EXPORTING, PRODUCTIVITY AND MARKET INTEGRATION: *Italian manufacturing firms within the European context*

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Abstract

The potential linkage between international trade and economic growth is always at the core of large and intense debates amongst academic researchers and policy makers. Recently, the attention is increasingly moving towards the exporting-productivity relationship, acknowledging the important role played by the heterogeneous firms and the trade policy.

After having provided an overview of the recent theoretical and empirical literature – by focusing especially on Meltiz-Ottaviano model (2008) – this paper is aimed at investigating empirically the link between exporting and firm productivity in Italy within the context of European integration. By using a panel of Italian manufacturing firms for the years 2000 and 2003, we document coherently with the theory that: *i)* exporters turn out to have a higher performance than firms solely oriented to the home market, highlighting that Europeanized exporters are relatively more productive than Globalized ones; *ii)* these productivity differentials across firm groups are due to both pre-existing productivity gaps before starting any international activity (self-selection mechanism) and differences in productivity growth during exporting period; *iii)* the average firm productivity is higher as the industry export propensity towards more integrated European markets is considered, despite Europeanized exporters' productivity premium seems to be – although slightly – smaller as the perspective of the more integrated European market is adopted; and finally *iv*) a heterogeneous impact of industry-level trade integration on economic performance occurs across the various firm categories.

Keywords: Exporting, Productivity, Heterogeneous firms, European integration.

JEL Classification*:* D21, F14, F15

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1 Introduction

The potential linkage between trade and economic growth is always at the core of intense debates amongst academic researchers and policy makers. This issue can be faced through two alternative approaches. The first analyzes the correlation between trade openness and per capita GDP at a country level, i.e. whether more open economies effectively experience higher income growth than relatively closed economies (*macroeconomic approach*). The second explores the relationship between exporting and firm performance, i.e. whether exporters turn out to be more productive than non-exporters (*microeconomic approach*).

Over the last decade, empirical and theoretical studies are increasingly focusing on the microeconomic perspective, since Bernard and Jensen (1995) documented empirically the firm heterogeneity within international trade dynamics: in fact, they found that a very small portion of US manufacturing firms were actually exporters, which turned out to be more productive, larger and more likely to survive than firms exclusively oriented to the home market. Further studies have attempted to verify the causal relation between exporting and firm performance, namely whether firms self-select into international markets, as only the more productive ones are able to cover the sunk costs to entry into foreign markets, and to face foreign competition (*Self-selection hypothesis*), or alternatively – and simultaneously – whether firms become more efficient after they start exporting, basically because of knowledge flows arising from their foreign buyers (*Learning-by-Exporting hypothesis*). On this, Wagner (2007a) has recently carried out a literature review, stressing that the first hypothesis was robustly supported by the empirical evidence, unlike the second hypothesis whose studies led to mixed results. This is the reason why the pioneer theoretical models interacting international trade, heterogeneous firms and imperfect competition (Bernard et al. (2003) and Melitz (2003)) are based on the existence of the export productivity premium – meant as productivity gap between exporters and non-exporters – due to the self-selection mechanism, as well as the aggregate productivity growth within industry due to the production reallocation mechanism – i.e. economic activity reallocation from the least productive firms to the most productive ones – in turn, connected to the fall in trade costs.

More recently, theoretical and empirical studies have explored other firm characteristics that, in some way, might explain international trade dynamics: such as differences in markups (rather than productivity or size), activities diversification (by allowing for the number of traded products and the number of trading country-partners), geo-economic orientation of exports (e.g. by distinguishing export propensity towards developed and developing countries), import behaviour and FDI behaviour.

Since the positive relationship between trade and economic performance – in particular between exports and firm productivity – has been empirically confirmed, an important role is played by trade policy. Indeed, part of the latest literature focuses on the exporting-productivity link with increasing degrees of trade openness and integration, beginning from the first form of trade liberalization, a decrease in trade tariffs, up to the complete international economic integration (see Tybout (2003) for an empirical literature review).

