Laboratory of Economics and Management

Sant'Anna School of Advanced Studies
Piazza Martiri della Libertà, 33 - 56127 PISA (Italy)
Tel. +39-050-883-343 Fax +39-050-883-344
Email: lem@sssup.it Web Page: http://www.lem.sssup.it/

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Self-selection along different export and import markets

Francesco Serti [§]
Chiara Tomasi [*]

[§] LEM-Scuola Superiore Sant'Anna, Pisa, Italy and University of Alicante, Spain
[*] LEM-Scuola Superiore Sant'Anna, Pisa, Italy and University of Urbino, Italy

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Self-selection along different export and import markets*

Francesco Serti
Scuola Superiore S.Anna
University of Alicante

Chiara Tomasi
Scuola Superiore S.Anna
University of Urbino

Abstract

How are firms' performances influenced by the specific characteristics of markets where exports are directed and imports originate from? Using a rich database on Italian manufacturing firms, this essay adds new evidence on the relationship between trade status and firm characteristics. First, exploiting firm-level information on the destination of export and the origin of imports, we observe the heterogeneity among firms trading with different type of markets. We show that different destinations of exports and different origins of imports map into distinctive firm characteristics. Second, we test the hypothesis that the self-selection mechanisms occur market to market. We observe that firms exporting to and importing from high income countries face higher sunk costs than those trading with less developed markets. Third, we investigate the underlying sources of these ex-ante differences by looking at how countries' characteristics such as population, exchange rate, productivity and distance may impact on firms' performances.

JEL codes: F10, F16, J21

Keywords: heterogeneous firms; exports; imports; productivity; market of destination and origin

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1 Introduction

Starting from Bernard and Jensen's pioneering paper (Bernard and Jensen, 1995), several empirical studies using firm level data from different countries and time periods have found that exporters are larger and exhibit significant performance premia relatively to non-exporting firms.[1] At least two theoretical interpretations have been proposed to explain such a productivity export premia: the self-selection hypothetis and the learning by exporting effects. The first approach argues that the existence of sunk costs induces a self-selection of more productive firms (Roberts and Tybout, 1997; Bernard and Jensen, 1999a).[2] The second line of argument claims that firms can become more efficient after they begin exporting (Clerides et al., 1998). Empirical evidence has provided rather robust support for the first hypothesis, while results on the post-entry effects are more mixed. While much progress has been done on the relationship between export and productivity, there are still some open questions within this rapidly expanding literature.

First, while substantial work has been done on firm heterogeneity and exporting activities, much less attention has been devoted to the relationship between import behavior and firm's characteristics. Even fewer analyses consider both imports and exports. Only recently some authors start arguing that also import should be taken into account in order to understand the nature of heterogeneity across different firms in the economy. In line with the results found for export, new empirical research provide evidence of a positive correlation between import and firm's productivity (Bernard et al., 2007; Halpern et al., 2005; Kasahara and Lapham, 2008; Amiti and Konings, 2007; Castellani et al., 2009). Thought some tentative explanations have been proposed to explain this evidence, much remain to be done on the understanding of firm behavior on the import side.

Second, the lack of firm level information on trading activity (both importing and exporting) by markets has often prevented researchers to further explore the characteristics of traders in term of their geographical diversification. In fact, there is very little evidence on how firms' heterogeneity is related to different market penetrations strategies and why firms export to or import from some countries and not others. The idea underlying this issue is that the characteristics of traders vary with the type of market served by exporters or source from importers. More precisely, one can argue that differences between market of origin or destination, reflecting *inter alia* the geographic, technological and socio-economic distance between countries and institutions, entail important diversities in terms of costs and learning opportunities faced by firms in their trading activities. Take for instance the export case. On the one hand, if the nature of export entry costs vary across markets this will eventually translates into ex-ante differences in terms of firms' performance between firm exporting to different countries. On the other hand, if there is scope for learning by exporting (for instance through access to new production methods or new product design from foreign buyers), this is more likely to happen when firms export to advanced regions.

The aim of our paper is to illustrate and contribute to a better understanding of the two aspects we have just recalled using a rich database on Italian manufacturing firms. The available information on import and export enable us to overcome a sort of "export obsession" of scholars who have long neglected imports in their international trade analyses. The database thus provides the opportunity to evaluate contemporaneously the import and the export side and to study how the degree of involvement in international trade is associated to firms' perfor-

[1] See Greenaway and Kneller (2007) and Wagner (2007) for surveys.

[2] The self-selection hypothesis has been incorporeted by Melitz (2003) in a theoretical model that combines firm heterogeneity with a monopolistic competition framework.

mances. Second, we exploit the richness of our dataset to identify markets of destination and origin of Italian exports and imports, respectively. We analyze how the geographic distribution of trade activities mirrors into the performances of manufacturing firms. The availability of this information allow to furthered our understanding of the relationship between trade and productivity.

The rest of this paper has the following structure. In Section 2 we shortly review the related empirical literature and develop a conceptual framework underlying our empirical exercises. Section 3 describes the data-sources we use and provides an overview of how differences in Italian firms' involvement in international trade are associated with diversities in productivity and other characteristics. In Section 4 we investigate firms' heterogeneity across destinations and markets of origins of their export and import, respectively. Our analysis proceeds in several step. In Section 4.1 we present the export and import orientation of Italian manufacturing firms. In Section 4.2 we assess, by parametric analysis, whether the relationship between trade activities and firms' performances depends on the destination of exports and on the origin of imports. In Section 4.3 we perform robustness check at the 2-digit sectoral level and using quintile regression technique. In Section 5 we test if the self-selection mechanisms vary market to market. Section 6 will summarize the results and conclude.

2 Conceptual framework

Recent research in international trade, both theoretical and quantitative, has increasingly emphasized the high and persistent level of heterogeneity across firms (Bernard and Jensen, 1995; Aw and Hwang, 1995; Bernard and Jensen, 1999b; Clerides et al., 1998). These studies have identified a series of stylized facts regarding the role of firms in international trade. They found that exporting firms are larger, more productive, more skill and capital intensive and pay higher wages than non-exporting firms.

Recently it has been stressed that export is only part of the story. The availability of detailed transaction data have spurred new empirical research on firm heterogeneity and international trade, combining information on both the import and export sides. Some studies have shown that there is a positive correlation between import and firms' productivity. More importantly, they provide evidence on the strong interconnection between the two side of trade: the majority of exporters are also importers and vice versa. Many of these analyses reach the conclusions that the decision to engage in both exporting and importing is correlated with firm characteristics. [3] Using the same dataset on Italian manufacturing firms, we show in a complementary paper (Castellani et al., 2009) than a sort of hierarchy emerges among traders: being involved both in importing and exporting is associated with the highest premium in terms of various economic performances. In addition, firms involved in importing but not in exporting activities outperform those engaged only on the export side. Moreover, when we control in a regression for both the import and the export status of a firm, the export premia remain statistically significant but drop and become lower than the import premia. This suggests that the advantages of exporters may be actually related to the fact that more efficient firms

[3]Bernard et al. (2005) consider exporters and importers in US, showing that both trading firms are associated with better performances. Similarly, Muuls and Pisu (2007), using Belgian data, provide evidence of a positive relationship between firms' productivity and both import and export, while Altomonte and Bekes (2008) investigate the complementarity of importing and exporting activity for Hungarian firms. Vogel and Wagner (2008) estimate significant export and import productivity premia among German firms. Focusing only on the import side, Halpern et al. (2005), Kasahara and Rodrigue (2005) and Amiti and Konings (2007) find evidence of substantial heterogeneity and a high level of productivity among importers.

are those that also import. All together these stylized facts suggest that firm characteristics are systematically related to both importing and exporting activities and neglecting one of the two sides of trade could end up with misleading results.

How can we explain the positive relationship between importing activity and firm performances? In principle, as in the export case, both post-entry and self-selection effects could underlie the observed relationship. Starting from the R&D-based models of growth and trade, the theoretical and empirical literature have recognized that import of intermediate and capital goods could raise productivity via learning, variety or quality effects (Markusen, 1989; Grossman and Helpman, 1991; Eaton and Kortum, 2001; Acharya and Keller, 2007). Productivity gains could arise because of learning effects from the foreign technology embodied in the imported intermediate inputs. Positive productivity effects could be due to the access to more varieties of intermediate inputs and better match between input mix and the desired technology or product characteristics. Alternatively, importers may purchase abroad higher quality inputs compared to those domestically available and this may, in turn, increase their productivity.

While there is ample empirical evidence, especially at aggregate level, on the post-entry effects of import on productivity, very little is done on the self-selection hypothesis (see Kasahara and Lapham, 2008; Halpern et al., 2005). In Castellani et al. (2009) we show that both post-entry and self-selection effects are plausible explanations. In fact, we provide empirical evidence on the existence of some ex-ante differences even in the import case. Our intuition is that importers may need to invest in some complementary assets (or absorptive capacity) in order to be able to effectively use imported inputs in their production process (see Castellani et al., 2009, for a discussion on this topic).

Information on the markets of origin of imports could be of much help here. If importers need to accumulate absorptive capacity in order to benefit from imported goods used in the production, this is more likely to happen when firms import capital and technological intensive goods rather than row materials. The technological or the quality level of imported goods varies systematically with the level of development across countries: technological intensive products are more likely to be sourced from high income economies.[4] It follows that the characteristics of import markets are presumably important for the self-selection into importing effects.

