Managers' Mobility, Trade Performance, and Wages

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ABSTRACT: Knowledge is key to the competitiveness and success of an organization and in particular of a firm. Firms and their managers acquire knowledge via a variety of different channels which are often difficult to track down and quantify. By matching employer-employee data with trade data at the firm level we show that the export experience acquired by managers in *previous* firms leads their *current* firm towards higher export performance, and commands a sizeable wage premium for the manager. Moreover, export knowledge is decisive when it is *market-specific*: managers with experience related to markets served by their current firm receive an even higher wage premium; firms are more likely to enter markets where their managers have experience; exporters are more likely to stay in those markets, and their sales are on average higher. Our findings are robust to controlling for unobserved heterogeneity and, more broadly, endogeneity and indicate that managers' export experience is a first-order feature in the data with an impact on a firm's export performance that is, for example, of the same order of magnitude of firm productivity.

Keywords: Managers, firm trade performance, job mobility, export experience, wage premium

JEL classification: M2, L2, F16, J31, J62

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1. Introduction

A growing literature in economics explores how the management of a firm affects its performance. Empirical studies have exploited the increasing availability of information on managerial practices and managers' characteristics to establish a strong connection with firm—as well as a country—productivity;[1] theoretical contributions have analyzed different facets of the firm-manager nexus, including matching, incentive provision, ownership,[2] and, of particular relevance to our analysis, trade.[3]

This paper shows that the export experience gained by managers in *previous* firms leads their *current* firm towards higher export performance, and commands a sizeable wage premium for the manager. Moreover, export knowledge is decisive when it is *market-specific*: managers with experience related to markets served by their current firm receive an even higher wage premium; firms are more likely to enter markets where their managers have experience; exporters are more likely to stay in those markets, and their sales are on average higher. The management literature offers several case studies consistent with our findings, but lacks a systematic and quantitative evaluation.[4] While it is reasonable to expect managers to learn valuable skills or information from their previous jobs, it is surprising that managers' export experience is a first-order feature in the data, and that its effect on a firm export performance is of the same order of magnitude as firm productivity. Our results call for further theoretical work on the connections between trade and the labor market.[5]

Three ingredients make our analysis feasible and robust: reliable data on one country (Portugal) covering the universe of firms and their workers for several years, including rich information on the characteristics of both; the possibility of tracking workers—and in particular managers—as they move from firm to firm (and especially between exporters and non-exporters); a research design that accounts for unobserved heterogeneity, omitted variables, and, more broadly, endogeneity.

We construct a unique dataset for Portugal by merging two sources: a matched employer-employee dataset (*Quadros de Pessoal*) covering virtually the entire population of firms and their workers, and widely used in the labor literature; data on the universe of trade transactions—coming from customs returns forms (extra-EU trade) and Intrastat forms (intra-EU trade)—by firms located in Portugal. The combined dataset allows us

[1] See Bertrand and Schoar (2003), Bloom and Van-Reenen (2010), Bloom et al. (2011), and Guiso and Rustichini (2011) among others.

[2] See Bandiera et al. (2011), Burkart et al. (2003), and Lazear and Oyer (2007) among others.

[3] See Antràs et al. (2006), and Caliendo and Rossi-Hansberg (2012) among others.

[4] See Andersson and Wictor (2003) and Rialp et al. (2005) among others.

[5] A burgeoning literature (e.g. Helpman et al., 2010, 2012) explores the connections between trade and the labor market in a setting featuring workers' and firms' heterogeneity.

to finely measure firm trade performance and worker wage as well as to draw a sharp portrait of worker mobility across firms. Knowing if a worker was employed, in the past, by an exporting firm—and the markets in which this firm was operating—allows us to consider various measures of export experience.

We perform two complementary analyses. First, we estimate a wage equation to identify the existence of a premium for export experience. We control for worker and firm fixed effects, previous firm observables, job-change patterns, as well as worker and current firm time-varying observables. We consider both managers and non-managers and conclude that a premium arises for managers only. Export experience for a manager corresponds to a 11.3 percent (2.9 percent) higher wage—which is equivalent to 20.4 percent (50.9 percent) of the manager status premium—when not accounting (accounting) for unobserved heterogeneity.

One caveat potentially applying to our wage analysis is that export experience might simply be a proxy for some unobservables: for example, having being employed by an exporter could signal the unobserved ability of a manager. We account for this if unobserved ability is time-invariant or if it is captured by characteristics of the worker's *previous* firm such as size, productivity and industry. We further strengthen our results by comparing managers that have export experience in at least one of the markets to which their current firm is exporting to those who have experience in other markets. We find the former managers to enjoy an additional wage premium.

In the second part of the paper, we assess whether export experience brought by managers affects a firm's export performance. More specifically, we evaluate a firm's likelihood to enter (or to stay) in a new (current) market as well as a firm's exports conditional on entry (continuation). We control for endogeneity by using firm-year fixed effects and market-year dummies.[6] We find that having managers with experience in a specific market increases the probability that the firm enters (stays) in that market by at least 22 (0.7) percent (with respect to the average firm in the sample). Both in the case of entry and stay, the effect of such experience is of the same order of magnitude as that of productivity. Market-specific experience also increases exports value in the case of continuation by up to 20%. Interestingly, we do not find evidence of a strong relationship between export experience not specific to a market and firm trade performance.

Our findings are consistent with the hypothesis that managers transfer valuable export-specific knowledge when moving across firms. Furthermore, our results suggest that such knowledge has a strong market-specific nature. The latter is, for example,

[6]The actions a firm can take to improve its trade performance are, based on the international trade literature (Bernard et al., 2012), predominantly firm-time specific (e.g. productivity, skill intensity, R&D intensity, quality) are thus fully accounted for in our setting. In Section 5.3, we discuss more elaborated forms of reverse causality and provide insights on the, a priori ambiguous, sign of the potential bias.

consistent with evidence that export entry costs are mostly country-specific (as opposed to global).[7]

Besides the research on how managers' characteristics and practices affect firm performance, our paper contributes to the following literatures. First, the impact of managers' export experience on firm trade performance adds to the empirical literature on the determinants of firm trade behaviour[8] which has so far focused on productivity and selection,[9] sunk costs,[10] innovation,[11], quality,[12], workforce composition,[13] and uncertainty about demand.[14] Second, our interest in managers as workers who need specific skills and perform difficult tasks relates to the literature on trade and tasks (Blinder, 2006, Grossman and Rossi-Hansberg, 2008). Third, the role played by workers' mobility across firms in our analysis contributes to the recent debate about the channels via which knowledge transfer takes place (Balsvik, 2011, Parrotta and Pozzoli, 2012). Last, but not least, our wage analysis contributes to the literature devoted to explaining the determinants of managers' pay (Gabaix and Landier, 2008, Guadalupe and Wulf, 2008), and to the literature that studies the internal organization of the firm and how this relates to a firm's characteristics such as export status (Caliendo and Rossi-Hansberg, 2012, Caliendo et al., 2012).

The remainder of the paper is organized in five additional Sections. Section 2 describes the construction of the dataset. In Section 3, we provide (and discuss) both the definition of managers and of export experience (and its refinements); we also show raw data evidence both on the existence of an export experience wage premium for managers, and on the impact of managers with export experience on a firm's trade performance. Section 4 develops a Mincerian wage analysis to test both whether an export experience premium exists and whether such a premium is related to the type of worker (managers vs. non-managers). In Section 5, we show that managers with market-specific export experience increase both the probability to start and continue exporting to a specific market as well as the firm's exports (conditional on continuation). Section 6 concludes and provides directions for further research.

[7]See Eaton et al. (2011) and Moxnes (2010) among others. In a recent (September 6th, 2010) Financial Times article, Anthony Pierce, the vice national chairman of the Institute of Export, explains that distribution channels can widely differ from country to country; he makes the example of Polaroid, that, many years ago, after selling successfully its Swingers cameras in the UK through the supermarkets, tried to do the same in France "...but nobody bought them because there nobody went to the supermarket to buy cameras. They went to specialist camera shops." See `http://www.ft.com`.

[8]See Bernard et al. (2012) for a recent survey.

[9]See Bernard and Jensen (1999) and Bernard and Jensen (2004) among others.

[10]See Das et al. (2007), Impullitti et al. (2012) and Roberts and Tybout (1997) among others.

[11]See Bustos (2011) among others.

[12]See Iacovone and Javorcik (2012) and Verhoogen (2008) among others.

[13]See Muendler and Molina (2010) and Yeaple (2005) among others.

[14]See Arkolakis (2010) and Eaton et al. (2012) among others.

Additional details about the data are provided in the Data Appendix. An Online Appendix provides further analyses, and complementary Tables.

2. Data

Our analysis relies on information resulting from the merge of two major datasets: a panel dataset on international trade at the firm-country-product level and a matched employer-employee panel dataset. Trade data come from Statistics Portugal while employer-employee data come from *Quadros de Pessoal* (henceforth, QP), a dataset made available by the Ministry of Employment. We describe the two datasets as well as the sample resulting from the merge.

The combined data allow us to track workers—especially managers—as they move from firm to firm. Knowing each firm's trade status allows for the identification of, in each year, each worker's export experience. Two quite unique features of the data make this feasible: an exhaustive coverage of firms, their workers, and their trade activity as well as a high degree of reliability. The richness of the data also makes it possible to control for a wealth of both worker and firm characteristics as well as for unobserved heterogeneity by means of various fixed effects.

2.1 Trade data

Statistics Portugal collects data on export and import transactions by firms that are located in Portugal on a monthly basis. These data include the value and quantity of internationally traded goods (i) between Portugal and other Member States of the EU (intra-EU trade) and (ii) by Portugal with non-EU countries (extra-EU trade). Data on extra-EU trade are collected from customs declarations, while data on intra-EU trade are collected through the Intrastat system, which, in 1993, replaced customs declarations as the source of trade statistics within the EU.[15] The same information is used for official statistics and, besides small adjustments, the merchandise trade transactions in our dataset aggregate to the official total exports and imports of Portugal. Each transaction record includes, among other information, the firm's tax identifier, an eight-digit

[15]Statistics on trade between the Member States of the European Union are based on a European Parliament and Council Regulation (EC) No 638/2004 of 31 March 2004 and on the implementing Commission Regulation (EC) No 1982/2004 of 18 November 2004 which lay down or supplement the rules on methodology, thresholds and specific movements and one amending Commission regulation ((EC) No 1915/2005 on simplified quantity reporting). The Community's basic customs legislation is contained in the Customs Code (Council Regulation (EEC) No 2913/92) and the Code's implementing provisions (Commission Regulation (EEC) No 2454/93). See http://europa.eu/legislation_summaries/internal_market/single_market_for_goods/free_movement_goods_general_framework/l11011a_en.htm for an overview of the Intrastat system and http://ec.europa.eu/taxation_customs/customs/procedural_aspects/index_en.htm for details on procedural aspects related to extra-EU trade.

Combined Nomenclature product code, the destination/origin country, the value of the transaction in euros, the quantity (in kilos and, in some case, additional product-specific measuring units) of transacted goods, and the relevant international commercial term (FOB, CIF, FAS, etc.).[16] We were able to gain access to data from 1995 to 2005 for the purpose of this research. We use data on export transactions only, aggregated at the firm-destination-year level.

2.2 *Matched employer-employee data*

The second main data source, *Quadros de Pessoal*, is a longitudinal dataset matching virtually all firms and workers based in Portugal.[17] Currently, the data set collects data on about 350,000 firms and 3 million employees. As for the trade data, we were able to gain access to information from 1995 to 2005.[18] The data are made available by the Ministry of Employment, drawing on a compulsory annual census of all firms in Portugal that employ at least one worker. Each year, every firm with wage earners is legally obliged to fill in a standardized questionnaire. Reported data cover the firm itself, each of its plants, and each of its workers. Variables available in the dataset include the firm's location, industry, total employment, sales, ownership structure (equity breakdown among domestic private, public or foreign), and legal setting. The worker-level data cover information on all personnel working for the reporting firms in a reference week. They include information on gender, age, occupation, schooling, hiring date, earnings, hours worked (normal and overtime), etc. The information on earnings includes the base wage (gross pay for normal hours of work), seniority-indexed components of pay, other

[16] In the case of intra-EU trade, firms have the option of "adding up" multiple transactions only when they refer to the same month, product, destination/origin country, Portuguese region and port/airport where the transaction originates/starts, international commercial term, type of transaction (sale, re-sale,...etc.), and transportation mode. In the case of intra-EU trade, firms are required to provide information on their trade transactions if the volume of exports or imports in the current year or in the previous year or two years before was higher than 60,000 euros and 85,000 euros respectively. More information can be found at: http://webinq.ine.pt/public/files/inqueritos/pubintrastat.aspx?Id=168.

[17] Public administration and non-market services are excluded. *Quadros de Pessoal* has been used by, amongst others, Cabral and Mata (2003) to study the evolution of the firm size distribution; by Blanchard and Portugal (2001) to compare the U.S. and Portuguese labor markets in terms of unemployment duration and worker flows; by Cardoso and Portugal (2005) to study the determinants of both the contractual wage and the wage cushion (difference between contractual and actual wages); by Carneiro et al. (2012) who, in a related study, analyze how wages of newly hired workers and of existing employees react differently to the business cycle; by Martins (2009) to study the effect of employment protection on worker flows and firm performance. See these papers also for a description of the peculiar features of the Portuguese labor market.

