Centre for Economic Performance

Discussion Paper ISSN 2042-2695

No.1774
June 2021

Sequential exporting across countries and products

Facundo Albornoz
Héctor F. Calvo Pardo
Gregory Corcos
Emanuel Ornelas

LSE The London School of Economics and Political Science

30 YEARS CEP

UKRI Economic and Social Research Council

Abstract
How do exporters expand their product scope and geographical presence? We argue that new exporters are uncertain about their profitability in different countries and products, but learn it as they start to export. As a consequence, exporters add products and countries sequentially, in an interdependent process. Exploiting disaggregated data on French exporters, we find empirical support consistent with such a mechanism, where firms learn from their initial export experiences and then adjust their sales, number of products and destination countries accordingly. Our results indicate that part of the learning is firm-specific, and not merely product- or market-specific. Furthermore, we find that firms tend to expand in the sub-extensive margin first by widening product scope within a destination and later by entering new destinations; and that firms' core products are particularly resilient despite being used to "test the waters" when entering additional countries.

Key words: export dynamics, experimentation, uncertainty, multiproduct firms, market inter-dependence
JEL codes: F10; F14; D22; L25

This paper was produced as part of the Centre's Trade Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

This research is supported by a grant of the French National Research Agency (ANR), "Investissements d'Avenir' (LabEx Ecodec/ANR-11-LABX-0047). We thank Andrew Bernard, Paola Conconi, Fredrik Heyman, Henrik Horn, Vincent Rebeyrol, Ariell Reshef, Felix Tintelnot, Maurizio Zanardi, as well as seminar participants at the 2020 CESifo Global Economy Workshop, Recent Trends in Firm Organization and Trade Dynamics Conference, 2019 ETSG, 2018 FREIT EIIT, 2019 FREIT SETC, IFN, Erasmus University, University of Cergy-Pontoise, University of Paris-Est and CREST for valuable comments.

Facundo Albornoz, University of Nottingham and CEPR. Héctor F. Calvo Pardo, University of Southampton, CPC, CEPR and ILB. Gregory Corcos, Ecole Polytechnique and CREST. Emanuael Ornelas, Sao Paulo School of Economics-FGV, CEPR, CESifo and Centre for Economic Performance, London School of Economics.

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

1 Introduction

Firm export dynamics involves expansion, as well as contraction, at different sub-extensive margins. Over time, some firms reach new destinations and add products to current and new destinations. At the same time, others discontinue products, abandon countries, and sometimes quit exporting altogether. This process is particularly characteristic of young exporters. What explains this seemingly erratic export path? If, from the perspective of a firm, the profitability of exporting each product to each country were known and independent from its other export decisions, determining the firm's optimal "internationalization path" would be relatively straightforward. However, that would be difficult to reconcile with the observed gradual, but uneven, process of firm export dynamics. This matters. For example, in an insightful recent survey of the literature on firm dynamics, Alessandria, Arkolakis, and Ruhl (forthcoming) conclude that "...despite the careful modeling of entry costs, the literature has largely avoided the treatment of a firm's dynamic decisions across multiple destinations. [...] Answers to key questions [...], such as the effects of bilateral trade wars, may be critically affected by the exact nature of trade costs across destinations and the opportunities for market switching" (p. 35).

In this paper, we propose and test a mechanism based on firm-level uncertainty about its own export profitability to explain some features of the process of export dynamics within and across foreign countries. When entry is costly, firms need to consider the consequences of learning as a result of different entry strategies across destinations with different products at different time periods. Faced with that problem, what does experimentation by new exporters reveal about profitability in foreign markets? After initially successful export experiences, are firms more likely to expand within their initial destinations or to venture to other countries? And after unsuccessful export experiences, do firms discontinue all types of products in the same way? This paper answers these and other related questions.

Exploiting data on all French exporters between 1993 and 2006 at the firm-product-destination-year level, we start by documenting that, in line with previous research, exporters exhibit significant entry and exit in foreign markets as well as churning of products sold abroad. As in other contexts, new exporters typically start small in volume, reaching a single export market with a single product. Many quickly give up exporting. Conversely, the majority of those that keep serving foreign markets expand along all these dimensions: total volume, number of products sold abroad, and number of countries served. Moreover, we observe that branching out through new products and new countries

follows a sequential pattern: most of the expansion that happens early in a firm's export tenure is by adding products, whereas adding countries tends to happen later.

To rationalize these facts, we build on the mechanism developed by Albornoz, Calvo-Pardo, Corcos, and Ornelas (2012, ACCO henceforth). ACCO's key hypothesis is that, upon entering in a foreign market, new exporters learn about their profitability in that market and also in other destinations. Here we extend that rationale to incorporate the product dimension, which is absent in ACCO. We argue that, upon entry, firms operating a flexible manufacturing technology infer information about their ability to successfully export their core (and non-core) products in their first foreign destination as well as in other potential destinations. Firms have to incur fixed costs both to start selling to new countries and to expand/adapt their product scope within destinations. When export profitability is persistent over time and correlated across countries and products, uncertainty and fixed costs create destination and product scope option values for firms, which then optimally engage into sequential product-and-destination exporting.

This setup yields some clear-cut empirical implications. Since uncertainty is higher for new exporters, first-ever export spells are characterized by high initial failure rates despite potentially large sunk costs to enter. On the other hand, conditional on surviving their first export experience, firms tend to expand along all margins, increasing export volumes of their initial products in their initial destinations, adding products in their initial destinations, and entering new destinations with new and old products. Observe that our proposed mechanism does not rule out the possibility that learning happens at the product and destination levels, but it does require that, on top of those possible channels, learning also happens at the firm level. An implication of firm-level learning is that there should be early growth (conditional on survival) in a firm's export tenure on top of growth that may happen right after it introduces a new product or enters a new market. Similarly, exit rates of new exporters should be higher even when compared with exit rates after an incumbent exporter introduces a new product abroad or enters a new destination.

Our empirical analysis provides robust support for each of these predictions, consistent with new exporters engaging into experimentation early in their exporting life cycle along their geographic and product scope expansion. Our methodology relies on a comparison between a firm's first-ever export spell and subsequent spells with old and new products in old and new countries. To do so, we define categorical variables for the first year of a spell, the first product sold and the first country served by each firm. By using these variables, as well as double and triple interaction terms, we can tease out age dependence in exporters' growth, exit and entry behavior. For instance, growth in the

second year of the first-ever spell is between 11 and 25 percentage points higher than growth after the second year of other spells with either the same product or country. Entry into new destinations follows a similar pattern: conditional on survival, young exporters are substantially more likely to expand scope in their first destination and to take their first product to other destinations than more experienced exporters. Furthermore, immediate exit is 15 percentage points more likely in an exporter's first-ever export spell than in a later spell with a different product in a different country, and the triple-interaction coefficient shows differential exit in firms' first market and first product of about 6 percentage points.

We show that these novel empirical findings apply both to firms that start exporting very small (the large majority) and to firms that start exporting multiple products to multiple countries, or that are part of a multinational company. They remain valid when we allow for learning from export 'pioneers' and when we control for firms' financial constraints. They are also robust to changes in firms' productivity (for the restricted sample of firms for which balance sheet data is available, representing 60% of the full sample), to partial-year effect corrections, and to different definitions of experienced exporters.

Our paper connects the literatures on firm export dynamics and on multi-product firms in international markets. The two topics are often studied independently. For example, Alessandria, Arkolakis, and Ruhl (forthcoming) review the literature on firm export dynamics without explicit reference to multi-product firms. In turn, as discussed below, the literature on multi-product exporters concentrates on cross-sectional facts and steady-state analyses. Our focus on export dynamics of multi-product exporters intersects both lines of research with specific contributions to each of them.

Within the export dynamics literature, one stream emphasizes the role of experience and market interdependence. Inspired by pioneering work by Evenett and Venables (2002) and Eaton, Eslava, Kugler, and Tybout (2008), ACCO developed and tested the notion of export experience and profit correlation across destinations as a way to learn profitability in multiple destinations. This mechanism has been adapted and extended both to explain facts on export dynamic patterns in specific contexts (as, for example, the international releases of U.S. movies, studied by Holloway, 2017) and to explain the process of firm internationalization more generally, as in Egger, Fahn, Merlo, and Wamser (2014), Conconi, Sapir, and Zanardi (2016), Chen, Senga, Sun, and Zhang (2018), Chen, Sun, and Zhang (2020), and Berlingieri, Marcolin, and Ornelas (2021). While this body of work has shown evidence of the core mechanism based on firms learning their own profitability abroad as

they engage in exporting, none has integrated the product and destination dimensions in a single framework, as we do here.

Other contributions, by Defever, Heid, and Larch (2015), Albornoz, Fanelli, and Hallak (2016), Morales, Sheu, and Zahler (2019) and Alfaro, Castro-Vincenzi, Fanelli, and Morales (2021), have studied how geographic interdependence affects firm decisions to export to new countries. For example, Morales, Sheu, and Zahler (2019)'s "extended gravity" forces imply that entry in a destination facilitates entry in other related destinations according to contiguity, geographical or cultural distances, structurally estimating the extent to which these factors reduce sunk export costs. Similarly, Albornoz, Fanelli, and Hallak (2016) allow sunk and fixed export costs to be lower for an "experienced" firm, making export decisions across countries interdependent. While this line of research has allowed for interdependence across destinations, a key distinguishing feature of this paper is that we introduce interdependence at the product-destination level and show how both dimensions are key to understand firms' export paths.

Other papers on export dynamics focus on learning, but without interdependence across products or countries.[1] A recent contribution to that line of research is Berman, Rebeyrol, and Vicard (2019), who develop a Bayesian model of learning about product demand and find compelling evidence that French firms adjust volumes in line with that mechanism, especially early in their export-destination spells. Similarly, Fitzgerald, Haller, and Yedid-Levi (2019) find that the declining hazard rate over time and the observed quantity and price dynamics in Irish exports are explained by a process of gradual learning about demand, together with investment in marketing and advertising.[2] Our paper shows how learning in a foreign market can inform firm decisions to expand within as well as across foreign destinations.

Our paper also relates to the literature on multi-product firms in international markets. That line of research typically focuses on cross-sectional regularities in terms of export product scope, productivity, production quality, or the effect of trade liberalization via changes in the product mix.[3] The importance of understanding multi-product exporting is obvious: as Bernard, Jensen, Redding, and Schott (2018) show, multi-product, multi-country firms account for most of a coun-

[1] As explained by Alessandria, Arkolakis, and Ruhl (forthcoming), a common finding in this literature is that export dynamics depend on past export participation and export tenure.

[2] Other contributions in this line of research include Freund and Pierola (2010), Nguyen (2012), Cadot, Iacovone, Pierola, and Rauch (2013), Aeberhardt, Buono, and Fadinger (2014), Timoshenko (2015a), Araujo, Mion, and Ornelas (2016), Cebreros (2016), Carrère and Strauss-Kahn (2017), Ruhl and Willis (2017), Arkolakis, Papageorgiou, and Timoshenko (2018), Li (2018), Lawless and Studnicka (2019), and Esteve-Perez (2021).

[3] See, for example, Eckel and Neary (2010); Bernard, Redding, and Schott (2011); Dhingra (2013); Qiu and Zhou (2013); Nocke and Yeaple (2014); Mayer, Melitz, and Ottaviano (2014, 2021); Eckel, Iacovone, Javorcik, and Neary (2016); and Arkolakis, Ganapati, and Muendler (forthcoming).

try's aggregate exports at any point in time. Our paper is concerned with the process through which multi-product firms expand their sales within and across countries. Also, much of the multi-product literature relies on the concept of "core" products, defined in different ways but ultimately related to the most profitable product of a firm. One of our contributions is to establish new facts about core products in firm export dynamics: they are both more resilient within a destination and prevalent in firms' choice of products to introduce in new destinations.[4]

Very few papers within the multi-product firm literature focus on product-level export dynamics. Notable exceptions are Timoshenko (2015b) and Sheveleva and Krishna (2017). The former finds that the variation in export scope declines with exporters' age in a new destination. This process of new exporters adding and dropping products in foreign countries is rationalized as learning about the "product appeal" of their products, in a context where marginal costs rise with firms' product scopes. Instead, Sheveleva and Krishna (2017) rationalize the same finding assuming that firms know the product appeal but not the value of the "brand" to foreign customers, which can only be unveiled by actual sales. Our emphasis on firm-level learning about profitability subsumes the discovery of product appeal and generates similar patterns at the firm-product level. We expand on this research by showing how the decision about adding products interacts with the decision about entry in new countries, creating a process whereby firms expand (and contract) through a broader set of sub-extensive margins.

The rest of the paper is organized as follows. In Section 2, we uncover novel descriptive facts about new exporter dynamics, which suggest that uncertainty is important at the product-destination sub-extensive margins. Section 3 describes informally our theoretical mechanism and its empirical predictions; the formal model is developed in the Online Appendix.[5] In Section 4, we test the predictions of that framework for export dynamics at the firm-country-product-year level using a sample of French exporters. Section 5 presents the results of a variety of robustness checks. We conclude in Section 6.

2 Stylized facts on firm export dynamics and export age

In this section, we use highly disaggregated French customs data between 1993 and 2006 to document some key stylized facts about firm export dynamics and age as exporters.[6] First, we compute

[4]These findings complement the pioneering work of Iacovone and Javorcik (2010), who establish that new exporters usually enter foreign countries with a product already sold domestically.

[5]See `https://www.dropbox.com/s/4wy3l35ag8kwvor/acco_ii_online_appendix.pdf?dl=0`

[6]See Appendix A for details on the construction of the dataset and for descriptive statistics on aggregate exports.

the relative importance of the intensive, extensive and sub-extensive margins for export growth. Second, we reveal some salient patterns of firm expansion in foreign markets. Third, we document how the performance of the first product that firms export differ from the performance of their subsequent export products.

2.1 Margin decomposition of 1994-2006 export growth

We decompose the long difference in aggregate French exports between 1994 and 2006. We consider three margins: a firm (extensive) margin, a product-country (sub-extensive) margin and an intensive margin. An exporting firm is assumed to be 'new' if it did not export in 1994. A country is 'new' for firms that did not serve that country in 1994. We consider a product as 'new' for firms that did not export that product in 1994. Products are defined at the HS 6-digit level. The exercise extends Bernard, Jensen, Redding, and Schott (2009) by adding new sub-extensive margins. For the sake of comparison, we also report the results from applying the exact Bernard, Jensen, Redding, and Schott (2009) decomposition in the Online Appendix.

Table 1 displays the contribution of net changes along each margin, in percentage terms, as well as the contribution of gross changes. Similar to what has been found for other countries (e.g., Eaton, Eslava, Kugler, and Tybout, 2008; Bernard, Jensen, Redding, and Schott, 2009), the intensive margin accounts for 26.5 percent of the variation in overall French exports across destinations. The pure extensive margin, given by the entry of new exporters, explains most of export growth (54.2 percent). The remaining 19.4 percent is explained by the sub-extensive, product-country margin. That net effect hides much greater gross contributions of entry (57.6%) and exit (38.2%) of product-country pairs. Hence, firms' internationalization strategies at the extensive and sub-extensive margins are the main driver of France's export growth.[7]

The table further decomposes the product-country sub-extensive margin into four mutually exclusive activities: adding an entirely new product in a new destination country ('new p, new c'); adding a new country for an already exported product ('old p, new c'); adding a new product to an existing export destination country ('new p, old c'); and adding an old product into an old export destination country ('old p, old c'). This decomposition reveals two findings. First, about two thirds of the product-country sub-extensive gross margin is explained by firms that reach new destinations with old products ('old p, new c'). Second, expanding the product scope in a previously entered

[7]The sub-extensive product-country margin can be further decomposed into a country and a product margin, representing 13.28% and 6.14% of net export growth respectively. The full table is available upon request.

Table 1: Margin Decomposition of 1994-2006 Export Growth

Margin	**Share of total**
Exporter births	+77.16%
Exporter deaths	-23.01%
Net entry	*+54.15%*
New Product-Countries	+57.62%
out of which	
New p, New c	+9.87%
Old p, New c	+29.62%
New p, Old c	+6.45%
Old p, Old c (swap)	+11.68%
Retired Product-Countries	*-38.20%*
Net Product-Country Margin	*+19.42%*
Growing Product-Countries	+42.84%
Shrinking Product-Countries	-16.41%
Net Intensive Margin	*+26.43 %*

destination country matters quantitatively as well: adding (new or old) products into countries where firms already export explains about one third of the gross product-country margin.

These findings show that firms expand their sales abroad by branching out destinations and products. In a given destination, firms grow by introducing new products. For a given product, firms expand by reaching new destinations.