Analogously, if there is scope for learning effects from import, this is more likely to happen when firms source from developed countries. Because of the sophisticated technologies used in these advanced regions, import from these area is more likely to be a source of domestic firm's increase in productivity. Through the adoption and the imitation of these imported technologies, firms may improve their efficiency of their production. Also, the higher product quality and the greater variety available in these countries with respect to less developed economies are believed to represent forces enhancing importers' productivity (Kugler and Verhoogen, 2009). As suggested by Kugler and Verhoogen (2008), to the extent that trade liberalization allows importing a larger variety of goods, more productive firms would self-select into import of high-quality inputs and this would lead firms to upgrade the quality of final goods they produce and to boost their productivity (the "quality-complementarity hypothesis").

[4]In order to properly investigate this issue one should ideally have the information on imports by product. In an updated version of the Italian dataset (which we will soon available) we will have information, from 1998 to 2006, on the volume of export and import differentiated according to five categories (defined by the Main Industrial Grouping breakdown): lasting consumption commodities, non-lasting consumption commodities, capital commodities, intermediate products, energy.

A similar line of arguments can be used in the case of heterogeneity in export destination characteristics. Firms' performances are likely to be affected by how "distant" export markets are, not only in terms of geographic dispersion, but also of cultural, institutional, and technological characteristics (Kneller et al., 2008; Kogut and Singh, 1988). Whichever dimension of distance one may consider, it is acknowledged in the literature that it will affect trade costs faced by exporting firms. Moreover, the more distant markets are, the more they may provide access to knowledge assets that are relatively rare and unfamiliar, hence more valuable. Other factors correlated with the type of market served by exporters - as for instance market size, degree of competition or quality standard - are likely to be related with firms' characteristics. As in the import case, the heterogeneity across export destinations can be expected to be a further driver for self-selection and learning by trading processes which will in turn translate into differential productivity level. If the nature of entry costs differ among markets, as it is likely to be, one may expect to observe more productive firms exporting to countries with relatively higher sunk costs. Analogously, the learning opportunities are presumably related to the type of markets firms serve: higher productivity gains are expected to observe for firms exporting to more developed regions.

The idea that different firm characteristics are required to export with various foreign markets has been considered recently in the theoretical model proposed by Chaney (2008). Expanding the work of Melitz (2003), this model derives a gravity specification for bilateral trade flows where trade costs affect both the extensive and intensive margin of trade, i.e. the average export per firm and the number of firms involved in export respectively. According to the model, the combination of market specific fixed entry costs and productivity differences among firms may explain why the number of firms - the extensive margin - able to overcome trade barriers change from market to market. In this model self-selection occurs from market to market, which implies that each foreign market is associated with a productivity threshold. Firms will enter all markets whose productivity threshold is lower than their own productivity level. We should indeed observe firms with low productivity serving a limited number of markets with low productivity thresholds. By contrast, firms with high productivity should export to a large number of markets and with high productivity thresholds.

On the empirical side, few research based on micro level data investigate how exporters' characteristics vary with the country of destinations (Damijan et al., 1998; Ruane and Sutherland, 2005; De Loecker, 2007; Verhoogen, 2008; Pisu, 2008; Crino' and Epifani, 2009), and even fewer studies analyse the relationship between importers' performances and country of origins (Andersson et al., 2007).Damijan et al. (1998) report evidence on Slovenia exporters, showing that the productivity level required to enter developing countries (especially familiar markets such as CEEC and former Yugoslavia) is lower than that observed for firms serving high-income economies. In addition, learning effects are relatively greater for firms exporting to OECD countries. De Loecker (2007) finds significantly higher productivity premia for Slovenian firms starting to export to higher income regions.Verhoogen (2008), using a sample of Mexican manufacturing firms, show that an increase in the incentive to export in a developing countries forces exporting firms to upgrade their production process and their technologies and, as a consequence, to maintain higher quality workforce.

Table 1: Number of firms

Years	Micro1	Micro1-COE merged
1989	19922	
1990	21208	
1991	19740	
1992	21301	
1993	22076	22111
1994	21720	21745
1995	20004	20028
1996	17231	17261
1997	15532	14934

3 Data Description and summary statistics

This paper relies upon a data panel which combines two different datasets developed by Italy's Bureau of Statistics (ISTAT), namely Micro.1 and COE.[5]

Micro.1 contains longitudinal data on a panel of 38.771 firms representing the entire universe of Italian manufacturing companies with 20 employees and it covers the years between 1989-97.Over the period covered by the data there are missing values partly due to the fact that some firms may exit from the database as they reduce their size and fall below the 20 employees threshold. The existence of missing values makes Micro.1 an unbalanced panel dataset, containing information for an average of around 20.000 firms per year. As documented in Bottazzi and Grazzi (2007), which employs the same database, despite the unbalanced nature, the validity of the database is largely supported by its census nature, which avoids possible biases in the data collection process, and by the fact that there are no particular trends or changes in the structure and performance of firms that do not appear for some years (i.e. firms that exit and re-appear again in the database). In addition, as reported in Bartelsman et al. (2004), though manufacturing firms with less than 20 employees account for about 88% of the total Italian firm population, firms with more than 20 employees cover almost 70% of the total employment.

Firms are classified according to their principal activity, as identified by ISTAT's standard codes for sectoral classification of business (Ateco), which correspond, to a large extent, to Eurostat's NACE 1.1 taxonomy. The database contains information on a number of variables appearing in a firm's balance sheet. We utilize the following pieces of information: number of employees, type of occupation of employees, turnover, value added, capital, intermediate inputs cost, capital assets, industry and geographical location (Italian regions). Capital is proxied by tangible fixed assets at historical costs (net of depreciation). All the nominal variables are measured in millions of 1995 Italian liras and they are deflated using various 2 digit industry-level price indices provided by ISTAT. As regards the workforce composition separate pieces of information are available for production workers and non-production workers.[6] For the

[5]The databases have been made available under the mandatory condition of censorship of any individual information.

[6]Production workers include blue collars, assistants, trainees and home-based workers corresponding respectively to the terms: *operai*, *commessi*, *apprendisti* and *lavoratori a domicilio*. Non production workers comprise managers and clerks, corresponding respectively to the terms: *dirigenti* and *impiegati*. Unfortunately

Table 2: Trade participation rates of Italian manufacturing firms, by sector (1993-97)

	Non-traders	**Exporters**	**Importers**	**Two-way traders**	**N.Obs**
Food, Beverages	26.6	61.2	63.0	50.8	1327
Tobacco	33.3	63.6	45.5	42.4	13
Textiles	27.7	66.2	64.2	58.1	1708
Wearing, Apparel	48.8	48.1	44.3	41.3	1364
Leather, Allied Product	25.9	72.8	60.5	59.1	1007
Wood Manufacturing	23.1	58.9	71.6	53.6	509
Paper, Allied Product	18.0	72.0	72.2	62.3	456
Printing, Publishing	33.7	55.6	52.1	41.4	675
Coke and Petroleum	40.7	44.0	51.8	36.5	77
Chemical Products	14.1	80.4	79.0	73.5	735
Rubber, Plastics	15.4	80.0	76.2	71.6	1022
Non Met. Min. Products	35.9	57.3	49.5	42.8	1233
Basic Metals	20.5	73.7	69.8	64.0	572
Metal Product	36.4	58.1	50.0	44.4	2418
Industrial Machinery	16.5	81.4	72.0	69.9	2452
Office Machinery	23.7	67.8	73.1	64.5	49
Electrical Machinery	29.2	65.4	62.9	57.5	835
Radio, TV, etc.	25.3	67.3	68.4	61.0	245
Med., Prec.,Opt. Instr.	20.0	75.6	73.0	68.6	416
Motor Vehicles	19.3	74.7	70.4	64.5	405
Other Transp. Equip.	27.3	65.6	63.4	56.4	236
Furniture Manufacturing	21.4	75.0	61.0	57.4	1463
Manufacturing	27.2	67.1	62.0	56.3	19216

purpose of this paper we consider the juxtaposition between these two worker categories as a proxy of the distinction between unskilled and skilled workers, respectively.[7]

The Micro.1 database has been merged with ISTAT's external trade register (COE), which provides firm-level information on exports and imports over the 1993-1997 period. All incoming (imports) and outgoing (exports) invoices are registered in COE so it is possible to keep track of all transactions. Note that due to the way COE is built and updated - that is by registering transactions at the border - the link of Micro.1 and data in COE does not introduce any "¡selection"¿ bias in the dataset.[8] The COE database supplies data on firms' trade status and their volume of trade. Moreover, data are available on the destination of exports and the origin of imports for some geographical areas. A table reporting all the areas for which we have detailed information is reported in Appendix 1. Table1 present the number of firms active within the manufacturing sector, respectively for the original Micro.1 database and for the database obtained after the merge with the foreign survey (Micro.1-COE).

no detailed data are available for these sub-categories included in the two main classes of production and non production workers.

[7]See Berman et al. (1994) for a discussion on this categorization.

[8]Though the 20 employees threshold does not allow us to consider the totality of firms involved in international trade and prevent us from analyzing the behavior and the performances of smaller units, the representativeness of Micro.1 is endorsed by the fact that a large amount of the aggregate Italian trade is generated by large firms. As reported by the Italian Statistical Office (www.coeweb.istat.it), for instance in 2005 firms with less than 20 employees accounted for 10% of the total manufacturing export while nearly 90% of the aggregate value was generated by firms with more than 20 employees.