On this, Melitz and Ottaviano (2008) develop an 'all-comprehensive' theoretical framework, which introduces firm heterogeneity – in productivity terms – and endogenous markups – linked to the 'toughness' of market competition – in a monopolistically competitive model of trade, emphasizing how such features change across markets on the basis of their size, and trade integration levels (larger, more trade integrated markets exhibit larger and more productive firms, more product varieties, lower markups and lower prices), and then, studying the impact of different trade liberalization policies.

This paper is basically aimed at studying empirically the exporting-productivity linkage in Italy within the context of European integration. It is organized as follows. In the *section 2* we introduce the theory and the evidence on 'exporting and firm productivity' – focusing mainly on the latest theoretical and empirical challenges that go beyond the direct export-productivity link – and 'the role of policy' – considering the evolution from trade liberalization to complete international economic integration. *Section 3* describes the dataset used for the analysis. *Section 4* presents the econometric methodology, meant to investigate the relationship between firm productivity and exporting under increasing levels of market integration. S*ection 5* and *section 6* show the empirical results and their robustness check, respectively. Finally, in the *Section 7*, we draw our conclusion on the basis of our findings, providing some policy recommendations.

2 Theory and evidence

2.1 Exporting and firm productivity

Over the last decade, a large number of empirical studies found firm heterogeneity within sector in terms of several economic performance measures – such as productivity and size – which would turn out to be strongly correlated with the firm decision to engage in international activities – such as exporting, importing, direct investing abroad (in particular, see Greenaway and Kneller (2007) for a survey). This is the reason why many researchers have begun to develop new theoretical frameworks on international trade by removing the assumption of a representative firm within sector[1] and moving the attention from country/industry to firm/product perspective. Bernard et al. (2003) – by referring to the multi-county Ricardian model – and Melitz (2003) – by being based on Krugman`s model of intra-industry trade – can be considered as the pioneers of the so-called 'new new trade theory', where firm heterogeneity assumes a basic role to explain the international trade dynamics.

In particular, the Melitz's model can be deemed the actual turning point, since it appears to be particularly tractable as well as the basis for further theoretical implications concerning international trade[2]. It incorporates two main mechanisms: *self selection*, i.e. solely the most productive firms are able to serve the foreign markets because of the presence of the sunk costs to entry, and *resources reallocation,* since the trade openness leads to a resources shift from less to more productive firms within industry, causing an increase in industry aggregate productivity.

More recently, several researchers face the causality problem related to export status and firm performance, since the exporter productivity premium – productivity gap between exporters and non-exporters – can be due to the self-selection mechanism on the one hand, and the *learning-by-exporting effect* on the other hand, i.e. firm's trade openness would determine improvements in terms of productivity given that exporting is per se considered to be a channel for knowledge transfer. These two hypotheses are not

[1] It is one of essential assumptions of the old (such as Ricardian and Heckscher-Ohlin models) and new (Dixit-Stiglitz, 1977; Krugman, 1979; and Helpman & Krugman, 1985) trade theories.
[2] For instance, Helpman, Meltiz and Yeaple (2004), Bernard, Redding and Schott (2007), Greenaway and Yu (2004), Yeaple (2005), Baldwin and Okubo (2006), Helpman, Melitz and Rubinstein (2008), Melitz and Ottaviano (2008), and Chaney (2008).

necessarily mutually exclusive, in the sense that if one occurs, this does not imply that the other one cannot also occur. For instance, Aw, Roberts and Winston (2007) provide evidence on the coexistence of both hypotheses, by using panel data related to the Taiwanese electronics industry for the years 1986, 1991 and 1996. In fact, their findings highlight that the export decision is positively affected by both firm's performance and prior international experience – supporting the existence of sunk costs to enter in foreign markets and the related self-selection mechanism – as well as the positive linkage between firm's export status and its future productivity, which is in turn enhanced trough R&D investments – sustaining the learning-by-exporting hypothesis and the role of firm investments aimed at improving the absorptive capacity for new technologies coming from foreign customers.

However, reviewing numerous empirical studies on the issue and confirming the existence of export productivity premium in all cases, Wagner (2007a) notes as the results related pre-entry differences in performance between exporters and non-exporters are always significant – coherently with the self-selection hypothesis – whereas the results relative to post-entry productivity gap between the two categories turns out to be mixed, supporting only partially the learning-by-exporting hypothesis. Hence, he reaches the conclusion that '*exporters are more productive than non-exporters, and the more productive firms self-select into export markets, while exporting does not necessarily improve productivity*'.

