, to get a deeper understanding of the consequences.

A quantitative analysis of the same research question could also possibly help highlight the issue.

Although many areas for further research remain, and we have not been able to draw any definite conclusions regarding the depreciation's effect on the costs and benefits of standing outside the EMU, it still seems that we have not been barking up the completely wrong tree when claiming that the exchange rate depreciation benefitted the Swedish forest industry exports in one way or the other during the crisis.

Bibliography

Ahlstrom Annual Report [Report]. - Helsinki, Finland : Ahlstrom Corporation, 2009.

Ahlstrom Annual Report [Report]. - Helsinki, Finland : Ahlstrom Corporation, 2008.

Alse J. and Bahmani-Oskooee M. Do Devaluations Improve or Worsen the Terms of Trade? [Journal] // Journal of Economic Studies. - 1995. - 6 : Vol. 22. - pp. 16-25.

Backman M. Exchange Rate Volatility - How the Swedish Export is Influenced [Report]. - Jönköping, Sweden : Jönköping International Business School, 2006.

Bahmani-Oskooee M. and Ltaifa N. Effects of Exchange Rate Risk on Exports: Crosscountry Analysis [Journal] // World Development Vol 20, No 8. - 1992. - 8 : Vol. 20. - pp. 1173-1181.

Baron D. P. Flexible Exchange Rates, Forward Markets, and the Level of Trade [Journal] // The American Economic Review. - 1976. - 3 : Vol. 66. - pp. 253-266.

Baxter M. and Stockman A. C. Business Cycles and the Exchange-Rate Regime [Journal] // Journal of Monetary Economics. - 1989. - Vol. 23. - pp. 377-400.

Bergs Årsredovisning [Report]. - Mörlunda, Sweden : Bergs Timber AB, 2008-2009.

Bergs Årsredovisning [Report]. - Mörlunda, Sweden : Bergs Timber AB, 2007-2008.

Bergs Årsredovisning [Report]. - Mörlunda, Sweden : Bergs Timber AB, 2006-2007.

Beureau van Dijk Orbis Database [Online] // Orbis - A World of Company information. - 2010. - 07 05, 2010. - <https://orbis.bvdep.com/version-2010623/cgi/template.dll>.

Billerud Årsredovisning [Report]. - Solna, Sweden : Billerud, 2009.

Billerud Årsredovisning [Report]. - Solna, Sweden : Billerud, 2008.

Breuss F. Austria, Finland and Sweden after 10 years in th EU: Expected and Achieved Integration [Report]. - Vienna, Austria : EI Working Paper NO.65, Europainstitut, University of Economics and Business Administration Vienna, 2005.

Bun M.J.G. and Klaassen F.J.G.M. The Euro Effect on Trade is not as Large as Commonly Thought (Revised Version of "The Importance of Accounting for Time Trends when Estimating the Euro Effect") [Report]. - Amsterdam, Netherlands : Tinbergen Institute Discussion Paper, TI 2003-086/2, 2004.

Company1 [Interview]. - August 9, 2010.

Company2 [Interview]. - August 10, 2010.

Company3 [Interview]. - August 10, 2010.

Company4 [Interview]. - August 10, 2010.

Company5 [Interview]. - August 12, 2010.

De Vita G. and Abbot A. The Impact of Exchange Rate Volatility on UK Exports to EU Countries [Journal] // Scottish Journal of Political Economy. - February 2004. - 1 : Vol. 51.

