The Role of Product Level Entry and Exit in Export and Productivity Growth in Estonia

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Abstract

Recent empirical studies on international trade stress that the firm-level decisions about the number of export products or markets represent an important margin of adjustment to globalization and changes in economic conditions. In this study, we investigate how firms' decisions about the export product mix are associated with the aggregate export dynamics and productivity of firms. For that purpose we use detailed product and export market level data of full population of Estonia's firms. Decomposition analysis of trade flows shows that both the relative importance of entry of firms into exporting and the role of product level churning (adding and dropping products by firms) in total export growth of Estonia increases significantly after entry to the EU in 2004. We show that export product level entry and adding and dropping of export products in the same period by the firm is associated with higher firm productivity, compared to exporters that keep their export mix unchanged or decrease its breadth. Dropping peripheral products is associated with higher productivity only in the case of firms with relatively large number of export products.

JEL: F10, F14, D24

Keywords: exporting, multi-product exporters, extensive margin of trade

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I. Introduction

There has been a recent significant increase in attention in trade literature on the role of product and firm level heterogeneity in trade and productivity dynamics. Empirical regularities found about the importance of product level heterogeneity have given guidance to the development of new multiproduct producer-based models of trade theory (Bernard et al. 2010, Eckel and Neary 2010, etc). These recent models of international trade have outlined that important adjustments to globalization may function through within-firm product level extensive margin of trade (number of exported products). Some of their implications have also been further tested in empirical papers. The empirical studies concentrate mainly on the general descriptive statistics about product level heterogeneity and trade, the role of trade liberalization and fall in trade costs as drivers of changes in export product mix of firms (e.g. Iacovone and Javorcik 2010, Berthou and Fontagné 2012, etc.), and the relationship between changes in product mix of producers and their productivity (e.g. Bernard et al. 2010, 2011a, 2011b).

Our paper investigates, based on firm- and export product level data of full population of exporters from Estonia, whether introduction of new export products and dropping of existing export products (export product churning) is a significant driver of aggregate export growth and whether it is a significant explanatory factor of productivity differences among Estonia's exporters. It adds to the previous papers by concentrating on a small open economy in Europe where a very large share of output is exported (according to Statistics Estonia, exports accounted for 61 per cent GDP in 2010). Therefore also the export product level entry-exit may possibly be expected to have strong effects at aggregate level. One contribution of the paper is that it accounts for changes in the CN product codes over time. For that purpose a Stata code is developed that accounts for changes in CN classification at 8-digit level, over years 1995-2009. Our paper investigates the period before and after entry of Estonia to the

EU, covering years 1995-2009. Also, an advantage of this study is that before the EU entry, for 1995-2003, the dataset covers all the exporters, also the small firms. Investigation of the newly available dataset of Estonia's exports at firm- and product-level enables to find out some new stylized facts about exports and firm-level adjustments that are unobservable in the case of analysis at a more aggregate level.

Among the Central and Eastern European countries, similar datasets have been used to study other related topics in the case of Slovenia by Damijan et al. (2011) and in the case of Hungary by Görg et al. (2012). This study complements also a more detailed analysis of causal effects of multiproduct and multimarket export entry on productivity in Masso and Vahter (2011). This paper provides a variety of descriptive statistics related to the 'breadth' of firms' export mix.

The standard new-new trade theory models (Melitz 2003, Melitz and Ottaviano 2008) that allow for heterogeneity of productivity of firms assumed that each firm produces and exports just one variety of a product. More recently, the theoretical literature of the new-new trade theory has gone in more detail in outlining the role of firm and product level heterogeneity in explaining the changes in firm-level and aggregate level performance (see e.g. Bernard et al. 2010, Eckel and Neary 2010). These new papers concentrate increasingly on the relationship between adjustments of 'breadth' of product mix (i.e. adding and dropping of products), international trade and performance of firms.

For example, in some models it is found that trade liberalization or change in competition induces endogenous changes in the number of (export) products produced by the firm. For example, in the heterogeneous producer multi-product (and monopolistic competition) trade model of Bernard et al. (2010) it is shown that as a result of trade liberalization or increase in competition firms may drop their marginal products (those with high unit costs) and concentrate to their core competencies only (i.e. products with relatively low unit costs). This results in within-firm productivity improvement due to reallocation of resources and specialization on products where the firm has lower unit costs. Similar implication can be drawn from the trade model (with oligopolistic competition) of Eckel and Neary (2010). Thus one could expect product level decisions within the firm about dropping and adding of export products to have significant consequences on performance of firms and therefore on economy-wide performance as well.

The rapid development of the new-new trade theory models with product level heterogeneity has been accompanied by an increase in empirical analysis of the relationship between micro-heterogeneity and aggregate export changes. Especially since 2010 there has been also an increase in empirical studies on product level heterogeneity and trade (e.g. Iacovone and Javorcik 2010, Berthou and Fontagné 2012, etc.). For example, these include Iacovone and Javorcik (2010) using data from Mexico, Freund and Pierola (2010) from Peru, Bernard et al. (2010) from the USA, Albornoz et al. (2010) from Argentina, Görg et al. (2012) from Hungary, Damijan et al. (2011) from Slovenia and Defever et al. (2010) from China. Such studies also pose challenges to researchers due to the need for very detailed firm level export data, broken down at different export product level. Only recently has access to such data become somewhat more available. Another challenge in the case of panel data is created by the need to account for the changes in the classification of export products over time. This is important in order to avoid confusing the changes in product classification with product level entry and exit.

A good early and introductory overview about importance of product level selection processes based on analysis of firm and product level trade data is provided in Bernard et al. (2007). Bernard et al. (2010) show the importance of within-firm reallocation effects in determining the aggregate output growth. They find that net product adding and dropping by surviving firms in the US accounts to roughly 1/3 of the aggregate growth in US manufacturing industry. Iacovone and Javorcik (2010) show based on data from Mexico that product and market level churning is an important margin of adjustment to globalization. They also show that new exporters enter foreign markets with a small number of products and that new export discoveries are relatively rare and are imitated shortly by other firms. Export discoveries are defined as products not exported before by any firms in the country.

Bernard et al. (2010) show that US manufacturing firms that faced above-median Canadian tariff reductions after introduction of the NAFTA reduce the number of goods they produce relative to firms, which experience only below-median fall in Canadian tariffs. Based on detailed trade data from Hungary, Görg et al. (2012) outline how the duration of exports of a single product variety to a foreign destination depends on firm and product level characteristics. They find, in line with theoretical models, that firm- as well as firm-product specific competencies are important in determining firms' export mix.

Berthou and Fontagné (2012) demonstrate, using a dataset from France that the effects of a fall in trade costs appear to function especially through changes in the number of products exported by firm. This effect is stronger for more productive firms. For identification of the effects of falling trade costs, these authors use the event of introduction of euro.

Our empirical approach in this paper employs detailed trade transaction data from Estonia. It includes information about exports of each Estonian firm by its destination and product group at CN 8-digit level. The studied period covers 1995-2009. There was a significant amount of changes in definitions of product groups in the CN classification over this period (see Appendix B, and the Eurostat' website of CN classification: http://ec.europa.eu/eurostat/ramon/relations/index.cfm?TargetUrl=LST_REL&StrLanguageCode=EN&IntCurrentPage=2). We have endeavoured to account for this, as otherwise one could possibly mistake a part of the effects of changes in product mix with changes in the definitions of product groups in the CN classification. For analysis of the relationship between product churning and firm productivity we use also additional firm level information from the Business Registry of Estonia.

Based on various decomposition methods and regression analysis we show the significant importance of product level entry and exit by firms for aggregate trade and productivity statistics in Estonia, The effects on trade dynamics are especially evident after entry into the EU, which increased the product churning rate (esp. the product destruction rate) compared to the previous period. More intensive product adding and both adding and dropping by the firm is associated with higher productivity within the firm in the next periods.