[18] Information for the year 2001 is only partly available due to issues arisen in the collection of the data. In the Data Appendix we provide details on how we deal with this missing data problem in our analysis.

regularly paid components, overtime work, and irregularly paid components.[19] It does not include employers' contributions to social security.

Each firm entering the database is assigned a unique, time-invariant identifying number which we use to follow it over time. The Ministry of Employment implements several checks to ensure that a firm that has already reported to the database is not assigned a different identification number. Similarly, each worker also has a unique identifier, based on a worker's social security number, allowing us to follow individuals over time. The administrative nature of the data and their public availability at the workplace—as required by the law—imply a high degree of coverage and reliability. The public availability requirement facilitates the work of the services of the Ministry of Employment that monitor the compliance of firms with the law (e.g., illegal work).

2.3 Combined dataset

The two datasets are merged by means of the firm identifier. As in Cardoso and Portugal (2005), we account for sectoral and geographical specificities of Portugal by restricting the sample to include only firms based in continental Portugal while excluding agriculture and fishery (Nace rev.1, 2-digit industries 1, 2, and 5) as well as minor service activities and extra-territorial activities (Nace rev.1, 2-digit industries 95, 96, 97, and 99). Concerning workers, we consider only single-job, full-time workers between 16 and 65 years old, and working between 25 and 80 hours (base plus overtime) per week. The (log) hourly wage in euros is based on the total number of hours worked (normal plus overtime) and is constructed as the sum of the base wage plus overtime wages and regular benefits.[20] Our analysis focuses on manufacturing firms only (Nace rev.1 codes 15 to 37) because of the closer relationship between the export of goods and the industrial activity of the firm.[21]

We perform below two complementary analyses.[22] In Section 4, we estimate a wage equation to identify the existence of a wage premium for workers'—and in particular for managers'—export experience. In Section 5, we quantify the impact of the presence of managers with export experience on a firm's trade performance, restricting the sample

[19] It is well known that employer-reported wage information is subject to less measurement error than worker-reported data. Furthermore, the Quadros de Pessoal registry is routinely used by the inspectors of the Ministry of Employment to monitor whether the firm wage policy complies with the law.

[20] To control for outliers, we apply a trimming based on the hourly wage and eliminate 0.5 percent of the observations on both extremes of the distribution.

[21] As explained below, even though we focus on manufacturing firms we use data *both* on manufacturing and non-manufacturing firms to build some of our variables, including export experience as well as the Nace rev.1 2-digit code, size, and productivity of the previous employing firm.

[22] Because of the requirements imposed by our definitions, both analyses have been performed over the period 1996-2005.

to firms with at least one employed manager.[23] Section 3.2 provides raw data evidence that is consistent with the results of both analyses.

Insert Table 1 about here.

Table 1 reports summary statistics, for 2005, of the main worker-level and firm-level—both for the worker's current and previous firm—variables used in our wage estimations and referring to observations for which all covariates are jointly available.[24] The top panel of Table 1 indicates that, in 2005, our sample includes 437,742 workers, with an average (log) hourly wage of 1.35, an average age of 38.2 years, an average education of 7.45 years, and an average firm tenure of 10 years.[25] The middle panel of Table 1 shows that these workers are employed by 25,769 firms, and reports the average firm (log) size, (log) productivity, (log) age, and the share of foreign-owned firms (2.4 percent).[26] Finally, the bottom panel provides the average (log) size and productivity of the 48,318 firms *previously* employing the workers in our sample.[27]

Table 2 reports selected summary statistics—for 2005—referring to the trade performance sample. In Section 5 we model a firm's entry and continuation into a specific export market m and analyze both the probability to start and continue exporting as well as the value of exports conditional on entry/continuation. We partition countries into seven groups: Spain (the most frequent destination), other top 5 export destination

[23]The sample of firms is thus different in the two analyses; below we refer to the two sample as "wage sample" and "trade performance sample". The majority of firms in the wage sample lacks a (employed) manager. To identify managers in the data we need the person(s) running the firm to receive a wage: this can be a self-employed owner or a third person employed by the owner(s). Our trade performance analysis is thus representative of larger and more organizationally structured firms. Firms with at least one manager represent (in 2005) 53.6 percent of exporting firms, account for 91.8 percent of exports, and 61.5 percent of employment of the Portuguese manufacturing industry.

[24]For previous firm variables, as well as for current firm variables requiring knowledge of managers' age and education, we add a set of dummies equal to one whenever the data are missing, while recoding missing values to zero. We do this to maximize exploitable information. When we then turn to the trade performance analysis which is, as detailed above, representative of larger and more organizationally structured firms we simply discard missing observations. For observations on which information on the previous employing firm is not available (e.g. workers who entered the labor market in our time frame or workers who always stay in the same firm) we set previous employing firm variables to zero and add dummies accordingly. We consider both manufacturing and non-manufacturing firms in constructing previous employing firm variables.

[25]Carneiro et al. (2012) find that average (log) hourly earnings (in real Euros) are 1.34 for men and 1.13 for women, in the 1986-2005 period. Workers' tenure and wage are described in the Data Appendix. As for education, we thank Anabela Carneiro for providing us with the conversion table between education categories (as defined in QP) and number of years of schooling.

[26]Firm age, size, productivity and foreign-ownership are described in the Data Appendix. Other firm-level variables used in the analysis but not reported in Table 1 are the mean and standard deviation of both age and education of managers, the share of skilled workers, export status, industry-level exports, 2-digit industry dummies, and NUTS3 location dummies. See the Data Appendix for details.

[27]In the wage analysis, we also use two dummies indicating whether the current and the previous firm belong to the same (2-digit) industry. Both dummies are identified because, as explained above, missing values for previous employing firm variables have been set to zero (and dummies have been introduced accordingly).

countries (Italy, UK, France, and Germany), other EU countries, OECD countries not belonging to the EU, countries belonging to the Community of Portuguese Language Countries (CPLP in Portuguese),[28] China, and the rest of the World.[29] Table 2 shows, for each of the seven markets, the number of exporting firms and average exports (in thousand euros).

Insert Table 2 about here.

3. Key definitions and evidence from raw data

In the first part of this Section, we discuss the distinction between managers and non-managers, and present the definition of export experience (and its refinements). In the second part, we show raw data evidence on the existence of an export experience wage premium for managers, and on the impact of managers with export experience on a firm's trade performance.

3.1 Key definitions

Managers

Throughout our analysis, we distinguish between managers and non-managers. Conceptually, we want to identify a group of workers that is responsible for the main strategic decisions taken within the firm: managers are responsible for high-level tasks including the organization of the firm, strategic planning, and the shaping of technical, scientific and administrative methods or processes.[30] In practice, we refer to a classification of workers, according to eight hierarchical levels, defined by the Portuguese law[31] and used, among others, by Lima and Pereira (2003). Classification is based on the tasks performed and skill requirements, and each level can be considered as a layer in a hierarchy defined

[28]CPLP includes Angola, Brazil, Cape Verde, Guinea-Bissau, Mozambique, Sao Tome and Principe, and Timor-Leste

[29]We adopted this partition because of the following reasons. First, Portugal is an economy deeply rooted into the European market. EU countries are special and we further divide them into top 5 destinations (based on the number of Portuguese exporting firms, as well as total exports, in 2005) and other EU countries. The strong cultural ties and proximity to Spain also require attention which is why we separately consider Spain. Exports to OECD as compared to non-OECD countries are likely to be different in terms of both exported products and quality range. At the same time, China and countries sharing language ties with Portugal are also likely to be characterized by different exports patterns.

[30]Bertrand and Schoar (2003) investigate whether individual managers affect corporate behavior. Even though they cannot claim causality, they do find systematic behavioral differences in corporate decision-making across managers. Bloom and Van-Reenen (2010) claim that differences in productivity across countries and firms largely reflect variations in management practices.

[31]See the Decreto Lei 121/78 of July 2^{nd} 1978.

in terms of increasing responsibility and task complexity. By law, each firm is required to classify workers according to this classification. Table A-1 in the Online Appendix provides a full description of the hierarchical levels. We define a manager as a worker belonging to one of the top two hierarchical levels: "Top management" and "Middle management". We define a non-manager as a worker belonging to lower hierarchical levels. Table 1 shows that, in the wage sample in 2005, 6.7 percent of the workers are managers and 27.4 percent of the firms have at least one manager.[32]

The distinction between managers and non-managers is relevant in light of recent developments in the international trade literature: Antràs et al. (2006) and Caliendo and Rossi-Hansberg (2012) explicitly focus on the formation of teams of workers in a globalized economy, and emphasize that the key distinction between managers and non-managers is that the former are in charge of complex tasks. Managers are different from other workers because they are responsible for the most complex tasks—those that are crucial for international trade performance—within a firm.

Second, managers are "special" when it comes to doing business in foreign markets because they are in charge of marketing and commercialization activities (which are not necessarily more complex) such as, for example, setting-up distribution channels, finding and establishing relationships with foreign suppliers, setting up marketing activities directed at finding and informing new buyers, and building a customer base.[33] Arkolakis (2010) and Eaton et al. (2012) stress the key role of search and marketing costs in international trade and provide evidence of the importance of the continuous "search and learning about foreign demand" problem that firms face when selling abroad. At the same time, Araujo et al. (2012) show the importance of trust-building in repeated interactions between sellers and buyers in an international market.

Insert Figure 1 about here.

Figure 1 provides raw data evidence supporting the idea that the distinction between managers and non-managers is relevant when considering a firm's trade activity. A large literature tries to identify and explain a wage premium paid by exporting firms.[34] As shown in Martins and Opromolla (2012), Portugal is not an exception to this robust empirical finding. Figure 1 shows that the exporter wage premium seems to come

[32]In Section 2.3, we explain under which conditions managers are reported in the data, as well as show that firms with managers account for the majority of exports, and employment in the manufacturing sector.

[33]It is certainly difficult to draw a straight line between these two dimensions under which managers are different from other workers. Researching the foreign regulatory environment and adapting the product to make sure that it conforms to foreign standards (which includes testing, packaging, and labeling requirements) is a commercialization activity that involves complex tasks. In a similar vein, making sure the product meets the right quality standards for the targeted foreign demand which is, as showed in Iacovone and Javorcik (2012) and Verhoogen (2008), a key element of international success is an example of an activity characterized by both a strong commercial nature and tasks complexity.

[34]See Frias et al. (2009), Munch and Skaksen (2008) and Schank et al. (2007) among others.

essentially from managers. More specifically, Figure 1 shows the kernel density of the log hourly wage distribution in our 2005 wage sample, both for managers and non-managers, broken down by firm export status (exporters and non-exporters). The wage density referring to managers employed by exporting firms clearly lies to the right of the one for managers employed by non-exporters. The difference in the average log wage implies a 43.5 percent wage gap. The difference between the densities is much less evident for non-managers: the gap in the average log wages is just 18.9 percent.

Export experience and its refinements

Having good reasons to believe that managers are special when it comes to trading on foreign markets does not mean that managers are all alike. Arguably, the knowledge and skills of a manager (and workers in general) evolve over time depending on the different situations faced along a career. In particular, only some managers have the chance to be involved in export activities. To the extent that experience acquired in exporting firms substantially improves the capacities and skills of a manager it should correspond to a wage premium. Furthermore, such experience is potentially valuable to all firms, but in particular to exporters, who might expect an improvement of their trade performance.

Exploiting the matched employer-employee feature of our dataset, we are able to track workers over time. For each firm-year pair, we can identify the subset of (currently employed) workers that have previously worked in a different firm. Exploiting the trade dataset, we can then single-out those workers that were employed in the past *by an exporting firm*. We define such workers as having export experience. We focus on managers but we also provide a number of results for non-managers to assess whether export experience has differential implications for the two categories of workers.

Table 1 indicates that about 22 percent of the managers have export experience,[35] while 8.3 percent of firms—i.e. one third of the firms with at least one manager—have at least one manager with export experience. Table 2 instead reports, for each of the seven markets we consider, the number of firms exporting and having at least one manger with exports experience. Approximately half of the firms exporting to any given market have at least one manager with export experience.

We stress that a stronger trade performance of firms that employ managers with export experience and an export experience wage premium for managers do not necessarily imply that valuable trade-specific knowledge diffuses through worker mobility. Export experience might be a proxy for some unobservable abilities of the manager and/or features of the previous employer. Furthermore, it does not necessarily entail a substantial set of trade-specific capacities and skills. We deal with these, as well as with

[35]Table 1 shows that 6.7 percent of workers are managers and 1.5 percent of workers are managers and have export experience. Taking the ratio of the latter to the former we get 22 percent.

other interpretation and endogeneity issues, when performing our econometric analyses in Sections 4 and 5.

To gain further insights we consider in our framework two related refinements of export experience. The first refinement is market m-specific export experience, where market m refers to one of the seven markets listed in Section 2.3. We define a worker as having market m-specific export experience if he/she has export experience *and* market m was among the destinations served by one of the worker's previous employers. The second refinement is matched export experience. We define a worker as having matched export experience if he/she has export experience *and* has market m-specific export experience in at least one of the markets to which the current employing firm is actually exporting.

If specific (or matched) export experience is associated to an even higher wage premium or stronger firm trade performance then it is more likely that valuable export-specific knowledge diffuses through worker mobility; alternative explanations, like vertical-type unobservable managers' ability, are in contrast with a worker's past activities being valued more by some firms (those exporting to some specific markets) and less by others. With reference to matched export experience, Tables 1 and 2 broadly indicate that in many instances export experience actually corresponds to matched export experience.

