

*Research article***Import experience and the post-entry performance of first-time exporters****Guadalupe Serrano¹, Francisco Requena^{2,*} and Raúl Mínguez³**¹ Department of Economic Analysis, Universitat de València, Valencia, Spain² Department of Applied Economics II, Universitat de València, Valencia, Spain³ Chamber of Commerce of Spain & Universidad Nebrija, Madrid, Spain*** Correspondence:** Email: francisco.requena@uv.es; Tel: +34 3828849.

Abstract: Using the universe of Spanish first-time exporters selling manufactured products over the period 1997–2018, we show that import experience is associated with higher survival rates in the export markets, and conditioning on survival, a higher growth rate of their exports. In both cases, the highest impact is obtained when previous import experience occurs within one year before firms start exporting. Import experience improves general knowledge about foreign markets but it is not market-specific. Post-entry success in terms of survival and persistent growth rises if new exporters are large importers and if they buy intermediate inputs from competitive foreign suppliers.

Keywords: first-time exporters, import experience, export survival, export growth**JEL Codes:** F23, F14, L25

1. Introduction

The high rate of mortality of new exporters is a well-known stylised fact in the field of export dynamics (Besedes and Prusa, 2006; Békés and Muraközy, 2012; Blum et al., 2013) that continues demanding further research about its causes. For example, in Spain, there are on average 15,000

first-time exporters every year and two-thirds of them will not export again the next year.¹

Research in international economics using firm-level data has unveiled some determinants of export survival, such as firm productivity, size and experience (Görg et al., 2012; Meinen, 2015; Carrère and Strauss-Kahn, 2017; Inui et al., 2017), information spillovers in the home country (Fernandes and Tang, 2014), domestic macroeconomic factors (Salomon and Shaver, 2005), or country-of-destination specific characteristics (Aeberhardt et al., 2014; Albornoz et al., 2016; Araujo et al., 2016). While these determinants are certainly important, the export survival literature seems to have nevertheless overlooked that many exporters also import (Bernard et al., 2018). The aim of our paper is to contribute to the understanding of firm's survival determinants by considering the role of previous import experience among first-time exporters.

Prior research has shown that importing is associated with some performance success elements such as product quality and productivity (Kasahara and Lapham, 2013; Bas and Strauss-Kahn, 2014) or with export entry decisions (Pierola et al., 2018; Erbahar, 2019). In line with our research interest, other papers have explored whether import activity has a positive influence on the duration of trade relationships (Stirbat et al., 2015; Choquette, 2019) or post-entry growth (van den Berg et al., 2019).

Previous import activity may influence post-entry export performance in two opposite ways. The learning perspective would predict a positive relationship between previous import experience and firm survival in export markets because knowledge reduces uncertainty and improves the chances to choose the right combination of time, product and destination to successfully export regularly. Contrarily, from a sunk cost perspective, past experience in foreign markets reduces the sunk costs associated with entry and exit, facilitating rotation and experimentation, and additionally reducing the level of commitment and therefore post-entry growth. The two views share the premise that previous import experience increases the knowledge that a firm has about foreign markets but differ in the predicted outcome of that knowledge (Timoshenko, 2015). It is an empirical question to determine what direct channel prevails. There is also an indirect channel connecting past import activity with new exporters' performance. Product upgrading facilitated by technology or quality embedded in imported inputs may help firms to increase the scale and breadth of their participation in export markets, leading to better post-entry performance in terms of more export sales and portfolio diversification (Feng et al., 2016).

In this paper we aim to investigate the role of previous import activity on two dimensions of export dynamics after the firm starts exporting: survival and post-entry growth. From the universe of Spanish exporters over the period 1997–2018, we select all first-time exporters of manufacturing products, most of them micro and small firms.² First, we study whether the probability of surviving among first-time exporters is positively related with firms having any previous import activity that improves firm's knowledge on international markets. Second, we check whether country-specific

¹ See Table 1 and Figure 1 in the next section. We define a first-time exporter as a firm that did not export ever and that sold more than 1,500 euros in the first year. Firms that start exporting in 2001 did not export over the period 1997–2000. Firms that start exporting in 2015 did not export over the period 1997–2014.

² It will be very difficult to get firm-level information such as sales and employment for the type of firm used in our analysis since most first-time exporters are micro firms and they tend to escape to the coverage of public databases with firm characteristics.

import experience matters, that is, the export activity of the entrant lasts longer when the firm starts exporting to a country from which has been importing in the past. Third, we investigate another dimension of export dynamics: sales growth conditional on survival. The idea is that the success of the new exporter in the export market not only consists of surviving another year but on its growth of exports to consolidate as a regular exporter in the market. Therefore, we examine whether first-time exporters with previous import experience share the same growth pattern than those without import experience that survive.

Our contribution to the literature is threefold. First, we add to the empirical meta-analysis literature by showing that previous import activity has a strong positive correlation with the probability to survive in export markets. Unlike previous studies, we use only first-time exporters as group of analysis, which allows us to isolate the role of import experience from other sources of experience on export survival than if we would use a sample of exporters with previous export experience. Our key finding is that, while 71% of new exporters interrupt their export activity in the first year, those with previous import experience reduce the likelihood of failure in the first year to 57%. The result is robust to different measures of import activity (import status, volume of imports, size of import portfolio and number of importing years). Our results are in line with Stirbat et al. (2015) for Laos but opposite to Choquette (2019) for Denmark, papers that used samples of firms with previous export experience and examined the determinants of survival in new export destinations.³ Therefore, since the cost sunk logic does not appear to dominate our results, the positive net effect of these two mechanisms on export survival supports the argument that the knowledge mechanism is the one underlying the positive correlation between import experience and export survival among first-time exporters.

Second, we examine whether the positive link between past import experience and post-entry export performance is related to the choice of the country of origin of imports and the country of destination of exports. We find that new exporters importing from a country that is different to the one that the firm starts exporting leads to higher survival rates than firms importing and exporting from the same country. Stirbat et al. (2015) find similar results for new firm-product-country relationships using regular exporters in Laos.⁴ We conclude that import experience provides general knowledge about how to operate in the foreign markets rather than exclusively market-specific knowledge. Since we examine first-time exporters, general knowledge refers to the learning-by-importing that first-time exporters get at home after operating in any international market (i.e. transaction costs related to

³ An explanation of why our results are different to Choquette (2019) is the nature of the data set. Alike Stirbat et al. (2015) we do not distinguish exporters by economic activity and firm size. However, Choquette (2019) uses a sample of 1920 manufacturing Danish exporting firms with more than 10 workers and complete information about firm-characteristics over the period 2001-2011. It is likely that these Danish exporters with previous export experience have already optimised their export portfolio and the investment to entry new destinations is so low that experimentation either exporting or importing is the optimal strategy.

⁴ In their analysis of the survival determinants of new export relationships (firm-product-country triplets) in Laos, Stirbat et al. (2015) found that having experience with particular countries as an importer had a positive but weak impact on the probability of survival as an exporter on that market. In line with our findings, prior imports from countries of origin different from the current export destinations improve more the survival rates of new export relationships among regular exporters than importing and exporting from the same country.

internationalization such as legal and administrative procedures or logistic and financial needs). Moreover, we also find that firms import before start exporting because they acquire inputs from the most efficient international supplier to improve their competitiveness, which seems to be unrelated to the choice of destination of exports once the firm starts exporting.