II. Data and methods

This paper employs detailed product-level and market-level foreign trade data of the full population of exporting firms in Estonia, covering the period from 1995 to 2009. Until Estonia's entry to the EU in May 2004, all the trade flows were recorded in the customs statistics. After that, in the case of intra-EU trade, only trade transactions of firms with value of intra-EU trade of more than 100,000 EUR per year were collected by the national statistics authority. However, such exporters have accounted for vast majority of Estonia's exports. Even after 2004 the export statistics in the dataset follows the aggregate export indicators of Estonia most closely (see Appendix A).

An advantage of the detailed trade data from Estonia is the good coverage of firms, especially for period 1995-2003. For example, in the study on Mexico by Iacovone and Javorcik (2010), only establishments of more than 100 employees were automatically included in the sample. In our case (until 2004), all small firms are included in the export dataset.

Estonia's dataset includes for each firm information about exports by product (defined based on the CN 8-digit code) and by destination country. For econometric analysis, the variables have been aggregated to a yearly format. Examples of products at the CN 8-digit level include milk with a fat content of less than 1 per cent, packed in a container not exceeding two litres (CN code 04011010); frozen peas (*Pisum sativum*, 07102100); aluminium wire, not alloyed, of maximum cross-sectional dimension exceeding 7mm (7605 1100); specific types of fertilizers (e.g. ammonium nitrate in aqueous solution: 31023010); specific types of fibreboard (e.g. 44111210 and 44111290); threaded sleeves (tube or pipe fittings) of iron or of stainless steel (73072210); self-propelled track laying machinery (8429 1100), etc. In the case of alcoholic drinks, beer and wine as general products are defined at the 4-digit level: 2203 for beer and 2204 for wine. Product code 22030001 at 8-digit level indicates beer made from malt, in bottles holding 10 litres or less.

There have been changes in the CN classification over our studied period. For example, some CN 8-digit product-level codes have been merged into one in the CN classification while others have been split. We have accounted for these changes in the CN-codes, as these may affect some of the findings about the role of product level extensive margin of trade. For details please see Appendix B. It is important to account for these changes and not to confuse changes in classification with adding or dropping of new export products.

As a result of these adjustments the dataset was reduced by about 5 per cent of firm-product combinations. This was inevitable because in a number of cases it was not possible determine unambiguously what the sequence or continuity in next periods of some of the particular export product definitions *i* in the CN classification was. The impact of accounting for these changes on estimated indicators was not large but still significant. For example, as a result the export variety creation and destruction rates dropped by 4 percentage points: from 46 per cent to 42 per cent in case of the export variety creation rate at 8-digit CN product code level.

The detailed export dataset has been merged with firm-level information about performance indicators and other firm-level controls (such as size, age, etc.). This firm-level information is available for the overall population of Estonia's firms, from the Estonia's Business Registry database. The matching of the two datasets was executed based on firms' registry codes and was therefore straightforward. The Business Registry's firm-level database includes the annual reports with balance sheets and profit and loss statements for all of Estonian firms. This source of data is employed to calculate the productivity of firms, and for calculating some control variables for the regression analysis.

Methods

Our empirical analysis relies, firstly, on decomposition of the change in the aggregate growth of exports into the donation of different components, incl. the product level extensive margin of trade. Secondly, we estimate simple (pooled OLS) regression models to describe the association between product churning and firm-level productivity.

Our export decomposition exercise applies at first the decomposition method similar to the one used in Bernard et al. (2010) to decompose the US aggregate manufacturing output into broad components. Bernard et al. (2010) divided the output growth into the contributions by firm level entry and exit, product level extensive margin (growth due to added and dropped products) of surviving firms, and due to the product level intensive margin of surviving firms (sales per product). They concentrated on analysis of 5-year periods, using information from the US Census of Manufactures over 1972-1997.

Instead of aggregate output we are interested in decomposition of aggregate real export growth. Therefore we perform the Bernard et al. (2010) type of decomposition using firm level export data of all exporters. Thus, we divide the real export growth of Estonia into contributions of firms entering/exiting from exporting and the contributions by continuing exporters. The contribution of continuing exporters is further divided into the contribution by added/dropped products (product level extensive margin) and growth/decline of continued export product (the product level intensive margin). Note that the entry to and exit from exporting may be partly caused by firm level start of business activities and firm level closure of all activities, in addition to firm level export market related decisions.

Let us denote here Y_t the aggregate exports at time t, thus denotes $\Delta Y_{t,t-k}$ the change in exports between time t and *t-k*., where *k* is the number of years (we made calculations with *k =1, 3, 5*). The aggregate change in total exports can then be decomposed as follows:

$$\begin{aligned}\Delta Y_{t,t-k} &= \sum_{j\in N}\Delta Y_{j,t-k} + \sum_{j\in X}\Delta Y_{j,t-k} + \sum_{j\in C}\left[\sum_{j\in G}\Delta Y_{i,j,t-k} + \sum_{j\in S}\Delta Y_{i,j,t-k} + \sum_{j\in A}\Delta Y_{i,j,t-k} + \sum_{j\in D}\Delta Y_{i,j,t-k}\right] = \\ &= \sum_{j\in N} Y_{j,t} + \sum_{j\in X} Y_{j,t-k} + \sum_{j\in C}\left[\sum_{j\in G}\Delta Y_{i,j,t-k} + \sum_{j\in S}\Delta Y_{i,j,t-k} + \sum_{j\in A} Y_{i,j,t} + \sum_{j\in D} Y_{i,j,t-k}\right]\end{aligned} \quad (1)$$

Here indicator *N* denotes new entrants into exports at time *t* (i.e. those that did not export at time *t-k*, but export at time *t*), *X* - firms that seize to export, *C*- firms that continue exporting (they export both in period *t* and *t-k*). In the case of continuing exporters, *G* denotes products with increasing exports, *S* shrinking products, *A* new export products and *D* products that are dropped (by continuing exporters).

Thus, the first term on the right-hands side of Equation (1) shows the contribution of new exporters to aggregate export growth over period between *t* and *t-k*. The second term shows the change in exports due to exiting exporters. The third terms outlines the contribution by continuing exporters. Among continuing exporters we differentiate between 4 types of products (see the terms in brackets in Equation 1). These are the contribution by growing, shrinking, new, and discontinued export products.

The alternative decomposition by Navarro (2008) in analysis of data from Chile decomposes the export sales of continuing firms (*C*) as follows:

$$\sum_{j \in C} \Delta Y_{j,t-k} = \sum_{j \in U} \Delta Y_{j,t-k} + \sum_{j \in M} \Delta Y_{j,t-k} + \sum_{j \in L} \Delta Y_{j,t-k} + \sum_{j \in E} \Delta Y_{j,t-k} \ . \tag{2}$$

The first term on the right-hand side of the Equation (2) denotes change in exports of continuing firms due to firms that do not change their export product mix (*U*). The second term shows the contribution by continuing exporters that increase their number of products (*M*), third term is the contribution by firms that decrease their variety of export products (*L*). Last term in Equation (2) shows the donation by firms that change their product mix—both add and drop products—but keep their number of export product at the same level as in the previous period *t-k* (this group is denoted by *E*).

