Exports Dynamics: Raising Developing Countries Exports Survival through Experience

Céline Carrère
University of Geneva, CEPR and FERDI

Vanessa Strauss-Kahn
ESCP Europe and CEPII

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Abstract

This paper focuses on developing countries exports to the OECD and obtains several important results on export dynamic, linking exports experience and exports survival. It also provides insights on the role of preferential trade agreements (PTAs) in facilitating export experience and thus survival. Using product level data at the SITC 5 digit level for the 1962-2009 period, we show that prior exports experience obtained in non-OCDE markets increases survival in OECD markets. The effect of experience depreciates however rapidly with time: gaining experience for more than two years is worthless. Moreover, a break in export experience prior to entering the OECD reduces the benefit on survival. Geographic export dynamic reveals that experience is acquired in neighbor, easy to access markets before reaching more distant, richer partners and ultimately serving the OECD. PTAs among developing countries thus help exporters finding partners where to learn about their export potential. Finally, exporters may acquire experience directly within the OECD market trough a process of trial and error. By facilitating this process, PTAs between developing countries and the OECD help boosting survival in the long run.

Keywords: duration of export, survival analysis, experience and learning, developing countries

JEL codes: C41, F10, F14, O50

1. Introduction

In a World Bank survey on African export survival conducted by the International Trade Department of the World Bank and reported in Cadot et al. (2011) most respondent suggested an export strategy where experience matters: products are first tested on the domestic market, then exported to regional markets before reaching more distant markets. Such firms' behavior is described in Albornoz et al. (2012) as "sequential exports".

We posit that trade abilities and quality/ fit of exported product from developing countries to OECD markets depends on or may be revealed by previous experience notably on non-OECD markets. By acquiring experience on how to export and to improve their products, exporters increase the likelihood of surviving in the OECD exigent market. Such conjecture is in line with theoretical predictions of Rauch and Watson (2003) or Cadot, Carrere, Strauss-Kahn (2011) who model developed countries' search for developing country suppliers.

We analyze the role of dynamic experience in explaining exports survival in OECD markets and provide several empirical evidence concerning the dynamic of exports and the depreciation of experience. We also propose new unexpected results on the role of preferential trade agreement in boosting developing countries exports. More specifically, we explore empirically the impact of prior export experience in non-OECD countries on export survival in the OECD market. Experience acquired within the OECD trough a process of trial and errors is also considered. Such an analysis does not lack relevant policy implications for developing countries in search for long term export strategies.

We find that the timing of experience matters: one year of experience prior to reaching OECD markets drastically decrease the hazard rate. The impact of experience depreciates rapidly with time: Acquiring experience for two consecutive years prior to serving the OECD enhances survival; getting more years of experience is worthless. Moreover, a break in exports experience prior to entering the OECD market reduces the benefit on survival. Whereas exports experience acquired two or three years before entering the OECD still matter for survival, years of experience gained further in the past have no impact on export hazard rates.

Export experience is first acquired in the closest non-OECD market. Through time, it occurs in more distant, richer, and less accessible markets (i.e., with less preferential trade agreements, PTAs). We show that having more PTAs, and preferably with rich and close markets, allows acquiring more experience, which ultimately leads to higher survival in the OECD. We find however that non-OECD partner's characteristics do not directly impact

export duration. What matters is to get experience on your product, not where it was acquired.

Finally, we analyze another channel through which experience may be gained. We show that survival in the OECD increases with the number of existing previous spell within that market -- Exporters acquire experience directly within the OECD market through a process of trial and error. Strikingly, having a PTA with the OECD reduces survival as it allows entry of "bad" exporters that do not last long on OECD markets. We show however that by facilitating the trial and error process within the OECD, these PTAs help boosting survival in the long run.

The role of prior experience on firms' entry in export markets has received great interest both theoretically and empirically. Albornoz et al. (2012)'s paper offers a relevant framework.[1] The rationale behind studying the role of export experience on survival lies in the idea that exporters are initially uncertain about their export profitability. If export success depends on the exporter ability to trade or on its products quality, a first export experience would reveal such information. Through entry in a foreign market, exporters thus refine their expectations about future success in the entered market but also in other destinations.

Early empirical studies demonstrate that past export experience increase the likelihood of being an exporter today (e.g., Roberts and Tybout 1997, Evenett and Venables 2002 or Bernard and Jensen 2004). More recent empirical papers using firm level data show that exporting a product to a country increases the likelihood of selling the same product to another foreign market (Eaton et al. 2008 for Colombia, Albornoz et al. 2012 for Argentina, Lawless 2011 for Ireland and Ozler et al. 2009 for Turkey). These papers focus on entry and do not provide insights on the role of experience on export duration. Moreover, most of the literature analyzes the impact of one period of experience on entry but do not explore dynamic experience further in the past. Following Besedeš and Prusa (2011), we believe that what matters for trade deepening and export growth of developing countries is export survival not just foreign markets entry.

Whereas some findings on the role of experience emerge in the literature on markets entry, the literature on the determinants of export survival have much less to say on the topic. Experience, when included in the analysis, is viewed as a static phenomenon,

[1] Eaton et al. (2012) as well as Freund and Pierola (2010) also provide theoretical ground for the analysis of the role of export experience on entry in new foreign market. These papers do not however consider how experience may be acquired in other markets than the final targeted destination market.

capturing the state of a firm exports at the time it enters a new market. Experience is indeed measured by the number of product sold or the number of destinations reached by the exporter at the time it reaches a new export destination (Volpe and Carbello, 2008, Nitsch, 2009, Brenton et al., 2010 and Cadot et al. 2011). None of these studies investigates the dynamic of experience nor approaches experience as a sequential/continuous variable. We believe that exploring the dynamic of experience would enhance our understanding of the determinant of exports survival and entail relevant policy advises.

We focus on developing countries export to OECD markets. Thanks to preferential trade agreements and/or aid for trade from the OECD, the issue for developing countries is not so much on how to enter but rather on how to survive in OECD export market.[2] All of the 165 non-OECD countries included in our sample have exported several products (defined at the SITC level) to the OECD market over the 1962-2009 period (e.g., the yearly average is of 624 products) and report multiple spells for a given product. These exports are however very short-lived: 56% do not survive the first year while 84% are dead after five years. The situation is even worse for low-income countries: 63% of exports do not survive their first year in OECD markets. Our focus on survival rather than entry for developing countries thus seems particularly relevant.

We decided to focus on aggregate level data (5 digit SITC level) for the following reasons. First, accounting for dynamic experience and survival requires a very large time span. We need to observe exports for several years prior to entering the OECD market as well as many years of exports to the OECD for survival. We are not aware of firm level databases that would provide enough years of data for such an analysis. Second, the role of experience on survival might differ greatly across countries (e.g., important Diaspora, long term export subventions, etc.).[3] By using cross-section product-level data, we provide a global view of the role of export experience on survival controlling for country specific characteristics. Third, whereas export experience and export toward the OECD of a given product may come from different firms, it should not bias our results significantly. As revealed for example by Cadot et al (2011), synergies and information spillovers between firms are important.

[2] Following Besedeš and Prusa (2006a)'s seminal work which reveals the short duration of trade spells, several subsequent studies covering different countries and periods confirmed that trade spells are short lived. For example, Eaton et al. (2008) observe that many Colombian firms enter foreign markets every year. They also find however that almost half of them cease exporting in less than one year.

[3] Rauch and Trindade (2002) show that the existence of Chinese Diaspora creates networks that facilitate bilateral trade.

[4]This is especially true in developing countries where the number of firms per sector is low and the role of export agencies may be important. Finally, in an economic development perspective, it makes sense to focus on survival of exports flows at the countries level rather that at the firm level. Our work thus complements firm level studies on similar topics and enhances the existing product level literature on export survival.

The remainder of the paper is organized as follows. Section 2 presents data, definitions of export spells and basic export survival analysis. Section 3 examines the dynamic of experience. It explores the role of exports experience on exports survival focusing on the timing of experience. Section 4 investigates the characteristics of countries in which exporters acquire experience and ask whether the origin of experience matters for survival. Section 5 presents another way to gain experience, i.e. within the targeted OECD market. Section 7 concludes.