Third, we add new evidence in favour of the hypothesis that importing affects firm-level export growth. For the universe of new Spanish exporters of manufacturing goods accessing the export market, we find an import premium in export growth, that is, firms with previous import experience grow faster than the rest. van den Berg et al. (2019) find a positive correlation between five-year sales growth in an export market and the value of imports at the beginning of the period in the same market among regular Dutch exporters over the period 2008–2016. Surprisingly, they find that import diversification has a strong negative correlation with export sales growth. Opposite to their results, we find that diversification in the portfolio of importing countries enhances Spanish firms' exports growth. Another interesting result is that export growth is greater among those new exporters that import intermediate and capital goods instead of consumption goods, supporting the argument of Feng et al. (2016) about the effect of knowledge spillovers coming from high quality intermediate imports increasing firm's productivity and, as a consequence, enhancing export performance.

The rest of the paper is organized as follows. Section 2 introduces the data sources utilized in our analysis and provides a descriptive analysis of the role of previous import experience on post-entry export performance. Sections 3 and 4 present the econometric results on survival and growth. Finally, section 5 summarizes and concludes.

2. Research design

2.1. Data

Our empirical analysis is conducted using monthly exports and imports transaction data of Spanish firms compiled by Spanish Customs (AEAT-Aduanas) over the period 1997–2018. For each firm and month, we know the value in euros of their export and import transactions, defined as a triplet (province/country of origin, product at the 6 digits HS, country/province of destination). There are 3,983 products and 141 countries, after we eliminate non-manufactured products and destinations such as Andorra and Gibraltar (which Spanish firms consider as part of the domestic market).

Our sample is the universe of first-time exporters of manufacturing products.⁵ We define a first-time exporter as a firm without recorded export activity before start exporting. Note that the use of natural years would distort the export value in the initial year of entry since entry may happen at any time of the year. To avoid this problem, we use calendar-adjusted years considering periods of 12 months. For example, if the firm starts exporting in April 2001, the calendar-adjusted year of the firm is April 2001–March 2002 and it is a new exporter because the firm did not have any export experience

⁵ Due to statistical secrecy, we cannot identify the main activity of the firm so we can only identify the nature of the product. The classification of manufacturing products is based on the 6 digit CPA classification (codes 100000 to 329999), after using the concordance tables between 6 digits HS classification and 6 digit CPA (<https://ec.europa.eu/eurostat/ramon>). We select firms selling only manufactured products in the first year they start exporting.

between January 1997 and April 2001.⁶ Therefore, we calculate the annual value of exports (and imports in the previous year) using the export entry month as the reference point.

We do not have information on firm's transactions before 1997 and after 2018 implying a left and right censoring of firm's transactions. On the one hand, we only consider new exporters from 2001 onwards; thus, we drop spells beginning or running in years 1997, 1998, 1999, 2000 (left censored spells). On the other hand, there are spells running after 2018 (right-censored spells). We will use survival analysis methods in order to take into account right censoring. Additionally, the analysis of growth of new exporters requires at least a period of three years, so first spells start in the timeframe 2001–2015.

Table 1. Basic descriptive of first-time exporters with/without import experience.

| Period | New exporter | With import experience | Yes importer in previous 12 months to export entry | No importer in previous 12 months to export entry | Regular importer |
|--|--------------|------------------------|--|---|------------------|
| Number of firms | | | | | |
| 2001 | 10,981 | 2,453 | 2,022 | 431 | 834 |
| 2005 | 10,926 | 2,176 | 1,794 | 382 | 624 |
| 2010 | 15,926 | 2,080 | 1,557 | 523 | 581 |
| 2015 | 15,915 | 1,821 | 1,391 | 430 | 477 |
| 2001–2015 | 223,387 | 32,011 | 25075 | 6936 | 9143 |
| % | 100 | 14.3 | 11.2 | 3.1 | 4.1 |
| Initial value of exports. Median (th. euro) | | | | | |
| 2001 | 11.3 | 13.1 | 14.4 | 9.0 | 12.4 |
| 2005 | 8.5 | 12.7 | 13.6 | 9.9 | 11.6 |
| 2010 | 8.0 | 12.1 | 13.8 | 9.4 | 12.4 |
| 2015 | 7.4 | 10.2 | 10.7 | 9.3 | 8.8 |
| 2001–2015 | 8.5 | 12.6 | 13.8 | 9.6 | 11.3 |
| Value of imports (last 12 months before start exporting). Median. (th. euro) | | | | | |
| 2001 | | 140.1 | 207.6 | 15.8 | 309.8 |
| 2005 | | 127.6 | 185.6 | 15.5 | 317.6 |
| 2010 | | 76.8 | 144.7 | 16.9 | 237.2 |
| 2015 | | 59.5 | 113.2 | 11.1 | 258.1 |
| 2001–2015 | | 107.8 | 176.5 | 16.0 | 294.7 |

Note: First-time exporters selling manufactured products to 141 destination markets First time exporters are firms selling more than 1,500 euros in entry month-year and zero previously. Regular importer includes all new exporters that imported continuously every 12 months during the previous 48 months until export entry. Source: Own elaboration using AEAT-Aduanas database.

⁶ Since our analysis starts in year 2001, there is a minimum period of 48 months without previous export activity. Several empirical studies have shown that the role of experience is almost fully depreciated after 3 years without exporting (Roberts and Tybout, 1997; Carrère and Strauss-Khan, 2017). Due to our definition of first-time exporters, the sample excludes re-entrant firms (in other words, there are not firms with repeated spells in our sample).

We aim to investigate the importance of previous import experience in the post-entry performance (survival and growth). We define firm's import experience as a direct purchase of the firm in foreign markets. A new exporter lacks import experience if she did not import in the previous 48 months. In the opposite side, a firm is a regular importer if the firm has been importing before exporting continuously during at least 48 months.

Table 1 presents some descriptive of the new exporters of manufacturing products in Spain over the period 2001–2015. The sample consists of 223,387 firms, with 14,170 new entries per year on average. The number of first-time exporters with previous import experience represents a 14.3% of all first-time exporters (column 2 in Table 1). The majority of those new exporters with import experience were importing in the 12 months previous to start exporting (11.2%) (see columns 3 and 4). Additionally, for the whole period only 4.1% of new exporters are regular importers, that is, they have continuously imported up to 48 months when they start exporting. New exporters with import experience start selling more than those without import experience, particularly those that were importing in the previous 12 months to start exporting. We also observe that firms that were importing in the previous 12 months to start exporting have an initial value of exports larger than those without import experience in the previous 12 months to start exporting. As expected, firms importing in the previous 48 months exhibit the largest value of imports before start exporting; surprisingly, they do not have the largest initial value of exports.⁷

2.2. Research questions and non-parametric analysis

We aim to investigate whether previous import experience affects post-entry performance of new Spanish exporters through the following baseline hypotheses:

- H1a: There is a positive relationship between previous import experience and firm survival and growth in export markets because firms acquire know-how with international transactions, exposure to international quality and build reputation for reliability.
- H1b: There is a negative relationship between previous import experience and firm survival and growth in export markets because previous import experience in foreign markets reduces the sunk costs associated with entry and exit, facilitating experimentation in export markets and leading to higher rotation.

We provide a first examination of the two hypotheses using use non-parametric techniques. For the survival analysis, Figure 1 presents the Kaplan-Meier survival functions of new exporters by import status. It is clear that having import experience reduces the likelihood of failure: 43% of firms that become exporters having a previous import experience survive in the export market after one year, while this figure drops to 26% for new exporters without import experience. In the second year the rates of survival of new exporters by import status decreases to 29% and 16%, respectively. The difference in the survival rates between new exporters with and without import experience persists over time.

