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Dirk Boehe
Camila F. S. Campos
Naercio Menezes-Filho

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Dirk Boehe
Massey University

Camila F. S. Campos
Insper

Naercio Menezes-Filho
Insper and University of Sao Paulo

Abstract

New exporters tend to exit markets more often. Despite significant sunk costs of exporting, the rate of survival in the first year of a product in a new market is very low. In this paper, we use detailed export and import transactions panel data from Colombia to examine how import activity by exporters increases export survival. We use the lagged importer's exchange rate index as an instrument for imports and control for different types of synergies and for firm, product and destination-year fixed effects. The main result shows that imports significantly increase the probability of export survival after the first year. The volume imported by an exporter siginificantly increases the probability of survival, notably through the diversification margin. Diversification, here understood as the number of products imported and the number of origins of imports, positively impacts the probability of survival at the moment of entry in a new market.

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1 Introduction

After many years of research in export dynamics, there is still little clarity as to why exporters exit their export markets. In developing economies, survival rates tend to be low (Blum et al., 2013; Cadot et al., 2013; Fernandes et al., 2016). In Colombia, for instance, only 30% of new varieties survive after one year. Despite inconclusive evidence in this field of inquiry, research in international economics has made progress and unveiled some determinants of export survival, such as productivity, size or experience (Freund and Pierola, 2010; Görg et al., 2012), inter-organizational synergies and information spill-overs (Cadot et al., 2013), domestic macroeconomic factors (Salomon and Shaver, 2005), or destination-country specific factors (Araujo et al., 2016). While these determinants are certainly important, the export survival literature seems to have nevertheless overlooked that many exporters also import. Since prior research has shown that importing is associated with common export success factors such as product quality and productivity (Bas and Strauss-Kahn, 2015; Kasahara and Lapham, 2013), we hypothesize that imports positively influence the survival in export markets.

Therefore, in this paper we study the impact of imported inputs on export survival of new entrants in foreign markets. In line with the empirical evidence (especially for developing countries) we observe that a relevant share of varieties does not survive more than a year in a foreign market. We then investigate whether imports of inputs increase the probability of survival of a new variety (a firm-product-market triplet) in a foreign market. Our results suggest that larger volumes of imports of capital and intermediate inputs do increase the likelihood of export survival.

Our empirical analysis uses transactional data of Colombian exporters, at the firm-product-destination-year level, covering the years from 2001 to 2011. Colombian transaction data is well-suited to study export dynamics as previous work has demonstrated (Eaton et al., 2008; Roberts and Tybout, 1997). Our study combines export and import transactional data with accounting data (for a sub-sample of firms), which allows us to control for time-variant firm-specific characteristics, such as firm size, sales volume or profitability measures. Beyond profitability and size, our models also control for a series of other determinants of export market survival, such as firm, product and destination-year fixed effects, that capture demand shocks in export destination countries, export product and firm characteristics. In addition, we control for synergy effects, often resulting from information spill-overs and economies in financial and trade intermediation (Cadot et al., 2013). Our results are robust to the use of these different controls, samples and specifications.

To investigate the role of imports of inputs in affecting the probability of survival of a variety in a foreign market, we used lagged imports as the main variable of interest and apply an instrumental variable strategy, since imports could be correlated with other time-varying firm-specific unobserved variables that also determine export survival. Our instrument for the lagged volume of imports is the lagged firm-specific imports exchange rate index, measured as the weighted average of the countries of origin of imports' exchange rates, with weights given by the firm-specific share of imports from each country in the previous period.

We find that as imports in the previous period increase, exporters are also more likely to survive in export markets. This result suggests that importing seems to

create benefits beyond an initial productivity threshold required to overcome the sunk costs of exporting. The effect of importing on survival is economically significant: all else equal, an increase in the value of imports in the previous year by one standard deviation raises the probability of survival of a new product in a new destination by approximately 30 percentage points.

We also find that the effect of imports on survival probability is higher when the number of products imported and the number of countries of origin of imports are higher and when the firm also imports from the destination country. This suggests the product variety and relationships between exporting and importing countries matter for export survival. Our main result remains qualitatively the same when we exclude all the firms that do not import and the firms that import from the destination country, when we use current rather than lagged imports and when we define new products as those that were not exported in the previous two years (rather than one year).

2 Literature Review

Previous research has found that firms that import inputs have higher productivity and also that productivity is associated with higher rate of survival (Syverson, 2011). The "learning by importing" hypothesis posits that importing intermediate inputs can raise productivity (Kasahara and Rodrigue, 2008). Halpern et al. (2015) have identified two channels through which imports enhance productivity, by increasing

price-adjusted product quality and imperfectly substituting inferior domestic inputs. Moreover, several studies have provided empirical evidence for productivity and product variety enhancement through importing (Bas and Strauss-Kahn, 2014; Bernard et al., 2011). Imports of intermediate products can lead to enlarged product scope because increasing access to new intermediate products and cheaper access to existing intermediate products allows firms to expand their product varieties (Goldberg et al., 2010). In addition to broadening the range of intermediate products, improved quality of intermediate imports can also result in new product development (Colantone and Crinò, 2014). Overall, these mechanisms reduce firms' marginal costs or enhance their profit margins respectively. Thus, these mechanisms allow to compensate for the sunk costs of exporting and increase firms' competitiveness in export markets.

Prior research has found evidence that lower input tariffs increase total factor productivity (TFP) more strongly than output tariffs, indicating that productivity improvements through imported manufacturing input seem to be a stronger mechanism than productivity improvements through enhanced competition by finished products (Amiti and Konings, 2007; Kim et al., 2011; Topalova and Khandelwal, 2011).

Imports of capital goods can also enhance productivity, by making production processes more efficient. Specifically, imports of capital goods help diffusing technological knowledge across borders, so that firms in less technologically advanced countries can benefit from R&D conducted overseas. Indeed, total factor productivity (TFP) and R&D investments seem to particularly benefit from importing

(Goldberg et al., 2010). Developing countries typically import capital goods that were engineered and produced in a small number of advanced economies, allowing capital goods importers to absorb advanced technology through learning-by-doing (Alfaro and Hammel, 2007).

Using country-level data, Eaton and Kortum (2001) find that lower relative equipment prices raise the productivity by up to 25%. Similarly, Caselli and Wilson (2004) show that capital goods imports result in rising productivity at the country level. On the firm level, imports of capital goods are likely to raise productivity within the first two years after the transaction (Habiyaremye, 2013).

Since firm productivity, product scale, scope, variety and quality can increase a firms' competitiveness, they may also be associated with higher export survival levels. Hinting at such relationship, Görg et al. (2012) uses Hungarian firm-transaction level export data to examine what determines the survival of products that are part of a firm's export mix. They find that firm productivity, product scale and tenure are associated with higher export survival levels. However, some studies have also indicated that productivity explains export survival only to a limited extent (Eaton et al., 2011; Nguyen, 2012). Therefore, we need to consider additional determinants of export survival.

Freund and Pierola (2010) use Peruvian international transactions data to reveal substantial entry, exit and re-entry behavior. While entry into new markets is costly for an existing export product, the amount of trials suggests that entry costs cannot be too high. For instance, they find that firms start exporting small quantities. Additionally, they find that exporters of new products tend to be bigger, export more

products, and are more experienced. Entrants into new product-market combinations are relatively large exporters and experience in the same product is positively related and significantly correlated with pioneering new product-markets. Hence, the high relevance of firm characteristics, such as size and experience, to explain export success.

Regarding inter-firm synergies, the paper most related to ours is Cadot et al. (2013) that studies how relevant synergies are in explaining the first year of export success for firms from four African countries. Synergies, i.e., positive externalities or information spill-overs from industry peers or trade intermediators as well as economies of scope in product markets, are measured as the number of firms selling the same product to the same destination; the number of destinations in which a firm is selling the same product; and the number of products being sold by a firm in the same destination market. Consistent with their findings, we also obtain that synergies are relevant for high turnover of varieties from Colombia in export markets.