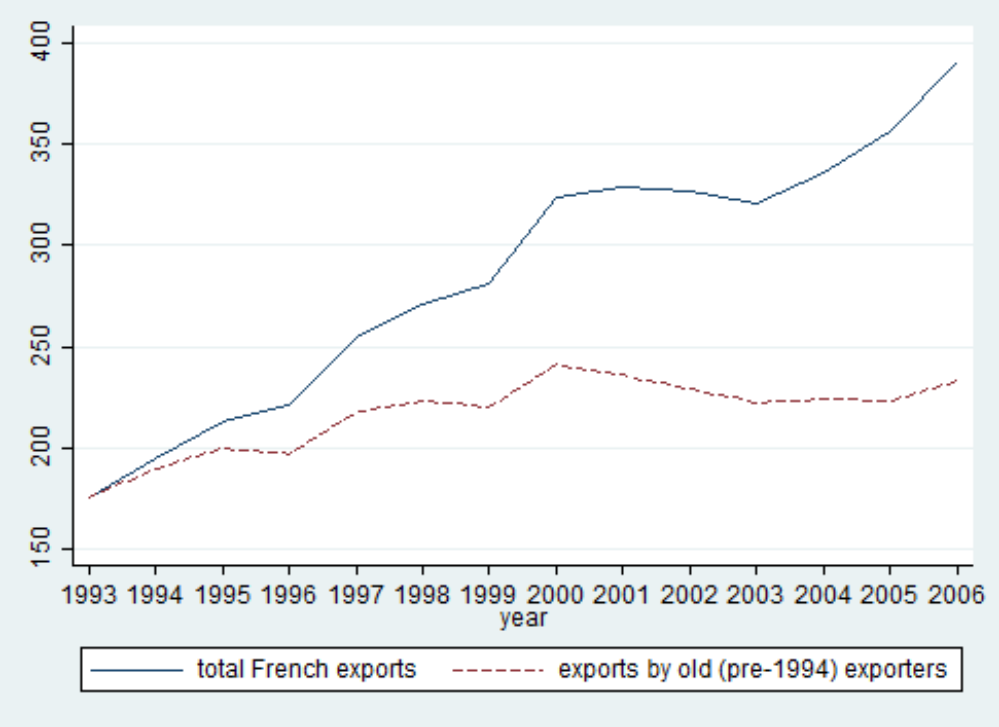
2.2 Firm foreign expansion

Having seen the role of the various margins for export growth, we now turn our attention to firms, starting at the moment when they first enter a foreign market.

2.2.1 Contribution of new exporters to total exports

We observe that new exporters start small but, collectively, they gradually account for a significant and increasing share of total exports. Figure 1 shows total exports and exports by old exporters, i.e., those who sold abroad in 1993. The figure reveals that, within 10 years, new exporters account for over 40 percent of total exports. This fact, which has been documented in other contexts, highlights the importance of new exporters for countries' aggregate foreign sales in the long run.

Figure 1: Total exports and exports by old (pre-1994) exporters, bn euros.



2.2.2 Firm export growth by entry mode

We now show how firms enter the export market and how, conditional on survival, they expand across the country and product margins.

We begin by examining the export profile of exporters at age 1. Table 2 gives a snapshot of the different entry patterns. The predominant entry strategy consists in starting small: out of 324,004 new exporters, roughly 70 percent serve just a single country with a single product. A little over 13 percent of firms enter with multiple products in a single destination. This contrasts with less than 4 percent of entries with the reverse pattern, of a single product in multiple destinations. The remaining 13 percent of entries involve multiple products in multiple destinations. These "simultaneous exporters" account for over 75 percent of exports by age-1 exporters.

Interestingly, by age 5 the small exporters almost double their contributions to total exports within their cohorts, to over 19 percent. The mirror image of this relative expansion is the relative contraction of the simultaneous exporters, whose contribution to the total exports of the cohort falls by 12 percentage points by age 5. This suggests that the contribution of new exporters to total export growth stems mostly from firms that start with a single product in a single country.

Table 2: Number of products and countries at exporting age 1, all new exporters

Age-1 Entry Strategy	# Firms	Freq. (%)	Age-1 Exp. Share (%)	Age-5 Exp. Share (%)
1 product, 1 country	226,220	69.82	10.93	19.12
1 product, many countries	12,595	3.89	5.04	5.92
1 country, many products	43,545	13.44	7.38	10.57
Many countries and products	41,644	12.85	76.64	64.39
Total	324,004	100	100	100

2.2.3 Firm export growth by sub-extensive margin

To see in more detail how new exporters expand over time, Table 3 reports the number of products and destination countries by exporting age. The upper panel reports statistics on all active new exporters (a firm is excluded from the calculations once it exits). Among the 324,004 age-1 firms, the median number of products, countries and product-country pairs are all 1. Consider now the 64,543 exporters that are still active 4 years later ('age 5,' though they may not have exported in 5 consecutive years). In that group, the median numbers of products and countries are both 2, while the median number of product-country pairs is 3. Furthermore, the average number in each of those dimensions increases monotonically with export age.

Of course, that increase may capture selective exit of the least profitable firms, which have fewer product-country pairs, rather than a true gradual expansion at the firm level. To see the dynamics net of that selection effect, in the lower panel of the table we report the same statistics for the 40,078 firms that export in the five *consecutive* years (or more) after entry. The median and average numbers of products and countries rise gradually in that subpopulation, too. It is also worth noticing that, in both panels, the jump from age 1 to age 2 is, by far, the largest, whereas after age 3 the expansion is very modest. Taken together, Tables 2 and 3 suggest that the vast majority of successful new exporters add countries and products gradually, and do so more actively early on in their export experiences.

Is there any discernible pattern in new exporting firms' gradual expansion of their product lines and of destinations served as they become more experienced? Table 3 suggests that new exporters tend to add new products to already served export destinations before entering new destinations. To further explore this possibility, Figure 2 describes the number of product-country pairs by exporting age in further detail. We break down product-country pairs in four categories: pairs

Table 3: Number of products and countries by exporting age among all new active exporters (upper panel) and among new exporters exporting 5 consecutive years (lower panel)

All new exporters

	Number of products		*Number of countries*		*Number of product-country pairs*		
age	mean	median	mean	median	mean	median	number of firms
1	1.91	1	1.52	1	2.72	1	324,004
2	3.86	2	2.80	1	7.17	2	115,820
3	4.33	2	3.17	1	8.47	2	91,595
4	4.66	2	3.46	1	9.47	2	76,099
5	4.92	2	3.64	2	10.3	3	64,543

All new exporters with 5 years of consecutive exports

	Number of products		*Number of countries*		*Number of product-country pairs*		
age	mean	median	mean	median	mean	median	number of firms
1	3.869	2	2.916	1	7.358	2	40,078
2	5.697	2	4.105	2	11.759	4	40,078
3	6.311	3	4.530	2	13.435	4	40,078
4	6.582	3	4.819	2	14.468	4	40,078
5	6.543	3	4.860	2	14.809	4	40,078

involving initial products *and* initial countries (FMFP)[8]; pairs involving products other than the firm's first in the firm's first export countries (FMOP); pairs involving initial products in countries other than the firm's first (OMFP); and pairs involving other products in other countries (OMOP).[9] As in Table 3, the left panel considers the whole sample of entrants, while the right panel considers only firms exporting for 5 consecutive years after entry.

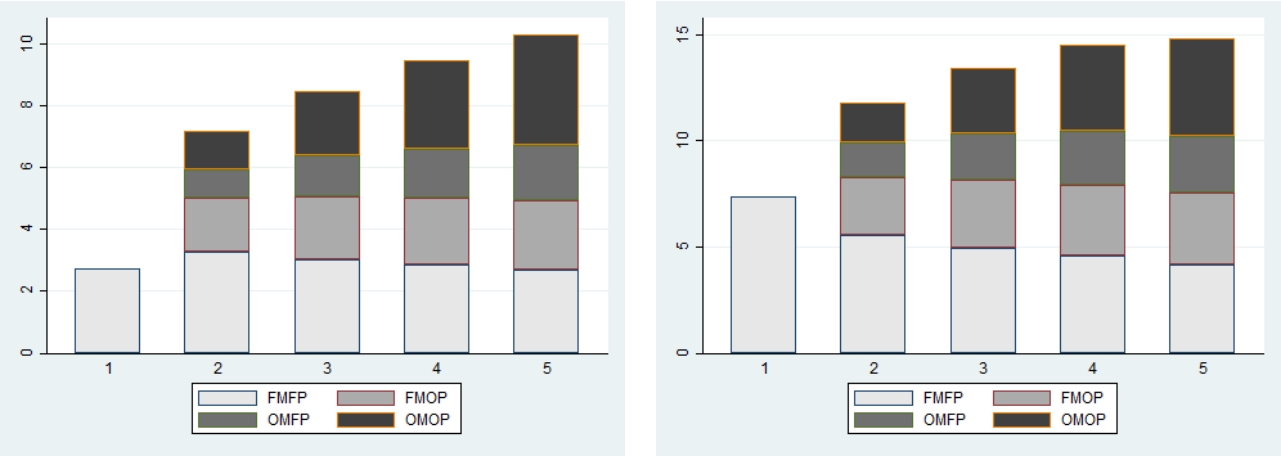
Figure 2 reveals that the main margin of expansion at an initial stage involves adding products in the initial destination(s), for all new exporting firms (left-hand-side panel) and for those that continuously export in the first five years since entry (right-hand-side panel). Although the latter enter with more products and into more markets than the former, for both groups of firms the highest growth rate at the product-destination margin happens between the first and the second year as exporters. Subsequently, entry in new markets with either old or new products gradually

[8]In principle, the number of FMFP pairs may increase with age. This can happen when a firm starts exporting more than one product and serving more than one destination. Thus, multiple products will have the status of "FP" and multiple markets will have the status of "FM." Then, if the firm subsequently sells one of its FPs in a different FM than it was first sold, we have an increase in the number of FMFP pairs for that firm. In practice, such cases are rare.

[9]We use the terms "market," "country" and "destination" interchangeably to denote a politically independent territory where firms can sell their products.

becomes the most common expansion strategy. These patterns suggest that firms branch out their exports sequentially, first expanding their product scopes in their initial destinations, and then gradually expanding geographically into new destinations.

Figure 2: Number of product-countries by age: all firms (left); all firms with 5 years of consecutive exports (right). FM: first market. FP: first product. OM: other market. OP: other product



2.3 First product

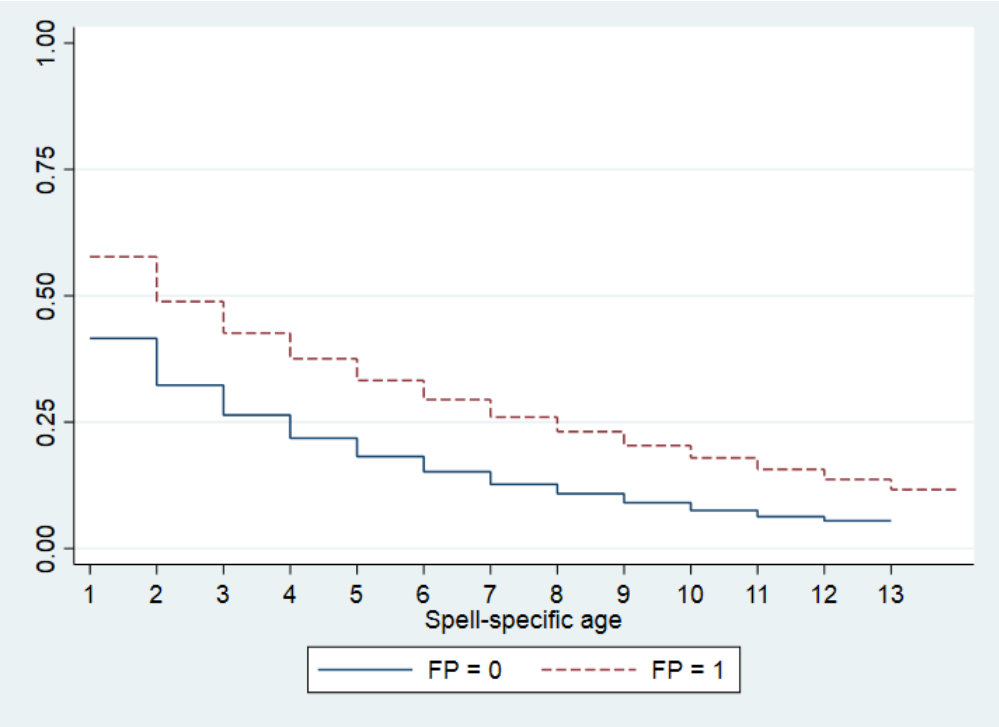
Finally, we document how the performance of firms' first export product differs from the performance of their additional export products across all margins.

2.3.1 Exit

Figure 3 describes Kaplan-Meier estimated survival probabilities up to age t, defined as the non-parametric estimator of the product of the complement of the exit probabilities at ages lower or equal to t. Age is defined at the firm-product-country spell level and refers to the number of years after a first recorded export, under the assumption that firms that are new did not export before 1994.[10] The two plots correspond to the first-ever exported product(s) (FP=1) and to subsequently exported products (FP=0) by a firm.

[10]See Appendix A and Appendix B.3 for details and robustness checks on that assumption, respectively.

Figure 3: Survival functions by firm-country-product exporting spell age of the first-ever exported products (FP=1) and other products (FP=0).



The figure shows that survival rates of first products (FP=1, red dashed line) are higher than those of subsequently introduced products (FP=0, blue solid line) at all ages. Because exit rates are at their highest in the first year of exporting—close to 50%—but fall sharply with age, survival rates fall at a decreasing rate with the duration of the age-spell. And since the exit rates of first products fall with age more sharply than those of other products, the survival probabilities of both types of products tend to converge at high spell ages. This echoes earlier empirical findings on exit rates out of exporting, although usually at a more aggregate level, and is consistent with learning models that predict that exit rates out of exporting decrease with exporting age.[11] However, to the best of our knowledge, the distinction between first and subsequently introduced products is novel.

2.3.2 Entry

When a firm starts to export, by definition it uses its FP. But which products does it use when entering additional markets?

[11] For example, Aeberhardt, Buono, and Fadinger (2014) find a similar pattern in the same French data at the firm-country level.

To answer this question, We consider a sample of successful entrants, i.e., firms who serve new product-country pairs after their first-ever export spell. According to our calculations based on the sample we use in entry regressions (explained in detail in section 4.1), 51 percent of entries in new destination countries within the third year of exporting involve FPs. We interpret this as evidence of prevalence of FPs in entry strategies.[12]

2.3.3 Foreign sales

Since FPs are more resilient and more prevalent in entry decisions, a natural question is whether these products are also the best-selling ones once established in a market. To study the relative export volume of FPs, we focus on mature products by multi-product exporters. Defining a product in a given market as mature after the third year of being exported to that market, we find that FPs are the bestselling products in 63% of mature markets. Also, FPs are the single product in 69% of markets served by firms with just one mature product.

2.4 Summary

To sum up, we uncover the following facts:

1. In addition to significant firm entry and exit in foreign markets, there is also significant entry and exit of exporting firms in other foreign markets as well as churning of products sold abroad.

2. Most firms start small in terms of their total export volumes, of the number of products they sell abroad (typically one product) and of the number of markets they serve (typically one market). Many of those new, small exporters give up very quickly, usually within a year of their first export experience. For those surviving the first year, most of their expansion happens early in a firm's export tenure, especially in terms of adding products, whereas adding markets tends to happen later.

3. First export products are more resilient, prevalent in subsequent export entries, and typically the best-selling products. Given this primacy, we associate First Products with Core Products and use these terms interchangeably.

[12]Note that we are defining products as 6-digit HS categories, implying an even higher prevalence of FPs at more aggregated levels.

Explaining these export dynamic patterns requires a theory that allows for sequential export entry in a multi-product, multi-destination setting. The framework should also explain the seemingly erratic dynamic patterns of fledgling exporters: they start very small, many give up very quickly (despite having incurred potentially large sunk costs to venture in foreign markets), whereas some expand rapidly in their initial markets, exporting higher values and selling different products, and eventually also expanding to other markets. We discuss in the next section a theory that allows for such patterns.

3 Sequential exporting across countries and products

We propose a theoretical framework that relies on firm-level learning about its export profitability as the firm starts to sell abroad. In particular, we consider an extension of the framework developed in ACCO that incorporates the product dimension, in addition to the country dimension. We start by summarizing the main assumptions, the mechanics and the main results of that model.

In ACCO, we develop a simple model based on the following three assumptions: (1) firms need to incur a sunk cost to start serving a foreign market; (2) firms are uncertain about their profitability as exporters; (3) the firm-level profitability is positively correlated over time and across markets, and is (mostly) resolved as the firm starts to export. Assumption (1) has been adopted in numerous trade models. Assumption (2) is, by now, also relatively uncontroversial. ACCO's main departure from the standard approach was assumption (3). The profitability correlation could come from either supply or demand components, creating interdependence in firms' entry strategies even if destination markets are segmented.

Under those assumptions, ACCO show that some firms may start exporting either seeking immediate profits or to gather information about their own profitabilities, which may guide future profits. This is what leads to sequentiality in the exporting process. Intuitively, a firm that is uncertain (and not particularly optimistic) of how good it is as an exporter will first pay the sunk cost to enter a single foreign destination. Once it finds out about its profitability, it has three options. Exit, if it discovers that it cannot make positive profits as an exporter. Remain in its initial market, if it finds out that it can do better than break even, given the entry cost in the first market is already sunk. Remain in its initial market while also expanding to other destinations, if the firm finds out that it can make larger profits through exporting—in which case it would make sense to incur the sunk costs to enter additional destinations.

We extend this framework by introducing the product dimension. That is, we decompose firm exports in the product-market dimension to investigate whether the same mechanism of "profitability discovery" extends to the product dimension. ACCO predictions in this extended framework allow for identifying whether learning and experimentation take place in both country and product dimensions. This is useful to understand the implications of learning and experimentation for the decisions of multiproduct firms.

The extension of ACCO's model to the product-market dimension is conceptually simple. In terms of its key assumptions, now they become: (1a) firms need to incur a sunk cost to start serving a foreign market; (1b) firms need to incur a product-specific sunk cost to start selling that product abroad; (2) firms are uncertain about their profitability as exporters; (3') the firm-level uncertainty is positively correlated over time, across markets and across products, and is (mostly) resolved as the firm starts to export; (4) firms operate a flexible manufacturing technology, i.e. have 'core-competence' in the production of a particular variety. Hence, relative to the original model, assumption (1) is enhanced by the introduction of a fixed cost for product development—which is standard in the multi-product firm literature—and assumptions (3') and (4) are necessary to add the product dimension to the initial assumption (3).

