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Costs of Trade and Self-selection into Exporting and Importing: The Case of Turkish Manufacturing Firms

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Abstract
This paper focuses on self-selection into trade by exporting and importing firms, and on the presence of differential variable and sunk costs between exporters and importers across different categories of imports. In addition the authors consider the role of intensive and extensive margins with respect to products or countries. They use a rich and recent dataset for Turkish manufacturing firms for the period 2003–2010. This allows them to provide a comprehensive analysis of firm heterogeneity and the connection between firm-level performance and international trade. They provide evidence on the remarkable heterogeneity across firms where only-importers (importers) perform better than only-exporters (exporters). They detect a self-selection effect for both importing and exporting firms with a stronger effect for importers. The results suggest that the nature of sunk costs varies between importing and exporting activities with importers facing higher sunk costs. Tariffs represent a potentially important source of variation in the variable costs of trading. When taking the tariffs faced by firms into account, the authors find that the self-selection effect associated with sunk costs is still present but greatly reduced with a smaller reduction for importers compared to exporters.

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Keywords Firm heterogeneity; self-selection; sunk costs; exports; imports

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1 Introduction

This paper analyzes the existence of self selection mechanism associated with both exporting and importing activities of firms in Turkey with a special focus on whether a stronger self selection mechanism is at work for importing activities than exporting activities. In order to get a better understanding of the mechanics at play, we search for the possible heterogeneity of both sunk costs and variable costs across firms by trading status. While doing so we aim to expand the empirical evidence on firm heterogeneity in international trade by offering a comprehensive analysis of Turkish firms' international trading activities. We further handle exporting and importing activities of firms along with their diversification patterns.

The international trade literature has witnessed a dramatic change over the past eighteen years where the focus has switched from the investigation of macro level agents to micro players of trade. In this context, firm heterogeneity in international trade has become a core topic. The microeconometrics of firms' engagement in international trade was pioneered by Bernard and Jensen (1995), Aw and Hwang (1995) and Roberts and Tybout (1997). The theoretical framework underlying the literature has been largely stimulated by the seminal works of Melitz (2003) and Bernard et al. (2003). With the availability of firm level datasets a substantial empirical literature has shown that internationalized firms show superior performance to the firms who serve only the domestic markets[1]. The majority of the empirical literature exclusively focus on exports, with much less of a focus on imports. In particular, there are relatively few studies on the importing activity and firm-performance nexus for developing countries.

The big picture from this literature suggests that the superior performance of internationalized firms emerges via self-selection and post-entry effects. Regarding the latter, on the one hand firms become more efficient after they begin exporting through learning, or as a resuls of economies of scale via interaction with foreign clients, and being exposed to intensive competition in international markets. On the other hand, post-entry mechanisms of importing suggest a strong learning effect through importing intermediate and capital goods via international knowledge spillovers, variety effects and quality effects. The self selection hypothesis which emerges from the theoretical literature on export behavior of firms suggests that, due to the existence of sunk costs and different productivity levels within the same industry, only the most productive firms self-select into export markets. Similarly, the self-selection of more productive firms into import markets arises due to the fixed costs of importing. More recent literature on self-selection provides insights as to the possible heterogeneity of sunk costs and thus of self-selection mechanism

[1] See Greenaway and Kneller, 2007; Wagner, 2007, 2012 and Redding, 2010 for surveys of the empirical evidence.

across importing and exporting activities. While exporters face sunk costs linked to knowledge of markets, marketing and advertising, and the set-up of foreign distribution channels importers do not typically face these costs. Importers face greater informational asymmetries associated with imperfect monitoring of the quality of the imported goods, and the costs associated with transferring and utilising the embedded technology (Altomonte and Békés, 2009).

We utilize the most recent available dataset covering the whole population of Turkish manufacturing firms[2] with more than 19 employees matched with international trade data over the period 2003-2010. Being an emerging economy for whom trade has been an important driver of growth[3], our case constitutes an interesting quasi-natural experiment since our data covers a period in which Turkey experienced a trade boom and underwent a structural transformation in terms of its production and trade patterns. The process of integration of the Turkish economy into the world economy gained momentum following the positive stimulus from the Customs Union with the EU in the late 1990s and the EU's decision to start accession talks with Turkey in 2004 accompanied by abundant foreign capital inflows. Further, following a series of macroeconomic and structural reforms, the Turkish economy recovered relatively quickly from the negative shock of the economic crisis in 2001. We analyze the period after 2002, over which Turkey experiences this recovery and a dramatic export boom [4],[5]. In the meantime, Turkey has undergone a structural transformation process both in terms of production and trade patterns along with sectoral and geographical diversification[6].

[2]Over the period the share of Turkish manufacturing industry in GDP was 23.5 percent on average. While manufacturing industry constituted 13.5 percent of overall employment in Turkey, it generated 93.5 percent of the total export volume. Although it has subsequently declined to around 80 percent of total exports, with this share Turkey is second to only China among the BRIC countries in terms of the share of manufacturing in exports. With such a large share the manufacturing industry plays an important role in determining Turkish export performance.

[3]Turkey is an upper-middle income country who is the 16^{th} in the World and 6^{th} in Europe. It grew with an average annual real GDP growth rate of 5 percent over the past decade. As the GDP levels more than tripled to USD 786 billion in 2012, up from USD 231 billion in 2002, GDP per capita rised to USD 10,504, up from USD 3,500 between 2002 and 2012 whereas foreign trade volume constituted 49.5 percent of its GDP on average over the given period.

[4]Turkey's total trade volume increased from $88 billion in 2002 to $389 in 2012, an increase of 342 percent in a decade's time. Turkey's exports increased by 325 percent (to $153 billion from $36 billion) over the same period. This compares to the average export performance of its peers in the same income group (Brazil, China, Mexico, and South Africa) whose exports grew by 212 percent in the same period.

[5]Due to the global financial crisis, being an open and free market economy Turkey was adversely affected by the declining external demand and falling international capital flows similarly to other emerging markets. Turkey experienced a decline in its export volume by 33 percent between 2008 an 2009

[6]2002-2012 period witnesses a structural shift away from traditional export sectors of textiles and clothing towards machinery and metals. A transition across destination markets occurs

We add four main contributions to the literature on trade and firm heterogeneity. First of all, to the best of our knowledge our paper is the first attempt to investigate self-selection mechanisms for Turkey. There are limited number of studies that simultaneously analyze import and exporting behavior with even more rare evidence on self-selection of importing especially for less developed countries (see Table 2 of Wagner 2012). In this study, by exploring the Turkish case we therefore expand the literature on self-selection into trade for emerging developing countries. In exploring the self-selection effects at work we control for the importing status of exporting firms and vice versa which is commonly neglected in the debate. This strategy enables us compare the strength of self-selection effects associated with importing and exporting activities[7]. Secondly while exploring the role of self-selection effects, and unlike previous papers, we take variable costs into account. Accordingly, we assess the impact of including variable costs (those associated with tariffs) on the size of the estimated sunk costs, and show that including these costs does impact on the results. Thirdly and building on the literature suggesting a link between productivity and product complexity, we investigate the differentials between sunk costs for importing/exporting of capital, intermediate and consumption goods. Finally, we assess and find a differential role for the product and country intensive margins on the productivity of importers and exporters.

Overall, in line with existing evidence we show that firms that engage in both sides of the trading activities perform better than the ones involved only in one side of trade, whereas all types of internationalized firms outperform the non-internationalized firms. Our findings also suggest that obtaining more varieties of imported intermediates (either in terms of numbers of products or countries) has a bigger impact on firm performance than exporting to more countries or exporting more products.

The distinction between exporters and importers provides further evidence on the remarkable heterogeneity across firms, where only-importers (importers) perform better than only-exporters (exporters). Observing a more persistent behaviour for importers with respect to exporters, our data suggest higher sunk costs for importing activity than for exporting. Indeed, we detect a self-selection effect

where the EU and EFTA lose grounds towards new markets in the Middle East and North Africa (MENA) as well as in Europe and Central Asia.

[7]Such a comparison is crucial for firms operating in Turkish manufacturing industry for whom the most significant characteristic is its dependence on imported intermediary goods. For instance, in 2010 the imported component of Turkish manufacturing industry was 40 percent. Furthermore, in 2010 the growth of imports for manufacturing has surpassed the growth rate of manufacturing itself, implying that the dependency of the manufacturing industry on imports has increased. Sectors that grow above the average industry growth of Turkey typically have larger share of import component.

for both importing and exporting firms with a stronger effect for importers. In contrast with much of the literature which has failed to control for importing status of exporting firms and vice versa, when we take trading status of firms into account, we find that the self-selection effect is still present but greatly reduced with a smaller reduction for importers compared to exporters.

Next, employing a dynamic approach we account for sunk costs by means of past-trade experience and show that nature of sunk costs varies between importing and exporting activities, and that Turkish manufacturing importers face higher sunk costs in. Moreover, in contrast with the previous empirical literature which fails to control for variable costs of trade, our results signals that such costs may indeed constitute an important part of the story. Once we take tariffs which is an important component of variable costs into account, we find that the sunk costs for importing and exporting declines, with a smaller reduction for importers compared to exporters. We further show that the sunk costs are higher for capital goods, than intermediate and consumption goods for both of trading activities with higher sunk costs for importers in terms of each category.

The remainder of this paper is organized as follows. Section two briefly reviews the existing literature while section three introduces the data used in the empirical investigation. Section four gives some descriptive evidence on trading status dynamics, intra and inter-sectoral concentration and country and product extensive margins of exports and imports. Section five presents the empirical results. Section six concludes.

