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The Role of Uncertainty for Export Survival: Evidence from Estonia

Siim Rahu*

Abstract

Export growth requires not only entry into new markets, but also the survival of trade flows. This paper analyses the role of initial product export share and product differentiation in Estonian manufacturing export survival. For this purpose, detailed firm-product-destination level export data is used from 1995–2011. The data show that adding and dropping new products is rife, about half of the firms change their export portfolio annually, but the average export flow duration remains modest at two years and the median even less. The Cox proportional hazards model reveals in various settings that survival is better if the initial export share is larger and exports are more differentiated. Previous experience with foreign markets and different products has a positive impact on survival. Policies aimed at increasing knowledge about foreign markets are supporting export success.

JEL Classification: F12, F14

Keywords: export survival, product level, Estonian manufacturing, Cox model

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1. INTRODUCTION

Standard trade models do not usually analyse the duration of trade. Some models, especially "old" and "new" theory models (Ohlin 1933; Krugman 1980), imply that trade relationships are rather long-lived and static. Traditional theories of international trade try to explain trade flows between countries on the basis of comparative advantage. As such advantage is usually stable in nature, so trade relationships should also show considerable persistence. Recent "new new" models of trade (Melitz 2003; Bernard *et al*. 2003) have focused more on heterogeneous firms and entry to foreign markets due to trade liberalization and how this influences overall productivity and induces changes in industry. Empirical work (Bernard *et al*. 2010) reveals that trade relations are short-lived and product switching is high. Export growth could be higher if the survival of the trade relationship was longer (Besedeš, Prusa 2007; Brenton, Newfarmer 2007).

This paper seeks to identify the role of initial export share and product differentiation in export survival. For this purpose the author uses Estonian manufacturing data. Both variables try to capture the effect of uncertainty on export survival. Export survival studies have become more popular research topics in recent years in addition to theories about starting to export. The novel aspect in this study relates export survival to uncertainty, which could be an important factor explaining export success, but has been left in the background in international trade studies. Uncertainty describes exporters expectations about potential export success. For product differentiation, the author uses a more flexible measure based on export prices compared to the traditional Rauch classification. For this purpose highly disaggregated customs and business registry data is used from 1995–2011. Estonia is an interesting case for trade studies, as the economy rapidly transformed from a planned to a market economy. This involved trade liberalization and Estonian firms starting to compete with foreign ones. In 2004, Estonia joined the EU and became part of the largest market, which led to a decrease in tariffs. The increase in international trade was rapid; the ratio of exports to GDP grew from 50 per cent in 2000 to 75 per cent in 2011. This changed environment brought new opportunities to local firms and it is interesting to study their behaviour.

There are different models explaining international trade, and consequently, there is no common theory on export survival. Different trade models may suggest various reasons affecting export spells, but they can also be unclear and lead to different results. Theories related to information about foreign markets could explain the length of an export spell. If a firm has less than perfect knowledge about the cost of exporting (Brenton *et al*. 2009), then relatively worse performing firms are likely to exit from some particular market after experiencing losses there. As it is impossible or very expensive to acquire perfect information about export markets, firms usually start with lower volumes to test the market and limit the potential for losses from unfavourable conditions. Therefore, export to geographically and culturally more distant markets or involving smaller initial export scales are relatively more often ceased. Shifts in the export pattern may also be associated with the diffusion of technology and product life-cycle (Grossman *et al*. 1994), where comparative advantage is created endogenously. There are other studies (Rauch *et al*. 2003, Araujo *et al*. 2007) that also look more at market entry and indirectly at the duration of trade relationships. Heterogeneous trade models (Melitz 2003, Bernard *et al*. 2007a, 2010) imply that factors affecting firm entry may also be relevant for exit, and consequently, overall trade relationship duration. Firms with productivity close to some profit cut-off level may leave the market soon after entry if there is a small unfavourable change in market conditions. If market

conditions are stable, less firms exit the market. In summary, there is no single approach explaining duration of trade flows; different models and theories generally imply that trade relationships should be rather persistent once started.

However, theoretical implications are not confirmed by the data. Bernard *et al*. (2010) show that about one-half of US firms alter their product mix every five years. The importance of new and about-to-be dropped products is high, because they account for approximately an amount that equals the share of recently created and about-to-exit firms. The concentration of trade across firms is particularly interesting (Bernard *et al*. 2007b): about 4 per cent of operating firms in the United States were exporters and the top 10 per cent of these accounted for 96 per cent of total exports in 2000. Frequent altering of the product mix indicates the short duration of the trade relationship; according to Besedeš *et al*. (2006), the median duration of exporting a product to the US is between two to four years. Eaton *et al*. (2004) examine the entry behaviour of French firms and find that about 70 per cent serve more than one market, which comprise over 90 per cent of total export value. Changes in product mix may depend on country characteristics. For instance, Goldberg *et al*. (2008) show that only about one third of Indian firms change their product mix in a five year period; the lower share of altering firms is due to heavy regulations on expanding capacity in the manufacturing sector. Changes in products produced and exported is consequently quite common and has to be taken into account when improving the theory of international trade. The current study reveals that starting to export products with a relatively larger share compared to the rest of the portfolio is related to longer survival. More differentiated products have higher survival rates; this effect also persists within the same Rauch classification product category.

The remainder of the paper is organized as follows. Section 2 briefly reviews relevant literature. Section 3 provides an overview of the data and descriptive statistics. Section 4 introduces the methodology and presents the results. Section 5 concludes.

2. INTERNATIONAL TRADE THEORY AND EXPORT DURATION

International trade theory does not directly explain the duration of trade. The phenomenon, that a large number of firms cease to export after a few years, has been little explained in theory. Different studies focus primarily on entering export markets and look at how trade policy affects aggregate outcomes. But these studies also have implications that could explain exiting from export markets and therefore trade duration.

The source of export growth can be seen in terms of the number of trade relationships and the volume of exports in a particular trade relationship, or the extensive and intensive margin of trade. The study by Besedeš and Prusa (2007) reveals that developing countries would experience significantly higher export growth if they were able to improve the survival of their trade relationships and increase existing volumes. For some countries, over half of new export relationships fail within two years, but more successful exporters experience failure at about half of that rate. A similar study by Brenton and Newfarmer (2007) of 99 countries finds that expanding existing products in existing markets has greater weight in export growth than diversification with new products and to new markets. Successful countries differ from less successful ones via the survival and deepening of existing trade. Therefore, it is not only important to understand the factors behind entry, but also to understand the success of keeping existing exports.