Despite its conceptual simplicity, introducing these extensions is relatively cumbersome and lengthy to develop, given all the discrete choices a firm has to consider, since there are multiple product-market combinations that a firm can choose in each period. Because of this multidimensionality, we leave a formal extension of ACCO, to two products and two markets, to the Online Appendix, while here we only discuss intuitively its testable predictions.

For the intensive margin, the model based on assumptions (1a), (1b), (2), (3') and (4) implies that:

Prediction 1 *Conditional on survival, the growth rate of exports of a firm is on average higher between the first and second years for its first-ever export spell than for its other export spells.*

Since export profitability is uncertain for a firm before it starts exporting, first-year exports are based on its expected profitability. If the firm anticipates positive variable profit with its main (or core) product in its first market, it produces according to that expectation. If the firm stays there in the second period, it must be because its uncovered export potential is indeed sufficiently high. Since the relevant distribution of profitability becomes a truncation of the original one, conditional on survival firms on average expand sales of their main product in their first market. If instead

the firm had entered that market just to learn about its export potential there (and to potentially benefit from expanding its product scope there and its geographical presence in the future), the firm initially produces just the minimum necessary for effective learning and the argument above applies even more strongly. On the other hand, once the uncertainty about export profitability has been resolved, there is no reason for further changes in sales, and there should be no systematic growth in export volumes of the first (or core) product in the first market in the years following this discovery period. Similarly, if the profitability of the firm in its first export destination conveys all information about export profitability in other products and destinations, then there is no reason for systematic export growth in markets and products other than the firm's first either.

This prediction comes from the strict version of the model, where a firm's export profitability is perfectly correlated across products, countries and time, and the first export experience is fully informative about the firm's future success as an exporter. More generally, one may expect learning to not be exhausted after the first export experience of a firm. One reason is that uncertainty may not be fully revealed at once. Another is that there may be additional learning when the firm introduces other products and/or enters other markets. Moreover, due to selection, one may expect differential growth in the first market the firm chooses to enter and/or in the first product the firm chooses to sell abroad. Accordingly, we also test whether the intensive margin growth from exporting after the first-ever spell (i.e., the first product in the first market) is higher than growth after subsequent types of entry. For example, growth after entering in a new market but with an already 'tested' product, or growth after introducing a new product in an already 'tested' market.

For exit, we obtain:

Prediction 2 *Exit rates are on average higher after a firm's first-ever export spell than after its other export spells.*

Because an experienced exporter is better informed about its own export profitability than a fledgling exporter, the latter is more likely than the former to find out that it is not worthwhile to keep serving a given market with a given product. Specifically, upon entry a firm may find out that exporting is not worthwhile and give up. If it does not, it is because it has uncovered a high enough export profitability, and from there on there is no further reason for the firm to exit.

Of course, exit from specific product-market spells could stem from other reasons even in the context of a learning model, if learning is incomplete or has a market- or a product-specific component. Moreover, if firms choose their first product and markets based on expected profitability,

then the subsequent ones will be, on average, less profitable. That would make their viability more susceptible to shocks unrelated to the learning mechanism. Accordingly, in the empirical analysis we also evaluate exit patterns from a broader perspective, comparing exit after firms' first export spell with exit after they enter a new foreign destination, or introduce a new product. In particular, as shown in Section 2, first/core products are typically associated with larger export volumes, which suggests higher profitability. In the context of our model, if we further allow for the possibility of (supply or demand) idiosyncratic shocks, this would imply lower exit rates in spells including the first product.

Finally, our framework delivers the following prediction for entry:

Prediction 3 *Conditional on survival, an exporter is more likely to expand its product scope and/or its geographical presence after its first-ever export spell than after its other export spells.*

Once a firm starts exporting, it will uncover its export profitability. Some new exporters will realize that they are sufficiently profitable and decide to expand in the next period to other countries and/or to add products to their export baskets. By contrast, experienced exporters already have a better idea of their export profitability, and therefore have already made their main sub-extensive entry decisions in the past.

Now, as uncovered in Section 2, expansion at the product and market dimensions takes place at different moments along the export tenure of the firm. Our framework is useful to inform about the consequences of the relative prevalence of early expansion along these different sub-extensive margins, which in general depends on firms' structure of fixed and marginal costs. Section 2 shows that early expansion is more prevalent in the product than in the country sub-extensive margin. In the context of our model, this indicates that the fixed cost to add a new product is small relative to the fixed cost to enter a new market, and/or that there is a sizeable difference between the trade cum production marginal costs of firms' core and other products.[13]

Naturally, there are other reasons why firms may enter additional foreign markets, but those are likely to be present regardless of the firm's export age. The contribution of our framework is to show that, early on in firms' export tenure, there is an additional motive for extensive margin expansion.

The predictions discussed in this section stem from a model that is extreme in that it requires all uncertainty to be resolved after the first period of exporting. This is motivated by the stylized

[13]Early expansion of the product scope is more likely than expanding geographically whenever the condition in Corollary 1 in the Online Appendix holds.

facts from Section 2, which reveal disproportionate adjustments early on in firms' export tenure. Naturally, one may want to consider a more flexible version of the model, where learning is gradual or partial. In that case, learning and experimentation may also take place after exporting new products in already served markets or reaching a new market with an already exported product. Nevertheless, as long as most of the uncertainty in firms' profitability as exporters is uncovered early in firms' export tenure, the three aforementioned predictions will still hold.

4 Empirical evidence

We now test the predictions of our framework.

4.1 Data and variables

We use the same dataset as in Section 2, which is described in Appendix A.

Our empirical investigation of export dynamics features three main dependent variables: export growth, exit and (conditional) entry. All three variables are measured at the firm-country-product-year ($ijpt$) level. Denote by x_{ijpt} the recorded sales of French firm i in country j of HS6 product p in year t. $Growth_{ijpt}$ is the annual growth rate of firm-country-product exports, measured in FOB value, or:

$$Growth_{ijpt} = \ln(x_{ijpt}) - \ln(x_{ijpt-1}). \tag{1}$$

$Exit_{ijpt}$ is a binary variable that is defined when the firm-country-product has positive exports in year $t-1$. It takes value one when exports of that triplet in year t is nil, and takes value zero otherwise:

$$Exit_{ijpt} = \begin{cases} 1 & \text{if } x_{ijpt} = 0 \text{ and } x_{ijpt-1} > 0 \\ 0 & \text{if } x_{ijpt} > 0 \text{ and } x_{ijpt-1} > 0. \end{cases} \tag{2}$$

$Entry_{ijpt}$ is a binary variable that is defined for firm-country-product triplets with no exports in year $t-1$. It takes value one when the triplet has positive exports in year t and takes value 0 otherwise:[14]

$$Entry_{ijpt} = \begin{cases} 1 & \text{if } x_{ijpt} > 0 \text{ and } x_{ijpt-1} = 0 \\ 0 & \text{if } x_{ijpt} = 0 \text{ and } x_{ijpt-1} = 0. \end{cases} \tag{3}$$

[14]Those definitions imply that some $Entry_{ijpt} = 1$ observations capture re-entry, while some $Exit_{ijpt} = 1$ observations capture temporary exit.

Given our definition of non-entry, we must expand our dataset to *include firm-product-country-year observations that are never observed in the customs data.* More precisely, for all observed firm-product pairs, we span over all possible countries and years. By doing so, we allow for all the possible entry patterns a firm may consider for its products.[15] Finally, we exclude all post-entry observations in the entry analysis, in the sense that firm-product-country triplets with $Entry_{ijpt} = 1$ leave the sample from $t + 1$ onward.

Our hypothesis is that export dynamics depends on past export experience through learning effects. To capture this dependence, we create four variables. FY_{ijpt} takes value one when firm i exports product p to market j in year t, but not in year $t-1$, and zero otherwise. That is, it records the first year in which a triplet ijp has recorded exports. In contrast, FY_{it} takes value one when firm i exports its first-ever product to its first-ever market in year t. That is, it records the year in which firm i has exporting age 1. FM_{ij} takes value one if j is the first country firm i exports to (this may apply to several countries), and zero otherwise. That is, it records the first market(s) served by firm i. Finally, FP_{ip} takes value one if p is the first product that firm i exports (this may apply to several products), and zero otherwise. That is, it records the first product(s) exported by firm i.

In our analysis, we include several gravity control variables. They include four continuous variables: population-weighted distance to France ($distw$), population (pop_d), GDP (gdp_d) and GDP per capita ($gdpcap_d$); and nine binary variables: contiguity with France ($contig$), common official language ($comlang\_off$), past colonial ties at any time ($colony$) or after 1945 ($col45$), GATT/WTO membership ($gatt_d$), Regional Trade Agreement with the EU (rta), common legal origin ($comleg$), common currency ($comcur$) and participation in cooperation agreements between the EU and African, Caribbean and Pacific countries (acp). The data come from the CEPII's Gravity database.[16]

4.2 Empirical results

We now test Predictions 1-3, which summarize the implications of our theoretical framework for individual export growth, exit and subsequent entry. Fundamentally, we examine whether first-time exporters have systematically different dynamics relative to more mature exporters, including when both face new environments.

[15] Implicitly, we assume that the relevant set of products a firm considers for exports is the one it eventually exports. This is the best we can do in the absence of data on domestic sales by product.

[16] See Head, Mayer, and Ries (2010) and references therein for more details on the definitions of those variables.

4.2.1 Export growth

Prediction 1 states that, conditional on survival, a firm's export growth is highest in its second year of exporting its first export product to its first destination. This is because firms keep exporting only if they have discovered that they are profitable enough, and their first export experience is key for this discovery.

To test this prediction, we look for differential export growth in the second year of firms' first exporting spell relative to other spells. More precisely, we estimate the following equation:

$$\begin{aligned}\Delta \log X_{ijpt} = \alpha_0 + \alpha_Y FY_{ijp,t-1} + \alpha_{YM}\left(FY_{ijp,t-1} \times FM_{ij}\right) + \alpha_M FM_{ij} + \alpha_{YP}\left(FY_{ijp,t-1} \times FP_{ip}\right) \\ + \alpha_P FP_{ip} + \alpha_{MP}\left(FM_{ij} \times FP_{ip}\right) + \alpha_{YMP}\left(FY_{ijp,t-1} \times FM_{ij} \times FP_{ip}\right) + G_{jt} + \{FE\} + u_{ijpt},\end{aligned} \tag{4}$$

where $\Delta \log X_{ijpt}$ is the growth rate of the value of exports between t and $t-1$ by firm i of product p and market j, $FY_{ijp,t-1}$ is a dummy indicating whether firm i exported product p to destination j in $t-1$ for the first time, FM_{ij} indicates whether j is the firm's first export market and FP_{ip} takes value 1 if p is firm i's first ever exported product. G_{jt} is a vector of gravity variables. $\{FE\}$ denotes a large set of fixed effects, described below.

To focus on new exporters, we exclude all firms exporting in 1993.[17] Note also that $\Delta \log X_{ijpt}$ is only defined for consecutive observations X_{ijpt} and X_{ijpt-1}. Prediction 1 indicates a positive coefficient for the triple interaction term: $\alpha_{YMP} > 0$. Naturally, we include FP_{ip}, FM_{ij} and $FY_{ijp,t-1}$ by themselves as well as their other interactions, since there could be other reasons that make growth different for the first product exported, in the first export market of a firm, or in the first year of a subsequent export spell.[18]

[17] Results remain qualitatively unchanged if we include firms exporting in 1993 or if we treat firms exporting in 1994 and 1995 as old exporters (see Appendix B.3).

[18] In particular, the coefficient on $FY_{ijp,t-1}$ is expected to be positive due to a 'partial year effect' that is unrelated to our prediction. Bernard, Bøler, Massari, Reyes, and Taglioni (2017) show that correcting for the overestimation of first-year sales growth rates amongst surviving firms doubles the contribution of exporters' extensive (entry and exit) margins to total export growth. Nevertheless, since our interest here is *not* in the coefficient on $FY_{ijp,t-1}$, this is not a central concern for our analysis. Indeed, although "partial-year effects reduce the number of products sold abroad in the first year of exporting and overstate the growth in number of exported products and their share in sales between years one and two. [...] Several papers in the literature on exporter dynamics are able to avoid or mitigate the partial-year bias through their choice of empirical specification. Albornoz, Calvo-Pardo, Corcos, and Ornelas (2012) focus on the role of prior export experience and compare export growth in new markets for first-time exporters and exporters new to the market but with prior experience in other markets. They mention the possibility of partial-year effects overstating first-year growth rates and include a dummy for average first-year export growth"(Bernard, Bøler, Massari, Reyes, and Taglioni, 2017, p.3213). This is also the approach we take here. Still, in Appendix B we deploy their correction explicitly and show that, while the coefficient on $FY_{ijp,t-1}$ is indeed affected, the results that matter for our analysis are essentially unchanged by the partial-year-effect correction.

Many other factors can affect a firm's export growth of a product to a market, such as the general conditions of the destination country, its current economic situation, and the firm and its products' own distinguishing characteristics. To account for those factors, we add standard gravity equation covariates and include a wide range of fixed effects. They include firm, year, destination and product fixed effects. Firm fixed effects control for all systematic differences across firms that do not change over time and affect export growth (e.g., firm-specific export growth trends). Year fixed effects control for global, as well as France-specific contractions and expansions. Destination fixed effects and gravity variables subsume export market characteristics. Product fixed effects capture general trands in the appeal of specific products. Finally, firm-specific TFP growth controls, obtained from Levinsohn-Petrin regressions (Levinsohn and Petrin, 2003), capture unobserved sources of changes in productivity specific to the firm.[19] In these and all subsequent regressions, standard errors are clustered by firm.

For brevity, in the main tables we only report the estimates of the main coefficients of interest and of relevant sums of coefficients (at the bottom of the tables). Tables with the full results are in Appendix B.5.

Table 4 shows the results of estimating equation (4). Column 1 reports the results from a simple OLS estimate of equation (4), while column 2 adds gravity controls and year and destination fixed effects. Columns 3 and 4 further include product and firm fixed effects, respectively.[20] Finally, columns 5 and 6 examine the robustness of the results reported under columns 3 and 4 to firm-specific unobserved sources of TFP growth, for the sample of firms for which balance sheet data is available. The specifications with firm fixed effects are particularly revealing, because they control for productivity and other unobserved firm characteristics that could, potentially, affect firm export growth.

[19] See Appendix A for further details.

[20] The results are robust to the inclusion of destination-year and product-year fixed effects. The former capture unobserved shocks to aggregate demand, exchange rates, policy environments, etc. The latter capture unobserved demand and supply shocks that are specific to a product, shocks to product-specific trade costs, etc. Results are reported in Appendix B.4.

Table 4: Export growth rate regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Growth	Growth	Growth	Growth	Growth	Growth
α_{YMP}	0.183***	0.182***	0.182***	0.246***	0.110***	0.136***
	(0.020)	(0.021)	(0.021)	(0.022)	(0.028)	(0.030)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.015	0.015	0.019	0.065	0.019	0.057
Number of Observations	2.5e+06	2.4e+06	2.4e+06	2.4e+06	8.9e+05	8.9e+05
Coefficient Tests						
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.443***	0.439***	0.446***	0.566***	0.388***	0.462***
	(0.011)	(0.011)	(0.012)	(0.014)	(0.017)	(0.021)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.125***	0.119***	0.120***	0.217***	0.074***	0.124***
	(0.018)	(0.018)	(0.018)	(0.016)	(0.018)	(0.021)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.129***	0.126***	0.122***	0.223***	0.068***	0.126***
	(0.014)	(0.014)	(0.014)	(0.016)	(0.022)	(0.026)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.126***	0.121***	0.126***	0.213***	0.058***	0.102***
	(0.011)	(0.012)	(0.012)	(0.013)	(0.017)	(0.020)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (population weighted distance to France, population, GDP, GDP per capita, contiguity with France, common official language, past colonial ties, GATT/WTO membership, Regional Trade Agreements with the EU, common legal origin, common currency and participation in cooperation agreements between the EU and African, Caribbean and Pacific countries), firm TFP growth and different sets of fixed effects as in specification (4). We only report estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$) coefficient. The full set of estimates is reported in Table B.10 in Appendix B. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

We find a consistently positive and significant coefficient for the triple-difference term, α_{YMP}. It shows that the additional first-year intensive margin growth in the first market is between 11 and 25 percent higher for the firm's first product than for subsequent products.[21] That is, the

[21]The first difference—early growth in the first market with the first product relative to late growth in the first market with the first product—is given by $(\alpha_Y + \alpha_{YM} + \alpha_{YP} + \alpha_{YMP})$. The double-difference estimate subtracts

differential growth in not simply coming from the introduction of a new product in the firm's first market; there is differential growth early in the firm's first market for its first product, i.e., when the firm starts to export. Interpreted from the perspective of the results in ACCO, this result indicates that the differential first-year-first-market growth effect obtained there is between 14% and 25% higher (in the specifications with firm fixed effects) for a firm's first product than for its subsequent products.

A strict version of ACCO's extension to products only yields the prediction about the triple interaction term. However, if there were additional learning after entering other markets or after introducing additional products, other coefficients would also be positive and significant. The same would happen if the growth potential in the first market or of the first product were higher than for other markets and products. We focus on comparing growth in firms' first ever spell against growth in their old spells and growth at the onset of their subsequent spells. Specifically, we compare:

- Growth at the beginning of the first-ever spell vs. growth at a later stage in subsequent products and markets. The difference is given by the sum of all seven coefficients: $\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$.