Nevertheless, cross-country comparisons, and even cross-study comparisons for one country, are difficult through a 'simple' survey of several empirical studies, since the latter adopt different approaches and methodologies. Therefore, in order to generate stylized facts in a more convincing way, ISGEP (2008) define a common approach and estimate the identical empirical models, using comparable firm level panel data for 14 countries (Austria, Belgium, Chile, China, Colombia, Denmark, France, Germany, Italy, Republic of Ireland, Slovenia, Spain, Sweden and United Kingdom). Their findings are coherent with Wagner (2007a) statement, and also document different exporter premiums across countries, which turn out to be positively connected with countries' trade openness and government effectiveness.

The literature has recently moved towards other aspects of firm heterogeneity and international trade. Some studies consider *other characteristics* (apart from productivity and size) that vary at a firm level, which in some way explain why solely some firms are involved in export activities (such as markups). Other studies focus on particular behaviours of firms involved in international activities (such as product and country diversification, import behaviour, geo-economic orientation and FDI behaviour). Some recent investigations are reported below.

- ***Exporting and markups***. By referring to a simplified version of Melitz-Ottaviano model[3] and using firm-level data for the French manufacturing sector from 1986 to 2004, Bellone, Musso, and Nesta (2008) estimate firms' price cost margins, by relating them to productivity and export intensity at a firm level, as well as to market size and import penetration ratio at the industry level. They see that markups are higher for more productive firms and exporting firms, and lower in larger domestic markets and in industries with stronger import penetration. In addition, they find counter-cyclical markups – by controlling for GDP growth – and pro-competitive effect of the Single Market Program – by adding simply an interactive dummy Post1992.

- ***Product and Country diversification***. Some studies focus on the diversification of firms` activities, by allowing for the number of traded products and the number of countries where they trade (the so-called *product and country extensive margins*). Andersson, Johansson and Lööf (2008) investigate the link between firm performance and international trade in the Swedish manufacturing sector, having at their disposal firm-level data for the period 1997-2004. After having compared Sweden (a small open economy) with the U.S. and France (large open economies) data, finding out several similarities, they estimate export and import productivity premiums – recognizing in both cases that they may be due to self-selection hypothesis and/or post-entry effects – which appear to be significant and of an analogous magnitude. In addition, their results reveal that such trade productivity premiums are increasing in both number of traded goods and number of trading partner countries, confirming that only highly-productive firms are able to offer different products – associated with different levels of fixed cost and profitability – and serve in several countries – associated with asymmetric sunk costs to entry (as

[3] The theoretical framework of Melitz and Ottaviano (2008) will be examined in the next section.

in Chaney (2008) and Helpman et al. (2008))[4]. Indeed, less performing firms would limit themselves to offer a few products connected to low levels of fixed costs, in a restricted number of markets with low productivity thresholds.

By considering plant-level data of German manufacturing sector in 2004, Wagner (2007b) explores the relationship between firm performance and exporting, considering the export market size. In particular, he notices that firms selling abroad but exclusively within the Eurozone are more productive than firms solely oriented to the home market and less productive than firms exporting outside the Eurozone too. Thus, he proves that the higher entry costs related to the market outside the Eurozone can be paid only by the most productive firms.

- ***Import behaviour***. More recently, attention has been extended to the *import behaviour of firms*, for which similar productivity-related hypothesis may be distinguished: in the sense that the positive correlation between import-status and economic performance, retrieved in several empirical studies, might be due to the *self-selection mechanism* – since importers may sustain sunk costs in order to establish some relationships with foreign suppliers (for example, costs related to market surveys, new workers with international communication skills, and so on) – or the *learning-by-importing hypothesis* – when import firms attain some benefits in performance terms, arising from the higher quality of foreign inputs, the implicit transfer of know-how embodied in imported intermediate and capital goods, etc..