2. Theoretical Background, Data and Basic Survival Analysis

2.1 Theoretical Background (to be completed)

Theoretical heterogeneous firms' model (e.g., Bernard et al. 2003 and Melitz 2003) and models with sunk cost and export hysteresis (e.g., Baldwin and Krugman 1989 and Das et al. 2007) have rationalized several observed trade patterns and most importantly why few firms exports. They however stay silent on the high rate of failure in export markets. Rauch and Watson (2003) and Cadot, Carrere, Strauss-Kahn (2011) provide insight on this high level of entry and exit in foreign markets. They built frameworks where developed countries' search for developing country suppliers in state of uncertainty on the ability of suppliers to fulfill orders. If exporters fail, the trade relationship is terminated.

Recent papers on the dynamics of exports (e.g., Freund and Pierola 2010 and Eaton et al. 2012) also introduce uncertainty in the trade relationship. In these papers exporters face uncertain about their ability to export (e,g, number of buyers, export fixed or variable cost…), such ability is revealed through export experience. Other papers investigates the sequence of entry into new markets and show that export experience in a market raise the likelihood of entering subsequent markets by reducing the associated uncertainty (e.g., Lawless 2011, Chaney 2011, Albornoz et al. 2012, Defever et al. 2010, Morales et al. 2012 and Nguyen 2012). This stems from the correlation in profitability across time and destinations.

4 Freund and Pierola (2010) report anecdotal evidence about Peruvian export of paprika, which confirms the information spillovers across local producers.

Exporters use their initial export experience to infer information on their future success in that market and elsewhere. Correlation across countries may come from similarities in demand (e.g., consumer's taste and networks) or supply (e.g., learning about export finance and insurance, maintenance of export department within the firm, distribution and customs procedures).

Albornoz et al. (2012)'s paper offers an interesting framework in order to understand how prior experience matters for export duration. In their model the source of uncertainty regarding firms' ability to earn profits abroad is quite general (not necessarily liked to demand patterns as in other models) and can be resolved only through experience in foreign markets. Through entry in a foreign market, the firm refines its expectations about future profit in the entered market and elsewhere. Albornoz et al. (2012), s theoretical findings on sequential exporting essentially concerns entry. Our analysis confirm, in the context of survival, several of their predictions concerning the role of prior export experience, the consequence of breaks in experience and the type of goods which benefit more from export experience.

2.2 Data and Definition

We study the role of experience in export survival using 5 digit level SITC data (using the backwards classification – revision 1) over the 1962-2010 period. The database encompasses 165 non-OECD exporters (including 133 developing countries).[5] We consider these countries' exports toward the OECD market.[6] The composition of the sample is further described in Table A1 in the Appendix.

We exclude from the database mineral fuel (SITC section 3) and arm products (SITC section 9) which specificities are likely to bias the results. We thus consider 1,268 products. Import data tend to be more reliable than export data, especially for non-OECD countries, we thus follow the common strategy of using mirror statistics (imports as declared by the OECD countries from all available exporters).

The period considered (47 years of trade data) is long enough for export survival analysis. Prior studies, with the exception of Hess and Person (2011), do not go back that far in time (e.g., Brenton et al. 2010 focus on the 1985-2005 period). We drop from the sample all countries that do not report any exports to the world for at least 10 consecutive years. Following Besedeš and Prusa (2006a), a "new" export of country i to the OECD market corresponds to a product that was not exported in year $t-1$ but is exported in t.[7] As a first step, we do not impose any minimum export value for new export. We will however test for the robustness of our results by imposing a minimum of 1000 $ as done in Besedeš and Prusa (2006a) or Brenton et al. (2010).

We do not consider an export as "new" if the first year of positive trade corresponds to the first years of reporting data. We thus drop left-censored data, i.e., if the first year of exports coincides with the first year of reported trade data, the observation (i.e., the spell) is dropped from the analysis. By contrast, the sample still includes trade flows that are positive in the last years of our sample (2009)

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[5] The distinction between developed and developing countries follows the World Bank definition. Developing countries encompass all non high income countries in the database.

[6] The definition of OECD used in this paper includes 24 OECD high-income countries. It corresponds to all pre-1973 OECD countries plus Korea, i.e. Australia, Austria, Canada, Denmark, Finland, France, Italy, Japan, Germany, Belgium, Luxembourg, Spain, Greece, Ireland, Iceland, Korea, Netherland, Norway, New-Zealand, Portugal, Sweden, Switzerland, United Kingdom and United States.

[7] We also test robustness using alternative – and more restrictive - definitions of new products. Further information on this robustness is given below.

and for which we do not have any information on how long they will last. These right-censored data are not an issue as econometric techniques handle them easily.

The final sample thus includes 62,031 trade relationships (defined as a product being sent to the OECD from a given exporter) or 277,477 trade spells (defined as a period of time with an uninterrupted product export from a given country to the OECD market). As well described by Besedeš and Prusa (2011), the Kaplan-Meier estimator can be used as a first step to non-parametrically characterize survival functions by providing the fraction of spells that will survive at least t years. Figure A1 in Annex 1 provides the survival function by income groups. The spell duration (calculated as the number of consecutive years with non-zero data and reported in Table A2 in Annex 1), is of only 1 year for 56% of the sample, of 2 years for 15% of the sample with a maximum of 47 years for 0.2% of the export spells. Interestingly, only 26.6% of the trade relationships correspond to a one-shot export spells over the period, the remaining face multiple spells within the OECD market (from 1 to a maximum of 15). We will make use of the full sample including multiple spells within the OECD in Section 5, where we focus on experience acquired within the OECD market through a trial and error process.

We first study the experience gained on non-OECD markets prior to entering the OECD for the "first" time. Such analysis requires a slight modification of the database. We focus on the sub-sample of first export spells to OECD markets. We do this in order to insure that we are capturing new export spells for which prior non-OECD experience is easily identifiable. Our sample size is thus reduced to 62,031 spells (this sub-sample is used in Section 3 and 4).[8]

2.3 Basic Survival Analysis

About half of these 62,031 first spells acquire experience before serving the OECD markets. Table 1 provides an overview of the timing profile of this prior experience. The experience in non-OECD market occurs in the few years preceding entry (one to five years).[9] Whereas 42.2% of the spells acquires experience for at least

[8] Given our definition of "new" products, a "first" spell may start in 1963. Unfortunately, our data being left censored, we cannot guaranty that such spell is the very first one to the OECD market. Importantly, only 10 % of the sub-sample of "first" spells occurs before 1972, so that the left censored nature of our data is unlikely to affect our result significantly. We test robustness using only post-1980 first spells in the econometric analysis.

[9] We also take into account left-censoring in pre-OECD experience. As for export to the OECD, if the first year of export to any market (where

one year prior to entry the OECD, few spells have experience for more than two years. Interruption in experience is also quite significant with 22.3% of the spells having no experience in the year preceding entry while there is experience two or three years before serving the OECD markets.

Table 1. Time profile of continuous (i.e. without breaks) experience prior to entering the OECD market.

Previous experience	28,611	100.0%
Exp.. in t-1	*12,068*	*42.2%*
including:		
Exp t-2 /Exp t-1=1	2,062	7.2%
Exp t-3/Exp t-1=1 & Exp t-2=1	1,171	4.1%
Exp t-4/Exp t-1=1 & ... & Exp t-3=1	774	2.7%
Exp t-5/Exp t-1=1 & ... & Exp t-4=1	2793	9.8%
Exp≥ t-6/Exp t-1=1 & ... & Exp t-5=1	0	0.0%
Exp. older than in t-1	*16,543*	*57.8%*

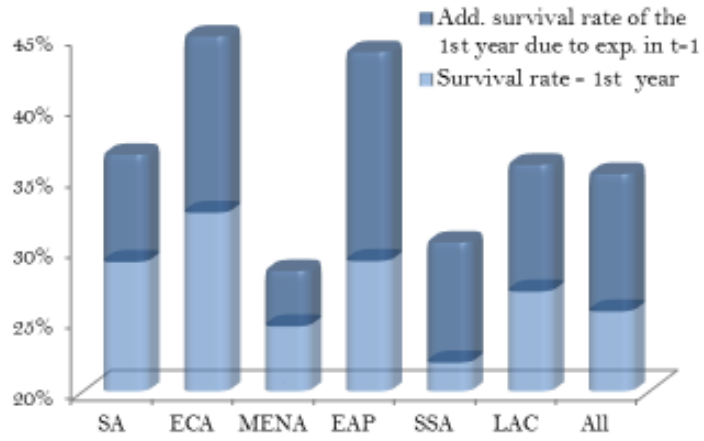
Source: Authors' computation from COMTRADE's database

Figure 1 shows the increase in survival rate (after one year of export to the OECD) consequent to having an export experience in the year prior to entering the OECD and reveals an important impact of non-OECD prior export experience on survival. Over all developing exporters, prior experience in t-1 raises the survival rate by 9.7 percentage point or 33.4%.