Synergies from export pioneers to followers might explain export survival because export pioneers can transmit information and knowledge on viable export markets, logistics and transportation links to followers (Artopoulos et al., 2013; Wagner and Zahler, 2015). For instance, it seems that a higher number of exporters in the same export market makes it more profitable and less risky for financial services, logistics and export consultants to provide supporting services (Cadot et al., 2013). Consistent with Cadot et al. (2013) and Koenig (2009), Albornoz et al. (2012) argue that positive spill-overs from pioneers to followers hold particularly after initial small scale market entries. Conversely, a city level study finds that spill-over effects from neigh-

boring exporters incentivize weaker firms to follow; being less productive, however, these firms are less likely to survive (Fernandes and Tang, 2014).

With respect to country-level characteristics, complementary explanations for the high turnover of varieties suggest that firms experience uncertainty and therefore test new markets first to learn about foreign market demand (Iacovone and Javorcik, 2010; Nguyen, 2012; Albornoz et al., 2012). In this vein, Békés and Muraközy (2012) explore both theoretically and empirically the existence of temporary trade, addressing its determinants including destination country and some firm characteristics (productivity and financial stability). They use Hungarian firm-transaction level export data to show that about one third of firm-destination and about one half of firm-product-destination export spells are short-lived, or temporary. They find that the likelihood of permanent trade rises with geographic proximity, destination countries' GDP as well as firm productivity and financial stability.

Relatedly, Araujo et al. (2016) finds export survival to be more likely when export market institutions are stronger. Foreign market institutions encompass the regulatory framework, such as the rule of law, especially contract law, and market access regulations, i.e., tariff and non-tariff barriers to trade. Stronger regulatory institutions make foreign market distributor opportunism and contract infringements less frequent. Hence, exporter-distributor relationships last longer (Araujo et al., 2016). In the same vein, export survival becomes more likely for those exporters who face more favorable market access conditions relative to their competitors (Fugazza and McLaren, 2014). Moreover, (Carrère and Strauss-Kahn, 2017) find that prior export experience obtained in non-OECD markets by developing countries significantly in-

creases survival of pioneer exports toward the OECD.

Foreign market opportunities may not last long, but if they are appealing they make it optimal for the firms to export even for one or two periods. The opposite also holds true: firms may invest in temporary trade because of negative demand shocks in their domestic market. To compensate for sluggish domestic demand, firms often start exporting be it only for a single period (Békés and Muraközy, 2012). Other studies have also suggested that domestic and international sales can be interrelated (Salomon and Shaver, 2005). Particularly, positive domestic demand shocks can lead to export market exit especially of smaller, less efficient occasional exporters (Blum et al., 2013). Specifically, positive domestic demand shocks may lead to market exit if export intensity is low and export markets serve merely as a valve for excess capacity.

To summarize, the export dynamics literature has yet to examine the relationship between imports and export survival. Still, prior research supports our argument that imports can raise export market survival by several complementary effects resulting from intermediate and capital goods imports. Intermediate goods imports may enhance export product quality through higher quality raw materials or components. Likewise, intermediate goods imports can increase export product variety by realizing new combinations among imported and existing components or raw materials. In addition, intermediate goods imports can make exporters more resilient to exchange rate fluctuations (Alvarez and López, 2008; Greenaway et al., 2012), e.g., through cheaper import prices that compensate higher export prices. Capital goods imports can increase firm productivity, particularly by means of machinery imports (relevant for process improvements), but also through R&D equipment imports (rel-

evant for product improvements and innovation). Depending on the type of capital goods, raising product varieties and quality can further increase and make firms more competitive in their export markets.

In terms of our econometric methodology, Bastos et al. (forthcoming) have (independently) devised a similar strategy for identification, using exchange-rate movements (interacted with indicators for initial exports) as instruments for the destination of exports to identify its effect on the prices of inputs used by Portuguese firms.

3 Data and Descriptive Statistics

3.1 Data

Our data come from the Colombian tax and customs authority (DIAN), which provides monthly records of all Colombian exports and imports. These records identify the exporter (importer), the date of the transaction, the destination country (country of origin), the 10-digit product code, the dollar FOB value and the kilo-weight of each transaction, among other variables. We consolidated monthly import and export transaction data into a database covering the 12 years from 2000-2011, consisting of firm, product, destination country (country of origin) triplets. In our analysis, we only include imports of capital and intermediate goods, based on the classification provided by the National Administrative Department of Statistics (DANE).

In addition, we built a unique database using the Colombian tax identification number (NIT) to match customs data with accounting data obtained from the Su-

perintendency of Corporations, a regulatory agency. Firms with assets or sales larger than US$ 5,2 mi as of 2006 (at least 30,000 minimum wages) are required to report their balance sheets to the superintendency. Thus, approximately 10,000 corporations in Colombia are legally required to report their balance sheets on an annual basis. The Superintendency of Corporations makes accounting data available to the general public and the government. As not all exporters are covered, merging accounting with export and import transaction data reduces the actual size of our database to 3,000-4,000 exporters per year. This unique database allows us to directly control for specific firm characteristics, such as size, firm performance, among others. We used this smaller combined database for robustness checks. We are aware of an alternative firm-level database, the Annual Survey of Manufacturers (*Encuesta Anual Manufacturera*, EAM), administrated by DANE. However, DANE uses its own internal firm identifiers for confidentiality reasons, other than the tax file number (NIT – *Número de Identificación Tributaria*), which we use. Therefore, we cannot merge our import-export database with EAM.

Despite its known domestic political and military conflicts, Colombia has shown a solid economic performance with an average GDP growth rate of 4.3% over the 11-year period covered by our database. This growth performance is higher than that of several South American peers, such as Brazil (3.6%) and Chile (4.1%). Between the years from 2000 to 2011, Colombian exports experienced a remarkable growth from US$ 13.1 bi in 2000 to US$ 56.9 bi in 2011. Similarly, imports rose from US$ 10.9 bi to US$ 51.5 bi in the same period. These growth trajectories, briefly interrupted during the crises of 2001-2002 and 2009, can be tracked back to the commodity price

boom cycle, among other factors. For instance, the main export products, coal, crude oil, coal, lubricating oils, coffee, bananas and flowers together accounted for more than 56% of total exports in 2000 and more than 65% of total exports in 2011. Overall, mining exports expanded from 37.2% of total exports in 2000 to 55.7% in 2011, while the share of agricultural exports diminished from 8.9% to 4% during the same period. Manufactured exports dropped from 53.8% to 40% between 2000 and 2011. The decrease of non-mining exports manifests itself after 2003/2004 and goes along with a significant appreciation of Colombia's real effective exchange rate starting in 2004.

Over the period covered by our data, the importance of the United States as an export destination country has decreased from 49.6% in 2000 to 38.6% in 2011, while exports to the European Union slightly increased from 13.8% to 15.7% in 2011. Other traditionally important export partner countries such as Venezuela and the Mercosur countries became less important export destinations. China and India, in turn, increased their importance in Colombian exports achieving shares of 4.4% and 1.5% respectively in 2011.

The composition of imports[1] remained stable for consumption products (around 19% of total imports) and capital goods (around 20% of total imports). However, the share of intermediate products and raw materials over total imports shrank from

[1]For the purpose of our analyses, we classify imported goods into intermediate and capital goods, which allows us to more precisely interpret our results because the third available category, consumption goods, conceptually differs from the broader category of final products to which consumption goods belong. The classification adopted here follows the standards provided by the National Administrative Department of Statistics (DANE), https://www.dane.gov.co/files/sen/nomenclatura/ciiu/CIIURev31AC.pdf (accessed in November 2019).

50.3% in 2000 to 41.7% in 2011. Imports from traditional partners such as the United States also lost ground between 2000 (33%) and 2011 (25%), whereas imports from China rose from around 3% to 15% over the same period.

3.2 Descriptive statistics on export and import behavior

We now describe the export behavior of the firms and the varieties in our sample. Table 1 shows that our sample consists of an average of 54,527 varieties –defined as firm-product-destination triplets. The number of varieties experiences a discrete growth in 2004 of 19%, caused by an increase in the number of firms by 13% in that year as well as an increase in the number of destination countries, which surged from 175 to 191. The average number of firms per year is 9,787 firms, reaching a peak in 2005 and suffering a drop during the global financial crisis, from 2008 onwards. On average, Colombian exporters sell 5.6 different products in each export destination country, whereas a typical firm sells 2 products per destination, which indicates that most firms in our database tend to be small exporters.