Table 3: Differences between non-traders and other trading categories (average values 1993-1997)

		Non-traders	**Exporters**	**Importers**	**Two-way traders**
LP	mean	63.7	81.3	82.9	83.5
	sd	(58.5)	(46.6)	(47.8)	(47.6)
TFP	mean	98.0	127.3	129.3	131.0
	sd	(71.5)	(86.9)	(87.9)	(88.5)
N.Empl	mean	62	123	124	130
	sd	(216)	(820)	(831)	(870)
CI	mean	101	125	132	130
	sd	(630)	(1214)	(1268)	(1326)
SLI	mean	16.4	25.5	26.0	26.4
	sd	(17.1)	(18.0)	(18.4)	(18.2)

Table 2 illustrates the propensity to trade in the Italian manufacturing industry. As reported in the last row, slightly less that three-forth of manufacturing firm are internationalized: on average, over the 1993-1997 period, 67% were exporting goods, and 62% were importing. While the distinction between exporters and importers is relevant is also interesting to observe that the two sides of trade are strongly interconnected. The fourth column of the table identifies the participation rate for those firms involved in both import and export, which we name *two-way traders*. As we can notice the large majority of internationalized firms are engaged in both import and export (on average 56%), meaning that there is a strong and positive correlation between the two side of trade. 84 percent of exporting firms also import, while almost the totality of importing firms (91%) also export. Only a small share of firms are instead engaged in either only export or only import activities. However, significant heterogeneity exists across industries. The share of two way traders is relatively higher in sectors such as Chemical Products, Rubber and Plastic, Motor vehicles, Medical Instruments and Industrial Machinery where we can expect to find a large number of multinational firms.

In Table 3 we provides an overview of how differences in Italian firms' involvement in international trade are associated with diversities in firms' performances, considering both the importing and exporting activities. As anticipated in Section 1, this is per se a partial novelty in the empirical literature, as most international trade contributions normally concentrate on exports. In order to detect the heterogeneity across firms we present summary statistics for a large set of economic indicators: productivity, scale of operation, capital and skilled intensity. To measure the scale of operation we used the total number of employees. With respect to capital endowment, we focus on the value of capital per employee (capital intensity, CI). The skilled labor intensity (SLI) is a measure of firms' skill composition that is given by the percentage of non-production workers over the total number of employees.

To properly measure the productivity differences between traders and non-traders (and more generally between firms), ones should ideally observe the quantities and the qualities of varieties produced by a firm (Marschak and Andrews, 1945; Melitz, 2001).[9] In order to partially solve this problem the empirical literature has used deflated sales as a proxy for

[9]The Italian dataset provides information in nominal terms and without firm-specific pricing data. It is indeed impossible to perfectly separate changes in quantities from changes in prices/mark-ups.

firm production analysis, assuming that goods produced by firms in a given industry are homogeneous. The productivity obtained as a residual from an estimated production function, has then been considered as a measure combining real productivity and pricing strategies. In our analysis we measure firm level productivity with the Labour Productivity (LP) index, i.e. value added per employee, and with the Total Factor Productivity (TFP) that is the residual of three inputs (capital, white collar and blue collar) Cobb-Douglas production function estimated using the semiparametric method implemented by Levinsohn and Petrin (2003). However, this approach has some drawbacks since it assumes that all firms within the same industry face the same prices and it does not make any assumptions on how trading firms versus non-traders could influence firms' investment decision or intermediate inputs demand. [10] Recently, empirical and theoretical studies have more carefully tackled the issue of possible distortions and mis-interpretations raised when estimating the firm productivity level. Melitz (2001) developed a new methodology, strongly related to the one proposed by Klette and Griliches (1996), which allows to re-interpret the productivity estimates even in the context of differentiated - multi product mix firms within the same industry. De Loecker (2007) argues that unobserved productivity shocks correlated to export status and differences in market structures and demand conditions between exporters and non-exporting firms may have important consequences when investigating the export-productivity link. [11]

Looking at Table 3 we observe that, consistently with other studies, non traders are less productive, smaller, less capital and skill intensive with respect to internationalized firms. Moreover, in line with the results found for export, there is a positive correlation between import and firm's productivity. More generally, importers display similar characteristics as those observed for exporters. There results suggest that firms characteristics are systematically related to trade activities, both exporting and importing. More interesting, firms deeply involved in foreign markets, i.e. the two-way traders, are those showing the highest performance. This is in line with findings of Castellani et al. (2009) on Italy [12], Muuls and Pisu (2007) on Belgium, Andersson et al. (2007) on Sweden and Vogel and Wagner (2008) on Germany. Moreover, it is consistent with previous evidence showing that increasing global engagement of firms is associated with better performances.

4 Firms heterogeneity across markets of exports and imports

The descriptive statistics in the previous section suggest that a significant fraction of the intra-industry heterogeneity is related to the international activities of Italian firms. In this section we further investigate the heterogeneity within the traders category. We assess whether the relationship between trade activities and firms performances depends on the destination of exports and the origin of imports. Before moving to the analysis of the relationship between firm

[10] Ackerberg et al. (2004) show that both the Olley and Pakes (1996) and the Levinsohn and Petrin (2003) methodologies may suffer from collinearity problems which may further be problematic for the interpretations of the results.

[11] Both the Olley and Pakes (1996) and the Levinsohn and Petrin (2003) methodologies assume an exogenous productivity process that is in contradiction with the learning by exporting hypothesis. De Loecker (2007) decomposes the productivity shock in two components, one following an exogenous Markov process and another one following an endogenous Markov process determined by past export experience.

[12] Readers interested in a detail analysis on the difference between importers and exporters can refer to Castellani et al. (2009)

Table 4: Trade flows: a detailed analysis (1993-1997)

	Exporters			**Importers**		
	a	*b*	*c*	*a*	*b*	*c*
Total	26.1			17.9		
Europe (HI)	18.2	62.8	59.3	6.0	68.1	58.7
EFTA (HI)	3.4	17.7	7.2	2.2	26.6	8.6
US (HI)	5.2	14.6	7.9	1.5	17.5	7.4
Other Dev.Countries (HI)	2.5	12.9	5.9	2.2	19.2	6.1
ACP (LI)	0.7	4.4	0.5	3.8	15.8	1.0
OPEC (MI)	2.1	8.4	2.7	2.4	13.6	3.1
NICs (MI)	3.2	11.7	6.7	2.4	15.8	3.6
Other NonDev Countries (LI)	2.2	9.3	4.0	2.6	18.7	4.0
CEECs (LI)	2.3	12.8	4.3	2.9	23.2	6.1
PECs (LI)	2.0	5.8	1.1	2.7	18.9	1.3
	European Countries					
France	5.6	21.3	24.3	2.2	26.0	26.1
Belgium and Luxembourg	1.9	6.9	5.3	1.6	15.8	6.6
Netherlands	2.1	6.3	5.0	1.5	14.4	7.5
Germany	8.6	26.2	32.8	3.1	36.7	36.1
UK	3.4	10.1	12.9	1.3	15.3	10.4
Ireland	0.6	1.9	0.7	1.2	8.1	1.5
Denmark	1.0	2.9	1.5	1.0	9.6	1.2
Greece	1.3	7.2	3.2	1.4	13.1	1.2
Portugal	1.2	4.9	2.5	0.1	9.5	0.6
Spain	2.5	10.9	9.2	1.2	16.5	6.0

Note: Country income level in parenthesis: high income (HI),medium income (MI), low income (LI).a = average firms' trade intensity to area g ; b = average firms' trade share to area g; c = total trade share to area a. Numbers in column b do not necessarily add up to 100% since we use all firms, also those trading to multiple destinations.

performances and market heterogeneity, we briefly present the export and import orientation of Italian manufacturing firms.

4.1 Pattern of export and import orientation

The aggregate trade flows to each destination and from each country can be decomposed in terms of firm intensive and extensive margin. The intensive margin is given by the average value of export (import) per firm sell to (source from) each market, while the extensive margin is given by the number of firms exporting to (importing from) each country. Important insights can be gained from Table 4 that presents the intensive margin of market-specific flows. Precisely, the table shows in column a the average value of firms' export (import) intensity to geographical area g defined as

$$\text{Export Intensity}_g = \frac{1}{N_g}\sum_i \frac{EXP_{i,g}}{TS_i} \quad ,$$

where N_g is the total number of firms exporting to the geographical area g; $EXP_{i,g}$ is

firm's export to area g; and TS_i is firm's total sales. In column b the average value of firms' export (import) share to area g is defined as

$$\text{Export Share}_g = \frac{1}{N_g}\sum_i \frac{EXP_{i,g}}{EXP_i} \quad ,$$

where EXP_i if firm's total export. In column c, Italian value of export (import) share to area g is defined as

$$\text{Total Export Share}_g = \frac{\sum_i EXP_{i,g}}{EXP}.$$

where EXP is Italian total export. The same holds for imports. Thought the import intensity so defined is uncommon, we believe that this is a useful strategy to compare both sides of trade. Indeed, even if imports comprehend not only intermediate inputs but also capital goods, the import share in sales is a convenient way to compare firms' trade to firm size. The first row of Table 2 reports the average firms' export (import) intensity. Though firms typically export a small fraction of their sales, the average export intensity is higher than the corresponding value for import. The average fraction of sales exported abroad is 26% while the average fraction of sales imported from abroad is around 18%.

Detailed information on the most important markets with which firms trade reveal interesting patterns of internationalization. Although we do not explicity test the gravity equation model, it is worth to notice that, at first sight, our data seems to validate the hypothesis that export (import) intensity increases with market size (proxied by GDP) and decreases with distance.[13]

On the export side, the percentage levels reported in columns a confirm that firm's export is mostly directed to high-income and bordering countries: the highest level of export intensity are in fact observable for high income economies as Europe (18.2%), US (5.2%), EFTA (3.4%) and Other Developed countries (2.5%).[14] Almost the totality of firm's export share (column b) is directed towards these areas. Even more striking, the fraction of Italian export to these four destinations sum up to 80.3%. Exchanges with Europe and EFTA, which are by far the more "closest" markets, cover almost 70% of Italy total trade volume. Besides, within the European countries the pattern emerging is much more similar to the story one would guess a priori, that is to observe the highest value for Germany, followed by France, UK and Spain; the closest countries among the biggest EU economies. The fact that neighbors are the most frequent destinations for exporters confirms the importance of distance. Among medium and low income countries the most important destinations are given by New Industrialized Countries (NICs) and Central and Eastern European Countries (CEECs).