The importance of country-specific barriers to trade (e.g. Eaton et al., 2011, Moxnes, 2010) makes specific and matched export experience two natural refinement of the notion of export experience. In unreported results, we have experimented with other definitions of export experience. We discuss the key insights stemming from such analyses in Section 4.

3.2 Evidence from raw data

In this sub-section, we provide raw data evidence on the existence of a substantial wage premium for managers with export experience—the premium for non-managers is much smaller—and on the impact of managers with export experience on a firm's trade performance. The presence of a manager with export experience *in a given market* substantially increases the probability of entry into that same market, positively affects the probability of staying in the market, and increases a firm's exports conditional on staying in the market. These descriptive results are confirmed by the econometric testing of Sections 4 and 5.

Wage premia for export experience

Figure 2 shows the kernel density of the (log) hourly wage in the 2005 wage sample for three categories of managers: those without export experience, those with export

experience, and those with matched export experience. Managers with export experience enjoy substantially higher wages with respect to those without such experience: on average, export experience commands a 20.3 percent wage premium; matched export experience commands an even higher premium of 25 percent. Figure 3 provides the same type of information for non-managers; export experience (or matched export experience) is associated to a much less pronounced wage pattern. Non-managers with export experience enjoy a wage premium of about 5 percent, and non-managers with matched export experience receive a premium of 11.8 percent.

Insert Figures 2 and 3 about here.

Export performance when managers have export experience

Probability to start and continue exporting. Figure 4 shows entry rates—defined as the ratio between the number of firms entering market m at time t and the number of firms not exporting to market m at time $t-1$—for each market in 2005. We consider three categories of firms: those without managers with export experience, those with at least one manager with export experience, and those with at least one manager with specific export experience. Figure 4 shows that, in each of the seven markets, firms with at least one manager with export experience are substantially more likely to enter than firms without managers with export experience. Having managers with specific export experience further boosts entry rates and these are between two to three times higher depending on the specific market. The same pattern holds—though with lower magnitudes—when considering continuation rates (Figure 5).[36] Managers with export experience—even more those with specific experience—increase the probability of entering or staying in a foreign market.

Insert Figures 4 and 5 about here.

Value of exports conditional on entry and continuation. Figures 6 and 7 are the counterparts of Figures 4 and 5 on the intensive margin side, i.e., (log) exports values conditional on entry into and continuation to market m. In the case of entry, exports values are somewhat higher for firms having managers with export experience or specific export experience; though, the pattern is not clear and depends on the specific market considered. The situation is more clearcut in the case of continuation: firms with managers with export experience (or specific export experience) export substantially more in each market.

Insert Figures 6 and 7 about here.

[36]Continuation rates are defined as the share of firms continuing to export to market m at time t among those firms that were already exporting to market m at time $t-1$

4. Wage analysis

The first step in the quest of a relationship between the export experience brought by managers into a firm and its trade performance consists in assessing whether export experience corresponds to a wage premium. In this Section, we estimate a Mincerian wage equation to show that managers with export experience (as defined in Section 3.1) enjoy a sizeable wage premium. The premium is robust to controlling for worker and firm fixed effects, previous firm observables, job-change patterns, as well as a large set of worker and current firm time-varying observables. Moreover, managers with experience in (at least) one of the markets currently served by their firm—i.e. *matched* export experience—enjoy an even higher wage premium.[37] Crucially, we do not find evidence of a wage premium for non-managers, which is the reason why, later on, in the trade performance analysis of Section 5 we focus on managers only. These results confirm the evidence coming from raw wage data shown in the previous Section.

The existence of a wage premium for managers with export experience is not the end of our quest. There are caveats in our analysis as well as alternative explanations for the existence of a premium that do not involve the transfer of valuable export-specific knowledge by managers. Though, such alternative explanations are at odds with the existence of an additional wage premium for matched export experience. We discuss these issues in more detail at the end of this section; while in Section 5, we provide complementary evidence of the positive impact of managers' export experience on a firm's trade performance by analyzing the likelihood of firms to start/continue exporting to a specific market and the value of exports conditional on entry/continuation.

4.1 Econometric model

Workers are indexed by i, *current* employing firms by f, *previous* employing firms by p, and time by t. Each worker i is associated at time t to a unique current employing firm f and a unique previous employing firm p.[38]

[37] Countries are partitioned into seven groups: Spain, other top 5 export destination countries, other EU countries, other OECD countries, countries belonging to the Community of Portuguese Language Countries, China, and rest of the World. See Section 3.1 for a discussion of this partition and further details.

[38] When information on the previous firm is not available (e.g. when workers enter the labor market in our time frame or when workers never change firm) we set variables related to the previous firm to zero and add dummies accordingly. We consider both manufacturing and non-manufacturing firms in constructing controls related to the previous employing firm.

The wage equation we estimate is:

$$
\begin{aligned}
w_{it} = {} & \beta_0 + \beta_1 Manager_{it} + \mathbf{Mobility'_{it}\Gamma_M} + (\mathbf{Mobility_{it}} \times Manager_{it})' \mathbf{\Gamma_{Mm}} + \\
& + \beta_2 Experience_{it} + \beta_3 \left(Experience_{it} \times Manager_{it}\right) + \\
& + \beta_4 Matched_Experience_{it} + \beta_5 \left(Matched_Experience_{it} \times Manager_{it}\right) + \\
& + \mathbf{I'_{it}\Gamma_I} + \mathbf{P'_{pt}\Gamma_P} + \mathbf{C'_{ft}\Gamma_C} + \eta_i + \eta_f + \eta_t + \varepsilon_{it},
\end{aligned}
\tag{1}
$$

where w_{it} is the (log) hourly wage of worker i in year t, $Manager_{it}$ is a dummy indicating whether worker i is a manager at time t, the vector $\mathbf{Mobility_{it}}$ contains a set of dummies taking value one from the year t a worker changes employer for the 1^{st}, 2^{nd},..time, $Experience_{it}$ and $Matched_Experience_{it}$ are dummies indicating whether worker i has, respectively, export experience and matched export experience at time t, the vector $\mathbf{I_{it}}$ stands for worker i time-varying observables,[39] the vectors $\mathbf{P_{pt}}$ and $\mathbf{C_{ft}}$ refer to, respectively, the previous and current employing firm observables,[40] η_i (η_f) are individual (firm) fixed effects and η_t are time dummies.

The key parameters in our analysis are $\beta_2 + \beta_3$, i.e., the wage premium corresponding to export experience for a manager, and $\beta_4 + \beta_5$, i.e., the extra premium corresponding to matched export experience for a manager. β_2 and β_4 indicate, respectively, the premium related to export experience and matched export experience for a non-manager. Mobility of workers across firms is needed, according to our definition, to acquire export experience: $Experience_{it}$=1 if worker i has, among his/her previous employers, an exporting firm while $Matched_Experience_{it}$=1 further requires the current employing firm to be exporting in at least one of the markets to which previous employers were exporting. In other words, identification of export experience premia comes from workers moving across firms. To disentangle wage variations due to mobility from those related to export experience we consider the set of dummies $\mathbf{Mobility_{it}}$. We further interact $\mathbf{Mobility_{it}}$ with manager status $Manager_{it}$ to allow mobility to have a differential impact on managers and non-managers.

$\mathbf{Mobility_{it}}$, $Experience_{it}$, and $Matched_Experience_{it}$, as well as their interaction with manager status, thus define a difference-in-difference setting with two treatments (acquiring export experience and eventually also matched export experience) and a control

[39] A worker's age, age squared, education, and tenure. See Section 2 and the Data Appendix for further details.

[40] Previous firm observables are size, productivity, and two dummies indicating whether the current and previous firms belong to the same industry or not. Current firm observables are size, productivity, share of skilled workers, export status, age, foreign ownership, mean and standard deviation of both age and education of managers, and industry-level exports. In specifications without firm and worker fixed effects we add NUTS3 location and Nace rev.1 2-digit dummies as further controls. See Section 2 and the Data Appendix for further details.

group of workers (managers and non-managers) changing employer *without acquiring export experience*.

Equation (1) is estimated both with (group A) and without (group B) worker and firm fixed effects. In both cases we consider three specifications: with export experience only (1A and 1B), with export experience interacted with dummies indicating the number of years elapsed since acquiring experience (2A and 2B), and with both export experience and matched export experience (3A and 3B).[41]

4.2 Results

Table 3 reports the estimated export experience premia obtained from the different variants of (1) both for manager and non-managers. The Table also shows the significance levels of the premia, along with values of the F-statistics for managers' premia and T-statistics for non-managers' premia.[42] Table A-2 in the Online Appendix provides information on all the covariates that were not necessary to compute the export experience premia. Such a Table shows that coefficient signs and magnitudes are in line with previous research based on Mincerian wage regressions, i.e. wages are: higher for managers, increasing and concave in age, increasing in education and tenure, higher in larger, more productive, foreign-owned and older firms, higher in firms with a larger share of skilled workers.

Insert Table 3 about here.

Table 3 provides answers to the following three questions:

[41]It is important to note that, for specifications belonging to group B, identification of export experience coefficients comes from comparing the same treatment and control groups as in group A. However, only the comparison of wage changes over time between treatment and control groups matter for group B as wage levels are controlled for by worker fixed effects while at the same time firm fixed effects control for average wage differences across firms. All specifications are estimated with OLS. With large data sets, estimation of a linear regression model with two high-dimensional fixed effects poses some computational challenges (Abowd et al., 1999). However, the exact least-square solution to this problem can be found using an algorithm, based on the "zigzag" or full Gauss-Seidel algorithm, proposed by Guimarães and Portugal (2010). We use, for our estimations, the Stata user-written routine reg2hdfe implementing Guimarães and Portugal (2010)'s algorithm; this routine has also been used in Carneiro et al. (2012), and Martins and Opromolla (2012). The main advantage of this routine is the ability to fit linear regression models with two or more high-dimensional fixed effects under minimal memory requirements. Moreover, the routine provides standard errors correctly adjusted for the presence of the fixed effects. We apply the reg2hdfe routine setting the convergence criterion for the iteration method to 0.001. As we are not interested in worker and/or firm fixed effects per se, we keep all observations for which covariates are available and not the largest connected group.

[42]Managers' premia are obtained from sums of covariates' coefficients in equation (1). Therefore, their significance is tested with an F-statistic. Non-managers' premia correspond instead to individual coefficients in equation (1) and so the T-statistic is used.

Does export experience pay for a manager? The answer provided by specifications 1A and 1B is positive. Export experience commands a wage premium for a manager of either 11.3 or 2.9 percent depending on whether firm and worker time-invariant heterogeneity are accounted for. The difference in the premium suggests that managers with export experience are "better managers" and work for better paying firms. However, a premium remains when controlling for firm and worker time-invariant heterogeneity indicating that export experience is not simply a proxy for managers' unobserved ability and/or selection into higher paying firms. Export experience is neither a trivial proxy for, as an example, a stronger bargaining position of a manager moving out of a successful/productive firm. We do control, in all specifications, for the size, productivity, and industry affiliation of the manager's previous firm. As shown in Table A-2, managers that come from more productive firms *do* earn a higher wage, but export experience *continues* to be positively and significantly associated to a wage premium for managers.

The premium associated with export experience for a manager is economically sizeable. First, we compare the export experience premium to the premium for being a manager (see Table A-2): the export experience premium is equivalent to 50.9 percent (20.4 percent) of the manager status premium when accounting (not accounting) for unobserved time-invariant heterogeneity.[43] Second, we consider the evolution of the export experience premium over time by measuring the number of years—three dummies, 1-3 years, 4-6 years, and 7-9 years—elapsed since acquiring export experience.[44] Our estimates (see specifications 2A and 2B) indicate that the export experience premium for managers grows over time reaching a peak of 6.6 (15.5) percent with (without) firm and worker fixed effects after 6 to 9 years. These numbers are considerably larger that those in specifications 1A and 1B, reflecting the fact that for the average manager in our sample a low number of years has elapsed since acquiring export experience.

Is there an additional premium for matched export experience for managers? Specifications 3A and 3B, including both export experience and matched export experience, point to a differential premium. Managers with export experience (but not matched export experience) receive a wage premium of 6.7 (1.5) percent when not considering (considering) firm and worker fixed effects; managers with matched export experience enjoy an *additional* premium of 5.5 (1.8) percent. These results are consistent with the hypothesis that managers with export experience transfer valuable export-specific knowledge to their new employing firms. While the existence of a premium for export experience is

[43]The premium for being a manager is 5.7 (55.3) percent when accounting (not accounting) for unobserved time-invariant heterogeneity. See Table A-2.

[44]Given our definitions and the time frame of our data, 9 years of export experience is the maximum we can observe. Note that we further interact the dummies with the managers' status to identify the differential time trend for managers and non-managers.

also consistent with the transfer of knowledge not *uniquely* related to exporting (e.g. R&D skills, organizational practices, etc.) the additional premium for matched experience does reinforce the view that export-specific knowledge is an important component of the knowledge transfer. Furthermore, our results suggest that such knowledge proves to be very valuable when it is *market-specific*. There is strong evidence that market-specific entry costs are a major barrier to trade (e.g. Eaton et al., 2011, Moxnes, 2010) and export experience might thus be particularly valuable to overcome such hurdles.

