LUND UNIVERSITY
School of Economics and Management

Department of Economics

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The importance of sunk costs of exporting in risky situations.

- The case of the Swedish export industry

Author: Katrin Möller
Supervisor: Joakim Gullstrand
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Abstract

This paper investigates if the importance of sunk costs differs between markets with different exchange rate risk. First, it examines the importance of sunk costs on the export participation decision by estimating the effect the previous export status has on the current export decision. Second, it analyses the effects of product-market characteristics on the export participation decision. Third, it provides estimates on the empirical relevance of exchange rate volatility on sunk costs. By using data on representative information of the export status of different Swedish industries and individual markets, the paper finds that sunk costs of exporting and hysteresis in trade are prominent factors in determining export market participation. Further, it finds that the expected revenues from exporting increase with market size, the income of the recipient country and a favourable exchange rate. Finally, the importance of sunk export costs varies with the degree of exchange rate uncertainty faced by the exporter.

Keywords: Sunk costs of exporting; Export hysteresis; Exchange rate uncertainty

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1 Introduction

The entry and exit of firms in foreign markets are decisions that often are made in an uncertain environment and are costly to reverse later. The export participation decision in response to real exchange rate fluctuations is an interesting instance. Exchange rates have fluctuated widely since the breakdown of the Bretton Woods system of fixed exchange rates in the early 1970's. Volatile exchange rates make international trade and investment decisions more difficult because volatility increases exchange rate risk. Exchange rate risk refers to the potential to lose money because of a change in the exchange rate. To understand the effects of exchange rate changes on a country's trade balance one could address how such exchange rate changes affect a firm's propensity to make a positive export decision. To explain the behavior of export decisions to exchange rate movements, recent studies have stressed the importance of sunk costs and hysteresis in trade when entering foreign markets. Devaluations that induce entry into the export market may permanently increase the flow of exports, and even if the currency afterward appreciates firms do not exit due to the induced sunk costs, which creates hysteresis in trade. However, conditions that appear favorable to exporting may not induce entry into the export market if they are regarded as uncertain. In this case, the expected revenues may not cover the sunk costs of entering foreign markets, and this could create an option value of waiting[1].

With this as focus, the aim of this paper is to contribute to the literature on sunk export costs by investigating whether the importance of these costs differ between markets with different exchange rate risks. The theoretical conviction is that high exchange rate volatility affects the export participation decision negatively, and the importance of sunk costs to increase in a given period of time.

The general perception in the literature on sunk costs is that sunk costs of exporting are important for firms export decision. The results of previous research show that the previous exports status is found to be strongly related to the occurrence of sunk costs. Studies like Campa (1993 and 2004), Roberts & Tybout (1997) and Gullstrand (2011), all find significant support of the importance of sunk cost hysteresis in determining export market participation. Campa (2004) does investigate

1 Roberts, M.J. & Tybout, J.R. (1997), The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs, The American Economic Review, Vol 87(4): 545-564.

the relationship between exchange rate volatility and sunk costs, but finds no evidence for a correlation between the degree of hysteresis and the degree of exchange rate uncertainty faced by the exporter. The literature on sunk costs of exporting have concentrated on asymmetries in the response of trade flows, and import (or export) prices to exchange rate changes without explicitly focusing in the entry and exit decision in export markets. For example, Baldwin (1988) shows that large appreciations affect imports and alter the composition of the US domestic market and lower prices permanently. We know that costs of exporting are important for firms export decision and we have models explaining the implications of theses costs, presented in chapter 2 and 3. However, our knowledge when it comes to how the importance of sunk cost varies between markets with different exchange rate risk is limited. Therefore, this paper estimates a dynamic discrete choice model of the export participation decision. The model includes the exchange rate volatility as both an exogenous variable and as an interaction with the variable for previous export decisions. This will provide a better basis to explore whether the exchange rate volatility in fact affects the decision to export through the presence of sunk costs and its relationship with the hysteresis theory.

The impact of exchange rate volatility on sunk costs may be determined by product characteristics and vary across markets. This paper use product-market level data from a sample of Swedish industries to indentify the importance of sunk cost hysteresis in export markets. We restrict the use to product-market level data for each year and product group and not for specific firms, due to data accessibility. The explicit sunk cost of an individual firm is therefore not our focus, but rather the probability of a positive export status of Swedish exports given the previous export status. Because Sweden is a developed diverse economy, aided by timber, hydropower and iron ore, it constitutes the resource base of an economy oriented toward foreign trade. The Swedish export market is large and exhibits a diversity of sectors, which target international markets. The diversity allows for sectors that are expected to face high sunk costs and those that are not. The country exhibits sectors that have extensive export partners, sectors of different sizes and experience in exports, and both old and upcoming export commodities. The diversity of sectors in a small but rich country as Sweden will function well as a case for examining the characteristics of sunk costs and the potential effects of exchange rate volatility on the export-participation decision.

The paper is organised as follows. The second chapter present some previous research with the intention of explaining the general theoretical and empirical research in the area. The theoretical framework underlying the thesis is presented in the third chapter, such as sunk costs, and exchange rate volatility and their relationship with hysteresis in trade. The fourth chapter will introduce the data sample used in this paper, and the section contains information about how the data is compatible with the assumptions underlying the analysis. The fifth chapter presents the empirical methodology, the variables used in the analysis and their expected impact on the export participation decision, as well as the econometric estimation techniques and issues. The sixth chapter describes the results of the econometric estimation, followed by the analysis of the results. The paper summarises the results of this study in the seventh and last chapter, which also includes concluding remarks and potential forthcoming policy implications.

2 Previous research

The general perception in the most previous research is that sunk costs of exporting are important for firms export decisions. The results of previous research show that the previous exports status, after one has controlled for market characteristics, is strongly related to the occurrence of sunk costs. Roberts and Tybout (1997) showed that Columbian firms that exported in one period were about 60 % more likely to export. Bernard and Jensen (2004) found that the probability of exporting for USA plants today, having exported last period, increased by 36 %. Bugamelli and Infante (2002) found this probability to be as high as 90 % for Italian manufacturers, while Requena-Silvente (2005) found it to increase by 75 % for small and medium enterprises in the UK. Gullstrand (2011) found that the results of the export status of Swedish exporters in the food and beverage industry varied between 77 % and 37 % depending on what econometric methodology was used. This variation in results is possibly due to the usage of different control variables and data. However, the results point in the same direction, that previous export status is of importance for firms present export decision. Entering and exiting markets becomes inert in the presence of sunk costs, hence, the persistence in exporting could through this logic be explained by sunk costs.