- Growth at the beginning of the first-ever spell vs. growth at the beginning of a subsequent spell with an additional product and market. The difference is given by $\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$.

- Growth at the beginning of the first-ever spell vs. growth at the beginning of a subsequent spell in the first market, but with an additional product. The difference is given by $\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$.

- Growth at the beginning of the first-ever spell vs. growth at the beginning of a subsequent spell with the first product, but in an additional market. The difference is given by $\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$.

We find that all four sums of coefficients are positive and highly significant across all specifications. Results of the first test show that experience matters significantly for export growth: even after controlling for firm, country and year characteristics, growth rates are much higher early

from this term the difference between early growth in a subsequent market with the first product relative to late growth in a subsequent market with the first product ($\alpha_Y + \alpha_{YP}$), yielding ($\alpha_{YM} + \alpha_{YMP}$). Finally, the triple-difference estimate subtracts from this term the analogous double-difference for subsequent products (α_{YM}), yielding the triple-difference coefficient, α_{YMP}.

in the first-ever spell than later in subsequent spells. Estimates of the difference range from 44 to 57 percentage points in the specifications with firm fixed effects. The second sum shows the differential first-year growth of the first-ever spell relative to a spell that has subsequent products and markets. The difference falls, as expected, but remains large, between 12% and 22% in the specifications with firm fixed effects. The last two sums reflect similar comparisons, but with the fist-year growth of spells that contain, respectively, subsequent products in the first market and the first product in subsequent markets. The magnitudes remain very similar.

Overall, these results show clearly that, for firms that keep exporting beyond their first attempt, the earliest export experience is rather special, as the growth after the the first-ever spell of a firm is systematically higher than its growth in all other combinations of years and spells. This evidence is consistent with meaningful learning early in firms' export tenure encompassing both the market and the product dimensions.

4.2.2 Exit

Our second prediction is that exit from foreign markets is more likely among fledgling exporters than experienced exporters, everything else equal. Exit rates should be higher right after the first-ever export experience, relative to later years with the same product-country spell and to the first year in other product-country export spells. Again, this happens because the first export spell is informative about the profitability of exporting all product-country pairs, implying that some unlucky exporters will choose to stop exporting after learning that they are not profitable enough.

This prediction applies to our whole sample, including exporters that were active in 1993. We test it by estimating the following equation:

$$\begin{aligned} Exit_{ijpt} = \beta_0 + \beta_Y FY_{ijp,t-1} + \beta_{YM}\left(FY_{ijp,t-1} \times FM_{ij}\right) + \beta_M FM_{ij} + \beta_{YP}\left(FY_{ijp,t-1} \times FP_{ip}\right) \\ + \beta_P FP_{ip} + \beta_{MP}\left(FM_{ij} \times FP_{ip}\right) + \beta_{YMP}\left(FY_{ijp,t-1} \times FM_{ij} \times FP_{ip}\right) + G_{jt} + \{FE\} + w_{ijpt}, \end{aligned} \tag{5}$$

where $Exit_{ijpt}$, formally defined in equation (2), is a binary variable that takes value one if firm i stops exporting product p in market j in year t after doing so in year $t-1$, and zero otherwise. All other variables are defined as before.

Table 5 shows the estimates from a linear probability model. The six columns are organized exactly as in the previous table: (1) simple OLS; (2) adds gravity controls and year and country

fixed effects; (3) adds product fixed effects; (4) replaces product with firm fixed effects; (5) and (6) add firm TFP growth controls to (3) and (4), respectively. In all but the firm fixed-effects specification without controlling for TFP growth (column 4), we find a positive and highly significant coefficient for the triple-difference coefficient. Depending on the specification, exit rates are found to be between 2 and 6 percentage points deferentially higher after the first year of the first-ever spell. Interpreted from the perspective of the results in ACCO, this result indicates that the differential first-year-first-market exit effect obtained there is about 6 percentage points higher (in the specifications with product fixed effects) for the firm's first product than for its subsequent products. To assess the magnitudes, they can be compared with a 32.9% average exit probability for an ijp triplet across the whole sample.

Table 5: Exit regressions

	(1) Exit	(2) Exit	(3) Exit	(4) Exit	(5) Exit	(6) Exit
β_{YMP}	0.036***	0.034***	0.062***	-0.024***	0.064***	0.017***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.003)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.122	0.142	0.202	0.299	0.244	0.305
Number of Observations	2.1e+07	2.1e+07	2.1e+07	2.1e+07	9.0e+06	9.0e+06
Coefficient Tests						
$\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	0.166***	0.111***	0.147***	0.021***	0.156***	0.066***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.009)	(0.002)
$\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.157***	-0.179***	-0.124***	-0.194***	-0.143***	-0.188***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)
$\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.163***	-0.176***	-0.120***	-0.202***	-0.136***	-0.180***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
$\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$	0.005**	-0.003	0.034***	-0.023***	0.031***	0.008***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)

Notes: The table reports the results of regressions of firm exit on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (5). We only report estimates for the triple interaction ($FY_{ijpt-1} \times FM_{ij} \times FP_{ip}$) coefficient. The full set of estimates is reported in Table B.11 in Appendix B. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

The negative coefficient in column (4) should be interpreted with care. It does not identify the effects on exit from single-observation firms, which are by construction excluded from the estimation of the specification with firm fixed-effects. Importantly, single-observation firms are key

for our analysis of exit among young exporters. As can be seen from Table 2, almost 70% of new exporters enter with just one product in just one country. Furthermore, an implication of our framework is that the firms that are less confident about their export profitability will do precisely that: enter with one product in one market, to avoid wasting too much in sunk costs in case they decide to stop exporting. But those are exactly the firms that are more likely to exit. Our exit regression is designed to capture precisely those exits. For the exit pattern of multiple-observation firms, our theoretical framework has little to offer. For those reasons, we treat the coefficient in columns (3) and (5) as our preferred estimates, and report the estimates with firm fixed effects just for consistency with the results on the other margins of adjustment.

We test additional hypotheses related to whether the information revealed after the first export experience is key for the exit decision of firms. Specifically, and analogously to the export growth analysis, we compare:

- Exit at the beginning of the first-ever spell vs. exit at a later stage in subsequent products and markets. The difference is given by the sum of all seven coefficients: $\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$.
- Exit at the beginning of the first-ever spell vs. exit at the beginning of a subsequent spell with an additional product and country. The difference is given by $\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$.
- Exit at the beginning of the first-ever spell vs. exit at the beginning of a subsequent spell in the first market, but with an additional product. The difference is given by $\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$.
- Exit at the beginning of the first-ever spell vs. exit at the beginning of a subsequent spell with the first product, but in an additional market. The difference is given by $\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$.

The first line at the bottom of Table 5 shows that, controlling for product, country and year characteristics, exit rates are significantly higher at the beginning of the first-ever spell than in mature spells. In the specifications with product fixed effects, the difference is almost 16 percentage points.

Turning to comparisons between young exporters and old exporters starting a new spell, results are more subtle. The fourth sum of coefficients shows that exit right after a firm starts to export is

more likely than exit from a new spell with the first product but in subsequent markets, consistent with the notion that, if the firm has incurred the sunk cost to enter an additional market, it must be because it is sufficiently confident about its profitability—which, on average, translates into more success and a lower probability of exit.

On the other hand, exit right after a firm starts to export is *less* likely than exit from a new spell when the firm is introducing a different product, be that in the first market or not. This suggests, first, that the sunk cost to introduce new products in foreign markets is relatively low. And second, that subsequent products tend to be less profitable on average than firms' core export products. If there is a component of uncertainty at the firm-product level that lingers on after the firm's first export experience, even if it takes an i.i.d. form, then we would observe such a pattern. That is, after uncovering their fundamental export profitability, firms keep experimenting with additional products in the foreign market. Since they are relatively less profitable than the firms' first/core product (and that is why they were not introduced first), even small negative firm-product shocks cause firms to discontinue their foreign sales.

4.2.3 Entry

Our third prediction is that, conditional on surviving in their first-ever export spell, firms are more likely to engage in a second export spell sooner rather than later. This is because the profitability of their first-ever entry is informative about their prospects with other product-country pairs. On average, surviving firms update their beliefs upwards and some will find worthwhile to serve product-country pairs which they had not expected to be profitable ex ante.

Because Prediction 3 applies to conditional entry, i.e., entry by exporters with a successful first spell, we must test it on a special sample. In Section 4.1 we explain in detail the construction of $Entry_{ijpt}$ and the corresponding sample, in particular how the dataset is expanded to include $ijpt$ quadruplets with no recorded trade flows. Specifically, if in year t a firm-product pair ip is observed in the original sample for the first time, we define an entry dummy for ijp for every country j where ip was *not* observed in t for all subsequent years until entry in that market for that product by that firm is recorded; once the entry is recorded, that ijp triplet is dropped from the sample. Furthermore, we exclude firms appearing in the first year of our sample ('old' exporters) and firms exporting only in a single year, in consonance with our goal of investigating how exporters that are new (i.e., that have no previous export experience) and turn out to be successful (i.e., export for more than a year) expand abroad. Finally, for computational reasons we must take a random draw

of 30% of the initial sample; this still leaves us with roughly 250 million observations.

Using that sample, we estimate the following linear probability model:

$$Entry_{ijpt} = \gamma_0 + \gamma_Y FY_{i,t-1} + \gamma_{YM}\left(FY_{i,t-1} \times FM_{ij}\right) + \gamma_M FM_{ij} + \gamma_{YP}\left(FY_{i,t-1} \times FP_{ip}\right) + \gamma_P FP_{ip} + \gamma_{MP}\left(FM_{ij} \times FP_{ip}\right) + \gamma_{YMP}\left(FY_{i,t-1} \times FM_{ij} \times FP_{ip}\right) + G_{jt} + \{FE\} + v_{ijpt}, \tag{6}$$

where $Entry_{ijpt}$, formally defined in equation (3), is a binary variable that takes value one if firm i enters destination j with product p at time t, and zero otherwise. $FY_{i,t-1}$ equals one if firm i is in the second (consecutive) year of its export history. Observe that, unlike in equations (4) and (5), here FY is defined at the *firm* level, not at the firm-product-market level. All other covariates are defined as before.

Table 6 reports the results from estimating equation (6). The columns are organized just as in the previous two tables. The coefficient γ_Y indicates whether a young exporter is more likely than an old exporter to enter in a different market with a different product. Except for the specifications with firm fixed effects, the estimates suggest that to be the case. The magnitudes are small, but range between 10 and 22 percent of the unconditional probability of entry (for a new ijp triplet) of 0.31% in the sample. Intuitively, only firms that discover a particularly high export profitability become willing to incur the sunk costs to both introduce a new product and enter a new market right after they start exporting.

The coefficients γ_{YM} and γ_{YP} are always positive and statistically significant. γ_{YM} corresponds to the additional probability of entry for a young exporter, relative to an old exporter, when we restrict entry to their first market. The magnitude is large, of 3.5 percentage points. In turn, γ_{YP} corresponds to the additional probability of entry for a young, relative to an old, exporter when we restrict entry to their first product. Its magnitude is smaller, but is not small relative to the unconditional probability of entry.

To shed light on the prevalent patterns of entry, we can contrast early vs. later entry as well as distinguish the type of entry (i.e., with new products or in new markets). In particular, we focus on the following comparisons:

- Adding a product in the first market right after a successful first-ever spell vs. adding a product in the first market later. The difference is given by $\gamma_Y + \gamma_{YM}$.
- Entering a new market with the first product right after a successful first-ever spell vs. en-

Table 6: Entry regressions (30% sample)

	(1) Entry	(2) Entry	(3) Entry	(4) Entry	(5) Entry	(6) Entry
γ_Y	0.000***	0.001***	0.001***	-0.000***	0.001***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
γ_{YM}	0.036***	0.035***	0.035***	0.035***	0.021***	0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
γ_{YP}	0.002***	0.002***	0.002***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.009	0.012	0.013	0.016	0.010	0.013
Number of Observations	2.5e+08	2.4e+08	2.4e+08	2.4e+08	6.2e+07	6.2e+07
Coefficient Tests						
$\gamma_Y + \gamma_{YM}$	0.036***	0.036***	0.036***	0.035***	0.022***	0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$\gamma_Y + \gamma_{YP}$	0.002***	0.003***	0.003***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\gamma_{YM} - \gamma_{YP}$	0.034***	0.033***	0.033***	0.033***	0.018***	0.018***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Notes: The table reports the results of regressions of firm entry conditional on surviving on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (6). We only report estimates for the FY_{ijpt-1}, $FY_{ijpt-1} \times FP_{ip}$ and $FY_{ijpt-1} \times FM_{ij}$ coefficients. The full set of estimates is reported in Table B.12 in Appendix B. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last three rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

tering a new market with the first product later. The difference is given by $\gamma_Y + \gamma_{YP}$.

- The difference between expanding with different products in the first market vs. expanding with the first product in different markets right after a successful first-ever spell relative to later. The difference is given by $\gamma_{YM} - \gamma_{YP}$.[22]

The first test shows that a young exporter that did not exit soon after entering is substantially more likely to expand its product scope in its first market than an old exporter. That is, firms are more prone to introduce new products in their first markets right after an initial successful experience there than later. Similarly, the second test shows that a young exporter is also more likely to take its first product to another market than an old exporter, although the magnitude of this effect is not as large as the previous one. This last result can be interpreted as the analog of the sequential entry result in ACCO, here restricted to the firm's first product.

The third test of Table 6 compares expansion for young versus old exporters in products relative to markets. It shows that early (relative to later) expansion is much more prevalent in products than in markets. This finding confirms the stylized fact uncovered in Section 2, according to which firms tend to first expand in their initial export market by adding new products before reaching new export destinations. As discussed in Section 3, our model generates this result if the fixed cost to add a new product is small relative to the fixed cost to enter a new market, and/or the trade plus production marginal cost of the core product is sufficiently low compared to other products.[23]

Altogether, these results on entry patterns support the view that firms start exporting without fully knowing their export potential, but learn soon about it. Some of those that do not give up expand quickly, across products and markets, but primarily by adding products in their first market.

5 Heterogeneity and robustness

Research on firm-level export data has shown the importance of heterogeneity and export spillovers across firms. In this section, we extend our empirical analysis to incorporate these features. First, we focus on firms belonging to multinational companies and on those that start exporting with multiple products or in multiple markets. As we show, these distinct firms also exhibit export

[22] Notice that the first difference is given by $\gamma_{YM} + \gamma_M - \gamma_{YP} - \gamma_P$, whereas the second difference is given by $\gamma_M - \gamma_P$. We obtain the difference-in-difference term $\gamma_{YM} - \gamma_{YP}$ by subtracting the latter from the former.

[23] See Corollary 1 to Prediction 3 in the Online Appendix for details. This result also extends to cases where most but not all of the firm's export profitability is uncovered early.

dynamics compatible with learning in the early stages of their export tenure. Second, we control for different sources of export spillovers. Last, we report a selection of robustness checks.

5.1 Multinational Companies and Simultaneous Exporters

Most firm-level export datasets show that export volumes are concentrated in a small group of firms, as pointed out by Bernard, Jensen, Redding, and Schott (2018), among others. Using rich data on Chilean firms, Blum, Claro, Horstmann, and Tombe (2020) show that this also applies to new exporters, and that the bulk of export growth among new exporters comes from a relatively small group of firms. Moreover, these firms often belong to multinational companies. Freund and Pierola (2020) provide a similar message, stressing the disproportional contributions for export growth of the top five exporters in 32 developing countries, which they also find to be often linked with foreign capital. Like them, we find substantial heterogeneity among new exporters at entry in the French data as well. As we observe in Section 2, at entry only 13% of new French exporters sell multiple products in multiple countries, but they account for almost 77% of age-1 total exports. Their contribution to total exports within their cohort diminishes after 5 years, but remains a hefty 64 percent.

Given this vast heterogeneity, we investigate whether the growth, exit and entry patterns observed for the average exporter also apply to those larger new exporters. More precisely, we consider two groups of firms: the above-mentioned exporters with multiple products and countries at age-1, and firms with non-French parent or affiliates (henceforth Multinational Companies, or MNCs). Note that the two groups are not mutually exclusive.

Presumably, if a firm enters with a large scale, incurring the fixed costs to introduce multiple products in multiple countries, it is because it is relatively "confident" about its export profitability. Similarly, if the firm is part of a multinational corporation, it may face less uncertainty due to experience from its parent or affiliate. This suggests that the strong early dynamics that we observe for the average exporter may not extend to the "top" exporters and to plants that belong to MNCs. Yet as we show below, we find that our proposed mechanism applies to them as well, albeit in a slightly weaker form for affiliates of foreign companies than it does for the average exporter.

Multinational Companies We start by investigating whether MNC ownership status affects age-dependence in exports. One may think that exports of multinational firms are more likely to

be intrafirm, with less room for uncertainty and learning to drive trade dynamics.[24] We can test for that for a subset of our data, where we observe if a French firm is foreign-owned or owns foreign affiliates itself. We define the binary variables FO and $Parent$ to capture both (non mutually exclusive) possibilities. We also define the binary variable MNC, which takes value one if either FO or $Parent$ takes value one. These variables are defined at the firm-year level, as some firms change status during the sample period. This makes it possible to estimate their direct effects on each margin of adjustment even in the specifications with firm fixed effects. We then include and interact the three binary variables with our coefficients of interest in the growth, exit and entry regressions.