Theories relating market knowledge and entry to exporting can probably also explain exiting (Rauch, Watson 2003; Araujo, Ornelas 2007). If firms have limited information about a particular market or export scenario, then starting with small volumes helps to get to know the foreign environment and its own abilities with relatively limited risk exposure. Therefore, exit is more likely to happen when starting small scale. Rauch and Watson (2003) describe a model in which a developed country buyer makes decisions regarding potential cooperation with a less developed country supplier. They show that buyers often start with small amounts and then subsequently increase trade volumes. Usually, the buyer has to make an investment in training the supplier in terms of organizing its work and sometimes using new machines. Starting small shows whether the supplier is able to provide the agreed amount at the required quality before making an irreversible investment. If the buyer estimates that the risks are low or that doing business with the supplier is profitable, then trading can start with large amounts right away and participants skip the getting-to-know period. Once the buyer is on the foreign market, it gets access to a pool of other potential partners, which may decrease the probability of continuing with the initial partner. Impullitti *et al*. (2013) show that the presence of uncertainty and sunk costs have an option value to enter or exit, meaning that some firms may even continue to export when experiencing losses. The ease of entering a foreign market increases experimentation and may also shorten average export duration. The duration of the relationship should be longer when a partner has been in the foreign market previously and when these relationships have been long-lasting. Higher initial export share indicates less perceived uncertainty and export spells should be longer.

Improvements in the institutional framework help to mitigate the negative effect of uncertainty. Araujo and Ornelas (2007) created a model where trading partners build reputation to overcome the weak enforcement of international contracts. A potential exporter looks for distributors in a foreign country, but a weak legal framework allows some partners to behave opportunistically and not to fulfil agreements. In such cases, forward looking distributors contribute to building their reputation and distinguishing themselves from myopic competitors. Starting small scale makes it possible to minimize losses while finding trustworthy partners, and trading volumes can increase with exporting experience. Therefore, the probability of ceasing the export activity decreases the longer the exporter-distributor partnership lasts. Improvements in institutional quality should also increase the scale of initial exports and the duration of the trade partnership. On the other hand, improvements in the legal framework reduce default probability and thereby may also decrease the incentive for some firms to build up reputation, as they can no longer differentiate themselves from others effectively. If the initial level of contract enforcement is low, then building better institutions may temporarily decrease trade flows. Reputation building is still an imperfect substitute for an effective legal framework, as getting to know partners is time consuming, and during that period, trade is depressed.

Starting with small volumes also helps the exporter to learn its own ability in foreign markets. Albornoz *et al*. (2012) created a model that rationalizes experimentation, and profits in one market lead to entering another. They call this phenomenon “sequential exporting”, where profitable expansion comes from intensive and extensive margins, and trade barriers especially reduce entry to new markets. Policies can foster foreign trade by supporting entry to neighbouring markets where firms can find out their potential export profitability. As new exporters and new markets are related to higher risk, then exiting from exporting should also be higher in these cases. Therefore, the authors of the model assume, in addition to the productivity heterogeneity described in recent models, also information heterogeneity, which can explain exporting behaviour. Edwards (2009) suggests that longer relationships with matching and searching processes explains lower instances of exiting from export markets,

reflecting the imperfect information in international trade. Trade between long-term partners (matched firms) differs from trade between new entrants (searching firms). The latter may experience losses and are more sensitive to market shocks; therefore, making them more prone to exit. This explanation is in line with many studies; for example, Besedeš *et al.* (2006) find that if a firm is able to survive in the exporting market for the first few years it has a very small likelihood of failure.

Information uncertainty is also important at product level. Dividing products into differentiated, homogeneous, and intermediate categories, Rauch (1999) shows that search barriers to trade are higher for differentiated than for homogeneous products. Similarities like colonial ties and common language are more important for differentiated products than for products traded on organized markets; also, other gravity equation variables are more important for the former group of goods. For homogeneous goods, such as corn and oil, buyers make their decision mainly based on price, and therefore, higher initial purchases can be expected for these goods due to lower information uncertainty and shorter trade relationships, as it is possible to find lower prices. Besedeš and Prusa (2006) study US trade duration and find that the average purchase for homogenous goods is up to four times larger, and median survival time is about half that for differentiated goods. Similarly to previous studies, trade duration increases with initial purchase, but interestingly differences in survival times for different product types increase with initial size. Differentiated products are traded longer because they involve higher investment costs, and switching partners is less likely. Therefore, information symmetries are important factors explaining trade relationships, and taking steps to reduce uncertainty or its effect helps to increase trade volumes through scale and duration.

Duration of trading some product depends also on competitors. Feenstra and Rose (2000) analyse trade through product cycle theory and rank commodities using the order in which they are exported to the United States. Product cycle theory states that there is an ordering of the commodities that a country develops and begins to export. Advanced countries innovate and start exporting new varieties, which are later imitated by low-cost less developed countries and improved by developed countries. Therefore, countries are more advanced if they are earlier exporters of a particular good, and newly exported goods are usually less advanced than later exported copies. New successful goods face stronger imitation and can have lower trade durations.

Recent models mainly try to analyse the dynamics of multi-product firms, and the assumption about heterogeneity has shifted from firms to products. Mayer *et al.* (2011) created a model that highlights how competition pressures firms to drop their worst performing products. This skews firms to produce more best performing products and increase overall productivity. The authors calibrate their model on French data and find that exports are shifted towards their better performing products in large destinations. Eckel and Neary (2010) also assume that firms have a core competency product with a lowest marginal cost. Every additional product has a higher marginal cost and increasing competition leads to cannibalization effects. Higher productivity firms and lower competition can be associated with higher survival rates in trade relationships and more core products should survive longer.

Different theories suggest that informational uncertainty about foreign markets definitely plays a significant role in explaining trade relationships. Higher initial export and more differentiated goods can be associated with longer export spells. Measures of firm abilities can also explain success in exporting and test the role of uncertainty; higher productivity

firms are more flexible and should be better survivors. Tough competition in foreign markets influences the entering and exiting of firms and shapes trade duration between partners.

3. DATA AND DESCRIPTIVE STATISTICS

The data used for this study are manufacturing sector foreign trade data at product and market level covering the full population of exporting firms in Estonia from the available in 1995 to 2011. Until May 2004, when Estonia joined the EU, all trade flows were recorded in customs statistics. After entry to the EU, all extra-EU trade flows were recorded in customs data, but the requirement to collect intra-EU trade transactions no longer existed for firms with transactions of less than 100,000 euros. Customs data is merged within the Business Registry database in order to calculate productivity measures. The Business Registry database is at firm level and includes annual accounting reports (balance sheets and earnings reports) for all Estonian firms.

The customs dataset includes firm information about product and destination country. For duration analysis, it is necessary to choose suitably aggregated product codes. Some studies use highly disaggregated data (Besedeš 2008, Nitsch 2009) with product codes at the 7- or even 10-digit level. But more aggregated products are also used (Besedeš *et al*. 2006, Brenton 2007) focusing on 1- or 3-digit level generalizations. If the data is more aggregated, the analysis captures more industry trends rather than competition between products. In addition, higher aggregation causes longer trade duration and tells us little about product export success or the underlying trade dynamics. For example, two countries can have equal duration at industry level, but one can change its product mix frequently and the other can have a more stable export portfolio, which is important information for analysing product competitiveness. Besedeš and Prusa (2006) studied the service sector and found that for the 1972–88 period, the mean spell length increases from 2.7 years in 7-digit TS data to 3.9 years in 5-digit SITC data and to 8.4 years in 1-digit SITC data. Over aggregating the data reduces the ability to observe entry and exit patterns. By contrast, using overly disaggregated data is prone to the influence of product revisions and includes changes that are not important for examining competitiveness.