- Erungor E.O.** On the Resolution of Financial Crises: The Swedish Experience [Report]. - Cleveland, USA : Federal Reserve Bank of Cleveland, Policy Discussion Paper No. 21, 2007.
- Falk M.** Rigid svensk marknad ger billigt svenskt virke [Online] // Tidningen SkogsVärden. - Skogssällskapet, December 2007. - 3 August 2010. - http://www.skogssallskapet.se/skogsvarden/2007_4/sv15.php.
- Faruqee H.** Measuring the Trade Effects of EMU [Journal] // IMF Working Paper. - 2004. - 154 : Vol. 4.
- Forestindustries** Statistics Figures [Online] // Forestindustries.fi. - 2010. - May 13, 2010. - <http://www.forestindustries.fi/statistics/tilastokuviot/Basics/Forms/AllItems.aspx>.
- Friberg R. and Wilander F.** The Currency Denomination of Exports - A Questionnaire Study [Journal] // Journal of International Economics. - 2008. - Vol. 75. - pp. 54-69.
- Goldberg P. K. and Knetter M. M.** Goods Prices and Exchange Rates: What Have We Learned? [Journal] // NBER Workin Paper Series. - 1996. - p. Working Paper 5862.
- Gottfries N.** Market Shares, Financial Constraints and Pricing Behaviour in Export Markets [Journal] // Economica, New Series. - 2002. - 276 : Vol. 69. - pp. 583-607.
- Gylfason T. [et al.]** Nordics in Global Crisis - Vulnerability and Resilience, ch.8 [Book]. - Helsinki : The Research Institute of the Finnish Economy (ETLA), Taloustieto Oy, 2010.
- Henrekson M.** De svenska devalveringarna och exportföretagens prisbeteende. En kommentar [Journal] // Ekonomisk Debatt. - 1985. - 1 : Vol. 13. - pp. 60-64.
- Henrekson M.** Did the Devaluations of 1981 and 1982 Include a Structural Shift in the Swedish Economy? [Report]. - Stockholm, Sweden : Skandinaviska Enskilda Banken Quarterly Review 4/1990, 1990.
- Hietala J.** The Effects of Exchange Rates in Sawnwood Exports From Finland and Sweden During the EMU Regime [Report]. - Helsinki, Finland : Univeristy of Helsinki, Department of Forest Economics, 2009.
- Holmen** Annual Report [Report]. - Stockholm, Sweden : Holmen AB, 2009.
- Holmen** Annual Report [Report]. - Stockholm, Sweden : Holmen AB, 2008.
- Holmen** Annual Report [Report]. - Stockholm, Sweden : Holmen AB, 2007.
- Huhtamäki** Annual Report [Report]. - Esboo, Finland : Huhtamäki Oyj, 2008.
- Huhtamäki** Annual Report [Report]. - Esboo, Finland : Huhtamäki Oyj, 2009.
- Hänninen R., Laaksonen-Craig S. and Toppinen A.** EMU and Forest Products Pricing in Europe [Report]. - Vancouver, British Columbia : Presented at the Western Agricultural Economics Association Annual Meeting, 2000.
- Jonung L. and Sjöholm F.** Should Finland and Sweden Form a Monetary Union [Report]. - Stockholm, Sweden : Stockholm School of Economics Working Paper Series in Economics and Finance, No 224, 1998.

Jonung L., Schuknecht L. and Tujula M. The Boom-Bust Cycle in Finland and Sweden 1984-1995 in an International Perspective [Report]. - Frankfurt am Main, Germany : Center for Financial Studies, CFS Working Paper No. 2006/13, 2006.

Jonung L., Söderström H. T. and Stymne J. Depression in the North - Boom and Bust in Sweden and Finland, 1985-1993 [Journal] // Finnish Economic Papers. - 1996. - Vol. 9.

Kiander J. and Vartia P. Lessons from the Crisis in Finland and Sweden in the 1990s [Report]. - Vienna, Austria : Conference on the Aftermath of the Financial Crises, Austrian National Bank, 2009.

Korsnäs Årsredovisning [Report]. - Stockholm, Sweden : Investment AB Kinnevik, 2009.

Korsnäs Årsredovisning [Report]. - Stockholm, Sweden : Investment AB Kinnevik, 2008.

Lipská E., Vlnková M. and Macková I. Unit Labour Costs [Report]. - Bratislava. Slovak Republic : National Bank of Slovakia, BIATEC, Volume XIII, 2/2005, 2005.

Lybeck J.A. Devalveringar - Ett inslag i de nordiska ländernas stabiliseringspolitik [Journal] // Ekonomisk Debatt. - 1985. - Vol. 4.

McKenzie M. D. The Impact of Exchange Rate Volatility on International Trade Flows [Journal] // Journal of Economic Surveys. - 1999. - 1 : Vol. 13. - pp. 71-106.

Metla Puun ja metsäteollisuustuotteiden vienti 1/1994-4/2010 [Online] // Metla Metinfo Tilastopalvelu Tilastopalvelun Etusivu. - 2010. - 03 08 2010. - <http://www.metla.fi/metinfo/tilasto/>.

Meurers M. Incomplete Pass-through in Import Markets and Permanent versus Transitory Exchange Rate Shocks [Report]. - Munich, Germany : Discussion Paper IFO Institute für Wirtschaftsforschung an der Universität München, 2003.

M-Real Annual Report [Report]. - Metsä, Finland : M-Real Corporation, 2009.

M-Real Annual Report [Report]. - Metsä, Finland : M-Real Corporation, 2008.

Mundell R. A theory of Optimal Currency Areas [Journal] // American Economic Review. - 1961. - Vol. 51. - pp. 609-617.

NASDAQ OMX Stockholm AB Räntor och Valutakurser [Online] // Sveriges Riksbank. - 16 08 2010. - <http://www.riksbank.se/templates/stat.aspx?id=17216>.

OECD Country Statistical Profile 2009 [Online] // OECD Statistics. - 2009. - 22 04 2010. - <http://stats.oecd.org/Index.aspx>.

OECD Harmonised Systems 1988 [Online] // OECD Statistics. - 05 07 2010. - <http://stats.oecd.org/Index.aspx?DatasetCode=HS1988>.

OECD Unit Labour Costs - Quarterly Indicators (MEI) [Online] // OECD Statistics. - 17 08 2010. - http://stats.oecd.org/Index.aspx?DataSetCode=ULC_QUA.

Rottneros Årsredovisning [Report]. - Stockholm, Sweden : Rottneros AB, 2009.

Rottneros Årsredovisning [Report]. - Stockholm, Sweden : Rottneros AB, 2008.