Table 2 displays the summary statistics for all 490,723 cases of new varieties over the 9 years covered by our data. A new variety corresponds to any product-firm entering a new country of destination, or any product being added by the same firm in a new destination or a new firm entering any market (product or export destination). The table shows that, on average, only 29% of the new varieties introduced in a market survive more than one year. In 20% of the cases, new varieties mean that firms are introducing new products in their export markets ("Add Product Only"), whereas in 12% of the cases the firms are exporting to a country to which they did not export

before ("Add Destination only"), and 11% of the firms are exporting a new product to a new destination country ("Add both Product and Destination"). The remainder are those firms that already exported the product, but not to this country, and those that already exported to this country, but not this product. For example, suppose a firm that sells product A in the U.S.A. and product B in France. A firm that starts selling product A in France, has already accumulated experience in exporting product A (to the U.S.A.) and in exporting to France (product B). Therefore, this case encompasses those varieties in which the firm has export experience in the product and in a particular foreign market, but not exactly in the product-destination market combination to which it initiates exports (product A to France). This is the omitted category in our empirical implementation.

Table 2 further tells us that on average 6.3 firms already export the same product to the same destination country. An average firm exports the same product to 2 different destination countries, while the most internationally diversified exporters ship the same product to a maximum of 54 countries. Roughly in line with the yearly averages in Table 1, each firm ships on average 6.2 products to the same destination country, while the firms that have most strongly diversified their product range export over 300 products to the same destination country. The average value of exported products is US$ 1,085 (ln score of 6.99) and the last row shows that the average share of a product per destination country is 12.6%, which indicates the importance of particular products for an exporter.[2]

Figure 1 displays survival rates over time. In the first year, the survival rate of

[2]In order to calculate the number of firms exporting the same products to the same destination market, we used our original dataset, before selecting only the new varieties.

exporting corresponds to almost 29%; in the second year, approximately 53% of the surviving varieties survive an additional period; which increases to 64% in the third year and to 74%, 82%, 85% and 88% in the following periods. Approximately 15.4% of the new varieties survive for 3 consecutive years, 10% for 4 years and 7% for 5 years. Therefore, the survival rate increases substantially with export tenure.

These numbers indicate that the survival in the first year is crucial for future behavior. For this reason, the emphasis of this paper is on the survival after the first year. This overall pattern is similar to other countries. Survival after the first year seems to be higher for Colombian exporters than for African exporters (10-22%) (Cadot et al., 2013), but lower than for exporters based in Chile (53%) (Blum et al., 2013). As anticipated, survival rates dropped during the global financial crisis from 29.5% in 2007 to 26.5% 2008.

A more detailed analysis of these rates shows that the pattern of survival is relatively robust. Survival rates according to entry cohorts indicate that they are constant over time (Figure 2). Little variation is also observed if considering different export destinations and export values. Exporting to OECD or to other Latin American countries lead to similar survival rates (Figure 2). Similarly, if we split the sample by the firm's value of exports, we also find comparable rates. For firms exporting between $10,000 and $100,000, we find slightly larger survival rates, in the range of 33-34%. However, although the volume of exports does have an impact on survival rates, the magnitude does not seem as important as one might have expected.

Since our aim is to examine the impact of imports on the survival rate, we now

examine the importing behavior of the exporting firms. Tables 3 and 4 report classifications of importers. Over the period considered, the share of importers among exporters consisted of 30-40% (Table 3). Among exporters, approximately 24% imported capital goods and 31% intermediate goods. Among importers, 10% on average only imported capital goods over the 2002-2010 period, whereas 29% on average only imported intermediate products; thus, 61% of all importers purchased both capital and intermediate goods from abroad.

Table 4 classifies firms by import values, origin, and type of imported products. Note the gradually decreasing share of OECD countries as an origin of capital and intermediate goods imports by Colombian firms. This trend may be due to the rise of non-OECD countries such as China as global suppliers. Capital goods account for approximately 35.4% of total imports while intermediate goods account for 64.6%.

Table 5 describes the exporting behavior of firms and varieties in our sample for the subsample of firms covered by the Superintendency of Corporations database, which adds accounting data for a smaller sample of larger firms. Accordingly, the average number of firms drops to 2,618 or 27% of the average for the entire sample. The average number of varieties drops much less, to 25,827 firm-product-destination varieties (47% of the average in the total sample). With 10 products per destination country, the average number of products per destinations per firm is nearly twice as high as in the full dataset. Interestingly, this average declines over time and so does the median, which drops from 4 products to 3 products per destination.

4 Empirical strategy

To examine survival we select only the observations corresponding to the first year of a new variety in a market. Our sample then consists of single year observations of each new variety and our dependent variable is whether the variety lasts for only one year (failure) or if the variety survives for at least two consecutive years (success).

The explanatory variables are a combination of product, firm and export destination market characteristics. We also include variables to capture spillovers among products, firms and destinations (Cadot et al., 2013). To measure these spillovers, we use our original dataset - before selecting only the new varieties - to construct the following variables: the number of firms selling the same product to the same destination, the number of destinations to which a firm is selling the same product and the number of products being sold by the firm in the same destination market. While the former reflects possible information spillovers, the latter two indicators seek to capture the exporter's previous experience, which has been found to be an important alternative predictor of export market survival (Araujo et al., 2016).

To control for the size of the firm we include the (log) value of total exports. This control is important since smaller exporters tend to disproportionately contribute to export market and within-firm churning (Berthou and Vicard, 2015). Since experience and size are correlated, previous research has recommended controlling for size and experience in the same regressions (Berthou and Vicard, 2015). To capture how relevant a product is for a firm (in the spirit of "core competencies") we include the share of the product in the destination by firm[3].

[3]To construct this variable, we use our original dataset - before selecting only the new varieties.

Our main variable of interest is the lagged value of imports (by firm) in constant Colombian pesos of 2010. Since the firm's imports could be endogenous to export survival, we instrument the value of imports using a firm-level exchange rate index. For those firms that import, the instrumental variable we use is a weighted average of bilateral exchange rates of the Colombian peso relative to the countries of origin of the firm's imports, weighted by the lagged share of imports from each country. Following Campa (2004), for those firms that do not import (either in the current period or in the last period) we impute a product level exchange rate index using the average of the firms that export this same product. Therefore, for non-importers, variation of the exchange rate index within firms is due to product variation[4]. It is worth mentioning that our estimates are robust to the exclusion of the firms that do not import.[5]

This instrumental variable would not satisfy the exclusion restriction if the firm-specific import-based exchange rate had a direct effect on export survival. An appreciation of the peso against all currencies could decrease the probability of export survival directly, for instance, by making exporting less profitable through a reduction in export prices received by Colombian exporters and/or by making exports more expensive in foreign markets.

To avoid this direct effect of the firm-specific import index, all our regressions control for destination-year fixed effects. This should capture any relationship be-

[4]Bastos et al. (forthcoming) have devised a similar strategy using exchange-rate movements (interacted with indicators for initial exports) as instruments for the destination of exports to identify its effect on the quality of inputs.

[5]The estimates excluding the non-importers show that the results are qualitatively the same (see Table 11).

tween the bilateral Colombian exchange rate relative to export destinations and the probability of export survival. Therefore, by using this instrument we identify the effect of imports on export survival solely by using the variation from the Colombian exchange rate relative to the mix of countries of origin of the firm's imports, excluding the variation that comes from the destination country.

The mix of import and export partner countries - whether firms buy and sell from the same countries or different ones – could potentially raise a concern. We observe, though, that, for instance, in 2010, only 2% of the firms imported exclusively from the country of destination of their exports, and 21% imported solely from countries different from their destination markets. Approximately 18% imported also from the country to which they started exporting, and 57% of the firms did not import capital or intermediate goods. These patterns suggest that the set of origins differs from the set of destinations. Furthermore, our results are robust to the exclusion of all firms that import goods from their destination country (Table 11).

If exports of a product (or variety) are actually taking place despite the relatively high price that prevails after a peso appreciation, this may imply that there is a strong demand for the product that may also affect export survival. In order to control for such possible country-specific product demand conditions, all regressions include the real value of exports, the number of firms selling the same product to the same destination and the number of products sold by the firm in the same destination market. Thus, our identification assumption is that there are no country-specific unobserved product demand effects not captured by any of these variables together with the destination-year fixed effects.