2 The Literature

The international trade literature has witnessed a dramatic change over the past eighteen years after Bernard and Jensen (1995) and Aw and Hwang (1995). These studies attracted the focus to the firm level analyses from country and industry-level studies. The initial microeconomic empirical literature examining international trade at firm level reveals that exporting firms perform better than non-exporters. More recently, further evidence of firm heterogeneity related to firms' importing activities is put forward (Halpern et al. 2005; Bernard et al, 2007; Kasahara and Lapham, 2008).

The empirical findings of the literature on firm performance and trading activities reached their solid theoretical basis with Bernard et al.'s (2003) and Melitz's (2003) general equilibrium models. These studies explain the mechanism of most productive firms' self-selection into export markets. According to their models, there is substantial heterogeneity of firms within narrow industry borders in terms of productivity, size and other firm characteristics. Melitz (2003) builds his monopolistic competition model onto the assumption that there exist additional costs

for the firms selling in international markets. Therefore, only the firms surpassing some threshold level of productivity can make positive profits in international markets. These costs, which are defined as sunk costs, are related to transportation and establishing new distribution channels. They constitute entry barriers and hence only the most productive firms self select into exporting. On the other hand, Bernard et al. (2003) advocates that self-selection into exporting occurs via variable trade costs. Moreover, market size and these variable costs can create self selection of productive firms into foreign markets regardless of the existence of sunk costs. There is a vast empirical evidence supporting self selection hypothesis (Roberts and Tybout,1997; Bernard and Jensen, 1999; Aw et al., 2000; Bernard and Wagner, 1997; Isgut, 2001, Delgado et al., 2002). Another observation of the regarding literature is that exporters tend to pay higher wages and benefits. Some scholars argue that this wage premia is a result of self selection into exporting. That is, if more productive firms self select into foreign markets it is natural to expect these future exporters to pay ex ante higher wages. For instance, Schank et al. (2010) show that wage premia exist for exporters some years before entry to the export market in Germany[8].

Besides the self selection mechanism indicating ex-ante productivity differences, some scholars explain the performance premia of exporting firms by learning by exporting hypothesis. This hypothesis originates from Arrow's (1962) learning by doing model. It suggests that exporting improve firm performance both via interaction with the foreign clients and being exposed to intensive competition in the international markets. This process creates positive learning effects pushing firms to the efficiency frontier with respect to the non-internationalized firms. Several studies find support for post entry mechanism (see among others Castellani, 2002; Baldwin and Gu, 2004; Girma et al., 2004; Van Biesebroeck, 2005; Isgut and Fernandes, 2007; Lileeva and Trefler, 2007; Serti and Tomasi, 2009; Maggioni, 2012). However, this evidence is numerically less, controversial and conditional on special circumstances compared to the self selection mechanism[9,10]. Regarding wage premia, from the point of learning by exporting; it is hypothesized that

[8]See also Serti et al. (2010) for Italy; Tsou et al. (2006) for Taiwan; Kandilov (2009) for Chile; and Amiti and Davis (2008) for Indonesia.

[9]For instance, while Clerides (1998) find strong support for the self selection hypothsesis, he finds no evidence for the learning by exporting in Colombia, Mexico and Morocco. In adition, in their emprical study Aw et al (2000) reveals that leraning by exporting mechnanism is evident in Taiwan but not in South Korea. In a different manner, in their empirical investigation of Spanish manufacturing firms Delgado et al. (2002) finds evidence for learning by exporting mechanism only for a supsample of young firms. In a cross country comparison, The International Study Group on Exports and Productivity (2008) finds hardly any evidence on learning by exporting while suggesting self selection for 14 European countries.

[10]For a detailed survey of the learning-by-exporting literature see Silva et al. (2010) and see Martins and Yang (2009) for a detailed analysis of 33 empirical studies.

exporting improves firm productivity leading to higher wages (Bernard and Jensen, 1999; Bernard and Wagner, 1997; Baldwin and Gu, 2004).

While there is a vast literature on the issue of firm heterogeneity from the exporting side, there are limited numbers of studies dealing with importing activities[11]. Although the literature is not yet well established, the literature on import premia also focuses on the self-selection mechanism of importing (positive effect of productivity on importing) and post-entry mechanisms (positive effect of importing on productivity). Self selection hypothesis builds on the observation that due to fixed costs of importing, only the firms above some productivity threshold could import where firms with high productivity levels offshore their production while low productivity firms limit themselves to sourcing from domestic markets. Similar to the self selection mechanism in the exporting case although the nature of these costs are different; they are also referred as sunk costs (e.g. search costs for foreign suppliers, inspection of goods, negotiation, contract formulation, learning and acquisition of customs procedures). Particularly, importers face greater informational asymmetries associated with imperfect monitoring of the purchased goods quality and cost of transferring the technology embedded into it (Altomonte and Békés, 2009). There is limited evidence on the self-selection into importing. Vogel and Wagner (2010) for Germany, Eriksson et al. (2009) and, Smeets and Warzynski (2010) for Denmark, Altomonte and Békés (2010) for Hungary find supporting evidence for the self selection mechanism of importing.

Regarding the post entry mechanisms of importing theoretical models (Grossman and Helpman, 1991; Eaton and Kortum, 2001; Acharya and Keller, 2007) emphasize a strong causality effect from importing intermediate and capital goods to firm performance via international knowledge spillovers, variety effect (higher productivity due to the access to more variety of inputs) and a quality effect (utilizing better quality inputs than domestic ones). Indeed, while there exists a large number of empirical studies for importance of knowledge spillovers through imports at the country and industry level[12], there remains limited number of studies at firm level. Kasahara and Lapham (2008) for Chile, Bas and Strauss-Kahn (2010) for France, Forlani (2010) for Ireland and, Paul and Yasar (2009) and Dalgıç et al. (2014) for Turkey provides empirical evidence for the post entry mechanisms of importing.

Firm heterogeneity entered the empirical literature with evidence on two way trading activities as well. In particular, there is a number of empirical studies combining firms' importing and exporting activities by classifying them as exporters only, importers only or two-way traders. The general finding of this recently devel-

[11] Early empirical literature focused exculusively on firms' exporting activities since exporting information of firms were reported more properly and comprehensively in censuses of production (Foster-McGregor, 2014).

[12] See the seminal works of Coe and Helpman (1995) and Coe et al. (1997).

oped empirical literature is that two-way traders are more productive than firms that either only import, only export, or do not trade at all (Muuls and Pisu, 2009; Andersson et al., 2008; Kasahara and Lapham, 2008; Vogel and Wagner, 2010; Smeets and Warzynski, 2010; Serti and Tomasi, 2009; Altomonte and Békés, 2009; Silva et al.,2012; Castellini et al., 2010, Foster-McGregor et al., 2014). Furthermore, there is a hierarchy in firm performance generally from two-way traders to importers and then to exporters, while the non-internationalized firms perform the worst.

Firm heterogeneity in international trade literature also tackles the issue at the dimension of concentration as well as firms' geographical and product diversification i.e. country and product extensive margins (see Mayer and Ottoviano, 2007). This view points out that trade is concentrated in a few firms within an industry where concentration of trade is followed by unequal productivity distribution of firms. For example, Bernard et al. (2007) reports that in US a high percentage of export volume is performed by a small number of firms which are very diversified in terms of products and destination countries. Muuls and Pisu (2009) also present evidence that exports of Belgium rely largely on a small number of firms. Empirically a similar pattern is proven to be available for importing activities (e.g. Damijan et al., 2004; Andersson et al., 2008). Regarding diversification of trading activities, the proponents of self selection mechanism emphasize that firms which are more diversified in terms of country and product margins are more productive with respect to less diversified firms. This view is again supported by the idea of additional costs of selling goods in foreign markets. As the product and country range expands these additional costs are expanded and thus only a small number of firms with better performance can serve more variety of products to more countries (Muuls and Pisu, 2009; Wagner, 2007; Lawless, 2009).

3 Data

This paper relies on a recent dataset based on two different sources of data collected by Turkish State Institute of Statistics (TURKSTAT). The first one is The Annual Industry and Service Statistics and the second one is Annual Trade Statistics. The Annual Industry and Service Statistics is a census of firms with more than 19 employees while it is a representative survey for firms with less than 20 employees. For this study, we select the whole population of private Turkish manufacturing firms with 20 employees or more[13]. It includes information on entry, exit and

[13]Firms with 20 and more than 20 employees account for a large share of Turkish manufacturing industry. For example, they constitute 87 percent of production in value and 75 percent of employment in 2009. It shows a similar pattern in the previous and following years. Moreover in the presence of sunk costs since trade activity is mostly performed by large firms our selection

missing values of some variables of the firms as well. In Annual Industry and Service Statistics dataset, firms are classified according to their main activity, as identified by Eurostat's NACE Rev.1.1 standard codes for sectoral classification[14].

The database provides detailed information on a number of structural variables which are mainly seen on a firm's balance sheet such as revenues, value added, labour cost, intermediate inputs cost, tangible and intangible investment costs[15] together with information on industry and geographical location, foreign ownership and the number of employees. We calculate capital stock series of firms applying the perpetual inventory methodology and using the data on investment cost series for machinery and equipment, building and structure, transportation equipment and computer and programming[16].

The second source of data we utilize is firm level foreign trade flows, which are sourced from customs declarations. The import and export flows are collected for the whole universe of the imports and exports at 12-digit GTIP classification the first 8 digits of whom correspond to CN classification whereas the last 4 digits are national. The information on the origin/destination countries of trade flows is also available in the dataset.