In Tables 7, 8 and 9, we report results from estimations with gravity controls, year and country fixed effects, and controls for TFP growth in every specification. Furthermore, we add either product or firm fixed effects in addition to those other controls. For each of these two specifications, we show results (i) simply adding a MNC dummy to the regression; (ii) adding and interacting the MNC dummy with each of our (seven) main variables and its interactions; (iii) adding and interacting both the FO and the $Parent$ dummies with each of our main variables and its interactions.

In the growth regressions (Table 7), we do not find any systematic difference in the growth rates of multinational and non-multinational exporters, as the coefficient of the MNC, FO and $Parent$ indicators are almost always not significant. More importantly, when we interact the $MNC/FO - Parent$ dummies with our (seven) main variables, the triple interaction coefficient α_{YMP} falls slightly in magnitude relative to the baseline specification, but remains statistically significant at the 1% level. Furthermore, the quadruple interaction term does not show a robust pattern except for displaying a small magnitude and for not being statistically significant in any specification.

The exit regressions (Table 8) show that multinationals do not display systematically different exit patterns, since the estimates of the coefficients on the indicators MFN, FO and $Parent$ are almost always not significant. More importantly, when we interact the indicators with our (seven) main variables, the triple interaction coefficient β_{YMP} hardly changes relative to the baseline specification. Estimates with product fixed effects (in odd-numbered columns) suggest that foreign-owned firms have a differential 4.6 extra percentage point probability to exit in the first year of

[24]Note, however, that Chen, Senga, Sun, and Zhang (2018) find robust evidence of substantial sales' forecast errors decreasing with firm age (and firms' parent company exporting experience) when exploiting a unique longitudinal data set covering 20 years of Japanese multinational activity.

Table 7: Growth Regressions with MNC Controls

	(1) Growth	(2) Growth	(3) Growth	(4) Growth	(5) Growth	(6) Growth
α_{YMP}	0.109***	0.136***	0.098***	0.133***	0.098***	0.133***
	(0.029)	(0.031)	(0.032)	(0.036)	(0.032)	(0.036)
MNC	0.035**	0.021	0.024	0.007		
	(0.018)	(0.021)	(0.025)	(0.029)		
$\alpha_{YMP} \times MNC$			0.032	0.002		
			(0.066)	(0.066)		
$\alpha_{YMP} \times FO$					0.044	0.022
					(0.065)	(0.063)
$\alpha_{YMP} \times Parent$					0.003	-0.034
					(0.213)	(0.200)
FO					0.026	0.011
					(0.021)	(0.032)
Parent					-0.033	-0.017
					(0.070)	(0.053)
Gravity controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes
Product FE	yes	no	yes	no	yes	no
Firm FE	no	yes	no	yes	no	yes
TFP Growth Control	yes	yes	yes	yes	yes	yes
R-squared	0.020	0.059	0.020	0.059	0.020	0.059
Number of Observations	8.7e+05	8.7e+05	8.7e+05	8.7e+05	8.7e+05	8.7e+05
Coefficient Tests						
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.386***	0.463***	0.366***	0.447***	0.366***	0.448***
	(0.017)	(0.022)	(0.018)	(0.025)	(0.018)	(0.025)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.067***	0.122***	0.050***	0.104***	0.050***	0.105***
	(0.018)	(0.021)	(0.018)	(0.025)	(0.018)	(0.025)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.068***	0.125***	0.053**	0.111***	0.053**	0.112***
	(0.023)	(0.027)	(0.024)	(0.031)	(0.024)	(0.031)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.053***	0.101***	0.043**	0.091***	0.044**	0.092***
	(0.017)	(0.020)	(0.017)	(0.023)	(0.017)	(0.023)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), and all interacted with indicators for being part of a multinational (MNC) either foreign-owned (FO) or owning a foreign affiliate ($Parent$), in addition to controls for gravity variables (the full list is available in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (4). We only report coefficient estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$), its interaction with our indicators of being part of a multinational, and multinational status indicators. Columns 1-2 report results without quadruple interactions for firm multinational status, while columns 3-4 include them. Columns 5-6 separate results under columns 3-4 for foreign-owned versus owning a foreign affiliate. All columns report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

their first spell relative to later in its exporting cycle. This compares with a 7.1 percentage point differential for non-multinationals. Still, in qualitative terms, the pattern is the same.

Finally, Table 9 reveals some quantitative differences between the entry patterns of affiliates of foreign-owned companies (although not of parents) and non-multinationals. Nevertheless, their qualitative patterns are similar. The coefficients on the indicators are positive and sometimes statistically significant, but are always tiny. More importantly, when we interact the $MNC/FO-Parent$ dummies with our (seven) main variables, our main coefficients of interest, γ_Y, γ_{YM} and γ_{YP}, hardly change. The interaction with the first of them is near zero and not statistically significant. The coefficient on the interaction of MNC with γ_{YM} is negative and significant. It appears that this comes entirely from foreign-owned firms. The magnitude, however, remains about 60 percent of the estimated coefficient on γ_{YM} alone. This implies that foreign-owned firms are also more likely to add products to their first market immediately after entry, but that the additional probability is not as high as with other firms. In contrast, the coefficient on the interaction of MNC with γ_{YP} is positive and significant. Again, this comes entirely from foreign-owned firms rather than from French parents. The magnitude of the coefficient is almost twice as large as the estimated coefficient on γ_{YM} alone. This implies that foreign-owned firms are even more likely to enter a new market with their first product immediately after entry than other firms.

Overall, then, both French affiliates of foreign MNCs and French parents exhibit export dynamics that are qualitatively similar to non-MNCs. The former are slightly less likely to exit early and more likely to expand early in the country dimension than in the product dimension, relative to other firms. These results are consistent with the evidence from Chen, Senga, Sun, and Zhang (2018) on the importance of imperfect information and learning even among multinational firms, showing that similar product-level dynamics within multinational firms are present.

Simultaneous Exporters We now turn to firms exporting multiple products to multiple countries at age 1 ("simultaneous exporters"), corresponding to the firm in the last row of Table 2.

Table 10 reveals that the same export dynamics patterns broadly hold among simultaneous exporters. The first two columns display the results of growth regressions with firm fixed effects in the main estimation sample and in the sample with TFP growth controls. Estimates of α_{YMP} remain positive and significant. The somewhat lower magnitudes (84% and 62% of the corresponding baseline estimates, respectively) suggest that early learning plays a lesser but still important role in explaining age dependence in export growth among those firms.

Table 8: Exit Regressions with MNC Controls

	(1) Exit	(2) Exit	(3) Exit	(4) Exit	(5) Exit	(6) Exit
β_{YMP}	0.064***	0.017***	0.074***	0.014***	0.074***	0.014***
	(0.007)	(0.003)	(0.008)	(0.003)	(0.008)	(0.003)
MNC	-0.010*	-0.003	-0.006	0.004		
	(0.006)	(0.005)	(0.013)	(0.007)		
$\beta_{YMP} \times MNC$			-0.040***	0.012*		
			(0.011)	(0.007)		
$\beta_{YMP} \times FO$					-0.037***	0.016**
					(0.011)	(0.008)
$\beta_{YMP} \times Parent$					-0.021	-0.024
					(0.020)	(0.019)
FO					0.003	0.008
					(0.013)	(0.007)
Parent					-0.002	-0.009
					(0.019)	(0.016)
Gravity controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes
Product FE	yes	no	yes	no	yes	no
Firm FE	no	yes	no	yes	no	yes
TFP Growth Control	yes	yes	yes	yes	yes	yes
R-squared	0.242	0.306	0.242	0.306	0.242	0.306
Number of Observations	8.9e+06	8.9e+06	8.9e+06	8.9e+06	8.9e+06	8.9e+06
Coefficient Tests						
$\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	0.157***	0.064***	0.164***	0.058***	0.164***	0.058***
	(0.009)	(0.002)	(0.011)	(0.003)	(0.011)	(0.003)
$\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.141***	-0.189***	-0.136***	-0.192***	-0.136***	-0.192***
	(0.004)	(0.002)	(0.005)	(0.002)	(0.005)	(0.002)
$\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.136***	-0.180***	-0.126***	-0.182***	-0.126***	-0.182***
	(0.003)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
$\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$	0.032***	0.008***	0.035***	0.000	0.035***	0.000
	(0.003)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)

Notes: The table reports the results of regressions of firm entry conditional on surviving on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), and all interacted with indicators for being part of a multinational (MNC) either foreign-owned (FO) or owning a foreign affiliate ($Parent$), in addition to controls for gravity variables (the full list is available in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (5). We only report coefficient estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$), its interaction with our indicators of being part of a multinational, and multinational status indicators. Columns 1-2 report results without quadruple interactions for firm multinational status, while columns 3-4 include them. Columns 5-6 separate results under columns 3-4 for foreign-owned versus owning a foreign affiliate. All columns report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table 9: Entry Regressions with MNC Controls

	(1) Entry	(2) Entry	(3) Entry	(4) Entry	(5) Entry	(6) Entry
γ_Y	0.001***	-0.000***	0.001***	-0.000***	0.001***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
γ_{YM}	0.021***	0.021***	0.025***	0.025***	0.025***	0.025***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
γ_{YP}	0.003***	0.003***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\gamma_Y \times MNC$			0.000	-0.000		
			(0.000)	(0.000)		
$\gamma_{YM} \times MNC$			-0.015***	-0.015***		
			(0.002)	(0.002)		
$\gamma_{YP} \times MNC$			0.003***	0.004***		
			(0.001)	(0.001)		
$\gamma_Y \times Parent$					-0.001	0.000
					(0.001)	(0.001)
$\gamma_{YM} \times Parent$					-0.004	-0.004
					(0.005)	(0.004)
$\gamma_{YP} \times Parent$					0.001	-0.000
					(0.002)	(0.002)
$\gamma_Y \times FO$					0.000	-0.000
					(0.000)	(0.000)
$\gamma_{YM} \times FO$					-0.015***	-0.015***
					(0.002)	(0.002)
$\gamma_{YP} \times FO$					0.003***	0.004***
					(0.001)	(0.001)
MNC	0.000*	0.000	0.001**	0.000		
	(0.000)	(0.000)	(0.000)	(0.000)		
Parent					0.001***	0.000
					(0.000)	(0.001)
FO					-0.000	-0.000
					(0.000)	(0.000)
Gravity controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes
Product FE	yes	no	yes	no	yes	no
Firm FE	no	yes	no	yes	no	yes
TFP Growth Control	yes	yes	yes	yes	yes	yes
R-squared	0.010	0.013	0.011	0.013	0.011	0.013
Number of Observations	6.1e+07	6.1e+07	6.1e+07	6.1e+07	6.1e+07	6.1e+07
Coefficient Tests						
$\gamma_Y + \gamma_{YM}$	0.022***	0.021***	0.026***	0.025***	0.026***	0.025***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
$\gamma_Y + \gamma_{YP}$	0.003***	0.002***	0.003***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\gamma_{YM} - \gamma_{YP}$	0.019***	0.019***	0.023***	0.023***	0.023***	0.023***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)

Notes: The table reports the results of regressions of firm entry conditional on surviving on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), and all interacted with indicators for being part of a multinational (MNC) either foreign-owned (FO) or owning a foreign affiliate ($Parent$), in addition to controls for gravity variables (the full list is available in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (6). We only report coefficient estimates for the FY_{ijpt-1}, $FY_{ijpt-1} \times FP_{ip}$ and $FY_{ijpt-1} \times FM_{ij}$, their interaction with our indicators of being part of a multinational, and multinational status indicators. Columns 1-2 report results without quadruple interactions for firm multinational status, while columns 3-4 include them. Columns 5-6 separate results under columns 3-4 for foreign-owned versus owning a foreign affiliate. All columns report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table 10: Growth, exit and entry regressions results for simultaneous exporters

	(1) Growth	(2) Growth	(3) Exit	(4) Exit	(5) Entry	(6) Entry
α_{YMP}	0.206***	0.084**				
	(0.036)	(0.036)				
β_{YMP}			-0.004	0.022***		
			(0.005)	(0.007)		
γ_Y					-0.001***	-0.001***
					(0.000)	(0.000)
γ_{YM}					0.021***	0.012***
					(0.001)	(0.001)
γ_{YP}					0.003***	0.005***
					(0.000)	(0.000)
Gravity controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes
Product FE	no	no	no	no	yes	yes
Firm FE	yes	yes	yes	yes	no	no
TFP Growth control	no	yes	no	yes	no	yes
R-squared	0.050	0.042	0.206	0.251	0.015	0.013
Number of Observations	1.6e+06	6.5e+05	3.5e+06	1.3e+06	1.0e+08	2.7e+07

Notes: The table reports the results of regressions of firm growth, exit and entry on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), in addition to controls for gravity variables (the full list is available in Table 4 notes), firm TFP growth and different sets of fixed effects as in specifications (4) under columns 1-2, (5) under columns 3-4, and (6) under columns 5-6. We only report coefficient estimates corresponding to columns 4 and 6 in Tables 4 and 6 and 3 and 5 in 5. All columns report results for the restricted sample of firms exporting multiple products to multiple countries at exporting age 1, in the last row of Table 2. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Columns 3 and 4 show the results of exit regressions with product fixed effects in both samples. Without TFP growth controls, the estimate of β_{YMP} is close to zero and is not statistically significant. However, when we control for TFP growth (in the restricted sample), the coefficient becomes positive and significant, although it is about a third of the magnitude of the baseline specification.

Finally, columns 5 and 6 report the results entry regressions with firm fixed effects in both samples. Some magnitudes are smaller and other larger than in the baseline specifications, but qualitatively the results remain similar to the main specification.

Taken together, these results suggest that our proposed mechanism applies to both "simultaneous" and sequential (non-simultaneous) exporters in terms of subsequent entry and of intensive margin growth. Exit patterns of new simultaneous exporters also show some age dependence, but less than new sequential exporters.

5.2 Export spillovers

We now examine whether early growth, exit and entry behavior may be influenced by the behavior of nearby exporters. Such local spillovers may come from firms inferring some of their export profitability from neighboring firms, or firms hiring personnel with experience among exporters in the same local labor market (Fernandes and Tang, 2014). Alternatively, there may be competition effects working in the other direction. For example, as Ciliberto and Jäkel (2021) show for large Danish exporters, competition between them significantly reduces entry in a foreign market. Whatever the prevailing force, it may be an omitted variable in our analysis.

To verify this possibility, we follow Fernandes and Tang (2014) and construct measures of (lagged) neighboring firms' growth and of the number of such neighboring firms. We treat each of France's then 22 *régions* as our geographical unit. We then compute the log of the number of continuing exporters to the same product-country jp from the same *région* r between $t-2$ and $t-1$. The signal variable is defined as the unweighted average growth rate of continuing exporters to the same product-country jp from the same *région* r between $t-2$ and $t-1$. Finally, we interact both variables.

These three new independent variables are added to the baseline growth, exit and entry regressions as additional controls. Estimation relies on the restricted sample, for which information on location by region is available. Results are reported in Table 11. Reassuringly, the coefficients of interest in each regression are very similar to those obtained without controlling for the possibility of export spillovers (see columns 5 and 6 in Tables 4, 5 and 6).

5.3 Additional robustness analyses

We carry out several additional robustness exercises. As discussed above, export growth regressions potentially suffer from partial-year effects during the first year after entry in a new market. Accordingly, we apply a partial-year effect correction based on Bernard, Bøler, Massari, Reyes, and Taglioni (2017). The results for the coefficients of interest are similar to those obtained in the baseline specification (Appendix B.1). Another potential concern is whether our results reflect financial constraints that could be particularly binding during the early stages of export tenure. To address this concern, we include a measure of asset tangibility proposed by Manova (2013), which allows us to control for industry-specific financial frictions (Appendix B.2). We also explore

Table 11: Local Export Spillovers

	(1) Growth	(2) Growth	(3) Exit	(4) Exit	(5) Entry	(6) Entry
α_{YMP}	0.113***	0.134***				
	(0.034)	(0.036)				
β_{YMP}			0.065***	0.017***		
			(0.007)	(0.004)		
γ_Y					0.002***	-0.001***
					(0.000)	(0.000)
γ_{YM}					0.036***	0.034***
					(0.002)	(0.002)
γ_{YP}					0.007***	0.007***
					(0.000)	(0.000)
log(# neighbors)	-0.011***	0.010***	-0.005***	-0.020***	0.001***	0.001***
	(0.004)	(0.002)	(0.001)	(0.001)	(0.000)	(0.000)
signal	-0.243***	-0.250***	-0.004***	-0.002***	-0.000***	-0.000***
	(0.007)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)
log(# neighbors) × signal	0.029***	0.027***	-0.001***	-0.002***	0.000***	0.000***
	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)
Gravity controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes
Product FE	yes	no	yes	no	yes	no
Firm FE	no	yes	no	yes	no	yes
R-squared	0.037	0.078	0.185	0.271	0.014	0.054
Number of Observations	7.3e+05	7.3e+05	5.8e+06	5.8e+06	2.2e+07	2.2e+07

Notes: The table reports the results of regressions of firm growth, exit and entry on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), controlling for measures of local export spillovers, measured by the number ($log(\#neighbors)$) and growth rate ($signal$) of neighbouring firms, in addition to controls for gravity variables (the full list is available in Table 4 notes) and different sets of fixed effects as in specifications (4) under columns 1-2, (5) under columns 3-4, and (6) under columns 5-6. We only report the corresponding coefficient estimates as reported in Tables 4, 5 and 6 under columns 4 and 6 for growth and entry, and 3 and 5 for exit. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

broader definitions of old exporters and additional fixed effects.[25]

We refer to Appendices B.3 and B.4 for their specific discussion. Finally, in the Online Appendix, we report and briefly discuss product-by-product regressions. Reassuringly, the overall message emerging from these robustness checks is supportive of our baseline results.