Do export experience and/or matched export experience pay for a non-manager? The answer in Table 3 is broadly negative. When accounting for unobserved heterogeneity, the premium for non-managers is never positive and significant. Significance is not much of a concern when firm and worker fixed effects are not included, but magnitudes are far below what we find for managers. Given the key role of managers for export-specific activities, the lack of evidence for premia among non-managers is consistent with export experience entailing some valuable export-specific knowledge. Managers are "special" because exporting requires successfully performing a number of complex tasks and managers are the employees that are responsible for the most sophisticated tasks within a firm (e.g. Antràs et al., 2006, Caliendo and Rossi-Hansberg, 2012). Furthermore, managers are also different because they are in charge of marketing and commercialization activities. As suggested by Arkolakis (2010) and Eaton et al. (2012), searching for customers and suppliers and learning about their needs play a key role in determining the success of a firm on the international market.

4.3 Caveats and further discussion

Endogeneity. For the estimated premia to have a causal interpretation we need, as is typically the case for Mincerian analyses, matching between firms and workers to be random conditional on covariates in (1). Though admittedly restrictive, this hypothesis is made less strong by the fact that we use a large battery of controls for worker, past employer, and current employer characteristics while accounting for unobserved time-invariant heterogeneity by means of both firm and worker fixed effects. The lack of strong instruments for the mobility of workers (and in particular managers) across firms and the absence of specific events on which one could convincingly draw to design, for example, a regression-discontinuity exercise prevent us from going any further with the issue of non-random matching. Nevertheless, in Section 5 we will come back to this issue by providing a complementary solution as well as some insights on the direction of the potential bias.

Proxy for something else? One caveat potentially applying to our analysis is that export experience might simply be a proxy for some omitted variables or unobservables. For example, having being employed by an exporter could signal the unobserved ability of a manager if exporters screen workers more effectively (e.g. Helpman et al., 2010, 2012). Another possibility is that workers (previously) employed by exporters could be expected to enjoy stronger wage rises over the course of their career—as would occur, given the (widely documented) productivity advantage of exporters, in the context of strategic wage bargaining and on-the-job search (e.g. Cahuc et al., 2006).[45] We account for these issues in three ways. First, we use worker fixed effects to capture any time-invariant unobserved characteristic of the worker (including ability); second, we use previous firm characteristics (size, productivity, and industry) to control for the fact that some workers are expected to enjoy stronger wage rises over the course of their career; third, we use a refined definition of export experience that is more directly linked to the actual exporting activities undertaken by the worker's previous firms—i.e. matched export experience. We find it considerably more difficult to argue that matched export experience does not correspond to valuable trade-specific knowledge acquired when working for an exporting firm.

Alternative definitions of export experience. Many other refinements of export experience are possible. In unreported results, we employed the number of years spent in an exporting firm—to capture "accumulation of experience"—, and having worked for a firm exporting above the sectoral-median—to capture the "intensity of the experience" and further considered combinations of these two features. Although all these alternative definitions typically delivered similar results and some additional premia with respect to export experience, the market-specific dimension captured by matched export experience is the one providing the strongest and clearest results.

5. Trade performance analysis

As a second (and final) step of our quest, we assess whether export experience brought by managers has an impact on a firm's trade performance. We model a firm's entry and continuation into a specific market and analyze both the probability to start and continue exporting as well as the value of exports conditional on entry/continuation. In some specifications we control for endogeneity by using firm-year, as well as market-year, fixed effects.

[45] In a nutshell, workers employed by more productive firms will, on average, receive better on-the-job offers from other firms.

Results show that the presence of (at least) one manager with specific export experience (as defined in Section 3.1) positively affects both the probability to start and to continue exporting, with the magnitude being particularly sizeable for the former; specific export experience also affects exports value in the case of continuation. Interestingly, we do not find evidence of a strong relationship between having (at least) one manager with export experience and a firm's trade performance. These results partially confirm the raw data evidence of Figures 4 to 7, discussed in Section 3.2.

These findings, along with the existence of wage premia for managers with export experience—even more for those with matched experience—are consistent with the hypothesis those managers carry valuable export-specific knowledge, and that such knowledge has a very strong market-specific nature. At the end of this section, we discuss a number of potential caveats applying to our analysis (including reverse causality).

5.1 Econometric model

We restrict our analysis to the sample of firms with at least one manager and index firms by f, export markets by m, and time by t.[46] At each point in time we observe whether firm f exports (or not) to one of the seven groups of destinations considered in the previous Section.[47] We model a firm's entry and continuation into market m and analyze both the probability to start and continue exporting as well as the value of exports conditional on entry/continuation. We now describe the entry model (with the one for continuation being its mirror image).

For each firm f and time $t \in [1996, 2005]$, we consider all the markets m to which the firm was *not* exporting in $t-1$. We construct the binary dependent variable $Entry_{fmt}$ taking value one when firm f starts exporting to market m at time t (and zero otherwise). In each period, each firm decides whether or not to enter into one or more of the destinations in which it was not present in the previous year.[48] We then define the continuous dependent variable $Exports_{fmt}$ equal to (log) exports of firm f to market m at time t. $Exports_{fmt}$ is observed when $Entry_{fmt}$=1.

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[46] Our trade performance analysis is representative of larger and more organizationally structured firms that account for the bulk of trade in Portugal. Firms with at least one manager represent (in 2005) 53.6 percent of exporting firms, account for 91.8 percent of exports, and 61.5 percent of manufacturing employment. See Section 2 for further details.

[47] We partition countries into seven groups: Spain, other top 5 export destination countries, other EU countries, other OECD countries, countries belonging to the Community of Portuguese Language Countries, China, and the rest of the World. See Section 2.3 for a discussion of the rationale of this partition.

[48] In unreported analyses, available upon request, we have experimented with more stringent definitions of new and continuing exporters in a given market, based on firm activity in both $t-1$ and in $t-2$ (as in Eaton et al. (2008)), finding very similar results.

The following selection model is estimated:

$$\begin{aligned} Entry_{fmt} &= \mathbf{1}_{[Entry^*_{fmt}>0]}, \\ Entry^*_{fmt} &= \delta_1 + ManExp_{fmt}\beta_1 + \mathbf{Z'_{1ft}\Gamma_1} + \eta_{1mt} + \zeta_{1fmt}, \\ Exports_{fmt} &= \delta_2 + ManExp_{fmt}\beta_2 + \mathbf{Z'_{2ft}\Gamma_2} + \eta_{2mt} + \zeta_{2fmt}, \end{aligned} \tag{2}$$

where $ManExp_{fmt}$—our main variable of interest—is a dummy indicating the presence of (at least) one manager with export experience and/or specific export experience, $\mathbf{Z_{1ft}}$ and $\mathbf{Z_{2ft}}$ are two vectors of firm- and time-varying covariates affecting, respectively, entry and exports conditional on entry that are captured with either observables or firm-year fixed effects,[49] and η_{1mt} and η_{2mt} are market-year dummies.

We consider separately export experience and specific export experience and estimate one specification of equation (2) for the former—in which we allow for firm fixed effects—and two specifications for the latter—in which we allow for either firm or firm-year fixed effects. We use market-year fixed effects in all specifications.

When considering export experience, $ManExp_{fmt}$ is only firm-time varying (i.e. $ManExp_{fmt}$=$ManExp_{ft}$) and equals one if firm f has at time t at least one manager with export experience (zero otherwise). In this case, we allow for firm fixed effects, i.e. ζ_{1fmt}=η_{1f} + υ_{1fmt} and ζ_{2fmt}=η_{2f} + υ_{2fmt}, and assume that υ_{1fmt} and υ_{2fmt} are uncorrelated with each other as well as with covariates. Under these conditions, we can separately estimate the selection and outcome equations using the within estimator while clustering standard errors at the firm-level.

When considering *specific* export experience, $ManExp_{fmt}$ is firm-*market*-time varying and equals one if firm f has at time t at least one manager with market m-specific export experience (zero otherwise). In this case, we can be more general and allow for firm-year fixed effects while getting rid of the redundant firm-time observables: we consider ζ_{1fmt}=η_{1ft} + υ_{1fmt} and ζ_{2fmt}=η_{2ft} + υ_{2fmt}, and assume υ_{1fmt} and υ_{2fmt} are uncorrelated with each other as well as with covariates. We use again the within estimator for both the selection and outcome equations and cluster standard errors at the firm-level. To ease comparability, we consider the same sample in all specifications.

Three comments are in order. First, the identifying variation for export experience is provided by its changes over time within a firm. In the case of specific export experience and firm fixed effects, identification also comes from variation in the market dimension, still within a firm. When considering specific experience and *firm-year* fixed

[49]Observables are firm size, productivity, share of skilled workers, age, foreign ownership, mean and standard deviation of both age and education of its managers, mean and standard deviation of the worker fixed effects corresponding to its managers and coming from the wage analysis (specification 1B), and industry-level exports. See Section 2 and the Data Appendix for further details.

effects identification comes from the within-firm market variation only meaning that, for example, when analyzing the probability to start exporting we draw on firms entering in at least two markets in the same year (one market for which the firm has a manager with specific export experience and one for which it has not) to identify β_1.

Second, the selection equation corresponds to a liner probability model. Such a model has a number of advantages over non-linear alternatives but also a number of caveats when dealing with fixed effects (Wooldridge, 2002); estimations of a fixed effects Logit model (see Table A-5 in the Online Appendix) qualitatively confirm linear probability model results.

Third, imposing that υ_{1fmt} and υ_{2fmt} are uncorrelated with each other amounts to assuming that, once firm-time and market-time covariates and/or unobservables are controlled for, selection is no longer an issue. This is consistent with the literature on trade and firm heterogeneity (pioneered by Bernard and Jensen (1999)), which relies on firm-time determinants (productivity, size, past export status, skill intensity, R&D intensity) and market-time determinants (distance and other proxies for trade costs, market size, other market characteristics like the quality of institutions) to model a firm's export behavior across time and markets. At the end of this section, we provide further insights about the issue of selection as well as a possible way forward.

Finally, all right-hand side variables (including $ManExp_{fmt}$ and the other dummies) have been divided by their respective standard deviation to provide a comparable metric. For example, a coefficient of $0.0x$ for firm size in the selection equation indicates that a one standard deviation increase in firm size roughly increases the probability of entry by x percent. Coefficients are thus comparable, in terms of how much variation in the probability of entry (or continuation) or in the value of exports is induced, across covariates and specifications.

5.2 Results

Table 4 reports estimates, for the core covariates' coefficients, both for our analysis of a firm's probability to entry (left panel) and to continue (right panel) exporting to a specific market. Table 5 reports core covariates' coefficients for the (log) value of exports conditional on entry (left panel) and continuation (right panel). Besides our main variables of interest (i.e. the presence of at least one manager with export experience or with specific export experience), we report coefficients for firm size and productivity, given their widely-documented importance in the trade literature (Bernard and Jensen, 2004). All the other controls are displayed in Tables A-3 and A-4 in the Online Appendix.

Probability to start and continue exporting

Column 1 of Table 4 indicates that the presence of managers with export experience does not significantly affect the probability to start exporting to a specific market. On the other hand, column 2 points to a positive and significant impact of managers with *specific* export experience; this is further confirmed in column 3 when using firm-year fixed effects. The same conclusions hold for the probability to continue exporting (columns 4 to 6): only the presence of managers with *specific* export experience has a positive and significant effect.

These results suggest that export experience improves a firm's trade performance only if it has particular features, namely market specificity. In Section 4, we showed that export experience corresponds to a wage premium for managers and market-specific experience corresponds to an even higher premium. We can rationalize these results as follows: Export experience corresponds to a broad capacity of a manager to affect a firm's performance (R&D, organizational practices, business links, etc.) leading to higher expected profits for the firm and to a wage premium for the manager. When the experience of a manager matches the market-specific export activity of a firm, it boosts trade performance which turns into additional profits for the firm and an even higher wage for the manager.

Insert Table 4 about here.

Table 4 delivers another important message: the impact of specific export experience is sizeable both with respect to the unconditional probability of entry into a new market (see the top of the Table), and with respect to the impact of firm size and productivity—the focus of recent trade literature. A one standard deviation increase of $ManExp_{fmt}$ corresponds to an increase of the probability to start exporting to market m between 0.011 (column 2) and 0.016 (column 3). When considering unconditional probabilities, these two figures translate into 22 and 32 percent higher chances to start exporting with respect to the average firm in the sample. Comparing the coefficient of $ManExp_{fmt}$ with the ones of firm size and productivity shows that the presence of managers with specific export experience affects entry more than firm productivity (but less than size).

Results are qualitatively identical, though less strong, for the probability to continue exporting to a market. A one standard deviation increase in $ManExp_{fmt}$ corresponds to either 0.7 percent (column 5) or 2 percent (column 6) higher chances to keep exporting, with respect to the average firm in the sample. Specific export experience is a determinant of continuation as strong as firm productivity (but far less strong than firm size).

There are many ways of rationalizing a smaller impact on continuation with respect to entry. For example, firms that already export to a given market are likely to have managers without specific export experience who helped the firm to enter to that market in the past. Therefore, the impact of having a manager with specific export experience

might well be positive for such firms (as suggested by our analysis) but not as important as for firms who wish to start exporting.

Value of exports conditional on entry and continuation

Table 5 provides two clear results. First, the presence of managers with export experience and/or specific export experience does not significantly affect initial export values in a new market. Second, specific export experience positively affects the value of exports of those firms that already are in the market; a one standard deviation increase corresponds to either 7 percent (column 5) or 20.1 percent (column 6) higher exports. These magnitudes are comparable to that of productivity (about 11 percent), though far below that of firm size (about 68 percent).

Insert Table 5 about here.