In order to correctly apprehend the impact of experience on export survival one should however control for variables that may influence survival rates such as country and spells size as well as specific links with the OECD (e.g., distance, contiguity but also non-reciprocal preferential schemes). This is what we ought to do in the next section through the estimation of continuous-time (Cox model) and discrete-time model (random effect probit).

experience is acquired) coincides with the first year of reported trade data, the observation (i.e., the spell) is dropped from the analysis.

Figure 1. Additional survival rate in OECD market for the first spells with or without experience in t-1, 1962-2009



Note: based on Kaplan-Meier survival function of DC's exports on OECD market. (details are given in annex 4). SA stands for South Asia, ECA for Europe and Central Asia, MENA for Middle East and North Africa, EAP for East Asia and Pacific, SSA for Sub-Saharan Africa, LAC for Latin America and Caribbean.
Source: Authors' computation from COMTRADE's database

3. The dynamic of experience matters for survival

3.1 Control variables and methodology

We investigate the timing profile of a product exports before its first entry into the OECD market, allowing for dynamic experience in non-OECD countries. Such experience allows the exporter to learn about its ability to sale in foreign markets as well as about the quality and/or fit of its products. We thus need to construct a product-level measure of experience.

Three measures reflecting the timing profile of experience are introduced into the analysis. The first one is a dummy variable at the exporter-product level which takes a value of 1 if there is a prior experience on non-OECD market before reaching the OECD. The second one accounts for the number of consecutive years of prior experience acquired before entry into the OECD market. This measure captures the impact on survival of export experience in t-1 but also potential additional impacts of already being an exporter in t-2, t-3, etc. Finally, the third variable specifies whether the experience in non-OECD markets occurred just before entry in OECD markets or whether it was an older interrupted experience. That is: does experience in say t-2, while that was no export experience in t-1, also matters? These latter sets of variables allow us to approximate a kind of "depreciation" rate in experience.

We run survival analysis including dynamic experience variables and, as controls, other common variables found in the survival literature (e.g., Besedeš and Prusa 2006b, Fugazza and Molina 2009 or Brenton et al. 2010). Such variables consistently and significantly impact the hazard rate. They include the initial export value, GDP, market access, the number of exporters of the same products to the OECD market and a dummy variable capturing whether the trade relationship consists on several spells. These variables are further described in Appendix 2. "Gravity-type" variables such as geographical distance and contiguity are controlled for with exporter fixed effects. Finally, as in Nitsch (2009), Brenton et al. (2010), Volpe and Carballo (2008) or Cadot et al. (2011), we also include variables capturing static experiences (i.e., market and product experience) as defined below.

For a new export of product *i* to the OECD by exporter *j* in *t*, "static" experience is defined as: (i) the *"current product experience"*, i.e. the number of non-OECD countries to whom product *i* is exported from country *j* at time *t*; (ii) the *"current market experience"*, i.e. the numbers of products other than *i* exported to the OECD in *t*.[10] In contrast with the dynamic measures of experience defined above, contemporaneous measures do not refer to the life cycle of the product and may actually correspond to exporters' geographic risk diversification or market access. Contemporaneous measures do not capture the impact of dynamic export experience on survival.

In order to assess the impact of experience on the hazard rate, we first use the most popular semi-parametric continuous Cox (1972) survival model. Our Cox model is stratified in order to take into account unobserved heterogeneity at the product level (as in, e.g., Brenton et al. 2010), so that we do not force the baseline hazard to be proportional across products. We also introduce year and exporter fixed effects.

Finally, Following Araujo et al. (2012) or Hess and Persson (2010), we also check for robustness by using discrete-time probit model with random effects, which, in addition to properly account for unobserved heterogeneity, also solve for the potential intrinsic non-proportionality effects of explanatory variables. We consider a binary dependent variable that takes value 1 if the exporting country, which entered OECD market in year t for product *i*, is still exporting this product to the OECD market after k periods. The vector of control variables in the case of the probit is the same as in the Cox model.[11] In addition to the SITC product random effects,

[10] Note that Brenton et al. (2010) use a variant of static experience, i.e. they measure the exporter sales of the product in other foreign countries and its total export sales in the new destination.

[11] i.e. value in t of the initial export value, GDP, market access, the number of exporters of the same products to the OECD market, and the two

we introduce fixed effects for exporter countries and calendar years. We follow Araujo et al. (2012) and run a probit for each k and report in appendix A3 table A6 results for k= 1, 2, 5, 10. Estimating a probit for every k imposes much less restrictions on the time profile of survival than a hazard function as the effects of explanatory variables may vary across the survival period.

3.2 Time dynamic of experience

We report in table 2 the marginal coefficients of the Cox estimates. Acquiring export experience before entering OECD markets clearly matters. As shown in col. (2) and (3) of Table 2, having at least one year of prior experience before entering OECD markets counts for survival (i.e., it decreases significantly the export hazard rate). However, two years of experience just before entry to the OECD markets is enough for a country to experiment its export profitability. A country having two years of experience has the same exporting hazard rate than countries with additional years of experience. These results can be seen in columns (3) where the coefficient on experience in t-1 is negative and highly significant whereas the coefficient on t-2 loses in size but remains significant and coefficient on t-3 and further dates are not significant. Thus, only the two consecutive years of experience prior to entering the OECD market matters for export survival.

The estimation in column (4) confirms and adds to this result. Countries that have recent export experience are more likely to survive. Recent experience matters much more in terms of lowering the hazard rate than experience that occurred further in the past (in our case older than t-3). The effect of experience thus decreases rapidly over time. Having at least one year of export experience in t-2 instead of t-1 decreases the impact on that experience on the survival rate by 0.8 percentage point, i.e. by about 15%. Having at least one year of export experience in t-3 instead of t-1 decreases the impact on that experience on the survival rate by 39%. Having an experience older than 3 years in the past does not help surviving longer on the OECD market. This strong depreciation rate is in line with results obtained at the firm level by Ozler et al. (2009) on the probability of entry into a new market. They find that the likelihood of exporting to new markets for a plant that exported 2 years ago is 79% lower than the likelihood for a plant that exported one year ago (see also Robert and Tybout 1997). Using a large and lengthy country level database, we find that the depreciation of experience matters not only for entry but also for survival.

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variables of current market and product experiences. As in Araujo et al. (2012), for some country variables (i.e., GDP and market access), we introduce growth between period t and t +k in addition to the level of these variables. Our results are unchanged.

Table 2: Dynamic Experience in non-OECD markets and Survival of first spells, 1962-2009.

Developing countries											
		(1)		(2)		(3)		(4)		(5)	
Initial Value	*ln*	-0.053	a/	-0.053	a/	-0.053	a/	-0.053	a/	-0.045	a/
GDP	*ln*	0.001		0.002		0.002		0.003		0.032	
Market Access	*[0;1]*	0.006		0.007		0.007		0.007		0.018	
Competition	*unit=1 country*	-0.003	a/	-0.003	a/	-0.003	a/	-0.003	a/	-0.006	a/
Multiple Spell	*unit=1 spell*	0.349	a/	0.350	a/	0.349	a/	0.350	a/	0.401	a/
Current Market exp.	*unit=1 product*	-0.001	a/	-0.001	a/	-0.001	a/	-0.001	a/	-0.0004	a/
Current Product exp.	*unit=1 country*	-0.053	a/	-0.051	a/	-0.046	a/	-0.046	a/	-0.047	a/
Prev. Product Exp.	*dummy*			-0.032	a/						
Exp t-1	*dummy*					-0.035	a/	-0.054	a/	-0.060	a/
Exp t-2 /Exp t-1=1	*dummy*					-0.025	c/				
Exp≥ t-3/Exp t-1=1 & Exp t-2=1	*dummy*					-0.012					
Exp≥ t-4/Exp t-1=1 & Exp t-2=1 & Exp t-3=1	*dummy*					0.034					
Exp t-2 /Exp t-1=0	*dummy*							-0.046	a/		
Exp≥ t-3/Exp t-1=0 & Exp t-2=0	*dummy*							-0.033	a/		
Exp≥ t-4/Exp t-1=0 & Exp t-2=0 & Exp t-3=0	*dummy*							-0.007			
σ										0.001	c/
σ. Exp t-1										0.001	a/
Model		Cox		Cox		Cox		Cox		Cox	
Year FE		yes		yes		yes		yes		yes	
Exporter FE		yes		yes		yes		yes		yes	
Product stratification		yes		yes		yes		yes		no	
Nber of Spells		62,031		62,031		62,031		62,031		36,668	
log likelihood		-210,805		-210,801		-210,799		-210,796		-349,394	

We report the marginal coefficients of the Cox estimates. Sample: survival, on the OECD market, of exports from developing countries, sub-sample of first spells. a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust standard error.