These findings support the basis premise of the hysteresis literature, that there are substantial sunk costs involved in entering or exiting the export market. Roberts & Tybout (1995) recognises that temporary changes in market variables, such as exchange rates, can result in permanent changes in market structure and exports because of the entry and exit of exporters. Baldwin (1990) presented a model of hysteresis in trade that is based on the existence of sunk entry costs and how large exchange rate swings can cause hysteresis in such an environment. Baldwin & Krugman (1989) allow for a stochastic exchange rate and show that hysteresis in trade leads to hysteresis in the equilibrium exchange rate. Baldwin (1988) shows, with the US import prices as a starting point, that if market entry costs are sunk, temporary exchange rate shocks can alter domestic market structure and create hysteresis in import prices and quantities. Baldwin (1988) and Baldwin & Krugman (1989) suggest that there exists an asymmetry between the exchange rates that trigger entry and exit

in the export market. Because the exchange rate triggering entry will deliver expected gross profits greater than the sunk entry cost, but the exchange rate triggering exit have to reach the point where the expected gross profits from remaining in the market are negative. Dixit (1989a, 1989b) constructs a model of optimal inertia in investment decisions under uncertainty and shows that the size of the interval between the exchange rates that trigger entry and exit is not constant. This means that as the exchange rate becomes more volatile, firms will tend to wait longer to enter, widening the exchange rate interval in which neither entry or exit occurs. The impact of exchange rate volatility on the export participation decision and the export supply was investigated by Campa (2004), he found that sunk cost hysteresis is an important factor in determining export market participation. However, the results suggest that trade adjustments to exchange rate changes mainly occur through the adjustment of quantities by existing exporters rather than through changes in the number of exporting firms. Bernard & Jensen (2004) investigated the relationship between an industry exchange rate measure and the export participation decision, and found that an appreciation of the domestic currency reduces the probability of exporting, though the relationship was only significant at the 10% level. The general conclusion of the literature is that exchange rates seem to have an effect on the intensive margin of current exporters, influencing the export supply rather than the decision for a non-exporter to start export (extensive margin), and that exchange rate volatility has no effect within the frames of these studies.

3 Theoretical specification

This section will present the theoretical background to the empirical methodology in section five. It is divided into the presentation of sunk costs and of exchange rate uncertainty and its relationship with trade flows and hysteresis in trade.

3.1 Sunk costs

Entering a market may be related to irreversible costs, such as costs of gathering information on consumer preferences and product modifications, establishing distribution channels and so on. Gullstrand (2011, p.204) explains that costs of exporting may be sunk in the sense that firms know that they have to pay an irreversible cost, independent of the export volume, before they enter a market and set profit maximizing prices or quantities. The basic assumption of the prevailing theoretical literature is that a non-exporter must incur such an irreversible entry cost. Dixit (1989) argues that the most important feature of entry decisions in an environment of ongoing uncertainty is "hysteresis". It is defined as the failure of an effect to reverse itself as its underlying cause is reversed. Firms can be induced to enter the export market when the expected profits from participating in that market are greater than the sunk cost. The firm do not exit when the stimulus is removed, only when the expected profits from remaining in the market becomes negative will the firm exit. Roberts & Tybout (1995, p.1) argue that start-up costs mean that macro shocks can lead to permanent changes in market structure, and thus that trade flows may not be reversed when a stimulus is removed. That is, sunk costs produce "hysteresis" in trade flows.

The decision to export is decided by numerical factors like firm-level specifications, macroeconomics, and sunk costs. Sunk costs are most easily measured as the effect the previous export status have on the present status, the persistence in entering and exiting export markets are hence explained by the presence of sunk cost. The difficulty to quantify the sunk costs is due to the lack of data availability, but it is not of importance when the focus to explain the inert environment of the export market. Firms that are considering entering a new market will look to the costs of entering, including the sunk costs, in relation to the profits that are within its grasp. The firm will choose to export when the profits of this engagement are larger than the

loss, otherwise it will not enter the market. The results of Gullstrand (2011, p.210) also show that the relationship between sunk entry costs and firms' characteristics are important for the probability of making a positive export decision. The importance of the previous export status are smaller for firms that are more productive and larger, firms with these characteristics are also found to be more likely to export in general. The characteristics of the destination market have also been proven to have a significant impact on the probability to export. Gullstrand (2011) finds for instance that larger markets tend to downsize the importance of sunk costs, which also a larger distance to the export market tends to do. The importance of the previous export status on the export decision is evidently affected by many different factors.

Roberts and Tybout (1997) presents a discrete-choice decision specification that depends on the expected revenue (π_{ipt}) from the current costs (c_{ipt}) of serving and sunk costs of entering (s_{ipt}) the export market p. Y_{ipt-1} takes the value 1 if the firm exported in period $t-1$ and 0 if it did not export. Which indicates that s_{ipt} will take a value different from zero if the firm did not export in period $t-1$. The subscripts i and p indicate that the sunk costs of exporting may vary depending on firm and market characteristics. The export decision of firm i regarding market p at time t (Y_{ipt}) may be represented by the following discrete-choice equation:

$$Y_{ipt} = \begin{cases} 1 \ \text{(exporter)} \Leftrightarrow \pi_{ipt} > c_{ipt} + s_{ipt}(1 - Y_{ipt-1}) \\ 0 \ \text{(non-exporter)} \end{cases} \tag{1}$$

where

$$\pi_{ipt} = r_{ipt} + \delta_p \left(E_t \left[V_{ipt+1}(\cdot) \middle| Y_{ipt} = 1 \right] - E_t \left[V_{ipt+1}(\cdot) \middle| Y_{ipt} = 0 \right] \right) \tag{2}$$

and r_{ipt} is export revenues, while $E_t[.]$ is the expected values of future income depending on the firms export decision of today. Eq. (2) represents the expected increase of future income if firm i serve market p at time t, and a firm that expects a positive effect on its profits decides to export. Gullstrand (2011) argues that the implications of sunk costs of exporting, as discussed in earlier sections, is that a firm's export decision becomes inert, and hence it may create export hysteresis. That is, sunk costs may prevent entry due to a negative historic export decision, while sunk costs also can prevent exit because firms want to avoid paying the re-entry costs. One can test for the presence of sunk costs by looking whether state dependence exists in

the export participation decision or not, i.e. if the probability that firm *i* is an exporter at time *t* depends on whether the firm was an exporter at time *t-1* or not (Campa, 2004 p.531). The following equation is the reduced form of Eq. (1) and it is parameterized by firm, industry and market specific variables:

$$Y_{ipt} = \begin{cases} 1 \Leftrightarrow \beta X_{it} + \lambda Z_{pt} - s\left(1 - Y_{ipt-1}\right) + \varepsilon_{ipt} > 0 \\ 0 \ \ otherwise \end{cases} \tag{3}$$

where vector X_{it} consists of firm-specific characteristics, vector Z_{pt} is a set of market characteristics, ε_{it} is a firm-market-time specific shock, β and λ are vectors of parameters to be estimated, and s is the estimated sunk costs of exporting. The purpose is to capture the relationship between different variables and the export decision in order to test whether they are of any importance.

3.2 Exchange rate uncertainty

In this section we turn to the impact the exchange rate volatility may have on the export participation decision. As commented on in the previous section, many factors are in work when investigating the importance of the previous export status on the propensity to export. Gullstrand (2011) found evidence for an affect of exchange rate variation on the probability to export. This is the first study with firm-market specific exchange rates instead of industry average, which may be the reason for theses findings. It also provides a base to further investigate whether exchange rate volatility can magnify the importance of sunk costs. To be able to discuss the basic results highlighted in the hysteresis literature, mainly the presence of sunk costs of entry and the importance of exchange rate uncertainty, this paper must also consider the work of Campa (2004).