In this study, the author uses a 5-digit SITC product classification. This level of aggregation shows, for example, ice-cream whether or not it contains cocoa (02233) or washing machines with a dry linen capacity not exceeding 10 kg (77511), which belong accordingly to the groups milk and cream products other than butter or cheese (022) and household electrical and non-electrical equipment (775). Every year, firms exported on average 1,500 different 5-digit SITC level products in the manufacturing sector. During the period of the study, some of the products were reclassified, which complicates duration analyses as it creates erroneous export exit and entry data. A concordance table showed about 600 changes in the 5-digit product classifications and this affected about 10% of the products in this dataset. As most changes are from splitting or unifying product categories, it is not always possible to identify exact matches. There is no reason to believe that reclassified products behave differently from products with an unchanged code. In order to obtain more reliable results, reclassified products were deleted, and therefore, an unchanged set of products is used in the main empirical analyses. This reduces the sample size by about 13% to more than 160,000 firm-product-year observations.

During the period of the study, there was on average more than 1,800 exporting manufacturing firms a year. Table 1 shows that the largest number of exporters was at the

beginning of 2000. Later, the number of exporting firms decreased with the largest slump at the start of the financial crisis. Every year on average more than 20% of firms enter exporting and one quarter of these are re-entering, meaning that most of the entrants are new exporters. The high share of new firms at the beginning of period is probably influenced by the fact that it is not known whether the firms exported before 1995 and some re-entries are counted as new entries. Later in the study period, these numbers fall to around 15%, and new entrants account for two thirds of this. The smallest share of entrants were in the boom years, but this is also influenced by the high number of firms during that period; in the final years, the entry rate increases and the share of re-entry in entry also increases. The exit rate follows the same magnitude as entry, but temporary exit is about 1 percentage point lower than the re-entry rate. This is logical as temporarily exited firms start to export again when the economic situation starts to improve and the number of firms is at low levels, which influences the re-entry rate.

Table 1. Overview of exporting firms

Year	Firms	Entry rate (re-entry), %	Exit rate (tempo-rarily*), %	Share of firms adding a product, %	Share of firms dropping a product, %	Share of firms add and drop product, %
1995	2063	-	-	-	58,3	-
1996	1885	27,6 (-)	31,8 (6,2)	51,5	54,4	38,8
1997	1959	34,4 (5,5)	27,9 (5,7)	50,9	55,0	37,6
1998	1978	28,6 (4,6)	33,7 (5,8)	52,1	50,6	36,2
1999	1977	33,6 (6,6)	18,3 (4,6)	52,8	60,2	41,5
2000	2131	24,2 (4,9)	15,6 (4,3)	58,9	59,7	46,8
2001	2274	20,9 (4,0)	16,1 (4,1)	57,2	59,8	46,5
2002	2326	18,0 (4,2)	15,3 (2,9)	60,9	60,8	49,0
2003	2443	19,4 (4,0)	21,9 (3,8)	59,6	68,4	50,9
2004	2135	10,6 (2,9)	33,2 (7,3)	70,2	64,4	54,7
2005	1647	13,4 (4,2)	20,0 (5,0)	69,5	54,1	44,9
2006	1562	15,6 (6,1)	17,9 (4,4)	55,4	54,1	42,1
2007	1538	16,6 (5,3)	15,9 (4,1)	55,1	53,1	42,2
2008	1534	15,6 (5,6)	37,5 (4,7)	51,9	40,5	29,8
2009	1225	21,7 (8,1)	19,5 (2,0)	51,5	45,7	36,2
2010	1271	22,4 (9,2)	19,8 (-)	51,7	42,0	35,1
2011	1412	27,8 (7,6)	-	45,6	-	-
Average	1845	21,9 (5,5)	23,0 (4,6)	55,9	55,1	42,1

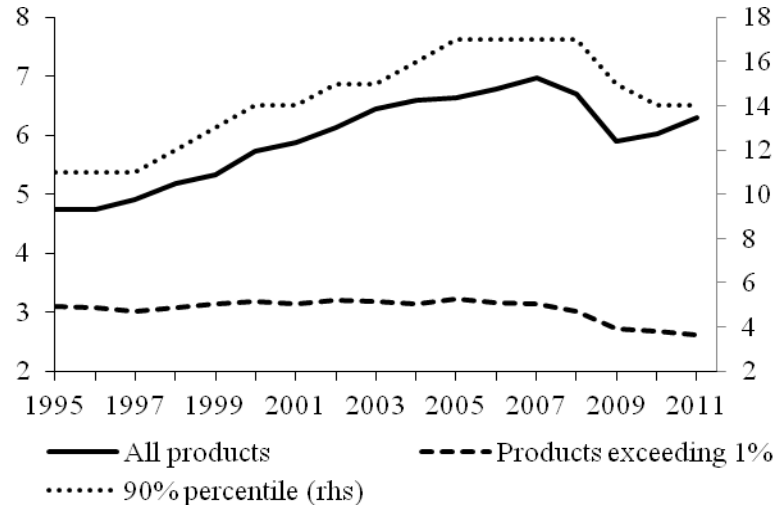
*temporary exit shows share of firms (included in total exit rate) that resume exporting after a pause of one or more years.

Every year, more than half of the firms add at least one new product to their export portfolio, and a similar share drop products. In the case of adding, only firms that have been at least one year on the market are considered, and accordingly dropping products is based on firms that stay at least one more year on the export market. The share of simultaneously adding and dropping firms is also quite high, and therefore, firms are constantly changing their product mix. The share of firms adding a new product remained close to average during the financial crisis, but the share of dropping firms decreased more. One reason is that relatively less successful firms exited from exporting and did not adjust through their export portfolio, and changing their product mix also decreased during the economic slowdown. If we exclude

products with a share of less than 1% in export volume, then the shares of adding and dropping fall roughly 10 percentage points. In Table 1, a new product is defined if exporting is suspended for one or more years, but longer pauses decrease (longer than a 3-year pause decreases about 5 percentage points) the share of firms adding and dropping products as expected.

The number of exporting firms has evolved without a clear trend, but the average number of products per firm has increased (Figure 1) over the period. The solid line shows an increase of about 40% in average exported products per firm, and although there was a decrease in the number of products in the crisis period, the trend was still upward. The number of exported products according to 90th percentile firms (according to number of products) increased even at a greater rate, but the median firm constantly exported 3 products. This suggests that the average number of exported products increased mainly due to the increased share of exporters with a large number of products.

Figure 1. Number of products per firm. All products and products exceeding 1% of the export portfolio are on the left hand scale.



Although firms increased the number of products they exported, total export volume usually depends on a few products and the majority of products can constitute a small share. Figure 1 shows that the average number of exported products representing more than 1% in export turnover has been fairly flat. Excluding the crises years, the average number of products of more than 1% of the total export portfolio has been around 3. About 70% of firms exported more than one product, but the share of firms exporting more than five products has increased by about ten percentage points to 35% during review period. This illustrates that firms have some core export products and less important products have increased the average number of exported products.