- Rörvik** Årsredovisning [Report]. - Huskvarna, Sweden : Rörvik Timber, 2009.
- Rörvik** Årsredovisning [Report]. - Huskvarna, Sweden : Rörvik Timber, 2008.
- Salvatore D.** International Economics, 10th Edition [Book]. - [s.l.] : John Wiley & Sons, Inc, Cop. 2011.
- SCA** Annual Report [Report]. - Stockholm, Sweden : Svenska Cellulosa Aktiebolaget SCA, 2009.
- SCA** Annual Report [Report]. - Stockholm, Sweden : Svenska Cellulosa Aktiebolaget SCA, 2008.
- SCA** Annual Report [Report]. - Stockholm, Sweden : Svenska Cellulosa Aktiebolaget SCA, 2007.
- Sercu P. and Uppal R.** Exchange Rate Volatility and International Trade: A General Equilibrium Analysis [Journal] // European Economic Review. - 2003. - Vol. 47. - pp. 429-441.
- Skogsindustrierna** Skogsindustrin en faktasamling 2008 [Online] // Skogsindustrierna.org. - 2009. - June 12, 2010. - http://www.skogsindustrierna.org/web/Skogsindustrin_en_faktasamling_2008.aspx.
- Skogsindustrierna** Skogsindustrin en faktasamling 2009 [Online] // Skogsindustrierna.org. - 2010. - 16 August 2010. - http://www.skogsindustrierna.org/web/Skogsindustrin_en_faktasamling_2008_1.aspx.
- Skogsstyrelsen** Samtl tabeller och figurer [Online] // Skogsstyrelsen. - 2009. - 1 August 2010. - <http://www.skogsstyrelsen.se/epi-server4/templates/SFileListing.aspx?id=16583>.
- Skogssällskapet** Finland Behöver Skogsindustrin - Behöver Skogsindustrin Finland [Online] // Skogssällskapet Pressarkiv. - 2005. - May 03, 2010. - http://www.skogssallskapet.se/skogsvarden/2005_1/sv26.php.
- SOU1996:158** [Report]. - Stockholm, Sweden : Finansdepartementet.
- Stora Enso** Annual Report [Report]. - Helsinki, Finland : Stora Enso Oyj, 2008.
- Stora Enso** Annual Report [Report]. - Helsinki, Finland : Stora Enso Oyj, 2009.
- Tavlas G.S.** The "new" Theory of Optimal Currency Areas [Journal] // The World Economy. - 1993. - Vol. 16. - pp. 663-685.
- Toivonen R., Toppinen A. and Tilli T.** Integration of Roundwood Markets in Austria, Finland and Sweden [Journal] // Forest Policy and Economics. - 2002. - 4. - pp. 33-42.
- UPM** Annual Report [Report]. - Helsinki, Finland : UPM Group, 2009.
- UPM** Annual Report [Report]. - Helsinki, Finland : UPM Group, 2008.
- Yrjölä T.** Forest Management Guidelines and Practices in Finland, Sweden and Norway [Report]. - Joensuu, Finland : European Forest Institute, EFI Internal Report 11, 2002.