One question that naturally arises from our findings is why specific export experience matters for the probability to start exporting but not for the value of exports conditional on entry. A possible answer is that a manager with specific export experience might help a firm overcome market-specific *sunk* costs of entry (e.g. technical standards, packaging requirements or preferences, links to distributors, marketing strategies) without significantly reducing *marginal* costs or enhancing *marginal* revenues. By the same token, one might also conjecture that the presence of managers with specific export experience affects the marginal revenue and/or marginal cost of firms wishing to continue exporting to a specific market leading to the higher export values we observe.

5.3 Caveats and further discussion

Endogeneity. Does a firm hire managers with export experience to improve its trade performance or does the firm receive a positive shock and/or improve its trade performance by other means and then hires managers with export experience? In other words, how important is the issue of reversed causality, and more broadly of endogeneity, in our analysis? First, it is important to note that the "other means" a firm can exploit to improve its trade performance are, based on the international trade literature (Bernard et al., 2012), predominantly firm-time specific (e.g. productivity, skill intensity, R&D intensity, quality). To the extent that positive and negative shocks affecting firm trade performance are also firm-time specific—though arbitrarily correlated with the presence of managers with specific export experience—both such shocks and the other activities a firm can implement are fully controlled for in our specification with firm-year fixed effects.

If, however, there are sizeable firm-time-market idiosyncratic shocks and/or firm-time-market omitted variables, and if they are correlated with the presence of specific

experience then our estimations do suffer from endogeneity. With the available data, we cannot rule out such a possibility but we can nevertheless provide some insights about the sign and magnitude of the bias. The bottom line of our reasoning is that the sign of the bias is far from being clear, which means we are not necessarily over-estimating the importance of export experience. At the same time, it is quite unlikely that the presence of managers with specific export experience does not affect trade performance at all because hiring such managers requires paying a considerable wage premium.

More specifically, suppose that a firm is interested in entering (or staying, or improving its performance) in market m. The firm can either hire a manager with market-m export experience or undertake another costly activity, A_{fmt}, unobservable to us. Suppose that both choices affect the firm trade performance with respect to market m. Both choices are costly: in particular, our wage analysis shows that hiring a manager with specific export experience entails paying an extra wage premium. If the distribution of the unobservable A_{fmt} across firms, markets and time is positively (negatively) correlated to $ManExp_{fmt}$, the estimated coefficient of the latter will be upward (downward) biased. A positive correlation means that the A activity and hiring a manager with specific export experience are complementary. A negative correlation instead reveals that the two forms of investment are substitutes. The empirical international trade literature (Bernard et al., 2012) has no clear stance towards investments improving trade performance being substitutes or complements. Therefore, the sign of the bias is a priori ambiguous.

Suppose that the presence of managers with market m-specific experience does not really affect trade performance with respect to market m (or any other market). We know that firms will have to pay higher wages for those managers which means they likely contribute to some other firm performance margin. In such a scenario, finding a positive and significant coefficient for specific export experience means that those other firm performance margins must be strongly and positively correlated with trade performance in market m while not being trade performance in market m. We believe this is quite unlikely.

Selection. The value of exports is observed only if a firm starts or continues to export to a market. We cope with the issue of firm selection into a market by using firm-year fixed effects and market-year dummies; most of the determinants of export entry emphasized by the trade literature are either at the firm-time or market-time level. A more recent strand of the literature, including Morales et al. (2012), is exploring other determinants of firm export behavior which are truly firm-time-market specific and are related to a firm's past activity in "related" markets. We could certainly incorporate such determinants in our analysis to better address selection but, so far, it is not clear whether they provide

valid exclusion restriction, i.e. whether they affect entry and/or continuation but not the value of exports.

Alternative definitions of entry and continuation. Though characterized by an overall strong degree of persistency over time, export activity can be erratic, especially when considering "young exporters". Eaton et al. (2008) show, using Colombian data, that nearly one half of all new exporters stops exporting after just one year, and total exports are dominated by a small number of large and stable exporters.[50] Békés and Muraközy (2012) shows, using Hungarian data, that temporary trade is a pervasive feature of the data which is characterized by a number of specificities in terms of the firms, markets, and products involved. Therefore, a concern could be whether our results are sensitive to the the presence of short-lived export participation. In unreported results, available upon request, we have experimented with more stringent definitions of continuing and new exporters in a given market, based on the firm activity both in $t-1$ and in $t-2$ (as in Eaton et al., 2008), finding very similar results.

6. Conclusions

We construct a unique dataset for Portugal by merging two sources: a matched employer-employee dataset covering virtually the entire population of firms and their workers, and a dataset on the universe of firm trade transactions. The combined dataset allows us to finely measure firm trade performance and workers' wages as well as to draw a sharp portrait of workers' mobility across firms.

This paper shows that the export experience gained by managers in *previous* firms leads their *current* firm towards higher export performance, and commands a sizeable wage premium for the manager. Moreover, export knowledge proves to be very valuable when it is *market-specific*: managers with experience related to markets served by their current firm receive an even higher wage premium; firms are more likely to enter markets where their managers have experience; exporters are more likely to stay in those markets, and their sales are on average higher.

There are several directions deserving further research and, in what follows, we propose some. First, in our framework we consider the impact of export experience on entry and continuation into the export activity and the value of exports conditional on entry and continuation; however, there are other firm performance margins that can be fruitfully explored like, for example, productivity and innovation. The existence of a

[50] See Amador and Opromolla (2012) for similar findings using Portuguese data.

wage premium for export experience is consistent with the transfer of knowledge that is not, uniquely, related to exporting (e.g. R&D skills, management practices, etc.).

A related second avenue of research is to explore, more in depth, the nature of the export-valuable knowledge transferred by managers. For example, does the presence of managers with export experience increase the likelihood of entry into the export market because it improves a firm competitiveness beyond what can be captured by firm size and productivity? Do these managers help overcoming trade costs and/or market uncertainty? Or do they increase demand by bringing, or helping to find, valuable clients? Our results on the importance of market-specific export experience already give some insights but, to answer these questions more completely, we need a deeper analysis of the different margins of export performance. In this respect, we see the possibility of being able to identify foreign buyers, which is a feature of very few trade datasets, as particularly interesting. In the same vein, a finer classification of the different functional categories of managers (sales, financial, marketing, human resource, etc.) can be useful to shed further light on the nature of the information flow we have identified. All of the above are the subjects of ongoing research.

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Data Appendix

Each worker in *Quadros de Pessoal* (QP) has a unique identifier based on her social security number. We drop from the sample a minority of workers with an invalid social security number and with multiple jobs. If a worker is employed in a particular year, we observe the corresponding firm identifier for that year. Since worker-level variables are missing in 2001, we assign a firm to workers in 2001 in the following way: if a worker is employed by firm A in 2002 and the year in which the worker had been hired (by firm A) is before 2001 or is 2001, then we assign the worker to firm A in 2001 as well; for all other workers, we repeat the procedure using 2003. In case neither 2002 nor 2003 allow us to assign a firm to a worker in 2001, we leave the information as missing.
All the information in QP is collected during the month of November of each year. Worker-level variables (not available in 2001) refer to October of the same year. Firm-level variables refer to the current calendar year (except firm total sales that refer to the previous calendar year).
The location of the firm is measured according to the NUTS 3 regional disaggregation. We keep only NACE rev.1 2-digits industries between 10 and 95 (excluding agriculture, fishery, other minor industries and extra-territorial activities). Results shown in the paper refer to the manufacturing firms only (NACE 15 to 37).
In the trade dataset, we restrict the sample to transactions registered as sales as opposed to returns, transfers of goods without transfer of ownership, and work done.
In the following, we report further details about the definitions of some key variables.

Firm-level variables
Firm Age Firm age at time t is equal to the difference between t and the year (minus one) the firm was created. The year the firm was created is replaced to missing whenever it is earlier than 1600.
Firm Export Status We divide firms into new, never, continuing, exiting and other exporters. Firm f at time t is a new exporter if the firm exports in t but not in $t-1$. If the opposite happens, the firm is an exiting exporter at time t. If the firm exports both in $t-1$ and in t it is a continuing exporter in t. If the firm does not export neither in $t-1$ nor in t then it is a never exporter in t. If the firm is not observed in $t-1$ then we classify it as other exporter in t. Never exporter is the reference category in the wage analysis.
Firm Productivity Firm (apparent labor) productivity at time t is equal to the (log) ratio between total sales (sales in the domestic market plus exports) and the number of all workers employed by the firm as resulting from the firm record.
Firm Size Firm size at time t is equal to the number of all workers employed by the firm as resulting from the firm record.
Foreign Ownership A firm is defined as foreign-owned if 50 percent or more of its equity is owned by a non-resident.
Industry-level Exports They are obtained aggregating HS6 codes export data from the BACI dataset provided by CEPII (Centre d'Etude Prospectives et d'Informations Internationales) and represent (log) aggregate exports of Portugal of products belonging to Nace rev.1 2-digit industries.
Share of Skilled Workers Share of firm's workers with 12 or more years of education.

Worker-level variables

Hourly Wage (Log) hourly wage is computed adding base and overtime wages plus regular benefits (at the month-level) and dividing by the number of regular and overtime hours worked in the reference week multiplied by $4.\bar{3}$. We apply a trimming of the top and bottom 0.5 per cent. Regular and overtime hours worked are set to (i) missing if (individually) greater than 480 per month, (ii) to zero if negative.

Hiring Date The year the worker was hired in the firm is a variable that is directly registered in QP. Since there are few instances when the hiring date changes from year to year for the same worker-firm spell, we create a robust version of the hiring date computed using the mode for each firm-worker spell. If there is a tie, we take the minimum year in the spell.

Tenure This variable is measured as the difference between the current year and the hiring date.

Country-groups

Spain, other top 5 export destination countries (Italy, UK, France, and Germany), other EU countries (Austria, Belgium or Luxembourg, Denmark, Finland, Greece, Ireland, Netherlands, Sweden), OECD countries not belonging to the EU (USA, Australia, Canada, Switzerland, Czech Republic, Hungary, Iceland, Japan, South Korea, Mexico, Norway, New Zealand, Poland, Slovakia, Turkey), countries belonging to the Community of Portuguese Language Countries (CPLP in Portuguese—Angola, Brazil, Cape Verde, Guinea-Bissau, Mozambique, Sao Tome and Principe, and Timor-Leste), China, and the rest of the World.

Table 1: Selected Summary Statistics, Wage Sample, 2005

Variable	Mean	Std. Dev.	Median	Min.	Max.	N
Worker-level						
Hourly Wage (log)	1.351	0.518	1.215	0.756	3.449	437,742
Age (Years)	38.196	10.7	37	16	65	437,742
Education (Years)	7.449	3.585	6	0	16	437,742
Tenure (Years)	10.031	9.273	7	0	53	437,742
Manager (0/1)	0.067	0.25	0	0	1	437,742
Manag. X Export Exp. (0/1)	0.015	0.123	0	0	1	437,742
Manag. X Matched Export Exp. (0/1)	0.012	0.109	0	0	1	437,742
Current firm-level						
Firm Size (log)	2.335	1.143	2.197	0	8.19	25,769
Firm Productivity (log)	10.479	0.908	10.439	3.322	15.922	25,769
Firm Age (log)	2.459	0.816	2.565	0	5.521	25,769
Foreign Ownership (0/1)	0.024	0.154	0	0	1	25,769
At Least One Manag. (0/1)	0.274	0.446	0	0	1	25,769
At Least One Manag. with Export Exp. (0/1)	0.083	0.276	0	0	1	25,769
At Least One Manag. with Matched Export Exp. (0/1)	0.050	0.218	0	0	1	25,769
Previous firm-level						
Firm Size (log)	2.527	1.3	2.398	0	9.769	48,318
Firm Productivity (log)	7.563	4.8	9.952	0	17.513	48,318

Notes: This Table shows summary statistics, relative to 2005, for a subset of worker-level and firm-level variables used in the regressions of Section 4 and 5. Statistics refer to observations for which all covariates in the wage regression sample of Section 4 are jointly available. Firm-level variables subdivide into those relative to the worker's current firm and to those relative to the previous firm. Variable names followed by "(0/1)" refer to dummy variables. In the last column, "N" refers to the number of workers for worker-level variables, and to the number of (current or previous) firms for firm-level variables. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables.

Table 2: Number of Exporters and Average Exports, by Country-group, Trade Sample, 2005

		Markets					
Variable	Spain	IT-UK FR-DE	Other EU	Other OECD	CPLP	China	ROW
# of Exporting firms	1,719	1,734	1,298	1,414	1,119	205	1,244
of which:							
Have Manag. with Export Exp.	847	842	650	716	564	127	656
Have Manag. with Matched Export Exp.	724	741	527	627	459	57	550
Avg. Exports	2,305	4,005	1,443	1,234	296	593	938

Notes: This Table shows the number of firms exporting to each of the seven markets we consider (see Section 2.3 for details) and their average exports (in thousands euros) for the 2005 sample year. The number of exporters further subdivides into those having at least one manager with export experience and those having at least one manager with matched export experience. Statistics refers to observations for which all covariates in the trade performance analysis sample of Section 5 are jointly available. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries.