6 Conclusion

How do exporters expand their product scope and geographical presence? The answer probably hinges on knowledge that firms acquire as they start to venture in foreign markets. But as Alessandria, Johnson, and Yi (2021) point out, "understanding how this firm-level organizational capital can be used across products and destinations is an unsettled issue" (p. 19). The question becomes particularly complex because these decisions are interdependent. We propose a simple mechanism that allows us to address such interdependence for new exporters. Specifically, we argue that firms are uncertain about their profitability when selling different products in different countries, but learn it as they start to export. Since there are fixed costs both to introduce a new product abroad and to sell in a different country, firms tend to start exporting by selling a single product in a single foreign destination. Once they have an initial experience and learn about their capacity to make profits as exporters, they decide whether to give up or to expand, at the intensive margin and at the sub-extensive product and destination margins. A direct implication of this process is a particularly volatile process of firm expansion (or contraction) in foreign markets early in their export tenure.

Exploiting data on all French exporters between 1993 and 2006, we find strong evidence of significant early entry and exit in foreign markets as well as churning of products sold abroad. Indeed, new multi-product exporters typically start small in volume, reaching a single export country with only one product. Conditional on survival, however, they tend to quickly increase the total volume exported, boost the number of products sold, and expand the set of countries served. Importantly, we do not simply compare the behavior of "new" versus "old" exporters. Rather, the different dynamics that we observe for fledgling exporters is also relative to their own dynamics at the product-destination level right after they add a new product and right after they enter a new destination. This allows us to control for a large set of possible confounders. The conclusion from

[25]More specifically, we report results of growth and exit regressions with country-year and product-year fixed effects to control for omitted supply and demand shocks. Due to the sheer size of the entry dataset, computational constraints prevent us from estimating a similarly augmented model of entry.

our empirical analysis is that uncertainty at the firm level is critical when firms first venture into foreign markets, and learning about their own export profitability is a key determinant of their future foreign experience.

We also find that the process of branching out begins initially by adding products, whereas expansion to other countries tends to come later in the internationalization process of exporting firms. Such a pattern adds nuance to our proposed mechanism of "self-discovery" at the firm level, suggesting that firm profitability across countries and products is imperfectly correlated, resulting in a gradual expansion process. Furthermore, we find that firms often use their "core" products to break in new foreign destinations, and they prove to be particularly resilient. This result can be linked to an established literature on multi-product firms that stresses the concept of core products, but in the context of static models. More theoretical work to accommodate these findings into a full-blown model of firm export dynamics is still required.

Our paper contributes to a recent literature that seeks to understand the interdependent choices that firms make about what, when and where to sell their products. This is a potentially very hard optimization problem, as Alfaro, Castro-Vincenzi, Fanelli, and Morales (2021) make clear. Our approach has the virtue of allowing for interdependence at both the country and product margins, whereas previous work has focused on one or the other. However, we need to simplify the firm problem in several aspects to make it tractable. The need for a structural approach that could accommodate interdependence in both the product and destination dimensions, allowing for both complementarity and substitutability, is warranted.

This matters beyond simply enhancing our knowledge of firm export dynamics. In particular, the interdependence in firms export decisions has implications for understanding the consequences of trade policy and quantifying its effects. For example, a central takeaway from our analysis is that entry in a foreign market reveals information that affects the value of future entry in new countries and of introducing new products abroad for the firm. This creates trade policy spillovers affecting export decisions at the product and destination levels. Hence, our findings indicate that assessments of trade liberalization (or its reversal) should consider its impact on export decisions at the extensive and sub-extensive product margins in third countries.

References

Aeberhardt, R., I. Buono, and H. Fadinger (2014): "Learning, Incomplete Contracts and Export Dynamics: Theory and Evidence from French Firms," *European Economic Review*, 68, 219–249.

Albornoz, F., H. F. Calvo-Pardo, G. Corcos, and E. Ornelas (2012): "Sequential Exporting," *Journal of International Economics*, 88, 17–31.

Albornoz, F., S. Fanelli, and J. C. Hallak (2016): "Survival in Export Markets," *Journal of International Economics*, 102, 262–281.

Alessandria, G., C. Arkolakis, and K. J. Ruhl (forthcoming): "Firm Dynamics and Trade," *Annual Review of Economics*.

Alessandria, G., R. C. Johnson, and K.-M. Yi (2021): "Perspectives on Trade and Structural Transformation," NBER Working Papers 28720.

Alfaro, A., J. M. Castro-Vincenzi, S. Fanelli, and E. Morales (2021): "Firm Export Dynamics in Interdependent Markets," Unpublished Manuscript.

Araujo, L., G. Mion, and E. Ornelas (2016): "Institutions and Export Dynamics," *Journal of International Economics*, 98, 2–20.

Arkolakis, C., S. Ganapati, and M.-A. Muendler (forthcoming): "The Extensive Margin of Exporting Products: A Firm-level Analysis," *American Economic Journal: Macroeconomics*.

Arkolakis, C., T. Papageorgiou, and O. A. Timoshenko (2018): "Firm Learning and Growth," *Review of Economic Dynamics*, 27, 146–168.

Bergounhon, F., C. Lenoir, and I. Méjean (2018): "A Guideline to French Firm-level Trade Data," Unpublished Manuscript.

Berlingieri, G., L. Marcolin, and E. Ornelas (2021): "Service Offshoring and Export Experience," Unpublished Manuscript.

Berman, N., V. Rebeyrol, and V. Vicard (2019): "Demand Learning and Firm Dynamics: Evidence from Exporters," *The Review of Economics and Statistics*, 101, 91–106.

Bernard, A. B., E. A. Bøler, R. Massari, J.-D. Reyes, and D. Taglioni (2017): "Exporter Dynamics and Partial-Year Effects," *American Economic Review*, 107, 3211–28.

Bernard, A. B., J. B. Jensen, S. J. Redding, and P. K. Schott (2009): "The Margins of US Trade," *American Economic Review, Papers and Proceedings*, 99, 487–93.

——— (2018): "Global Firms," *Journal of Economic Literature*, 56, 565–619.

Bernard, A. B., S. J. Redding, and P. K. Schott (2011): "Multiproduct Firms and Trade Liberalization," *The Quarterly journal of economics*, 126, 1271–1318.

Berthou, A. and V. Vicard (2015): "Firms' Export Dynamics: Experience Versus Size," *The World Economy*, 38, 1130–1158.

Beveren, I. V., A. B. Bernard, and H. Vandenbussche (2012): "Concording EU Trade and Production Data over Time," NBER Working Papers 18604, National Bureau of Economic Research.

Blum, B. S., S. Claro, I. Horstmann, and T. Tombe (2020): "The DNA of New Exporters: Spin-offs and FDI at the Extensive Margin of Trade," *AER: Insights*, 3, 397–408.

Cadot, O., L. Iacovone, M. D. Pierola, and F. Rauch (2013): "Success and Failure of African Exporters," *Journal of Development Economics*, 101, 284–296.

Carrère, C. and V. Strauss-Kahn (2017): "Export Survival and the Dynamics of Experience," *Review of World Economics (Weltwirtschaftliches Archiv)*, 153, 271–300.

Cebreros, A. (2016): "The Rewards of Self-Discovery: Learning and Firm Exporter Dynamics," Working Papers 2016-08, Banco de México.

Chen, C., T. Senga, C. Sun, and H. Zhang (2018): "Uncertainty, Imperfect Information, and Expectation Formation over the Firm's Life Cycle," Discussion Papers 18010, RIETTI.

Chen, C., C. Sun, and H. Zhang (2020): "Learning and Information Transmission within Multinational Corporations," CESifo Working Paper Series 8477.

Ciliberto, F. and I. C. Jäkel (2021): "Superstar exporters: An empirical investigation of strategic interactions in Danish export markets," *Journal of International Economics*, 129, 103405.

Conconi, P., A. Sapir, and M. Zanardi (2016): "The Internationalization Process of Firms: From Exports to FDI," *Journal of International Economics*, 99, 16–30.

Defever, F., B. Heid, and M. Larch (2015): "Spatial Exporters," *Journal of International Economics*, 95, 145–156.

Dhingra, S. (2013): "Trading away wide brands for cheap brands," *American Economic Review*, 103, 2554–84.

Eaton, J., M. Eslava, M. Kugler, and J. Tybout (2008): "Export Dynamics in Colombia: Firm Level Evidence," in *The Organization of Firms in a Global Economy*, ed. by E. Helpman, D. Marin, and T. Verdier, Cambridge, MA: Harvard University Press, chap. 8.

Eckel, C., L. Iacovone, B. S. Javorcik, and J. P. Neary (2016): "Testing the Core-competency Model of Multi-product Exporters," *Review of International Economics*, 24, 699–716.

Eckel, C. and J. P. Neary (2010): "Multi-product Firms and Flexible Manufacturing in the Global Economy," *The Review of Economic Studies*, 77, 188–217.

Egger, P., M. Fahn, V. Merlo, and G. Wamser (2014): "On the Genesis of Multinational Foreign Affiliate Networks," *European Economic Review*, 65, 136–163.

Esteve-Perez, S. (2021): "Previous Experience, Experimentation and Export Survival: Evidence from Firm-product-destination Level Data," *The World Economy, forthcoming.*

Evenett, S. J. and A. J. Venables (2002): "Firm Export Dynamics in Interdependent Markets," Unpublished Manuscript.

Fernandes, A. P. and H. Tang (2014): "Learning to Export from Neighbors," *Journal of International Economics*, 94, 67–84.

Fitzgerald, D., S. Haller, and Y. Yedid-Levi (2019): "How Exporters Grow," NBER Working Papers 21935.

Freund, C. and M. D. Pierola (2010): "Export Entrepreneurs: Evidence from Peru," Policy Research Working Paper Series 5407, The World Bank.

——— (2020): "The Origin and Dynamics of Export Superstars," *The World Bank Economic Review*, 34, 28–47.

Head, K., T. Mayer, and J. Ries (2010): "The Erosion of Colonial Trade Linkages after Independence," *Journal of International Economics*, 81, 1–14.

Holloway, I. R. (2017): "Learning via Sequential Market Entry: Evidence from International Releases of US Movies," *Journal of International Economics*, 104, 104–121.

Iacovone, L. and B. S. Javorcik (2010): "Multi-product exporters: Product churning, uncertainty and export discoveries," *The Economic Journal*, 120, 481–499.

Lawless, M. and Z. Studnicka (2019): "Old Firms and New Export Flows: Does Experience Increase Survival?" Working Papers 19/19, School of Economics, University College Dublin.

Levinsohn, J. and A. Petrin (2003): "Estimating Production Functions Using Inputs to Control for Unobservables," *The Review of Economic Studies*, 70, 317–341.

Li, S. (2018): "A Structural Model of Productivity, Uncertain Demand, and Export Dynamics," *Journal of International Economics*, 115, 1–15.

Manova, K. (2013): "Credit Constraints, Heterogeneous Firms, and International Trade," *Review of Economic Studies*, 80, 711–744.

Mayer, T., M. J. Melitz, and G. I. P. Ottaviano (2014): "Market Size, Competition, and the Product Mix of Exporters," *American Economic Review*, 104, 495–536.

——— (2021): "Product Mix and Firm Productivity Responses to Trade Competition," *The Review of Economics and Statistics*, forthcoming.

Morales, E., G. Sheu, and A. Zahler (2019): "Extended Gravity," *Review of Economic Studies*, 86, 2668–2712.

Nguyen, D. X. (2012): "Demand uncertainty: Exporting delays and Exporting Failures," *Journal of International Economics*, 86, 336–344.

Nocke, V. and S. Yeaple (2014): "Globalization And Multiproduct Firms," *International Economic Review*, 55, 993–1018.

Pierce, J. R. and P. K. Schott (2012): "Concording U.S. Harmonized System Categories over Time," Finance and Economics Discussion Series 2012-16, Board of Governors of the Federal Reserve System (U.S.).

Qiu, L. D. and W. Zhou (2013): "Multiproduct Firms and Scope Adjustment in Globalization," *Journal of International Economics*, 91, 142–153.

Ruhl, K. J. and J. L. Willis (2017): "New Exporter Dynamics," *International Economic Review*, 58, 703–726.

Sheveleva, Y. and K. Krishna (2017): "Learning Versus Knowing: a Dynamic Model of Multiproduct Exporters," Unpublished Manuscript.

Timoshenko, O. A. (2015a): "Learning versus Sunk Costs Explanations of Export Persistence," *European Economic Review*, 79, 113–128.

——— (2015b): "Product Switching in a Model of Learning," *Journal of International Economics*, 95, 233–249.

Appendices

A Data Appendix

A.1 Data Sources

Our analysis is conducted on two main datasets. The *full dataset* consists of French Customs data on all export transactions between 1993 and 2006 by firm, HS6 product, destination country and year. All values are in euros.[26] To deal with revisions of the HS classification, we concord product categories using data from Beveren, Bernard, and Vandenbussche (2012), who use a version of the Pierce and Schott (2012) algorithm. We match this dataset with standard gravity regression covariates from the CEPII Gravity dataset used in Head, Mayer, and Ries (2010). Finally, we exclude countries with less than 5% of all French exports in order to reduce the size of our dataset. The resulting full dataset contains export values for 392,624 firms, 4212 HS6 products, 89 countries and 14 years.

[26] A detailed presentation of this dataset can be found in Bergounhon, Lenoir, and Méjean (2018).

The *restricted dataset* consists of the intersection between the above-described dataset and balance sheet data from the French tax authority's (FICUS dataset). This dataset documents firms' value-added, employment, capital stock, cost of materials as well as their primary industry. For all firms outside the distribution industry, we use these data to compute Total Factor Productivity (TFP) at the firm-year level using the Levinsohn-Petrin method (Levinsohn and Petrin, 2003). In each NACE 1-digit industry, we estimate TFP as the residual of a regression of firm output on capital and labor stocks, using intermediates to control for serially correlated technological shocks unobserved by the econometrician. In all estimated models, we report results of a variant with TFP growth as a control, usually in the 2 rightmost columns, to filter supply shocks out of export dynamics. The resulting dataset has 149,229 firms, 4209 HS6 products, 89 countries and 14 years, representing 67.05% of all exports in the full dataset.

Table A.1 reports some descriptive statistics when data in both datasets are aggregated at the *firm-year* level. There are moderate but non-negligible differences between firms in both samples: firms in the restricted sample are larger, more productive, have higher export volumes, more products and more destinations. For this reason, we report results for both datasets throughout the paper rather than the restricted sample only.

Table A.1: Summary Statistics by Firm-Year

	Full Dataset			Restricted Dataset		
Characteristic	Mean	Median	N	Mean	Median	N
Sales †	17.3	1.78	1,465,158	20.9	2.08	592,041
Number of employees	67.01	9	1,465,158	99.16	16	592,041
Capital Stock †	10.3	.11	1,465,158	17.8	.20	592,041
Value-Added per Worker ‡	59.22	44.54	1,465,158	57.60	43.25	592,041
Exports	2,384,173	31709	1,465,158	3,956,396	58,036	592,041
Number of Exported Products	5.40	2	1,465,158	6.22	2	592,041
Number of Destination Countries	4.55	2	1,465,158	6.16	2	592,041
Exporting Age (years)	4.79	4	1,465,158	5.40	5	592,041

Notes: All monetary values in euros unless otherwise indicated. †: million euros; ‡ thousands of euros; N refers to the number of observations (firm-years).

We occasionally rely on subsamples of these two main datasets. As explained in Section 4.1, computational reasons force us to run entry regressions on a *random sample of 30% of all firms*.[27] The resulting sample has 6,814,109 firm-country-product-year observations, with 228,513 firms, 88

[27]To analyze the timing of entry we must construct artificial pre-entry observations for each firm-product present in the data. Keeping all firms would result in an entry dataset with over 2bn observations which cannot be handled by our statistical package. Growth and exit regressions run on a random sample with the exact same group of firms yield similar estimates as those reported in the main text, and are available upon request.

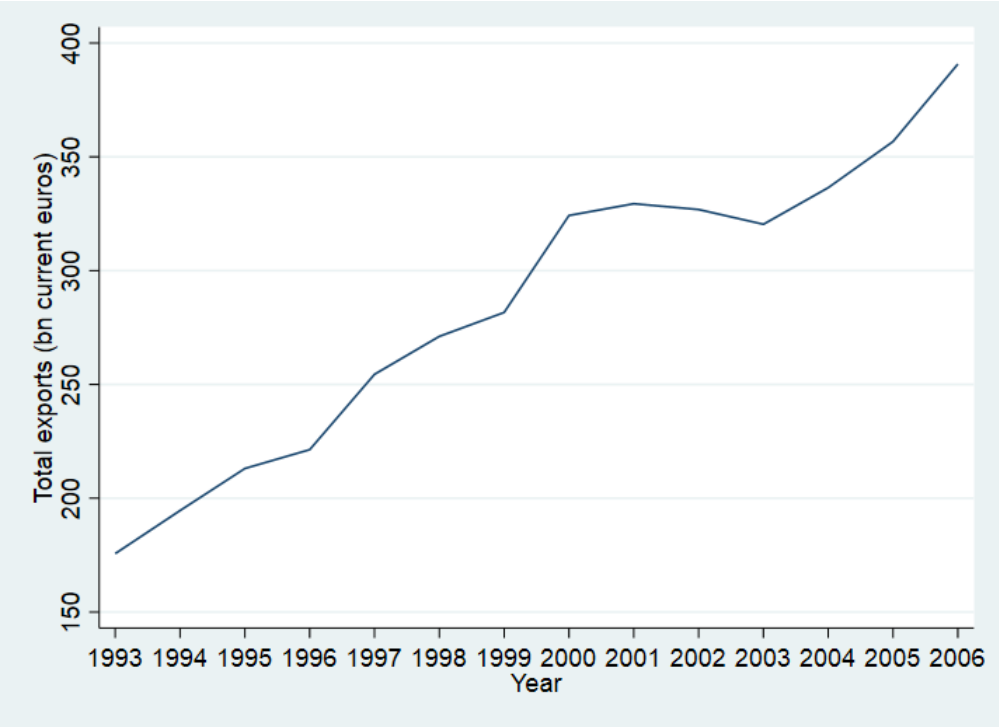
countries, 4211 concorded HS6 products and 14 years.