We estimate the following linear probability model:

$$\begin{aligned} S_{fpdt} &= \beta_0 + \beta_1 Imports_{f,t-1} + \beta_2 AddProd + \beta_3 AddDest + \beta_4 AddProdDest \\ &+ \beta_5 \log NFirms_{pdt} + \beta_6 \log NDest_{fpt} + \beta_7 \log NProd_{fdt} \\ &+ \beta_8 \log(ExportValue)_{fpdt} + \gamma_p + \delta_f + \Theta_{dt} + \varepsilon_{fpdt} \end{aligned}$$

where S_{fpdt} is the survival after the first year, $Imports_{f,t-1}$ measures imports at the firm level[6] in the previous year; $AddProd$ is a dummy indicating the introduction of a new product in the export market; $AddDest$ is a dummy indicating a new destination for a product that the firm already exports; $AddProdDest$ indicates that the variety corresponds to both a new product and a new destination[7]; $\log NFirms_{pdt}$ measures the number of firms that already export this product to that destination; $\log NProd_{fdt}$ measures the number of products that the firm already exports to this destination; $\log NDest_{fpt}$ measures the number of destinations to which the firm already exports this product; $\log(ExportValue)_{fpdt}$ is the total volume of exports. The regressions also control for product (γ_p), firm (δ_f) and destination-year (Θ_{dt}) fixed effects. The standard errors are clustered at the firm-level.

The first-stage regression is:

$$\begin{aligned} Imp_{ft} &= \alpha_0 + \alpha_1 ExchRateIndex_{ft-1} + \alpha_2 AddProd + \alpha_3 AddDest + \alpha_4 AddProdDest \\ &+ \alpha_5 \log NFirms_{pdt} + \alpha_6 \log NDest_{fpt} + \beta_7 \log NProd_{fdt} \end{aligned}$$

[6]We use the sum of all products imported by the firm in a given year. Therefore, its value is the same for all varieties exported by the same firm.

[7]The omitted category represents the cases where the firm already exported that product to another country or another product to the same country.

$$+ \quad \beta_8 \log(ExportValue)_{fpdt} + \gamma_p + \delta_f + \Theta_{dt} + \varepsilon_{fpdt}$$

where $ExchRateIndex$ is the weighted average of the countries of origin exchange rate index, with weights equal to each country's share of imports in the previous period.

5 Results

We first present our baseline estimations, as well as breakdowns by types of imports and then include controls using the accounting data available for a sub-sample of firms, and we also estimate regressions for different export values. Table 6 presents the results of the first-stage regressions, relating the volume of imports to the lagged firm-specific exchange rate index, conditional on the other controls that will be used in the second-stage. Column (1) relates the lagged value of imports to the lagged exchange rate index for the entire dataset, and column (2) does the same for the sample of larger firms only (for which we have firm-level accounting information). Columns (3) and (4) present the results of the same specfications when only the value of capital goods imports are instrumented and columns (5) and (6) use only the value of intermediate goods imports as the endogenous variable of interest. All columns of the Table show a strong positive and statistically significant relationship between the firm-specific exchange rate and the volume of imports, even conditional on firm, product and destination-year fixed effects, for the overall sample as well as for the firms covered by the Supersociety of Corporations database, for total imports as well for capital and intermediate inputs. The estimated coefficients are largest for

the total imports and smallest for imports of intermediate goods.

At the bottom of Table 6 we also present some diagnostic statistics, namely the heteroskedasticity-robust Kleibergen and Paap (2006) test statistics for under-identification and also for weak instruments. The p-values of the Kleibergen and Paap under-identication test clearly indicate rejection of the null in all columns, as do the p-values of the Kleibergen and Paap Wald rk F-statistics for weak instruments. This means that our instrumental variable modelling strategy is identified.

Table 7 presents our main results, describing the effects of lagged import values on export survival. Column (1) presents the specifications with no other controls, showing that the value of imports is positively related to the probability of export survival. We add firm, product and destination-year fixed effects in column (2), whereas column (3) includes all the other variables of interest, such as the proxies for product characteristics, synergies and size. The coefficient of *ImportValue* remainns marginally statistically significant in column (3).

As imports could be correlated with other time-varying omitted variables that also determine export survival, in column (4), we instrument the lagged value of imports with the lagged imports exchange rate index, measured as the weighted average of the countries of origin's exchange rates, with weights given by the firm-specific share of imports from each country in the previous period. The magnitude of the estimated coefficient increases significantly with respect to the OLS estimates reported in column (3) and is statistically significant. The estimated magnitude implies that a firm that increases its imported volume by one standard deviation because of an exchange rate appreciation of the Colombian peso with respect to a

basket of currencies from which the firm imported in the past period will increase its probability of survival in the export market by 32 percentage points.[8] Column (5) reports the results of the same regression for the smaller subsample of firms included in the Supersociety of Corporations database. The impact of imports estimated using this sample is smaller than the one obtained in the main sample, but still statistically significant. This is reassuring given that this sample is much smaller and mostly composed of bigger firms. These results suggest that imports have a causal effect on the probability of survival in export markets.

Export market survival could be explained by other factors as well. First, export market survival can increase due to demand shocks in specific export markets, which are unrelated to product characteristics or the productivity-enhancing effects of importing. An economic crisis in a particular market and year may disrupt sales irrespective of the exporter's strategy. Similarly, a boom cycle in a particular export market may extend sales to that market even for less competitive exporters whose products might not have survived in these markets otherwise. Moreover, currency devaluations can affect both imports and exports. We have accounted for these possibilities by controlling for destination-year fixed effects. To ensure that our results are not driven by differences in the international demand for specific products, we control for product fixed effects. Unobserved firm-specific factors, such as sector of activity, product development or marketing capabilities, skilled labour or capital intensity, among others, may also affect export market survival and are controlled for

[8]The magnitude of the effect is large, but in line with other studies that examined the effect of imported inputs. (Goldberg et al., 2010), for example, find that lower input tariffs account for 31 percent of the new products introduced by domestic firms in India and that this effect is driven mainly by increased firm access to new input varieties.

by firm fixed effects, so long as they do not vary over time.

The estimated coefficients of the other variables in the regression are also interesting by themselves. It is noteworthy that experience counts, since adding a new product to the export market is negatively related to survival, as is exporting to a new destination. The results also show that there are spillovers among firms, products and destinations. A larger number of firms exporting the same product to the same destination increases the probability of success of a variety. If a firm exports the same product to a larger number of export destinations then the probability of success also increases substantially. Moreover, more diversified firms, in terms of the number of products it exports to a specific destination have higher survival probabilities. Firm size (proxied here by the value of exports) is also correlated with survival, and the more relevant the product is for the firm in the destination country ("Share of Prod. by Dest.) the higher its probability of survival.

Learning and spillovers from firms in the same industry are also relevant for varieties to survive their first year. An increase of one standard deviation in the (log) number of firms selling the same product in the same foreign market raises the probability of survival by 6 percentage points. Experience in selling an export product (proxied by the number of destination countries to which a firm sells a particular product) raises the probability of survival by 1 percentage point, given a 10 percent growth in export destinations. Experience in selling in a given foreign market generates an increase in the probability of survival by 8 percentage points, given an increase of one standard-deviation in the (log) number of products sold. At the same time, if a product is relatively more important to a firm, which is measured

by the share of this product in the firm's total exports, the higher is the probability of survival.

In order to examine what type of imported inputs are more important for export survival, columns (2) and (3) of Table 8 replicate these empirical exercises for imports of capital goods and of intermediate goods, separately. The coefficients of import values are consistently positive and statistically significant in both cases. Interestingly, the impacts are stronger for imports of capital goods than for intermediate inputs and total imports. It seems, therefore, that imported machinery that becomes cheaper as the Colombian peso appreciates is slightly more important for export survival than imports of intermediate products.

We now use in Table 9 the "Supersocieties of Corporations" subsample to test for the robustness of our results after including time varying controls for profitability (Return on Sales, Return on Equity, Return on Assets) as well as sales volume. These are important alternative explanations, since exporters may churn varieties according to firm performance and domestic market dynamics (Berman et al., 2015). Table 9 presents the results and, as expected, all profitability ratios increase the likelihood of survival (Columns 2-4). Higher sales volumes, however, are not statistically significant for export survival (Column 5). More importantly, adding these controls does not substantially change our results.