Source: Authors' computation from COMTRADE's database

In order to test for robustness, we reduce the sample to spells with initial values above 1,000 US$. Results obtained with this sub-sample of large spells are provided in Table A3 in Appendix 3. We also report in table A4 robustness test for alternative definitions of first spells. In order to be more restrictive on what we call "first" spell (accounting for potential left censoring issues), we then restricted our sample to the post-1980 first spells. Results are report in table A5. Finally, Table A6 provides results using the discrete-time probit model described above. It reports result of survival analysis of length 1, 2, 5 and 10 years. Note that results are very

robust across specifications, especially regarding to the experience variables. The sign and significance of the experience coefficients in the survival analysis after k years is confirmed by the probit analysis: the likelihood that an exporter to the OECD market will still serve that market after k years increases with the previous experience of the country. And the magnitude of the effect is far from negligible. For example, using the unconditional probability of survival as reference, having a previous experience before entering the OECD market would increase the probability of survival of an exporter after one year by more than 28% ($1 \times 0.068/0.242$, see col. 1 table A6). After 5 years, the impact of experience is clearly important: a previous experience more than double the probability of surviving.

As expected, higher values of initial exports reduce the hazard of exporting.[12] This finding corroborates previous results on export duration. Market access and GDP variables are insignificant once the exporter fixed effects are included.[13] Note however that, interestingly, the market access variable enters with a positive coefficient. This suggests that having a higher PTA index and therefore a facilitated access to OECD markets would reduce survival. This surprising result is further analyzed in Section 5.

Unexpectedly, the tougher the competition on the OECD market for a given SITC product (i.e. the higher the number of competitors on the OECD market), the lower the exporting hazard. Cadot et al. (2011) find similar results at the firm level (i.e., the existence of other firms exporting the same product to the same destination increase survival in export markets) and interpret it as synergy effects. In our case, it more likely reflects high demand in OECD markets for specific products originating from developing countries. That is: for a given product, the market exists and is large.

As for the multiple spells variable, it shows the expected positive sign, suggesting that first spells in multiple-spells relationships are systematically shorter than in single-spell relationships.

Importantly, our results clearly suggest that static export experience is product, rather than market specific. Selling the product to an additional destination country reduces the hazard by approximately 5 percentage points (pp) while introducing an

[12] Note that, in our sample, an exporter benefiting from a previous export experience starts on the OECD market with a significant higher value of initial export (by around 35%) than an average exporter without experience.

[13] This is to be expected as the time dimension of this survival model depends on having sufficient variation at the first export-product level for a country over the period.

additional product on the OECD market lowers the hazard by a much lower 0.1 pp. These results are in line with the findings obtained by Volpe and Carballo (2008) on Peruvian firm data and by Brenton et al. (2010) on aggregate data for a shorter time span than ours.

Finally, we confirm in column (5) one of the predictions of Albornoz et al. (2012)'s model: experience matters more for differentiated good than for homogeneous one. We test for this hypothesis using our experience measures interacted with the elasticity of substitution between varieties as estimated by Broda et al. (2006) for the US over 1994 – 2003 at the HS-3 digit and denoted by σ. The interaction of experience and the elasticity of substitution has indeed a positive impact, implying that experience lower less the exporting hazard when σ is high, i.e. when goods are more substitutable. Note also that the introduction of the elasticity of substitution alone confirms one of the results found in survival analysis namely that differentiated goods survive the longest. This is probably due to the fact that exporters of homogenous goods face fiercer competition in international market (see Fugazza and Molina, 2009 or Besedeš and Prusa 2006a).[14]

4. Acquiring experience.

We established in section 3 that recent experience in non-OECD countries prior to serving the OECD market notably increases exports survival. In term of timing, exporting in the year preceding OECD entry is the experience that matters. We now focus on OECD pre-entry and ask the three following questions: Where do exporters gain their experience? What can help developing countries in their search for experience? Does survival depend on where the experience was acquired?

4.1 Geographic dynamic of experience

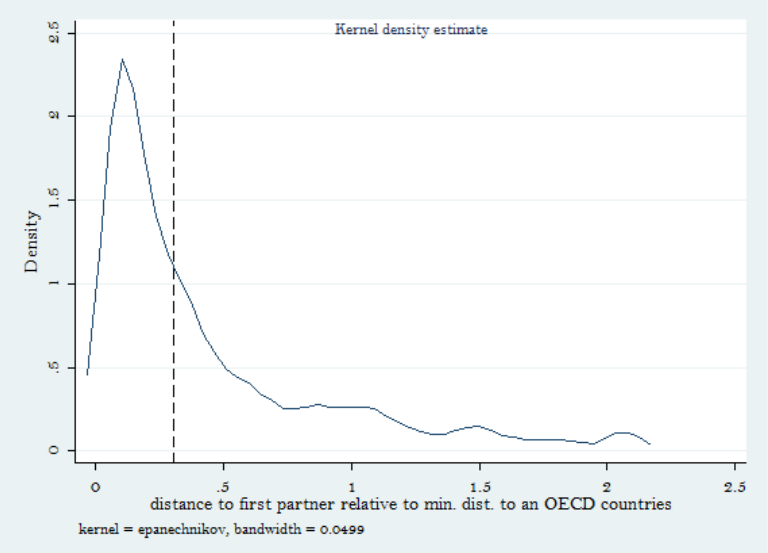
Knowing that accumulating experience is primordial for export survival in the OECD, leads to the natural question of where the experience is acquired. The literature on foreign market entry provides several insights. Recent theoretical and empirical literature emphasize that countries are more likely to export (i.e, export expansion at the extensive margin) to markets that are larger, geographically closer and share a common language (e.g., Eaton and Kortum 2002 and Helpman et al. 2008). More specifically, several recent studies show that trying products on neighbor markets

[14] The number of observations is drastically reduced when σ is introducing due to data availability and classification conversion (from HS-3 digit to SITC rev.1 - 5 digits). Importantly, coefficients on variables are very stable.

increase the likelihood of entry in subsequent, more distant markets. Evenett and Venables (2002) work at the country level and document a "geographic spread of exports" where exporting to a given country is more likely if the product is already sold in neighboring countries. In the same vein, Eaton et al. (2008) show that once a Colombian firm exports to both its neighbors and other Latin American destinations, it enjoys 24% chances to expand further to reach an OECD market. Closeness thus stands out, among other characteristics, as an essential determinant of entry, suggesting that developing countries may look for experience in the most accessible markets.

We analyze the ratio of the distance between the exporter and its non-OECD partner to its minimum distance with the OECD and find an interesting pattern. Figure 2 represents the kernel distribution of this ratio, the dashed line being the median. The Figure shows that 75% of the observations present a ratio significantly lower than 1 which suggests that non-OECD export partners where experience is acquired tend to be closer to the exporter than the OECD market. Exporters likely use their neighbors in order to test their export ability and get experience before reaching the more distant OECD market.

Figure 2: Kernel density of the distance between the exporter and its non-OECD partner relative to the minimum distance between the exporter and the OECD market.



Note: the 10% observations with the highest ratio are not reported here.
Source: Authors' computation from COMTRADE's database

As an important piece of evidence on the geographic dynamic of experience, we study the evolution of exports for exporters that report five consecutive years of exports experience before serving

the OECD markets. Such exporters commonly add partners over the period. In the year prior to entry into the OECD market (i.e., t-1), we thus compare the characteristics of old and new non-OECD partners. Old partners refer to partners that were already present in t-5 (on average 2 per exporter/product, with a maximum of 12), whereas new partners are the new markets served by the exporter in t-1. These new partners represent 53% of the total number of non-OECD partners in t-1.