Table 3: Export Experience Premia for Managers and Non-managers

	(1A)	(1B)	(2A)	(2B)	(3A)	(3B)
	Export Experience Premia for Managers					
Export Exp.	0.113^a	0.029^a			0.067^a	0.015^b
	(885.39)	(631.79)			(119.21)	(4.61)
1-3 Yrs Export Exp.			0.091^a	-.011^b		
			(398.73)	(4.95)		
4-6 Yrs Export Exp .			0.105^a	.027^a		
			(332.61)	(27.30)		
7-9 Yrs Export Exp.			0.155^a	.066^a		
			(426.73)	(116.71)		
Matched Export Exp.					0.055^a	0.018^a
					(83.11)	(10.01)
	Export Experience Premia for non-Managers					
Export Exp.	0.007^a	-0.002			0.024^a	-0.001
	(7.96)	(-0.92)			(24.26)	(-0.34)
1-3 Yrs Export Exp.			0.001	-.011^a		
			(0.98)	(-6.08)		
4-6 Yrs Export Exp.			0.013^a	-0.005^a		
			(10.61)	(-2.90)		
7-9 Yrs Export Exp.			0.026^a	-0.006^a		
			(14.35)	(-2.90)		
Matched Export Exp.					-0.031^a	-0.001
					(-29.01)	(-1.02)
Worker-Year, Current Firm-Year, and Previous Firm-Year controls	X	X	X	X	X	X
Worker and Firm FE		X		X		X
Observations	4,208,456	4,208,456	4,208,456	4,208,456	4,208,456	4,208,456
Number of Workers	1,276,161	1,276,161	1,276,161	1,276,161	1,276,161	1,276,161
Number of Firms	45,072	45,072	45,072	45,072	45,072	45,072
R^2	0.601	0.930	0.601	0.930	0.601	0.930

Notes: This Table reports export experience premia from the OLS estimation of several variants of the mincerian wage equation (1). The dependent variable is a worker's (log) hourly wage in euros. Export experience and matched export experience are dummies. See Section 3.1 for the definition of a manager and the export experience (and its refinements). Estimations include a number of covariates whose coefficients and standard errors are reported in Table A-2. Worker-year covariates include a worker's age, age square, education, and tenure. Current firm-time covariates include firm size, productivity, share of skilled workers, export status, age, foreign ownership, mean and standard deviation of both age and education of managers, and industry-level exports. Previous firm-time covariates include firm size, productivity, and two dummies constructed from current and previous employing firms industry affiliations. See the Data Appendix for details on covariates. Specifications labelled with (1), (2), and (3) include, respectively, export experience only, export experience interacted with dummies indicating the number of years elapsed since acquiring experience, and both export experience and matched export experience. Specifications labelled with "B" additionally include worker and firm fixed effects. All specifications include year dummies, and those not including worker and firm fixed effects (labelled with "A") also contain region (NUTS-3) and industry (NACE 2-digits) dummies. Robust F-statistics (t-statistics) for managers (non-managers) premia in parentheses: $^a p < 0.01$, $^b p < 0.05$, $^c p < 0.1$.

Table 4: Probability to Start and Continue Exporting to a Specific Market - Core Covariates

	Prob. Start Exporting			**Prob. Continue Exporting**		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Prob.	0.050	0.050	0.050	0.862	0.862	0.862
	Presence of Managers with Export Experience					
Manag. w/ Export Exp.	0.001			-0.000		
	(0.001)			(0.002)		
Manag. w/ Specific Export Exp.		0.011^a	0.016^a		0.006^a	0.017^a
		(0.001)	(0.001)		(0.001)	(0.004)
	Selected Controls					
Firm Size	0.025^a	0.022^a		0.099^a	0.098^a	
	(0.004)	(0.004)		(0.010)	(0.010)	
Firm Productivity	0.005^a	0.005^a		0.009^a	0.009^b	
	(0.002)	(0.002)		(0.003)	(0.003)	
Firm-Year Controls	X	X		X	X	
Destination-Year Dummies	X	X	X	X	X	X
Firm FE	X	X		X	X	
Firm-Year FE			X			X
Observations	201,612	201,612	201,612	61,686	61,686	61,686
R^2	0.031	0.033	0.014	0.068	0.067	0.039
Number of firms	11,489	11,489	11,489	5,363	5,363	5,363
Number of firms-years			37,212			19,208

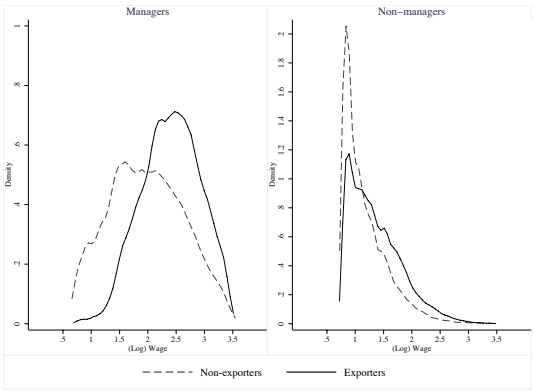
Notes: This Table reports within estimator coefficients and standard errors for the core covariates of Section 5's model of firm's entry and continuation into a foreign market (2). Estimation results for all other covariates are provided in Table A-3. The dependent variable takes value one when a firm f starts exporting to a new (left panel) or continues exporting to a current (right panel) market m at time t. The key independent variable in columns (1) and (4) is a dummy indicating if the firm has at least one manager with export experience. In columns (2), (4), (5), and (6), the key variable is instead a dummy indicating if the firm has at least one manager with specific export experience. See Section 3.1 for the definition of a manager and the export experience (and its refinements). Specifications in columns (1), (2), (4), and (5) include firm fixed effects while specifications (3) and (6) include firm-year fixed effects. Firm-time controls are firm size, productivity, share of skilled workers, age, foreign ownership, mean and standard deviation of both age and education of firm f managers, mean and standard deviation of worker fixed effects corresponding to the managers of firm f coming from the wage analysis (specification 1B), and industry-level exports. See the Data Appendix for more details. All specifications include destination-year dummies. All covariates, except destination-year dummies, have been divided by their respective standard deviation in order to deliver a comparable metric. Standard errors clustered at the firm-level in parentheses: $^a p < 0.01$, $^b p < 0.05$, $^c p < 0.1$.

Table 5: (Log) Value of Exports to a Specific Market Conditional on Entry or Continuation - Core Covariates

	Exports Condit. Entry			Exports Condit. Contin.		
	(1)	(2)	(3)	(4)	(5)	(6)
	Presence of Managers with Export Experience					
Manag. w/ Export Exp.	0.007			0.015		
	(0.042)			(0.012)		
Manag. w/ Specific Export Exp.		0.029	-0.021		0.070^a	0.201^a
		(0.037)	(0.096)		(0.014)	(0.039)
	Selected Controls					
Firm Size	0.152	0.147		0.684^a	0.672^a	
	(0.129)	(0.129)		(0.049)	(0.049)	
Firm Productivity	0.011	0.011		0.111^a	0.109^a	
	(0.049)	(0.049)		(0.022)	(0.022)	
Firm-Year Controls	X	X		X	X	
Destination-Year Dummies	X	X	X	X	X	X
Firm FE	X	X		X	X	
Firm-Year FE			X			X
Observations	10,022	10,022	10,022	53,203	53,203	53,203
R^2	0.119	0.120	0.039	0.274	0.275	0.126
Number of firms	4,278	4,278	4,278	4,559	4,559	4,559
Number of firms-years			7,836			17,325

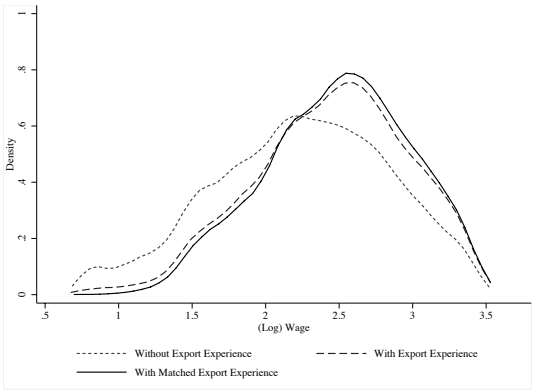
Notes: This Table reports within estimator coefficients and standard errors for the core covariates of Section 5's model of firm's entry and continuation into a foreign market (2). Estimation results for all other covariates are provided in Table A-4. The dependent variable is equal to the (log) exports value of firm f to market m at time t. This variable is observed only if firm f starts (continues) exporting to market m at time t. The key independent variable in columns (1) and (4) is a dummy indicating if the firm has at least one manager with export experience. In columns (2), (4), (5), and (6), the key variable is instead a dummy indicating if the firm has at least one manager with specific export experience. See Section 3.1 for the definition of a manager and the export experience (and its refinements). Specifications in columns (1), (2), (4), and (5) include firm fixed effects while specifications (3) and (6) include firm-year fixed effects. Firm-time controls are firm size, productivity, share of skilled workers, age, foreign ownership, mean and standard deviation of both age and education of firm f managers, mean and standard deviation of worker fixed effects corresponding to the managers of firm f coming from the wage analysis (specification 1B), and industry-level exports. See the Data Appendix for more details. All specifications include destination-year dummies. All covariates, except destination-year dummies, have been divided by their respective standard deviation in order to deliver a comparable metric. Standard errors clustered at the firm-level in parentheses: $^a p < 0.01$, $^b p < 0.05$, $^c p < 0.1$.

Figure 1: Wage Density for Managers and Non-Managers, by Firm Export Status, 2005



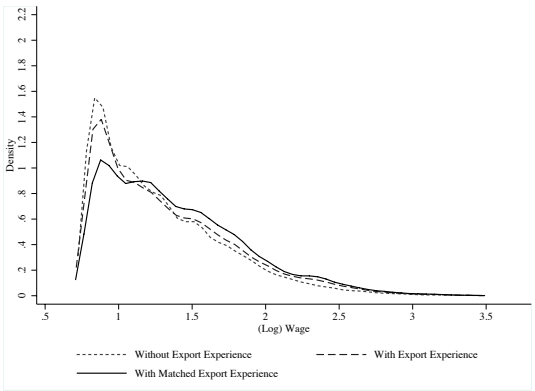
Notes: This Figure shows the kernel density of the (log) hourly wage distribution in 2005 for managers (left panel) and non-managers (right panel), broken down by firm export status (exporters and non-exporters). Statistics refers to observations for which all covariates in the wage regression sample of Section 4 are jointly available. See Section 3.1 for the definition of a manager and the Data Appendix for details on all other variables. The kernel is Epanechnikov and the kernel width is the Stata default one.

Figure 2: Wage Density for Managers, by Export Experience, 2005



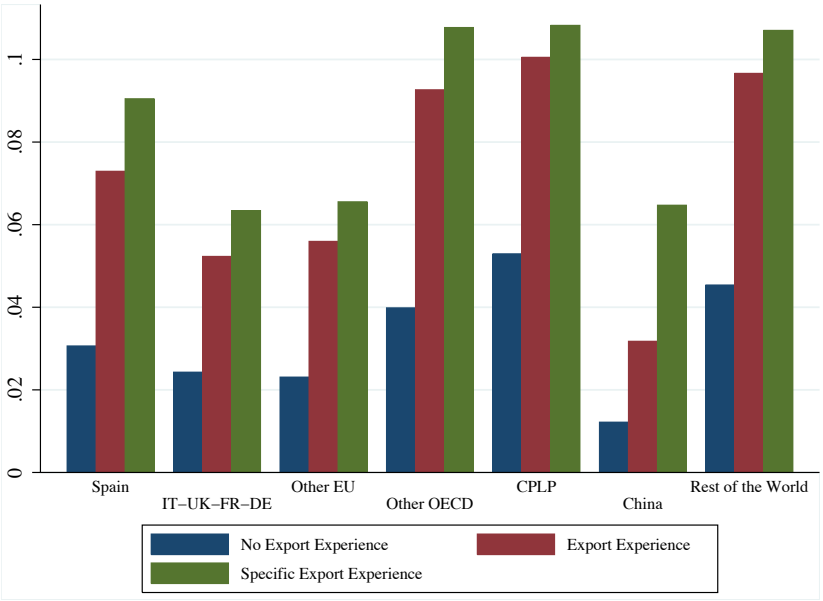
Notes: This Figure shows the kernel density of the (log) hourly wage distribution in 2005 for managers, broken down by degree of export experience. Statistics refers to observations for which all covariates in the wage regression sample of Section 4 are jointly available. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. The kernel is Epanechnikov and the kernel width is the Stata default one.

Figure 3: Wage Density for Non-Managers, by Export Experience, 2005



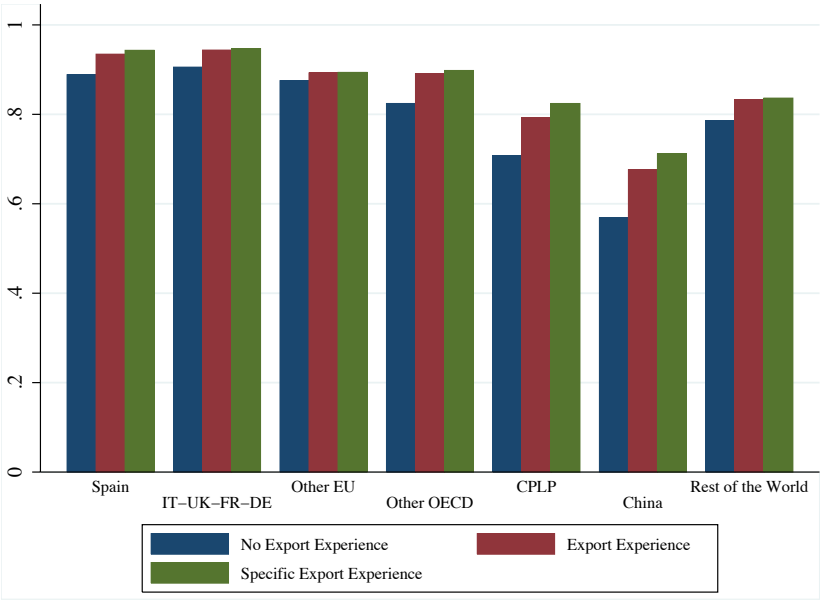
Notes: This Figure shows the kernel density of the (log) hourly wage distribution in 2005 for non-managers, broken down by degree of export experience. Statistics refers to observations for which all covariates in the wage regression sample of Section 4 are jointly available. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. The kernel is Epanechnikov and the kernel width is the Stata default one.