In order to conduct our analyses on firm level heterogeneity and international trade status of firms we merge annual industry and service statistics with annual foreign trade statistics. Our unbalanced panel covers longitudinal data of 38223 firms over the period 2003-2010[17]. Our sample is mainly constituted by small (62 percent) and small-medium firms (17 percent) whereas the rest of them are medium-large (21 percent)[18].

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does not create biased results.

[14]The economic activities that are included in the survey are the ones in the NACE sections from C to K, and from M to O.

[15]All nominal values are deflated using 4-digit NACE price indices with the base year 2003. For capital goods we use an aggregate investment deflator provided by the Ministry of Development. Wages are deflated by consumer price index.

[16]Initial capital stock is calculated by assuming that firms are at their balanced growth path and it is obtained by dividing the initial investment flow to the sum of depreciation rate and growth rate of output. For firms that reportzero investment in their initial year, it is assumed that they cannot be producingwithout capital. Therefore, initial capital stock is calculated at the year they reportpositive investment and this amount is iterated back to the beginning year bydividing capital stock each year.

[17]The original sample size in the merged dataset was slightly larger but we applied a cleaning procedure which is largely inspired by Hall and Mairesse (1995). We threw out the abnormal observations (zero / negative) for the main variables such as output, intermediate inputs, labor cost etc. Then, we excluded observations where main variables and ratios (e.g. employee, value added per employee, capital per employee) display extraordinary jumps and drops over one year. Finally, we excluded firms in NACE sectors 16 (Manufacture of tobacco products), 23 (Manufacture of coke, refined petroleum products and nuclear fuel), 30 (Manufacture of office, accounting and computing machinery), 37 (Recycling) since they include small number of firms.

[18]Firms with the number of employees 20-50 are defined as micro, 51-100 are defined as small,

Table 1 presents the number of firms and total number of employees in each year. On average we have 17000 firms over the analysis period. There is a big growth in the number of firms over 2003-2010. Accordingly, we observe that between the starting (2003) and the end period (2010) the entire sample of manufacturing firms has increased by 42 percent. The total number of employees hired by these firms was over 1232802 at the beginning of the period and reached 1957774 towards the end of the period. It is not surprising to observe a significant slump in the sample size in 2009 since Turkish economy was seriously hit by the global crisis in 2008.

Insert Table 1 *here.*

We utilize different indicators to assess the firm heterogeneity according to their trade status. We use two different measures for firm-level productivity. One is total factor productivity (TFP) calculated using the Levinsohn and Petrin's (2003) approach[19]. The other is the standard labour productivity (LP), defined as value added (gross output net of intermediate inputs) per employee. To measure the scale of operation or size we utilize total manufacturing sales (Sales) and number of employees (Employee). We define capital intensity (Capint) of the firm as the ratio of the capital stock to the number of employees. To proxy skill intensity, we use wage per employee (Wage_L).

4 Preliminary Evidence

In order to explore the linkages between firm characteristics and the internationalization status of firms we first classify the firms according to their trading status. We define the firms serving in the domestic market only as 'non-traders'; the firms engaged in exporting activities (including those that only export and those that not only export but also import) as 'exporters'; firms engaged in importing activities (including those that only import and those that combine their imports with exporting activities) as 'importers'; firms that do not export or import separately but are simultaneously involved in exporting and importing activities as 'two-way traders'. We define 'only-exporters' and 'only-importers' as well.

In Table 2, we provide descriptive evidence on our manufacturing industry panel, differentiating firms according to their participation in foreign markets. Over the period 2003-2010, on average 64 percent of all firms are internationalized. Two-way traders representing 39 percent of the whole sample constitute the

101-250 are defined as medium and 250+ are defined as large.

[19]Levinsohn and Petrin's (2003) methodology is a semi-parametric approach where TFP is measured as the residual of labour and capital under Cobb-Douglas technology, employing the firms' usage of intermediate inputs as a proxy variable for unobserved productivity shocks.

largest share of internationalized firms, while firms that engage in only exporting or only importing activities are a minority (only exporters, 11 percent and only importers, 13 percent). Exporting firms constitute 50 percent of the panel whereas importing firms' share is slightly higher with 52 percent on average. Different sample definitions in the related empirical literature make cross-country comparisons difficult. Nevertheless, Silva et al.(2013) working with Portugese data reveals a similar structure. In contrast other studies/contexts provide evidence on the relatively small or high share of exporting firms. For instance, Bernard et al. (2007) reports the share of exporters in the US manufacturing industry as 18 percent while Andersson et al. (2008) reports the share of exporters among whole Swedish firms as 83 percent. Bas et al. (2010) and Castellani et al. (2010) find somewhat different shares of exporters for France and Italy compared to our work. With an unrestricted sample, for Belgium, Muuls and Pisu (2009) reports the share of exporters as 41 percent, whereas with a restricted sample of firms with more than 20 employees ISGEP (2008) show that this share doubles to 84 percent.

Throughout our period of analysis the distribution of firms according to trading status stays fairly constant. For instance, the share of only-exporters stays in a range between 8.5-12 percent while share of importers stays in a range between 12.1-14 percent[20]. Column three of Table 2 shows that two-way traders are the most likely group to preserve their status. Yet, there is quite a lot of churning in terms of entry and exits. The share of entrants in 2010 with respect to 2003 is 94.5 percent[21]. The share of entrants is highest in only-exporters category, where the smallest share of entry has been realized by only-importers. Firms that were active in 2003 but not in 2010 (i.e. exiting firms/deaths) are evident in all categories with a share of 51.8 percent in total. Over the analysis period, the largest share of such exits has been realized by non-internationalized firms, which is consistent with the theoretical and empirical view that non-traders are at the lowest part of the productivity distribution (see Bernard et al., 2003; Melitz, 2003). Consistently, the smallest share of deaths is realized by the firms engaging in both sides of the trading activities which are shown to be at the highest part of the productivity distribution. Additionally, the rate of exits is higher for only-exporting firms compared to the only-importers (49.4 percent for only-exporters vs. 43.6 for the latter). This

[20]However, compared with previous studies with former data on Turkey the shares in this study are higher. For instance, our data also suggest that the share of exporters stays in a range between 46-54 percent while share of importers stays in a range between 49-54 percent. Maggioni (2012) finds this share of exporters to be in the range 25-31 percent, whereas the share of importers is found to be ranged between 26-33 percent over 1990-2001. This indicates the increasing internationalisation of Turkish firms

[21]For instance, there are 14788 firms in 2003 while 13968 firms entered to the sample throughout 2003-2010.

evidence might be attributable to higher productivity thresholds for only-importers relative to those of only-exporters, and for which we provide evidence later in this paper. Finally, Table 2 also presents that internationalized firms create a large share of employment in Turkish manufacturing industry.

Insert Table 2 here.

Table 3 presents the dynamics of continuing internationalized firms' switching between trading categories. Movements of firms between trading categories shows significant variation. We observe that it is easier for both only-importers and only-exporters to alternate between the two kinds of trading activities. Moreover, starting to trade as a two-way trader is a rare event for a non-trader whereas stopping to trade for a two-way trader is the least likely outcome.

Insert Table 3 here.

It is also interesting to see the trading status dynamics over the global crisis period (2007-2009)[22]. In 2009, the number of firms shrank sharply with the 2008 global crisis. Overall, over the period 2007-2009 the number of firms fell by 17 percent. When considering performance differentials in 2007, we find that the exiting firms are found to be smaller and less productive compared to the survivors. The main driver of the fall in the number of firms are the non-internationalized firms while the impact on two-way traders is minor[23]. Note also, that in our sample foreign affiliation is a significant property of internationalized firms, hence trading activities may linked to the intra-firm international fragmentation of production. Among the foreign affiliated firms approximately 85 percent are exporters.

The evidence highlights that trade is more concentrated than employment or sales (See also Castellini et al. (2010) for Italy; Muuls and Pisu (2009) for Belgium; Bernard et al. (2007) for US; Silva et al. (2013) for Portugal).[24] Compared with Silva et al. (2013) who utilize Theil indices for Portuguese manufacturing firms, trade is more concentrated in Turkey than. Unlike the Portuguese case but similarly to Belgium and Italy, trade concentration shows an increasing trend in over time. Investigating by sectors, while there is clear sectoral heterogeneity, trade is more concentrated than sales and employment, for every Turkish manufacturing sector. These findings could be attributable to inter-industry trade specialization

[22] A variety of transition dynamics between alternative pairs of years is available upon request.

[23] Our choice of the crisis period might seem arbitrary i.e. taking the last quarter of 2008 would be the best interval for defining the beginning of the crisis. However, since we do not have quarterly data, we defined the pre-crisis year to be 2007. Still, we also checked the firms' transitions from 2008-2009. The transition dynamics is similar for both choice of periods.

[24] Although not presented here, Gini and Theil coefficients confirm this finding for both exports and imports over the period 2003-2010.

(where trade is concentrated in few sectors) and also intra-industry trade specialization (where within the sector a subset firms carry out most of the trade). When we decompose the Theil index, it is the intra-industry component of the Theil index that explains the largest proportion of the concentration of trade i.e. trade is typically concentrated in a handful of firms within an industry. Although inter-sectoral components of our inequality measures in terms of exports and imports are low, exports are found to be concentrated mainly in six sectors (food and beverages, textiles, apparel, machinery and equipment, motor vehicles, basic metals) representing on average 73 percent of total export volume. Similarly, imports are concentrated mainly in four sectors (textiles, chemicals, motor vehicles, basic metals) representing on average 62 percent of total import volume.