When a firm is considering entering a new market, the positive export decision will only be made when the expected profits of entering are larger than the loss. In a world where exchange rate changes are perceived to be permanent (and exchange rate uncertainty zero), the firm will enter the export market when the expected gross profits from participating in that market are greater than the sunk entry cost. The firm, however, will not exit until the exchange rate reaches the point where the expected gross profits from remaining in the market are negative (Campa 2004, p.528). The value of the exchange rate will affect the sunk costs, which most probably are paid

with foreign exchange. This can be illustrated by Eq. (1), where the expected returns of exporting, π, will decline if the sunk entry costs, $s(1-Y_{ipt-1})$, is enlarged by an unfavourable exchange rate. Hence, large sunk cost could be related to unfavourable real exchange rates, which would discourage exports. When faced with the export-participation decision in a world where exchange rate changes are transitory and future exchange rate uncertainty is much present, firms can decide to wait to enter when the level of uncertainty is high, observe next period's realization of the exchange rate, and then consider entry again, (Campa, 2004, p.528). The option to enter may be strongly related to exchange rate fluctuations, when volatility is high the export-participation decision may be found to be negative because of the risk involved. The risk involves experiencing unprofitable exchange rates and consequently a large sunk entry cost that minimizes the expected returns. The risk also involves the loss of return after entry, and not being willing to exit immediately due to the entry sunk cost, that is, exchange rate volatility stimulate hysteresis in trade. Considering Eq. (1) again, the expected returns of exporting are subject to risk in the sense that the higher the uncertainty, the broader the interval in which the exchange rate fluctuates, which imposes the sunk costs to vary within the same interval. At some value in this interval it may be profitable to enter the market (small sunk costs), but some other value in the same interval can prove to be devastating (large sunk cost). Roberts & Tybout (1995) state that when future market conditions are uncertain, sunk costs make patterns of entry and exit dependent upon the stochastic processes that govern variables like the exchange rate.

4 Sample and Data

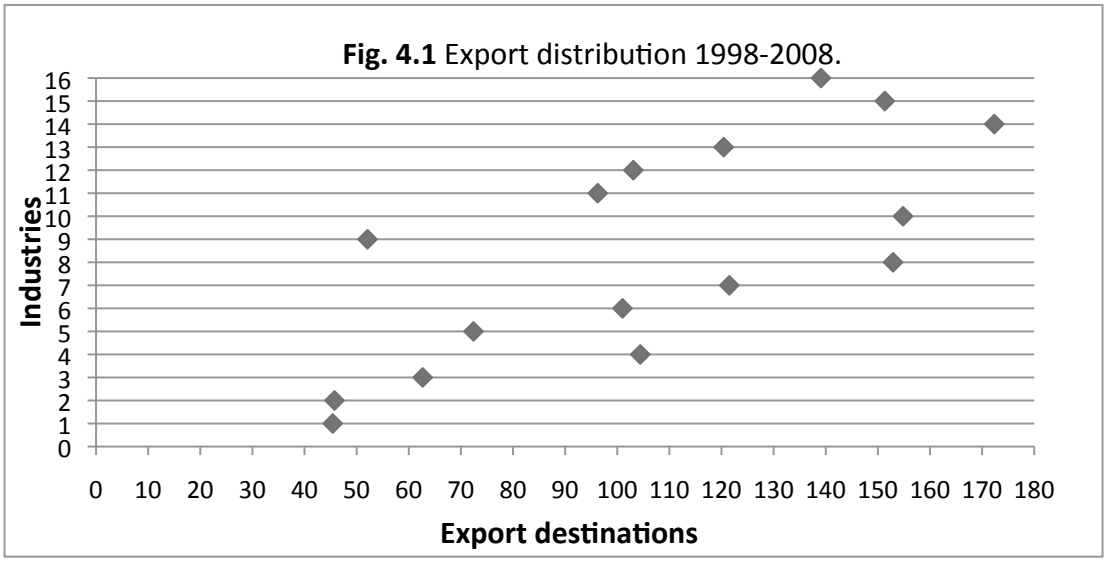
In this section the data collection process is presented. It includes both the description of data sources as well as figures describing the collected sample. The data sample in this paper focuses on a set of commodity specific data and bilateral trade data. In this paper we reject the aggregate trade flow data because, as McKenzie (1999, p.85) studies compile, the use of such data may contribute to the array of conflicting results derived. Using national trade data implicitly assumes the impact of exchange rate volatility is uniform between countries and commodities both in terms of direction and magnitude. In this paper we will analyze the effect of exchange rate volatility on trade across different country pairs, commodity groups and over time, so to allow us to better control for other factors that may affect trade other than exchange rate volatility. This will improve the chance to detect an effect of exchange rate volatility on trade. The impact of exchange rate volatility on traded commodity groupings has been shown, in some studies, to have greater significance than on aggregated trade data (McKenzie 1999, p.87).

The export data is collected from the United Nations Commodity Trade Statistics Database (COMRADE) and covers the period 1998 to 2008. It contains information regarding the bilateral trade in 16 different commodity groups between Sweden and 188 export destinations. The period we utilize is motivated by data accessibility, because the use of many developing destination-markets would limit the data on industry specific exports if we move further back in time. The time period is also motivated by that it, inter alia, intercepts the financial and economic crisis of 2007-2008.

The 188 recipient countries were chosen on the basis of data availability, this would unconsciously exclude the poorest countries due to the lack of data for these recipients. Market specific data is collected from The World Bank Database (WDI). The data contains information of GDP and population. Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) distributes data on distance.

The data concerns exports from 16 different commodity groups that were chosen from the Harmonized Commodity Description and Coding System (HS) at a two-digit level. At the two-digit level the HS system is made up of 99 categories, which in turn

can be divided into 15 groups of product characteristics. The 16 commodity groups were chosen arbitrary on the basis that they are representative of the variety of Swedish exports and are concluded in table A1. The sample consists of a total of 33264 industry-destination-time observations out of which approximately 18700 observations showed a positive export status. The degree of export participation (number of export-destinations) varies across the 16 commodity groups. This is illustrated in figure 4.1 where the export destinations range from approximately 40 to 180 for the 16 commodity groups. There are four industries that export to over 150 destination markets, commodity groups 39, 48, 85 and 87. They represent 72 percent of total exports volumes. If we address the individual export destinations, the major export markets for Swedish products among the 16 commodity groups are Denmark, Germany, United Kingdome, France, Norway and USA. They constitute approximately 47 percent of total exports over the whole sample period, and the largest export destinations are Germany and USA that constitute about 21 percent of total exports together.



COMTRADE distributes information on both value and quantity of exports, this data sample only include the value of exports since information on quantity often is lacking or estimated with the help of exported value. COMTRADE does not contain estimates for missing data. Therefore, trade of a country group could be understated due to unavailability of some country data. Hence there is no distinction between data obtained on when export is zero and when trade has not been reported. In this paper all sectors within countries with missing values are defined as non-exporters. This makes it possible to measure the transition from being a non-exporter to an exporter.

The problem with this generalization is that it can produce biased results, because some exporters will be treated as non-exporters due to unreported trade flows.

The development of the total export destinations over the whole sample period is shown in figure 4.2.