In addition to the decomposition analysis we investigate also the role of product entry and exit for productivity of Estonia's firms. To find out whether the productivity differs on average between firms that add export products, firms that drop export products, firms that both add and drop export products, or firms that do not change their export mix , we estimate simple OLS regression models, based on the following equation:

$$\begin{aligned} \ln(VA_{it+1} / L_{it+1}) &= \beta_0 + \beta_1 ADD_{it} + \beta_2 DROP_{it} + \beta_3 ADD\_AND\_DROP_{it} \\ &+ \beta_4 X_{it} + \delta_k + \gamma_t + \varepsilon_{it} \end{aligned} \tag{3}$$

Here *i* denotes firm, *k* - sector and *t* - year. VA_{it} denotes value added (deflated), L_{it} - number of employees. ADD_{it} is a dummy variable (0,1) that is equal to 1 in the case of firms that add new export products in the current year (compared to the previous year), but do not drop any product varieties. $DROP_{it}$ is a dummy variable (0,1) that is equal to 1 if firm drops export products in the current year (compared to the previous year), but do not add any new export varieties. $ADD\_AND\_DROP_{it}$ is a dummy variable (0,1) that is equal to 1 in the case of firms that both add and drop products in a current year (compared to the previous year). This last variable enables to find out the conditional productivity premium of firms that both add and drop their export products in a year. The Equation (3) includes also sector fixed effects at 3-

digit NACE sector level (δ_k), year effects (γ_t), and an idiosyncratic error term (ε_{it}). We also check whether the coefficients of product dropping or adding dummies are different for firms with different number of export products.

The coefficients of the product adding and dropping dummies enable us to make some conclusions about the role of product churning for productivity of firms. For example, based on trade theory model of Eckel and Neary (2010), we could expect that dropping of (peripheral) products (with relatively high unit costs) is associated with higher firm level productivity, due to concentration on core competences of the firm. Also, if product level experimenting with entry is important for success of firms and for discovering own competitive advantages abroad, then we could expect the coefficient of dummy $ADD\_AND\_DROP_{it}$ to be positive in Equation (3), and potentially also larger than the coefficient of the dummy ADD_{it} (firms that only add new products). We could expect that firms that are actively involved in testing the foreign markets with different products have higher productivity than firms that do not change their export mix, or only drop their existing export products or only introduce new ones during a year.

Of course, our analysis provides simple correlations that should not be interpreted as evidence of clear causal effects. The causality can in Equation (3) run also the other way around: firms with higher productivity may be able to overcome product-specific fixed costs of export entry and can therefore add new export products. This two-way causality is confirmed in more detail in analysis of productivity growth of new export entrants in Masso and Vahter (2011). There the authors show at first that multiproduct export entry requires higher productivity of the firm to cover the sunk costs of exporting. At the same time, export entry with multiple products results in stronger effects on firm productivity than export entry with only one product variety.

III. Results

In Estonia, the total number of exporting firms represents a rather high proportion of all active firms in the manufacturing industry (see Table 1), in 2003 it was 49.1 per cent.[2] If we exclude micro-firms, then this ratio is even higher. This number is high in an international comparison, exporting is a common activity among firms in Estonia. For example, Bernard *et al.* (2007) show that exporters account for only about 4 per cent of all firms in the US manufacturing industry (based on figures from 2000). At the same time, the share of exporters in manufacturing industry in Sweden is even higher than in Estonia (Lööf 2010).

The bulk of aggregate export of Estonia is concentrated among a small share of firms, as evident from Figure 1. The largest 1 per cent of exporters account for almost 50 per cent of exports in 2009. The largest 5 per cent of exporters account for 70 per cent and the largest 1 per cent account for about 85 per cent of exports. For a long time about 1/3 of exports of Estonia were accounted by one electronics manufacturer Elcoteq. Compared to the 1990s, the concentration of exports has slightly decreased, but remains still at a high level. The high concentration of exports is of course not a surprise. It is a stylized finding from other countries as well, including larger countries than Estonia. For example, Berthou and Fontagné (2012) show this for France, and Mayer and Ottaviano (2008) for several European countries.

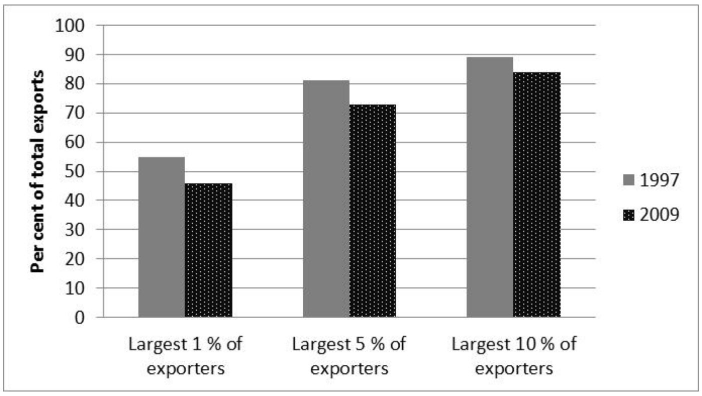

Figure 1 Share of the largest exporters in total exports of Estonia (%)

[2] Note that after the EU enlargement our dataset from Statistics Estonia does not reflect correctly the share of exporters in the total number of firms, as the intra-EU trade statistics are not fully collected for all small exporters after entry to the EU.

The average breadth of product varieties that an ‘average’ Estonia’s exporter sells abroad has been growing. Table 1 outlines that the average number of export products of a firm was 6.5 in 1997, 8.8 in 2003 and 9.3 in 2009. This reflects the increased diversification of production by Estonia’s exporters. The average number of export markets (countries) that each firm exports to has also grown. It was 2.9 in 1997, 3.3 in 2003 and 4.5 in 2009.

Table 1 Number of firms and varieties

	Year	Number of exporting firms	Share of exporters	Number of products, 8 digit	Average number of products per firm, 8 digit	Average number of products per firm, 5 digit	Average number of product markets, 8 digit	Average number of markets
Manu-facturing	1997	1740	57.5	11305	6.5	5.3	9.4	2.9
	1999	1944	47.8	14290	7.4	5.9	10.6	2.9
	2001	2217	48.2	17913	8.1	6.5	12.0	3.1
	2003	2388	49.1	20979	8.8	7.1	13.7	3.3
	2005	1640	29.0	14319	8.7	7.1	15.7	4.0
	2007	1454	24.2	13732	9.4	7.6	17.6	4.3
	2009	1377	22.2	12169	8.8	7.1	17.6	4.6
All firms	1997	5691	28.2	36140	6.4	5.3	8.7	2.3
	1999	5606	19.9	42686	7.6	6.3	10.8	2.5
	2001	6256	18.8	54927	8.8	7.1	13.1	2.5
	2003	6550	17.6	61822	9.4	7.6	14.5	2.6
	2005	4654	9.9	44382	9.5	7.5	14.9	2.9
	2007	4896	8.5	48046	9.8	7.7	15.8	2.9
	2009	5464	7.6	54006	9.9	7.7	15.5	2.8

Similar statistics, broken down by new and continuing exporters, are shown in Table 2. New exporters are defined here as firms that are exporting for the first year (i.e. did not export in the previous period). New exporters make up, depending on year, about 6–36 per cent of all exporters. Their share in relation to the total number of exporters varies significantly over time. Similarly to the study by Iacovone and Javorcik (2010) on Mexico, we find that the average number of export product varieties is higher among continuing exporters than among new exporters. This provides support to the idea (e.g. Rauch and Watson 2003, Albornoz et al. 2010) that expansion of exports takes place gradually. The sequential entry takes place to different foreign destinations and also in the case of different products.

Table 2 Average number of firms and varieties by exporting status

	Number of firms		Number of products, 8 digit		Number of products, 6 digit	
Year	**Continuing exporter**	**New exporter**	**Continuing exporter**	**New exporter**	**Continuing exporter**	**New exporter**
1997	4142	1495	8.4	2.9	7.4	2.7
1999	4439	1465	9.9	3.4	8.7	3.1
2001	5010	1359	10.7	3.3	9.4	3.0
2003	4672	974	10.8	3.5	9.4	3.2
2005	3253	1949	11.8	3.2	10.2	3.0
2007	3534	1789	13.0	2.4	11.2	2.3

Continuing exporters (firms that have been exporting for at least one year) sell their goods to larger number of export markets. A continuing exporter has on average 3.6 foreign markets, while a new exporter has only 1.6 (based on statistics from 2003). In all the years that were studied, new exporters started with a relatively small number of different products and markets. In terms of share of exports, the multiproduct firms that sell several products abroad have usually a dominating product that accounts for the vast majority of their export sales (see Appendix C for more details). For example, in the case of firms that sell 10 different export products, a single product (at 6-digit CN level) accounts on average for about 70 per cent of their total export sales. First 5 export products, ranked by their share in sales, amount for about 98 per cent of their total export sales. Similar regularities hold obviously also for firms, that sell less or more than 10 products abroad.