Figure 4: Export Entry Rate, by Firm-type, 2005



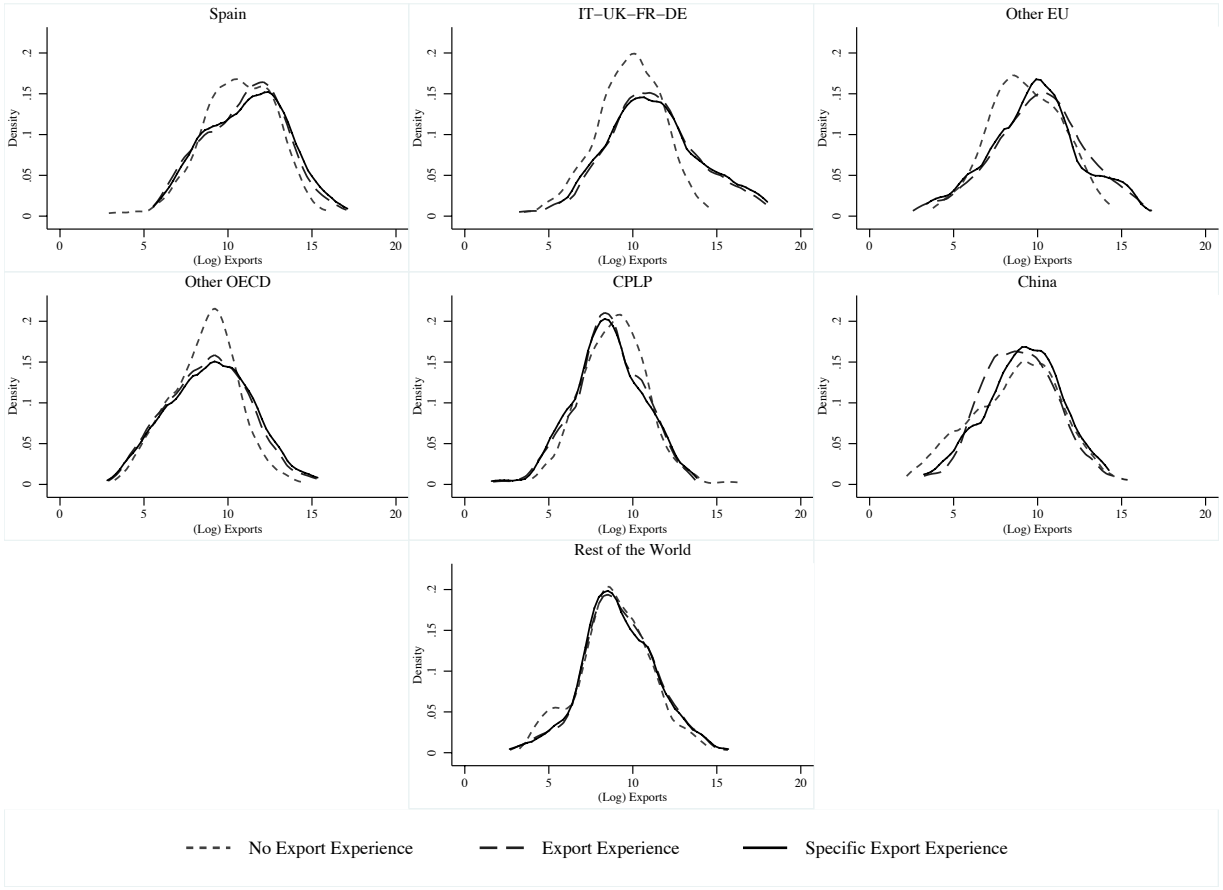
Notes: This Figure shows entry rates, defined as the ratio between the number of firms entering market m at time t and the number of firms not exporting to market m at time t-1, for each market in 2005, for three groups of firms: those that have no managers with export experience at time t, those that have at least one manager with export experience at time t, and those that have at least one manager with specific export experience at time t. Statistics refers to observations for which all covariates in the trade performance analysis of Section 5 are jointly available. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries.

Figure 5: Export Continuation Rate, by Firm-type, 2005



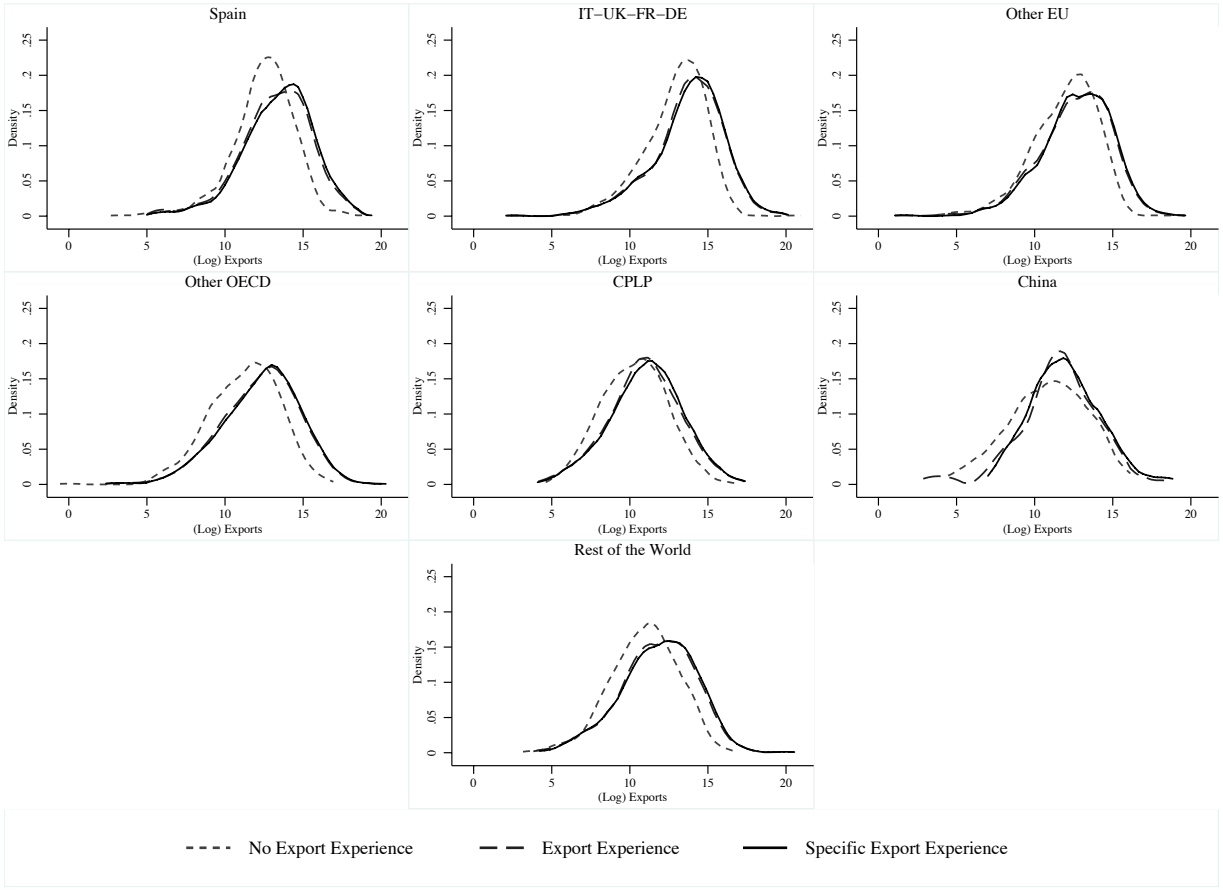
Notes: This Figure shows continuation rates, defined as the share of firms continuing to export to market m at time t among those firms that were already exporting to market m at time t, for each market in 2005, for three groups of firms: those that have no managers with export experience at time t, those that have at least one manager with export experience at time t, and those that have at least one manager with specific export experience at time t. Statistics refers to observations for which all covariates in the trade performance analysis of Section 5 are jointly available. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries.

Figure 6: Exports Density for Entrants, by Firm-type, 2005



Notes: This Figure shows the kernel density of the (log) exports values for firms that start exporting to market m at time t, for each market in 2005, for three groups of firms: those that have no managers with export experience at time t, those that have at least one manager with export experience at time t, and those that have at least one manager with specific export experience at time t. Statistics refers to observations for which all covariates in the trade performance analysis of Section 5 are jointly available. The kernel is Epanechnikov and the kernel width is the Stata default one. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries.

Figure 7: Exports Density for Continuers, by Firm-type, 2005



Notes: This Figure shows the kernel density of the (log) exports values at time t for firms that continue to export to market m at time t, for each market in 2005, for three groups of firms: those that have no managers with export experience at time t, those that have at least one manager with export experience at time t, and those that have at least one manager with specific export experience at time t. Statistics refers to observations for which all covariates in the trade performance analysis of Section 5 are jointly available. The kernel is Epanechnikov and the kernel width is the Stata default one. See Section 3.1 for the definition of a manager and the export experience (and its refinements) and the Data Appendix for details on all other variables. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries.

Online Appendix - not intended for publication

Table A-1: Classification of Workers According to Hierarchical Levels

Level	Tasks	Skills
1. Top executives (top management)	Definition of the firm general policy or consulting on the organization of the firm; strategic planning; creation or adaptation of technical, scientific and administrative methods or processes	Knowledge of management and coordination of firmŠs fundamental activities; knowledge of management and coordination of the fundamental activities in the field to which the individual is assigned and that requires the study and research of high responsibility and technical level problems
2. Intermediary executives (middle management)	Organization and adaptation of the guidelines established by the superiors and directly linked with the executive work	Technical and professional qualifications directed to executive, research, and management work
3. Supervisors, team leaders	Orientation of teams, as directed by the superiors, but requiring the knowledge of action processes	Complete professional qualification with a specialization
4. Higher-skilled professionals	Tasks requiring a high technical value and defined in general terms by the superiors	Complete professional qualification with a specialization adding to theoretical and applied knowledge
5. Skilled professionals	Complex or delicate tasks, usually not repetitive, and defined by the superiors	Complete professional qualification implying theoretical and applied knowledge
6. Semi-skilled professionals	Well defined tasks, mainly manual or mechanical (no intellectual work) with low complexity, usually routine and sometimes repetitive	Professional qualification in a limited field or practical and elementary professional knowledge
7. Non-skilled professionals	Simple tasks and totally determined	Practical knowledge and easily acquired in a short time
8. Apprentices, interns, trainees	Apprenticeship	

Notes: Hierarchical levels defined according to Decreto Lei 121/78 of July 2nd (Lima and Pereira, 2003).

Table A-2: Export Experience Premia for Managers and Non-managers - Other Covariates

	(1A)	(1B)	(2A)	(2B)	(3A)	(3B)
Age	0.028^a	0.027^a	0.028^a	0.027^a	0.028^a	0.027^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age Squared	-0.000^a	-0.000^a	-0.000^a	-0.000^a	-0.000^a	-0.000^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.041^a	0.003^a	0.041^a	0.003^a	0.041^a	0.003^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tenure	0.005^a	0.004^a	0.005^a	0.004^a	0.005^a	0.004^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Manager	0.553^a	0.057^a	0.554^a	0.057^a	0.552^a	0.057^a
	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)	(0.002)
2nd Firm (or later)	-0.015^a	0.017^a	-0.017^a	0.017^a	-0.014^a	0.017^a
	(0.001)	(0.000)	(0.001)	(0.003)	(0.001)	(0.003)
3rd Firm (or later)	0.016^a	0.009^a	0.014^a	0.009^a	0.016^a	0.009^a
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
4th Firm (or later)	0.030^a	0.010^a	0.028^a	0.009^a	0.030^a	0.010^a
	(0.003)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)
5th Firm (or later)	0.026^a	0.011^a	0.024^a	0.010	0.024^a	0.010
	(0.009)	(0.003)	(0.009)	(0.008)	(0.009)	(0.008)
6th Firm (or later)	0.031	0.020^b	0.031	0.019	0.031	0.019
	(0.026)	(0.009)	(0.027)	(0.023)	(0.026)	(0.023)
7th Firm (or later)	0.158	0.106^a	0.155	0.101	0.154	0.100
	(0.118)	(0.028)	(0.117)	(0.092)	(0.117)	(0.092)
2nd Firm (or later) $\times$ manag.	-0.059^a	0.057^a	-0.051^a	0.072^a	-0.060^a	0.057^a
	(0.004)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)
3rd Firm (or later) $\times$ manag.	0.037^a	0.048^a	0.033^a	0.030^a	0.040^a	0.045^a
	(0.006)	(0.002)	(0.006)	(0.006)	(0.006)	(0.005)
4th Firm (or later) $\times$ manag.	0.030^b	0.035^a	0.026^c	0.024^c	0.032^b	0.035^a
	(0.013)	(0.004)	(0.014)	(0.013)	(0.013)	(0.013)
5th Firm (or later) $\times$ manag.	-0.017	-0.037^a	-0.023	-0.048^c	-0.014	-0.038
	(0.038)	(0.011)	(0.039)	(0.029)	(0.038)	(0.029)
6th Firm (or later) $\times$ manag.	0.048	0.059^c	0.037	0.048	0.053	0.062
	(0.110)	(0.034)	(0.109)	(0.082)	(0.107)	(0.081)
7th Firm (or later) $\times$ manag.	-0.667^b	-0.330^a	-0.629^b	-0.298^b	-0.644^b	-0.325^b
	(0.273)	(0.088)	(0.275)	(0.128)	(0.259)	(0.139)
Firm Size	0.030^a	0.057^a	0.030^a	0.058^a	0.030^a	0.057^a
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Firm Productivity	0.068^a	0.006^a	0.068^a	0.006^a	0.068^a	0.006^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry-Level Exports	0.014^a	0.063^a	0.014^a	0.063^a	0.014^a	0.063^a
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Firm Age	0.002^a	-0.000	0.002^a	-0.001^c	0.002^a	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Foreign Ownership	0.029^a	0.006^a	0.029^a	0.006^a	0.029^a	0.006^a
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Share of Skilled Workers	0.153^a	0.035^a	0.153^a	0.035^a	0.153^a	0.036^a
	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)