These results mean that one of the most important channels that affect export survival is via the purchase of inputs from foreign countries. This is overall in line with evidence from Goldberg et al. (2010), who find that one of the most important effects of trade liberalization is to allow firms to import new varieties of inputs that

are used to produce new varieties of domestic products. Our findings are also consistent with Bas and Strauss-Kahn (2014), who report that imports tend to increase export volumes. Our evidence adds to this literature that imports also allow firms to survive in export markets.

5.1 Mechanisms

In this section, we examine the mechanisms behind the impact of imports on export survival. First, we evaluate whether the fact that a firm is an importer, regardless of the magnitude or value of imports, is relevant. Secondly, we evaluate the role of import diversification for the survival in the export market. Diversification, in this context, is captured by two variables: the number of different products imported by a firm and the number of countries of origin of imports. Finally, we analyze whether exporting to and importing from the same country impacts survival through a dummy variable.

In Table 10, we consider all these components and use each of them, one at a time, to predict export survival, all instrumented by the exchange rate index. In column (1), we use a dummy identifying the firms that import, regardless of the magnitude of their imports. The effect is positive, although only marginally statistically different from zero, at the 10 percent level of significance. This indicates that importing by itself is not a strong predictor of export survival. Diversification is explored in Columns (2) and (3). Column (2) uses the number of different products imported by a firm as the main explanatory variable, and the result shows a positive and statistically significant coefficient, which attests the relevance of product variety for

import survival. This is in line with Goldberg et al. (2010) who estimate substantial gains from trade through the access to new imported inputs, which contributes to the expansion of the firms' domestic product scope. This could potentially increase the likelihood of introducing new varieties also to export markets and of their survival in new markets.

We also explore the number of countries of origin as a measure of diversification of imports. In column (3) (Table 10) we obtain a positive and significant coefficient, with a lower magnitude than in column (2). This suggests that searching inputs from a broader set of countries raises the probability of survival of new exporters. This may occur because a broader set of countries can increase the importer's opportunities to learn from a range of suppliers. In addition, importers can enhance their flexibility in times of exchange rate or supply shocks when they import from a larger set of countries. However, the magnitude of the coefficient is smaller than the product diversification margin, i.e., 0.18 versus 0.31. Finally, column (4) uses a dummy indicating that the firm imports from and exports to the same country. The estimated coefficient is highly significant, indicating that market knowledge and/or network effects also increase the probability of export survival. This mechanism is consistent with Bertrand (2011) who found that importing from and exporting to the same country increases export performance.

Our findings suggest that most of these mechanisms are present and contribute to explain the relationship between imports and the survival of new exporters. The possibility to compare the relative contributions of each variable is limited since we only have one instrument.

5.2 Robustness Checks

We conduct robustness checks to assess whether our main results are consistent under a different definition of varieties and across different samples (Table 11). Since our research question is very specific - we are interested in the survival of new exporters - we defined our main outcome variable as an indicator of whether a new variety survives the first year. However, misreporting of export transaction may be a potential concern. For instance, if a variety is missing in a particular year (t) although it is present in the preceding (t-1) and following years (t+1), export transactions may not have been properly reported in year (t), and we would erroneously capture a new entry. Even though such errors might be rather unlikely nowadays with ever improving IT solutions, we tested this using a narrower definition of variety (Column 1). In Column 1, we define a "new variety" as a firm-product-country triplet that did not occur in the previous two years, instead of the previous year alone. Reassuringly, the estimated coefficients did not change significantly, indicating that our originally reported results are robust. In our main specification, the coefficient of the value of imports is equal to 0.031 whereas the coefficient of the narrower specification equals 0.025, both being statistically significant at the 1% level.

We also tested the robustness of our instrumental variable. Recall that we constructed our instrumental variable adopting an imputation procedure to fill in information on imports for those firms that did not import in t and (t-1). To test whether our imputation method could be biasing our results, we implemented two robustness checks. In Table 11, column (2), we include firms that import in the year prior to the launch of the new export, excluding those that did not. Column

(3) excludes all the firms that never imported in our sample period. Once more, the estimated coefficients did not change significantly, suggesting that our results are robust. The coefficient of the value of imports changes from 0.031, in our main specification, to 0.021 and 0.036 in columns (2) and (3), respectively, being both statistically significant at the 1% level.

To further investigate the adequacy of our instrumental variable strategy, we exclude firms that also import from the destination country of its new variety in Column (5), while Column (6) excludes those firms that import solely from this country. Results show that the coefficients are positive and statistically significant (at 10 %) for both specifications, increasing from 0.031, in our main specification, to 0.046 and 0.032 in Columns (5) and (6) respectively (Table 11). The effect is more imprecisely estimated when we exclude the firms that import from and export to the same destination country (Column 5), which reinforces the fact that these relationships are relevant.

We have also tested specifications with contemporaneous values of imports and lagged firm-specific import-based exchange rates as instruments. The coefficients are very similar to those of our main results, as reported in Column 4 of Table 11. When we included the contemporaneous values of imports and instrument both in (t), however, the estimated coefficient is not statistically different from zero. Therefore, import activities seem to respond with a delay to exchange rate movements, which is well-established in the related literature. For instance, Foster-McGregor et al. (2014) highlight the fixed costs of importing, and Lewis (2017) identifies price stickiness and strategic complementarities as potential reasons for such delays in exchange rate

responsiveness.

6 Conclusion

In this paper we examine the relationship between the volume of imports and export survival of new exporting varieties after the first year. We find that the importing behavior of the exporting firm affects its export survival and that the effect is stronger for imports of capital goods. We also find that the effect of imports on survival probability is higher when the number of products imported and the number of countries of origin of imports are higher and when the firm also imports from the destination country. This suggests the product variety and relationships between exporting and importing countries matter for export survival. Our main results remain qualitatively the same when we exclude all the firms that do not import and the firms that import from the destination country, when we use current rather than lagged imports and when we define new products as those that were not exported in the previous two years (rather than one year). We also examine the role of synergies among firms and products: a higher number of firms exporting the same product to the same destination country increases the probability of success of a new firm in that market.

Our findings have important implications for the export dynamics literature. While extant research has primarily focused on firm-level (Albornoz et al., 2012), inter-firm level (Cadot et al., 2013), home country (Berman et al., 2015; Blum et al., 2013) or destination country-level factors (Aeberhardt et al., 2014; Araujo et al.,

2016) to explain export survival, this is –to the best of our knowledge– the first study that extends this body of research to imports. Our findings also extend the nascent stream of research on importing-exporting relationships (Bas and Strauss-Kahn, 2014, 2015; Kasahara and Lapham, 2013) by demonstrating that imports do not only affect export market entry or export product scope, but also the probability of survival in export markets.

Thus, this study incorporates three elements of a global value chain: the import country of origin, the exporter's home base and the export destination country. This perspective of an interconnected globalized value chain on export survival has important implications for policy makers. While productivity, export experience, synergies among exporters, products and destination country effects continue being important, imports seem to result in additional benefits for export survival. This is because importing likely increase product variety and quality, enhances technological learning, in addition to shielding exporters from declining export competitiveness when their home country currency appreciates. This further highlights the complementarity between importing and export success. Since export survival is important to raise long-term export revenues (Aeberhardt et al., 2014), policy makers should raise their exporters' success chances by facilitating imports of capital and intermediate goods, e.g. by manipulating tariffs and non-tariff barriers to importing.

Future research may advance this field by investigating further which mechanisms are more relevant for establishing the link between imports and export survival. Since importing seems to raise productivity and product level innovation through a cheaper channel compared to internal innovation (Liu and Qiu, 2016), future studies may in-

vestigate under what specific conditions importing is more effective than in-house innovation to promote export survival. Future studies may also consider whether the characteristics of particular import countries of origin and/or export destination countries change the importing-export survival relationship. Whereas our study looked into importing of intermediate and capital goods as a source of export success, the question of how importing may affect export survival chances through competition in the domestic market was also beyond the scope of this project and constitutes a promising future research avenue.