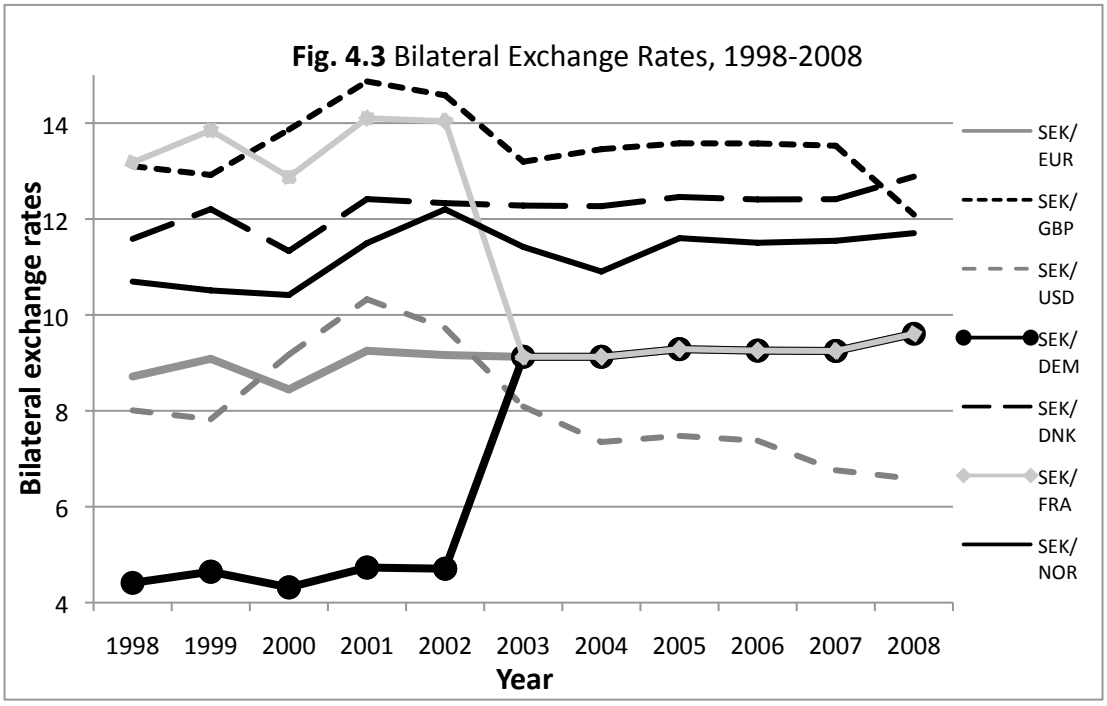
Note: the vertical axis measures the movements of the entry and exit from export markets over the years. The year 1997 is included to provide a extended view of the movements.

The number of export destinations in our sample differed much during the first years and has a less irregular and even an inert development at the end of the sample. In 1999 to 2000 there was a large increase in export market entry, there is a little decrease in 2002 that indicate an exit from some destination markets, but there is not a great an exit as there were an entry to be found in this sample.

The Bank of Sweden collects the bilateral real exchange rate between Sweden and each recipient country. The bilateral exchange rate data runs over a whole year. The highest, lowest, and mean values of the bilateral exchange rate of one year are used to calculate the exchange rate volatility. When a bilateral exchange rate between Sweden and the recipient country is absent the US dollar exchange rate is used. The Swedish banks calculate a fixing rate daily at 9.30 a.m. according to the formula: (buy+sell)/ 2. NASDAQ OMX Stockholm AB establishes a joint MID-PRICE at 10.05 a.m. by calculating the average value of the banks' fixing rates. The euro-countries national exchange rates ceased to be recorded the 28th of February 2002. This means that there will be a shift in these exchange rates during this period that might depend on both fluctuations and the transfer to a new currency.

This paper uses the real exchange rate variable because it is a more relevant measure. The effects of uncertainty on a firm's revenues and costs that arise from fluctuations in the nominal exchange rate are likely to be offset in large part by movements in costs and prices (McKenzie 1999, p.79). In general the literature on the effects of exchange rate volatility on trade show that the empirical results suggest that the distinction between real and nominal does not impact significantly on the results achieved (McKenzie 1999, p.85).

The development of the bilateral exchange rate between Sweden and the countries with the highest total percentage of exports received, USA, France, Germany, Denmark, Norway and Great Britain, are shown in figure 4.3.

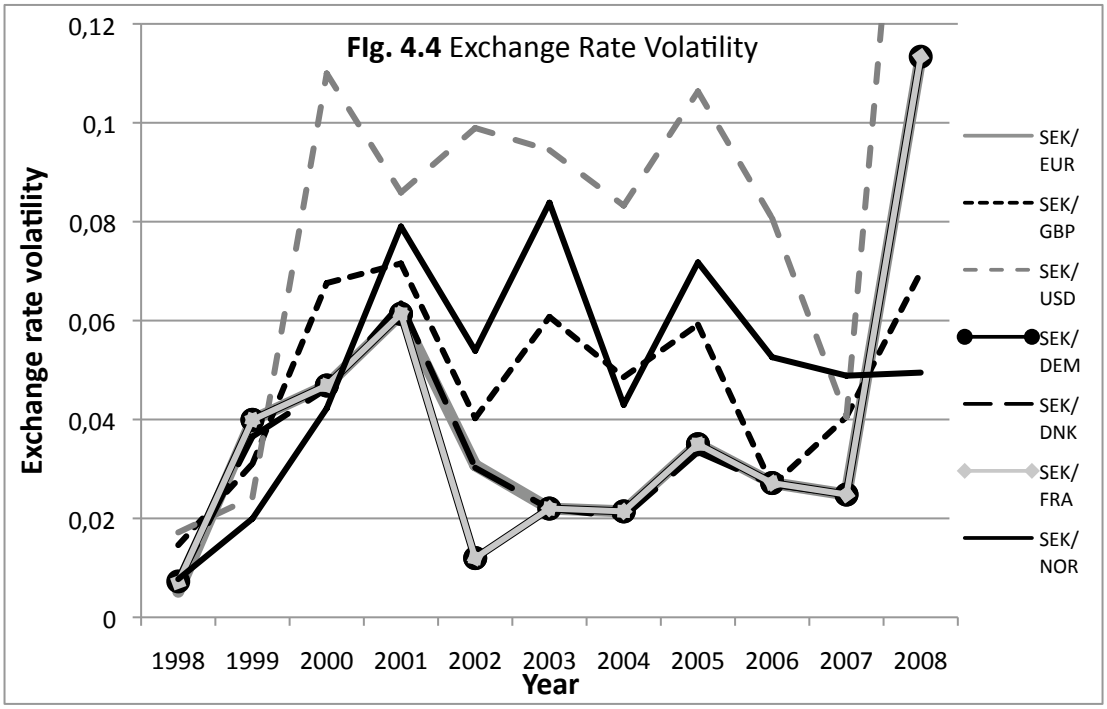


At the beginning of the sample there is a depreciation of the SEK towards the USD and GBP, after 2002 the exchange rate fall back and even appreciate. Towards the EUR and the bilateral exchange rates of the euro-countries, as well as the Danish kroner, the exchange rate follows the same development and do not fluctuate significantly. There is a slight appreciation of the SEK followed by depreciation towards these exchange rates in the beginning of the sample. Towards the Norwegian currency there is a similar behaviour as towards the USD and GBP, but in the case of

the NOK currency, the fluctuations benefit the Swedish kroner in the end of the sample, which depreciates slightly.

In the case of hysteresis in trade, we should be able to find an increase in export destinations in figure 4.2 as the Swedish currency depreciates and further an inert development downwards of the export destinations as the currency falls back to its original level. In the presence of the USD, GBP and the NOK some indication of this relationship is shown. The entry in new export markets starts to increase in 1999 to 2000 Sweden is experiencing a depreciation of its currency towards three of its largest trade partners, and as the SEK later appreciates there is an inert development downwards of the exit from foreign export markets.