The yearly export product churning rates are notably high in Estonia: at 8-digit CN product level, on average, the yearly export variety creation rate is 42 per cent and export variety destruction rate 40 per cent, over 1995-2009 (see Table 3). We define export variety creation rate as the ratio of new export varieties introduced at period *t* divided by the total number of varieties exported at *t-1*. We define the export variety destruction rate as the ratio of number of varieties that are dropped from export mix at time *t* divided by total number of varieties exported at period *t-1*. Gross churning is defined, similarly to Iacovone and Javrocik (2010), as the sum of export variety creation and destruction rates. Net churning is defined as their difference. The high importance of product level entry and exit is the expected result, as Estonia is a small country and firms need to start exporting early, due to limited local market. Also, as Estonia is a member of the EU since 2004, the export entry costs are not high for entry into nearby other EU markets.

Table 3 Export variety churning, for different CN product code levels, manufacturing industry

Level of commodity code	Export variety creation	Export variety destruction	Gross churning (1)+(2)	Net churning (1)-(2)
4	36%	35%	71%	1%
6	40%	38%	78%	2%
8	42%	40%	82%	3%

Note: Period 1995-2009. Average yearly product churning rates.

The net variety creation is positive in the first part of the sample (1995-2002). Part of this can be attributed to the high level of entry of new firms into exporting. The net variety creation rate decreases and becomes negative, especially in the manufacturing industry, since 2003.[3] Export variety creation rate has a clear decreasing trend over time, as presented in Figure 2 and 3. Note that the year of EU enlargement is denoted with a vertical line. Variety destruction rate is somewhat more stable, except for the years 2003 and 2004. Important break in trend is the temporary significant increase in export variety destruction rates due to entry to the EU in 2004. This is because EU entry meant also ending of the free trade agreements of Estonia outside the EU (with Ukraine) and correspondingly also changes in the variety of products exported abroad.

[3] Iacovone and Javorcik (2010) found based on data from Mexico that the average product creation and destruction rates were respectively 18.8 and 11.4 per cent. They used, however, a different classification from the CN product classification system.

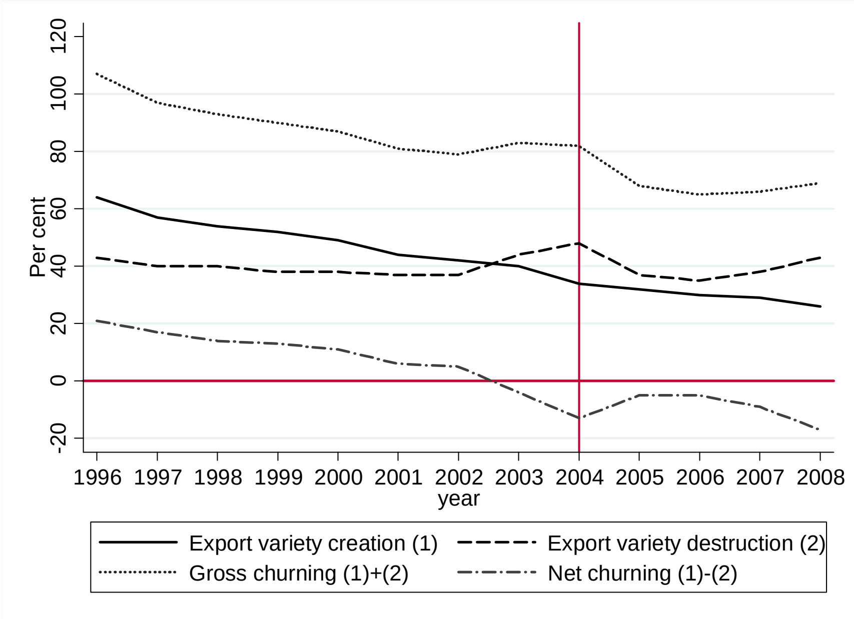

Figure 2 Product churning in manufacturing industry

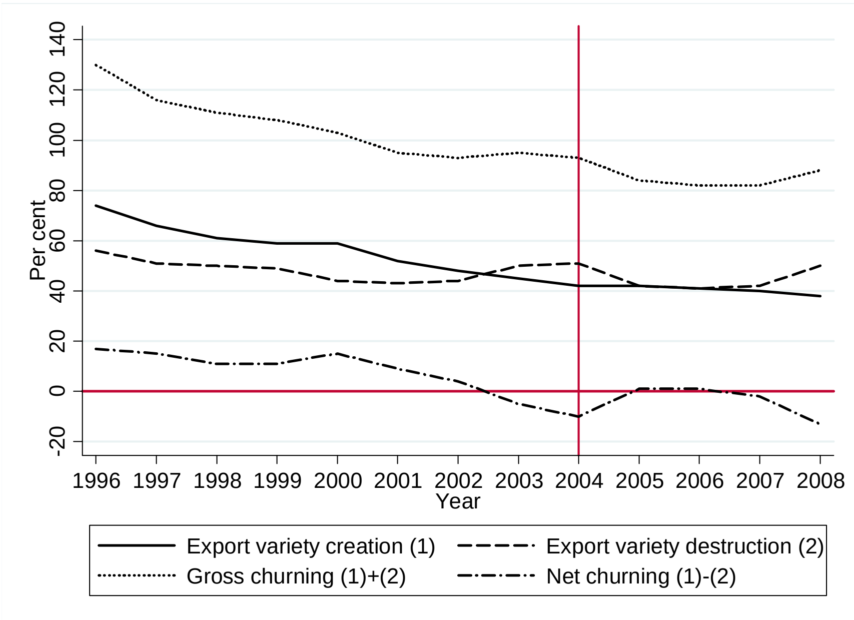

Figure 3 Product churning in the full sample of firms, including the services sector

The average export product churning rates that we demonstrate hide important across-sector heterogeneity (see Figure 4). The largest export product creation and destruction rates are in production of electrical and optical appliances (with NACE 2-digit code 30) and production of transport equipment (NACE code 35). This is not surprising considering the multi-product and rapidly developing nature of these industries in the world. In both sectors the export variety creation and destruction rates are about 60-65 per cent of previous year's number if varieties. Significantly lower level of churning is, for example, found within the Estonia's chemical industry (NACE code 24), where often one plant produces only a rather limited number of product varieties.