In this study, the main focus is on how long a firm exports a certain product. There are different ways of constructing export spell. One problem arising from survival analyses is censoring. Left censoring means that there is an observation in the first year, but we do not know how long the trade spell has already existed. Similarly observations are right censored when it is not known how long the spell will continue after the final year. The latter problem is smaller as survival estimation techniques can handle this. To use left censored data, it is usually necessary to make assumptions or have additional information. Therefore, left

censored data is excluded from this study, as the sample period is long and it reduces sample size by about 10%.

Another problem with survival analysis is treating multiple spells; an export can stop and start several times over the study period. The simplest solution is to use one year or a longer pause as a start for a new export spell. But short pauses between export spells may mean building inventories or timing the export for a certain moment and not necessarily the end of exporting. Therefore, the 3-year definition is also used, where a pause of 3 or more years indicates the start of a new export spell. According to this definition, the firm has stopped exporting a particular product if there is no observation after at least three years. This also means that observed values in the final three years are censored, as it is not known what happened after the final year.

The majority of products are exported only for a short period of time. The average trade duration is about two years and the median is one year. Table 2 shows that using a 1-year pause definition, 69.3% of trade relations last one year. This is almost identical to 68.6% when using a 3-year pause to complete the spell. The frequency of longer trade spells is decreasing rapidly, showing that Estonian manufacturing exports are very dynamic. As expected using the 3-year definition, the share of longer trade spells is higher, especially the share of durations of more than seven years. Right-censored spells show higher durations, but their share is roughly 15% and has little impact on the overall duration pattern.

Table 2. Spell distribution according to pause in exporting, %

	1 year definition		3 year definition*			
Duration	completed	on-going	completed	on-going	local	foreign
1	69,28	47,28	68,60	49,03	64,88	63,60
2	15,12	14,99	13,14	11,47	12,52	12,66
3	6,21	9,30	7,71	7,96	7,62	7,36
4	3,83	4,08	5,46	5,54	5,30	5,41
5	1,96	3,68	0,30	4,25	2,98	3,15
6	1,34	3,10	0,22	3,36	2,25	2,31
7	0,76	5,63	1,46	3,26	1,47	1,58
8	0,52	2,22	1,03	2,43	0,99	1,25
9	0,32	1,69	0,70	2,45	0,75	0,73
10	0,30	1,87	0,62	2,40	0,57	0,85
11	0,17	1,45	0,35	1,89	0,28	0,58
12	0,12	1,32	0,27	1,80	0,25	0,35
13	0,05	1,46	0,14	1,82	0,14	0,16
14	0,01	0,63	-	0,90	-	-
15	0,00	0,76	-	0,81	-	-
16	-	0,54	-	0,63	-	-

*3 year definition – pause 3 years or more starts a new export spell.

Looking at more important products and excluding products with less than 1% value in exports, reduces the share of one-year trade spells to 64% and slightly increases longer spells. Foreign firms have slightly longer trade spells; they export on average 0.1 years longer. Trade duration is longer in the textiles industry and lower in other products. Some sectors probably have more long-term contracts, but differences are generally not considerable.

Excluding less important products increases the average export spell and product share at the time of introduction is especially important. In different industries (communication, medical and precision instruments) foreign firms generally export longer, which may suggest the importance of knowledge transfer in high-tech industries, but then again foreign firms are also more successful in the textiles sector; foreign firm trade may also include intra group transactions.

The manufacturing sector in Estonia is dynamic with most firms changing their export portfolio every year. But the duration of product export is quite low, meaning that aggregate export volume could be increased by lengthening survival. The following analysis will investigate factors that could be related to duration in export markets.

4. ESTIMATING TRADE DURATION

Export survival patterns can be described using survival functions. Before estimating the Cox model, it is useful to analyse trade duration non-parametrically using the Kaplan-Meier estimator. If T is a random variable for spell length, then in discrete time, the survival function is defined as the probability of exporting at least to time t:

$$S(t) = \Pr(T \geq t), \quad t = 1, 2, ... \tag{1}$$

The Kaplan-Meier estimator of the survival function is

$$S(t) = \prod_{t(i) \leq t} \frac{n_i - d_i}{n_i} = \prod_{t(i) \leq t} (1 - h_i), \tag{2}$$

where n_i is the number of observations at risk and d_i is the number of ended spells at time $t_{(i)}$. Therefore, the Kaplan-Meier estimator uses both censored and non-censored data. According to definition, the above survival function is equal to a multiplication by one minus the hazard of exiting (h_i) at every time up to $t_{(i)}$. The Kaplan-Meier method provides initial estimates about export survival and shows the relationship to potential explanatory variables.

Further analyses use the Cox proportional hazard function to study the effect of potential factors on export duration. Brenton et al. (2009) have criticized the proportional hazard assumption in trade analyses because of individual heterogeneity, but the Cox model is still widely used in trade survival analysis, as the sign of the factor is usually more important than its magnitude. Hess and Person (2012) studied different Cox model drawbacks, including unobserved heterogeneity and the assumption of proportional hazard, replicating the results of Besedeš and Brusa from 2006. They found that there are significant albeit not huge differences in the results and none of the coefficient signs changed across models. Violating assumptions also increases mistakes if more observations last longer, but as the majority of exits happen in the first years, then the Cox model can still be suitable for studying the effect of different independent variables. In this article, the author uses graphic tests to study the proportional hazard assumption and finds that this assumption holds, although the Schoenfeld residual test does not show hazard proportionality for all covariates. In the Cox model, hazard is defined as follows:

$$h(t, x, \beta) = h_0(t) \exp(x\beta), \tag{3}$$

where $h_0(t)$ is the baseline hazard, which is multiplied by the function of covariate x. This model is referred to as semi-parametric, as the baseline hazard is not specified and is left unparametrized. The Cox model assumes that factors influencing survival have a proportionate impact on the baseline hazard, and therefore, change the hazard rate by the same factor in any period. The above simplifications have made this model quite popular and

it is easy to estimate the parameters by maximizing the partial likelihood function. The principal interest lies in finding parameters β, which show the effect of independent variables on the hazard rate. In the presentation of the research results the hazard ratios are usually shown, and values less than one are associated with hazard rates decreasing with covariate values.

In this study, the principal interest is finding the impact of uncertainty on survival. Less familiar foreign markets or little experience in exporting have higher risks of ceasing trade. One way to measure these risks is through initial export engagement, which is the share of a particular export product in the first year to total export portfolio value. Spells starting with higher volumes should have longer export duration. It may also be important to use the initial scale, as a moving or final value may become endogenous; in other words, firms decide to reduce exports before finally dropping them. Theory suggests that more differentiated goods are exported longer, as price is not the only factor influencing buying decisions. Bastos and Silva (2010) show that unit values are well suited to Rauch's categorization, and describe the degree of differentiation, but the latter categorization is quite static and does not make it possible to study differentiation within particular Rauch categories. Therefore, a more flexible measure is used and product differentiation is measured as a ratio of the standard deviation of the price to its mean value; higher values imply higher differentiation. An alternative measure of product differentiation can be the first year unit value relative to the same product category.