The development of the exchange rate volatility between the same countries as in figure 4.3 is shown in figure 4.4.



Note: Exchange rate volatility on the vertical axis measures the standard deviation from the mean value of the exchange rate in each period.

The development of the volatility between the SEK and the USD, the GBP, and the NOK exchange rate indicates an irregular fluctuation between 2000 and 2008. All the other exchange rates experience moderate volatility during 2002 and 2007. There are however a large jump in the beginning of the sample and a large and short change between 2007 and 2008. In 1998-1999 the large increase in exchange rate uncertainty should discourage entry, this is compared with figure 4.2, which shows a decrease in

export destinations this period. In 1999-2000 the Swedish kroner depreciate towards all the currencies presented in the figures, this should indicate an increase in exports, and the assumption is confirmed and depicted in figure 4.2. The irregularity during the years 2002-2007 should discourage entry, it anticipates the inert development of the increase in export destinations in figure 4.2, that is, there is neither large entry nor exits in the export markets. The data sample shows that there is a strong possibility for a relationship between the export participation, the bilateral exchange rate and the exchange rate volatility.

5 Empirical methodology

The empirical approach follows Roberts and Tybout (1997), Bernard and Jensen (2004), and Gullstrand (2011) although we use product-market level trade flows instead of firm-level or firm-market level. We estimate the average sunk costs within broader product groups without the possibility to decompose it between firms. The reason for not choosing firm-level data is due to the data accessibility, it is of great importance to produce as accurate variables as possible, when using a large variation of product groups this becomes difficult on the firm-market level, therefore we use product-market level data in this thesis. Roberts & Tybout (1995), among others, found that variations in firm-level cost and demand conditions have much less effect on the profitability of exporting than variations in macroeconomic conditions and sunk costs do. The objective is to estimate a model that will capture the basic results highlighted in the theoretical framework, mainly the presence of sunk costs of entry and the existence of effects on the export-participation decision due to exchange rate uncertainty.

5.1 Econometrical specification

To research how exchange rate fluctuations affect the export decision and the trade patterns, the model will incorporate the export decision, which depends on expected revenues, as the dependent variable. The exchange rate volatility is included as an explaining variable and the model will also incorporate control variables, which includes factors that might have an impact on trade patterns.

From the theoretical background on sunk costs and exchange rates we have the eq.3 from chapter 3.1. In this papers framework the subscript *i* stands for product instead of firm, and the firm-level specific variable *X* is dropped, since the data is on product-market level:

$$Y_{ipt} = \begin{cases} 1 \Leftrightarrow \lambda Z_{ipt} - s(1 - Y_{ipt-1}) + \varepsilon_{ipt} > 0 \\ 0 \ \ otherwise \end{cases} \qquad (4)$$

Based on the theoretical consideration, the following testable hypothesis is suggested: a larger volatility in exchange rates can be the source of a negative export decision. We want to find out if high volatility and the inherent uncertainty affect the perceived sunk-costs of exporting to increase, and hence, decrease the propensity to export. Equation 4 is modified and parameterized by product and market specific variables as well as variables regarding the bilateral exchange rate and the exchange rate volatility:

$$Y_{ipt} = \begin{cases} 1 \Leftrightarrow \beta_0 X_{ipt} + \beta_1 e_{jt} - \beta_2 \sigma_{jt} - sY_{ipt-1} - s_\sigma(Y_{ipt-1})\sigma_{jt} + \varepsilon_{ipt} > 0 \\ 0 \ otherwise \end{cases} \quad (5)$$

Where vector X_{ipt} consists of product-market specific characteristics of product i in market p at time t, σ_{jt} is the bilateral exchange rate volatility for country j at time t, and ε_{pt} is a market specific shock, β_i are a vector of parameters to be estimated, and s is the estimated sunk cost of exporting, while s_σ is a vector with estimates indicating whether the importance of sunk costs varies across exchange rate volatility. The variables most important for our purpose are the exchange rate variables e_{jt} and σ_{jt}. The volatility of the exchange rate enters the export participation decision by altering the expected revenue of exporting under the two alternative scenarios of being an exporter or not. It affects the interval of exchange rates that cause entry and exit, so the width of the hysteresis band should increase as the higher the level of exchange rate uncertainty faced by the industry. Hence, the importance of sunk costs becomes larger as the level of exchange rate uncertainty increases. Changes in the current exchange rate may affect both the current profitability from exporting, and the expected future value from being an exporter (depending on the extent that the current exchange rate affect expectations of future exchange rates).

Since we want to examine both the importance of the bilateral exchange rate and exchange rate volatility on sunk costs of exporting, we also use the following extended specification:

$$Y_{ipt} = \begin{cases} 1 \Leftrightarrow \beta_0 X_{ipt} + \beta_1 e_{jt} - \beta_2 \sigma_{jt} - sY_{ipt-1} - s_\sigma(Y_{ipt-1})\sigma_{jt} - s_e(Y_{ipt-1})e_{jt} + \varepsilon_{ipt} > 0 \\ 0 \ otherwise \end{cases} \quad (6)$$

Where e is a vector for the bilateral exchange rate affecting the importance of sunk

costs for an industry's export decision. That is, s is the estimated mean importance of sunk costs while s_e is a vector with estimates indicating whether the importance of sunk costs varies across bilateral exchange rate appreciation or depreciation.

5.2 Variables used in the analysis

In this section we first present the exchange rate variables used in the econometric specification. Later we discuss the other control variables that might affect the importance of sunk entry costs.

The bilateral exchange rate is measured as the annual average from the Bank of Sweden (SEK/currency of the export decision) times the ratio of CPI (consumer price index) of the destination to the CPI of Sweden. The depreciation of the Swedish currency is expected to encourage the propensity to export, since the Swedish goods become more affordable, and the demand increases.

Exchange rate fluctuations are measured as historical exchange rate volatility by the coefficient of variation (C_v). The coefficient of variation is a dimensionless number. So for comparison between data sets with different units or widely different means, one should use the coefficient of variation instead of the standard deviation. The data on the bilateral exchange rates in this sample are both in units of 1 and 100. The coefficient of variation is the ratio of the standard deviation (σ) to the mean (μ). Given information on the yearly maximum, minimum and mean value of a bilateral exchange rate observed during that period, we can calculate the standard deviation from the mean and the annual volatility of the exchange rate. The formula for standard deviation is as follows.

$$\sigma = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

Where N is the number of observations, x_i the yearly maximum or minimum value and $\bar{x}$ is the yearly mean value of the bilateral exchange rate. We then calculate the coefficient of variation with the formula stated below.

$$C_v = \frac{\sigma}{|\mu|}$$

By including this variable into the regression model it investigates whether the fluctuations of the exchange rate have any persistent impact on the export decision and trade patterns of a country. The volatility variable is expected to have a negative effect on the propensity to export, since increased uncertainty in a market should discourage exports. By using values on the bilateral exchange rate for the same year as for the export decision, we estimate the effect of the current value of the exchange rate volatility on the current export decision. Turning to uncertainty and time an issue needs to be addressed regarding the effects of exchange rate volatility on trade flows. Thorbecke (2008) explains that using exchange rate changes in a year to explain export in the same year inevitably implies that exchange rates in later months would be used to explain exports in earlier months. However, exporters do not observe these changes in later months when making export decisions in earlier months. Therefore, as exporters are unlikely to respond immediately to changes in volatility, it is of importance to estimate for lagged exchange rate volatility because it may serve as a better proxy than current estimated exchange rate volatility.