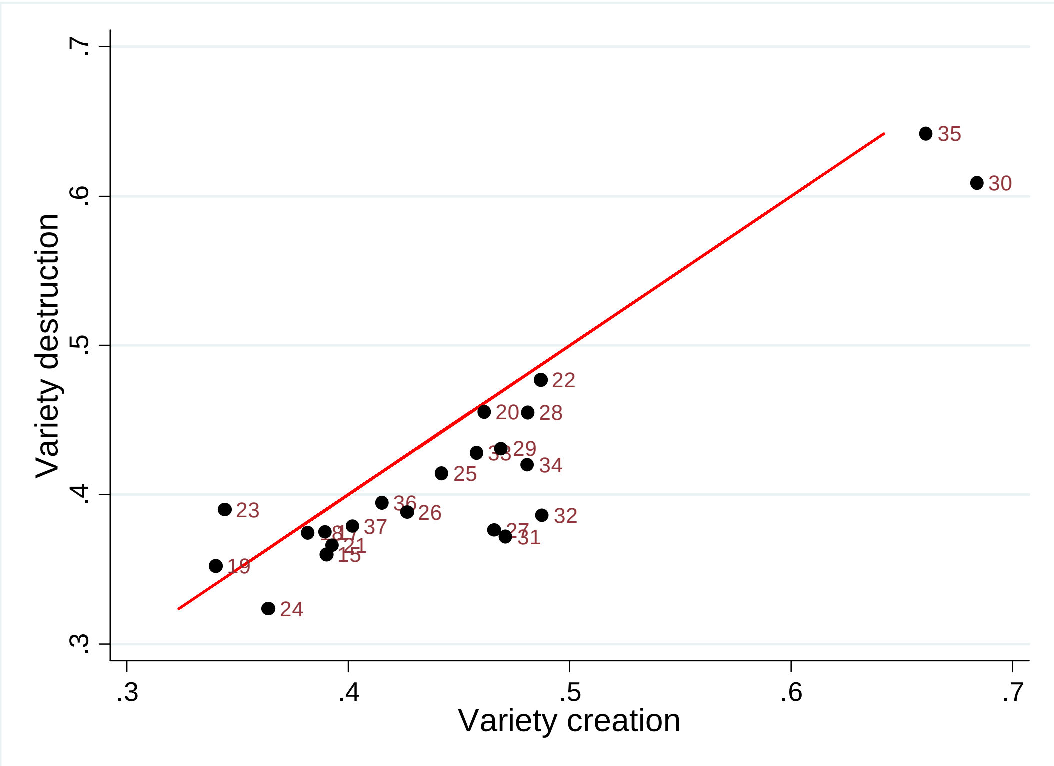

Figure 4 Export variety creation and destruction across manufacturing industries (at 2-digit NACE level), average yearly creation and destruction rates over period 1995-2009

Note. The numbers denote the 2-digit NACE industry codes. Scale of product churning rates: 0-1.

But a most notable finding about product churning at sector level is evident in Figure 4 above. It is clear from that graph that export variety creation and destruction are highly correlated across 2-digit industries[4]. The corresponding correlation coefficient is even 0.87. This significant correlation is similar to the result of Bernard et al. (2010) for the US. The strong correlation between these two measures indicates that the product level adjustments— adding

[4] The high correlation persists even if we exclude sectors with NACE code 30 and 35 that have much higher variety creation and destruction rates than the rest of the manufacturing industries.

and dropping of products—cannot be explained solely in terms of a reallocation of export and production from some industry's products to others. They cannot be explained by specialization to exports of goods from sectors where the country has comparative advantage. Sectors that actively drop existing products are also very active in introducing new export products. The observations in Figure 4 lie relatively close to the 45 degree line.[5] Of course, this correlation is not perfect: most of the sectors add somewhat more products than they drop each year. For example: electronics sectors with NACE code 31 and 32 (i.e. radio, TV and communication equipment) have significantly higher product creation rate than product destruction rate.

As argued in Bernard et al. (2010) and Navarro (2008), different patterns of product level entry and exit could occur because of either product-specific, firm-specific, or firm-product specific explanations. These papers study detailed trade data from USA and Chile. They outline the importance of the firm-product specific explanations: the idea that firm level shocks may have different consequences for different products and that product level shocks (e.g. changes in demand) have different consequences for different firms. This seems to be the case also in Estonia, as the product adding and dropping rates are highly positively correlated and as there is a very high share of firms that both add and drop some product varieties during a year.

Firm specific and product specific shocks seem to be the unsuitable explanations of the product churning patterns in Estonia. There is no indication of any dominance of sectors and firms that only add or only drop their export products, no evidence of a negative correlation between product adding and dropping rates at firm or sector level. Prevalence of product level or firm level demand or supply shocks would not be consistent with the positive correlations between product adding and dropping rates (Navarro 2008).

[5] The results are similar if we look at this correlation also within the non-manufacturing sectors. Often there the product churning rates were even higher than in the sectors of manufacturing industry, which is expected. Note, however, that these are the churning rates of products, not services.

Within each sector, most of firms in each year both add and drop new export varieties and also products sold at the home market (see Table 4). Product 'switching' is widespread and frequent, regardless at which aggregation level of the CN classification it is studied. On average, 64 per cent of exporters in Estonia both add and drop export products (CN 8-digit level) in a year. 10 per cent only add new products, 10 per cent only drop their old products without adding new ones. In comparison, the corresponding numbers in other studies seem to depend on the country studied and product definitions used. For example, in Bernard et al. (2010) study of US that used information on both domestic and exported product varieties, the proportion of firms that added and dropped products was 68 per cent, but in Iacovone and Javorcik (2010) study on Mexico it was just 6-8 per cent of firms.

Table 4 Product switching, share of firms

Commodity code	Sector	Firms that add products only, CN 8 digit level	Firms that drop products only, CN 8 digit level	Firms that both add and drop products, CN 8 digit level
Initial	Manufacturing	10.2%	12.2%	63.9%
	Services	9.9%	10.1%	72.9%
	All	9.6%	10.5%	70.9%
Transformed	Manufacturing	10.7%	12.3%	57.4%
	Services	10.2%	10.2%	65.2%
	All	9.7%	10.4%	63.6%

Notes. Initial: product switching if changes in the CN product classification are not accounted for. Transformed: product churning rates that account for changes in the CN product classification over the 1995-2009 period.

Accounting for changes in the CN classification of goods affects both the churning rates and product switching indicators only to a limited extent (see Table 4) and does not change the qualitative conclusions in this paper. In this paper, all the results, unless otherwise stated, are based on the dataset where the changes in CN codes have been accounted for.

Decomposition of export growth

Before we go into detailed analysis about the role of export product level entry and exit as a driver of trade dynamics, we show the results of a more general decomposition analysis.

Table 5 outlines relative share of new exporters, continuing exporters' new products and continuing exporters old (i.e. previously exported) products in the total exports, for each year over 1997-2009. We confirm that the largest share of exports is due to the already previously exported products of continuing exporters. Depending on the year these contribute between 76 and 91 per cent of total exports. The share of new exporters fluctuates between 2 and 14 per cent. The share of new products of continuing exporters ranges between 6 and 15 per cent. Clearly evident is the temporary increase in the role of new exporters and new products of continuing exporters in the trade statistics in 2004 when Estonia entered the EU.

Table 5 Decomposition of export volume of each year, 1997-2009

Year	New exporters	Continuing exporters, new products	Continuing exporters, old products
1997	0.09	0.15	0.76
1998	0.03	0.15	0.81
1999	0.04	0.14	0.82
2000	0.03	0.09	0.88
2001	0.02	0.07	0.90
2002	0.02	0.17	0.81
2003	0.02	0.07	0.91
2004	**0.14**	**0.11**	**0.76**
2005	0.05	0.06	0.89
2006	0.07	0.14	0.79
2007	0.05	0.16	0.79
2008	0.06	0.06	0.88
2009	0.06	0.09	0.85

*Note: the sum of each row is 1. Small differences from that are due to rounding.

Next, we move to the more detailed decomposition analysis, as outlined previously in Equation (1). Again, we see that most of the aggregate export growth is accounted for by continuing exporters and their product level intensive margin: sales of previously exported varieties. These regularities hold both in manufacturing industry and the full sample of firms that includes also services sector firms. These regularities hold for small (less than 50 employees), medium-sized (50-250 employees) and large firms (not reported in table in order save space). It holds also in the case of export growth calculated over 1-, 3- or 5-year period.