⁷ New exporters tend to be single destination–single product firms. Table A1 in the Appendix shows that, out of 223,387 new exporters, 78.4% only export one product to one destination; only 0.5% of the firms start exporting more than 5 products to more than 5 destinations.

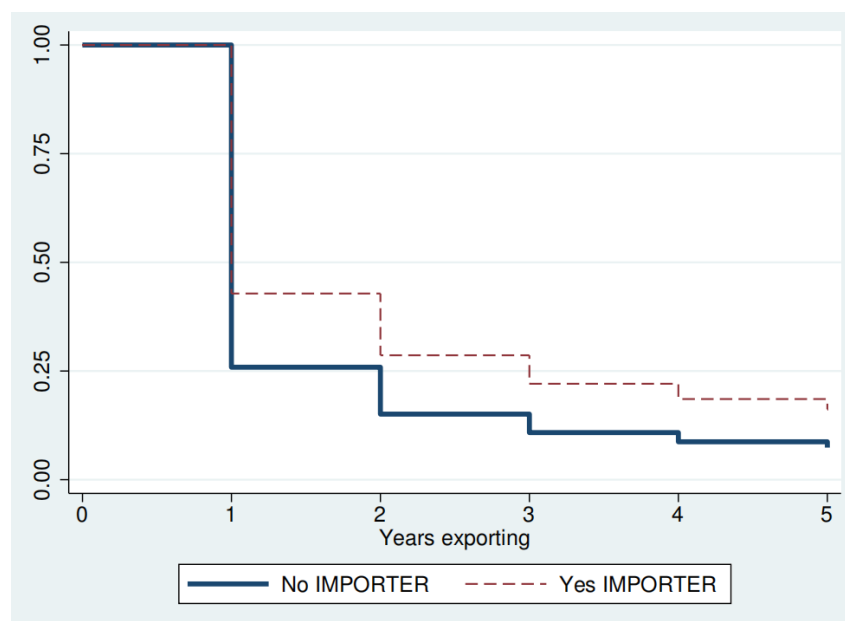


Figure 1. Survivor function estimates by import status (dummy).
Source: Own calculations using AEAT-Aduanas database.

In Figure 1 the two mechanisms, (H1a) acquiring knowledge on international transactions and (H1b) reducing sunk costs, are acting but the first one seems to dominate the other (the net effect is positive), supporting the argument that the knowledge hypothesis is the one underlying the positive effect of import experience on export survival of first-time exporters.

Next, we formulate additional hypotheses related to the positive impact of import experience on export survival using alternative measures of import experience, calculated based on 12-months calendar-adjusted years: the value of imports, the diversification of import portfolio and the dynamics of import activity in the months previous to start exporting.

- H2a. New exporters with large commitment in past import activities measured by the value of imports are more committed in export activities, favouring the odds of survival.
- H2b. New exporters with large commitment in past import activities measured by a more diversified import portfolio are more committed in export activities, favouring the odds of survival.
- H2c. More recent import experience depreciates less the acquire knowledge about foreign markets, improving the odds of survival when the firm start exporting.

In order to provide a first exploration of these hypotheses, Table 2 displays a non-parametric analysis of the data: there are 423,618 observations over the period 2001–2015, corresponding to 223,387 firm spells, of which 94.1% end over the sample period. After one period of service, 71% of spells had ended, and only 13% of new spells survive over 3 years. Thus, the vast majority of firm export spells are very short-lived. However, the attrition rate of export spells slows down with the age of the spell. Next, Table 2 splits the sample into firms with previous import experience (32,416) and without previous import experience (180,249). The values of the Kaplan-Meier survival rates correspond to those of Figure 1 and stratified log rank test lead to reject the null hypothesis of equality of survivor functions. The rest of the Table 2 splits the sample into groups of importers according to: (i) the value of imports; and (ii) the size of the import portfolio (product-country pairs); (iii) the

trajectory of firm's import activity. The value of imports is split according to terciles (which approximately correspond to less than 10 thousand euros, between 10 thousand and 80 thousand euros and more than 80 thousand euros). The size of import portfolio, based on the number of product-country pairs, is divided into 1, 2 to 5 and 6 or more pairs. The import trajectories are defined using the 48-months window previous to the start of exports: the first category includes firms that imported at least 12 months before exporting (1XXX); the second category includes firms that imported but not in the 12 months previous to export (0XXX). The stratified log rank test by each explanatory variable always leads to reject the null hypothesis of equality of survivor functions.

The three hypotheses (H2a, b, c) are validated in the data for new Spanish exporters. Among new exporters with previous import experience, survival rates increase with the value of imports, the number of products and country of origin of imports and the lack of interruption in the import activity until the firm starts exporting. For the three measures, the log-rank test rejects the null for the equality of survivor functions among new exporters with different degree of import experience.

Having established a positive link between previous import experience and export survival, we also examine the second part of our baseline assumption (H1a) concerning growth to analyse whether new exporters with or without import experience exhibit different patterns of post-entry growth. Figure 2 panel A uses index numbers to compare the evolution of aggregate exports of new exporters with and without import experience. At the end of the first year of export activity, the index number takes value 100 for both groups. The value of aggregate exports in the second year of survival is expressed as a percentage of the value of the initial year, and so on for the rest of years, so that we can compare both groups' trends of export values. The index number for the value of exports of the group of new exporters with previous import experience exhibit a fast growth during the three first years of survival while the group of new exporters without previous import experience shows no growth until they become regular exporters (after 4 years exporting).

Figure 2 panel B shows the cumulative average growth rate (CAGR) of exports of the average firm surviving different number of calendar-adjusted years, separately for the group of firms with and without import experience. Calculations use the value of exports at the end of the first 12-months survived period. On average, export growth for a new exporter having previous import experience is always higher than that of a firm without import experience, independently of the number of years passed since the firm entered the export market. Nevertheless, the gap narrows with the number of years, suggesting that the importance of import experience as driver of post-entry success depreciates over time.

Table 2. Export survival of first-time exporters and previous import characteristics

| | Kaplan-Meier survival rate | | | | Log rank tests (p-value) | Number of spells | Number of failures | Number observations |
|-----------------------------------|-------------------------------------|------|------|------|-----------------------------|---------------------|-----------------------|------------------------|
| | Calendar-adjusted 12-month periods: | | | | | | | |
| | 1 | 3 | 6 | 9 | | | | |
| BENCHMARK | 0.29 | 0.13 | 0.08 | 0.06 | | 223,387 | 210,254 | 423,618 |
| IMPORTER | | | | | | | | |
| No | 0.26 | 0.11 | 0.07 | 0.05 | 3406.7 | 180249 | 171100 | 333481 |
| Yes | 0.43 | 0.22 | 0.14 | 0.11 | (0.000) | 32416 | 28895 | 90137 |
| Import value | | | | | | | | |
| 1st tercile <10,000 euro | 0.29 | 0.12 | 0.07 | 0.05 | 1225.9 | 7304 | 7788 | 15246 |
| 2on tercile [10,000, 80,000 euro] | 0.39 | 0.18 | 0.12 | 0.08 | (0.000) | 8692 | 9517 | 23263 |
| 3rd tercile >80,000 euro | 0.52 | 0.29 | 0.20 | 0.15 | | 12899 | 15111 | 51628 |
| Size of import portfolio | | | | | | | | |
| 1 pair product-country | 0.32 | 0.14 | 0.08 | 0.06 | 615.9 | 7347 | 6848 | 15463 |
| [2-6 pair product-country] | 0.43 | 0.21 | 0.13 | 0.10 | (0.000) | 11549 | 1088 | 31042 |
| +6 pairs product-country | 0.49 | 0.27 | 0.18 | 0.14 | | 13520 | 11659 | 43632 |
| Trajectories of import experience | | | | | | | | |
| 0XXX | 0.27 | 0.11 | 0.06 | 0.04 | 1229.1 | 6,196 | 5,301 | 20,116 |
| 1XXX | 0.48 | 0.25 | 0.17 | 0.13 | (0.000) | 26,220 | 23,594 | 70,021 |