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7 Figures

Figure 1: Kaplan-Meier Estimates

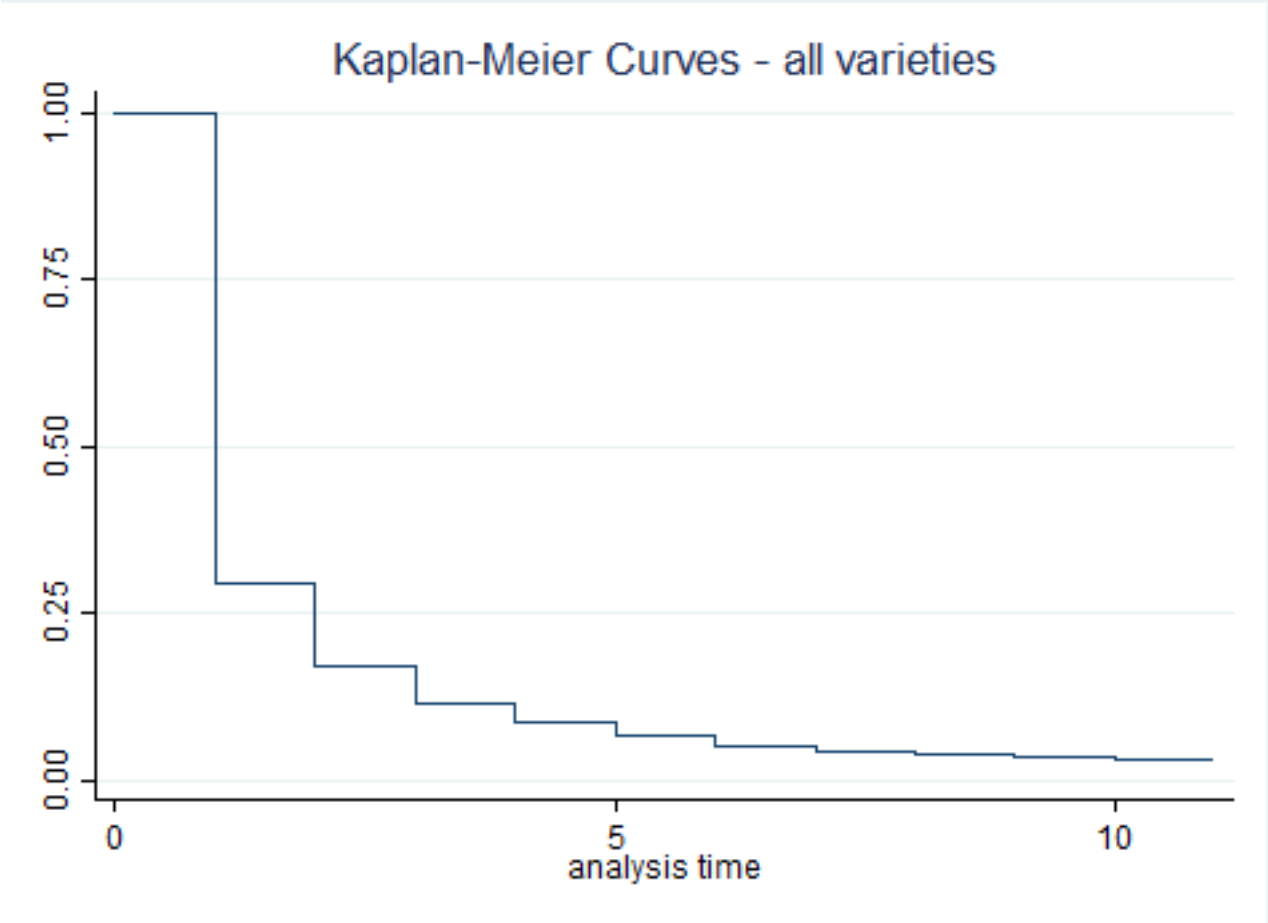
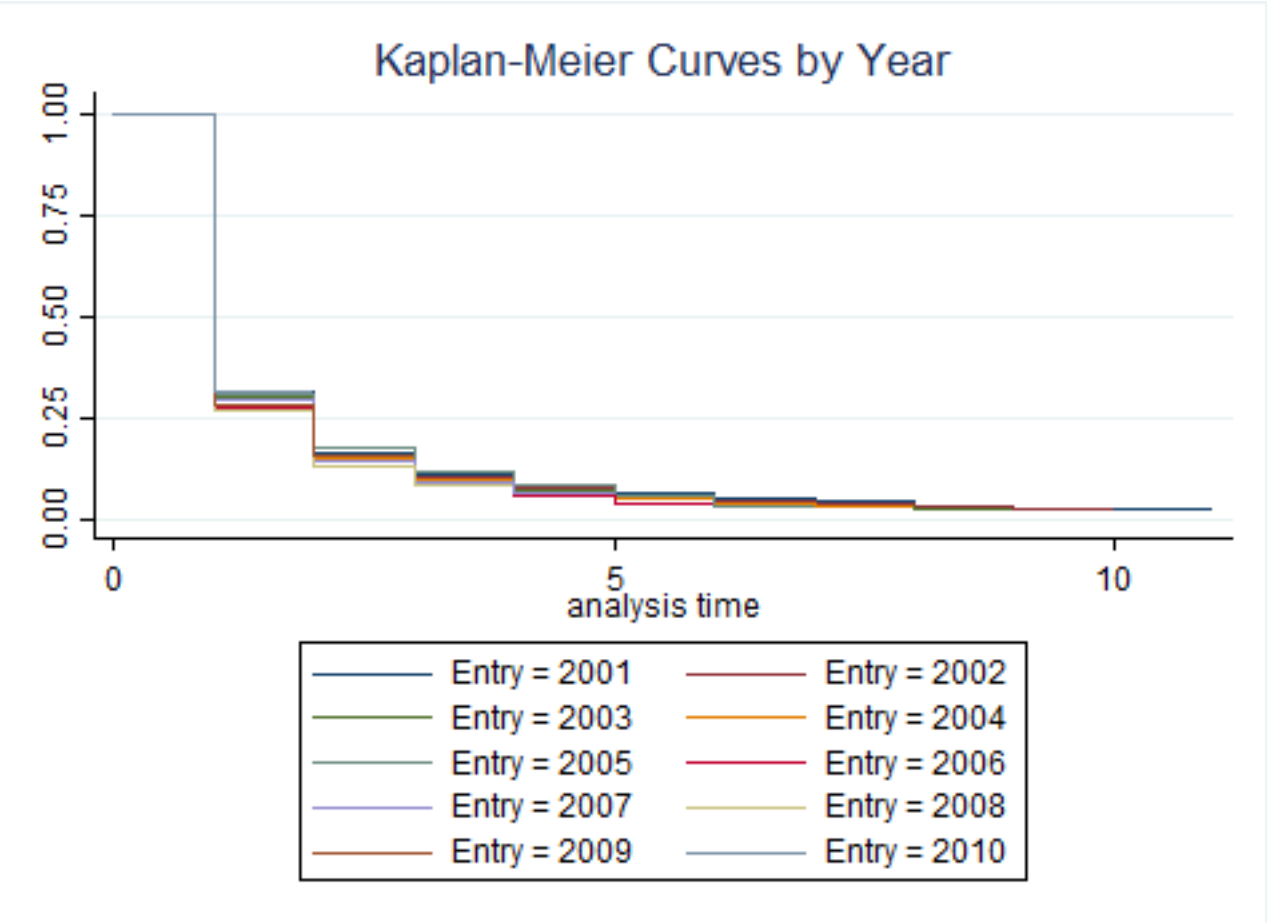


Figure 2: Kaplan-Meier Estimates



8 Tables

Table 1: Number of Varieties, Firms, Products and Destinations Over Time

	Varieties	Firms	Products	Destinations	Products-Destinations	
					Firm average	Median firm
2002	44148	7828	3869	175	5.6	2
2003	51620	8887	4074	175	5.8	2
2004	61509	10052	4158	191	6.1	2
2005	66327	11226	4175	182	5.9	2
2006	56269	10364	4117	193	5.4	2
2007	57469	10423	4133	188	5.5	2
2008	50344	10126	4124	200	4.9	2
2009	55131	10651	4150	196	5.1	2
2010	47906	8528	4002	191	5.6	2

Notes: This table describes the evolution in the number of varieties, firms, products and destinations during the sample period. Varieties are defined as any firm-product-destination triplets.

Table 2: New Varieties and Firm Characteristics

	N	Mean	Std. Deviation	Median	Min	Max
Success in the First Year	490723	0.290	0.454	0	0	1
Add Product Only	490723	0.201	0.400	0	0	1
Add Destination Only	490723	0.121	0.327	0	0	1
Add both Prod. and Dest.	490723	0.111	0.314	0	0	1
N. of Firms by Prod. Dest. (log)	490723	1.846	1.533	1.609	0	6.639
N. of Destin. by Firm Prod. (log)	490723	0.710	0.900	0	0	4.007
N. of Prod. By Firm Dest. (log)	490723	1.824	1.274	1.791	0	5.713
Export value (log)	490723	6.991	2.811	7.122	-4.605	20.634
Share of Prod. By Dest.	490723	0.126	0.277	0.005	0	1

Notes: This table is only based on the sample included in the regressions.