Interesting differences between the time periods are revealed if we compare, the pre-EU period with years after entry to the EU (on 1st of May 2004). The net entry of enterprises contributed only 6.3 per cent of the full export growth over 2000-2003. However, after the EU entry, over period 2004-2008, net entry (entry and exit of firms) accounted for a very large share: about 40 per cent of the export growth during that period. Over the same time-frame also the relative role of product level extensive margin in export growth grew a lot. Over 2000-2003 product level entry and exit of continuing exporters accounted for 2 percentage points out of the full 16 per cent growth of exports (i.e. its share in export growth was 12.5 per cent). However, during 2004-2008 the relative share of product level entry and exit accounted for 20 per cent of the total export growth.

Table 6 Decomposition of the exports change

		Entry and exit into exporting			Total	Intensive margin			Extensive margin		
Subsample	Aggregate growth	Net	Entry	Exit	conti–nuing exporters	Net	Growing products	Shrin–king products	Net	Product entry	Product exit
1	2	3	4	5	6	7	8	9	10	11	12
Manufacturing, over 1 year	0.12	0.01	0.02	-0.01	0.11	0.09	0.29	-0.20	0.02	0.07	-0.05
Manufacturing, over 3 year	0.46	0.06	0.15	-0.09	0.39	0.28	0.51	-0.23	0.11	0.23	-0.12
Manufacturing, over 5 year	0.91	0.18	0.35	-0.17	0.73	0.48	0.70	-0.22	0.25	0.40	-0.15
All, 1996-2000	**0.21**	**0.04**	0.08	-0.05	**0.17**	**0.12**	0.36	-0.24	**0.05**	0.18	-0.13
All, 2000-2003	**0.16**	**0.01**	0.05	-0.03	**0.14**	**0.13**	0.33	-0.21	**0.02**	0.11	-0.10
All, 2004-2008	**0.10**	**0.04**	0.07	-0.04	**0.07**	**0.05**	0.28	-0.23	**0.02**	0.07	-0.05
All, over 1 year	0.15	0.03	0.07	-0.04	0.12	0.09	0.32	-0.22	0.03	0.11	-0.09
All, over 3 years	0.51	0.16	0.31	-0.15	0.36	0.27	0.48	-0.22	0.09	0.27	-0.17
All, over 5 years	0.96	0.36	0.62	-0.27	0.60	0.39	0.58	-0.19	0.21	0.41	-0.19

Note. The table reports the decomposition in the change of the aggregate exports. The first column presents the percentage change in the aggregate exports. The next 3 columns report the contribution to exports growth from firm entry and exit into exporting. Columns 7, 8 and 9 show the contribution to exports growth from intensive margin of continuing exporters (growing or declining sales per product), on columns 10-12 from extensive margin (entry into exporting with new products and dropping of products).

An alternative decomposition analysis, based on Equation (2) is provided in Table 7. It shows that the export growth of continuing exporters that exported also in previous year is almost fully due to firms that have changes in their export product mix. To be more precise, this donation is by firms that increase their number of export products. Notably, firms with static export product mix (at CN 8-digit level) contribute almost nothing to the aggregate export growth. This result is robust to different time-periods and firm size groups. The results are consistent with the previously reported statistics that over each year majority of firms both add and drop export varieties.

Table 7 Decomposition of the exports change among continuing exporters according to the changes in product mix

Subsample	Aggregate growth	Total continuing exporters	No change in product mix	Change in product mix	Number of products: More products	Less products	Equal number
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Manufacturing, over 1 year	0.12	0.11	0.00	0.11	0.10	-0.01	0.01
Manufacturing, over 3 year	0.46	0.39	0.01	0.38	0.32	0.03	0.03
Manufacturing, over 5 year	0.91	0.73	0.01	0.73	0.56	0.11	0.05
All, 1996-2000	0.21	0.17	0.00	0.16	0.19	-0.04	0.01
All, 2000-2003	0.16	0.14	0.00	0.14	0.16	-0.04	0.02
All, 2004-2008	0.10	0.07	0.01	0.05	0.06	-0.01	0.00
All, over 1 year	0.15	0.12	0.01	0.11	0.13	-0.03	0.01
All, over 3 years	0.51	0.36	0.01	0.34	0.31	-0.01	0.04
All, over 5 years	0.96	0.60	0.01	0.59	0.48	0.06	0.05

Note. The table reports the decomposition in the change of the aggregate exports. The 2nd column presents the percentage change in the aggregate exports. The 3^{nr} column presents the total growth of exports of continuing exporters. Column 4 presents the contribution to the export growth from the firms that did not change their product mix. Column 5 presents the contribution to the export growth from the firms that changed their product mix. Columns 6 to 8 presents the contribution to the export growth from the firms that increased, decreased or did not change their number of products. Columns 6 to 8 add up to the values at column 5, small differences are due to rounding.

In addition to the decomposition analysis we provide statistics about the role of adding and dropping firms' export products for their productivity. The statistics in the upper part of Table 8 show the levels of log of labour productivity after change in firm's export product mix for:

i) exporters that only add new export products (compared to the rest of firms),

ii) exporters that only drop export products (compared to the rest of firms),

iii) exporters that both add and drop export products (compared to the rest of firms).

The indicators are measured for different periods after the change in firm's export mix at year *t*.

An important finding is that the highest level of (log) labour productivity is reached by firms that both add and drop export products. As we showed before, this is also the largest category of exporters. However, the average differences between the main categories of firms in Table 8 are small. Obviously, these unconditional means hide a lot of heterogeneity across firms. The statistics in Table 8 do not account for other factors, like firm size, number of exported products, sector specific effects, etc.

Table 8 Export variety churning and productivity of firms

Productivity variable	**Group value**	**8-digit code**		
		Product adding only	Product dropping only	Product adding and dropping
Log Productivity at time t+1	0	12.04	12.05	11.98
	1	12.05	12.00	12.09
Log Productivity at time t+2	0	12.07	12.07	11.99
	1	12.07	12.07	12.11
Log Productivity at time t+3	0	12.09	12.09	12.01
	1	12.08	12.07	12.14
Log Productivity at time t+4	0	12.10	12.11	12.02
	1	12.12	12.09	12.16
Growfth over 1 year	0	4.01	4.49	3.74
	1	6.81	2.45	4.59
Growth over 2 years	0	6.36	6.51	6.45
	1	8.48	7.11	6.64
Growth over 3 years	0	6.58	6.88	6.79
	1	9.09	6.39	6.85
Growth over 4 years	0	6.58	6.91	6.79
	1	9.40	6.42	6.91

Note: log value added per employee. Productivity growth indicators are measured from the year of adding/dropping of products. Group value (0/1) indicates, depending on the column, firms that only add products (1) and others (0), firms that only drop products (1) and others (0), firms that both add and drop products (1) and others (0). t -denotes year of change in export product mix. Period: 1995-2009. The sample includes also these firms that do not change their export product mix.

Note that the higher level of productivity of firms that both add and drop export products (i.e. are more active in testing the markets) may be due to causal effect of export product churning, but it may be also simply an indicator of selection effects: that only the relatively productive firms are able to cover the sunk costs of product churning. Also, there might possibly be other (unobserved) factors that affect both the level of productivity and the decisions about the product level entry/exit or the breadth of firm's export product mix. One such factor could be the production and exporting experience of the managers of the firm. Such variables may introduce a positive correlation between product level entry/exit and decisions and firm's productivity, even if there is no causal relationship between these two.

If we turn our attention to the growth of labour productivity, the highest growth rates are found on average for the category of exporters that add new products but do not drop any old ones. The next in terms of productivity growth are the exporters who both add and drop export products in a year. The lowest average productivity growth rates are reached by firms that drop their export products, but do not add new products. This could be due to badly performing firms losing their markets to better performing firms.

The estimated OLS productivity Equation (3) is given in Table 11. It shows the conditional correlation between indicators of product adding and dropping with firm's productivity in the next year. The estimation accounts for several firm level variables and sector and time specific fixed effects. The results are given here for product churning at the CN 8-digit product code level. The results are qualitatively the same and similar in their magnitude if one uses the broader 6-digit CN product level instead.