Table 3. Comparison of non-OECD partners between t-5 and t-1 (average over new partners vs. old ones in t-1)

New	obs.	Contiguity	Same Language	Distance	PTA	GDPpc
Trad. Partners	5564	0.454	0.798	1336.7	0.515	3926.4
New partners	6734	0.261	0.622	2663.9	0.436	4130.4
Test of mean diff.		*a/*	*a/*	*a/*	*a/*	*b/*
Variation		-42.5%	-22.0%	99.3%	-15.2%	5.2%

. a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%.
Source: Authors' computation from COMTRADE's database

Table 3 clearly shows that new partners are more distant to and have lower PTAs index with the exporter than old partners. New partners also have higher GDP. The first/old partners are also more likely to share frontier and language with the exporter. We thus confirm at the aggregate level several firms entry characteristics revealed by the literature. Our findings are in line with a story where exporters acquire experience in the most accessible markets in term of distance, size and PTAs before serving more distant and larger markets as well as markets outside PTAs.[15]

4.2 How can we boost experience?

We posit that having a better access to non-OECD markets allow exporters to acquire experience at low cost before serving the OECD. As PTAs between developing countries is the potential policy tool, we are especially interested in the role of PTAs in promoting export experience. That is: Do PTAs between developing countries boost export experimentation? In order to verify such conjecture, we test whether the likelihood of gaining experience on non-OECD foreign markets increase with the PTAs index. The previous section points out that exporter tend to acquire experience in close markets, we therefore also introduce a variable that account for distance in the analysis. Our first variable measure market access as a weighted average of the exporter PTAs with

[15] Similarly, Molina (2010) shows a pattern of export dynamic where exports expand from within PTAs member countries to non-members countries.

other non-OECD countries.[16] In our second variable, instead of using countries' GDP as weights, we exploit a measure of each country's distance with the exporter.

Table 4 provides the results. The coefficient on the GDP weighted market access variable is positive and significant. Having preferential trade agreements (PTAs) with other non-OECD countries helps acquiring experience prior to serving the OECD market.[17] Having PTAs with countries close by also increases the likelihood of gaining experience in non-OECD markets. The effect is however of lower importance than the GDP weighted one. Given a shared PTA, the wealth of the partner thus matters. Higher GDP partners represent larger markets which increasing the likelihood of entry and thus of experience within these markets. Alternatively, having a high GDP partner may be relevant because it provides information about trade with wealthy countries and thereby increase survival within the OECD market. This last comment suggests that characteristics of the country where the experience is acquired prior to serving the OECD market may directly impact survival in the OECD. This is what we investigate in the next section.

Table 4. PTAs between non-OECD countries and experience

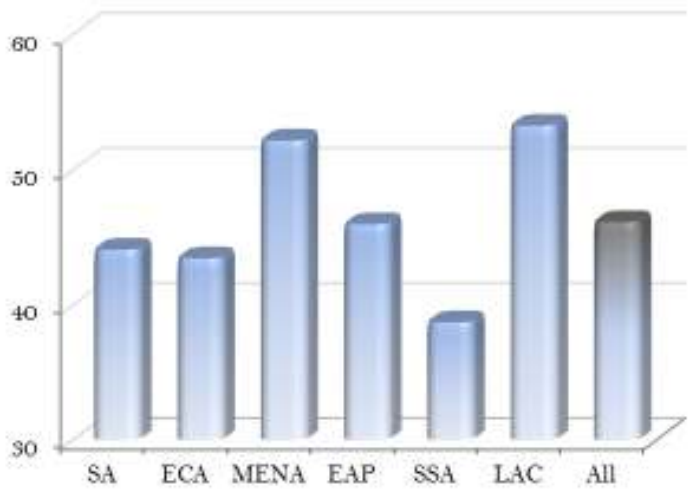
Probit / Experience before entering the OECD market	(1)		(2)	
Market Access in non OECD countries weighted by GDP	3.22	a/	1.08	a/
Market Access in non OECD countries weighted by (1/distance)	0.45	a/	0.24	a/
const.	-0.51	a/	-8.78	a/
Nber of Spells to OECD	62,031		62,031	
log likelihood	-38,748		-29,183	
SITC product Random effects	yes		yes	
Year dummies	no		yes	
Exporter dummies	no		yes	

Sample: survival, on the OECD market, of exports from developing countries, sub-sample of first spells, 1962-2009. a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust Standard Error.
Source: Authors' computation from COMTRADE's database

[16] For a detail explanation of this measure, refer to Annex 2.
[17] These findings confirm Albornoz et al. (2012) prediction that PTAs promote export experience and therefore enhance exports to non-members.

4.3 Does survival depend on where the experience was acquired?

Figure 3. % of first spells to OECD benefiting from a previous product experience on non-OECD market, 1962-2009



Note: SA stands for South Asia, ECA for Europe and Central Asia, MENA for Middle East and North Africa, EAP for East Asia and Pacific, SSA for Sub-Saharan Africa, LAC for Latin America and Caribbean.
Source: Authors' computation from COMTRADE's database

Evenett and Venables (2002), Defever et al. (2010), Lawless (2011) and Morales et al. (2012) find that proximity between prior and targeted export partners in terms of both geography and level of development significantly boosts the probability of entry. Does it matters as well for survival? In order to capture such proximity, we introduce in the equation reported in table 2 col. (3), the 3 following variables: (i) the PTA index between the non-OECD partner and the OECD market; (ii) the geographical minimum distance between this partner and the OECD market and (vi) the GDP of the partner. We also introduce a dummy equal to one if the non-OECD partner is a high income country. Once again, none of these variables seems to have a direct impact on survival rate.

What matters is thus the established experience, wherever it was acquired. Testing your product and your ability to export on a non-OECD country represents important knowledge in order to survive on OECD markets. Such experience may be improved by developing PTAs with the most open non-OECD markets (i.e., the largest and closest markets). Having a high GDP partner help exporters learn about themselves (e.g., quality and fit of product, ability to trade) but not about the destination market (i.e., the OECD). The specificity of the market in which the experience is acquired is not relevant for survival.

5. Another form of experience: acquiring experience within the OECD market.

Prior exports experience matters for survival in subsequent export markets. Exporters may however choose to directly export to the targeted destination market. We thus explore the possibility of experience acquired directly within the destination market through a process of trial and error, i.e., product-market experience. While focusing on prior experience, we needed to capture the timing of experience and the country in which the exporters gathered information on its export profitability; we thus restricted our database to the first spells of export into the OECD market. As we now need to observe the number of spells within the OECD, we make use of the full sample of spells as described in Section 2.

5.1 Acquiring product-market experience within the OECD?

Table 5 reports the marginal coefficient of the Cox estimates, using the full sample. Export experience is captured by counting the number of previous spells within the OECD market at the exporter-product level. As shown in Table 5, the existence of previous spells increases exports duration in OECD markets: product-market experience greatly matters for survival. As reported in col. (1), each prior experience within the OECD market (i.e., a previous spell) decreases the hazard rate by 5 pp.[18] Thanks to these previous spells, exporters infer information about OECD demand and trade specificities that they can exploit in subsequent exports in that market.

Interestingly, and as already mentioned in table 2 on the first spells sub-sample, we find that market access affects the hazard rate with a positive sign: an increase in preferential trade agreements with OECD countries decreases exports survival. This counterintuitive result was also noted by Brenton et al. (2009). They find a negative effect of free trade agreements between low-income developing countries on the survival of their trade spells.[19] An explanation in

[18] As an alternative measure of prior experience within the OECD, we introduce, instead of the number of previous spells, the cumulated numbers of years of these spells. This measure accounts for the number of years of experience accumulated in the OECD market. We obtain a coefficient of -0.031 (other variables' coefficients are unchanged): each additional year of previous experience on the OECD market decrease the hazard rate by 3%. Given that previous spells (i.e. all spells except the last one) last on average about 2 years, results with number of spells and cumulative years are consistent.