  In particular, by using longitudinal data on approximately 20.000 Italian manufacturing firms over the 1993-1997 period, Castellani, Serti and Tomasi (2008) document that imports and exports are more concentrated than employment and sales. Furthermore, they analyze the intensive (in terms of traders number and the intensity of their activities) and extensive margins (in terms of both product and geographical diversification) in firms' international trade, finding that: a) few firms

[4] Helpman et al. (2008) and Chaney (2008) define a theoretical model, combining Melitz`s model with a gravity equation for bilateral trade, aimed at capturing the trade costs effects on both the extensive and intensive margins of trade. In both models, self-selection mechanism operates market by market, bearing in mind that trade costs vary across countries and each firm will export to a given country if the country-specific productivity threshold is lower than its productivity level. In other words, the higher productivity firms are assumed to be able to serve simultaneously many more markets characterized by different levels of trade costs.

detain high trade shares predominantly within the sector, rather than in different sectors (confirming the most recent trade theory about heterogeneous firms, rather than the traditional trade theory linked to the comparative advantage); b) few firms trade in many sectors and with many countries, taking into consideration these diversified traders account for the majority of exports and imports. Finally, they ascertain that traders are more productive than domestically-oriented firms and this may be due to both pre-entry and post-entry effects: in particular, the two-way traders – firms which simultaneously buy and sell abroad – appear to be the most productive, while the only-importers seem to perform better than only-exporters, stressing that the relatively high performance of only-importers is more associated to the self-selection mechanism, rather than the other hypothesis[5].

- ***Geo-economic orientation.*** The *geo-economic orientation (source) of exports (imports)* is considered relevant to explain firm heterogeneity in productivity in several empirical studies, emphasizing particularly the role of different markets` characteristics, apart from the extent of trade barriers, such as distance, size, income, language, legal and institutional structures. By referring to Slovenian exporters, Damijan et al. (2004) show that the productivity level required to serve developing countries is lower than one required to export towards developed economies.

By using firm-level data of the Italian manufacturing sector over the years 1993-1997, Serti and Tomasi (2008) show the existence of trade premium in productivity, size, capital and skilled intensity and that two-way trading firms are more strongly performing than firms involved in either exporting or importing only. In a second step, they alight on possible heterogeneity of firms due to trading with different types of market, having at disposal information about geographic destination (origin) of firms' exports of output (imports of intermediate inputs). They find that firms exporting to European countries are less productive than

[5] Anyhow, in this case, they focus on the effects of imports of intermediate inputs on firm performance – having firm-level data available on the acquisition of intermediates inputs abroad – which are assumed to be positive. However, if we consider the impact related to imports of final goods on firms within an industry – measured by the link between industry import penetration ratio and import-competing firm` s productivity (Tybout, 2003) – the relationship between imports and productivity could change, in the sense that it could have a negative sign. In fact, if domestic firms are highly productive compared to foreign ones within a given sector, then imports of intermediate inputs at a firm level will increase, while imports of final goods at the industry level will decrease.

exporters direct towards other destinations – stressing that the possible reason might be the lower productivity level needed to enter in those markets due to lower sunk costs – and some learning-by-exporting effects occur only for exporters oriented towards developed economies. Conversely, importers sourcing from Europe seem to be more performing under several aspects – probably because they mainly buy high-tech capital goods there – and at the same time, affected by *learning-by-importing* effects.

- ***FDI behaviour***. All arguments about export behaviour of firms have been subsequently extended to *FDI behaviour of firms*. In particular, Helpman, Melitz and Yeaple (2004) develop a theoretical model where the firms` export and FDI decisions are related to economic performance. They assume that FDI is horizontal (or market seeking) – occurring when the same stage of production is located abroad – and alternative respect to exports. In addition the sunk costs to enter into the foreign market are higher through FDI rather than exporting. In other words, firms self-select into international markets by considering different penetration channels: the higher productivity firms will become exporters, but the best ones will establish directly some subsidiaries abroad. However, several empirical studies have already paid attention to cases uncontemplated within the model: *i)* vertical (or factor seeking) FDI, occurring when different stages of production are located in foreign country; *ii)* complementarity between FDI and exports – existing, for example, when the firm produces several product lines, which are horizontally o vertically interrelated – and finally, *iii)* the case where exporting is more costly than foreign investing, e.g. when the foreign country is small, but abundant of factor intensively used by domestic firms[6].