Table 3. Exporting hazard rates by various firm groupings (quartiles)

	Average hazard			First year hazard		
Variable	All	>1% intro	>5000 EUR	All	>1% intro	>5000 EUR
TFP Q1	0,341	0,357	0,323	0,619	0,585	0,520
TFP Q2	0,240	0,244	0,217	0,560	0,510	0,453
TFP Q3	0,166	0,158	0,150	0,499	0,460	0,411
TFP Q4	0,141	0,141	0,131	0,464	0,429	0,400
Entry share Q1	0,181	0,226	0,195	0,532	0,548	0,473
Entry share Q2	0,230	0,212	0,212	0,570	0,517	0,474
Entry share Q3	0,223	0,203	0,199	0,543	0,501	0,446
Entry share Q4	0,192	0,177	0,173	0,491	0,473	0,417
Different. Q1	0,301	0,301	0,299	0,572	0,545	0,507
Different. Q2	0,227	0,220	0,211	0,563	0,537	0,477
Different. Q3	0,176	0,170	0,166	0,534	0,512	0,455
Different. Q4	0,159	0,164	0,146	0,467	0,447	0,372
Employees Q1	0,299	0,345	0,273	0,604	0,593	0,501
Employees Q2	0,212	0,221	0,196	0,507	0,474	0,405
Employees Q3	0,189	0,188	0,172	0,504	0,436	0,421
Employees Q4	0,178	0,159	0,170	0,484	0,396	0,417
Local	0,215	0,206	0,199	0,547	0,507	0,459
Foreign	0,185	0,175	0,173	0,496	0,438	0,424

>1% intro, >5000 EUR – observes only products, where the initial share in export portfolio was greater than 1% or the initial value greater than 5,000 euros. *Entry share* is initial product share in export portfolio. *Different* shows product differentiation and *employees* is the number of employees.

Different control variables are also used that may be important in explaining survival. More productive firms are able to survive more shocks, and therefore, should have longer export duration. Productivity is measured as turnover less inputs per employee and all values are deflated using the GDP deflator. The survival graphs in the appendix show a sharp decrease in the hazard after the first year as was already suggested by the previous tables. Half of the export spells stop in the first year and later hazard rates decrease. To estimate the potential effect of different variables, the sample is divided into groups on the basis of the quartiles of the explanatory variables. When observing products with an initial (Table 3) export share higher than 1%, the hazard rates increase for the first and second quartile compared to all observations, but the first year exiting rate drops for all quartiles. The alternative measure for initial share is in absolute values, and the probability of dropping is lower for products that were sold for more than 5,000 euros (value close to the first quartile) in the first year. Survival and initial entry shares are related to a lesser extent. Hazard rates become smaller when excluding less important products in relative terms; the hazard pattern remains similar to all observations when using 5,000 euros as the threshold.

Exports that started with a higher unit price compared to other similar products do not have a different survival pattern compared to starters with a lower unit price. There may be found some differences across industries; for example, starting with a higher price than the average among products already on the market leads to greater survival in the medical and precision instruments sector, but lower survival in the food sector. In some industries price is probably related to quality, but in other sectors quality differences are lower by nature. Exporting products in the highest quartile of our indicator of differentiation faces a probability of ceasing almost two times lower than in the lowest quartile. Products at or closer to the firms core competence in both relative and absolute terms also have higher survival rates; products that have the highest export share in the firm's export portfolio face 5% higher survival rates than the products with the second highest share. Theoretical prediction about the relationship between survival in export markets and productivity is confirmed, as exports from higher productivity quartiles survive longer. The average hazard for dropping a product in each year in the highest quartile is about 14% and in the lowest productivity quartile it is over 30%. The influence of firm size on the probability of dropping an export has a similar pattern as that in the productivity quartiles. This finding is somewhat expected as larger firms are usually more productive, and therefore, firm size could be a useful control variable in analyses. Foreign firms have lower hazard rates compared to local firms; Ilmakunnas and Nurmi (2010) also found that foreign owned firms in Finland exported longer. Differences for first year hazards are higher than for average values, which may suggest that foreign firms have better ties to other partner firms and markets. Foreign firms may also have more experience in exporting.

5. RESULTS

The Cox model results are presented in Table 4. The variables of primary interest here are significant and have the expected signs. The higher initial export share of a particular product is related to the lower probability of dropping that particular product. This is also in line with the theory that core products are more likely to be exported for longer. As expected, more differentiated products have higher survival rates. According to Rauch's classification (results in column 5) only the parameter for reference priced products is significant and this indicates lower survival probability compared to homogenous products. Differentiation based on Rauch's classification does not seem to explain export duration in the Estonian manufacturing sector compared to Besedeš (2006), and the product differentiation measure based on unit prices is more informative. The differentiation measure based on the ratio of

standard deviation and the mean of the unit values also explains duration within Rauch's categories and is thus more flexible.

Initial export share and product differentiation remain significant if including other explanatory variables. The productivity variable is highly significant. Larger firms are usually more productive, but in column two both variables (firm size and productivity) have a positive effect and are significant. These variables may capture different effects on export duration; for example, larger firms may have more export partners and this effect is not accounted for by productivity. Ownership is related to export survival, namely foreign firms drop products 6% less likely compared to local firms, probably due to their better knowledge of foreign markets.

Table 4. Survival model results (1)

	(1)	(2)	(3)	(4)	(5)
Entry share	0,794***	0,652***	0,719***	0,639***	0,767***
	(0,016)	(0,015)	(0,018)	(0,015)	(0,015)
Differentiation	0,902***	0,914***	0,915***	0,915***	0,918***
	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)
TFP		0,845***	0,844***	0,850***	0,845***
		(0,005)	(0,005)	(0,005)	(0,005)
No. employees		0,919***	0,935***	0,926***	
		(0,004)	(0,004)	(0,004)	
Foreign (dummy)		0,937***	0,940***	0,936***	
		(0,012)	(0,012)	(0,012)	
Experience (years)		1,007***			
		(0,002)			
Price above average		1,021*	1,018*	1,022*	
		(0,012)	(0,012)	(0,012)	
Experience (dummy)			1,251***		
			(0,020)		
Product experience (dummy)				0,815***	
				(0,019)	
Differentiated					1,053
					(0,062)
Reference					1,122*
					(0,069)
No. of observations	46104	41004	41004	41004	46104

*** p<0,01; **p<0,05; *p<0,01; standard errors in parentheses. Differentiated, reference and homogenous products are according to Rauch's classification. Homogenous is the benchmark.

The other measure of differentiation was the price of the product in the first year relative to the average in the same category products, and this has a negative effect on survival, but this effect is not very large or significant. Higher unit price may reflect higher production costs and not necessarily higher quality. Introducing industry dummies (results not presented here due to brevity) reduces the significance of the latter variable further, which suggests it is more industry specific, but parameters of other variables remain similar after accounting for

industry effects, overall industry effects do not seem to matter. Experience shows how many years a firm has been on export markets when introducing this product, but contrary to expectations, the effect is negative. Products that are introduced by more experienced firms have a higher risk of exiting.