Appendices

Appendix 1 – Macroeconomic Variables for Sweden and Finland

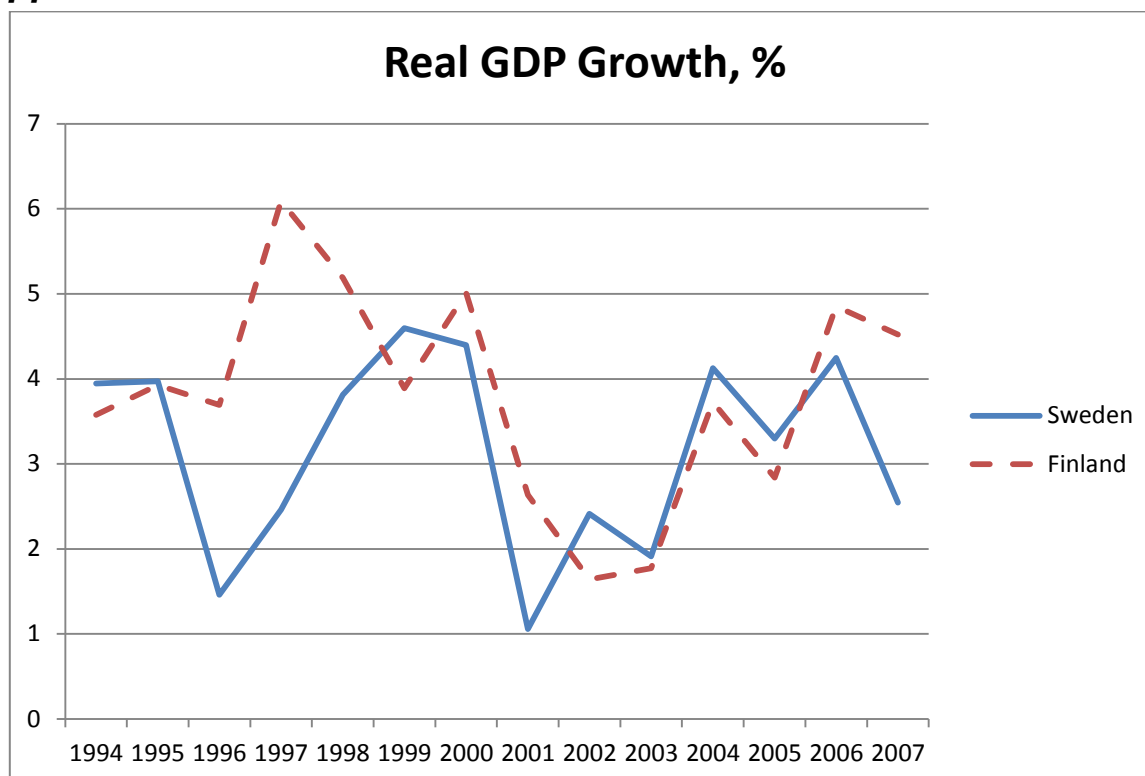


Figure 10 – Real GDP Growth for Sweden and Finland

Source: (OECD, 2009)

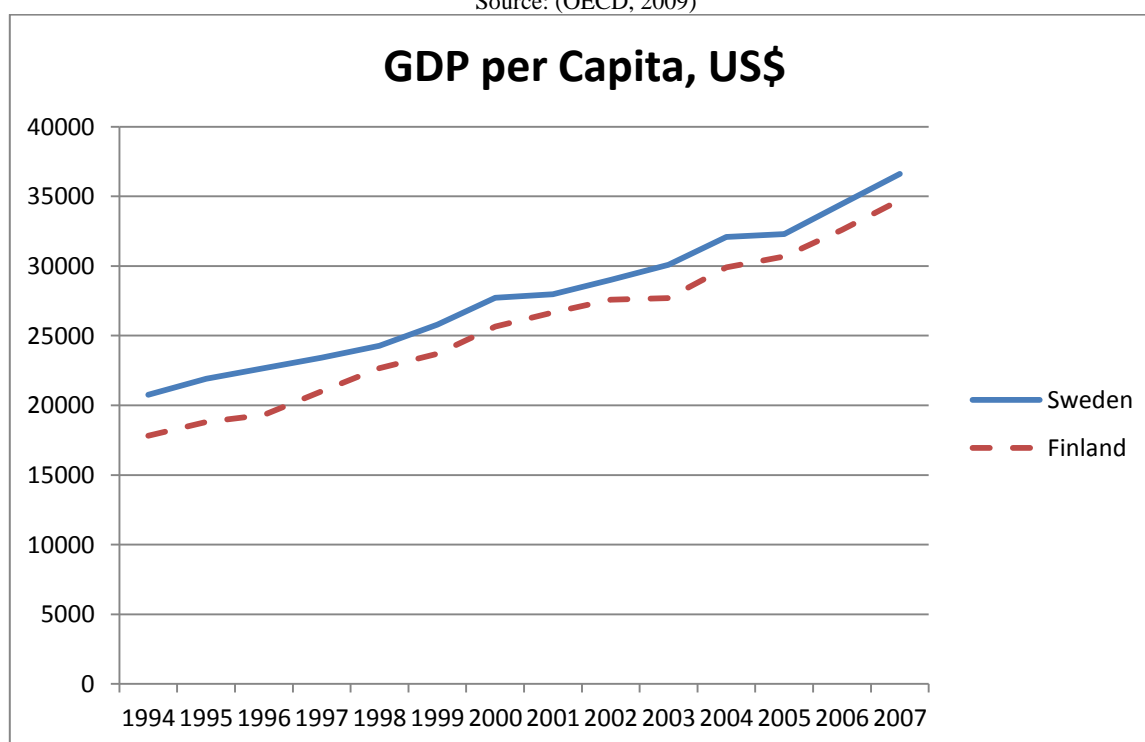


Figure 11 – GDP per Capita for Sweden and Finland

Source: (OECD, 2009)