We also investigate the diversification of trade along product and country extensive margins. The product extensive margin refers to the number of products that a firm exports/imports whereas the country extensive margin refers to the number of countries a firm trades with (Eaton et al., 2004; Mayer and Ottaviano, 2007)[25]. On average Turkish manufacturing firms export 10 products[26] and to 7 countries[27], whereas they import 17 products[28] and from 6 countries[29]. These figures are smaller relative to evidence for developed countries[30]. Turkish firms' diversification in terms of product and country extensive margins increase both for exports and imports between 2003 and 2009[31] with much less striking rates for imports. Moreover, the rate of diversification is much higher in terms of country extensive margins relative to product extensive margins.

There is also some evidence on a negative relationship between the extensive margins and number of firms. For instance Andersson et al. (2008) find that in Sweden as the number of countries and products that firms export (import) increases the number of exporting (importing) firms decreases. Muuls and Pisu (2009) for Belgium and Castellani et al. (2010) for Italy also find a similar relationship between the country and product extensive margins and number of firms. These empirical results are consistent with the theoretical view that exporters (importers) incur additional costs of engaging in foreign markets and thus only a small number of firms can exist in international markets. We confirm these stylized facts for Turkish firms as well. In Tables 4 and 5, we present the share of exporting firms

[25] Product correspons to a 6-digit HS category.

[26] A maximum of 423 different types of export products (HS6) are available in our dataset.

[27] A maximum of 110 different types of countries to export are available in our dataset.

[28] A maximum of 759 different types of import products (HS6) are available in our dataset.

[29] A maximum of 64 different types of countries to import from are available in our dataset.

[30] Investigating Belgian manufacturing firms Muuls and Pisu (2009), report that on average 12 products are exported and 34 products are imported, while Bernard et al. (2005) report that on average exporters sell 8.9 products and importers buy 10 products in US.

[31] We exlude 2010 from this growth calculations due to the crisis effect.

(importing firms respectively) along with country and product extensive margins in 2003 together with firms' share of trade volumes. We show that a small proportion of firms account for a high proportion of the value of trade and this can be seen both the product and country extensive margins. For instance, according to the upper panel of Table 4, in 2003 46 percent of all exporting firms serve in up to 5 countries and 5 products, whereas 2.5 percent of firms export more than 20 products to more than 20 countries. From the lower panel of Table 4 one can infer that this small share of firms performs approximately 41 percent of total export volume in Turkish manufacturing industry. Compared to the studies on other countries with extensive margins above 5, in general Turkish manufacturing firms seem to be more diversified. For instance, the percentage of firms that export more than 5 products to more than 5 countries is 20 percent for Hungary, 35 percent for France, 43 percent for Portugal, 50 percent for Sweden and 70 percent for Italy while in Turkey this percentage is 54 percent.

Insert Table 4 *here.*

Insert Table 5 *here.*

5 Empirical Analysis

5.1 Do internationalized firms perform better?

In this part of the paper we continue to focus on some stylized facts in the recent trade literature. Our simple descriptive statistics presented in Table 6, are fully in line with the big picture that emerges from the literature reviewed earlier. We show a clear ranking of firm types by performance from two-way traders to importers and then to exporters. In particular, we find that non-traders are less productive, are less capital intensive, smaller in terms of number of employees and sales and pay lower wages. Moreover, in terms of the criteria listed above two-way traders are the best performers. The discrimination between exporters and importers provides further evidence on the remarkable heterogeneity across firms. Only importers (importers) outperform only exporters (exporters).

Insert Table 6 *here.*

Next, we provide some empirical evidence on traders' premia, i.e., we present performance differentials between non-traders and trading firms controlling for other factors that could impact on performance. For instance, it is well established that larger firms are on average more productive than smaller firms or foreign

affiliated firms are on average more productive than firms that serve only to the domestic market. Furthermore, two-way traders are found to be larger and have a higher foreign affiliation share than non-traders. This raises the question whether the productivity differentials between non-traders and two-way traders arise simply because they are larger or have a higher foreign ownership share. To eliminate this bias, following Bernard and Jensen (1999) and several other studies, we explore the following relationship between firm level characteristics and international trading status with the OLS regressions presented below:

$$y_{it} = \alpha + \beta_1 D_{it}^{two-way} + \beta_2 D_{it}^{only-imp} + \beta_3 D_{it}^{only-exp} + \delta Controls + \varepsilon_{it} \qquad (1)$$

Where the subscript i denotes individual firms and t indexes year. The dependent variable y_{it} measures the logarithm of either firms' sales, number of employees, labor productivity (LP), total factor productivity (TFP), capital intensity or wage per employee. Dummies for the trading status are denoted by $D_{it}^{two-way}$, $D_{it}^{only-imp}$ and $D_{it}^{only-exp}$, respectively, dummy variables for a two-way trader, only importer and only exporters. We utilize a series of control variables denoted by the vector of controls including the logarithm of firm's employment, two-digit sector dummies, region[32] and year dummies. We also include foreign affiliation dummy, a dummy for the existence of foreign ownership as a control. The coefficients β_1, β_2 and β_3 in front of the trading dummies in equation (1) reveal the average trading premia in terms of various performance indicators. The traders premia are computed from the estimated coefficients as $100(exp(\beta) - 1)$, shows the average percentage difference in performance indicators between a firm in one of the three respective groups of trading firms and the non-traders, controlling for the characteristics included in the vector of controls. Equation (1) is also estimated with firm specific time invariant fixed effects, in order to deal with unobserved aapects of firm heterogeneity

The results from the pooled OLS regressions and FE regressions are reported in Table 7. Supporting the descriptive evidence above, the trade premia in terms of productivity, size, capital intensity and wages are of considerable magnitude and statistically significant. Specifically, internationalized firms have higher productivity levels, have higher capital intensity, larger in terms of employment and sales and pay higher wages than non-trading firms even after controlling for size, region, sector and time effects. In terms of the underlined performance criteria the magnitude of the trade premia coefficient declines significantly in the FE specifications pointing to the role of unobserved heterogeneity and the importance of firm specific factors. For instance, in terms of TFP while two-way traders are

[32]The region dummies identify 12 Turkish regions distrubuted according to the NUTS2 classification.

estimated to be 51 percent more productive than non-internationalized firms in the OLS specification, in the FE model this premia reduces to 14 percent.

In both the OLS and FE specifications, two-way traders have the highest premia for all performance indicators, followed by firms that only import, while firms that only export have the smallest estimated premia. Note that the hierarchy suggesting that two way traders perform best followed by only-importers, and then only-exporters and finally non-traders remains after the inclusion of time invariant fixed effects into equation 1. This performance ordering of firms is in line with general finding of the empirical literature using this workhorse model (Muuls and Pisu, 2009; Serti and Tomasi, 2009; Altomonte and Békés, 2009; Silva et al.,2012; Castellini et al., 2010) with a few exceptions of McCann (2009) and Vogel and Wagner (2010)[33]. The fact that importers are more productive than exporters can be attributed two different but not mutually exclusive explanations. The first is to do with self-selection effects and fixed costs; and the second is to do with the possible impact of importing on productivity. Indeed, regarding the latter Dalgıç et al. (2014) shows that importing has a greater impact on productivity compared to exporting in Turkish manufacturing industry where they construct treatment groups as firms that are involved only with import activities and only with export activities respectively[34].

Regarding the former, the advocates of the self-selection hypothesis suggest that only more productive firms will be able to import due to the fixed costs of importing. That the evidence from both descriptive statistics and regressions reflect higher performance premia for only-importers (importers) than only-exporters (exporters), may also suggest a stronger self-selection mechanism associated with importing at work with respect to exporting. Put differently, the fixed costs associated with importing might be higher than those of exporting. We therefore analyze the existence of the self selection mechanism with a special focus on the question of whether a stronger self selection mechanism is at work for importing activities than exporting in Turkish manufacturing industry.

Insert Table 7 here.

Note that, so far the analyses conducted provide correlations/associations between firm performance and international trade engagement as opposed to showing causality. The existing literature typically fails to employ dynamic specifications

[33]McCann (2009) and Vogel and Wagner (2010) finds that only exporting firms outperform only importing firms.

[34]They argue that this result is in line with the view that while importing intermediate and capital goods transfer foreign knowledge accumulation directly to the domestic production processes, learning by exporting is not an automatic process and exporting does not necessarily improve firms (see Albornoz and Ercolani 2007; Wagner 2012).

in to address possible issues of endogeneity. [35]. Therefore, in order to shed light on possible issues of endogeneity associated with the FE regressions, we test a dynamic specification, which also serves as a robustness check. Thus, we run a series of fixed effects regressions in which we incorporate the lagged dependent variable as an additional regressor. Including the lagged dependent variable may produce biased and inconsistent parameter estimates because of its correlation with the individual specific effects. In such cases, GMM estimators are generally used to account for this endogeneity source (Blundell and Bond 1998; Bond 2002). While a proper estimation procedure is to address this endogeneity problem via GMM methodology, in large samples as ours the standard results for the dynamic model indicate that the OLS levels estimator is biased upward, while the within-group estimator is biased downward (Bond 2002; Bernard and Jensen 2004). We report on the FE estimates with lagged dependent variables for equation 1 in Table 7. The results from the dynamic specifications are consistent with our previous finding indicating the positive correlation between firm performance and trade engagement as well as the clear pattern of performance ordering types of internationalization status. Further, the significant coefficient of the lagged dependent variables in these regressions confirms that a firm's performance history affects its current position.