We include also the number of products that firm had in the previous year as one control variable. Therefore the differences in number of previous export products (export scope) are taken account for in these regression models. Note, however, that the product dropping and adding may be correlated with productivity differently in the case of large or small number of existing export products. It is important to stress again that these results here are simple descriptive statistics showing the correlation between productivity at firm level and the decision to add and/or drop products, conditional on other observed confounding key factors of firm level productivity.

Our results suggest clearly that adjustments to export product mix are correlated with differences in productivity levels. Other controls that we have accounted for include sector specific fixed effects, time effects, firm age, size and number of products exported by the firm in the preceding year. As evident from Column (1) in Table 9 (in the case of firms with similar number of products in the preceding year) adding new export products at CN-8 digit code level is associated with about 13 per cent higher productivity of the firm than keeping the export product mix unchanged. At CN 6-digit code level, the same 'premium' is about 11 per cent. We also find that firms which drop old export products but do not introduce new ones have significantly lower productivity levels than the rest of firms. They have about 11 per cent lower productivity than firms that do not change their export mix.

Table 9 OLS productivity regressions: the correlation of product adding and dropping with firm level productivity

	(1)	(2)	(3)	(4)	(5)
Product adding	0.126 (0.150)***	0.180 (0.029)***	0.184 (0.039)***	0.157 (0.037)***	0.110 (0.024)***
Product dropping	-0.105 (0.026)***	-0.150 (0.032)***	-0.120 (0.035)***	-0.165 (0.034)***	-0.132 (0.024)***
Adding and dropping	0.120 (0.027)***	0.123 (0.020)***	0.157 (0.025)***	0.129 (0.023)***	0.096 (0.017)***
No. of products (-1)	0.016 (0.001)***	0.008 (0.001)***	0.018 (0.005)***	0.016 (0.004)***	
Product adding × Number of products (-1)			-0.004 (0.007)	0.000 (0.006)	
Product dropping × Number of products (-1)		0.010 (0.004)***	-0.001 (0.006)	0.002 (0.006)	
Adding and dropping× Number of products (-1)			-0.011 (0.005)**	-0.008 (0.004)**	
Size	-0.111 (0.031)***	-0.107 (0.031)***	-0.108 (0.031)***	-0.109 (0.032)***	-0.108 (0.026)***
Size squared	0.014 (0.005)***	0.016 (0.005)***	0.016 (0.005)***	0.017 (0.005)***	0.022 (0.004)***
Age	-0.313 (0.089)***	0.396 (0.089)***	0.397 (0.089)***	0.408 (0.089)***	0.193 (0.048)***
Age squared	-0.136 (0.024)***	-0.137 (0.024)***	-0.137 (0.024)***	-0.139 (0.024)***	-0.079 (0.014)***
Sector dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Number of obs.	10,457	10,457	10,457	10,457	12,557
R-squared	0.283	0.283	0.284	0.284	0.267

Note. All regressions have been estimated with 3-digit NACE industry dummies and year dummies. Dependent variable is log of value added per employee at year *t+1*. Standard errors in parentheses. Sample of all exporters in manufacturing industry, 1995-2009.

The productivity 'premium' of firms that experiment with different export products, by adding some products and withdrawing some other previously exported products from their foreign markets, is about 10-15 per cent (depending on the different set of controls in Table 9), compared to firms that do not change their export product mix. However, compared to firms that only add new products their productivity level is lower. A general conclusion is that there is some evidence of positive relationship between export product level churning and firm productivity.

The specification of the regression model with interaction term between number of export products and product dropping category dummy is provided in Column 2 of Table 9. This way one can differentiate between the 'effects' of product dropping for firms that have large number of export products and firms that have small number of products. Possibly, the effect may be different between these two groups. The coefficient of the product dropping category dummy in column 2 is equal to - 0.15. The coefficient of the interaction term is 0.01. Hence, we find clear negative relationship between product dropping and productivity for firms that have up to 15 export products. But for firms with large variety of export products (more than 15) we find that product dropping is associated with higher productivity in the next year. Thus there is some evidence in support of benefits from dropping products and concentrating on fewer number of (core) products, as expected based on trade theory model of Eckel and Neary (2010). For firms with small or moderate number of different export products (the vast majority of firms), giving up an export product is either the result or the cause of low productivity.

Earlier related research based on the US data in Bernard et al. (2010) suggest that product churning (adding some products and dropping others) in US firms plays a positive role for reallocation of economic activity within firms towards more productive uses. In addition, De Nardis and Pappalardo (2009) show based on detailed export data from Italy that the high frequency of product switching behaviour within exporting firms was significantly positively correlated with firm-level productivity growth, and that it contributed to a reallocation of economic activity within firms to more productive uses. De Nardis and Pappalardo (2009) found based on their estimated OLS regressions that simultaneous product adding and dropping increased the productivity one period later, while effects of only product adding were insignificant. Notably, product dropping (only dropping) had on average positive significant relationship with productivity and increased also output.

IV. Conclusions

Recent empirical papers stress the role of multi-product firms in determining the trade flows, and that the firms level decisions about number of export products or markets represent an important margin of adjustment to globalization and changes in economic conditions. This paper investigates the role of firm's decisions about the export product mix in aggregate export dynamics and for productivity growth. For that we use decomposition and regression analysis of product and export market level data of full population of Estonia's firms. A contribution of this paper is accounting for the changes in the product codes of the CN classification over 1995-2009.

We find that both the relative importance of entry of firms into exporting and the role of product level entry increases significantly in total export volume of Estonia after entry to the EU in 2004. Before that the relative role of export product churning as a component of trade growth was significantly lower. Last but not least, we show that export product adding and both adding and dropping by the firm is associated with higher firm productivity, compared to firms that keep their export mix unchanged or decrease their export mix. Product dropping is associated with higher subsequent productivity only in the case of firms that have relatively large number of exported products.