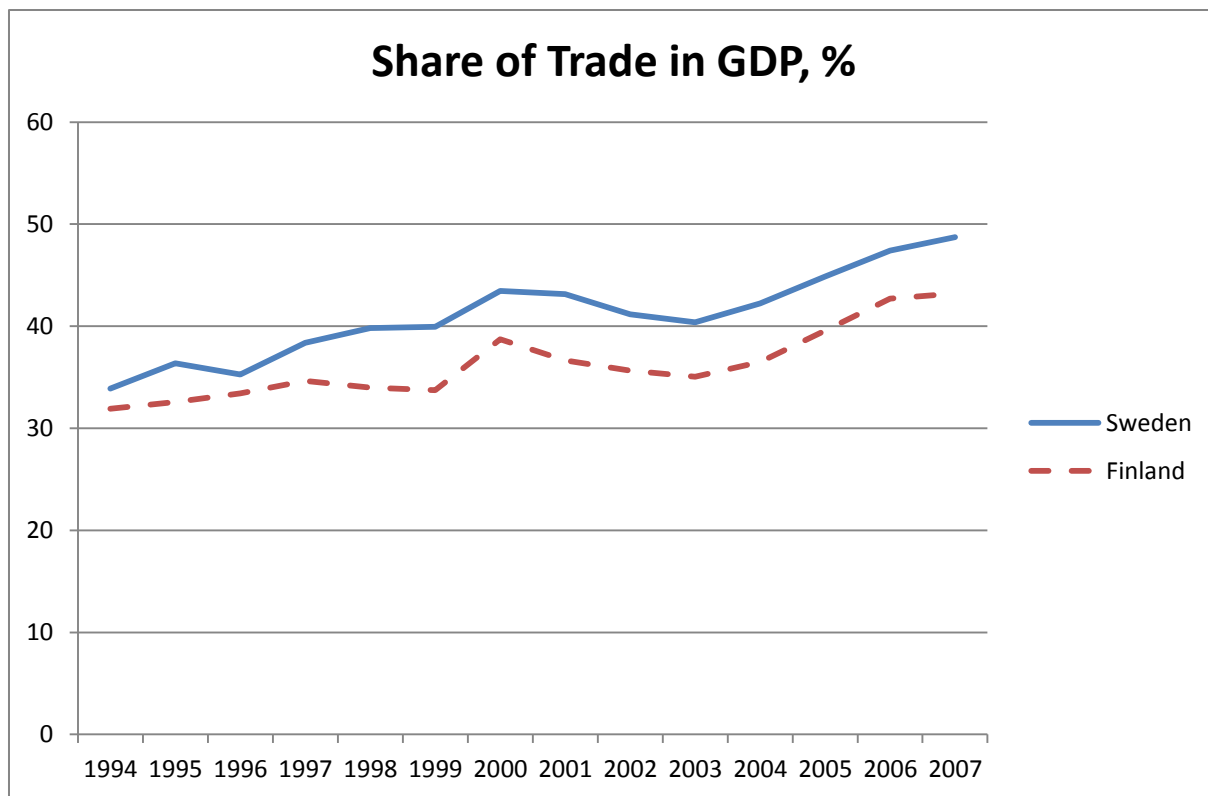


Figure 12 – Share of Trade in GDP for Sweden and Finland

Source: (OECD, 2009)

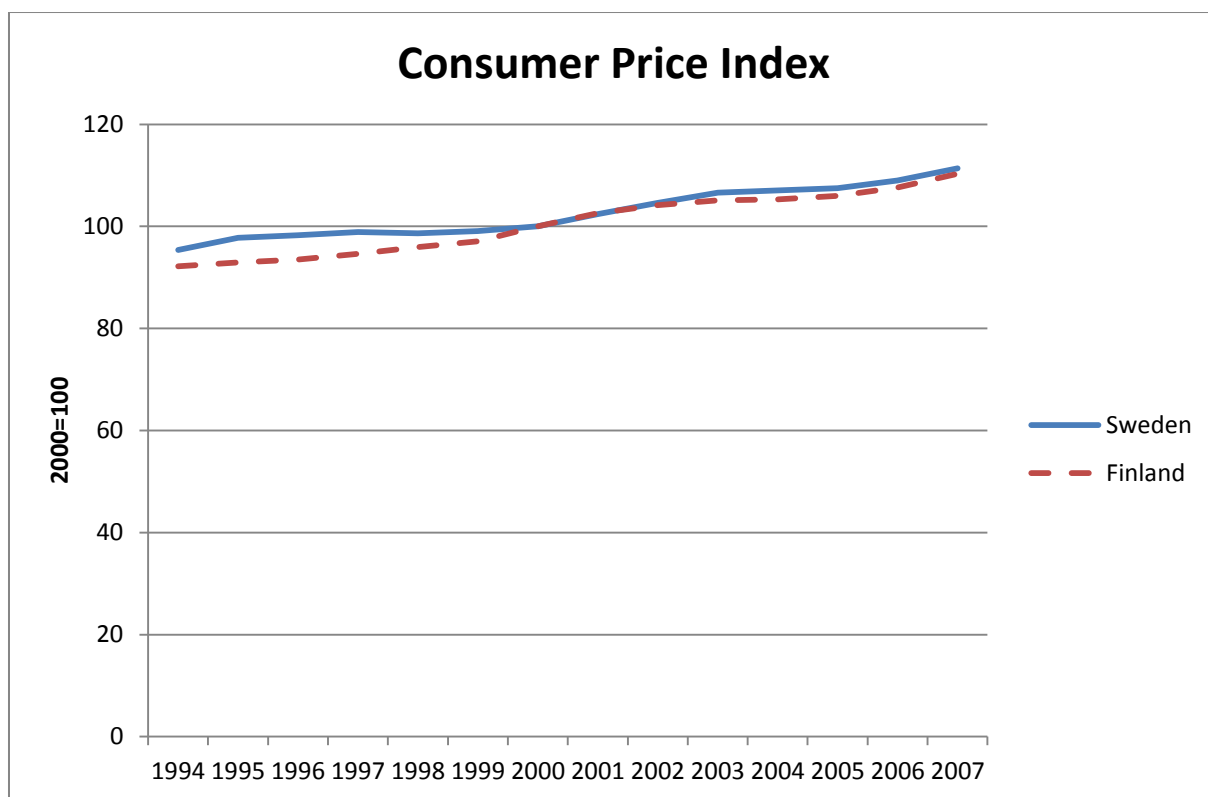


Figure 13 – CPI for Sweden and Finland

Source: (OECD, 2009)