[19] Brenton et al. (2009) interprets this finding as PTAs encouraging exports to more hazardous partners.

our context may run as follow: PTAs facilitate entry into OECD markets by reducing the initial search cost for trading partners. Better access thus entails entry of inept exporters or lead to exporting low quality products which do not last long on OECD markets. Thus, whereas PTAs boost trade between members (see e.g., Carrere 2006), it does not improve survival of new exported products, at least in a static framework. The dynamic effect of PTAs on the hazard rate through gaining experience over time tells a different story.

Table 5: Dynamic Experience in OECD markets and Survival

Developing countries		All spells		Spells > 1000$		Last spells		Last spells	
		(1)		(2)		(3)		(4)	
Initial Value	*ln*	-0.067	a/	-0.082	a/	-0.057	a/	-0.059	a/
GDP	*ln*	-2.62E-04	c/	7.46E-03	c/	-8.40E-03		-3.61E-03	
Market Access	*[0;1]*	0.025	c/	0.030	b/	0.036		-0.059	c/
Competition	*unit=1 country*	-0.003	a/	-0.003	a/	0.015	a/	0.014	a/
pre-spell	*unit=1 spell*	-0.049	a/	-0.051	a/	-0.084	a/	-	
Current Market exp.	*unit=1 product*	-0.001	a/	-0.001	a/	0.002	a/	-0.002	a/
Current Product exp.	*unit=1 country*	-0.068	a/	-0.071	a/	-0.098	a/	-0.111	a/
Model		Cox		Cox		Cox		Cox	
Year FE		yes		yes		yes		yes	
Exporter FE		yes		yes		yes		yes	
Product stratification		yes		yes		yes		yes	
Nber of Spells		277,477		230,829		85,891		85,891	
log likelihood		-1,200,173		-961,716		-168,132		-168,511	

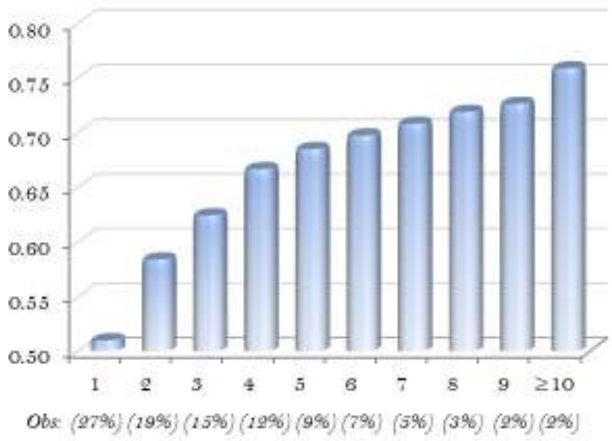
We report the marginal coefficients of the Cox estimates. Sample: survival, on the OECD market, of exports from developing countries, sample of all spells, 1962-2009. a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust Standard error. *Source: Authors' computation from COMTRADE's database*

5.2 The long term role of PTAs between developing countries and the OECD.

The impact of PTAs on export duration through their role in promoting spells should indeed be further examined. PTAs with OECD markets allow exporters to enter and re-enter at low costs. We may thus expect exporters to experience several trials and errors, which may ultimately lead to enhanced exports survival. Higher PTAs indices should thus correlate with higher numbers of spells per product. Figure 4 confirms this hypothesis. For each exporter-SITC products combination, we compute the total number of spells to the OECD over the 1962-2009 period. We then average our PTAs index by number of spells. It clearly appears that large number of spells corresponds to higher market access to the OECD.

As increasing market access is associated with a larger number of spells, given the strong impact of previous spells on the exporting hazard, the long-term effect of improved market access might be a drastic increase in the, *in fine*, survival rate. To illustrate this point, we compute a quite informative exercise. We regress, for each exporter/SITC, the total number of spells over 1962-2009 on the log of the lagged value of the PTA index.[20] Results are reported in Table 6.

Figure 4. Average PTA index according to the number of exporter-product' spells over 1962-2009.



Source: Authors' computation from COMTRADE's database

We find that a 10% increase in market access to the OECD is associated with an increase of minimum two spells – see column (1). Given the coefficient estimated in Table 5 each additional previous spells on the OECD market increases the probability of surviving by roughly 5pp. Then, if OECD markets offer a 20% higher market access to a developing country' product, this country should benefit from a process of trial and error on the OECD market that allows for, in fine, after several tries (4 additional trials for this given product), a decrease in the exported product's probability of failure of at least 20 pp. This is far from negligible. The effect of PTAs is however long run. It takes several spells and even more years for an exporter to develop its knowledge of OECD markets trough experience. It requires several trials and as many failures in order to success in lengthening export duration. We may thus conclude that sharing PTAs with the OECD impacts greatly survival, trough experience, but requires a long run export strategy.

[20] As 10% of the observations have a PTA indicator equal to zero we attribute a very small value instead of these zeros.

Table 6. Approximated long-term elasticity of exporting hazards to Market access

Total number of spells to the OECD market		(1)		(2)		(3)		(3)	
Market Access to OECD market	*ln*	**0.20**	a/	**0.23**	a/	**0.24**	a/	**0.25**	a/
GDP	*ln*			0.29	a/	0.51	a/	0.55	a/
Dist. Min	*1000 kms*			0.00	a/	0.00	a/	0.00	a/
Contiguity	*dummy*			-0.36		-0.29	a/	-0.38	a/
Prior Exp. in non-OECD	*dummy*							-0.81	a/
const.		2.53	a/	-3.92	a/	-8.81	a/	-9.36	a/
Observations		62,031		62,031		62,031		62,031	
R^2		0.04		0.10		0.21		0.24	
sitc product FE		no		no		yes		yes	
impact of 1 additionnal spells on HR c/		-5 pp		-5 pp		-5 pp		-5 pp	
Proxied long-term elast. of HR to market access		1.00 pp		1.15 pp		1.20 pp		1.25 pp	

Note: a/ denotes estimates significant at 1%, c/ corresponds to the marginal coefficients reported in col. (1) table 5.
Source: Authors' computation from COMTRADE's database

Few studies examine the impact of free trade agreements on exports survival (i.e., Besedeš and Prusa 2006b, Brenton et al. 2009 and Besedeš and Blyde 2010). The common finding is that lower tariffs improve trade duration. We believe that the number of previous spells (i.e., the experience) is the channel of transmission through which PTAs impact export survival. In order to test for such conjecture, we run the regression of Table 5 column (1) on the sub-sample of *last* spells at the product-exporter level. We focus on the last spells in order to account for the full experience acquired over the period. Column (3) and (4) of Table 5 provide the results of such estimation. Importantly, by excluding the number of previous spells as independent variable (i.e., column 4), we find a significant negative effect of PTAs on the hazard rate, thus confirming that experience is the channel through which higher PTAs positively affect export survival. Not controlling for the number of previous spells (as in Besedeš and Prusa 2006b or Besedeš and Blyde 2010) thus lead to misleading conclusions on the link between PTAs and export duration.[21]

Whereas facilitated access to OECD markets does not increase survival in the short run, we find that PTAs impact positively export duration on the long run. By allowing non-costly trial and

[21] Note that Brenton et al. (2009) include the number of previous spells in their analysis and find a positive, slightly significant effect of PTAs on export survival. By starting in 1985, their database does not however capture sufficiently the trial and error process. By restricting our database to their timing (i.e., 1985-2005), we obtain similar results to theirs.

error export processes, these PTAs play a big role in increasing export experience and therefore survival.

Finally, as shown in column (4) of Table 6, products for whose experience was acquired in non-OECD markets tend to have less spells in the OECD market. This result suggests that prior experience substitute for some trials (and errors) within the OECD. Exporters continue however inferring information on there profitability within the OECD market even if they have had prior experience. Whether to gain exports experience on foreign markets before serving the OECD may thus boils down to the relative cost of entry across non-OECD and OECD markets.

6. Conclusion (to be completed)

Our findings evidence the importance of export experience for export survival. For developing countries, exporting goods toward the world largest market (i.e., the OECD) is a key determinant of growth and development. In order to be successful in the long run (i.e., create a long term export relationship with the OECD), potential exporters may follow the following path: Acquire experience about their export potential by exporting their product to easily accessible non-OECD markets (i.e., close in distance, with large market and within the same PTA). Such experience should occur just before reaching the OECD market to be effective. Alternatively, if the country benefit from important PTAs with the OECD, it may try its product several times on OECD markets in order to reach, in the long run, a good fit.