Table 3: Importers by Type of Goods

	Importers (% of exporters)	Importers of capital goods (% of exporters)	Importers of interm. goods (% of exporters)	Among importers	
				Import only capital goods	Import only interm. Goods
2002	36.7%	24.5%	33.6%	8.6%	33.4%
2003	35.5%	24.2%	31.9%	10.1%	31.8%
2004	33.6%	22.6%	30.6%	9.1%	32.8%
2005	30.6%	21.8%	27.3%	11.0%	28.9%
2006	33.6%	24.3%	30.1%	10.4%	27.8%
2007	34.7%	25.6%	31.0%	10.5%	26.0%
2008	34.0%	25.4%	30.2%	11.2%	25.5%
2009	32.1%	22.9%	29.2%	9.1%	28.9%
2010	39.6%	28.3%	36.0%	9.1%	28.4%

Notes: This table reports the percentages of importing firms by type of import good. The goods are aggregated in capital and intermediate goods, according to their 10-digit product codes. In the first division between capital and intermediate goods, firms can belong to one or more groups; in the second one, each firm can belong only to one group.

Table 4: Import Value and Composition

	Import (U$S)		% imports	% of total import - average		Importers	Number of firms
	Average	Median	from OECD	Capital goods	Interm. Goods	(% exporters)	(exporters)
2002	3,008,230	166,760	58.7%	31.0%	69.0%	36.7%	7828
2003	3,121,651	174,955	59.4%	33.6%	66.3%	35.5%	8887
2004	3,403,694	157,567	55.9%	33.2%	66.8%	33.6%	10052
2005	4,219,078	197,825	52.4%	36.0%	64.0%	30.6%	11226
2006	4,751,980	221,913	53.1%	36.1%	64.0%	33.6%	10364
2007	4,980,885	254,851	50.3%	38.0%	62.1%	34.7%	10423
2008	5,939,962	304,371	49.4%	38.5%	61.6%	34.0%	10126
2009	4,323,624	245,905	47.9%	35.6%	64.4%	32.1%	10651
2010	5,560,137	285,981	46.2%	35.8%	64.2%	39.6%	8528
Total	4,408,666	219,276	52.4%	35.4%	64.6%	34.3%	-

Notes: This table reports values and compositions of imports in 2010 US$.

Table 5: Supersocieties of Corporations - Number of Varieties, Firms, Products and Destinations Over Time

	Varieties	Firms	Products	Destinations	Products-Destinations	
					Firm average	Median firm
2002	17926	1804	3001	161	9.9	4
2003	19918	1930	3171	165	10.3	4
2004	23057	1976	3225	179	11.7	4
2005	28759	2742	3394	168	10.5	4
2006	28746	3132	3449	181	9.2	3
2007	29388	3016	3501	177	9.7	3
2008	26086	2849	3439	180	9.2	3
2009	29540	3154	3502	188	9.46	3
2010	28526	2958	3444	180	9.6	3

Table 6: Imports and Export Survival - First Stage Regressions

	$ImportValue_{t-1}$ All Goods		$ImportValue_{t-1}$ Capital Goods		$ImportValue_{t-1}$ Intermediate Goods	
	(1)	(2)	(3)	(4)	(5)	(6)
$ExchangeRateIndex_{t-1}$	0.6514***	0.9629***	0.2724***	0.3978***	0.3790***	0.5651***
	(0.06247)	(0.09491)	(0.03525)	(0.05597)	(0.04418)	(0.06112)
Add Product Only	-0.0192	-0.0305	-0.0363**	-0.0479***	0.0171	0.0173
	(0.02103)	(0.02524)	(0.01421)	(0.01661)	(0.01285)	(0.01538)
Add Destination Only	-0.0985***	-0.0256	-0.0602***	-0.0368**	-0.0383**	0.0112
	(0.02086)	(0.02451)	(0.01287)	(0.01520)	(0.01487)	(0.01705)
Add Both Prod. and Dest.	-0.1286***	-0.0895**	-0.0929***	-0.0765***	-0.0357**	-0.0130
	(0.02704)	(0.03572)	(0.01825)	(0.02334)	(0.01619)	(0.02072)
Nº of Firms by Prod. Dest. (log)	-0.0366***	-0.0426**	-0.0013	0.0055	-0.0353***	-0.0481***
	(0.01066)	(0.01664)	(0.00653)	(0.00975)	(0.00576)	(0.01008)
Nº of Destin. by Firm Prod. (log)	0.0113	0.0096	-0.0102	-0.0196**	0.0216**	0.0293**
	(0.01217)	(0.01702)	(0.00711)	(0.00913)	(0.00872)	(0.01262)
Nº of Prod. by Firm Dest. (log)	0.0204	0.0414**	-0.0058	0.0123	0.0262***	0.0291***
	(0.01278)	(0.01800)	(0.00907)	(0.01214)	(0.00630)	(0.00982)
Real export value (log)	0.0066**	0.0162***	0.0047***	0.0095***	0.0019	0.0067**
	(0.00299)	(0.00462)	(0.00162)	(0.00246)	(0.00220)	(0.00326)
Share of Prod. by Dest.	0.0097	-0.1127*	-0.0150	-0.0857**	0.0247*	-0.0270
	(0.02355)	(0.06265)	(0.01652)	(0.04371)	(0.01294)	(0.03131)
"Supersociedades" Sample	No	Yes	No	Yes	No	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Product Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Dest-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Under-Ident. Kleibergen-Paap LM stat.	114.584	106.065	62.933	52.050	77.562	88.087
Kleibergen-Paap LM p-value	0.000	0.000	0.000	0.000	0.000	0.000
Weak Instr. Kleibergen-Paap rk F stat.	108.726	102.925	59.716	50.509	73.597	85.479
Kleibergen-Paap rk F p-value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	466615	229645	466615	229645	466615	229645
R-squared	0.788	0.793	0.817	0.829	0.756	0.770

Notes: Columns (1), (3) and (5) report the output of the first stage regressions corresponding to the Models in Table 8. Columns (2), (4) and (6) report the first stage regressions for the Supersocieties of Corporations subsample. Standard errors are clustered at the firm level. * statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 7: Imports and Export Survival

Dependent variable: 1 if an export variety survives in the first year, 0 otherwise

	(1)	(2)	(3)	(4)	(5)
$ImportValue_{t-1}$	0.0006**	0.0005**	0.0004*	0.0319***	0.0214**
	(0.00025)	(0.00023)	(0.00022)	(0.00997)	(0.00871)
Add Product Only			-0.0280***	-0.0274***	-0.0171***
			(0.00348)	(0.00351)	(0.00394)
Add Destination Only			-0.0357***	-0.0325***	-0.0360***
			(0.00339)	(0.00355)	(0.00367)
Add Both Prod. and Dest.			0.0083	0.0124**	0.0128**
			(0.00524)	(0.00562)	(0.00563)
N° of Firms by Prod. Dest. (log)			0.0410***	0.0421***	0.0395***
			(0.00283)	(0.00303)	(0.00358)
N° of Destin. by Firm Prod. (log)			0.1171***	0.1167***	0.1287***
			(0.00191)	(0.00193)	(0.00238)
N° of Prod. by Firm Dest. (log)			0.0584***	0.0578***	0.0647***
			(0.00146)	(0.00149)	(0.00185)
Real Export Value (log)			0.0394***	0.0392***	0.0387***
			(0.00069)	(0.00069)	(0.00063)
Share of Prod. by Dest.			0.1811***	0.1809***	0.1713***
			(0.00536)	(0.00543)	(0.00902)
"Supersociedades" Sample	No	No	No	No	Yes
Firm Fixed Effects	No	Yes	Yes	Yes	Yes
Product Fixed Effects	No	Yes	Yes	Yes	Yes
Dest-Year Fixed Effects	No	Yes	Yes	Yes	Yes
IV Regressions				*	*
Instrument				ERI (t-1)	ERI (t-1)
Observations	466616	466615	466615	466615	229645
R-squared	0.000	0.212	0.278	0.245	0.225

Notes: This table reports the output of the regression estimated using the import value of all goods. Standard errors are clustered at the firm level. * statistically significant at the .10 level; ** at the .05 level; *** at the .01 level. Column (1) is a simple regression without controls or fixed effects. In Column (2), the regression adds fixed effects. Column (3) adds controls. Columns (4) and (5) show the IV regression results for all firms and for firms of the Supersocieties of Corporations subsample, respectively.