To assess the strength of an independent link between exchange rate volatility and the export-participation decision in the 16 commodity groups, we also include the following control variables. We use explanations of market specific variations by Gullstrand (2011), with some modification since the control variables are product-market specific (*X)*.

Market size. GDP is used as a proxy for the market size. We expect there to be a positive effect of exporting if there is an increase in the GDP of a recipient country, since a larger market suggests an increased demand for different types of goods. There is also a negative association with an increase in the GDP, because a larger destination-market can potentially increase the competition.

Population. Population in each country is introduced as a proxy for domestic economic development. An increase in population is expected to have a negative effect on the propensity to export, when population increases as GDP is held constant the income of the country is divided over more people and hence the country becomes poorer, this should decrease demand for a range of consumer goods that are a part of our sample. Given a particular GDP level, the expected revenues from exporting are anticipated to be higher with a smaller population because richer countries are expected to provide greater export opportunities (Gullstrand, 2011 p.205).

Distance. CEPII provides information on the calculations of the control variable distance. We use the simple distances measurement, which is calculated following the great circle formula, which uses latitudes and longitudes of the most important city (in terms of population) or of its official capital. The distance formula used is a generalized mean of city-to-city bilateral distances developed by Head and Mayer (2002), which takes the arithmetic mean and the harmonic means as special cases. Distance is expected to have a negative impact on the probability of exporting, since the costs of transportation should discourage exports.

Comparative advantage. The Revealed Comparative Advantage (RCA) measure serves as a proxy for whether a country has a comparative advantage in a specific industry. The RCA that is utilised is Balassa (1965) measure of revealed comparative advantage. The revealed comparative advantage of one country in the trade of a certain product is measured by the item's share in a country's exports relative to its share in world trade. The measure of RCA will be as follows.

$$RCA = \frac{\left(X_a^i / X_a^c\right)}{\left(X_m^i / X_m^c\right)}$$

The expression X_a^i refer to the export of commodity *a* by country *i*. X_a^c refer to the export of commodity *a* by the set of countries *c*. X_m^i and X_m^c refers to the combined exports of the set of commodities *m* by country *i* respectively by the set of countries *c*. The RCA is a measure of country *i*'s export share in the commodity *a* with respect to some particular aggregation of commodities (*m*), relative to some particular benchmark of countries (*c*). Superscript *m* refers to the combined exports of the 16 product groups and superscript *i* to any of the 188 countries in the sample, and *c* to all 188 countries.[2] This specific measure is preferred because it is a relative export supply index measure and it estimates the comparative advantage a country may have in exports of a particular commodity in relation to some set of commodities, which the data sample of this thesis consist of. In our case countries operate within 16 different commodity groups and intra-industry trade is possible. If a country's RCA is positive, it has a favourable advantage in a certain commodity group and this implies that the domestically produced commodity preferably is sold at the domestic market.

[2] For further reading see; Balassa, B. (1965), Trade Liberalisation and Revealed Comparative Advantage, *The Manchester School,* Vol. 33: 99-123

In this case, the RCA will be negatively correlated with the propensity to export for Swedish industries.

5.3 Econometrical issues

In this paper there will be performed an estimation of Eq. (6), and this involves the need to address some issues. The estimation of Eq. (6) involves a test of the hypothesis that past export participation affects the present propensity to export. To be able to make an as accurate estimation as possible of this coefficient we need to control for all other determinants of export participation that are persistent over time (Campa, 2004). The inclusion of the exogenous control variables that may predict export participation controls these factors to a large degree, however, to the extent that unobserved variables are persistent determinants of export participation, there will be serial correlation in the error term ε_{pt} (Campa, 2004). This means that, if true, a correlation will be incorrectly attributed to past export participation causing the coefficient on past export participation to be significant and overstating the presence of sunk costs. A fixed-effects model would handle the problem with serial correlation by removing the destination-specific effects, but the dependent variable is correlated with the destination-specific effects and this model is therefore likely to produce a downward biased estimate of the importance of sunk costs (Gullstrand, 2011, p.207). The problem could also be solved by allowing for a random effect component in the equation but, hence, we assume that the error term is the sum of two normally distributed random components; a destination-specific component α_p and a transitory component η_{pt}, such that:

$$\varepsilon_{pt} = \alpha_p + \eta_{pt}$$

This requires the persistent effects to be uncorrelated with the error term, which is unlikely. By using a dynamic random-effects probit model the problem with persistent effects can be handled. By including the value of Y_{p0}, of the starting year 1998, in the control variable X_{ipt}, because this initial value is conditional upon destination characteristics and will result in the capture of the destination-specific component, α_p.[3]

[3] For further reading on including a distribution conditional on the initial value and the observed history of strictly exogenous explanatory variables see Wooldridge (2005).

6 Results

The first part of this section will focus the presentation and discussion on the estimation of the average importance of sunk costs of exporting and whether the results vary between different estimation methods. Secondly, we will focus on the presentation and discussion of the results concerning the control variables and the inclusion of the exchange rate variables and their interaction with sunk costs.

6.1 The average importance of sunk costs on exporting

In table 1 we observe the results of three estimation methods, the fixed-effects linear probability model, the random-effects probit model, and the dynamic random-effects probit model. The different estimation methods provide us with an interval, the fixed-effects linear probability model soaks up the importance of historical export decisions and the estimation results in a low economic significance. The random-effects specification does not include an initial dummy value, so it overestimates the importance of each variable included in the regression. The different estimation techniques serve as a sensitivity analysis of the control variables as well as the variable concerning previous export status (Gullstrand, 2011). In table 1 the dynamic random-effects probit model ends up with an estimate between these two, and the actual importance is somewhere in-between.

Table 1
The average importance of sunk costs and destination specific variables

	Fixed-Effects Linear Probability	Random-Effects Probit	Dynamic Random-Effects Probit
Lagged export status			
Exported Last Year	0.094 (0.000)	0.726 (0.000)	0.644 (0.000)
Initial dummy value	n/a	n/a	1.693 (0.000)
Destination characteristics			
Ln (GDP)	0.055 (0.000)	0.639 (0.000)	0.408 (0.000)
Ln (population)	-0.029 (0.435)	-0.078 (0.000)	-0.063 (0.000)
Ln (distance)	n/a	-0.423 (0.000)	-0.271 (0.000)
Revealed comparative advantage	0.013 (0.034)	0.112 (0.010)	0.072 (0.077)
Number of observations	32640	32640	32640
Rho	0.622	0.544	0.391
R^2	0.355	n/a	n/a
Log Likelihod	n/a	-8502.039	-7986.580
Chi-statistics (HO:all coefficients equal zero)	n/a	0.000	0.000

Number in parantheses are p-values

In parentheses we have the level of significance at the 5 percent level, and the coefficient of previous export status importance for the present export status are all

positive and significant. The fixed-effects linear probability estimation shows that if an industry exported in one period it is about 9 percent more likely to export in the next period. The random-effects probit model provides results for the upper bound, where the propensity to export increases with about 73 percent when the industry exported last year. The dynamic random-effects probit model estimation ends up at a probability of about 64 percent, in-between the other two estimations. This is in accordance with the previous research, where random-effect models estimate results in the upper bound, Bugamelli & Infante (2002) and Requena-Silvente (2005), and fixed-effect models estimate results in the lower bound, Bernard & Jensen (2004).