Notes: Log rank test for the equality of the survival functions for each explanatory variable. Size of import portfolio and import value is accumulated over the 48-months window before start exporting. 1XXX includes trajectories of new exporters that imported at least in the previous 12 months before export entry; and 0XXX includes the rest of trajectories of new exporters that did not import in the previous 12 months before export entry. Source: Own calculations using AEAT-Aduanas data.

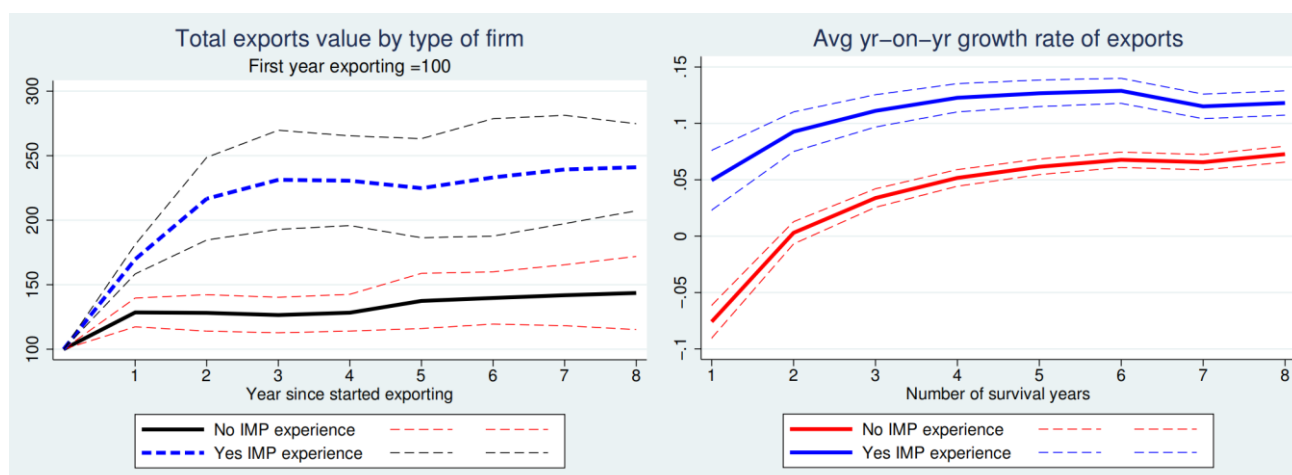


Figure 2. Export dynamics of first-time exporters. Panel A: Evolution of total exports by group of exporters. Panel B: Average firm-level export growth rate by group of exporters. Note: We split first-time exporters into two groups: Without previous import experience and with import experience. In panel A, we construct an index number of the value of total exports for each group of firms and each year after one-year survival. The value of total exports of each group at the end of the first survival year is the base value, X_0 , so the index in the first year of survival takes a value of 100 for both groups. The value of total exports in the following years of survival, t , are expressed as index numbers: $100 X_t/X_0$. In panel B, we consider the average firm for each group (with and without import experience), and calculate the annual growth rate of those firms' export value over a given survival period (T) using the CAGR formula $\ln(X_T/X_0)/T$. Upper and lower 95% confidence interval values are shown in dashed lines. Source: Own calculations using AEAT-Aduanas database

Overall, our descriptive analysis suggests that import-based previous experience on foreign markets is positively correlated with a superior export performance of first-time exporters, both in terms of survival and growth. The next section corroborates these results using econometric techniques in order to control for additional explanatory variables affecting both survival and growth.

3. Survival regression analysis

In this section we estimate a Cox proportional hazard model (Cox, 1972) in order to analyse the relationship between survival on export markets and previous import experience of first-time exporters.⁸ The Cox proportional hazard model allows to control for firm failure and the time of its occurrence, as well as addressing right-censoring, that is, that fact that some firms carry on exporting

⁸ We focus on time to the occurrence of an event or survival time and the event is stop exporting, which by definition is a discrete (count) variable. A central concept is the hazard rate, that is, the probability of occurrence of an event conditional on survival up to that period.

at the end of the observation period. Additionally, it also permits to check for biased estimation problems due to unobserved firm heterogeneity (frailty).

In a discrete-time framework, we consider the probability that firm i 's exports ceased in a given time interval t , conditional on having exported up to the beginning of period t . Thus, the discrete-time hazard for a duration interval t is defined as (omitting i sub-index for simplicity):

$$h(t) = P(T < t+1 | T \geq t) \quad (1)$$

The Cox proportional hazard model states that firm i 's probability of exit from the export market at time t , conditional on having survived up to that period t , can be expressed as follows:

$$h(t) = h_0(t) \exp(X'\beta) \quad (2)$$

where, t represents the survival period, and $h_0(t)$ is the baseline hazard that all the firms face –i.e. it corresponds to the value of the hazard if all covariates X are equal to zero- and it is unspecified. Thus, $\exp(X'\beta)$ is the relative risk that a firm stops exporting given her covariates,

$$\ln(h(t)) - \ln(h_0(t)) = (X'\beta) \quad (3)$$

The parameter estimates for all firms that survive up to period t measure the expected constant change in the baseline hazard for one-unit increase in one covariate, holding other covariates constant.

Furthermore, we also account for unobserved individual heterogeneity by considering a gamma frailty model. In this case, the frailty factor allows including an unobserved random effect in the hazard function:

$$h(t) = Z_m h_0(t) \exp(X'\beta) \quad (4)$$

which is the hazard function of the firm of group m , given the frailty of group $m=1, 2, \dots, M$ (Z_m) following a gamma distribution. To obtain efficient likelihood estimators and unbiased standard errors we use robust estimators.

Our explanatory variables of interest are related to import activity. All new exporters have their import experience before start exporting; thus, the potential reverse causality problem in the decision to import and export is not an issue in survival analysis because any import activity is previous to the moment firms decide to enter and exit the export market.⁹ Our vector of regressors (X) also includes an array of firm-level export characteristics.¹⁰ Among these firm-level export characteristics we include firm's initial value and portfolio size of exports. It is expected that the higher the value of exports, the more patient and conservative the firm is when negative shocks of demand hit the foreign markets, and thus the lower the probability of quitting the export market (Besedes and Prusa, 2006).

⁹ One example illustrates this idea. Consider a firm that starts both importing and exporting in 2001. Our research question is the probability to exit the export market in 2002, conditional on its entrance in 2001. Thus, imports in 2001 are pre-determined in our analysis on the probability of firm's failure in the export market.

¹⁰ Due to statistical secrecy, we cannot get information on firm specific attributes such as productivity, ownership or age. We try to amend this limitation selecting only firms that export manufactured product and include product dummies to control for time-invariant product-specific characteristics. See Table A4 in the Appendix for a description and basic statistics of the variables used in the regressions.