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Annex A1. Kaplan-Meier survival function of DC's exports on OECD market

Table A1. Sample Composition of exporters

a. Sample decomposition by Income group

	Nber	%
High Income	32	19.39
Upper Middle Income	43	26.06
Lower Middle income	52	31.52
LowIncome	38	23.03
Total	165	100

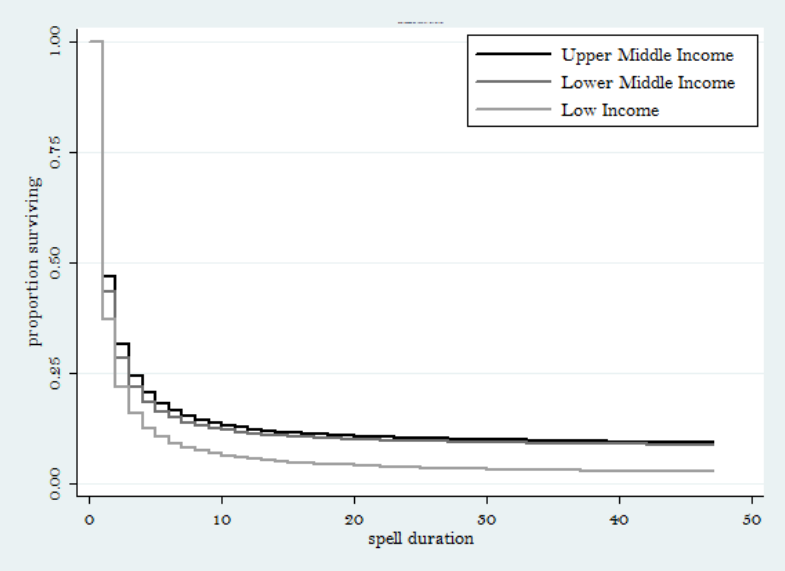
Note: Economies are divided according to 2009 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $995 or less; lower middle income, $996 - $3,945; upper middle income, $3,946 - $12,195; and high income, $12,196 or more.

b. Sample decomposition by region group for Developing Countries

	Nber	%	
South Asia	8	6.02	6.02
Europe & Central Asia	18	13.53	19.55
Middle East &NorthAfr.	12	9.02	28.57
East Asia& Pacific	20	15.04	43.61
Sub-SaharanAfrica	45	33.83	77.44
Latin America&Caribean	30	22.56	100
Total	133	100	

Source: Authors' computation from COMTRADE's database

Figure A1. Kaplan-Meier survival function by Income group for Developing Countries[22]



Source: Authors' computation from COMTRADE's database

The corresponding table of estimated Kaplan-Meier survival rate are reported in Table A1.

Table A2.Estimated Kaplan-Meier Survival Rates corresponding to figure A1.

year	All countries	Upper Middle Income	Lower Middle Income	Low Income
1	43.7%	46.7%	43.3%	37.0%
2	28.5%	31.3%	28.3%	21.9%
3	21.9%	24.4%	21.8%	15.7%
10	11.4%	13.1%	11.9%	6.2%
20	9.1%	10.6%	9.9%	4.0%

Source: Authors' computation from COMTRADE's database

Whatever the category, a very large fraction of trade spells fail after 1 or 2 years. For the Upper Middle Income only 47% of export spells survive one year, 31% survive 2 years, 13% survive 10 years. Hence, we confirm the already well-known result in recent empirical literature: the export spells are very short-lived.

[22] We follow the World Bank definition and call Developing Countries (DCs) all Middle and Low Income countries.

Annex 2. Description of control variables

These control variables include initial export value (Comtrade, in current dollars) and GDP (WDI, in constant 2000US$). Both are introduced in log and are expected to decrease the hazard rate. The former is expected to increase the hazard rate while the latter is expected to decrease transaction costs between the exporter and at least one country of the OECD, thereby decreasing the hazard rate. Note that our results are robust to the inclusion of exporter fixed effects instead of these time-invariant exporter specific "gravity-type" variables.

We also introduce a variable capturing market access. This variable is constructed using the bilateral database available from the website of Jeffrey Bergstrand (may 2011 version) and includes both reciprocal and non-reciprocal trade agreements.[23] We compute a weighted average of the preferential trade agreements (PTA) dummy between the exporter and OECD countries, where the weights correspond to each OECD country's GDP. As underlined by Liu and Ornelas (2012), it would be more relevant to better capture the intensity of the PTAs using the share of intra-regional trade as weight but given our dependent variable this should clearly introduce some endogeneity problem. Whereas preferential access to the OECD market (on average), is expected to increase entry, its effect on the hazard rate of exports is unknown as easier entry does not necessarily guaranty longer survival.

Two additional variables, common in the literature, are included in the analysis: The number of exporters of the same products to the OECD market (computed from Comtrade) and the number of multiple spells existing for a trade relationship. The former is expected to capture current competition on a specific product market and should increase the hazard rate. The latter refers to a dummy variable equal to 1 if the first spell is followed by other spell(s). It captures the fact that for trade relationships with multiple spells, the first spell is expected to be shorter. Multiple spells should thus lead to higher hazard rate.

[23] http://www.nd.edu/~jbergstr/

Annex 3. Robustness checks

Table A3 - First spells>1000 US dollars

Developing countries													
		(1)		(2)		(3)		(4)		(5)		(6)	
Initial Value	*ln*	-0.065	a/	-0.065	a/	-0.065	a/	-0.065	a/	-0.065	a/	-0.055	a/
GDP	*ln*	-0.010	a/	0.003		0.004		0.005		0.006		0.038	
Dist. Min	*unit= 1000 kms*	-9.2E-07		-		-		-		-		-	
Contiguity	*dummy*	-0.053	a/	-		-		-		-		-	
Market Access	*[0;1]*	0.059	a/	0.019		0.019		0.020		0.020		0.036	
Competition	*unit=1 country*	-0.002	a/	-0.003	a/	-0.003	a/	-0.003	a/	-0.003	a/	-0.006	a/
Multiple Spell	*unit=1 spell*	0.344	a/	0.356	a/	0.357	a/	0.356	a/	0.356	a/	0.411	a/
Current Market exp.	*unit=1 product*	-0.001	a/	-0.001	a/	-0.001	a/	-0.001	a/	-0.001	a/	-0.0004	a/
Current Product exp.	*unit=1 country*	-0.054	a/	-0.058	a/	-0.056	a/	-0.050	a/	-0.049	a/	-0.051	a/
Prev. Product Exp.	*dummy*					-0.038	a/						
Exp t-1	*dummy*							-0.047	a/	-0.064	a/	-0.067	a/
Exp t-2 /Exp t-1=1	*dummy*							-0.023					
Exp≥ t-3/Exp t-1=1 & Exp t-2=1	*dummy*							-0.016					
Exp≥ t-4/Exp t-1=1 & Exp t-2=1 & Exp t-3=1	*dummy*							0.039					
Exp t-2 /Exp t-1=0	*dummy*									-0.056	a/		
Exp≥ t-3/Exp t-1=0 & Exp t-2=0	*dummy*									-0.029	a/		
Exp≥ t-4/Exp t-1=0 & Exp t-2=0 & Exp t-3=0	*dummy*									-0.022			
σ												0.0009	c/
σ. Exp t-1												0.0015	a/
Model		Cox		Cox		Cox		Cox		Cox		Cox	
Year FE		yes		yes		yes		yes		yes		yes	
Exporter FE		no		yes		yes		yes		yes		yes	
Product stratification		yes		yes		yes		yes		yes		yes	
Nber of Spells		49,377		49,377		49,377		49,377		49,377		29,582	
log likelihood		-157,049		-156,944		-156,939		-156,937		-156,934		-276,479	

a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust standard error.
Source: Authors' computation from COMTRADE's database

Table A4 – Alternative definitions of "new products/spells".