This contradictory finding that products introduced by more experienced firms have shorter survival may simply show that firms have sunk costs and after incurring these, older firms are more flexible at starting to export more risky products. They may also have enough liquidity buffers that allow experimentation; although the credibility of that explanation is reduced by the fact that the correlation between cash stock relative to assets and product export duration is close to zero. Replacing the previously used experience variable with two dummies – whether the firm had exported any product or exported the same product before – reveals interesting results. Experience itself has a negative effect on survival (25% greater hazard of dropping a product), probably due to the reasons mentioned above. Kneller and Pisu (2006) show that exporters learn by exporting and report less barriers (i.e. smaller sunk costs) with increases in experience, and therefore, they maybe more inclined to start with new exports, but this does not have to be related to export duration. At the same time, previous experience with exporting the same product lowers hazard rates. The effect of entry share also becomes larger and more significant. Alvarez *et al*. (2013) found that previous experience with a certain product decreases sunk costs for later entries, and therefore, increases the probability of new export entries for this product. Having previous knowledge of exporting a particular product decreases insecurity and encourages the firm to start with higher volumes. Therefore, previous export experience is important for being successful in future foreign trade, and more specific know-how seems to matter more in respect to duration.

Previous explanatory variables were related to the firm, but the environment surrounding the exporter may also influence export success and the impact of uncertainty variables. One potential factor that could explain product export duration is competition. Competition is measured here using the Herfindahl index; although it is not always a good measure of competition (Boone *et al*. 2007), it is still widely used and appropriate for the purposes of the current study. Local market concentration is also correlated to international concentration. The sample firms primarily compete on foreign markets, but they also have to consider the activity of local competitors. Competition reduces available resources per firm, but also may induce firms to use better technology at lower costs. In this study, the concentration measure is used at two different aggregation levels. The Herfindahl index at industry level captures competition for resources to produce and to export and the same index at the 5-digit product level tries to express the cost of producing a particular product. Some products may belong to different sectors, but have similar functions. In the estimation, different values of the Herfindahl index are used that are calculated at different points during the export spell (index value at entry, exit and maximum value during export) to better capture competition effects.

Table 5 shows that the concentration index in the sector in the first year of product exports has no significant relationship with export duration; the index in the final export year was also insignificant. Interestingly, the maximum value of the Herfindahl index during the export spell is related to the hazard rate; therefore, higher concentration during exporting increases the likelihood of survival. Bombardini *et al*. (2012) found that higher firm productivity and lower productivity among local competitors within the same industry enhance exporting outcomes in Chile. Joana and Rosa (2014) also showed that export intensity tends to be higher in less concentrated industries. If the firm can cope with increasing competition or itself becomes larger in the sector, it will increase its survival time. Increasing competition probably increases costs and makes exporting more expensive.

Adding concentration indexes to the model does not significantly affect the parameters of the core set of variables.

Table 5. Survival model results (2)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Entry share	0,764***	0,758***	0,776***	0,738***	0,735***	0,737***	0,819***
	(0,016)	(0,015)	(0,016)	(0,015)	(0,015	(0,016)	(0,017)
Differentiation	0,919***	0,926	0,930***	0,892***	0,919***	0,917***	0,917***
	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)
TFP	0,846***	0,855***	0,837***	0,867***	0,857***	0,848***	0,857***
	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)	(0,005)
Herf. sector (entry)	0,968						
	(0,034)						
Herf. sector (max)		0,576***					
		(0,020)					
Herf. sitc (entry)			1,163***				
			(0,021)				
Herf. sitc (max)				0,717***			
				(0,013)			
No. Countries					0,991***		
					(0,001)		
No. Products						0,998***	
						(0,000)	
No. Countries this product							0,842***
							(0,008)

*** p<0,01; **p<0,05; *p<0,01; standard errors in parentheses. Number of observations 46104.

Contrary to the sector concentration index, product Herfindahl indexes are all significant, although they have different effects on survival. Higher concentration at product level at the beginning of exporting reduces the export duration of this product. This may suggest that if a particular product is exported by few firms, then the quality of the product is lower and it faces less demand from foreign markets. There may also be better products from other countries and only a few Estonian firms try to export this item. The Herfindahl index in the final year of exporting had a similar but somewhat lower effect. Similarly, the maximum value of the index during the lifetime of product exports has a positive correlation with survival. Exports of products with increased concentration (fewer firms continue to export it or some firms increase their market share of this export product), stay longer in foreign markets. Firms may have competitive advantage in exporting a given product, and therefore, become larger and can sell longer.

Other indicators in addition to those previously used include experience expressed in years (or dummies), number of countries that a firm serves and the number of exported products. Number of countries shows how many different countries a firm has already been exporting to when it started to export a particular product. Similarly, number of products refers to the number of exported product varieties in the beginning of the export spell under observation. Both variables should capture export experience related to foreign markets and products, and are expected to have an impact on export uncertainty. In addition to these, how many

countries a firm starts to export a particular product to in the first year of exporting this product is also measured. On the one hand, this may reflect productivity, as lower-cost products can be profitable in many markets, but on the other hand, it may be related to export experience and knowledge of export markets.

Number of countries that the firm already serves when starting to export a new product is positively related to export duration. One additional country decreases the hazard rate by 1%; on average firms exported to 6 countries (maximum was over 70). Export product variety has a significant and similar effect, although the impact is small. This is also in line with a previous study (Masso and Vahter 2011) in Estonia, where multi-market and product entry is related to increases in productivity. A considerable relationship exists between the product export hazard rate and the number of countries a firm starts to export this product to in the first year. Starting to export to one more country in the first year reduces the hazard rate by 16%. But the number of countries is usually quite low – the mean is 1.3. Therefore, previous experience with foreign markets and different products is important for survival; export experience with the same product is especially useful. Including the experience measure based on number of countries does not change the effect of the initial share.

In Table 6, additional robustness checks are performed. Excluding observations with a value less than 1% in the export portfolio in the first export year or excluding all products with a value less than 1% in the export portfolio in all years does not change the effect of the main variables; in the latter case the impact is bigger, which implies that the effect is larger for core products, and products exported with smaller values have higher volatility. Starting to export a higher share in the total portfolio has a particularly strong effect on firms that were constantly on export markets during 2000–2011. The productivity effect also increases by about 10 percentage points for those firms, and firms that were exporting a similar product face about a 60% lower hazard rate.