The last three columns of Table 4 show the import orientation of Italian manufacturing firms. Similar pattern as those found for export are observable for import, especially in the case of Europe where we have the highest value in terms of firms' average import intensity (6%), import share (68.1%) and fraction of Italian total import (58.7%). Firms' import intensity from EFTA, US and Other developed countries is slightly lower than the export intensity, but the values for the average share of import are similar. Compared to export, firms' import share is higher for medium and low income countries: on average, around 23% of firms' import

[13]The standard approach to modeling bilateral trade volume is the gravity equation, which relates exports (imports) from country H to country F to the markets size of F and H, and measures of the geographical barriers between them, such as distance.

[14]The geographical area "Other Developed Countries" includes, among other, Japan and Australia.

Table 5: Pattern of export and import orientation

	Exporters							
	EU	EFTA	US	OtherDev	ACP	OPEC	NICs	CEECs
EU	85							
EFTA	53	57						
US	40	32	43					
OtherDev	57	43	36	62				
ACP	18	15	13	17	19			
OPEC	34	27	24	31	14	35		
NICs	49	38	34	44	15	29	52	
CEECs	48	37	29	42	15	27	36	52
	Importers							
	EU	EFTA	US	OtherDev	ACP	OPEC	NICs	CEECs
EU	89							
EFTA	34	37						
US	29	17	31					
OtherDev	27	17	15	30				
ACP	3	2	2	2	4			
OPEC	7	4	4	5	2	7		
NICs	22	13	13	13	2	4	23	
CEECs	22	12	11	13	2	4	10	24

comes from Central and Eastern European Countries. The role played by these countries in the importing activities has become more and more important for Italian manufacturing firms. This may be interpreted as a signal of the raise of outsourcing processes involving these areas, although specific data would be necessary in order to properly measure this phenomena and to single out delocalizing firms from the group of traders. Although medium and low income countries have seen an important increase in firms' import share from 1993 to 1997 (not shown in the Table), their importance in the total import of Italy is still small (19%) compared to those of high income countries (81%).

Having looked at the average firm's export and import intensity by foreign market, we now examine the number of firms across destinations and markets of origins, i.e. the extensive margin. Recent empirical analyses have observed that the effect of distance and income on bilateral trade flows operates mainly through adjustments on the extensive margin rather than on the intensive margin (Bernard et al., 2007; Andersson, 2007; Mayer and Ottaviano, 2007). Table 5 provides information on the extensive margin, by showing the average percentage of exporters (upper part) and importers (lower part) trading with the most important markets. On the main diagonal one can read the percentage of firms exporting to (importing from) on of the eight markets, whereas lower off-diagonal values capture the frequency of exporting (importing) in two of the destinations selected. So, for instance, the first row tells us that, on average, almost all firms (85%) export towards EU countries, that 53% of firms export to EU and EFTA, 40% toward EU and US, and so on and so forth.

The analysis of both sides of trade, exports and imports, revels similar results as those found for the intensive margin. Suffice here to notice that, once again, we observe that the majority of traders sell and buy their products to high-income countries, especially EU, whereas a

lower fraction of the total number of firms trade with low income countries. However, while the percentage of exporters is relatively high also to developing countries (52% both for Nic and CEECs), it drops substantially in the case of import (23% for Nic and 24% for CEECs). Moreover, the percentage of firms exporting in two countries (value on the lower off diagonal) is higher in the export than in the import case. The first result could be view with the lens of the Italian specialization pattern according to which firms source from abroad mainly high-technological capital goods, and that this is more likely to happen from developed rather than developing countries. Moreover, the fact that there is a minor number of firms importing from more than one country is a signal of the lower geographical diversification of importers relative to exporters. These results are in line with the finding of Castellani et al. (2009) where we observed that importers tend to diversify less in terms of countries of origins than exporters do in terms of destinations, and a higher diversification on the import side is strongly associated with higher productivity at the level of the firm.

Figures in Table 5 allow us to compare the probability of export to a destination given the fact that a firm exports to another particular destination. Let us compare, for instance, the probability of exporting to the various destinations given that a firm exports to US with the probability of exporting to the various destinations given that a firm exports to EU. The 47% of firms exporting to EU also export to US (40/85), while the 93% of firms exporting to US also export to EU (40/43). The 67% of firms exporting to EU also export to Other Developed (57/85), while the 83% of firms exporting to US also export to Other Developed (36/43). The same pattern holds true comparing the other destinations, given exporting to EU or US. This fact signals that there is a hierarchy of markets: firms that are able to export to US have a higher probability to export to other markets with respect firms exporting to EU. This hierarchy could be related to market specific sunk costs. US is a more unfamiliar and distant market and therefore firms that are able to bear the sunk costs that are necessary to export overseas can also bear the lower sunk costs associated to exporting to other destination (including EU). Another explanation could be related to the different degree of competition that characterize the various markets. One can probably argue that firms able to succeed in the tight US markets are efficient enough to sell their products also to other less developed countries. Similar results are found for importers, reported in lower part of Table 5.

4.2 Traders premia across markets

How are firms' performances influenced by the specific characteristics of markets where exports are directed to and imports originate from? In this section we investigate the heterogeneity within the traders category, concentrating on the variety of countries with which a firm trades. As discussed in the introduction, there are several reasons which could make trade premia market-specific. Firms trading with countries characterized by similar, political and cultural conditions may not have to be as efficient as firms trading with markets that are more "distant" in geographical terms and, even more so, in terms of cultural and institutional characteristics.

In order to investigate how firms' characteristics hinge on heterogeneity of target foreign countries, we first group traders according to the type of market served. As shown in Table 6 we distinguish between three macro geographical areas: *European countries* (EU); *High-Medium Income* countries (HMI) including Efta, US and Canada, Other developed countries, NICs and OPECs; and *Low Income* countries (LIC), consisting of ACP, CEECs, PECs and Other non developed countries. While the majority of firms trade with more than one market, there is a small number of firms exporting to (or importing from) just one group of countries. In order to identify if a firm trades within a certain macro area we look at how much of its total export

Table 6: Exporters and Importers difference across markets

	Exporters to				Importers from			
Panel A 90%	EU	HMI	LI	MC	EU	HMI	LI	MC
LP	74.4	74.4	66.6	76.5	75.9	69.6	59.4	81.9
TFP	109.9	115.9	102.2	120.6	107.7	106.4	93.3	133.0
N.Empl	78	102	107	147	86	83	81	169
CI	126.7	120.3	111.0	116.7	127.9	113.4	87.1	134.4
SLI	22.3	23.8	23.6	27.1	24.0	24.0	18.1	28.4
N.Obs	4637	1926	385	8321	5813	1612	368	6192
Panel B 70%	EU	HMI	LI	MC	EU	HMI	LI	MC
LP	76.1	73.5	69.5	75.9	77.8	72.2	65.1	82.9
TFP	115.5	115.4	106.1	119.8	113.6	113.0	104.0	137.6
N.Empl	103	104	109	164	105	88	80	194
CI	125.9	115.9	110.1	112.6	130.2	117.9	98.2	136.7
SLI	24.0	24.1	25.8	28.1	25.2	25.2	20.5	28.8
N.Obs	7984	2709	549	4027	7724	2508	625	3128
Panel C 50%	EU	HMI	LI	MC	EU	HMI	LI	MC
LP	76.0	73.6	72.9	77.0	78.4	78.4	71.6	86.4
TFP	116.9	115.4	109.2	118.7	116.5	116.5	112.2	147.5
N.Empl	119	112	145	140	128	128	95	131
CI	122.9	115.5	111.7	113.1	130.6	130.6	112.3	148.0
SLI	24.6	25.0	27.5	30.7	25.8	25.8	22.6	27.5
N.Obs	9976	3748	767	778	9028	9028	936	536

Note: EU= Trading with European countries; HMI= Trading with High Medium Income countries; LI= Trading with Low Income countries; MC= Trading with more than one group of countries

(or import) is directed toward that area. In Panel A (upper panel of Table 6), for instance, we define as *EU exporters* those firms that sell to Europe more than 90% of their export share. Similarly, *HMI exporters* and *LI exporters* are those directing more than 90% of their flows to high income and low income countries, respectively. The category *MC exporters* is given by firms that trade with more than one group of countries, i.e. those firms that export less that 90% of their total volume to one specific macro area. Following this procedure we are able to identify four mutually exclusive dummies, one for each macro area served by the firm. In the same way we built importers' categories. To check the consistency of our results we take into account slight different definition using as threshold of 70% and 50% of export (import) share, as shown in Panel B and Panel C, respectively. Obviously, the number of firms that falls in the EU, HMI and LI category increases as the trade share decreases, while the opposite is true for the MC macro area.

Table 6 shows the means of the various performance measures for firms exporting to and importing from the different markets. Overall the table suggests that, as expected, traders' characteristics crucially hinge on heterogeneity of target foreign markets. However, the comparison between Panel A, B and C reveals that, though firms' heterogeneity across export destinations and import of origins persists, it declines as the threshold imposed to define the market-categories decreases.

Both for export and import we observe that firms trading with more than one group of

countries (MC category) appear to be the most productive, the largest, the most skill and capital intensive. This result is consistent with the idea that firms' performances increase with the number of countries with which firms trade (Bernard et al., 2007; Castellani et al., 2009). In line with the theoretical model of Chaney (2008), firms with high performances can trade with a large number of markets. This could be mainly related to the high sunk costs that a firm has to incur to serve more than one group of countries. Results are consistent with respect to the various thresholds of trade share.