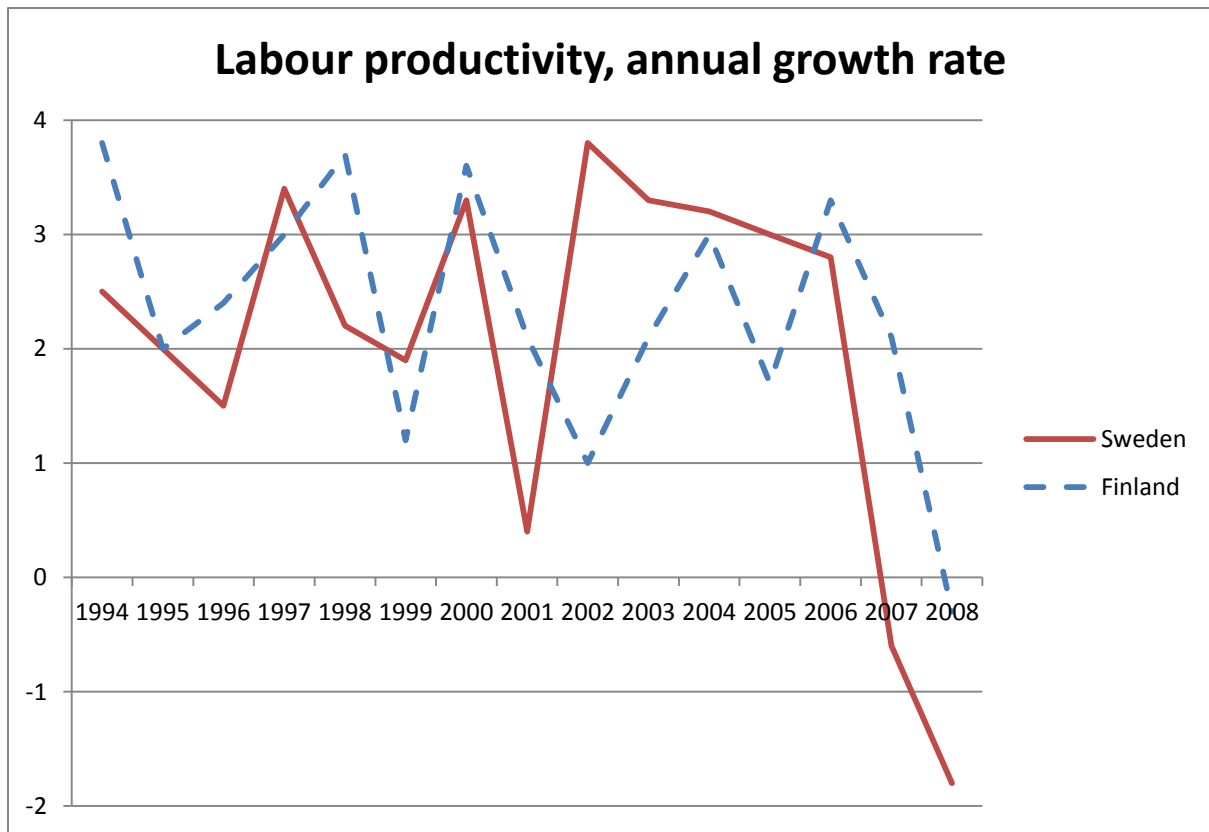


Figure 14 – Labour productivity for Sweden and Finland

Source: (OECD, 2009)