2.2.2 The role of policy: trade liberalization and economic integration

If firms increase their productivity with the intent on entering international markets, then any policy aimed at affecting a firms' decision to export – such as removal of non-

[6] See the survey of Greenaway and Kneller (2005) for more details and some empirical studies.

tariff barriers[7] or export-promotion policies[8] – generates automatically relevant effects on the firm-level productivity. Indeed, part of recent empirical literature focuses on the relationship between exporting and productivity as trade openness is increasing (because trade costs are decreasing). Thus, welfare gains from trade may be magnified if the increased competition induced by trade liberalization leads to higher productivity and lower markups, which in turn contribute to the fall in prices and the increase in real incomes.

A large number of studies find an increase in aggregate productivity following trade liberalization policies in developing countries, due to the survival and further growth of more productive firms. These cases could be considered unreliable since trade liberalization is only a part of important economic reforms.

However, similar results are found in developed countries. For instance, Bernard, Jensen and Schott (2006) show that a fall in trade costs determines an increase in probability of exiting and of exporting among US non-exporting plants and hence a reallocation of economic activities in favour of more productive exporting firms, causing a rise in average industry productivity. While, Trefler (2004) finds positive effects of tariff reductions on industry productivity in Canada, because of both market share reallocation in favour of higher-performance plants and resources reallocation across activities within plants.

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[7] The removal of trade restrictions across countries raises the profitability of becoming exporter and thus, the opportunity of enhancing the productivity.

[8] For example, they have been adopted by South-East Asian economies (Korea and Taiwan) where high rates of economic growth were associated to large human and physical capital accumulation and high volume of exports. Some studies argue that the major role for accelerated economic growth was played by the increase in TFP through exporting – being the main channel of technology/knowledge diffusion – whereas others state that increased exports are an effect rather than the cause of growth, since capital accumulation was the first determinant. For instance, Rodrik (1997) suggests that in South-East Asia an increase in profitability of investment determined an increase in imports – since most capital goods were imported – which in turn, would have implied an increase in exports, since economy could not borrow freely from abroad. In addition, he states that the profitability of exports was not relevant (having only considered direct subsidies to exports and not also indirect ones, such as public financial support for long-term investment, R&D, etc.).
Furthermore, we should take into account *i)* the ***export spillovers***, given that exporting firms can generate technology/knowledge which can be used by other firms within the same or different sector; and *ii)* ***other benefits***, since exporting might induce *technology licensing* from abroad and as well as an increase in *real wage* (which would attract workers educated and trained abroad, allowing knowledge transfer). Hence, more attention should be paid to the causal link from exporting to economic growth, by deepening the *learning-by-exporting* hypothesis and the role of *export externalities* (López, 2005).

On this matter, we can turn to the recent 'all-comprehensive' theoretical framework originated by Melitz and Ottaviano (2008), which introduces firm heterogeneity – in productivity terms[9] – and endogenous markups – linked to the 'toughness' of competition in a market[10] – into a monopolistically competitive model of trade, emphasizing how such features change across markets on the basis of their size and trade integration level (larger, more trade integrated markets exhibit larger and more productive firms, more product varieties, lower markups and lower prices), and then, studying the impact of different trade liberalization policies[11].

In particular, they start by analyzing a closed economy, stressing that larger market is associated with larger and more productive firms, many more product varieties and lower markups (thus, lower prices). Then, they consider the open economy version with two (or more) countries, showing that costly trade entails a partial integration between markets, and therefore, the effects of market size differences across trading partners persist: the bigger domestic market is, the more productive firms, more numerous product varieties and the lower markups (prices) are. Thus, the total removal of trade costs within the open economy model would be exactly equivalent to an increase in market size in the closed economy model, under the profile of effects.