Results for exporters suggest that, as far as productivity is concerned, firms selling goods to European and High-Medium income countries tend to be comparatively more productive than LI exporters. The same sort of hierarchy emerges when looking at the capital intensive variable. Hence, there appears to be a positive relationship between firm's productivity and per capita income of export destinations. However, both in terms of productivity and capital endowments, results are more mixed when comparing HMI and EU traders. Firms selling goods to Europe tend to have higher level of labour productivity with respect to those exporting to HMI countries. This result seems to be simply the consequence of the higher level of capital intensity. In fact, an opposite pattern is observed when considering the differences between the two groups of firms in terms of total factor productivity. If we look at firm's size and workforce composition the picture is more blurred. Firms exporting to HMI and LI countries are, on average, bigger and more skill intensive than those selling to European countries.

Results for importing reveal instead a much more clear picture. Importing from developed countries (Europe and HMI) is associated with better performances then sourcing from less developed countries. This is true for all the variables under analysis.

Of course, data in Table 6 only allow for a rough comparison. In order to shed further light on the relative importance of market heterogeneity and to see how the variety of countries is related to trading firms' performance, we resort to parametric regressions where we control for additional sources of heterogeneity. The regression technique allows us to take into account the import and the export side simultaneously. We estimate the following expression

$$\begin{aligned} y_{it} &= \alpha + \beta_1 E_{it}^{EU} + \beta_2 E_{it}^{HMI} + \beta_3 E_{it}^{LI} + \beta_4 E_{it}^{MC} + \\ &+ \gamma_1 I_{it}^{EU} + \gamma_2 I_{it}^{HMI} + \gamma_3 I_{it}^{LI} + \gamma_4 I_{it}^{MC} + \phi controls + \upsilon_{it} \quad , \end{aligned} \tag{1}$$

where y_{it} denotes the logarithm (except for the skill intensity variable) of either firm productivity, size, skilled intensity or capital intensity. Es and Is denote the dummies for exporters and importers, trading with European countries (EU), high medium income countries (HMI), low income countries (LI) and more than one group of countries (MC). As usual, $controls$ is a vector including the log of firm's employment together with region and year dummies. Hence the β_i and γ_i coefficients represent the percentage premia for firms exporting to and importing from the various markets, with respect to the baseline category of non-internationalized firms. [15]

In Table 7 we will estimate equation (1) using Pooled OLS model. For all the regressions we run the F-tests for the statistical difference between firms exporting to (importing from) the three macro areas. The p-values of the test are shown in the lower part of Table 7.

[15]Since the dependent variable is in logs and the explanatory variable are dummy variables, the exact percentage differential is given by $(e_A^{\beta} - 1) \cdot 100$. In the case of SLI the coefficients are to be interpreted directly as percentage values, as the dependent variable is the percentage of white collars over employees.

Table 7: Trade premia by country. Pooled OLS regressions (1993-1997)

	LP			**TFP**			**N.Empl**			**Capital Intensity**			**Skill Intensity**		
	90%	70%	50%	90%	70%	50%	90%	70%	50%	90%	70%	50%	90%	70%	50%
E^{EU}	0.070***	0.079***	0.081***	0.025***	0.035***	0.045***	0.047***	0.147***	0.198***	0.198***	0.180***	0.164***	0.767***	1.569***	2.119***
	(0.008)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.011)	(0.011)	(0.010)	(0.018)	(0.017)	(0.016)	(0.272)	(0.253)	(0.244)
E^{HMI}	0.091***	0.072***	0.074***	0.072***	0.054***	0.050***	0.166***	0.150***	0.176***	0.186***	0.131***	0.111***	3.198***	3.269***	3.797***
	(0.009)	(0.008)	(0.007)	(0.009)	(0.008)	(0.007)	(0.015)	(0.013)	(0.012)	(0.020)	(0.018)	(0.017)	(0.313)	(0.280)	(0.259)
E^{LI}	0.064***	0.074***	0.081***	0.024	0.0319**	0.034***	0.187***	0.183***	0.198***	0.185***	0.176***	0.148***	4.407***	5.438***	5.919***
	(0.015)	(0.012)	(0.011)	(0.015)	(0.013)	(0.011)	(0.024)	(0.022)	(0.020)	(0.030)	(0.026)	(0.024)	(0.482)	(0.438)	(0.397)
E^{MC}	0.066***	0.076***	0.093***	0.032***	0.047***	0.032***	0.228***	0.287***	0.398***	0.073***	0.073***	0.077***	4.200***	5.240***	8.019***
	(0.007)	(0.008)	(0.010)	(0.007)	(0.008)	(0.011)	(0.011)	(0.013)	(0.022)	(0.017)	(0.017)	(0.023)	(0.258)	(0.277)	(0.413)
I^{EU}	0.166***	0.170***	0.169***	0.063***	0.074***	0.078***	0.152***	0.222***	0.261***	0.354***	0.340***	0.325***	3.246***	3.936***	4.432***
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.011)	(0.011)	(0.011)	(0.015)	(0.015)	(0.015)	(0.237)	(0.228)	(0.224)
I^{HMI}	0.085***	0.110***	0.130***	0.073***	0.092***	0.111***	0.041***	0.108***	0.196***	0.226***	0.254***	0.275***	3.300***	4.102***	4.849***
	(0.009)	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.014)	(0.013)	(0.013)	(0.020)	(0.018)	(0.016)	(0.335)	(0.305)	(0.281)
I^{LI}	-0.011	0.036***	0.085***	0.027**	0.059***	0.085***	0.016	0.107***	0.170***	0.029	0.096***	0.177***	-0.287	0.854**	2.359***
	(0.016)	(0.013)	(0.012)	(0.015)	(0.012)	(0.011)	(0.022)	(0.022)	(0.020)	(0.034)	(0.028)	(0.026)	(0.492)	(0.441)	(0.426)
I^{MC}	0.196***	0.192***	0.226***	0.151***	0.152***	0.202***	0.440***	0.466***	0.619*	0.362***	0.350***	0.384***	5.691***	5.905***	4.941***
	(0.007)	(0.008)	(0.014)	(0.008)	(0.009)	(0.016)	(0.013)	(0.016)	(0.033)	(0.016)	(0.018)	(0.032)	(0.269)	(0.298)	(0.525)
N.obs	96077	96077	94527	94921	94921	93387	96079	96079	94529	95618	95618	94074	96079	96079	94529
R^2	0.18	0.17	0.17	0.27	0.27	0.27	0.17	0.15	0.14	0.12	0.12	0.11	0.16	0.16	0.16
	F-tests for equality between coefficients														
$\beta_{EU} = \beta_{HMI}$	0.033	0.370	0.170	0.000	0.020	0.466	0.000	0.801	0.000	0.548	0.004	0.002	0.000	0.000	0.000
$\beta_{EU} = \beta_{LI}$	0.686	0.666	0.967	0.960	0.820	0.314	0.000	0.089	0.997	0.673	0.878	0.473	0.000	0.000	0.000
$\beta_{HMI} = \beta_{LI}$	0.087	0.895	0.261	0.003	0.099	0.098	0.442	0.163	0.277	0.998	0.098	0.098	0.022	0.000	0.000
$\gamma_{EU} = \gamma_{HMI}$	0.000	0.000	0.000	0.273	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.874	0.578	0.109
$\gamma_{EU} = \gamma_{LI}$	0.000	0.000	0.000	0.012	0.097	0.571	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$\gamma_{HMI} = \gamma_{LI}$	0.000	0.000	0.000	0.003	0.014	0.024	0.307	0.974	0.226	0.000	0.000	0.000	0.000	0.000	0.000

Note: Standard Errors in parenthesis below the coefficients. Asterisks denote significance levels (***: p<1%; **: p<5%; *: p<10%). All regressions include the log of employment (except regressions where the dependent variable is number of employees), as well as the foreign-ownership dummy,region and year dummies as controls. EU= Trading with European countries; HMI= Trading with High Medium Income countries; LI= Trading with Low Income countries; MC= Trading with more than one group of countries

While some of the previous conclusions are confirmed when examining the regressions coefficients in Table 7, other results change. Let us first compare the coefficients for the export side with those for import. An interesting pattern concerns the characteristics of firms trading with multiple countries. It is in fact worth noting that diversification of imports has the strongest association wih firm heterogeneity: firms sourcing from more than one group of countries are by far the most productive, the biggest, the most capital and skill intensive. The same result, that appears to hold before also for exporters, is less pronounce when resorting to parametric regression. Even if bigger than other firms, exporters to multiple countries are similar in terms of productivity. More generally, we found that importing matters comparatively more than exporting in explaining traders' differences reinforcing the idea that firms' heterogeneity can be better captured by analyzing trade flows in greater details, both with export and import.

Looking closer at the export side we observe that, in terms of labour productivity, there does not seem to be much difference between firms selling to various areas. Only in Panel A (90%) the productivity premia of HMI exporters is higher and statistically different from that of EU and LI exporters. However, when comparing the estimated parameters in Panel B and C we can not reject the hypothesis of equality between coefficients. A somehow different story seems instead to emerge from the total factor productivity analysis. As one might expect, companies exporting to high-income economies have the best performance and those exporting to low income countries the lowest. Moreover, while β_{HMI} is higher and statistically different than β_{EU} and β_{LI}, we can not reject the hypothesis of equality between β_{EU} and β_{LI}. The first of these two evidences may be related to the fact the technologically advanced markets, such as those in high income countries, are characterized by higher sunk costs. At the same time, these markets may offer higher productivity spillovers though exports. The second result, i.e. the similarity in productivity level between exporters to EU and LI, is consistent with the view that the closer a market is, the higher is the familiarity with its formal and informal institutions and the lower are the productivity level required to enter this market (Andersson, 2007). The analysis for size, capital and skilled intensity shows some puzzling results. Both in terms of size and workforce composition the higher coefficients are observable for exporters to low income countries. This is somehow at odds with the results emerged from firms' productivity. Moreover, the destination of export seems not to matter much when we consider exporters' capital endowments: the coefficients for the capital intensity variable are not pairwise statistically different.