The same argument applies to the initial export portfolio diversification. Additionally, we consider how competitive is the main product-country pair of the new exporter, proxied by the revealed comparative advantage indicator of the product-country pair in Spanish exports. The higher the comparative advantage, the higher the likelihood of survival in the export market. Finally, networks are also expected to help survival by diffusing information about foreign markets characteristics, legal requirements or product preferences that may determine firm's export survival. These networks mechanisms can work through local agglomerations of exporters (Koenig, 2009; Wagner and Zahler, 2015). Thus, we include the number of peer firms located in the same province selling the same product to the same foreign market.

Finally, we use four sets of fixed effects (15 year-of-entry cohort dummies, 93 HS two-digit product dummies, 50 province-of-origin dummies and 141 destination-market dummies in the analysis to control for unobserved specific characteristics of sectors, firm location and specific-destination market shocks faced by firms. We will consider the main destination-product pair for the few new exporters that import from or export to more than one country. As an alternative specification, instead of country fixed effects, we include a set of gravity determinants such as country GDP, distance from Spain to the destination markets, and other dummy variables to approximate the closeness of destination countries to Spain, such as sharing a land border with Spain, belonging to UE-EFTA trade agreements, and having Spanish as official language. We also include a dummy variable for countries with high-risk country rating according to the OECD country-risk classification.¹¹

Table 3 presents the baseline results using the Cox model. The reported coefficients are hazard ratios, meaning that a unit increase in the covariate leads to a proportional increase in the conditional probability of leaving the export market if the coefficient estimates are greater than one, and would imply a negative effect on the probability of failure if the coefficient estimates were lower than one. Column 1 shows that import status (Haz. Ratio=0.866) reduces the likelihood of stop exporting after controlling for firm level export characteristics. Firms with large initial export values and large export portfolios (measured by the number of combinations of products and markets) exhibit higher survival rates. We also observe that survival rates improve as the number of other exporters selling the same product to the same destination (export agglomeration) increases. Moreover, exporting a product from a province with revealed comparative advantage rises the chances of more years exporting.

The results remain unaltered when considering gravity-type covariates to control for country-specific characteristics in column 2 of Table 3. For most of these gravity variables, the direction of the impact on the failure rate is the expected one. Exporting to distant and unsecured countries increases the risk of failure while exporting to countries that share with Spain a common language or belong to the EU-EFTA reduces the risk of failure.

Next, we replace the dummy of import status by dummies of import value and import portfolio in export survival analysis. We find that firms that imported more than 100 thousand euros or have an

¹¹ The OECD Country Risk Classification Method measures the country credit risk, that is, the likelihood that a country will service its external debt. Country political risk takes a value between 0 (no risk) to 7 (maximum risk) and it is revisited four times per year. We take the value of January. We create 3 categories of countries: (i) low-risk for value 0; (ii) medium-risk for values [1,4]; and (iii) high-risk for values [5,7]. More details can be found in <https://www.oecd.org/trade/topics/export-credits>.

import portfolio of more than one product and one country of origin pair, exhibit larger survival rates in export markets (columns 3 and 4 in Table 3).

As a robustness check, we replicate the analysis of Table 3 (columns 1, 3 and 4) using alternative samples of new exporters or estimation method. The results are reported in Table A2 in the Appendix. In an attempt to check the stability of the impact of the import experience on survival rates we split the sample before and after the financial crisis of 2008: in column 1 the sample includes the cohorts between 2001 and 2007 and in column 2 the sample includes the cohorts between 2008 and 2015. We do not appreciate significant differences in the coefficients. As additional robustness exercise, in column 3, we restrict the sample to new exporters selling one product-one country pair (77.4% of the total spells) in order to verify that multiproduct-multicountry firms are not affecting our conclusions. Similarly, in column 4, we select “the most committed” first-time exporters (defined as firms with an initial export value at the top quartile of the distribution) and again import experience remains an important driver of survival success. Finally, in column 5 we estimate the model controlling for frailty to account for firms’ heterogeneity in the model (equation 4). The results do not allow the rejection of the null hypothesis of the absence of firm heterogeneity in the whole sample of new exporters.¹² In all the cases, our results are robust suggesting that having previous import experience contributes to reduce the likelihood of failure of new exporters.

Table 3. Determinants of the probability of export market exit for first-time exporters. Main results. Semiparametric Cox survival model. Hazard ratios estimates.

| | (1) | (2) | (3) | (4) |
|---|---------------------|---------------------|---------------------|---------------------|
| import status | 0.866*** (0.004) | 0.851*** (0.004) | | |
| import value 1 st tercile [<10 th. euro] | | | 0.948*** (0.007) | |
| import value 2 ^{on} tercile [10–80 th. euro] | | | 0.898*** (0.007) | |
| import value 3 rd tercile [+80 th. euro] | | | 0.804*** (0.006) | |
| import portfolio [1] product-cou pairs | | | | 0.953*** (0.008) |
| import portfolio [2,5] product-cou pairs | | | | 0.870*** (0.007) |
| import portfolio [6+] product-cou pair | | | | 0.816*** (0.006) |
| initial export value 2 ^{on} tercile [6–16 th.euro] | 0.955*** (0.003) | 0.956*** (0.003) | 0.955*** (0.003) | 0.954*** (0.003) |
| initial export value 3 rd tercile [+16 th. euro] | 0.821*** (0.003) | 0.807*** (0.003) | 0.823*** (0.003) | 0.820*** (0.003) |
| initial export portf. [2,5] pto-cou pairs | 0.710*** (0.003) | 0.705*** (0.003) | 0.711*** (0.003) | 0.711*** (0.003) |

Continued on next page

¹² We use the STATA command ‘streg’ with options: distribution(exponential) frailty(gamma) shared(spell) cluster(firm).

| | (1) | (2) | (3) | (4) |
|---|---------------------|---------------------|---------------------|---------------------|
| initial export portfolio [6+] pto-cou pair | 0.419*** (0.006) | 0.407*** (0.005) | 0.420*** (0.006) | 0.421*** (0.006) |
| export agglomeration | 0.969*** (0.001) | 0.972*** (0.001) | 0.969*** (0.001) | 0.969*** (0.001) |
| export revealed comparative advantage | 0.952*** (0.003) | 0.951*** (0.003) | 0.952*** (0.003) | 0.952*** (0.003) |
| ln GDP | | 0.995*** (0.002) | | |
| ln distance | | 1.004* (0.002) | | |
| dummy no access to sea | | 1.030*** (0.004) | | |
| dummy belongs to EU-EFTA area | | 0.916*** (0.006) | | |
| dummy Spanish official language | | 0.989*** (0.004) | | |
| dummy countries with high-risk country rating | | 1.002 (0.003) | | |
| Observations | 212,665 | 212,665 | 212,665 | 212,665 |
| Fixed effects cohort | YES | YES | YES | YES |
| Fixed effects province of origin | YES | YES | YES | YES |
| Fixed effects product | YES | YES | YES | YES |
| Fixed effects country of destination | YES | NO | YES | YES |
| Log Likelihood | -2.35e+06 | -2.35e+06 | -2.35e+06 | -2.35e+06 |