This means that benefits stemming from the enlargement process of a trade bloc (i.e. an increase in the number of trading partners) tend to intensify following the related integration process (i.e. further decrease in trade costs, for instance, by removing non-tariff barriers, in addition to already dropped trade tariffs). Indeed, they lastly consider the stimulating role of trade liberalization[12] in market shares reallocation in favour of the most productive firms (exporters) and at the expense of the least productive ones (stoppers) – thus in aggregate productivity growth – which is basically due to increased import competition (rather than enhanced competition for scarce domestic labour resources, as in

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[9] As in the Melitz (2003) model.

[10] The competition toughness in a market is measured by the number and average productivity of competing firms in that market.

[11] Different other theoretical studies have been developed to show the impact of trade liberalization on productivity. For instance, Long, Raff and Stahler (2007) define an oligopolistic model of international trade with heterogeneous firms and endogenous R&D where they identify four effects of trade liberalization on firm and industry productivity – a direct effect (linked to changes in R&D investment), a scale effect, a selection effect and a market share reallocation effect – which operate when market structure is fixed (in the short run) or variable (in the long run).

[12] In both bilateral and asymmetric (unilateral or preferential) terms.

Melitz`s model[13]). In addition, they show that such productivity gains arising from pro-competitive effects in the short run, can be offset or even overturned in the long run, because of harder patterns of entry – i.e. the smaller proportion of entrants – which in turn entails less competition (*anti-competitive effects*).

Moreover, their model remains tractable even when it is extended to the case with more asymmetric countries integrated to different levels through asymmetric trade costs. Therefore, this model can be considered highly suitable to analyze trade and regional integration policy scenarios in a context of firm heterogeneity and markup endogeneity, bearing in mind that the profitable link between firm performance and trade intensifies as the extent of economic integration of trade bloc increases. For instance, the passage from the *custom union phase* to the *single market phase*, entails the free movement of production inputs (labour and capital), which in turn would determine a fall in input costs, and thus, a widespread improvement in terms of economic performance, within the involved regional area. Besides, the passage from the *single market phase* to the *monetary union phase*, through the introduction of a single currency, should enhance further trade integration (and consequently, the related positive productivity effects), since costs and risks related to exchange rates vanish. Hence, firms notice simultaneously an increase in productivity and a decrease in trade costs, which induce them to start or intensify exporting activities.

We can represent the whole Meltiz-Ottaviano`s story through a series of diagrams, by starting from the Closed Economy case up to the case of Totally Integrated Economy at an international level (see **Box 1**).

[13] In the *Melitz`s model (2003),* import competition has no role in the reallocation process (indeed, CES specification for demand implies that residual demand price elasticities are exogenously fixed and unaffected by import competition): the exposure to export market induces increased competition for scarce domestic labour resources as real wages are bid up by the more productive firms which expand production to serve the foreign markets. This increase in labour cost forces the least productive firms to exit. Hence, it contains an important channel for the redistributive effects of trade within industries.
Conversely, in the *Melitz-Ottaviano model (2008),* the impact of two channels is reversed: increased factor market competition plays no role (since the supply of labour to the differentiated goods sector is perfectly elastic), and enhanced product market competition is the only operative channel (by shifting up residual demand price elasticities for all firms at any given demand level, forcing the least productive firms to exit). Although only relatively more productive firms survive (with higher markup than the less productive firms to exit), we have a downward shift in the average markup. The distribution of prices then shifts down due to the combined effect of selection and lower markups, whereas firms size, profits, product variety increase. Thus, in this model, welfare gains from trade come from a combination of productivity gains (via selection), lower markups (pro-competitive effect) and increased product variety.

Box 1 – ***Transition from a Closed Economy to a Totally Integrated Economy by diagrams***