5.2 Self-Selection and Sunk Costs: Exporting vs. Importing

When considering the relationship between firm performance and trading the issues of self-selection and post-entry mechanisms arise[36]. Tables 2 and 3 demonstrated that a substantial number of firms switch their internationalization status. This variation in our data signals the importance of identifying the self-selection mechanisms at work. In addition (i) in Table 2 we observe a more persistent behavior for importing firms with respect to exporters and, (ii) in Table 3 we observe that a higher percentage of importers switch to two-way trading than that of exporters switch to two-way trading. (i) and (ii) together suggest higher sunk costs for importing with respect to exporting in Turkey. In this part of the study, we therefore shed light on whether firms self select into trade and whether this effect is stronger for importing and we then shed light on the driving forces behind this.

We start with addressing the question whether being a trader is associated with firms' ex-ante superior performance. If more productive firms become traders then

[35] Silva et al.(2013) is the only study that employs such a dynamic specification in this context.

[36] In terms of post-enty effects there exists evidence on higher efficiency gains from importing with respect to exporting in Turkish manufacturing industry (see Dalgıç et al. (2014) for further discussion) .

we should expect to find significant differences in productivity between future trade starters and future non-starters several years before entry. In order to do so, we define an only-export-starter as a firm which had never traded in the previous two years ($t-2$ & $t-1$) and starts to exporting only in year t. In this way, we can compare firms that did not trade internationally in years $t-2$ & $t-1$ and start to export in year t with firms that did not trade at all. Only-import-starters and two-way-starters are defined similarly. We thus have six cohorts and each corresponds to a year between 2005 and 2010. To explore the pre-entry differences in various performance indicators between trade starters and non-traders we estimate the following equation with the usual controls:

$$y_{it-\rho} = \beta_0 + \alpha_i + \beta_1 D_i^{Starter} + \delta Controls_{t-\rho} + \varepsilon_{it}, \text{ with } 1 \leq \rho \leq 2.$$

where $D_i^{Starter}$ is a dummy variable taking value one if the firm is a starter and zero if the firm is always a non-trader. Results are reported in Table 8. The coefficients show the average percentage performance differential at t-2 between starters at t and firms with no international trade activity over the whole period. Overall, in line with the previous studies we find a self-selection effect for both importing and exporting firms[37]. Specifically, the results confirm that internationalized firms are ex-ante larger, more productive, more capital intensive and pay higher wages than non-traders. The performance premia is highest for two-way starters in terms of all criteria.

Note that, the pre-entry levels of the indicators are larger for only-import starters than those of only-export starters. For instance, two years before entering the import market, import starters are already approximately 32 percent more productive (in terms of TFP) than always non-traders[38] while export starters are 28 percent more productive than always non-traders. This suggests that importing-only firms exhibit ex-ante performance advantages with respect to those that export-only, in turn indicating a stronger self-selection for importing than exporting.

Insert Table 8 here.

Failing to control for the importing status of exporting firms and vice versa might lead to overstating the role of self-selection in exporting and importing respectively. Thus, we further investigate the performance premia of future two-way traders compared to future only-exporters and future only-importers. In this way, we account for importers that start to export by comparing firms that imported

[37] See among others Kasahara and Lapham 2008; Altomonte and Bekes, 2009; Castellani et al., 2010.

[38] The traders premia are computed from the estimated coefficients as $100(exp(\beta)-1)$.

but not exported in years $t-2$ and $t-1$ and start to export in t with firms that always imported but not exported at all. Similarly, we investigate the performance premia of exporters that start to import. In the regressions presented in Table 8, the coefficients show the average percentage performance difference at t - 2 between only-exporters that start to import (only-importers that start to export) at t as well and only-exporters (only-importers) that do not start to import at all. We find that when taking into account the importing status of export starters, the performance premium of export starters is still present but it is greatly reduced. Similarly, the performance premium of import starters is still present but with a smaller reduction in the coefficient compared to the export starters.

Hence, taking into account the importing / exporting status of exporter / importers respectively serves to accentuate the the higher productivity associated with importing in contrast to exporting firms. In addition, these findings indicate that initial pre-entry premia reported in Table 8 are likely to overstate the extent to which export and import starters had higher initial productivity levels. In particular, the inclusion of the importing decision lowers the pre-entry productivity premia from 28 to 7 percent for period $t-2$, while the performance premium of import starters declines less - from 32 to 21 with the inclusion decision. We therefore conclude that for Turkish manufacturing firms the self-selection effect is evident in both exporting and importing activities but is stronger with respect to importing. A limited number of studies control for the importing status of exporting firms or vice versa in investigating self-selection effect associated with entering into foreign markets. Following a similar analysis and using Hungarian data, Altomonte and Békés (2009) find that ex-ante productivity of importing is larger than that of exporting.

The evidence so far highlights that there is a stronger self selection effect at work for import starters compared to export starters. This might suggest sunk costs of importing are greater than that of exporting for Turkish manufacturing firms. Indeed, the recent literature on the self-selection mechanism provides insights for the possible heterogeneity of sunk costs across trading statuses of firms. While exporters assumed to face sunk costs linked to marketing and setup of foreign distribution channels importers do not face these typical costs. Importers are more likely to face greater informational asymmetries associated with the imperfect monitoring of the purchased goods quality and cost of using and transferring the technology embedded in their imports (see Altomonte and Békés, 2010).

Accordingly, we investigate the self-selection mechanism emphasizing the relative importance of the sunk costs and shed some light on the differentials between the sunk costs of importing and exporting. In order to do so, we estimate three dynamic models for firms that only-export, only-import and those involved in both activities. Following Roberts and Tybout (1997), Bernard and Jensen (2004) and

Muûls and Pisu (2009), we account for sunk costs by means of past trade experience where the coefficient of the lagged dependent variable is interpreted as a measure of sunk costs[39].

Melitz and Ottaviano (2008) and Bernard et al. (2003) show that even in the absence of sunk costs most productive firms would still self select into exporting i.e., sunk costs may not be the sole determinant of self selecting into international trade. Accordingly, the lack of any performance controls for self selection process would lead to overstating the role of sunk costs. Thus we include lagged TFP, wage per employee and number of employees to account for past productivity performance, scale of operation and skill level respectively as well as controlling for endogeneity. We estimate the following random effects panel probit regression:

$$P(y_{it} = 1, x_{it}, y_{it-1}, u_i) = f(\alpha + \rho y_{it-1} + \beta' x_{it} + u_i) \tag{2}$$

where subscript i and index t denotes the individual firms and years, respectively. The binary variable y_{it} indicates whether the firm is a trader or not in one of three subsequent forms (exporting-only, importing-only or being a two way trader); x consists of our firm level performance controls including the mean of these controls as well as region, sector and year dummies; u_i captures the firm level unobservables where f denotes the cumulative normal distribution and where u_i can be expressed as [40]:

$$u_i = \beta_o + \beta_1 y_{i0} + \beta_2 \bar{x}_i + \epsilon_i \tag{3}$$

The results of the random effects dynamic probit model are presented in Panel A of Table 9. As standard in the literature, we confirm that the more productive and the larger the firms are, the more likely they self select into trade. Wage per employee is found to positively affect the probability of importing-only or being a two-way trader, yet it is surprisingly insignificant for only-exporters. We find that Turkish firms face sunk costs of engaging into international markets and the nature of these sunk costs varies between importing and exporting activities[41]. Specifically, the coefficient associated with lagged export status is lower than of

[39] Kashara and Lapham (2008) built a theoretical expansion on Melitz (2003) and are the first to quantify the sunk costs of trading activities. They test their model for Chilean data and find higher sunk costs for exporting firms than importing.

[40] In order to deal with the initial condition bias existing in dynamic limited dependent variable models and the possible correlation between the controls and unobserved heterogeneity we utilize Wooldridge's (2005) methodology which models firm specific effects u_i as a function of the initial condition and other explanatory variables. Accordingly, the model becomes a random effects probit model.

[41] The initial trade status coefficients are high in magnitude and statistically significant correcting for the bias introduced by the 'initial condition' problem.

the importer coefficient suggesting that the sunk costs of importing-only are higher than the sunk costs of exporting-only for Turkish manufacturing firms.

Insert Table 9 here

On the other hand, one possibility behind the self-selection mechanism might be linked to variable costs of trade. As in Melitz and Ottaviano (2008) and Bernard et al. (2003) higher variable costs of trading will mean only more productive firms will be able to enter into trade markets. That is they present different selection mechanisms based on variable trade cost instead of sunk costs of trading. In their model setting, market size and variable costs determine the toughness of competition and hence the strength of the self-selection effect. Data from the World Bank Doing Business Surveys suggests that there are indeed higher costs of importing. Exporting a standard container of goods requires larger number of documents, takes more time and costs higher for an importing firm than with respect to those of exporting[42].Such data is not available neither at the product or bilateral levels. However, another key variable cost are the tariffs faced by the firms both with regard to importing and in export markets. In order to control for the variable costs of trading we re-run the dynamic probit regressions in Panel B of Table 9 including import and export tariffs[43] as additional controls.

The results in Panel B of Table 9 reinforces our previous finding that there is a stronger self-selection effect for importers than exporters. We see that when we control for tariffs, the coefficients representing the sunk costs for exporting and importing shrink to 0.921 and 0.959 from 0.878 and 0.949, respectively; and that the biggest narrowing takes place with regard to exporters. This suggests that the tariff-related variable cost elements is a more important component of the forces driving self-selection effect for exporters than with respect to importers. However, in addition, now the sunk costs of importing-only become relatively higher than previously in comparison to the sunk costs of exporting-only. Hence failing to consider the variable costs of trade may underestimate sunk cost differences.