Notes: We report odd ratios. Import values and import portfolio are accumulated over the 48-months pre-export window. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In Table 4 we analyse the impact of import activity on export survival for all possible import trajectories up to four years before start exporting. Concerning import status, we include 15 dummies to our preferred specification (column 1 in Table 3), one for each possible import trajectory. For example, the dummy variable “1000” takes a value of 1 if the new exporter only imported the 12 months before the start of exports; the dummy variable “0011” takes a value of 1 if the new exporter only imported between months 25th and 48th before the start of exports but did not import in the 24 months before. We consider firms grouped according to their import experience: Group 1 includes firms having only import experience in the 12-months period previous to start exporting; Group 2 includes firms that began and continuously imported until they start exporting; Group 3 includes firms that did stop importing during the previous 13 to 36 months before start exporting and finally, Group 4 includes all firms that did not import in the 12 months previous to start importing. The largest impact occurs for the group of new exporters with only import experience in the 12 months before the start of exports (trajectory 1000), showing a hazard ratio of 0.79. Surprisingly, accumulated import experience (for example, being a regular importer that continuously imported, 1111) does not maximise the likelihood of exporting survival, showing a hazard ratio of 0.85. The interruption of past import activities and retake them near to the start of exports reduces the positive effect of import experience on new exporter’s survival rates (i.e. 1101, 1010, 1001). Finally, interrupting past import activities

without retaking them near to start exporting (i.e. 0101, 0010, 0001) implies a severe depreciation of the accumulated previous import experience and cancels out its effect on export survival.

Table 4. Determinants of the probability of export market exit for first-time exporters. Import experience trajectories. Hazard ratios estimates.

| Trajectories | (1) % spells | (2) coef. | (3) s.e. | (4) exp(coef.) | (5) t-stat | (6) Group |
|--------------|--------------|-----------|----------|----------------|------------|-----------|
| 1000 | 18.96 | -0.243 | 0.01 | 0.785 | -22.4 | 1 |
| 1100 | 17.83 | -0.224 | 0.01 | 0.800 | -19.7 | 2 |
| 1110 | 9.77 | -0.196 | 0.01 | 0.822 | -13.3 | 2 |
| 1111 | 28.83 | -0.141 | 0.01 | 0.869 | -16.2 | 2 |
| 1011 | 0.95 | -0.128 | 0.05 | 0.880 | -2.8 | 3 |
| 1010 | 0.89 | -0.105 | 0.04 | 0.900 | -2.4 | 3 |
| 1101 | 1.23 | -0.094 | 0.04 | 0.910 | -2.5 | 3 |
| 1001 | 0.66 | -0.061 | 0.05 | 0.941 | -1.3 | 3 |
| 0011 | 2.01 | -0.027 | 0.03 | 0.974 | -1.0 | 4 |
| 0101 | 0.07 | -0.005 | 0.05 | 0.995 | -0.1 | 4 |
| 0100 | 6.57 | 0.006 | 0.01 | 1.006 | 0.5 | 4 |
| 0010 | 3.98 | 0.012 | 0.03 | 1.012 | 0.5 | 4 |
| 0111 | 2.02 | 0.021 | 0.03 | 1.021 | 0.8 | 4 |
| 0110 | 1.95 | 0.023 | 0.02 | 1.023 | 1.4 | 4 |
| 0001 | 3.99 | 0.029 | 0.02 | 1.029 | 1.5 | 4 |

Notes: The Cox regression includes the rest of explanatory variables of column 1 in Table 3. Trajectory 1000 means that a new exporter imported only in the previous 12 months but not before, while trajectory 1011 means that a new exporter imported in the previous 48 months, though interrupted imports between month 13 and 24. Column 6 classifies the trajectories into 4 groups. We consider firms grouped according to their import experience: Group 1 includes firms having only import experience in the 12-months period previous to start exporting; Group 2 includes firms that began and continuously imported until they start exporting; Group 3 includes firms that did stop importing during the previous 13 to 36 months before start exporting and finally, Group 4 includes all firms that did not import in the 12 months previous to start importing. These groups will be used later in Table 5 (sample of exporters with previous import experience) and Table 6 panel B (growth differences among exporters with different import trajectories).

To round off our analysis, we use the sample of new exporters with previous import experience to examine possible channels through which import experience improves the odds of export survival. This sample allows us to include all the measures of previous import experience (trajectories, import value and import portfolio) at once. Table 5 column 1 presents the basic specification and the results are in line with those reported in Tables 3 and 4: having imported 12 months before exporting improves substantially survival chances; large values of imports augment the probability of export survival; and, having a large import portfolio also rises export survival rates.

First, we investigate whether similarity between the import and export portfolio in terms of products and countries affects export survival. If there is a learning by importing, importing a product-country combination before the firm starts exporting provides country-specific and/or product-specific knowledge that may improve firm's likelihood of export survival in the same market. Therefore, we

test whether importing the same product and/or from the same country that the firm will export later improves survival rates.

Table 5 column 2 includes four dummy variables according to the similarity between the market of imports and the market of exports.¹³ The reference category includes all new exporters with the same product-country pair in the export and import portfolio (10% of the sample). The other three groups of importers export (a) a different product to the same country; (b) a different product to a different country; and (c) the same product to different country. Concerning the acquirement of market-specific knowledge through imports and its effect on new exporter's survival in such markets, we find that new exporters with different export and import portfolios exhibit higher survival rates. Therefore, learning by importing is not market-specific. For example, compared to the reference situation (selling and buying the same product in the same country), firms reduce more the risk of failure if they import from a country that is different to the one the firm exports later (Haz. Ratio=0.81). Similarly, when a firm imports a product that is different to the one the firm exports later, it reduces more the risk of failure (Haz. Ratio=0.94) Therefore, we find that learning-by-importing provides general skills to operate in foreign markets.¹⁴

Second, we explore whether the nature of the imported product (consumption, intermediate or capital goods) have a different impact on export survival. Previous research on the export-import link finds that importing intermediate inputs or capital equipment improves the performance of regular exporters more than importing consumption goods. The reason is the existence of a positive external effect on production from absorption of new technologies embodied in imported products (Bas and Strauss-Kahn, 2014; Caselli, 2018). We test this hypothesis of the different effect of the type of imported products on survival rates using new exporters rather than regular exporters. Table 5 column 3 includes three categories of imported goods: intermediate, capital and consumption goods. Compared to the imports of consumption goods (the omitted category), survival rates improve among new exporters that import mainly imported intermediate goods (Haz. Ratio=0.89) and, to a lesser extent but still positive and significant, capital goods (Haz. Ratio=0.91). Therefore, new knowledge embodied in intermediate and capital imported goods improve firms' competitiveness in the domestic and foreign markets.

¹³ We define a market as a product-country pair. When a firm is multiproduct-multicountry, we use only the main product-country pair of the export and import portfolio.

¹⁴ Choquette (2019) investigates a different question: does import experience help to survive longer in countries that are culturally very different to the home market (Denmark)? She found a positive link but only for export destination markets very dissimilar to Denmark. We replicate her analysis using the notion of psychic distance stimuli (PDS) to classify countries according to high/medium/low market similarity with Spain (Dow and Karunaratna, 2006). The PDS index builds on 5 differences between two countries (language, education, industrial development, degree of democracy and religion) and use the Kogut and Singh (1988) methodology to calculate the PDS index. Data set is available in <http://dow.net.au>. Results in Table A3 show that the positive impact of previous import experience on survival is always positive in all export destination markets, though the impact is larger in more culturally distant with respect to Spain. The last three columns of Table A3 include the sample of new exporters that start selling above 16 thousand euros (third tercile of the distribution). For this sample of "large" exporters, previous import experience matters for export survival whatever the degree of cultural similarity between the country of destination and Spain.