Table A-2: Export Experience Premia for Managers and Non-managers - Other Covariates (Continued)

	(1A)	(1B)	(2A)	(2B)	(3A)	(3B)
Prod. of Prev. Firm	-0.270^a	-0.046^a	-0.275^a	-0.048^a	-0.273^a	-0.044^a
	(0.004)	(0.002)	(0.004)	(0.007)	(0.004)	(0.007)
Size of Previous Firm	-0.007^a	0.002^a	-0.006^a	0.003^a	-0.006^a	0.002^a
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Prod. of Previous Firm	0.030^a	0.005^a	0.030^a	0.005^a	0.030^a	0.005^a
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Sector of Previous Firm Equal	0.073^a	0.004^a	0.074^a	-0.285^a	0.072^a	-0.289^a
	(0.001)	(0.001)	(0.001)	(0.035)	(0.001)	(0.035)
Sector of Previous Firm Diff	-0.008^a	-0.011^a	-0.006^a	-0.302^a	-0.010^a	-0.305^a
	(0.001)	(0.001)	(0.001)	(0.035)	(0.001)	(0.035)
Managers' Age	0.007	0.032^a	0.007	0.034^a	0.007	0.034^a
	(0.004)	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)
Managers' Education	-0.085^a	-0.007^a	-0.085^a	-0.005	-0.085^a	-0.005
	(0.004)	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)
Avg. Managers' Age	0.001^a	-0.001^a	0.001^a	-0.001^a	0.001^a	-0.001^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Std. Dev. Managers' Age	0.000^a	0.000^a	0.000^a	0.000^a	0.000^a	0.000^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Avg. Managers' Education	0.005^a	-0.000^a	0.005^a	-0.000^a	0.005^a	-0.000^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Std. Dev. Managers' Education	0.003^a	-0.000^a	0.003^a	-0.000^b	0.003^a	-0.000^b
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
New Exporter	-0.004^a	0.002^a	-0.004^a	0.001^b	-0.002^b	0.002^b
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Continuing Exporter	-0.014^a	0.008^a	-0.014^a	0.008^a	-0.012^a	0.008^a
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Exiting Exporter	0.012^a	0.004^a	0.012^a	0.004^a	0.011^a	0.004^a
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Other Exporter	-0.007^a	0.002^a	-0.007^a	0.002^a	-0.006^a	0.002^a
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)

Notes: This Table reports results from the OLS estimation of several variants of the mincerian wage equation (1). Export experience premia are reported in Table 3. The dependent variable is a worker's (log) hourly wage in euros. Worker-year covariates include a worker's age, age square, education, and tenure. Current firm-time covariates include firm size, productivity, share of skilled workers, export status, age, foreign ownership, mean and standard deviation of both age and education of managers, and industry-level exports. Never exporter is the reference category for export status. Previous firm-time covariates include firm size, productivity, and two dummies constructed from current and previous employing firms industry affiliations. See the Data Appendix for details on covariates. Specifications labelled with (1), (2), and (3) include, respectively, export experience only, export experience interacted with dummies indicating the number of years elapsed since acquiring experience, and both export experience and matched export experience. Specifications labelled with "B" additionally include worker and firm fixed effects. All specifications include year dummies, and those not including worker and firm fixed effects (labelled with "A") also contain region (NUTS-3) and industry (NACE 2-digits) dummies. Robust standard errors in parentheses: $^a p < 0.01$, $^b p < 0.05$, $^c p < 0.1$.

Table A-3: Probability to Start and Continue Exporting to a Specific Market - Other Covariates

	Prob. Start Exporting		**Prob. Continue Exporting**	
	(1)	(2)	(4)	(5)
Firm Age	0.003	0.003	0.010	0.010
	(0.003)	(0.003)	(0.008)	(0.008)
Foreign Ownership	0.000	-0.000	0.006	0.006
	(0.002)	(0.002)	(0.004)	(0.004)
Industry-Level Exports	0.002	0.001	0.002	0.002
	(0.005)	(0.005)	(0.006)	(0.006)
Share of Skilled Workers	-0.001	-0.002	0.008^{c}	0.007
	(0.002)	(0.002)	(0.005)	(0.005)
Avg. Managers' Age	-0.001	-0.000	-0.002	-0.001
	(0.001)	(0.001)	(0.003)	(0.003)
Std. Dev. Managers' Age	0.001	0.000	0.001	0.001
	(0.001)	(0.001)	(0.003)	(0.003)
Avg. Managers' Education	0.000	0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.003)	(0.003)
Std. Dev. Managers' Education	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.002)	(0.002)
Avg. FE Managers	-0.001	-0.001	0.002	0.002
	(0.003)	(0.003)	(0.007)	(0.007)
Std. Dev. FE Managers	-0.001	-0.001	0.010^{a}	0.010^{a}
	(0.001)	(0.001)	(0.004)	(0.004)

Notes: This Table reports within estimator coefficients and standard errors of Section 5's model of firm's entry and continuation into a foreign market (2). Estimation results for core covariates are provided in Table 4. The dependent variable takes value one when a firm f starts exporting to a new (left panel) or continues exporting to a current (right panel) market m at time t. Specifications in columns (1), (2), (4), and (5) include firm fixed effects while specifications (3) and (6) include firm-year fixed effects. Firm-time controls are firm size, productivity, share of skilled workers, age, foreign ownership, mean and standard deviation of both age and education of firm f managers, mean and standard deviation of worker fixed effects corresponding to the managers of firm f coming from the wage analysis (specification 1B), and industry-level exports. See the Data Appendix for more details. All specifications include destination-year dummies. All covariates, except destination-year dummies, have been divided by their respective standard deviation in order to deliver a comparable metric. Standard errors clustered at the firm-level in parentheses: $^{a}p < 0.01$, $^{b}p < 0.05$, $^{c}p < 0.1$.

Table A-4: (Log) Value of Exports to a Specific Market Conditional on Entry and Continuation - Other Covariates

	Exports Condit. Entry		**Exports Condit. Contin.**	
	(1)	(2)	(4)	(5)
Firm Age	-0.204	-0.203	-0.044	-0.041
	(0.127)	(0.127)	(0.035)	(0.034)
Foreign Ownership	-0.056	-0.056	-0.003	-0.005
	(0.088)	(0.088)	(0.027)	(0.027)
Industry-Level Exports	0.225^c	0.225^c	0.039	0.038
	(0.123)	(0.123)	(0.035)	(0.034)
Share of Skilled Workers	-0.049	-0.051	0.045^c	0.041^c
	(0.080)	(0.080)	(0.023)	(0.023)
Avg. Managers' Age	-0.018	-0.017	-0.022	-0.019
	(0.052)	(0.052)	(0.014)	(0.014)
Std. Dev. Managers' Age	-0.033	-0.034	-0.005	-0.007
	(0.048)	(0.048)	(0.011)	(0.011)
Avg. Managers' Education	-0.050	-0.050	-0.010	-0.012
	(0.057)	(0.056)	(0.015)	(0.015)
Std. Dev. Managers' Education	-0.082^c	-0.082^c	-0.002	-0.004
	(0.046)	(0.046)	(0.012)	(0.012)
Avg. FE Managers	0.111	0.110	-0.041	-0.038
	(0.127)	(0.127)	(0.033)	(0.033)
Std. Dev. FE Managers	0.007	0.007	0.025	0.022
	(0.069)	(0.069)	(0.017)	(0.017)

Notes: This Table reports within estimator coefficients and standard errors of Section 5's model of firm's entry and continuation into a foreign market (2). Estimation results for core covariates are provided in Table 5. The dependent variable is equal to the (log) exports value of firm f to market m at time t. This variable is observed only if firm f starts (continues) exporting to market m at time t. Specifications in columns (1), (2), (4), and (5) include firm fixed effects while specifications (3) and (6) include firm-year fixed effects. Firm-time controls are firm size, productivity, share of skilled workers, age, foreign ownership, mean and standard deviation of both age and education of firm f managers, mean and standard deviation of worker fixed effects corresponding to the managers of firm f coming from the wage analysis (specification 1B), and industry-level exports. See the Data Appendix for more details. All specifications include destination-year dummies. All covariates, except destination-year dummies, have been divided by their respective standard deviation in order to deliver a comparable metric. Standard errors clustered at the firm-level in parentheses: $^a p < 0.01$, $^b p < 0.05$, $^c p < 0.1$.

Table A-5: Probability to Start and Continue Exporting to a Specific Market - Fixed Effects Logit Estimations

	Prob. Start Exporting			Prob. Continue Exporting		
	(1)	(2)	(3)	(4)	(5)	(6)
	Presence of Managers with Export Experience					
Manag. w/ Export Exp.	0.007			-0.012		
	(0.017)			(0.025)		
Manag. w/ Specific Export Exp.		0.096^a	0.197^a		0.068^a	0.182^a
		(0.013)	(0.021)		(0.022)	(0.043)
	Controls					
Firm Size	0.625^a	0.591^a		0.904^a	0.886^a	
	(0.069)	(0.068)		(0.067)	(0.064)	
Firm Productivity	0.087^a	0.087^a		0.072^a	0.075^a	
	(0.025)	(0.025)		(0.025)	(0.025)	
Firm Age	0.080	0.086		0.084	0.087	
	(0.055)	(0.055)		(0.058)	(0.058)	
Foreign Ownership	-0.006	-0.008		0.082^b	0.079^c	
	(0.026)	(0.026)		(0.041)	(0.041)	
Industry-Level Exports	0.003	-0.006		0.055	0.053	
	(0.065)	(0.065)		(0.059)	(0.059)	
Share of Skilled Workers	-0.025	-0.032		0.070^c	0.065	
	(0.041)	(0.041)		(0.040)	(0.040)	
Avg. Managers' Age	-0.028	-0.017		-0.009	-0.003	
	(0.027)	(0.027)		(0.027)	(0.027)	
Std. Dev. Managers' Age	0.016	0.010		0.017	0.012	
	(0.021)	(0.021)		(0.024)	(0.024)	
Avg. Managers' Education	0.011	0.008		-0.001	-0.003	
	(0.031)	(0.031)		(0.029)	(0.029)	
Std. Dev. Managers' Education	-0.022	-0.024		-0.004	-0.007	
	(0.020)	(0.020)		(0.024)	(0.024)	
Avg. FE Managers	-0.030	-0.030		0.063	0.063	
	(0.054)	(0.054)		(0.060)	(0.060)	
Std. Dev. FE Managers	0.011	0.006		0.062^c	0.059^c	
	(0.033)	(0.033)		(0.032)	(0.032)	
Firm-Year Controls	X	X		X	X	
Destination-Year Dummies	X	X	X	X	X	X
Firm FE	X	X		X	X	
Firm-Year FE			X			X
Observ.	201,612	201,612	201,612	61,686	61,686	61,686
Observ. actually used	91,844	91,844	36,546	50,173	50,173	19,983
Log-likelihood	-20,364	-20,337	-10,326	-12,845	-12,841	-5,814

Notes: This Table reports results from the Logit estimation of Section 5's model of firm's entry and continuation into a foreign market (2). The dependent variable takes value one when a firm f starts exporting to a new (left panel) or continues exporting to a current (right panel) market m at time t. The key independent variable in columns (1) and (4) is a dummy indicating if the firm has at least one manager with export experience. In columns (2), (4), (5), and (6), the key variable is instead a dummy indicating if the firm has at least one manager with specific export experience. See Section 3.1 for the definition of a manager and the export experience (and its refinements). Specifications in columns (1), (2), (4), and (5) include firm fixed effects while specifications (3) and (6) include firm-year fixed effects. Firm-time controls are firm size, productivity, share of skilled workers, age, foreign ownership, mean and standard deviation of both age and education of firm f managers, mean and standard deviation of worker fixed effects corresponding to the managers of firm f coming from the wage analysis (specification 1B), and industry-level exports. See the Data Appendix for more details. All specifications include destination-year dummies. All covariates, except destination-year dummies, have been divided by their respective standard deviation in order to deliver a comparable metric. Standard errors in parentheses: $^a p < 0.01$, $^b p < 0.05$, $^c p < 0.1$.