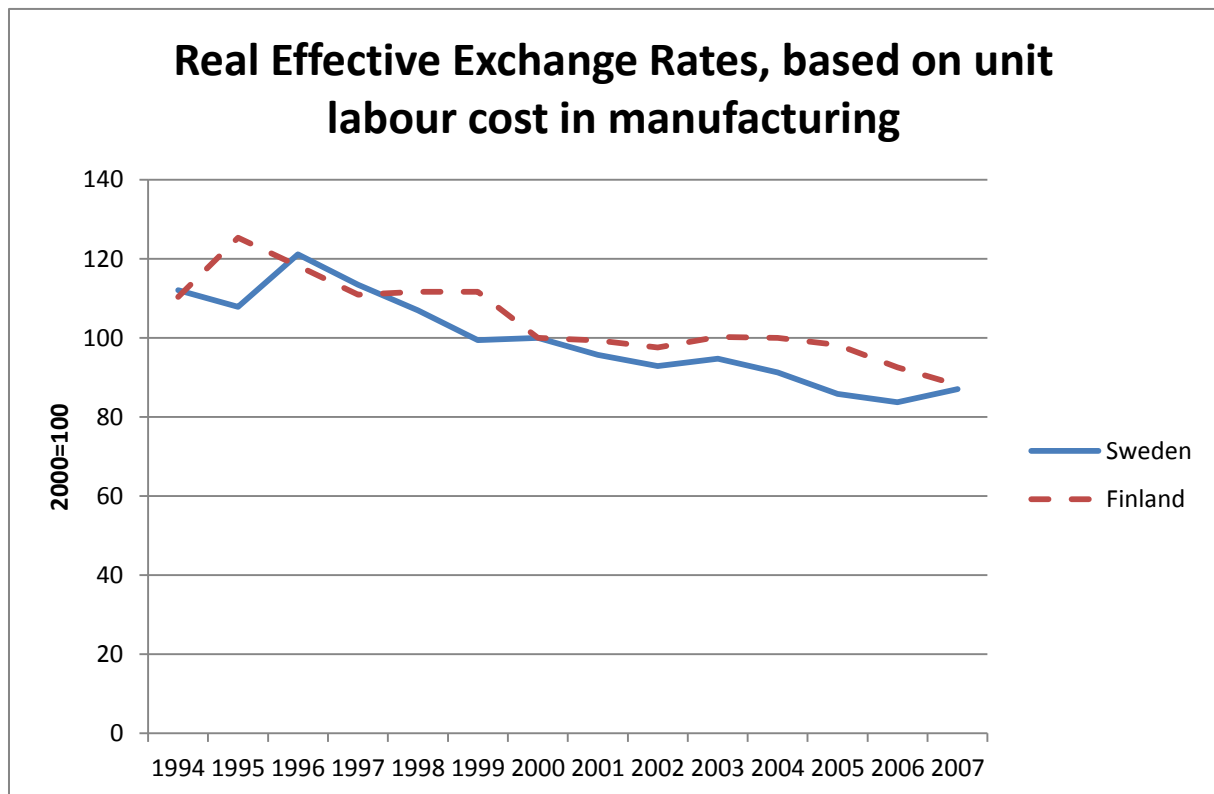


Figure 15 – Real Effective Exchange Rates for Sweden and Finland

Source: (OECD, 2009)

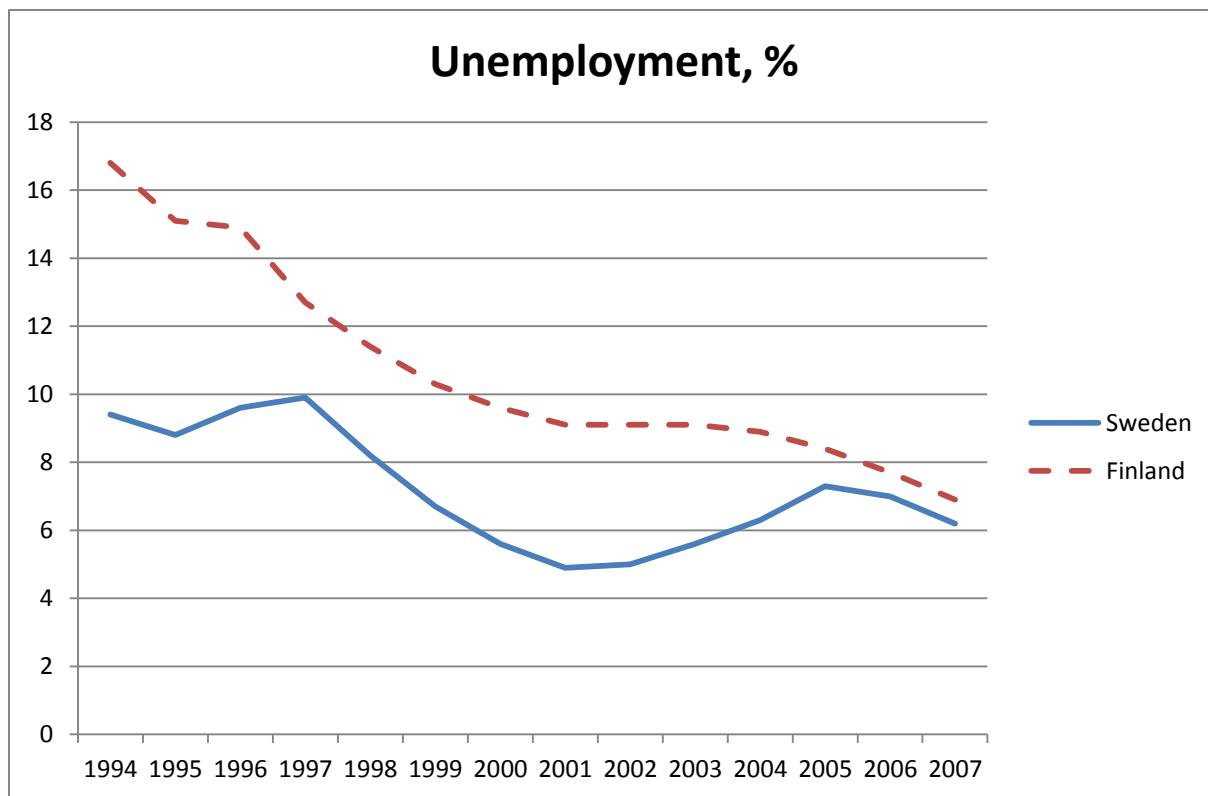


Figure 16 – Unemployment for Sweden and Finland

Source: (OECD, 2009)