Thirdly, we check whether the selection of an efficient combination of product and country of origin in imports affects export survival. Access to cheap imported goods provides regular exporters with a cost advantage that is reflected in a superior performance in the export markets (Feng et al., 2016; Edwards et al., 2018). We want to test this hypothesis on the survival of new exporters. For that purpose, we test whether importing a product from a country with comparative advantage helps to survive longer in export markets. Table 5 column 4 includes a dummy variable that takes a value of 1 for product-country pairs in the import portfolio with revealed comparative advantage (i.e. Balassa index above 1).¹⁵ The estimated hazard ratio (Haz. Ratio=0.92) confirms that importing a product from the most efficient sourcing country helps new exporters to operate longer periods in foreign markets.

Table 5. Determinants of the probability of export market exit for first-time exporters. Sample of new exporters with previous import experience. Hazard ratios estimates.

| | (1) | (2) | (3) | (4) |
|---|---------------------|---------------------|---------------------|---------------------|
| importer (1000) only - Group 1 | 0.782*** (0.010) | 0.768*** (0.010) | 0.770*** (0.010) | 0.770*** (0.010) |
| regular importer (11XX) - Group 2 | 0.896*** (0.011) | 0.884*** (0.011) | 0.888*** (0.011) | 0.888*** (0.011) |
| irregular importer (10XX) - Group 3 | 0.912*** (0.025) | 0.907*** (0.025) | 0.914*** (0.025) | 0.914*** (0.025) |
| import value 2 ^{on} tercile [10–80 th. euro] | 0.995 (0.012) | 0.997 (0.012) | 0.999 (0.012) | 0.942*** (0.015) |
| import value 3 rd tercile [+80 th. euro] | 0.908*** (0.014) | 0.913*** (0.014) | 0.917*** (0.014) | 0.830*** (0.012) |
| import portfolio [2,5] product-cou pairs | 0.947*** (0.012) | 0.955*** (0.012) | 0.956*** (0.012) | 0.812*** (0.014) |
| import portfolio [6+] product-cou pairs | 0.909*** (0.014) | 0.927*** (0.014) | 0.920*** (0.014) | 0.892*** (0.010) |
| different product - same country | | 0.939*** (0.015) | 0.941*** (0.015) | 0.906*** (0.012) |
| different product - different country | | 0.820*** (0.012) | 0.828*** (0.012) | 0.980** (0.009) |
| same product - different country | | 0.810*** (0.014) | 0.810*** (0.014) | 0.812*** (0.014) |
| import mainly intermediate goods | | | 0.893*** (0.010) | 0.892*** (0.010) |
| import mainly capital goods | | | 0.908*** (0.012) | 0.906*** (0.012) |
| import from country with comparative advantage | | | | 0.920** (0.009) |
| initial export value 2 ^{on} tercile [6–16 th.euro] | 0.956*** | 0.954*** | 0.954*** | 0.955*** |

Continued on next page

¹⁵ We use CEPII-BACI database to calculate the Balassa index. About 68% of imported products come from countries that have comparative advantage in the exports of that product.

| | (1) | (2) | (3) | (4) |
|---|----------|----------|----------|----------|
| | (0.009) | (0.009) | (0.009) | (0.009) |
| initial export value 3 rd tercile [+16 th. euro] | 0.813*** | 0.812*** | 0.817*** | 0.818*** |
| | (0.010) | (0.010) | (0.010) | (0.010) |
| initial export portfolio [2,5] product-cou pairs | 0.683*** | 0.687*** | 0.688*** | 0.688*** |
| | (0.008) | (0.008) | (0.008) | (0.008) |
| initial export portfolio [6+] product-cou pair | 0.440*** | 0.447*** | 0.444*** | 0.444*** |
| | (0.012) | (0.012) | (0.012) | (0.012) |
| export agglomeration | 0.954*** | 0.955*** | 0.957*** | 0.957*** |
| | (0.004) | (0.004) | (0.004) | (0.004) |
| export revealed comparative advantage | 0.943*** | 0.944*** | 0.945*** | 0.945*** |
| | (0.010) | (0.010) | (0.010) | (0.010) |
| Observations | 32,416 | 32,416 | 32,416 | 32,416 |
| Log Likelihood | -284114 | -284058 | -284032 | -284031 |

Notes: We report odd ratios. Each regression includes cohort, province of origin of exports, product and country of destination dummies. For column 1, see Table 4 column 6 for trajectories included in groups 1, 2, 3 and 4. The omitted category is group 4 (0XXX). For column 2, we add categories according to the similarity between the market of imports and the market of exports. The reference category includes all firms with the same product-country pair in both the export and import portfolio. The other three groups of importers export (a) a different product to the same country; (b) the same product to different country; and (c) a different product to a different country. For columns 3 and 4, the reference categories are detailed in table A5 in the appendix. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4. Results for post-entry export growth

In section II, we showed that there is a positive correlation between post-entry growth of exports and import activity among first-time exporters. To take into account other factors affecting firms' export growth, we use multivariate regression analysis.

We focus on firm's export performance proxied by the cumulative annual average growth rate of export sales of new exporters that have survived in period T ($expgrowth_{iT}$). As firm survives one additional year, a new growth period of T+1 years is defined and the growth rate is re-calculated. Thus, we run separate regressions for growth periods of T=2 (survival group of 2 years) up to T=8 (survival group of 8 years). Notice that, in order to calculate annual growth rates, we define a year as a 12-month period, taking into account the first month in which the firm begin to export. Therefore, we avoid the problem of the partial year bias effects (Bernard et al., 2014; De Lucio et al., 2015).

Our baseline fixed effects regression model is specified as follows:

$$expgrowth_{iT} = \beta_0 + \beta_1 X_{i0} + \beta_2 IMPORTER_{i0} + FE_{province} + FE_{product} + FE_{country} + FE_{cohort} + u_{iT} \quad (5)$$

where X_{i0} is the value of firm i's exports in the first exporting year to control for the level of export commitment of the new exporter, and $IMPORTER_{i0}$ is an indicator of the import activity of the firm before the firm start exporting. We use five indicators:

1. a dummy variable for the import status that takes value 1 when the new exporter has any import experience, 0 otherwise;
2. four dummies that capture alternative import trajectories (importer with less than one-year experience before export entry, [1000 trajectory]); regular importer [1100, 1110, 1111 & 1101]; irregular importer that imported at least twice [1001, 1010, 1011]; importer but not 12 months before exporting [0XXX]);
3. three dummies that capture the nature of the main imported product (intermediate, capital and consumption goods);
4. three dummies that capture the size of the import portfolio (1 product-country; between 2 and 5 product-country pairs; and 6 or more pairs);
5. four dummies that capture the extent of export-import country portfolio diversification (same product-same country of imports and exports; same product-different country; different product-same country; and different product-different country).

In all the regression we use vectors of fixed effects to control for time-invariant characteristics of province of origin ($50 FE_{province}$), product (52 HS 2 digits $FE_{product}$), country of destination ($98 FE_{country}$), and entry cohort ($15 FE_{cohort}$).

Table 6 panel A presents the estimation results of the growth model for exports at the firm level. Export commitment measured by the value of initial exports has a significant negative impact on the growth of exports among new exporters. Thus, the higher the value of initial exports, the lower the firms' export growth rate. Notice that the impact of the initial value of exports attenuates as firms survive longer periods: if the new exporter doubles the number of years in the export market from 3 to 6, the negative impact of a high value of initial exports is reduced by half. After 8 years operating in the export market, the catch-up effect is still negative and statistically significant.