Let us now turn to investigate the results for heterogeneity across firms that import from different countries. Some important regularities emerge from the data. Table 7 shows that importers sourcing from developed countries (EU and HMI) are more productive, bigger, more capital and skilled intensive than firms buying only from low income countries. As suggested in Section 2 this result could be related to the type of products imported from these countries. According to the international trade data of NBER-UN World Trade Data (Feenstra et al., 2005), Italian imports of specialized capital goods (and more in general of capital goods) are mainly sourced from producers based in the most industrialized countries (in particular from Europe).[16] Indeed, to the extent that buying high-tech capital goods requires the accumulation of absorptive capacity, this fact could explain why import activity from

[16]In 1993, about the 80 per cent of Italian imports value of Machinery (the SITC rev.2 sectors 7111 to 7849) came from developed European countries, while this percentage was of about 10 per cent for the aggregate of other non-European developed countries. Very similar percentages hold true if we concentrate on Machinery and Equipment Specialized for Particular Industries (the SITC rev.2 sectors 7281 and 7284)(Feenstra et al., 2005).

Table 8: Total factor productivity premia by country: sectoral analysis for Panel B

	E^{EU}	E^{HMI}	E^{LI}	E^{MC}	I^{EU}	I^{HMI}	I^{LI}	I^{MC}	N.Obs
Food, Beverages	0.014	**0.057**	-0.026	**0.052**	**0.104**	**0.098**	**0.141**	0.137	6617
Textiles	**0.077**	**0.077**	0.002	**0.083**	**0.111**	**0.079**	**0.166**	**0.154**	8527
Wearing, Apparel	**0.187**	**0.111**	**0.084**	**0.236**	**0.135**	**0.063**	**0.128**	**0.239**	6764
Leather, Allied Product	**0.133**	**0.142**	0.026	**0.152**	**0.149**	**0.089**	**0.072**	**0.241**	4998
Wood Manufacturing	0.029	**0.067**	0.024	**0.076**	**0.086**	**0.139**	0.015	**0.161**	2532
Paper, Allied Product	0.039	0.002	0.096	0.021	0.011	0.045	-0.008	**0.111**	2269
Printing, Publishing	0.014	0.009	**-0.140**	-0.062	**0.130**	**0.110**	0.059	0.054	3364
Rubber, Plastics	**0.052**	**0.091**	0.037	**0.071**	**0.069**	0.036	-0.027	**0.077**	5094
Non Met. Min. Products	-0.038	-0.007	0.012	-0.023	**0.086**	**0.002**	-0.006	**0.189**	6150
Basic Metals	-0.006	-0.013	0.070	0.001	**0.054**	**0.100**	**0.130**	**0.135**	2852
Metal Product	**0.054**	**0.054**	0.014	**0.036**	**0.087**	**0.062**	-0.004	**0.091**	12014
Industrial Machinery	0.009	**0.026**	0.035	0.018	**0.043**	**0.045**	**0.057**	**0.061**	12188
Electrical Machinery	**0.094**	**0.100**	0.024	**0.111**	0.030	-0.001	0.049	0.036	4153
Radio, TV, etc.	0.004	0.019	0.015	-0.022	0.067	**0.054**	-0.009	0.059	1215
Med., Prec. and Opt. Instr.	**0.102**	**0.111**	**0.104**	**0.103**	0.054	**0.042**	-0.078	**0.080**	2061
Motor Vehicles	0.028	0.021	-0.027	0.020	0.065	**0.048**	0.128	**0.092**	2020
Forniture Manufacturing	**0.040**	**0.029**	0.019	**0.036**	**0.081**	**0.050**	0.029	**0.112**	7261

Note: Bold coefficients are statistically significant at 5% confidence level. All regressions include the log of employment, as well as the foreign-ownership dummy,region and year dummies as controls.EU= Trading with European countries; HMI= Trading with High Medium Income countries; LI= Trading with Low Income countries; MC= Trading with more than one group of countries

these countries is associated with high performance premia. In other words, if imported goods are technologically complex intermediate inputs or machinery, importing firms should have developed an adequate absorptive capacity, in terms of technological capabilities, to integrate such inputs and capital goods into their production process. As a consequence, importers from EU and HMI display relatively better characteristics. At the same time, the relatively higher import premia for these firms may also be associated to "learning by importing" effects, which are more likely to occur when firms import capital goods incorporating advanced technologies.

4.3 Robustness check

Overall, results of the previous section seem to confirm that differences among firms can be partly explained by the variety of destinations and countries of origin with which firms trade. However, the Manufacturing category mix together firms engaged in very different economic activities and operating in different markets, which are likely to differ in terms of extent of competition, organizational structure, corporate strategies and technological content, just to mention but a few of the possible crucial characteristics. Hence, an extension of the analysis to a finer level of sectoral disaggregation comes not only as an interesting exercise, but also a necessary step, in order to clarify if the observed aggregate picture is revealing of completely general features characterizing the Italian productive system or, rather, it comes out as a mere statistical artifact due to misleading aggregation of very diverse phenomena.

The relationship between firms' characteristics and market heterogeneity will be indeed further explored at the level of 2-digit industries.[17] In Table 8 we show the estimates of equa-

[17]We report the regressions only for Panel B (70%). Results for the other two panels are similar and are available from the authors upon request.

Table 9: Total factor productivity premia by country: quintile regression for Panel B

	OLS	**Quintile Regressions**				
		10%	25%	50%	75%	90%
E^{EU}	0.079***	0.072***	0.078***	0.038***	0.006	0.013
	(0.007)	(0.009)	(0.006)	(0.006)	(0.006)	(0.009)
E^{HMI}	0.072***	0.082***	0.081***	0.050***	0.038***	0.051***
	(0.008)	(0.010)	(0.007)	(0.006)	(0.007)	(0.011)
E^{LI}	0.074***	0.070***	0.076***	0.064***	0.0222*	0.006
	(0.012)	(0.017)	(0.011)	(0.011)	(0.012)	(0.017)
E^{MC}	0.076***	0.109***	0.101***	0.045***	0.0114	-0.002
	(0.008)	(0.009)	(0.006)	(0.006)	(0.007)	(0.010)
I^{EU}	0.170***	0.058***	0.054***	0.068***	0.079***	0.080***
	(0.007)	(0.008)	(0.006)	(0.005)	(0.006)	(0.009)
I^{HMI}	0.110***	0.071***	0.085***	0.091***	0.104***	0.119***
	(0.008)	(0.010)	(0.007)	(0.007)	(0.008)	(0.011)
I^{LI}	0.036***	0.088***	0.071***	0.061***	0.070***	0.050***
	(0.013)	(0.016)	(0.011)	(0.010)	(0.012)	(0.017)
I^{MC}	0.192***	0.129***	0.123***	0.134***	0.165***	0.187***
	(0.008)	(0.010)	(0.007)	(0.006)	(0.007)	(0.010)
N.obs	96077	94921	94921	94921	94921	94921
R-squared	0.17	0.130	0.157	0.170	0.18	0.18

Note: Standard Errors in parenthesis below the coefficients. Asterisks denote significance levels (***: p<1%; **: p<5%; *: p<10%). All regressions include the log of employment (except regressions where the dependent variable is number of employees), as well as the foreign-ownership dummy,region and year dummies as controls.EU= Trading with European countries; HMI= Trading with High Medium Income countries; LI= Trading with Low Income countries; MC= Trading with more than one group of countries

tion (1) using as dependent variable the logarithm of total factor productivity, run for each of the 2-digit sector. Previous results are confirmed also at a finer level of disaggregation. On the export side we confirm the existence of a significant and positive relationship between exporting to High Medium income countries and firm's productivity. With only some exceptions the coefficient for the LI exporters are not statistically significant.

Even more interesting are the results for import. The estimates seem in fact to be supportive of two different sectoral patterns. While for a group of sectors such as Food and Beverage, Textiles, Wearing and Apparel importing from LI countries is associated to firm's high productivity (in some cases even higher than those reported for firms sourcing from HMI and European countries), for some other industries, such as Printing, Rubber Plastics, Non Metallic mineral products, Metal products, Radio TV, Optical instruments the opposite is true. Firms that belong to the first group of traditional industries are more likely to outsource from low income countries labour intensive inputs at a lower cost. This, in turn, may determine a reduction in production costs and an increase in firm's level efficiency. Whereas, firms belonging to the second group of sectors, which are more technological intensive, are likely to import high-tech capital goods from high and medium income countries. Hence, for these firms the higher productivity premia could be associated to the fact that they need to develop an adequate absorptive capacity, in terms of technological capabilities, to integrate such inputs and capital goods into their production process, or because of stronger learning by importing effects.

Until now we have analyzed the impact of market heterogeneity on firms' characteristics by means of ordinary least square techniques. As a further robustness analysis we will try to

Table 10: Export and Import Starters

	Export starters	**Import starters**
Total	1246	1006
EU	445	580
HMI	381	265
LI	207	66
More Countries	213	95

Note: EU= Trading with European countries; HMI= Trading with High Medium Income countries; LI= Trading with Low Income countries; MC= Trading with more than one group of countries

ascertain, by means of quintile regression, if and by what extent this impact is varying. The focus on the average firms, as in the case of standard least square model, may hide important feature of the underlying relationship between market heterogeneity and firm characteristics. By contrast, the quintile regressions enable us to assess the impact of a independent variable at different point of the conditional distribution of the dependent variable (see Koemker, 2005, for an introduction to quintile regression techniques). As in the sectoral case we will limit the analysis on the total factor productivity variable and for Panel B. The numerical results for OLS and quintile regressions estimation are presented in Table 9.