Table 8: Imports of Intermediate and Capital Goods

	Dependent variable: 1 if an export variety survives in the first year, 0 otherwise		
	(1)	(2)	(3)
$ImportValue_{t-1}$	0.0319***		
	(0.00997)		
$ImportValue_{t-1}$ *Capital Goods*		0.0763***	
		(0.02475)	
$ImportValue_{t-1}$ *Intermdiate Goods*			0.0549***
			(0.01751)
Add Product Only	-0.0274***	-0.0252***	-0.0289***
	(0.00351)	(0.00370)	(0.00352)
Add Destination Only	-0.0325***	-0.0311***	-0.0336***
	(0.00355)	(0.00371)	(0.00354)
Add Both Prod. and Dest.	0.0124**	0.0153**	0.0102*
	(0.00562)	(0.00599)	(0.00553)
N. of Firms by Prod. Dest. (log)	0.0421***	0.0411***	0.0429***
	(0.00303)	(0.00309)	(0.00303)
N. of Destin. by Firm Prod. (log)	0.1167***	0.1178***	0.1159***
	(0.00193)	(0.00197)	(0.00198)
N. of Prod. by Firm Dest. (log)	0.0578***	0.0589***	0.0570***
	(0.00149)	(0.00161)	(0.00153)
Real Export Value (log)	0.0392***	0.0391***	0.0393***
	(0.00069)	(0.00070)	(0.00069)
Share of Prod. by Dest.	0.1809***	0.1823***	0.1798***
	(0.00543)	(0.00556)	(0.00543)
Firm Fixed Effects	Yes	Yes	Yes
Product Fixed Effects	Yes	Yes	Yes
Dest-Year Fixed Effects	Yes	Yes	Yes
IV Regressions	*	*	*
Instrument	ERI (t-1)	ERI (t-1)	ERI (t-1)
Observations	466615	466615	466615
R-squared	0.245	0.198	0.242

Notes: This table reports the output of the regressions estimated using the import value of all goods, capital goods and intermediate goods for all firms. Standard errors are clustered at the firm level. * statistically significant at the .10 level; ** at the .05 level; *** at the .01 level. Columns (1), (2) and (3) show the IV regressions with controls for all goods, capital goods and intermediate goods, respectively.

Table 9: Imports and Export Survival - "Supersocieties of Corporations" Sample

	Dependent variable: 1 if an export variety survives in the first year, 0 otherwise				
	(1)	(2)	(3)	(4)	(5)
Import value (t-1)	0.0214**	0.0212**	0.0213**	0.0213**	0.0249***
	(0.00865)	(0.00865)	(0.00864)	(0.00865)	(0.00914)
Add Product Only	-0.0159***	-0.0157***	-0.0159***	-0.0159***	-0.0148***
	(0.00408)	(0.00408)	(0.00408)	(0.00409)	(0.00456)
Add Destination Only	-0.0363***	-0.0364***	-0.0363***	-0.0363***	-0.0318***
	(0.00380)	(0.00380)	(0.00380)	(0.00380)	(0.00399)
Add Both Prod. and Dest.	0.0158***	0.0153***	0.0158***	0.0156***	0.0101*
	(0.00576)	(0.00577)	(0.00576)	(0.00576)	(0.00608)
N. of Firms by Prod. Dest. (log)	0.0372***	0.0373***	0.0372***	0.0372***	0.0465***
	(0.00363)	(0.00363)	(0.00363)	(0.00363)	(0.00431)
N. of Destin. by Firm Prod. (log)	0.1318***	0.1318***	0.1318***	0.1317***	0.1580***
	(0.00242)	(0.00242)	(0.00242)	(0.00242)	(0.00266)
N. of Prod. by Firm Dest. (log)	0.0645***	0.0646***	0.0645***	0.0644***	0.0556***
	(0.00193)	(0.00193)	(0.00193)	(0.00193)	(0.00214)
Share of Product by Dest.	0.1734***	0.1739***	0.1735***	0.1737***	0.3627***
	(0.00932)	(0.00935)	(0.00931)	(0.00932)	(0.01089)
Real Export Value (log)	0.0387***	0.0387***	0.0387***	0.0387***	
	(0.00065)	(0.00065)	(0.00065)	(0.00065)	
Return on Sales		0.0007*			
		(0.00040)			
Return on Equity			0.0004***		
			(0.00012)		
Return on Assets				0.0103***	
				(0.00399)	
Real Sales (log)					-0.0121
					(0.01234)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Product Fixed Effects	Yes	Yes	Yes	Yes	Yes
Dest-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
IV Regressions	*	*	*	*	*
Instrument	ERI (t-1)	ERI (t-1)	ERI (t-1)	ERI (t-1)	ERI (t-1)
Under-Ident. Kleibergen-Paap LM statistic	117.674	118.146	117.730	117.777	117.921
Kleibergen-Paap LM p-value	0.000	0.000	0.000	0.000	0.000
Weak Instr. Kleibergen-Paap rk F statistic	114.230	114.690	114.283	114.329	114.472
Kleibergen-Paap rk F p-value	0.000	0.000	0.000	0.000	0.000
Observations	213322	213010	213291	213291	213010
R-squared	0.230	0.231	0.231	0.231	0.195

Notes: This table reports the output of the regressions estimated using the import values of all goods and some variables of the Supersocieties of Corporations database. Standard errors are clustered at the firm level. * statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 10: Mechanisms

	Dependent variable: 1 if an export variety survives in the first year, 0 otherwise			
	(1)	(2)	(3)	(4)
$ImportDummy_{t-1}$	1.9352*			
	(1.01079)			
$Log(1+N.ofProducts)_{j,t-1}$		0.3055***		
		(0.11275)		
$Log(1+N.ofOrigins)_{j,t-1}$			0.1852***	
			(0.05744)	
$ImportandExportSameCountry_{j,t-1}$		(Common Importer)		0.9406***
				(0.31798)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Product Fixed Effects	Yes	Yes	Yes	Yes
Dest-Year Fixed Effects	Yes	Yes	Yes	Yes
IV Regressions	*	*	*	*
Instrument	ERI (t-1)	ERI (t-1)	ERI (t-1)	ERI (t-1)
Observations	466615	466615	466615	466615
R-squared	-0.342	0.189	0.266	0.022

Notes: This table reports the output of the IV regressions estimated using different definitions of imports for all firms with the full set of controls used in Table 8. Column (1) shows the results for a dummy that indicates whether the firm imported or not. Columns (2) and (3) use the number of products and the number of countries from which a firm imported, respectively. Column (4) reports the results for a dummy that indicates whether the firm imported from the same country to which it exports the variety. Standard errors are clustered at the firm level. * statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 11: Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)
	New Definition of Variety	Only Importers	Never Importers	Current $Import_t$	Excl. Common Importer	Excl. Only Common Importer
Import Value	0.0248**	0.0205**	0.0357**	0.0908***	0.0464*	0.0317***
	(0.01037)	(0.00870)	(0.01574)	(0.03187)	(0.02769)	(0.00986)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Product Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Dest-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
IV Regressions	*	*	*	*	*	*
Instrument	ERI (t-1)	ERI (t-1)	ERI (t-1)	ERI(t-1)	ERI (t-1)	ERI (t-1)
Observations	385851	230148	151038	466615	392480	464683
R-squared	0.270	0.227	0.236	0.021	0.276	0.246

Notes: This table reports the output of the IV regressions with the full set of controls used in the main specification (see model 4 in Table 7). Column (1) defines a new product as a variety that has not been exported in the previous *two* years. Columns (2) and (3) show the results excluding the firms that do not import and excluding the firms that never import, respectively. Column (4) uses the current import value as independent variable and the same definition of survival as in the main specification. Column (5) shows the result excluding the firms that import also from the country to which they export. Column (6) excludes the firms that only import from the country to which they export. * statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.