Next, and given the previous finding that importing is associated with higher sunk costs we try and shed more light on the sunk costs that firms might face while selecting into trade markets. As mentioned before, Altomonte and Békés (2010) argue that importers face uncertainty in their trading relationships (e.g. with regard to the quality of the product). This uncertainty is likely to be higher the more complex is the good being traded; therefore fixed costs of trading are

[42]The data suggests that exporting a standard container of goods requires 7 documents, takes 13.0 days and costs $990.0. Importing the same container of goods requires 8 documents, takes 14.0 days and costs $1063.0 in 2010. Over 2005-2012, the period in which the data is available, one can see that cost of importing in all dimensions is higher that that of exporting for Turkey.

[43]Import and export tariffs at HS6 digit product category are collected from WITS-Trains database. We calculate firm level tariffs by weighting product-country level tariff information.

likely to be higher for more complex goods. They show that importers are more productive than exporters and associate this with higher import complexity. One way of looking at the complexity of goods is to classify them according to their final use. Therefore, we utilize United Nations' Classification by Broad Economic Categories (BEC) and define products traded in three broad categories as: consumption goods, intermediate goods and capital goods. Capital goods (e.g. machinery) are frequently more complex and may require after-sales service etc. with respect to other categories (Keller and Yeaple, 2008).

Descriptive evidence reveals that the share of capital goods imports in total imports is higher compared to capital exports in total exports for Turkish manufacturing industry thus Turkish imports seem to be more complex than exports. We distinguish betweeen three types of firms: capital goods importers/exporters; intermediate goods importers/exporters and consumption goods importers/exporters. An only-importer (only-exporter) firm is defined to be capital goods importer (exporter) if the share of capital goods imports (exports) in its total value of imports (exports) is equal or greater than 0.5. We define other categories similarly.

Table 10 presents the random effects dynamic probit regressions run with these categories of firms in question. We show that the sunk costs are higher for capital goods, than intermediate than consumption goods for both importers and exporters. For instance, the coefficient of the lagged dependent variable associated with sunk costs of importing-only are 0.992, 0.961 and 0.874 for capital, intermediate and consumption goods importers respectively. While, the coefficients associated with the sunk costs of exporting-only are 0.933, 0.925 and 0.873 for capital, intermediate and consumption goods importers respectively.

As the sunk costs of capital goods are higher, thie lends support to the notion that this arises because of the higher complexity associated with such imports (as in Altomonte and Békés (2010)). Note that in each case these coefficients are higher for importers with respect to those for exporters. Once again these results reinforce our previous finding that sunk costs, to the extent that they drive self-selection, are more important in the case of importing than exporting in Turkey. The hierarchy of sunk costs from capital to consumption goods traded remains even after controlling for tariffs which are associated with variable costs. Another result from Table 10 is that, in terms of importing when tariffs are included as a control, the smallest decrease in the sunk cost coefficient occurs for capital goods, whereas for exporting the smallest decrease is with respect to intermediate goods. This suggests that variable costs are a smaller component of the costs leading to self selection mechanism for capital goods imports in comparison to intermediate or fianl goods; and that the strongest self selection effect in terms of sunk costs are with respect to capital goods imports.

Insert Table 10 here

5.3 In search of diversification differentials: Exporting vs. Importing

The analysis so far has not addressed a key topic in the literature on firm heterogeneity in international trade, which assesses firms' the role of the diversification of firms in terms of geography and products. In this part of the paper, we therefore focus on those firms involved in both importing and exporting and explore the role of the country and product extensive margins in understanding diversification differentials between exporting and importing activities.

In Table 11, we compare the performance of two-way traders in terms of various firm characteristics. Here we group two-way traders according to their extensive margins. The first group consists of firms that trade less than 6 goods (countries), the second group consists of firms that trade 6-10 goods (countries), the third group consists of firms that trade 11-20 goods (countries) and the last group consists of firms that trade more than 20 goods (countries). We present the mean TFP and LP along extensive margins. Table 11 shows that the greater the number of either partners or products the higher is the level of productivity. For instance, the TFP of firms which export more than 20 products is on average 8 percent higher relative to the firms which export less than 6 products.

This differential is more significant on the import side than on the export side. Note Table 11 also shows that where the number of product or partners is low (e.g. 1-5), then the productivity is higher with regard to exporters than importers. As the number of either product or partners goes up, than the productivity associated with importers becomes higher than exporters. This could be linked to the hypothesis that more partners/products Turkey imports from, potentially the higher the fixed costs. This may be less of an issue on the export side, particularly as Turkey is largely exporting to EU markets with more open and easier access. Although the EU is also Turkey's major import partner, more distant countries such as China and United States have non-negligible shares in Turkey's imports[44]. In addition, on the import side, Turkey investment and intermediate goods comprise a high share of imports, and which are associated with higher sunk costs of trade relative to consumption goods[45].

[44] In 2013, top five export partners of Turkey are Germany, Iraq, UK, Italy and France whereas Russia, China, Germany, USA and Italy have the highest shares in Turkey's imports (Economic Outlook Report Ministry of Economy, 2013).

[45] In 2013, the share of investment and intermediate goods in exports of Turkey is approximately 60 percent while that share is 88 percent in imports.

Insert Table 11 here

However, in assessing the diversification of trade along country and product extensive margins one needs to control for other factors (e.g. sectoral or other firm characteristics) that could be associated with firm performance. Thus, we estimate the following specification controlling for the firm specific fixed effects:

$$y_{it} = \alpha_i + \beta_1 x_{it}^{NPE} + \beta_2 x_{it}^{NPI} + \beta_3 x_{it}^{NCE} + \beta_4 x_{it}^{NCI} + \delta Controls + \varepsilon_{it} \qquad (4)$$

where the dependent variable y_{it} measures the logarithm of either firms' sales, number of employees, labor productivity, total factor productivity, capital intensity or wage per employee. The variable x denote the product and country extensive margins (NPE, NPI, NCE, NCI, respectively) in logarithms. The vector of controls includes the logarithm of firms' employment, two-digit sector dummies, region and year dummies. Each regression covers the sample of firms which are two-way traders throughout the analysis period. The coefficients $\beta_1, \beta_2, \beta_3$ and β_4 in front of the margin variables in equation 4, show the elasticity of our selected performance indicators with respect to extensive margins. These elasticities are interpreted as diversification premium of traders.

Table 12 indicates that the greater is the number of products or partners, the larger, more productive the firms are and the higher wages they pay. This effect is most significant with regard to the import side. Specifically, the diversification of imports along country and product extensive margins creates larger premia than exports[46]. For instance, changes in the number of products imported would have a higher impact on productivity than changes in the number of products exported. A 1 percent increase the number of products imported (NPI) is associated with approximately 5.5 percent increase in labor productivity while a 1 percent increase the number of products exported (NPE) is associated with only a 1 percent increase in labor productivity. In terms of capital intensity the diversification premia is positively significant for imports while it is found to be insignificant for exports.

These findings suggest that obtaining more varieties of imported intermediates (either in terms of numbers of products or countries) is associated with a bigger impact on productivity than exporting to more countries or exporting more products. The former impacts directly on efficiency in production; whereas the mechanisms driving the latter are presumably linked with economies of scope. In fact, the use of imported foreign capital and intermediate inputs which embody

[46] In order to shed light on possible issues of endogeneity associated with FE regressions, we also test a dynamic specification as well as providing a robustness check. The results which are available upon request do not change substantially.

better technology is directly associated with technological upgrading and thus efficiency improvement (Damijan and Kostevc, 2010). In addition, the decision to invest in new technology can take place simultaneously with the decision of importing (Damijan et al., 2012). Both the existence of diversification premia and the more pronounced effect for imports results is also evident in Castellani et al. (2010) for Italian manufacturing firms and Silva et. al. (2013) for Portuguese manufacturing firms. They explain this differential as in order to enter new import markets, firms need to have the ability to value, assimilate and apply the new knowledge embodied in imports of high capital intensity.

Insert Table 12 *here*

6 Concluding Remarks

This paper uses a rich and recent dataset for Turkish manufacturing firms from 2003 to 2010 to provide the first comprehensive analysis of firm heterogeneity connecting firms' performances to international trade. More importantly, for the first time we investigate self selection into foreign markets systematically for Turkey and particularly focus on the differential among the nature of self-selection effect and the role of variable and sunk costs for importing and exporting.

Overall, in line with the big picture emerging from the existing literature we show that (i) a small proportion of firms account for a high proportion of the value of trade; (ii) firms that engage in both sides of the trading activities perform better than the ones involved only in one side of trade; (iii) all types of internationalized firms outperform the non-internationalized firms in Turkey. Descriptive analysis shows that although the distribution of firms according to their trade status stay fairly constant over the period in question, there is considerable churning in terms of entry and exit. The smallest share of exits is realized by firms engaging in both sides of the trading activities, with a higher rate of exits for only-exporting firms compared to the only-importers; suggesting higher productivity thresholds for only-importers relative to those of only-exporters.

Our preliminary regressions on trade premia also show a clear ranking of firm types by performance from two-way traders to importers-only and then to exporters-only. That the evidence from both descriptive statistics and regressions signal higher performance premia for only-importers (importers) than only-exporters(exporters), which in turn may suggest a stronger self-selection mechanism associated with importing with respect to exporting.