Table 6. Additional estimations of the regression equation to check for robustness

	Initial>1%	All>1%	Initial>5000	1 year definition	Only first	Industry Effects	Always 2000-2011
Entry share	0,818***	0,739***	0,752***	0,685***	0,650***	0,748***	0,155***
	(0,022)	(0,020)	(0,019)	(0,015)	(0,027)	(0,019)	(0,020)
Differentiation	0,925***	0,920***	0,912***	0,950***	0,983	0,937***	0,907***
	(0,008)	(0,008)	(0,006)	(0,005)	(0,014)	(0,006)	(0,013)
TFP	0,822***	0,835***	0,840***	0,899***	0,909***	0,889***	0,743***
	(0,008)	(0,007)	(0,006)	(0,005)	(0,012)	(0,006)	(0,016)
No. employees	0,846***	0,881***	0,912***	0,935***	0,997	0,933***	0,920***
	(0,006)	(0,006)	(0,004)	(0,003)	(0,011)	(0,004)	(0,011)
Foreign	0,900***	0,935***	0,942***	0,944***	0,992	0,969***	1,008
	(0,020)	(0,018)	(0,014)	(0,010)	(0,035)	(0,012)	(0,029)
Price above avg	1,024	1,026	1,028**	1,020**	1,033	1,017	1,035
	(0,018)	(0,017)	(0,014)	(0,011)	(0,03)	(0,012)	(0,029)
Experience	1,314***	1,265***	1,30***	1,25***		1,270***	1,164***
	(0,026)	(0,025)	(0,023)	(0,019)		(0,020)	(0,037)
Product experience	0,803*** (0,032)	0,781*** (0,028)	0,791*** (0,021)	0,815*** (0,010)		0,823*** (0,019)	0,411*** (0,031)
No. of obs.	17333	19880	31565	47889	6376	41004	9546

*** p<0,01; **p<0,05; *p<0,01; standard errors in parentheses

The ownership effect is not significant for long-term exporters; extensive exposure to foreign markets has a positive effect and diminishes the foreign owner impact. Estimating the model based on ownership does not change the impact of the core set of variables. These findings suggest that successful firms (those staying longer on foreign markets) are more sensitive to the main variables used in this study. Including industry effects does not change the results significantly, and the 1-year pause to separate longer spells also has an unimportant effect. Higher price seems to matter for larger export volumes, where it increases the probability of ceasing exports, showing that this is related rather to higher costs than quality. Entering foreign markets assumes incurring sunk costs, which may imply that the cost of exporting initial products differs from the cost of exporting subsequent products. This phenomenon is partially true as the degree of differentiation is not significant, but the other main variables still have some effect. Dividing the sample into pre- and post-EU periods does not change (results not presented here) the significance and sign of the independent variables (results not presented here, but available upon request), although the impact of product differentiation increases somewhat. Previous findings show that the initial share and differentiation variables have a significant effect on export duration and remain robust in different settings.

5. CONCLUSION

It is essential to increase export survival in foreign markets in order to achieve export growth. This paper analyses the role of initial export share at product level and product differentiation on export duration in Estonian manufacturing. The analysis uses disaggregated customs and Business Registry data from 1995–2011. Estonia is an interesting case for a trade study, as there have been rapid changes in the economy. The transition from a planned to a market economy and accession to the EU have created new opportunities and challenges for firms. Exports have risen rapidly in absolute and relative terms, and this trend is likely to continue as the small open economy wants to increase its market share, and therefore, more export entry is expected to take place.

Standard trade models usually do not attempt to explain the length of the export spell. Some models, especially older ones, imply that once engaging in trade, it is rather long-lived as comparative advantage is quite static by nature. Newer approaches focus more on heterogeneous firms and entry to foreign markets, but explain the export process less. Different studies have revealed that the average product export duration is only a few years. One potential candidate for explaining export duration is the firm's knowledge and uncertainty about the environment and its own abilities, which can be measured as the product's first year export share in turnover. Different products may also require different export strategies, and therefore, product differentiation can also explain duration. In this study, product differentiation is measured using the ratio of unit price standard deviation to its mean, which should be more informative than the standard Rauch classification.

Descriptive statistics show that every year about one fifth of all exporters are new exporters. Every year more than half of the firms change their export basket and the share of firms simultaneously adding and dropping products is also close to 50%. Although the average number of exported products per firm has increased, the number of products representing more than 1% in the export portfolio has remained relatively stable over the study period. Therefore, it is not surprising that the majority of the export spells last only for a year. The average duration of product export is close to two years and the median is one.

In the empirical part, the Cox proportional hazard model was used to study the effect of initial share and product differentiation. As expected, firms that start to export a product with a relatively larger share compared to the rest of the export portfolio are more successful in maintaining this trade flow. More differentiated products have greater survival rates; this effect also persists within the same Rauch classification product category. The export's initial share and product differentiation are not sensitive to adding additional control variables. Survival may also be related to competitors, and therefore, industry and product concentration variables were added to the model. Higher product export concentration can be related to lower competition and quality, and therefore, the result that product export concentration leads to a greater hazard of ceasing exports were as expected. However, if industry or product concentration increases during an export spell, this lengthens the survival of this export; this phenomenon can probably be explained by comparative advantage, which may also transmit to other exporters. The variety of exported products and markets reduces the hazard rate for new export products. Starting to export a product to an additional new country lowers the hazard rate by almost a fifth.

Current firm-product-country level data may still be too aggregated for an uncertainty study, as this is also influenced by the export partner and it would also be useful to use transaction level data. Different firms in the same country may have a higher effect on trade flows compared to firms in different countries. Studies based on product-level data are quite recent, and therefore, it is difficult to compare results from other countries, but over time this will become more possible. The majority of trade is conducted by multi product and country firms, and other firms may be and behave differently, but the robustness analysis results were quite stable. Estonia and its manufacturing sector may also be different from other countries and sectors, and therefore, it is difficult to apply these results elsewhere. The period of this study also covers the years of the crisis, which can also be considered as outliers, and therefore, caution must be used when generalizing the results from these years. The crisis years and the years surrounding it can provide good data for further uncertainty studies, as there were rapid changes in the economic environment and also possibly in terms of uncertainty.

The considerable share of multi-product firms and multi-product exporters together with the rapid change in trade relationships challenges us to seek answers to a new set of research questions. Increasing export duration is an important factor for achieving higher export volumes. Policy implications include support for potential destination country visits and market research to decrease uncertainty and make export relations more persistent. Such policies seem to be particularly important for differentiated goods. Support for initial entry with a new product or to a new market would help firms overcome uncertainty and enable them to obtain valuable experience for later expansion. In addition to export specific measures, support for increased productivity is also important for longer export spells. It would also be interesting to look more deeply into the causal relationships involved in export survival, and how these can be incorporated within export support policies.