Different results are obtained for exporters and importers. In the first case, the coefficients are much larger at the lower quintiles, especially for firms selling goods to European and LI countries. This means that the effect of export, though always positive, are decreasing in productivity. The evidence here suggests therefore then when we consider low-productivity firms, investment in foreign markets make an important contribution to their productivity growth. This is even more true for those firms exporting to developed economies. The opposite is true for importing firms: even if imports is always associated to higher performance in terms of productivity the effect is stronger at the higher quintiles.

5 Self-selection

In this section we will test if the self-selection mechanisms, that are central in many heterogeneous firms trade models, differ according to the characteristics of the country of destinations and country of origins.

As largely discussed in Section 2, if the nature of entry costs, the product quality requirements and the future expected profits vary across markets, this will eventually translates into ex-ante differences in terms of performances between firm exporting to different countries. Exporting to distant and unfamiliar countries may, for instance, entail *ceteris paribus*, higher entry costs. Alternatively, exporting to high productive and rich countries could require higher efficiency and product quality. Finally, markets size could be positively correlated with future expected sales and profits. On the import side, we expect that firms importing from distant countries face comparatively higher entry costs. Similarly, if the complexity and the quality of the imported products are positively correlated with the productivity level of the country of origin, higher competences (absorptive capacity) are required by those firms importing from developed countries.

The strategy we use to analyze these possible self-selection mechanisms is to compare the

characteristics of firms that start trading with those of non-traders, some years before entry into foreign markets. This methodology has been largely applied to test the hypothesis of selection into export (Bernard and Jensen, 1999a; Wagner, 2007; The International Study Group on Export and Productivity, 2008). In this section, we follow and enrich the same approach. As a first step we distinguish between three different groups of firms, according to their foreign market participation pattern. First, the group of import starters, as those firms that do not trade between $t-3$ and $t-1$ and start importing in year t. Similarly, the group of export starter is made by firms that do not trade between $t-3$ and $t-1$ and start exporting in year t. As third group we select in our sample firms that serve exclusively the domestic market for the entire period, which we name the non-traders. Since the database used in the empirical analysis covers five years, from 1993 to 1997, we can create two cohorts of import and export starters, those that begin in 1996 e in 1997, respectively. Table 10 reports the number of starters: we obtain in total 1006 firms that enter into the import market and 1246 into the export markets.

As a preliminary exercise, we regress the (log) value of various firm's characteristic at time $t-\rho$ on dummy variables indicating if a firm is an import (export) starter at time t and distinguishing among countries of origin (destination). To define an export (import) starters to a certain geographical macro area we take the 70% threshold of export (import) share, as done for Panel B. Hence, for instance, the dummy E^{EU} equals one for firms starting to export at least 70% of their export share towards European countries. Hence, we estimate the following regression

$$\begin{aligned} \ln(y)_{i,t-\rho} &= \alpha + \beta_1 E_{it}^{EU} + \beta_2 E_{it}^{HMI} + \beta_3 E_{it}^{LI} + \beta_4 E_{it}^{MC} + \\ &+ \gamma_1 I_{it}^{EU} + \gamma_2 I_{it}^{HMI} + \gamma_3 I_{it}^{LI} + \gamma_4 I_{it}^{MC} + \\ &+ \theta_B Controls_{it-\rho} + \upsilon_{it} \qquad \text{with } 1 \leq \rho \leq 3 \end{aligned} \tag{2}$$

where *Controls* includes dummies for year, sectoral and regional effects.

The estimation results are broadly consistent with our predictions(Table 11). Firms start exporting to high-medium income countries are the most productive ones, together with firms that are characterized by a more mixed portfolio of destinations. Interestingly, we also found that LI export starters are more productive than EU starters. This result would seem to suggest that country's distant impacts more on productivity requirements than the development level. Similar results hold for other firm's characteristics. Firms start importing from relatively less developed countries (LI) are very similar to non-starters: they differ only with respect to skilled labor intensity, being greater for LI starters at $t-3$. However, new importers from relatively more developed countries (EU, HMI) markedly outperform the control group. Overall, this preliminary analysis indicate that self-selection mechanisms occur from market to market and that each foreign market is associated with a productivity threshold.

The aim of our second exercise is to explore some of the underlying sources that make entry costs market specific. To do that we explicitly take into account some countries characteristics which, as largely discussed in the previous sections, are likely to influence firm's decision to invest in one market rather than another. In particular, we take into account the following variables: population, nominal exchange rate, labor productivity and distance (POP, ER,PROD and DIST).[18]

[18]Data on population, nominal exchange rate and labour productivity are from the Penn World Table 6.2 : POP, XRAT, RGDPWOK. Data on distance are from the CEPII database.

Table 11: Self-selection by country

	LP			**TFP**			**N.Empl**			**CI**			**SLI**		
	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$
E^{EU}	0.112***	0.090***	0.085***	0.101***	0.082***	0.074***	0.094**	0.103**	0.039	0.255***	0.239***	0.159***	0.951	1.242*	1.268*
	(0.022)	(0.022)	(0.022)	(0.023)	(0.023)	(0.022)	(0.035)	(0.034)	(0.031)	(0.053)	(0.055)	(0.059)	(0.697)	(0.739)	(0.675)
E^{HMI}	0.202***	0.158***	0.154***	0.222***	0.171***	0.166***	0.324***	0.272***	0.273***	0.438***	0.371***	0.338***	4.560***	4.544***	4.429***
	(0.029)	(0.029)	(0.026)	(0.031)	(0.030)	(0.027)	(0.057)	(0.054)	(0.049)	(0.063)	(0.060)	(0.064)	(1.060)	(0.982)	(0.997)
E^{LI}	0.142***	0.169***	0.116***	0.161***	0.193***	0.128***	0.296***	0.299***	0.262***	0.400***	0.351***	0.453***	4.277***	5.032***	3.718***
	(0.039)	(0.031)	(0.034)	(0.037)	(0.032)	(0.034)	(0.060)	(0.059)	(0.059)	(0.082)	(0.081)	(0.081)	(1.164)	(1.124)	(1.045)
E^{MC}	0.191***	0.139***	0.152***	0.173***	0.128***	0.139***	0.157**	0.171**	0.201**	0.312***	0.288***	0.430***	5.567***	5.762***	6.637***
	(0.044)	(0.041)	(0.043)	(0.045)	(0.043)	(0.045)	(0.070)	(0.063)	(0.070)	(0.085)	(0.077)	(0.087)	(1.160)	(1.321)	(1.209)
I^{EU}	0.141***	0.137***	0.119***	0.146***	0.133***	0.095***	0.161***	0.116***	0.082**	0.315***	0.277***	0.389***	2.068***	2.491***	1.215*
	(0.023)	(0.024)	(0.023)	(0.023)	(0.024)	(0.023)	(0.035)	(0.033)	(0.033)	(0.050)	(0.048)	(0.051)	(0.711)	(0.736)	(0.694)
I^{HMI}	0.138***	0.167***	0.114***	0.126***	0.155***	0.088**	0.147***	0.131**	0.076	0.300***	0.359***	0.337***	5.255***	3.996***	4.442***
	(0.040)	(0.031)	(0.033)	(0.039)	(0.032)	(0.034)	(0.051)	(0.051)	(0.048)	(0.075)	(0.066)	(0.073)	(1.353)	(1.137)	(1.302)
I^{LI}	0.094	0.038	0.048	0.095	0.039	0.053	0.128	0.104	0.117	0.084	0.085	0.187	4.668*	2.921	1.789
	0.066	0.080	0.051	0.063	0.081	0.049	0.103	0.086	0.087	0.187	0.159	0.165	2.763	2.519	2.154
I^{MC}	0.240***	0.110*	0.099	0.263***	0.156**	0.125*	0.457***	0.364**	0.332**	0.479***	0.180	0.006	9.300***	5.541**	6.077**
	(0.064)	(0.066)	(0.070)	(0.071)	(0.068)	(0.066)	(0.144)	(0.128)	(0.106)	(0.151)	(0.154)	(0.139)	(2.605)	(2.188)	(2.255)
N.obs	7739	10893	9869	7675	10793	9779	7739	10893	9869	7738	10891	9866	7739	10893	9869
R^2	0.454	0.454	0.443	0.423	0.419	0.407	0.133	0.114	0.120	0.448	0.440	0.400	0.410	0.397	0.375

Note: Standard Errors in parenthesis below the coefficients. Asterisks denote significance levels (***: p<1%; **: p<5%; *: p<10%). All regressions include foreign-ownership dummy, region, sectoral and year dummies as controls. EU= Trading with European countries; HMI= Trading with High Medium Income countries; LI= Trading with Low Income countries; MC= Trading with more than one group of countries

For each variable X we build a firm level indicator. The methodology employed in computing this indicator follows two steps.

In the first step we calculate, for each variable X, an index that aggregate country level information into geographical areas. [19] For each geographical area G, we compute an average weighting the country characteristics belonging to area G by the Italian's sectoral share of exports to country c.[20] For export the index $EX_{G,s}$ is given by

$$EX_{G,s} = \sum_{c \in G} X_c \frac{EXP_{c,s}}{EXP_s} \quad X \in \{POP, ER, PROD, DIST\} \quad ,$$

where X_c is the characteristics X of country c, $EXP_{c,s}$ is the Italian total export to country c in sector s, while EXP_s is the total export of Italy in sector s. [21] We follow the same procedure for import bulding the $IX_{G,s}$ index.