Considering import experience status (the reference category are new exporters without import experience), all estimated coefficients are positive for any survival period, suggesting the existence of an import-experience *premium* on post-entry export growth. However, the positive impact decreases as the length of the survived period increases. New exporters with import experience show export growth rates 0.10 per unit points higher than those not having import experience, and the difference is statistically significant at 5% level. This positive effect drops to 0.06 after 4 years surviving on the export market and continues decreasing but never disappears. After 8 years exporting, the import experience premium becomes smaller but still different from zero at 5% level. Therefore, the import experience premium on the export growth of new exporters does not to fully depreciate over time.

Next, we investigate to what extent import experience affects export growth considering the import trajectory of new exporters. Table 6 panel B shows that recent import experience matters more for export growth than remote import experience. Additionally, regular past import activity leads to higher export growth compared to irregular past import experience.

In Table 6 panel C we check whether export growth is affected by the size of the import portfolio. We observe that new exporters with large import portfolio (+ 6 product-country pairs) grew faster than the rest of new exporters.

In Table 6 panel D we analyse the effect of import experience on new exporters' export growth considering the type of imported products: intermediate, capital and consumption goods. Our results support the intuition of positive external effects arising from technological imports since the growth

premium of new exporters that imported mainly intermediate or capital goods is more than twice larger than those that imported mainly consumption goods.

Finally, in Table 6 panel E we examine whether the differences in the composition of the export and import portfolio affects export growth. The group of new exporters that grows faster is the one with an import portfolio different to the export portfolio. The last two results suggest that import diversification affects positively export growth.

Table 6. The impact of import-based experience on exports growth (Equation 5 in main text).

| # number of years exporting | 2 | 4 | 8 |
|--|----------------------|----------------------|----------------------|
| PANEL A. By import status | | | |
| ln initial exports | -0.228*** (0.004) | -0.089*** (0.002) | -0.054*** (0.002) |
| importer dummy | 0.103*** (0.015) | 0.060*** (0.007) | 0.039*** (0.007) |
| PANEL B. By import trajectories | | | |
| ln initial exports | -0.229*** | -0.090*** | -0.054*** |
| importer (1000) only - Group 1 | (0.004) 0.193*** | (0.002) 0.099*** | (0.002) 0.060*** |
| importer regular (11XX). Group 2 | (0.028) 0.099*** | (0.013) 0.058*** | (0.011) 0.034*** |
| importer irregular (10XX). Group 3 | (0.018) 0.060 | (0.008) 0.097** | (0.008) 0.078* |
| importer (0XXX). Group 4 | (0.089) -0.026 | (0.044) -0.014 | (0.040) 0.017 |
| PANEL C. By import portfolio size (number of product-country pairs) | | | |
| ln initial exports | -0.228*** (0.004) | -0.089*** (0.002) | -0.054*** (0.002) |
| 1 product-cou pair | 0.052 (0.033) | 0.018 (0.016) | 0.024 (0.016) |
| [2,5] product-cou pairs | 0.071*** (0.023) | 0.060*** (0.011) | 0.034*** (0.010) |
| [6+] product-cou pair | 0.142*** (0.020) | 0.072*** (0.009) | 0.046*** (0.008) |
| PANEL D. By type of imported product | | | |
| ln initial exports | -0.228*** (0.004) | -0.089*** (0.002) | -0.054*** (0.002) |
| importer intermediate goods | 0.147*** (0.020) | 0.069*** (0.009) | 0.051*** (0.008) |
| importer capital goods | 0.108*** (0.029) | 0.068*** (0.014) | 0.043*** (0.012) |
| importer consumption goods | 0.039 (0.026) | 0.032*** (0.013) | 0.038*** (0.012) |
| PANEL E. By differences in the composition of export and import portfolio | | | |
| ln initial exports | -0.228*** | -0.089*** | -0.054*** |

Continued on next page

| # number of years exporting | 2 | 4 | 8 |
|-------------------------------|---------------------|---------------------|---------------------|
| | (0.004) | (0.002) | (0.002) |
| same product - same country | -0.052 (0.052) | 0.045* (0.024) | 0.008 (0.020) |
| diff. product - same country | 0.070* (0.042) | 0.046** (0.019) | 0.034** (0.016) |
| same product - diff. country | 0.109*** (0.018) | 0.071*** (0.008) | 0.051*** (0.008) |
| diff. product - diff. country | 0.073** (0.030) | 0.036*** (0.013) | 0.015 (0.012) |
| Observations | 38,828 | 16,178 | 5,728 |
| R-squared [see note (+)] | 0.107 | 0.172 | 0.235 |

Notes: Dependent variable: For each firm, the cumulative annual average growth rate of exports over a survival period of T years using the CARG formula $\ln\left(\frac{x_T}{x_0}\right)/T$. Each column is a separate regression with a sample equal to the number of firms surviving at least T years in the export market. Each regression includes cohort, province of origin of exports, product and country of destination dummies. For panel E, we add categories according to the similarity between the market of imports and the market of exports. The categories are (a) all firms with the same product-country pair in both the export and import portfolio; (b) importers exporting a different product to the same country; (c) importers exporting the same product to different country; and (d) importers exporting a different product to a different country. See Table 4 column 6 for trajectories included in groups 1, 2, 3 and 4 of Panel B. R-squared reported only of regressions of Panel A. The R-squared coefficients in the regressions of the other panels are very similar. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5. Conclusions

Using the universe of first-time Spanish exporters over the period 1997–2018, we analyse the importance of import activity on first-time exporters' export survival and, conditional on survival, export growth.

Our results clearly show that (1) firms that start exporting having imported the year before do exhibit higher survival rates; (2) the interruption of past import experience leads to a smaller impact of import experience on survival; (3) the positive effect of previous import activity on survival probability is higher when import value is larger and the size of the import product-country portfolio is bigger; (4) importing intermediate and/or capital goods improves more new exporters' survival compared to consumption goods because they improve the efficiency and quality of exports through the absorption of embodied new technologies or the exploitation of comparative advantages of importing specific products from the most efficient countries; and, (5) past learning-by-importing effects are not market-specific.

Next, we examined whether first-time exporters with and without previous import experience exhibit the same growth dynamics. Our findings are that (1) having previous import experience leads to higher export growth rates; (2) recent import activity when exports activity begins is the most relevant characteristic of past import experience to improve export growth in the first year of exports; it depreciates in the following years but never completely disappears; (3) importing intermediate and capital goods leads to better post-entry performance in terms of growth during the four first years, that

is, until a new exporter becomes a regular exporter; and (4) import diversification of new exporters enhances their exports growth.

From a policy perspective, our results reveal the importance of foreign trade in all its modes, not only in the export activity. Thus, policies to promote imports are also important, through awareness campaigns, information, reduction of bureaucratic obstacles, training, financial facilities or the application of support and counselling programs to business internationalisation. Government support initiatives to enlarge the number of exporting firms should consider that two-way traders have higher chances of export success. In addition, these enhancing policies should take into account that new exporters importing intermediate and/or capital goods from low-cost countries tend to exhibit higher survival rates.

Use of AI tools declaration

The authors declare they have not used Artificial Intelligence (AI) tools in the creation of this article.

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Conflict of interest

All authors declare no conflicts of interest in this paper.

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