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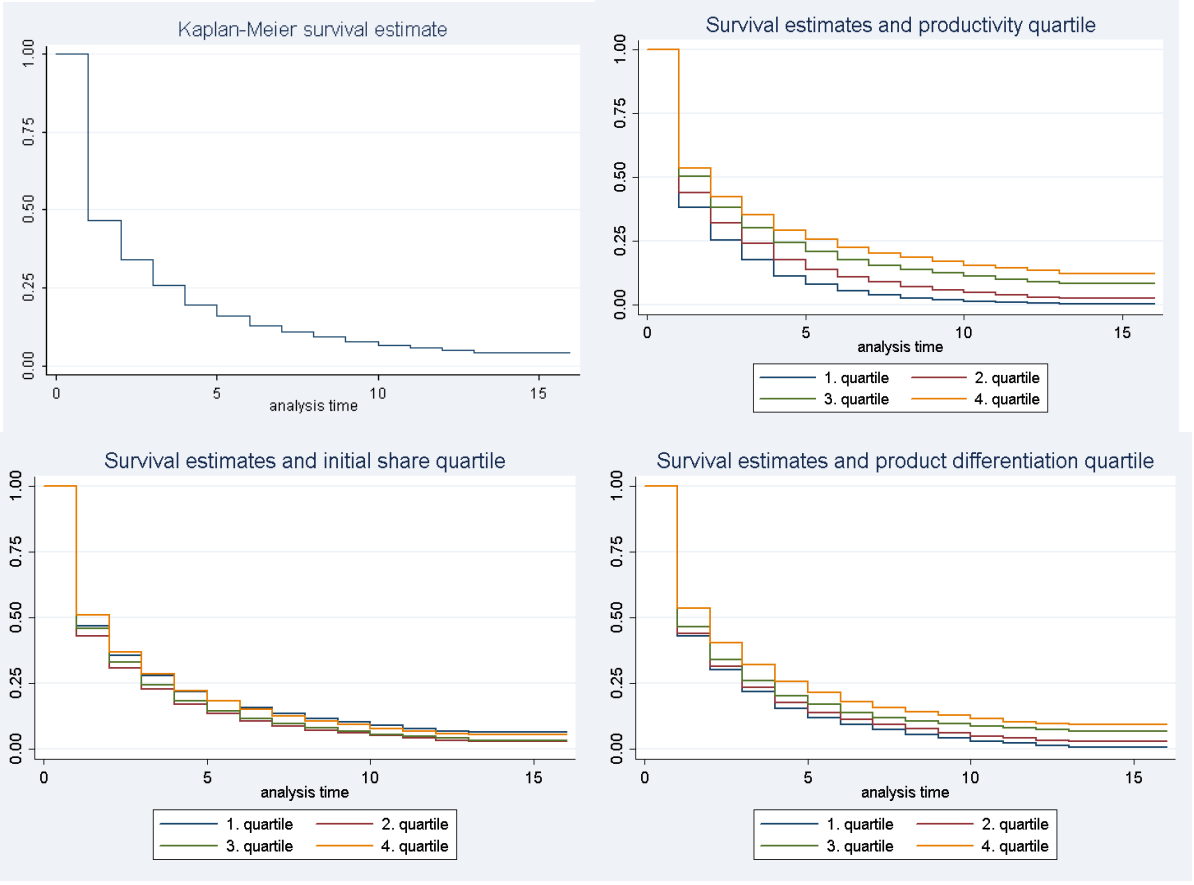
Appendix 1. Survival estimates



KOKKUVÕTE

Ebakindluse roll ekspordi kestvusele Eesti näitel

Ekspordi kasvatamisel on oluline roll ekspordi kestvuse suurendamisel. Käesolevas artiklis analüüsitakse toote esmase ekspordimahu ja selle diferentseerituse seost ekspordi kestvusega Eesti tööstussektoris. Analüüsis kasutatakse detailseid väliskaubanduse ja Äriregistri andmeid ajavahemikust 1995–2011. Eesti on huvitav riik kaubanduse analüüsiks, kuna majanduses on toimunud kiired muutused alates plaanimajandusest turumajandusse ning liitumine Euroopa Liiduga tõi kaasa uued võimalused ettevõtetele. Eksport on kasvanud kiiresti nii absoluutselt kui ka suhteliselt ning on oodata selle trendi jätkumist, kuna väikeriigile on ekspordi kasvatamine oluline.

Standardsed kaubandusteooriad tavaliselt ei selgita ekspordi kestvust. Vanematest teooriatest võib järeldada, et ekspordisuhe on pigem püsiv ja väga kiiresti ei lõpe. Uuemad käsitused keskenduvad rohkem heterogeensete ettevõtete turule sisenemisele ja ei uuri turgudel püsimist. Erinevad empiirilised uuringud on näidanud, et keskmine ekspordi kestvus on ainult paar aastat. Üks võimalik ekspordi kestvuse selgitaja on ettevõtete teadmised enda võimetest ja sihtturust ning sellega kaasnev ebakindlus, mida siin artiklis väljendatakse toote esimese aasta ekspordimahuga. Samuti erinevat tüüpi tooted võivad omada erinevat ekspordistrateegiat ning seetõttu vaadeldakse ka toodete diferentseeritust. Diferentseeritust mõõdetakse eksporditavate toodete hinna standardhälbe ja keskmise suhtena, mis on informatiivsem tavapäraselt kasutatavast Rauch klassifikatsioonist.

Eesti tööstussektori eksportijate hulgas on igal aastal ligikaudu viiendik ettevõtetest uued ning pooled ettevõtted muudavad oma ekspordiportfelli uute toodete lisamise või mõnest vanast tootest loobumise kaudu. Keskmine eksporditavate toodete arv on tõusnud vaadeldaval perioodil, kuid toodete arv, mille ekspordimaht moodustab rohkem kui 1% kogu portfellist, on püsinud suhteliselt stabiilsena. Keskmiselt eksporditakse toodet kaks aastat ning mediaan ekspordikestvus on veelgi vähem.

Empiirilise osa teostamiseks kasutatakse Cox proportsionaalse riski mudelit. Tulemused näitavad, et uue toote ekspordi suhteliselt suurem maht võrreldes kogu portfelliga on seotud pikema ekspordi kestvusega. Diferentseeritumaid tooteid eksporditakse kauem ning see efekt kehtib isegi sama Rauchi toote klassifikatsiooni sees. Toote ekspordi kestvus võib sõltuda ka konkurentidest ning seega vaadeldakse ka samas harus olevate ettevõtete ja toodete kontsentratsiooni mõju. Suurem toote kontsentratsioon võib näidata madalamat konkurentsi ja seega ka toote kvaliteeti ning ootuspäraselt oli seotud suurema toote ekspordi lõpetamise riskiga. Samas kui ettevõte suudab üle elada konkurentsi suurenemise siis see vähendab ekspordist loobumise riski. Ettevõtte senine kogemus erinevate turgude ja toodetega mõjub positiivselt ka uue toote ekspordi püsima jäämisele. Sisenedes uue tootega ühte lisariiki vähendab ekspordi lõpetamise tõenäosust ligikaudu viiendiku.

Ekspordi kestvuse suurendamine on oluline ekspordi mahu kasvatamisel. Toetusmeetmed, mis on suunatud potentsiaalsete turgude tundmaõppimisele vähendavad ebakindlust ning aitavad kaasa ekspordisuhte püsimisele. Sellised toetused on eriti olulised diferentseeritumatele toodetele. Esmase ekspordi toetamine aitab ettevõttel saada teadmisi enda võimekusest ning kogeda välisturgudele sisenemist. Lisaks ekspordi toetamisele on oluline aidata ettevõtetel kasvatada ka üldist tootlikkust. Edasistes uuringutes oleks huvitav vaadelda rohkem ekspordikestvuse põhjuslikke seoseid ning kuidas neid saaks kasuta ettevõtete toetamiseks eksportimisel.