Indeed, we confirm a self-selection effect for both importing and exporting firms with a stronger effect for importers in Turkey. While doing so we show that: (i) being a trader is associated with firms' ex-ante superior performance; (ii)

the pre-entry levels of firm's performance indicators are larger for only-importers than those of only-exporters; (iii) the self-selection effect is still present but is somewhat reduced with a smaller reduction for importers compared to exporters after controlling for the importing status of exporting firms and vice versa; (iv) the nature of sunk costs varies between importing and exporting activities with importers facing higher sunk costs.

We show that the self-selection mechanism is associated with both variable and sunk costs. In particular, once we take the tariff related variable costs of trade into account, we find that the sunk costs for importing are even higher than for exporting. We further show that the sunk costs are highest for capital goods, than intermediate and consumption goods for both of trading activities, with higher sunk costs for importers in terms of each category.

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Tables and Figures:

TABLE 1

Number of Firms and Total Employment over 2003-2010

	Number of Firms	Number of Employee
2003	14,788	1232802
2004	16,446	1482741
2005	18,463	1717504
2006	19,536	1817297
2007	18,481	1874599
2008	17,926	1853687
2009	15,487	1631150
2010	21,089	1957774

TABLE 2

Trade Participation and Employment Rates by Trade Status

	Percentage of Firms					Percentage of Employees	
	2003	**2010**	**Same Status**	**Exit**	**Entry**	**2003**	**2010**
Non-Traders	40	38.23	16.7	72.3	111.7	14.3	19.6
Only-Exporters	8.53	11.98	16.3	49.4	148.5	4.4	5.9
Only-Importers	13.99	12.1	18.2	43.6	75.4	12.8	11.2
Two-way Traders	37.5	37.69	53.2	33.6	70.8	68.5	63.4
Total			30.5	51.8	94.5		

Notes: Columns 3,4 and 5 give percentage of firms according to 2003 values. The 3rd column gives those that had not changed status in 2010. Colums 4 and 5 show exit and entry of firms according to 2003.

TABLE 3

Transition of Firms Between Trading Categories (2003-2010)

	2003	Start Trading	Stop Trading	Switch	2010
Non-Traders	100	11.0	7.9		136.4
Only-Exporters	100	13.9	9.9	24.4	200.4
Only-Importers	100	9.3	9.2	29.0	123.3
Two-way Traders	100	5.1	2.8	10.4	143.3
Total	100				142.6

Notes: The Table 3 gives percentage of firms according to 2003 values. The first column reports the number of firms existing in each category in 2003. The next three columns report the switches of continuing firms in and out of each status The movements between non-traders and the three types of traders are reported in column 2 and 3, while in column 4 we report those traders that switch trading status.

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TABLE 4

Distribution of Exports Along the Extensive Margins (2003)

		NCE				
%Exporting Firms		1--5	6--10	11--20	21+	Total
NPE	1—5	46.4	6.9	3.9	0.9	58
	6—10	8.8	4.7	3.2	1.3	18
	11--20	5.2	3.6	3.2	1.8	14
	21+	2.3	2.5	2.7	2.5	10
	Total	63	18	13	6	100
% Export Volume						
NPE	1—5	4.8	3.8	3.9	2.5	15
	6—10	1.9	2.1	4.6	5	14
	11--20	1.7	2.8	5.2	8.9	19
	21+	1.3	3	7	41.3	53
	Total	10	12	21	58	100

TABLE 5

Distribution of Imports Along the Extensive Margins (2003)

%Importing Firms		NCI 1--5	6--10	11--20	21+	Total
NPI	1—5	49.8	1.6	0.1	0	51
	6—10	12.5	6	0.5	0	19
	11--20	5.3	9.3	2.9	0	18
	21+	1.9	5.9	11.7	4.3	24
	Total	70	23	15	4	112
%Import Volume						
NPI	1—5	3	0.5	0.1	0	4
	6—10	1.7	2.2	0.3	0	4
	11--20	1.1	3.8	2.4	0	7
	21+	0.7	4.3	24.4	55.6	85
	Total	6	11	27	56	100

TABLE 6

Firm Performance According to Trade Status (2003-2010)

	LP	**TFP**	**Employee**	**Capint**	**Wage_L**
Exporters	10.16	7.76	138.89	10.83	8.79
Importers	10.24	7.83	144.23	10.91	8.82
TW traders	10.29	7.87	164.06	10.96	8.86
Non-traders	9.49	7.17	48.93	9.97	8.51
Only-Exporters	9.67	7.35	47	10.34	8.53
Only-Importers	10.07	7.69	85.18	10.79	8.68

TABLE 7

Trade Premia Regressions (2003-2010)

	Sales			***Employee***		
	Pooled Regression	FE	Dynamic FE	Pooled Regression	FE	Dynamic FE
Two-way trader dummy	1.715***	0.293***	0.181***	0.770***	0.153***	0.0847***
	(0.00799)	(0.00901)	(0.00793)	(0.00535)	(0.00575)	(0.00464)
Only-export dummy	0.458***	0.123***	0.0725***	0.0667***	0.0505***	0.0252***
	(0.00932)	(0.00835)	(0.00781)	(0.00533)	(0.00523)	(0.00452)
Only-import dummy	1.211***	0.169***	0.112***	0.408***	0.0891***	0.0539***
	(0.0101)	(0.00809)	(0.00735)	(0.00661)	(0.00513)	(0.00431)
Observations	126922	126922	98056	127171	127171	98319
R-squared	0.380	0.097	0.187	0.209	0.065	0.278
	LP			***TFP***		
	Pooled Regression	FE	Dynamic FE	Pooled Regression	FE	Dynamic FE
Two-way trader dummy	0.647***	0.146***	0.129***	0.411***	0.131***	0.116***
	(0.00658)	(0.00976)	(0.0106)	(0.00679)	(0.0100)	(0.0108)
Only-export dummy	0.174***	0.0732***	0.0609***	0.0769***	0.0715***	0.0584***
	(0.00782)	(0.00976)	(0.0107)	(0.00834)	(0.0101)	(0.0109)
Only-import dummy	0.512***	0.0846***	0.0807***	0.314***	0.0773***	0.0720***
	(0.00813)	(0.00957)	(0.0103)	(0.00837)	(0.00988)	(0.0105)
Observations	115987	115987	87308	111645	111645	85446
R-squared	0.231	0.036	0.039	0.771	0.014	0.011
	Capint			***Wage_L***		
	Pooled Regression	FE	Dynamic FE	Pooled Regression	FE	Dynamic FE
Two-way trader dummy	0.962***	0.0696***	0.0488***	0.163***	0.0343***	0.0248***
	(0.0120)	(0.00879)	(0.00572)	(0.00296)	(0.00350)	(0.00377)
Only-export dummy	0.375***	0.0218***	0.0172***	0.00692	0.00934***	0.00417
	(0.0151)	(0.00833)	(0.00573)	(0.0316)	(0.00339)	(0.00373)
Only-import dummy	0.792***	0.0538***	0.0416***	0.0994***	0.0184***	0.0171***
	(0.0147)	(0.00811)	(0.00553)	(0.00374)	(0.00332)	(0.00350)
Observations	119337	119337	94203	127171	127171	98343
R-squared	0.135	0.295	0.607	0.874	0.649	0.610

Notes: Reported are the estimated regression coefficients and the robust standard errors (in parentheses) from estimations of the dependent variables as number of employees (Employee), real manufacturing sales (Sales), labor productivity (LP), total factor productivity (TFP), capital intensity (Capint) and wages per employee (Wage_L) at time t respectively. Asterisks denote significance levels (***: p < 1%;**: p<5%; *:p<10%). All regressions include region, sector, foreign affiliation and year dummies as controls. LP, TFP, Capint and Wage_L regressions also include logarithm of firms' number of employees as control, Dynamic FE regressions include lagged dependent variables. All dependent variables are in natural logarithms.

TABLE 8

Ex-ante Performance Differentials of Trade Starters

					Sales					
	(t-2)	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*
Non-trader that starts to export in t (dummy)	0.518***	0.625***								
	(0.0323)	(0.0323)								
Non-trader that starts to import in t (dummy)			0.844***	0.945***						
			(0.0330)	(0.0326)						
Non-trader that start to two-way trade (dummy)					0.895***	0.959***				
					(0.0556)	(0.0547)				
Importer that starts to export in t (dummy)							0.237***	0.346***		
							(0.0405)	(0.0384)		
Exporter that starts to import in t (dummy)									0.718***	0.852***
									(0.0378)	(0.0366)
Observations	13220	17332	13428	17544	12657	16767	2686	3036	1914	2264
R-squared	0.066	0.066	0.104	0.102	0.070	0.068	0.057	0.068	0.104	0.106
					Employee					
	(t-2)	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*
Non-trader that starts to export in t (dummy)	0.136***	0.206***								
	(0.0220)	(0.0209)								
Non-trader that starts to import in t (dummy)			0.192***	0.266***						
			(0.0300)	(0.0284)						
Non-trader that start to two-way trade					0.196***	0.268***				
					(0.0323)	(0.0339)				
Importer that starts to export in t (dummy)							0.115***	0.035**		
							(0.0169)	(0.0168)		
Exporter that starts to import in t (dummy)									0.189***	0.143***
									(0.0178)	(0.0180)
Observations	13235	17369	13441	17583	12671	16801	2692	3040	1915	2264
R-squared	0.045	0.038	0.044	0.040	0.046	0.040	0.034	0.049	0.085	0.094