The results show that unobservable characteristics influencing Swedish industry export decisions are significant, that is, the variable for previous export status (*exported last year*) proves that historical export decisions are of great importance for an industry's decision to export when estimated in the dynamic random-effects probit model. Further evidence on the robustness of the dynamic random-effects specification is the inclusion of the initial dummy value, the strong economic and statistical significance suggests that it captures a lot of the persistent effects discussed in section 5.3 and hence, use more of the available information. This implies that the dynamic random-effects probit model is likely to produce the most reliable results and thus that is the model used to test for the importance of exchange rate volatility on sunk costs.

6.2 Product and market characteristics

In this section we analyse the effects of the different observable market characteristics, GDP, population, distance and revealed comparative advantage, and the exchange rate variables on the propensity to export, when previous export status has been controlled for. The benchmark regression Eq. (6) is found in Table 2 together with some extensions.

Table 2
Effects of volatility and the real exchange rate on sunk costs - Dynamic Random Effects Probit

	Benchmark	Extension Monthly volatility	Extension Lagged Volatility
Lagged export status			
Exported Last Year	1.123 (0.000)	0.918 (0.000)	0.668 (0.000)
Initial dummy value	1.663 (0.000)	1.670 (0.000)	1.683 (0.000)
Destination characteristics			
Ln (GDP)	0.408 (0.000)	0.412 (0.000)	0.408 (0.000)
Ln (population)	-0.049 (0.002)	-0.048 (0.000)	-0.054 (0.000)
Ln (distance)	-0.231 (0.000)	-0.225 (0.000)	-0.240 (0.000)
Revealed comparative advantage	0.077 (0.059)	0.079 (0.054)	0.074 (0.069)
Interactions with exchange rate variables			
Real exchange rate	0.053 (0.000)	0.046 (0.000)	0.041 (0.000)
Real exchange rate*Exported Last Year	-0.043 (0.000)	-0.034 (0.003)	-0.027 (0.009)
Exchange rate volatility	-3.169 (0.000)	…	…
Volatility*Exported Last Year	-2.250 (0.002)	….	…
Volatlity monthly	…	-13.906 (0.000)	…
Volatility monthly*Exported Last Year	…	-0.332 (0.912)	…
Volatility lagged one year	…	…	-4.885 (0.000)
Voltility lagged one year*Exported Last Year	…	…	3.124(0.001)
Number of observations	32640	32640	32640
Rho	0.389	0.388	0.386
Log Likelihod	-7931.975	-7932.387	-7951.589
Wald (H0:all coefficients equal zero)	4634.670	4623.540	4689.770

Number in parantheses are p-values

The results on the coefficient of GDP suggest that a larger market increases the expected returns from entering, rather than discouraging entry due to increased competition. All estimation strategies confirm the positive statistical significance a larger market provides, and the sign is as anticipated. If population is held constant as GDP increases, the aggregated demand for diversified goods increase and the destination market is considered more profitable. The coefficient for population is significant and we find support for a lower expectation of export revenues in poorer countries. That is, keeping GDP constant, an increasing population affects the export decision negatively. In the fixed-effects specification the coefficient for population is statistically insignificant, since we find weak economical support regarding higher returns from exporting to a larger market (only 6 percent), it seems likely to find no support for a higher expectation of export returns in richer markets. We also find statistical evidence for the importance of distance, the propensity to export decreases with distance. This is due to the transportation costs that increase with distance, and it can also be due to that cultural, linguistic, and geographical differences increase with

distance, which could appear to contribute to major differences in preferences that will incur further costs in factors as product differentiation (Gullstrand, 2011, p.209). The last control variable considered in this paper is the revealed comparative advantage (RCA), which is intended to capture whether the destination market experience a comparative advantage in any of the goods in the sample. The variables' economical signification is very small, and it is shown to be statistically insignificant. Except in the fixed-effects and random-effects specifications, where it is statistically significant but still rather weak economically. Overall, there is no evidence that the comparative advantage of countries have any impact on the export participation decision. The implications of this are that the measurement of the RCA used in this thesis might not be a good proxy for comparative advantage, on the other hand, the RCA may not play a significant role when it comes to explaining the propensity to export, which could be explained by the very small values of the economic coefficient. When it comes to intra-industry trade, comparative advantage theory lack to explain this relationship.

Turning to the inclusion of the exchange rate variables, all indices enter the model with significance, except for the interaction between the monthly measured volatility and *exported last year*. The control variables does not change in their economical interpretation, the values of each coefficient are approximately the same over the three regressions. This implies that the exchange rate variables do not create a problem in the specification, which makes the interpretation more straightforward.
The exchange rate effect is positive and significant as expected. An increase in value implies a depreciation of the Swedish currency, which increases the expected revenues from exporting. The interaction between the exchange rate and the previous export status (*exported last year*) are negative and significant, hence, we find evidence that a favourable exchange rate downsize the importance of sunk costs, and the expected returns from exporting becomes larger. This is in line with the theory presented in section 3.2. The economical significance is however small, which implies that the exchange rate does not have a large role in explaining the export participation decision, nor does it affect the importance of sunk cost to a large extent. The large effects of exchange rate volatility might soak up a lot of this effect.
The coefficients on the exchange rate volatility are negative and statistically significant over the three regressions. This suggests that the propensity to export is

lower to markets with high exchange rate uncertainty. Directing the attention to the interaction between the exchange rate volatility and the previous export status, we find a great distinction between the results. As discussed in previous sections, exchange rate volatility should magnify the importance of sunk cost, that is, the expected revenues of exporting are negatively correlated with exchange rate volatility due to the anticipatory increase in sunk costs. The benchmark regression finds exchange rate volatility to be statistically significant but the economical significance is more problematic, the sign of the coefficient is not as anticipated. The results suggest that the exchange rate volatility downsize the importance of sunk costs. The implications of this is that the volatility specification distorts the results, the fact that the benchmark regression uses a proxy based on the current exchange rate volatility may explain the unanticipated results. The volatility index introduced in the second column is the same as the benchmark index, only we use monthly reported data instead of yearly. Examining the results we find no statistical evidence that exchange rate volatility magnify the importance of sunk costs, nor do we find any support for the anticipated relationship. Now consider that in macroeconomics, the effects of exchange rate movements are subject to time lags, it takes time to adjust new information into decisions[4]. In the third column in table 2, the volatility index is the benchmark volatility index lagged one period. The interaction between the exchange rate volatility lagged one period and the previous export status is significant and has the anticipated sign. This implies that exchange rate uncertainty magnify the importance of sunk costs. The results support the anticipation that lagged exchange rate volatility is a better proxy to explain the correlation between exchange rate uncertainty and sunk costs, because it uses observed information, exporters would have had time to adapt to the information. On the other hand, already observed exchange rate volatility may cause exporters to make decisions on information that is outdated. This issue may be addressed by incorporating the future expectations of the exchange rate volatility.