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Appendix A: Export data

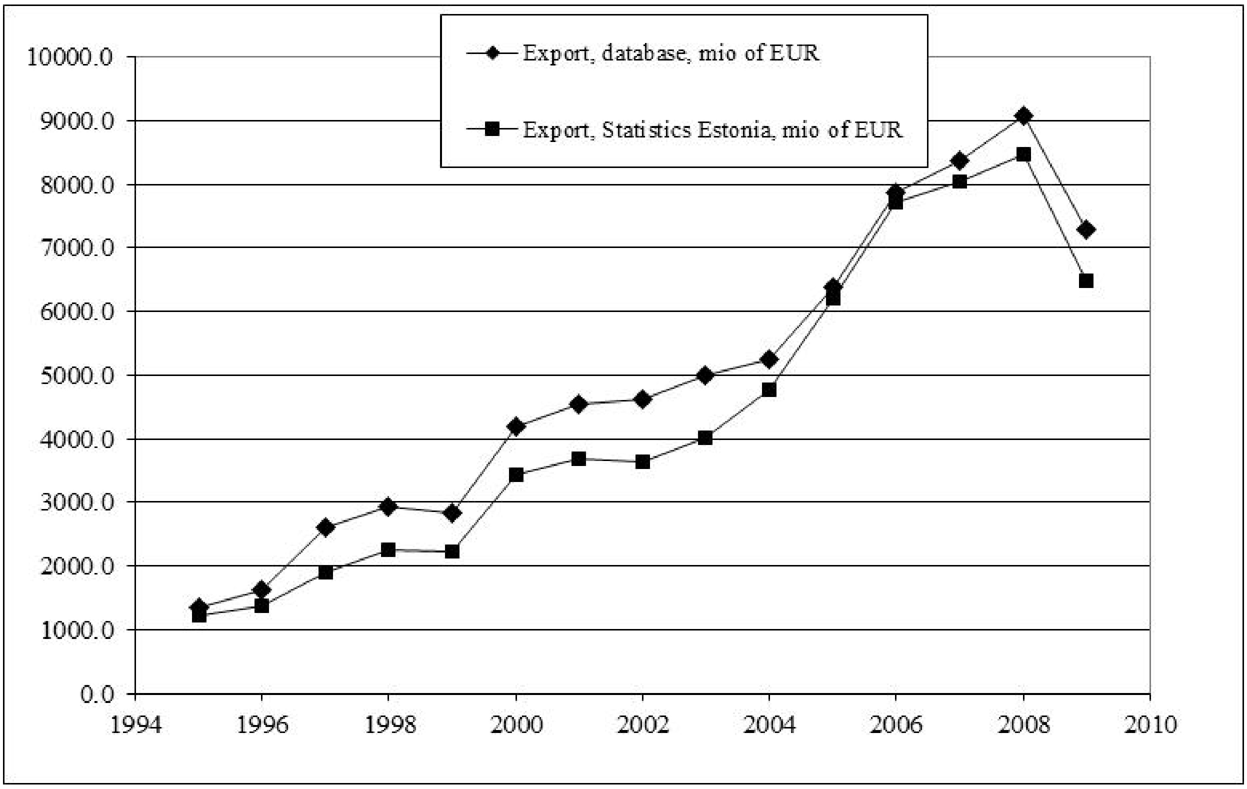

Figure A1. Total exports in the data and the aggregate data of Statistics Estonia

Appendix B. Transformations of the CN 8-digit product codes

The following 4 different kinds transformations of the CN product codes (with examples) are identified in the CN classification over 1995-2009:

One-to-one relationship

OLD CODE	NEW CODE
04031022 →	04031011

Action: replace old code with new code.

Merger

OLD CODE	NEW CODE
04031022	04031011
04031004	
04031024	

Action: replace old code with new code

Split

OLD CODE	NEW CODE
04031022	04031011
	04031013
	04031019

Action: replace new code with old code.

Non-unique transactions.

OLD CODE	NEW CODE
04031022	04031011
04031004	04031013
04031024	04031019

Solution – set the code missing everywhere, because it is not possible to determine, what the sequence or continuity of some of the particular export product definitions *i* was in next periods in the CN classification.

The table below describes the frequency of the various transactions, both in the file of transactions, and in the data file. As we can see, roughly the transactions influence about 10 per cent of the product codes, 5 per cent of the product varieties and 5-10 per cent (depending of the period) of the export volumes.

Correction

For the practical implementation of the corrections, a Stata do-file was written. Basically, a new product code was derived by going through these 2 steps.

1st step: correct for split and one-to-one change. Start with the last year (e.g. 2009), then merge product code with transactions in year 2009 and make the corrections, then repeat it for 2008, etc. until the first year in the dataset (i.e. 1995). It is done separately for different years, because the same code could be changed in different years (e.g. there could be one-to-one change in code in 2008, but split in 2005).

2nd step: correct for merger and one-to-one change. Start with the first year (e.g. transformations in year 1995) and move forward until the last year in the dataset (i.e. 2009). Analogously to previous step, the year-by-year correction accounts for the possibility that the same code could be in changed in different years. Thus, in most cases the new code is the one valid in 2009 (while in case of splits that could be also one of the earlier years). Alternatively, one may want to choose also a different end year (e.g. if analyzing only data before EU enlargement, 2003).

The lower level (i.e. 6-digit) codes are derived from the new 8-digit code. If the 6-digit code involves 8-digit products, for some of which the new code is missing (as there were some transformations for which the continuity of particular product could not be identified), the new 6-digit code is also set as missing.

The Stata do-file is available from upon request. If you use it, then please cite the current paper.

Table B1 Share of different kinds of transformations of the CN commodity code in the data

Period	Transformation	Number of observations in the transformations files	Number of observations in the exports files	Share of observations in the transformations files	Share of observations in the exports files	Share of exports in the exports files
2003-2009	1-to-1	412	4482	0.9%	0.3%	0.6%
2003-2009	Merge	1766	16264	3.9%	1.2%	1.7%
2003-2009	Non-unique	2007	37778	4.5%	2.8%	6.1%
2003-2009	No transaction	40499	1259063	90.0%	94.9%	90.8%
2003-2009	Split	294	9731	0.7%	0.7%	0.8%
1999-2003	1-to-1	318	3436	1.0%	0.5%	1.3%
1999-2003	Merge	772	4659	2.4%	0.7%	0.5%
1999-2003	Non-unique	1189	14618	3.7%	2.1%	2.7%
1999-2003	No transaction	29986	669893	92.1%	96.2%	95.1%
1999-2003	Split	298	3460	0.9%	0.5%	0.4%
1995-2000	1-to-1	439	1275	1.2%	0.2%	0.1%
1995-2000	Merge	1112	4613	3.1%	0.8%	0.9%
1995-2000	Non-unique	897	9066	2.5%	1.7%	1.4%

1995-2000	No transaction	32640	521872	90.9%	95.4%	96.4%
1995-2000	Split	834	10166	2.3%	1.9%	1.3%
1995-2009	1-to-1	1161	9178	1.2%	0.4%	0.9%
1995-2009	Merge	2992	21085	3.2%	1.0%	1.2%
1995-2009	Non-unique	3885	58937	4.1%	2.7%	5.0%
1995-2009	No transaction	84785	2063764	90.0%	94.9%	92.0%
1995-2009	Split	1384	22445	1.5%	1.0%	0.8%

Appendix C. Export sales by products

Table C1. Mean distribution of sales by the number of products

Rank in exports	Number of products exported, 4-digit									
	1	2	3	4	5	6	7	8	9	10
1st	1.00	0.89	0.87	0.82	0.83	0.83	0.78	0.75	0.84	0.74
2		0.11	0.12	0.14	0.13	0.12	0.14	0.16	0.09	0.17
3			0.02	0.04	0.03	0.04	0.05	0.05	0.04	0.05
4				0.01	0.01	0.01	0.02	0.02	0.02	0.02
5					0.00	0.00	0.01	0.01	0.01	0.01
6						0.00	0.00	0.00	0.00	0.01
7							0.00	0.00	0.00	0.00
8								0.00	0.00	0.00
9									0.00	0.00
10										0.00
	Number of products exported, 5-digit									
	1	2	3	4	5	6	7	8	9	10
1st	1.00	0.90	0.82	0.78	0.77	0.80	0.74	0.73	0.71	0.75
2		0.10	0.14	0.16	0.16	0.13	0.16	0.16	0.17	0.14
3			0.03	0.05	0.05	0.05	0.06	0.07	0.06	0.06
4				0.01	0.01	0.02	0.03	0.03	0.03	0.02
5					0.00	0.01	0.01	0.01	0.02	0.01
6						0.00	0.00	0.01	0.01	0.01
7							0.00	0.00	0.00	0.00
8								0.00	0.00	0.00
9									0.00	0.00
10										0.00
	Number of products exported, 6-digit									
	1	2	3	4	5	6	7	8	9	10
1st	1.00	0.89	0.81	0.78	0.76	0.79	0.69	0.73	0.68	0.69
2		0.11	0.15	0.16	0.18	0.14	0.18	0.15	0.18	0.17
3			0.03	0.05	0.05	0.05	0.07	0.07	0.07	0.07
4				0.01	0.01	0.02	0.03	0.03	0.03	0.03
5					0.00	0.01	0.01	0.01	0.02	0.02
6						0.00	0.01	0.01	0.01	0.01
7							0.00	0.00	0.00	0.00
8								0.00	0.00	0.00
9									0.00	0.00
10										0.00

Note. Each cell shows the average share of product in firm's total exports in descending order. The numbers are averages over firms and time. Only firms exporting up to 10 products are shown in the table.