TABLE 8 (Cont'd)

	LP									
	(t-2)	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*
Non-trader that starts to export in t (dummy)	0.195***	0.199***								
	(0.0278)	(0.0272)								
Non-trader that starts to import in t (dummy)			0.258***	0.321***						
			(0.0467)	(0.0452)						
Non-trader that start to two-way trade					0.377***	0.422***				
					(0.0281)	(0.0265)				
Importer that starts to export in t (dummy)							0.072**	0.107***		
							(0.0348)	(0.0326)		
Exporter that starts to import in t (dummy)									0.236***	0.275***
									(0.0363)	(0.0317)
Observations	10678	13623	10867	13818	10142	13096	2581	2902	1818	2177
R-squared	0.076	0.076	0.089	0.094	0.080	0.081	0.067	0.086	0.083	0.120

	TFP									
	(t-2)	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*
Non-trader that starts to export in t (dummy)	0.246***	0.253***								
	(0.0596)	(0.0599)								
Non-trader that starts to import in t (dummy)			0.274***	0.311***						
			(0.0467)	(0.0452)						
Non-trader that start to two-way trade					0.319***	0.445***				
					(0.0963)	(0.0901)				
Importer that starts to export in t (dummy)							0.065**	0.101***		
							(0.0321)	(0.0235)		
Exporter that starts to import in t (dummy)									0.191**	0.246***
									(0.0748)	(0.0689)
Observations	10073	12667	10266	12869	9554	12160	2549	2854	1784	2119
R-squared	0.057	0.050	0.058	0.052	0.059	0.053	0.084	0.092	0.112	0.117

TABLE 8 (Cont'd)

	Capint									
	(t-2)	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*
Non-trader that starts to export in t (dummy)	0.420***	0.456***								
	(0.0558)	(0.0526)								
Non-trader that starts to import in t (dummy)			0.692***	0.768***						
			(0.0935)	(0.0860)						
Non-trader that start to two-way trade					0.836***	0.893***				
					(0.0505)	(0.0473)				
Importer that starts to export in t (dummy)							0.209***	0.193***		
							(0.0652)	(0.0599)		
Exporter that starts to import in t (dummy)									0.560***	0.530***
									(0.0729)	(0.0649)
Observations	11630	14778	11839	14996	11087	14235	2654	2984	1877	2199
R-squared	0.043	0.045	0.057	0.057	0.043	0.044	0.042	0.044	0.093	0.080
	Wage_L									
	(t-2)	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*	*(t-2)*	*(t-1)*
Non-trader that starts to export in t (dummy)	0.0236	0.0146								
	(0.0113)	(0.0157)								
Non-trader that starts to import in t (dummy)			0.0422***	0.0460***						
			(0.0142)	(0.0136)						
Non-trader that start to two-way trade (dummy)					0.0541***	0.0908***				
					(0.0117)	(0.0106)				
Importer that starts to export in t (dummy)							0.0225	0.00397		
							(0.0168)	(0.0111)		
Exporter that starts to import in t (dummy)									0.0235	0.0409**
									(0.0187)	(0.0186)
Observations	13235	17369	13441	17583	12671	16801	2692	3040	1915	2264
R-squared	0.713	0.698	0.714	0.704	0.714	0.700	0.798	0.801	0.756	0.755

Notes: Reported are the estimated regression coefficients and the robust standard errors (in parentheses) from estimations of the dependent variables as number of employees (Employee), real manufacturing sales (Sales), labor productivity (LP), total factor productivity (TFP), capital intensity (Capint) and wages per employee (Wage_L) at time t-2 and t-1 respectively. Asterisks denote significance levels (***: p < 1%;**: p<5%; *:p<10%). All regressions include region, sector, foreign affiliation and year dummies as controls. LP, TFP, Capint and Wage_L regressions also include logarithm of firms' number of employees as control, All dependent variables are in natural logarithms.

TABLE 9

Dynamic Panel Probit Regressions

	Panel A(without tariffs)			*Panel B(with tariffs)*		
	Only-exporter	Only-importer	Two-way trader	Only-exporter	Only-importer	Two-way trader
Only-export dummy(t-1)	0.921***			0.878***		
	(0.0269)			(0.0260)		
Only-import dummy(t-1)		0.959***			0.949***	
		(0.0225)			(0.0223)	
Two-way trader dummy(t-1)			1.072***			1.055***
			(0.0217)			(0.0211)
Exporter dummy(t-1)						
Importer dummy(t-1)						
Employee(t-1)	0.0889**	0.0925**	0.112**	0.0855**	0.0997**	0.115***
	(0.0371)	(0.0475)	(0.0451)	(0.0442)	(0.0464)	(0.044)
TFP(t-1)	0.0215***	0.0348***	0.0416***	0.0268***	0.0335***	0.0483***
	(0.0067)	(0.0048)	(0.0138)	(0.005)	(0.0043)	(0.0134)
Wage_L(t-1)	0.0100	0.0203**	0.0603*	0.0109	0.0174***	0.0604**
	(0.0449)	(0.0083)	(0.0364)	(0.0424)	(0.0057)	(0.0354)
Observations	85412	85412	85412	85412	85412	85412

Notes: The table reports dynamic panel probit regressions. *(t − 1)* indicates that the variable is lagged. Reported are the estimated regression coefficients and the robust standard errors (in parentheses) from estimations of the dependent variables as binary outcome variables of being an only exporter, only importer and two way trader respectively. Asterisks denote significance levels (***: p < 1%;**: p<5%; *:p<10%). All regressions include means of the continuous explanatory variables and initial values of the dependent variables as well as region, sector, foreign affiliation and year dummies as controls.

TABLE 10

Dynamic Probit Regressions w.r.to BEC Classification

	WITHOUT TARIFFS						WITH TARIFFS					
	Capital Exporter Only	Intermediate Exporter Only	Consumption Exporter Only	Capital Importer Only	Intermediate Importer Only	Consumption Importer Only	Capital Exporter Only	Intermediate Exporter Only	Consumption Exporter Only	Capital Importer Only	Intermediate Importer Only	Consumption Importer Only
Capital Exporter Only (t-1)	0.933***						0.919***					
	(0.0213)						(0.0387)					
Intermediate Exporter Only (t-1)		0.925***						0.914***				
		(0.0782)						(0.0248)				
Consumption Exporter Only (t-1)			0.873***						0.820***			
			(0.0406)						(0.0396)			
Capital Importer Only (t-1)				0.992***						0.974***		
				(0.0411)						(0.0387)		
Intermediate Importer Only (t-1)					0.961***						0.923***	
					(0.0257)						(0.0277)	
Consumption Importer Only (t-1)						0.874***						0.831***
						(0.0438)						(0.0737)
Observations	82869	83105	83278	82696	83278	83278	82869	83105	83278	82696	83278	83278

Notes: The table reports dynamic panel probit regressions. *(t − 1)* indicates that the variable is lagged. Reported are the estimated regression coefficients and the robust standard errors (in parentheses) from estimations of the dependent variables as binary outcome variables of being an only exporter, only importer and two way trader respectively. Asterisks denote significance levels (***: p < 1%;**: p<5%; *:p<10%). All regressions include means of the continuous explanatory variables and initial values of the dependent variables as well as region, sector, foreign affiliation and year dummies as controls.

TABLE 11

Mean Productivity of Two-way Traders with respect to Extensive Margins (2003-2010)

	NPE		**NPI**		**NCE**		**NCI**	
	TFP	*LP*	*TFP*	*LP*	*TFP*	*LP*	*TFP*	*LP*
1--5	7.62	10.04	7.55	9.97	7.68	10.05	7.59	10.02
6--10	7.75	10.21	7.85	10.23	7.84	10.24	8.08	10.43
11--20	7.96	10.29	8.06	10.37	7.84	10.42	8.28	10.68
20+	8.23	10.48	8.25	10.74	8.09	10.7	8.52	11.07

TABLE 12

Trade Premia Along Extensive Margins (2003-2010)

	Sales	*Employee*	*LP*	*TFP*	*Capint*	*Wage_L*
NPE	0.0262***	0.00812**	0.0108*	0.0104*	0.00159	0.00199
	(0.00456)	(0.00362)	(0.00609)	(0.00622)	(0.00471)	(0.00244)
NPI	0.101***	0.0784***	0.0548***	0.0433***	0.0526***	0.0222***
	(0.00594)	(0.00432)	(0.00793)	(0.00812)	(0.00694)	(0.00333)
NCE	0.0824***	0.0590***	0.0518***	0.0503***	0.00828	0.0174***
	(0.00557)	(0.00465)	(0.00703)	(0.00716)	(0.00677)	(0.00396)
NCI	0.125***	0.0777***	0.0797***	0.0744***	0.0143*	0.0190***
	(0.00727)	(0.00559)	(0.00957)	(0.00978)	(0.00810)	(0.00309)
Observations	52872	52906	51207	50541	52128	52906
R-squared	0.194	0.139	0.064	0.026	0.308	0.639

Notes: Reported are the estimated regression coefficients and the robust standard errors (in parentheses) from estimations of the dependent variables as number of employees (Employee), real manufacturing sales (Sales), labor productivity (LP), total factor productivity (TFP), capital intensity (Capint) and wages per employee (Wage_L) at time t respectively. Asterisks denote significance levels (***: p < 1%;**: p<5%; *:p<10%). All regressions include region, sector, foreign affiliation and year dummies as controls. LP, TFP, Capint and Wage_L regressions also include logarithm of firms' number of employees as control, All dependent variables are in natural logarithms.