Developing countries		Def. 2		Def. 3		Def. 2		Def. 3		Def. 2		Def. 3	
		(1)		(2)		(3)		(4)		(5)		(6)	
Initial Value	*ln*	-0.070	a/	-0.055	a/	-0.070	a/	-0.056	a/	-0.070	a/	-0.055	a/
GDP	*ln*	0.0341		0.0201		0.0341		0.0207		0.0354		0.0235	
Market Access	*[0;1]*	-0.0295		-0.0618		-0.0303		-0.0606		-0.0288		-0.0579	
Competition	*unit=1 country*	-0.004	a/	-0.006	a/	-0.004	a/	-0.006	a/	-0.004	a/	-0.006	a/
Multiple Spell	*unit=1 spell*	1.273	a/	1.962	a/	1.272	a/	1.962	a/	1.272	a/	1.961	a/
Current Market exp.	*unit=1 product*	-0.001	a/	-0.001	a/	-0.001	a/	-0.001	a/	-0.001	a/	-0.0010	a/
Current Product exp.	*unit=1 country*	-0.045	a/	-0.029	a/	-0.034	a/	-0.00938		-0.040	a/	-0.022	a/
Prev. Product Exp.	*dummy*	-0.051	a/	-0.0315	c/		a/						
Exp t-1	*dummy*					-0.0298	a/	-0.00876		-0.066	a/	-0.085	a/
Exp t-2 /Exp t-1=1	*dummy*					-0.0362	c/	-0.0849	c/				
Exp≥ t-3/Exp t-1=1 & Exp t-2=1	*dummy*					-0.00215		0.0311					
Exp≥ t-4/Exp t-1=1 & Exp t-2=1 & Exp t-3=1	*dummy*					-0.0425		-0.118					
Exp t-2 /Exp t-1=0	*dummy*									-0.064	c/	-0.126	c/
Exp≥ t-3/Exp t-1=0 & Exp t-2=0	*dummy*									-0.0151		-0.0615	
Exp≥ t-4/Exp t-1=0 & Exp t-2=0 & Exp t-3=0	*dummy*									-0.0382		-0.0510	
Model		Cox		Cox		Cox		Cox		Cox		Cox	
Year FE		yes		yes		yes		yes		yes		yes	
Exporter FE		yes		yes		yes		yes		yes		yes	
Product stratification		yes		yes		yes		yes		yes		yes	
Nber of Spells		15,005		6,838		15,005		6,838		15,005		6,838	

Note: the definition of a new spell - at the country/product level - used in table 2 is Def1 = "no export in t-1, positive export in t". Among these first spells we alternatively select the sub-sample corresponding to the definition Def2 = "no export in t-1, positive exports in t and t+1" and to definition Def3 = "no export in t-2 and t-1, positive exports in t, t+1 and t+2".

a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust standard error.

Source: Authors' computation from COMTRADE's database

Table A5 – post-1980 First spells

Developing countries							
		(1)		(2)		(3)	
Initial Value	*ln*	-0.037	a/	-0.037	a/	-0.037	a/
GDP	*ln*	0.006		0.007		0.008	
Market Access	*[0;1]*	0.029		0.029		0.030	
Competition	*unit=1 country*	-0.002	a/	-0.002	a/	-0.002	a/
Multiple Spell	*unit=1 spell*	0.166	a/	0.165	a/	0.166	a/
Current Market exp.	*unit=1 product*	0.000	a/	0.000	a/	0.000	a/
Current Product exp.	*unit=1 country*	-0.047	a/	-0.041	a/	-0.042	a/
Prev. Product Exp.	*dummy*	-0.019	a/				
Exp t-1	*dummy*			-0.031	a/	-0.053	a/
Exp t-2 /Exp t-1=1	*dummy*			-0.019	c/		
Exp≥ t-3/Exp t-1=1 & Exp t-2=1	*dummy*			-0.053			
Exp≥ t-4/Exp t-1=1 & Exp t-2=1 & Exp t-3=1	*dummy*			0.064			
Exp t-2 /Exp t-1=0	*dummy*					-0.048	a/
Exp≥ t-3/Exp t-1=0 & Exp t-2=0	*dummy*					-0.026	a/
Exp≥ t-4/Exp t-1=0 & Exp t-2=0 & Exp t-3=0	*dummy*					-0.001	
Model		Cox		Cox		Cox	
Year FE		yes		yes		yes	
Exporter FE		yes		yes		yes	
Product stratification		yes		yes		yes	
Nber of Spells		34,855		34,855		34,855	
log likelihood		-102,990		-102,986		-102,985	

a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust standard error.
Source: Authors' computation from COMTRADE's database

Table A6 – results of the discrete-time probit model

Survival on OECD market after k year(s)		k=1 year *Prob. of surviving =0.242*			k=2 years *Prob. of surviving =0.125*			k=5 years *Prob. of surviving =0.056*		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Initial Value	*ln*	0.105 a/	0.105 a/	0.105 a/	0.134 a/	0.134 a/	0.134 a/	0.167 a/	0.166 a/	0.167 a/
GDP	*ln*	-0.002	-0.003	-0.004	-0.001	-0.003	-0.004	-0.038	-0.045	-0.045
Market Access	*[0;1]*	-0.005	-0.005	-0.005	0.026	0.026	0.026	-0.070	-0.071	-0.069
Competition	*unit=1 country*	0.013 a/	0.013 a/	0.013 a/	0.016 a/	0.016 a/	0.016 a/	0.019 a/	0.020 a/	0.019 a/
Multiple Spell	*unit=1 spell*	-0.260 a/	-0.258 a/	-0.260 a/	-0.611 a/	-0.608 a/	-0.609 a/	-1.306 a/	-1.302 a/	-1.305 a/
Current Market exp.	*unit=1 product*	0.001 a/	0.001 a/	0.001 a/	0.002 a/	0.002 a/	0.002 a/	0.002 a/	0.002 a/	0.002 a/
Current Product exp.	*unit=1 country*	0.088 a/	0.080 a/	0.077 a/	0.096 a/	0.088 a/	0.087 a/	0.116 a/	0.096 a/	0.102 a/
Prev. Product Exp.	*dummy*	0.068 a/			0.088 a/			0.146 a/		
Exp t-1	*dummy*		0.080 a/	0.118 a/		0.091 a/	0.125		0.123 a/	0.206 a/
Exp t-2 /Exp t-1=1	*dummy*		0.047 b/			0.048 b/			0.103 b/	
Exp≥ t-3/Exp t-1=1 & Exp t-2=1	*dummy*		0.045			0.052			-0.02	
Exp≥ t-4/Exp t-1=1 & Exp t-2=1 & Exp t-3=1	*dummy*		-0.111			-0.102 c/			0.019	
Exp t-2 /Exp t-1=0	*dummy*			0.099 a/			0.099 b/			0.216 a/
Exp≥ t-3/Exp t-1=0 & Exp t-2=0	*dummy*			0.096 a/			0.047 c/			0.139 a/
Exp≥ t-4/Exp t-1=0 & Exp t-2=0 & Exp t-3=0	*dummy*			-0.003			-0.009			-0.034
Model		Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit
Year FE		yes	yes	yes	yes	yes	yes	yes	yes	yes
Exporter FE		yes	yes	yes	yes	yes	yes	yes	yes	yes
Product RE		yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations		62,031	62,031	62,031	62,031	62,031	62,031	62,031	62,031	62,031

a/ denotes estimates significant at 1%, b/ at 5% and c/ at 10%. Robust standard error.
Source: Authors' computation from COMTRADE's database

Annex 4. Some descriptive Statistics on the first non-OECD export market for experienced exporters.

	Nber of countries	Nber of first spells to OECD	*Average Nber of first spells per country*	Survival rate - 1st year	Survival rate - 5th year	% having a previous exp.	% of previous exp. being in t-1	Survival rate of the 1st year with an exp. in t-1	Survival rate - 5th year with an exp. in t-1
South Asia	7	4,431	*633.0*	29.1%	9.2%	44.1	43.3	35.2%	11.1%
Europe & Central Asia	3	1,685	*561.7*	32.6%	8.9%	43.4	33.2	44.9%	15.0%
Middle East & North Africa	12	5,939	*494.9*	24.6%	5.0%	52.2	42.1	27.6%	5.6%
East Asia & Pacific	19	8,508	*447.8*	29.2%	9.1%	46.0	45.9	40.8%	15.3%
Sub-Saharan Africa	43	21,762	*506.1*	22.0%	4.4%	38.7	32.6	29.4%	6.2%
Latin America & Caribean	30	19,706	*656.9*	27.0%	6.9%	53.3	49.0	33.6%	10.3%
Total	114	62,031	*544.1*	25.6%	6.4%	46.1	42.2	33.4%	9.9%

Note: columns 4, 5, 8 and 9 corresponds to estimated Kaplan-Meier survival rates.
Source: Authors' computation from COMTRADE's database