Another subsample is used in robustness checks concerned with multinational companies. To identify French multinationals and foreign-owned French firms we rely on the French statistical office (INSEE)'s LIFI survey of ownership links between corporations. We match these data to the restricted sample to perform the analysis in Section 5.1.

A.2 Aggregate descriptives

French exports of goods grew from 175.7bn euros in 1993 to 390.8bn euros in 2006. This is summarized in Figure 4.

Figure 4: Total French exports, 1993-2006



This growth was very uneven across product categories, as shown by Table A.2. Throughout our sample the main export product categories were Machinery and Mechanical Appliances, Vehicles and Chemicals. The highest growth rates were experienced in the Arms and Ammunition, Mineral Products and Works of Art Sections. In contrast, exports of agricultural products, textiles and some raw materials experienced the lowest growth rates.

The geographical breakdown of French exports of goods also changed during the sample period.

Table A.2: Breakdown of total goods exports by HS Section.

HS Section	1993 Exports (current EUR bn)	2006 Exports (current EUR bn)	Growth rate (%)
LIVE ANIMALS; ANIMAL PRODUCTS	7.16	10.2	+42.0
VEGETABLE PRODUCTS	7.35	9.51	+29.3
ANIMAL OR VEGETABLE FATS AND OIL ...	.38	.85	+122.2
FOODSTUFFS, BEVERAGES AND TOBACCO	9.92	21.8	+120.2
MINERAL PRODUCTS	3.99	17.43	+337.2
CHEMICALS	17.91	56.04	+213.0
PLASTICS AND ARTICLES THEREOF...	7.97	21.11	+164.8
RAW HIDES AND SKINS, LEATHER...	1.23	3.55	+188.7
WOOD AND ARTICLES OF WOOD...	.99	2.52	+154.2
PULP OF WOOD...	3.855	8.365	+117.0
TEXTILES AND TEXTILE ARTICLES	7.13	12.81	+79.64
FOOTWEAR, HEADGEAR, UMBRELLAS...	.75	1.51	+101.9
ARTICLES OF STONE, PLASTER, CEMENT...	2.87	4.78	+66.62
NATURAL OR CULTURED PEARLS...	.95	2.42	+153.7
BASE METALS AND ARTICLES...	11.61	33.30	+186.9
MACHINERY AND MECHANICAL APPLIANCES	34.98	85.38	+144.1
VEHICLES, AIRCRAFT, VESSELS...	26.33	78.01	+196.3
OPTICAL, PHOTOGRAPHIC INSTRUMENTS...	4.55	13.16	+189.0
ARMS AND AMMUNITION; PARTS...	.06	.32	+459.1
MISCELLANEOUS MANUFACTURED ARTICLES	2.48	5.67	+128.4
WORKS OF ART, COLLECTORS' PIECES	.23	0.92	+308.0

Table A.3 shows the ten main export destinations in 1993 and 2006 and their respective shares of total French exports. Unsurprisingly, neighboring European countries and large economies such as the US, Japan and China feature prominently. French exports became more dispersed during the sample period, with a fall in the export shares of Germany and the UK and a rise in the shares of Spain, Switzerland, China and Poland.

Table A.3: Exports to France's Top 10 Destinations (current billion euros) and Share of Total Exports in 1993 and 2006

	1993			2006		
	Country	Exports	Share (%)	Country	Exports	Share (%)
1.	Germany	31.2	20.4	Germany	61.6	15.8
2.	United Kingdom	16.9	11.1	Spain	38.1	9.77
3.	Italy	16.8	11.0	Italy	35.2	9.03
4.	United States	12.7	8.32	United Kingdom	32.9	8.45
5.	Spain	12.0	7.84	Belgium	28.8	7.40
6.	Netherlands	8.66	5.67	United States	26.3	6.76
7.	Japan	3.52	2.31	Netherlands	16.0	4.10
8.	Portugal	2.79	1.83	Switzerland	10.4	2.68
9.	Sweden	1.83	1.20	China	8.09	2.07
10.	Algeria	1.81	1.19	Poland	6.99	1.79

B Robustness Checks and Additional Tables

B.1 Robustness: Partial-Year Effect Correction

A potential limitation of our growth regressions stems from our use of calendar year data. Some exporters might enter a market late in the (calendar) year relative to later shipments to the same market. Growth rates between the second (complete) calendar year and the first ('partial') calendar year would then be artificially high. Bernard, Bøler, Massari, Reyes, and Taglioni (2017) and Berthou and Vicard (2015) show that age patterns in growth are less pronounced once the precise timing of new exporters' entry is taken into account.

As explained in Section 4.2.1, this partial-year effect should be mostly absorbed by the FY_{ijpt-1} variable in equation (4). This variable captures any specific feature of growth rates right after entry in country-product jp. If exporters start new spells systematically later in the year than subsequent shipments in the same spell, the additional component in early growth will be captured by FY_{ijpt-1}.

Nonetheless, we check the robustness of our results to a correction proposed by Bernard, Bøler,

Massari, Reyes, and Taglioni (2017). In our dataset, exports are defined at the firm-product-country-year level. We first compute the average annual growth rate of exports among continuers with more than four years of consecutive exports, from which we infer a monthly export growth rate, $r-1$. As our data also report exports by month, we can inflate export values in the first year of each spell by the additional values for the missing months, assuming uniform growth at rate $r-1$. More precisely, suppose firm i starts exporting value X_{ijp}^{obs} to jp in its first calendar year. Denote by m the earliest month of that calendar year in which exports are recorded. We replace X_{ijp}^{obs} with a counterfactual annual export corresponding to a full year $X_{ijp,BBMRT}^{true}(m)$, defined as:

$$X_{ijp,BBMRT}^{true}(m) = \frac{1-r^{12}}{1-r^{13-m}} X_{ijp}^{obs}.$$

Table B.1 displays the results of the estimations with the corrected exports data. Its structure follows Table 4. Column 1 reports the results from a simple OLS estimate of equation (4), while column 2 adds gravity controls and year and destination fixed effects. Columns 3 and 4 further include product and firm fixed effects, respectively. Finally, columns 5 and 6 add controls for firm-specific unobserved sources of TFP growth, for the sample of firms for which balance sheet data is available.

Results are qualitatively similar to the baseline in all specifications, in that coefficients for α_{YMP} are positive and highly significant. One difference comes from the first coefficient test reported in Table B.1. Some specifications yield a negative estimate of α_Y implying that early growth rates in first-ever spells are lower than growth rates in subsequent years of subsequent spells. However, this result vanishes when introducing firm fixed effects or controls for idiosyncratic TFP growth. This suggests that our baseline estimates of α_Y did capture some calendar year effects, but that growth rates still exhibit age dependence when firm heterogeneity is controlled for.

B.2 Robustness: Financial Frictions

We now add controls for credit constraints to our baseline specification. The idea is that credit constraints may explain the gradual growth and expansion of successful but credit-dependent new exporters. Following Manova (2013), we use a measure of Asset Tangibility (AT) at the industry level to proxy for the lack of financial frictions. This variable records the share of net property, plant, and equipment in total book-value assets, averaged over 1986–1995 for the median firm in each industry. The measure is available at the 3-digit ISIC industry level in the manufacturing

Table B.1: Growth Regressions with Bernard et al. (2017) Partial Year Effect Correction

	(1) Growth	(2) Growth	(3) Growth	(4) Growth	(5) Growth	(6) Growth
α_{YMP}	0.234***	0.235***	0.240***	0.354***	0.227***	0.298***
	(0.029)	(0.030)	(0.030)	(0.032)	(0.029)	(0.031)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.003	0.004	0.009	0.062	0.010	0.057
Number of Observations	2.1e+06	2.1e+06	2.1e+06	2.1e+06	1.6e+06	1.6e+06
Coefficient Tests						
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	-0.093***	-0.079***	-0.068***	0.139***	-0.010***	0.047**
	(0.015)	(0.016)	(0.017)	(0.021)	(0.018)	(0.022)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.167***	0.165***	0.163***	0.316***	0.165***	0.268***
	(0.027)	(0.027)	(0.026)	(0.023)	(0.019)	(0.022)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.198***	0.193***	0.183***	0.345***	0.187***	0.306***
	(0.019)	(0.019)	(0.019)	(0.021)	(0.021)	(0.025)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.097***	0.088***	0.096***	0.224***	0.087***	0.160***
	(0.015)	(0.015)	(0.015)	(0.017)	(0.018)	(0.021)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (detailed in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (4) after applying Bernard et al. (2017) partial-year effect correction. We only report estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$) coefficient, for comparison with Table 4. The full set of estimates is available from the authors upon request. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

sector. We use concordance tables to convert that measure into our NACE sectors. As a result, our models are estimated on the sub-sample of manufacturing firms present in the restricted sample for which balance sheet data is available.

Results are shown in Tables B.2-B.4. All three tables have the same structure. Columns (1) and (2) report the results of the product fixed effects and firm fixed effects regressions with the AT measure as an additional independent variable. Columns (3) and (4) report the results of a similar regression on the sub-sample of the least constrained manufacturing industries (i.e. those with above-median AT).

Results are very consistent with our baseline estimates: coefficients on the key coefficients are highly significant and display the expected signs throughout, albeit with slightly lower magnitudes. For instance, the .121 and .118 coefficients in the growth regressions are to be compared with .110 and .136 in the baseline specification. Estimates have roughly the same magnitude in the

regressions on the sub-sample of 'unconstrained' manufacturing industries.

Table B.2: Growth Regressions: Financial Frictions

	(1) Growth	(2) Growth	(3) Growth	(4) Growth
α_{YMP}	0.121***	0.118***	0.113***	0.125***
	(0.031)	(0.031)	(0.032)	(0.034)
Asset Tangibility	0.116***	0.111***	0.101**	-0.032
	(0.040)	(0.041)	(0.046)	(0.143)
Gravity controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Country FE	yes	yes	yes	yes
Product FE	yes	no	yes	no
Firm FE	no	yes	no	yes
TFP Growth Control	yes	yes	yes	yes
Industries	all	all	unconstrained	unconstrained
R-squared	0.013	0.014	0.021	0.050
Number of Observations	7.7e+05	7.6e+05	7.6e+05	7.6e+05
Coefficient Tests				
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.406***	0.405***	0.407***	0.462***
	(0.018)	(0.018)	(0.019)	(0.023)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.087***	0.083***	0.076***	0.118***
	(0.019)	(0.019)	(0.020)	(0.023)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.090***	0.086***	0.073***	0.114***
	(0.025)	(0.025)	(0.026)	(0.030)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.068***	0.062***	0.066***	0.097***
	(0.019)	(0.019)	(0.019)	(0.021)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), firm assets tangibility, together with controls for gravity variables (detailed in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (4). We only report estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$) coefficient, for comparison with Table 4. The full set of estimates is available from the authors upon request. Columns 1-2 report results for firms in all industries, while Columns 3-4 report results for the restricted sample of firms operating in financially unconstrained industries. All columns report results for firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

B.3 Robustness: Different Definition of Old Exporters

In the main text, old exporters refer to firms exporting in the first year of our sample (1993). All others are treated as new exporters, even though we do not observe exports prior to 1993. To check that results are not driven by this definition, we now treat firms exporting at least once in 1993, 1994 *or* 1995 as old exporters. Results are shown in Tables B.5, B.6 and B.7, which are designed to parallel the three tables of the main specification.

Results are very similar to the baseline results. In the growth and entry regressions, the coefficients of interest have the same sign and significance, as well as very similar magnitude. In the

Table B.3: Exit Regressions: Financial Frictions

	(1) Exit	(2) Exit	(3) Exit	(4) Exit
β_{YMP}	0.050***	0.044***	0.047***	0.019***
	(0.007)	(0.007)	(0.007)	(0.003)
Asset Tangibility	-0.037***	-0.030**	-0.018	-0.005
	(0.013)	(0.013)	(0.013)	(0.040)
Gravity controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Country FE	yes	yes	yes	yes
Product FE	yes	no	yes	no
Firm FE	no	yes	no	yes
TFP Growth Control	yes	yes	yes	yes
Industries	all	all	unconstrained	unconstrained
R-squared	0.161	0.175	0.236	0.287
Number of Observations	8.2e+06	8.0e+06	8.0e+06	8.0e+06
Coefficient Tests				
$\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	0.164***	0.151***	0.140***	0.066***
	(0.009)	(0.009)	(0.009)	(0.003)
$\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.189***	-0.183***	-0.161***	-0.194***
	(0.004)	(0.004)	(0.004)	(0.002)
$\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.153***	-0.164***	-0.157***	-0.184***
	(0.003)	(0.003)	(0.003)	(0.002)
$\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$	-0.023***	-0.009**	0.011***	0.007***
	(0.003)	(0.003)	(0.003)	(0.002)

Notes: The table reports the results of regressions of firm exit on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), firm assets tangibility, together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (5). We only report estimates for the triple interaction ($FY_{ijpt-1} \times FM_{ij} \times FP_{ip}$) coefficient, for comparison with Table 5.The full set of estimates is available from the authors upon request. Columns 1-2 report results for firms in all industries, while Columns 3-4 report results for the restricted sample of firms operating in financially unconstrained industries. All columns report results for firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

exit regressions, signs and significance are also unchanged in five of the six columns. As explained before, the insignificant estimate for the triple-difference coefficient in column 6 of Table B.6 is not inconsistent with our theory: firm fixed effects estimation excludes a large number of firms with a single observation, which should account for the bulk of early exit.

B.4 Robustness: Additional Fixed Effects

We now run growth and exit regressions with additional fixed effects.[28] We include country-year and product-year fixed effects to control for potential omitted market-specific time-varying shocks that may affect exporter growth and survival. These may include various shocks to demand and

[28] Adding a large number of fixed effects is computationally too challenging in entry regressions, due to the sheer size of the dataset (250m observations even in the 30% random sub-sample).

Table B.4: Entry Regressions: Financial Frictions

	(1)	(2)	(3)	(4)
	Entry	Entry	Entry	Entry
γ_Y	0.000***	-0.000***	0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
γ_{YM}	0.017***	0.017***	0.016***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
γ_{YP}	0.003***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Asset Tangibility	-0.000	-0.001	0.003***	-0.002
	(0.000)	(0.001)	(0.001)	(0.006)
Gravity controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Country FE	yes	yes	yes	yes
Product FE	yes	no	yes	no
Firm FE	no	yes	no	yes
TFP Growth Control	yes	yes	yes	yes
Industries	all	all	unconstrained	unconstrained
R-squared	0.010	0.013	0.012	0.013
Number of Observations	5.0e+07	5.0e+07	1.5e+07	1.5e+07
Coefficient Tests				
$\gamma_Y + \gamma_{YM}$	0.017***	0.016***	0.017***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
$\gamma_Y + \gamma_{YP}$	0.003***	0.002***	0.004***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
$\gamma_{YM} - \gamma_{YP}$	0.014***	0.014***	0.013***	0.013***
	(0.001)	(0.001)	(0.002)	(0.002)

Notes: The table reports the results of regressions of firm entry conditional on surviving on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), firm assets tangibility, together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (6). We only report estimates for the FY_{ijpt-1}, $FY_{ijpt-1} \times FP_{ip}$ and $FY_{ijpt-1} \times FM_{ij}$ coefficients, for comparison with Table 6. The full set of estimates is available from the authors upon request. Columns 1-2 report results for firms in all industries, while Columns 3-4 report results for the restricted sample of firms operating in financially unconstrained industries. All columns report results for firms for which balance-sheet data is available (FICUS). The last three rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.5: Growth: New Definition of Old Exporters

	(1) Growth	(2) Growth	(3) Growth	(4) Growth	(5) Growth	(6) Growth
α_{YMP}	0.188***	0.187***	0.181***	0.243***	0.132***	0.152***
	(0.028)	(0.029)	(0.030)	(0.032)	(0.035)	(0.038)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.016	0.017	0.022	0.073	0.023	0.062
Number of Observations	1.7e+06	1.6e+06	1.6e+06	1.6e+06	5.7e+05	5.7e+05
Coefficient Tests						
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.450***	0.450***	0.458***	0.578***	0.406***	0.462***
	(0.015)	(0.015)	(0.016)	(0.019)	(0.020)	(0.027)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.119***	0.116***	0.113***	0.217***	0.082***	0.128***
	(0.026)	(0.026)	(0.026)	(0.022)	(0.021)	(0.025)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.136***	0.133***	0.124***	0.222***	0.086***	0.134***
	(0.017)	(0.017)	(0.017)	(0.019)	(0.026)	(0.032)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.126***	0.123***	0.125***	0.217***	0.061***	0.106***
	(0.014)	(0.014)	(0.015)	(0.016)	(0.021)	(0.023)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (detailed in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (4) considering as old exporters firms exporting in 1993, 1994 and 1995. We only report estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$) coefficient, for comparison with Table 4. The full set of estimates is available from the authors upon request. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.6: Exit: New Definition of Old Exporters