In the second step we compute the firm level index weighting the $EX_{G,s}$ by firm's export share to each geographical area G

$$Xe_i = EX_{G,s} * \frac{EXP_{i,g}}{EXP_i} \quad X \in \{POP, ER, PROD, DIST\} \quad .$$

Each index equals 0 if, in a given year, firm does not export or import, respectively. Similarly to the preceding empirical exercise, we regress the (log) value of various firm's characteristic at time $t-\rho$ on the above described indicators that summarize the characteristic of the geographical area a firms start to trade with at time t.

$$\begin{aligned} \ln(y)_{i,t-\rho} &= \alpha + \beta_1 POPe_{it} + \beta_2 ERe_{it} + \beta_3 PRODe_{it} + \beta_4 DISTe_{it} + \\ &+ +\gamma_1 POPi_{it} + \gamma_2 ERi_{it} + \gamma_3 PRODi_{it} + \gamma_4 DISTi_{it} + \\ &+ \theta_B Controls_{it-\rho} + v_{it} \qquad \text{with } 1 \leq \rho \leq 3 \end{aligned} \tag{3}$$

where $POPe$ ($POPi$) is the population index for the export (import) side, ERe (ERi) the exchange rate index for export (import), $PRODe$ ($PRODi$) the productivity index for export (import), $DISTe$ ($DISTi$) the distant index for export (import). *Controls* includes dummies for year, sectoral and regional effects.

In order to compare the magnitude of the coefficients and to interpret them as elasticities, Table 12 report the derivative of the $E(ln(y))$ with respect the log of the explanatory variables and the associated standard errors calculated at the mean values of the independent variables. [22]

The size of the future destination markets, $POPe$, is, *ceteris paribus*, negatively correlated with firm performances. Instead, at the import side, the size of the markets of origin, $POPi$, is always not statistically significant. This result indicates that selection is relatively lower for firms that start to export toward large markets. One can rationalize this result by arguing that the size of the destination market is positively correlated with expected sales and profits.

[19] This first step is required since at firm level we have access to information on firm's export and import to geographical areas rather than single countries.

[20] Sectoral level information at 3-digit on Italian' export and import by country are obtained by the Italian Statistical Office.

[21] For instance, we obtain for the characteristic "Population" an index for the sector "Textile" and the geographical area "Usa-Canada" which is given by the Italian's share of export to Usa in the textile industry multiplied by the population of Usa plus the Italian's share of export to Canada in the textile industry multiplied by the population of Canada.

[22] These calculations have been done by using the STATA command mfx.

Table 12: Self-selection and countries' characteristics

	LP			**TFP**			**N.Empl**			**CI**			**SLI**		
	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$	$t-3$	$t-2$	$t-1$
POP_e	-0.005***	-0.002***	-0.004***	-0.005***	-0.003***	-0.004***	-0.004	-0.003	-0.006**	-0.007***	-0.005***	-0.005**	-0.097**	-0.020	-0.086**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.048)	(0.045)	(0.041)
ER_e	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001*	-0.001	0.006	0.028
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.023)	(0.015)	(0.020)
$PROD_e$	0.012***	0.006***	0.005***	0.010***	0.006***	0.005**	0.006	0.007**	0.004	0.022***	0.016***	0.007	0.037	0.062	0.023
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.084)	(0.066)	(0.070)
$DIST_e$	0.010***	0.006***	0.008***	0.013***	0.008***	0.011***	0.020***	0.013***	0.018***	0.017***	0.011***	0.018***	0.422***	0.240***	0.343***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.005)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.094)	(0.070)	(0.080)
POP_i	-0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.002	0.000	0.000	0.004	-0.037	-0.034*	0.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)	(0.031)	(0.019)	(0.034)
ER_i	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001**	0.001***	0.001***	0.001***	0.000	0.003	0.005
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.004)	(0.005)
$PROD_i$	0.006***	0.006***	0.006***	0.007***	0.006***	0.004*	0.009***	0.005**	0.003	0.019***	0.016***	0.024***	0.087	0.122**	0.068
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.069)	(0.055)	(0.066)
$DIST_i$	0.005***	0.003**	0.001*	0.004*	0.002*	0.000	0.002	0.002	0.000	0.003	0.001	-0.004	0.222***	0.163***	0.172***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.004)	(0.066)	(0.047)	(0.061)
N.Obs.	7739	10893	9869	7675	10793	9779	7739	10893	9869	7738	10891	9866	7739	10893	9869
R^2	0.455	0.454	0.444	0.425	0.419	0.408	0.133	0.116	0.122	0.448	0.440	0.399	0.413	0.399	0.379

Note: Standard Errors in parenthesis below the coefficients. Asterisks denote significance levels (***: p<1%; **: p<5%; *: p<10%). All regressions include the log of employment (except regressions where the dependent variable is number of employees), as well as the foreign-ownership dummy,region, sectoral and year dummies as controls.

The exchange rate (Italian Liras for 1 unit of the foreign currency) of the future destination markets, ERe, is never statistically significant. However it is included in the regression because, in principle, we expect that selection is lower in markets where the home currency is relatively weaker. On the import side, we can instead notice that selection in terms of capital intensity is higher in markets where the exchange rate is less favorable to Italian Lira.

The development level of the future destination countries, $PRODe$, is positively correlated with starters productivity (both LP and TFP). Given that our measures of productivity are revenue based, the above result could be due to the fact that entering advanced countries markets requires high efficiency and/or to the fact that firms sell in these markets high quality goods at high prices. With respect to the other firm characteristics we do not have robust results across time periods. On the import side, we find that high productivity firms select in high productivity markets of origin of imports. If the productivity of the origin countries, $PRODi$, is positively correlated with the complexity and the quality of the imported items, this result would confirm the hypothesis that firms need to accumulate absorptive capacity to integrate in their production process relatively technologically complex inputs (Castellani et al., 2009).

Let us now consider the role of distance, $DISTe$ and $DISTi$. On the export side, we can notice that relatively more productive, bigger and more capital and skill intensive firms self-select in more distant markets. Exporting to more distant markets entails higher costs in terms of information and transportation, therefore only highly productive firms find profitable to enter these markets. Moreover, if product quality is positively correlated with capital and skill intensity (as for example in Hallak and Sivadasan 2008), we can interpret the above results as indicating that firms producing high quality goods self-select in distant markets. On the import side we find similar results: more productive and more skill intensive firms self-select in relatively more distant markets. Therefore information and transportation costs seem to be relevant also on the import side. Summing up, these section explicitly shows that the characteristics of import and export markets are an important determinant of the self-selection mechanisms both on the import and on the export side.

6 Concluding Remarks

The present paper has offered a portrait of Italian manufacturing firms that trade goods. The ultimate goal was to offer a comprehensive and empirically driven view about the possible determinant of intra-industry heterogeneity observed among trading firms. Exploiting a rich dataset that combines data on firms' structural characteristics and economic performance with data on their exporting and importing activity, we uncover evidence supporting recent theories on firm heterogeneity and international trade. We confirm that firms with different exposure to international markets have different performances, in terms of productivity, size, capital and skilled labor intensity. Moreover, we show that countries of destination and of origin matter in explaining the observed disparities in traders' performances.

On the export side, we observe higher productivity level for firms exporting to high medium income countries with respect to firms exporting to European and Low income countries. However, both in terms of size and workforce composition our resulst are more mixed, with firms exporting to low developed economies showing the relatively higher premia. More strong regularities emerge from the analysis of the importers behaviour. Firms sourcing from developed markets, as Europe and high-medium income countries, are those that exhibit the highest productivity premium, as well as skill and capital-intensity premia.

We claim that these results could be in principle the consequence of both self-selection mechanisms and post-entry effects which are market specific. Hence, in the second part of the paper we test if the self-selection mechanisms differ according to the type of markets with which a firm trades. Our results confirm that, both for exporters and importers, ex-ante trade premia are higher for those firms that start investing in more advanced economies. Findings for exporters can be rationalized with the fact that self-selection mechanisms are stronger for firm exporting to more distant and richer countries. The closer is a market the higher is the familiarity with its informal and formal institutions and the lower is the productivity level needed to enter this market. At the same time, markets in developed countries are generally more competitive than those in developing countries. Results for importers could be related to the type of goods sourced from developed countries, which are presumably high-quality and technological advanced goods. Hence, to the extent that buying high-tech capital goods requires the accumulation of absorptive capacity, this fact could explain why import activity from rich countries is associated with higher ex-ante performances.

As a final step, we look at the relationship between some countries' characteristics such as population, exchange rate, productivity and distance, and firms' characteristics. This type of analysis may be helpful in explore some of the underlying sources that make entry costs market specific. Indeed, our results suggest that country's development level and distance are correlated with the characteristics of both exporters and importers, confirming our previous conjectures.

All these results open up promising avenues for further investigation. Indeed, the analysis of market specific post-entry effect is left for future research.

Appendix 1: Firm level market information

Destination of export and Origin of import, by geographical area

List of geographical areas
Developed Countries (total)
European Countries
European Free Trade Association (EFTA)
US and Canada
Other developed countries
Non-Developed Countries (total)
Associated EC
African, Caribbean and Pacific (ACP)
Organization of Petroleum Exporting Countries (OPEC)
Newly Industrialized Countries (NICs)
Other non-developed countries
Other countries
Central and Eastern European Countries (CEECs)
Planned economies countries (PECs)
Other countries
Disaggregated information on European countries
France
Belgium and Luxembourg
Netherlands
Germany
UK
Ireland
Denmark
Greece
Portugal
Spain

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