Appendix 2 – Company List

Companies (figures from annual reports for 2009)	Home Country	Area of Operation	Turnover 2009	Export %	Importance of EU market	Most Important Sales Currencies	Hedging	Hedging time
Bergs Timber	Sweden	Sawmill	777,9 Millioner SEK	91,60%	76,5% of sales to EU	GBP, EUR, USD, SEK	50-75%	6 months
Billerud	Sweden	Packaging	3,3 miljarder SEK	n.a.	75-80% of sales to EU	EUR, USD, GBP	50(-100)%	12 (15) months
Holmen	Sweden	Paper, paperboard and sawned timber	14 Miljarder SEK	n.a.	EU 90% of turnover	EUR, USD, GBP	90-100%	4 months
Korsnäs	Sweden	Paper and paperboard	8,0 milliader SEK	n.a.	n.a.	SEK, EUR	no	n.a.
Rottneros	Sweden	Pulp	1,5 Miljarder SEK	87,80%	75,1% of turnover	USD, EUR, SEK	yes	n.a.
Rövik Timber	Sweden	Sawmill	1,3 Miljarder	54%	90% of turnover	EUR, USD, DKK, SEK	yes	n.a.
SCA	Sweden	Personal care products, tissue, packaging, publication papers and solid-wood products	111 Miljarder SEK	n.a.	88% of sales to EU	EUR, SEK, USD, GDP	yes	up to 18 months
Ahlstrom	Finland	Paper	1,6 Million EUR	n.a.	53% of sales	EUR, USD, GDP	100%	3 months
Huhtamäki	Finland	Packaging	2,0 Million EUR	n.a.	n.a.	EUR, USD, GDP	100%	12 months
M-Real	Finland	Paper and paperboard	2,4 million EUR	n.a.	n.a.	EUR, USD, GBP	100%	3 months
Stora Enso	Finland	Paper, packaging and wood products	8,9 Miljarder EUR	n.a.	61-84% of sales to EU	EUR, SEK, USD	50%	n.a.
UPM Kymmene	Finland	Pulp and paper	7,7 Million EUR	n.a.	72% of sales	EUR, USD, GDP	50%	12 months

Table 2 – Company Information

Appendix 3 – Evolution of Exports

All commodities					Forestry			
percentage change in exports	2007-2008	2008-2009	2007-2009		percentage change in exports	2007-2008	2008-2009	2007-2009
EU-27					EU-27			
Sweden	7%	-30%	-26%		Sweden	3%	-20%	-17%
Finland	6%	-36%	-32%		Finland	-4%	-28%	-31%
Euro					Euro			
Sweden	6%	-31%	-26%		Sweden	7%	-21%	-16%
Finland	6%	-34%	-30%		Finland	-4%	-30%	-32%
OECD					OECD			
Sweden	6%	-28%	-24%		Sweden	3%	-20%	-18%
Finland	6%	-33%	-29%		Finland	-8%	-26%	-32%
World					World			
Sweden	9%	-29%	-22%		Sweden	5%	-18%	-14%
Finland	8%	-35%	-30%		Finland	-4%	-27%	-30%

Table 3 – Evolution of Exports

Source: (OECD)

Appendix 4 – Questionnaire

Questionnaire

Price setting and invoicing

1. How do you set prices?
 - a. Do you for example set prices in negotiations or do you have a price list
 - b. Is there a traded market price?
 - c. How often are prices changed? Daily/monthly/quarterly/yearly?
 - d. In which currency are prices set?
2. Are expected movements in exchange rates relevant for the prices set?
3. Which currency/currencies do you use for invoicing?
 - a. Is it the same as the currency used for price setting?
 - b. Does the invoicing currency change with the nationality of the customer?
4. Do you hedge your currency risk exposure? What would in that case be the length of the contract?
5. More generally and to summarise: what is your international pricing strategy when exchange rates change?
 - a. For example, in a devaluation, do you adjust prices down correspondingly to gain volume or do you keep prices at the same level and increase profit margins?

The devaluation of the SEK, autumn 2008

1. How did you evaluate and react to the SEK depreciation in autumn 2008

Production strategies

1. Is the production strategy the same for your unit(s) in Finland and Sweden?
2. Do exchange rate changes affect production decisions (which incur costs in different currencies)?
3. Has the general over capacity in the forest industry affected your production strategy?
4. How have the Russian export timber duty affected your production strategy?

Thank you for your participation!