	(1) Exit	(2) Exit	(3) Exit	(4) Exit	(5) Exit	(6) Exit
β_{YMP}	0.033***	0.061***	0.075***	-0.056***	0.106***	0.006
	(0.007)	(0.007)	(0.007)	(0.004)	(0.009)	(0.006)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.022	0.054	0.127	0.239	0.145	0.215
Number of Observations	2.1e+07	2.1e+07	2.1e+07	2.1e+07	9.1e+06	9.1e+06
Coefficient Tests						
$\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	0.178***	0.173***	0.164***	-0.064***	0.202***	0.021***
	(0.005)	(0.004)	(0.005)	(0.004)	(0.007)	(0.005)
$\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.055***	-0.068***	-0.062***	-0.207***	-0.042***	-0.158***
	(0.006)	(0.006)	(0.006)	(0.003)	(0.008)	(0.004)
$\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.068***	-0.080***	-0.063***	-0.217***	-0.053***	-0.182***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.006)	(0.004)
$\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$	0.073***	0.069***	0.043***	-0.070***	0.088***	0.005
	(0.004)	(0.004)	(0.004)	(0.002)	(0.007)	(0.004)

Notes: The table reports the results of regressions of firm exit on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (5) considering as old exporters firms exporting in 1993, 1994 and 1995. We only report estimates for the triple interaction ($FY_{ijpt-1} \times FM_{ij} \times FP_{ip}$) coefficient, for comparison with Table 5.The full set of estimates is available from the authors upon request. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.7: Entry (30% Sample): New Definition of Old Exporters

	(1) Entry	(2) Entry	(3) Entry	(4) Entry	(5) Entry	(6) Entry
γ_Y	0.001***	0.001***	0.001***	-0.001***	0.001***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
γ_{YM}	0.038***	0.037***	0.037***	0.037***	0.022***	0.022***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
γ_{YP}	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.011	0.014	0.015	0.019	0.012	0.015
Number of Observations	1.4e+08	1.3e+08	1.3e+08	1.3e+08	3.3e+07	3.3e+07
Coefficient Tests						
$\gamma_Y + \gamma_{YM}$	0.038***	0.038***	0.038***	0.036***	0.023***	0.022***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$\gamma_Y + \gamma_{YP}$	0.003***	0.003***	0.003***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\gamma_{YM} - \gamma_{YP}$	0.035***	0.035***	0.035***	0.034***	0.020***	0.020***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Notes: The table reports the results of regressions of firm entry conditional on surviving on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (6) considering as old exporters firms exporting in 1993, 1994 and 1995. We only report estimates for the FY_{ijpt-1}, $FY_{ijpt-1} \times FP_{ip}$ and $FY_{ijpt-1} \times FM_{ij}$ coefficients, for comparison with Table 6. The full set of estimates is available from the authors upon request. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last three rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

supply conditions as well as trade costs, in particular exchange rate movements and trade policy changes.

Results are shown in Tables B.8 and B.9. Both have the same structure. Columns 1-3 apply to the full sample, while columns 4-5 report results for the restricted sample of firms for which we have balance sheet data. Column 1 in both tables reports the same estimates as column 1 in the baseline tables for ease of comparison. Column 2 reports estimates of a regression with country-year fixed effects, which absorb traditional gravity variables. Column 3 reports estimates of a regression with product-year fixed effects, where country and year dummies are also present. Columns 4 and 5 show estimates of the same regressions as columns 2 and 3, but for the restricted sample.

Overall, results are quantitatively and qualitatively similar to the baseline. In Table B.8, estimates in column 2 are very similar to their counterparts in column 2 of the baseline tables, suggesting our country dummies, year dummies and gravity variables already cover for most relevant omitted country-year variables. Similarly, estimates in columns 3 and 5 suggest that the results in columns 3 and 5 of the baseline table are robust to the inclusion of product-year dummies, even if the coefficients of interest are slightly lower.

In Table B.9, results are also broadly similar to the baseline estimates. The regression with country-year dummies (column 2) shows a positive and significant estimate of the main coefficient of interest, with a magnitude almost twice as high as in the baseline. Results in columns 3 and 5 with product-year dummies are remarkably similar to their counterparts of columns 3 and 5 in the baseline table.

B.5 Complete Tables for Growth, Exit and Entry Regressions

Tables B.10, B.11 and B.12 report the full set of estimates of our main growth, exit and entry regressions.

Table B.8: Growth Regressions With Additional Fixed Effects

	(1) Growth	(2) Growth	(3) Growth	(4) Growth	(5) Growth
α_{YMP}	0.183***	0.189***	0.175***	0.118***	0.102***
	(0.020)	(0.020)	(0.020)	(0.027)	(0.024)
Gravity controls	no	no	yes	no	yes
Country-Year FE	no	yes	no	yes	no
Country FE	no	no	yes	no	yes
Product-Year FE	no	no	yes	no	yes
TFP Growth Control	no	no	no	yes	yes
R-squared	0.015	0.017	0.044	0.015	0.070
Number of Observations	2.5e+06	2.5e+06	2.4e+06	9.1e+05	8.9e+05
Coefficient Tests					
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.443***	0.452***	0.439***	0.390***	0.374***
	(0.011)	(0.012)	(0.012)	(0.017)	(0.015)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.125***	0.121***	0.116***	0.087***	0.067***
	(0.018)	(0.018)	(0.017)	(0.018)	(0.015)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.129***	0.139***	0.119***	0.086***	0.064***
	(0.014)	(0.014)	(0.014)	(0.022)	(0.019)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.126***	0.115***	0.119***	0.063***	0.046***
	(0.011)	(0.012)	(0.011)	(0.017)	(0.015)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (detailed in Table 4 notes), firm TFP growth and different sets of fixed effects as in specification (4). We only report estimates for the triple interaction ($FY_{ijpt-1} \times FP_{ip} \times FM_{ij}$) coefficient, for comparison with Table 4. The full set of estimates is available from the authors upon request. Columns 1-3 report results for the full sample of firms, while Columns 4-5 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.9: Exit Regressions With Additional Fixed Effects

	(1) Exit	(2) Exit	(3) Exit	(4) Exit	(5) Exit
β_{YMP}	0.036***	0.067***	0.061***	0.073***	0.063***
	(0.003)	(0.003)	(0.003)	(0.007)	(0.006)
Gravity controls	no	no	yes	no	yes
Country-Year FE	no	yes	no	yes	no
Country FE	no	no	yes	no	yes
Product-Year FE	no	no	yes	no	yes
TFP Growth Control	no	no	no	yes	yes
R-squared	0.122	0.200	0.212	0.238	0.257
Number of Observations	2.1e+07	2.1e+07	2.1e+07	9.3e+06	9.1e+06
Coefficient Tests					
$\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	0.166***	0.156***	0.146***	0.166***	0.155***
	(0.004)	(0.005)	(0.005)	(0.009)	(0.009)
$\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.157***	-0.133***	-0.126***	-0.148***	-0.146***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
$\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.163***	-0.126***	-0.122***	-0.140***	-0.137***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
$\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$	0.005**	0.035***	0.034***	0.036***	0.029***
	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)

Notes: The table reports the results of regressions of firm exit on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (5). We only report estimates for the triple interaction ($FY_{ijpt-1} \times FM_{ij} \times FP_{ip}$) coefficient, for comparison with Table 5.The full set of estimates is available from the authors upon request. Columns 1-3 report results for the full sample of firms, while Columns 4-5 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.10: Export growth regressions

	(1) Growth	(2) Growth	(3) Growth	(4) Growth	(5) Growth	(6) Growth
α_Y	0.318***	0.319***	0.327***	0.349***	0.314***	0.337***
	(0.016)	(0.016)	(0.017)	(0.017)	(0.011)	(0.011)
α_{YM}	-0.018	-0.015	-0.013	-0.016	-0.008	-0.010
	(0.017)	(0.017)	(0.017)	(0.018)	(0.020)	(0.020)
α_M	0.015*	0.008	0.010	0.010	0.014	0.009
	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)
α_{YP}	-0.030*	-0.031*	-0.031*	-0.042**	-0.017	-0.028*
	(0.016)	(0.016)	(0.017)	(0.018)	(0.014)	(0.015)
α_P	0.029***	0.029***	0.024***	0.046***	0.033***	0.051***
	(0.007)	(0.007)	(0.007)	(0.010)	(0.009)	(0.010)
α_{MP}	-0.054***	-0.054***	-0.053***	-0.027***	-0.058***	-0.033***
	(0.009)	(0.009)	(0.009)	(0.010)	(0.012)	(0.011)
α_{YMP}	0.183***	0.182***	0.182***	0.246***	0.110***	0.136***
	(0.020)	(0.021)	(0.021)	(0.022)	(0.028)	(0.030)
TFP growth					0.007***	0.008***
					(0.002)	(0.003)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
R-squared	0.015	0.015	0.019	0.065	0.019	0.057
Number of Observations	2.5e+06	2.4e+06	2.4e+06	2.4e+06	8.9e+05	8.9e+05
Coefficient Tests						
$\alpha_Y + \alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.443***	0.439***	0.446***	0.566***	0.388***	0.462***
	(0.011)	(0.011)	(0.012)	(0.014)	(0.017)	(0.021)
$\alpha_{YM} + \alpha_M + \alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.125***	0.119***	0.120***	0.217***	0.074***	0.124***
	(0.018)	(0.018)	(0.018)	(0.016)	(0.018)	(0.021)
$\alpha_{YP} + \alpha_P + \alpha_{MP} + \alpha_{YMP}$	0.129***	0.126***	0.122***	0.223***	0.068***	0.126***
	(0.014)	(0.014)	(0.014)	(0.016)	(0.022)	(0.026)
$\alpha_{YM} + \alpha_M + \alpha_{MP} + \alpha_{YMP}$	0.126***	0.121***	0.126***	0.213***	0.058***	0.102***
	(0.011)	(0.012)	(0.012)	(0.013)	(0.017)	(0.020)

Notes: The table reports the results of regressions of firm sales growth rates on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (population weighted distance to France, population, GDP, GDP per capita, contiguity with France, common official language, past colonial ties, GATT/WTO membership, Regional Trade Agreements with the EU, common legal origin, common currency and participation in cooperation agreements between the EU and African, Caribbean and Pacific countries), firm TFP growth and different sets of fixed effects as in specification (4). The full set of estimates as reported in Table 4 is reported. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.11: Exit regressions

	(1) Exit	(2) Exit	(3) Exit	(4) Exit	(5) Exit	(6) Exit
β_Y	0.324***	0.290***	0.271***	0.216***	0.299***	0.254***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.006)	(0.002)
β_{YM}	-0.006**	-0.005*	0.004	0.027***	-0.006	0.019***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.006)	(0.003)
β_M	0.012***	0.002	-0.008*	-0.020***	-0.002	-0.027***
	(0.004)	(0.004)	(0.004)	(0.002)	(0.008)	(0.002)
β_{YP}	-0.093***	-0.086***	-0.075***	-0.047***	-0.078***	-0.049***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.006)	(0.002)
β_P	-0.069***	-0.090***	-0.083***	-0.124***	-0.096***	-0.147***
	(0.003)	(0.004)	(0.004)	(0.001)	(0.008)	(0.002)
β_{MP}	-0.037***	-0.033***	-0.024***	-0.006***	-0.026***	-0.001
	(0.004)	(0.004)	(0.004)	(0.002)	(0.007)	(0.002)
β_{YMP}	0.036***	0.034***	0.062***	-0.024***	0.064***	0.017***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.003)
TFP growth					-0.000***	-0.001***
					(0.000)	(0.000)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.122	0.142	0.202	0.299	0.244	0.305
Number of Observations	2.1e+07	2.1e+07	2.1e+07	2.1e+07	9.0e+06	9.0e+06
Coefficient Tests						
$\beta_Y + \beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	0.166***	0.111***	0.147***	0.021***	0.156***	0.066***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.009)	(0.002)
$\beta_{YM} + \beta_M + \beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.157***	-0.179***	-0.124***	-0.194***	-0.143***	-0.188***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)
$\beta_{YP} + \beta_P + \beta_{MP} + \beta_{YMP}$	-0.163***	-0.176***	-0.120***	-0.202***	-0.136***	-0.180***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
$\beta_{YM} + \beta_M + \beta_{MP} + \beta_{YMP}$	0.005**	-0.003	0.034***	-0.023***	0.031***	0.008***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)

Notes: The table reports the results of regressions of firm exit on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (5). The full set of estimates in Table 5 is reported. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last four rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

Table B.12: Entry regressions (30% sample)

	(1) Entry	(2) Entry	(3) Entry	(4) Entry	(5) Entry	(6) Entry
γ_Y	0.000***	0.001***	0.001***	-0.000***	0.001***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
γ_{YM}	0.036***	0.035***	0.035***	0.035***	0.021***	0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
γ_M	0.022***	0.019***	0.019***	0.019***	0.014***	0.014***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
γ_{YP}	0.002***	0.002***	0.002***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
γ_P	0.001***	0.001***	0.001***	0.002***	0.001***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
γ_{MP}	0.005***	0.005***	0.005***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
γ_{YMP}	-0.030***	-0.030***	-0.030***	-0.030***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
TFP growth					0.000	-0.000
					(0.000)	(0.000)
Gravity controls	no	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes	yes
Country FE	no	yes	yes	yes	yes	yes
Product FE	no	no	yes	no	yes	no
Firm FE	no	no	no	yes	no	yes
TFP Growth Control	no	no	no	no	yes	yes
R-squared	0.009	0.012	0.013	0.016	0.010	0.013
Number of Observations	2.5e+08	2.4e+08	2.4e+08	2.4e+08	6.2e+07	6.2e+07
Coefficient Tests						
$\gamma_Y + \gamma_{YM}$	0.036***	0.036***	0.036***	0.035***	0.022***	0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$\gamma_Y + \gamma_{YP}$	0.002***	0.003***	0.003***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\gamma_{YM} - \gamma_{YP}$	0.034***	0.033***	0.033***	0.033***	0.018***	0.018***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Notes: The table reports the results of regressions of firm entry conditional on surviving on our indicators for first year of an export spell (FY_{ijpt-1}), first exported product (FP_{ip}) and first export destination (FM_{ij}), separately and for three double and one triple interaction(s), together with controls for gravity variables (see Table 4 notes for the full list), firm TFP growth and different sets of fixed effects as in specification (6). The full set of estimates as reported in Table 6 is reported. Columns 1-4 report results for the full sample of firms, while Columns 5-6 report results for the restricted sample of firms for which balance-sheet data is available (FICUS). The last three rows report estimates and standard errors of sums of linear combinations of coefficients in the column's corresponding econometric specifications. Standard errors clustered at the firm level are reported in parentheses. ***, ** and * denote significance at 1%, 5% and 10%, respectively. Source: merged CEPII Gravity-French tax authority (FICUS)-French Customs data, 1993-2006.

CENTRE FOR ECONOMIC PERFORMANCE
Recent Discussion Papers

1773	Nicholas Stern Anna Valero	Innovation, growth and the transition to net-zero emissions
1772	Paul Dolan Christian Krekel Ganga Shreedhar Helen Lee Claire Marshall Allison Smith	Happy to help: The welfare effects of a nationwide micro-volunteering programme
1771	Xuepeng Liu Emanuel Ornelas Huimin Shi	The trade impact of the Covid-19 pandemic
1770	Tito Boeri Edoardo di Porto Paolo Naticchioni Vincenzo Scrutinio	Friday morning fever. Evidence from a randomized experiment on sick leave monitoring in the public sector
1769	Andrés Barrios-Fernández Jorge García-Hombrados	Recidivism and neighborhood institutions: evidence from the rise of the evangelical church in Chile
1768	Stephen J. Redding	Suburbanization in the United States 1970-2010
1767	Anna Valero	Education and management practices
1766	Piero Montebruno Olmo Silva Nikodem Szumilo	Court severity, repossession risk and demand in mortgage and housing markets
1765	Ghazala Azmat Katja Kaufmann	Formation of college plans: expected returns, preferences and adjustment process
1764	Anna Valero	Education and economic growth
1763	John Van Reenen	Innovation and human capital policy

1762	Sarah Flèche Anthony Lepinteur Nattavudh Powdthavee	The importance of capital in closing the entrepreneurial gender gap: a longitudinal study of lottery wins
1761	Elodie Djemaï Andrew E. Clark Conchita D'Ambrosio	Take the highway? Paved roads and well-being in Africa
1760	Sabrina T. Howell Jason Rathje John Van Reenen Jun Wong	Opening up military innovation: causal effects of 'bottom-up' reforms to U.S. defense research
1759	Marcus Biermann	Remote talks: changes to economics seminars during Covid-19
1758	Yatang Lin Thomas K.J. McDermott Guy Michaels	Cities and the sea level
1757	Maria Cotofan Robert Dur Stephen Meier	Does growing up in a recession increase compassion? The case of attitudes towards immigration
1756	Jo Blanden Andrew Eyles Stephen Machin	Trends in intergenerational home ownership and wealth transmission
1755	Martin Beraja David Y. Yang Noam Yuchtman	Data-intensive innovation and the State: evidence from AI firms in China
1754	Rafael Dix-Carneiro João Paulo Pessoa Ricardo Reyes-Heroles Sharon Traiberman	Globalization, trade imbalances and labor market adjustment

The Centre for Economic Performance Publications Unit
Tel: +44 (0)20 7955 7673 Email info@cep.lse.ac.uk
Website: http://cep.lse.ac.uk Twitter: @CEP_LSE