To check the robustness of the results we divided the sample into high-income and low-middle-income countries, and the results held for low-middle-income countries. In the sample with high-income countries all the exchange rate variables were statistically insignificant, which can be due to the small sample, it only contains 51

[4] Further reading see Pilbeam (2006).

destination markets.[5] The robustness check also included an investigation regarding the importance of the presence of extreme exporters. When we excluded four industries that exported to over 150 destinations, and six destination-markets that formed about 47 percent of total exports, the results were unchanged. [6]

[5] The unanticipated results of the high-income countries imply that other factors that are not addressed in this paper could also be determinants of the export participation decision in these countries. The unanticipated results of the high-income countries could also be derived from the extended use of the USD. The US dollar constitutes the exchange rate for many of the countries in this sample, and this could create biased results. Therefore, a regression with 100 countries was tested, thus, 88 low-middle income countries with USD as currency was removed from the sample. This sample consists of 51 high-income countries and 49 low-middle income countries, with 30 different exchange rates. The results hold for all three extensions in the dynamic random-effects model.

[6] These results are not presented in the paper but they are available upon request.

7 Summary and conclusion

This paper investigated if the importance of sunk costs differs between markets with different exchange rate risk. In the paper we tested for the importance of sunk costs of exporting by estimating the effect previous export status has on the current export decision, and then provide estimates on the empirical relevance of exchange rate volatility on sunk costs. By using data on representative information of the export status of different Swedish industries in individual markets, the paper finds that the history dependence of exporting, and hence, the importance of sunk costs and hysteresis in trade, is a prominent factor in determining export market participation. Additional information on individual destination markets, the control variables, does not alter the general results found on the importance of the previous export status. We find that the degree of exchange rate uncertainty faced by the exporter is related to the importance of sunk costs, that is, the expected revenues from exporting are lower in markets with high exchange rate risk.

The results suggest, that the mode of procedure in this thesis does not report any major differences in the results of the importance of previous export status on the propensity to export in comparison with the previous research; it is rather very much in line with it. As the data used in this thesis is on a product-market level, we assume a whole industry to be homogenous, and treat the firms within as making decisions collectively, it should have some effects on the importance of sunk costs. Because we treat an industry and the firms within as one unit we capture the general importance of previous export status on the export participation decision, because the approach captures both small and large firms, as well as, less or more productive ones and the effect it would have on them.

Further, the results show that the magnitude of the previous export status on the export participation decision decline from 1,123 to 0,668 as the interaction between the exchange rate volatility and previous export status becomes significant and has the anticipated sign.[7] The results of the extension with lagged volatility provide approximately the same economical value of the coefficient of *exported last year* as its equivalent in the dynamic random-effects specification without the

[7] See Table 2 in chapter 6.2

inclusion of exchange rate variables[8]. This suggests that the extension with lagged exchange rate volatility captures the investigated relationship the best, because its inclusion does not over- or underestimate the initial importance of sunk entry costs.

Thus, the results in this paper suggest that trade adjustments due to exchange rate uncertainty are controlled for through the destination markets. Countries with a highly fluctuating currency should, according to the results in this paper, experience a lower level of incoming trade flows. These findings have an important policy implication, since industries as a whole practice caution towards markets with high exchange rate risk it would be of great value to incorporate this information into policies regarding exchange rate stabilization. The emphasis of this paper has been in the implications of entry dynamics in the export market for the sensitivity of exchange rate changes, and we also suggest that the export decision varies with product and market characteristics. In this paper, we did not focus on the importance of foreign direct investment on the export participation decision, nor its relationship with exchange rate risk. Foreign direct investment could act as a promoting factor for exports in the recipient countries by enhancing domestic capital for exports, and for example helping to transfer technology and new products for exports. It would be interesting to evaluate this relationship, and the continued work in this direction will increase our understanding of the dynamics of successful participation in international markets.

[8] See Table 1 in chapter 6.1

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Appendix

Table A1: Commodity groups on the HS-classification code, two-digit level.

02 (1) - Meat and edible meat offal
03 (2) - Fish, crustaceans, molluscs, aquatic invertebrates
04 (3) - Dairy products, eggs, honey, edible animal product
22 (4) - Beverages, spirits and vinegar
25 (5) - Salt, sulphur, earth, stone, plaster, lime and cement
29 (6) - Organic chemicals
30 (7) - Pharmaceutical products
39 (8) - Plastics and articles thereof
41 (9) - Raw hides and skins (other than furskins) and leather
48 (10) - Paper & paperboard, articles of pulp, paper and board
61 (11) - Articles of apparel, accessories, knit or crochet
62 (12) - Articles of apparel, accessories, not knit or crochet
72 (13) - Iron and steel
85 (14) - Electrical, electronic equipment
87 (15) - Vehicles other than railway, tramway
94 (16) - Furniture, lighting, signs, prefabricated buildings

Note: in parentheses, the numbers for each commodity group as illustrated in figure 4.1

Table A2: Country list.

Afghanistan	China, Hong Kong	Haiti	Micronesia	Sierra Leone
Albania	China, Macao	Honduras	Mongolia	Singapore
Algeria	Colombia	Hungary	Morocco	Slovakia
Andorra	Comoros	Iceland	Mozambique	Slovenia
Angola	Congo	India	Myanmar	Solomon Islands
Antigua and Barbuda	Costa Rica	Indonesia	Namibia	South Africa
Argentina	Croatia	Iran	Nepal	Spain
Armenia	Cuba	Iraq	Netherlands	Sri Lanka
Aruba	Cyprus	Ireland	New Zealand	Sudan
Australia	Czech Republic	Israel	Nicaragua	Suriname
Austria	Côte d'Ivoire	Italy	Niger	Swaziland
Azerbaijan	Dem.Rep. of the Congo	Jamaica	Nigeria	Sweden
Bahamas	Denmark	Japan	Norway	Switzerland
Bahrain	Djibouti	Jordan	Oman	Syria
Bangladesh	Dominica	Kazakhstan	Pakistan	Tajikistan
Barbados	Dominican Republic	Kenya	Palau	Thailand
Belarus	Ecuador	Kiribati	Panama	Timor-Leste
Belgium	Egypt	Kuwait	Papua New Guinea	Togo
Belize	El Salvador	Kyrgyzstan	Paraguay	Tonga
Benin	Equatorial Guinea	Laos	Peru	Trinidad and Tobago
Bermuda	Eritrea	Latvia	Philippines	Tunisia
Bhutan	Estonia	Lebanon	Poland	Turkey
Bolivia	Ethiopia	Lesotho	Portugal	Turkmenistan
Bosnia and Herzegovina	Fiji	Liberia	Puerto Rico	Uganda
Botswana	Finland	Libya	Qatar	Ukraine
Brazil	France	Lithuania	Republic of Korea	United Arab Emirates
Brunei Darussalam	Gabon	Luxembourg	Republic of Moldova	United Kingdom
Bulgaria	Gambia	Macedonia	Romania	United Republic of Tanzania
Burkina Faso	Georgia	Madagascar	Russia	United States of America
Burundi	Germany	Malawi	Rwanda	Uruguay
Cambodia	Ghana	Malaysia	Saint Kitts and Nevis	Uzbekistan
Cameroon	Greece	Maldives	Saint Lucia	Vanuatu
Canada	Greenland	Mali	Saint Vincent and the Grenadines	Venezuela
Cape Verde	Grenada	Malta	Samoa	Viet Nam
Central African Republic	Guatemala	Marshall Islands	Sao Tome and Principe	Yemen
Chad	Guinea	Mauritania	Saudi Arabia	Zambia
Chile	Guinea-Bissau	Mauritius	Senegal	Zimbabwe
China	Guyana	Mexico	Seychelles	