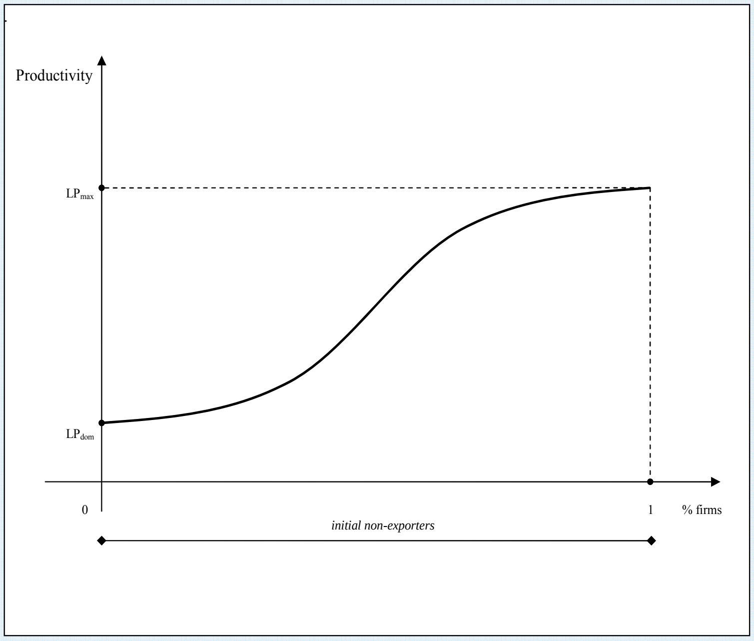

Figure 1 - Closed Economy

This shows the firms operating within a ***Closed Economy*** distributed according to the productivity level (LP), which lies between the minimum value necessary to make non-negative profits (the 'zero-profit productivity cutoff' (LP_{dom})) and the maximum value reached by the most competitive firms (LP_{max}).

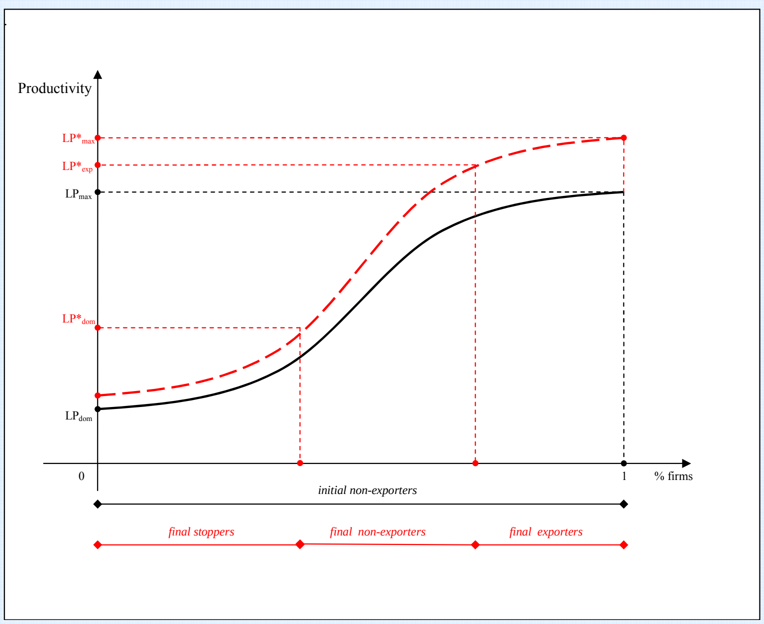

Figure 2 - Trade liberalization: from *closed economy* to *open economy*

This shows what happens following the ***trade liberalization process***, i.e. the transition from 'Closed Economy' to 'Open Economy', through for instance, a fall in tariff trade barriers.

We can observe a generalized increase in productivity for all domestic firms, due to import competition effect. Nevertheless, the least productive firms are forced to exit from the market since they are not absolutely able to face the foreign competitors, whose presence has basically pushed further the LP_{dom} upwards. Withal, solely the firms whose the productivity level is above a given higher threshold ('export productivity cutoff'(LP_{exp})) will be able to export, because of the sunk costs to entry into international market (self-selection mechanism): thus, they will see a strong increase in productivity, given that the foreign market shares will sum up to domestic ones. Finally, the intermediate firms, although not having the minimum requirements to serve export market, are able to compete domestically with foreign presence, namely to keep their own – even if reduced – home market share. Therefore, we will notice a business reallocation domestically from less productive firms (predominantly, exiting firms) to more productive ones (essentially, exporters). All these mechanisms – self-selection, import-competition and business reallocation – imply an increase in average aggregate productivity and the existence of export productivity premium (i.e. productivity gap between exporters and non-exporters).

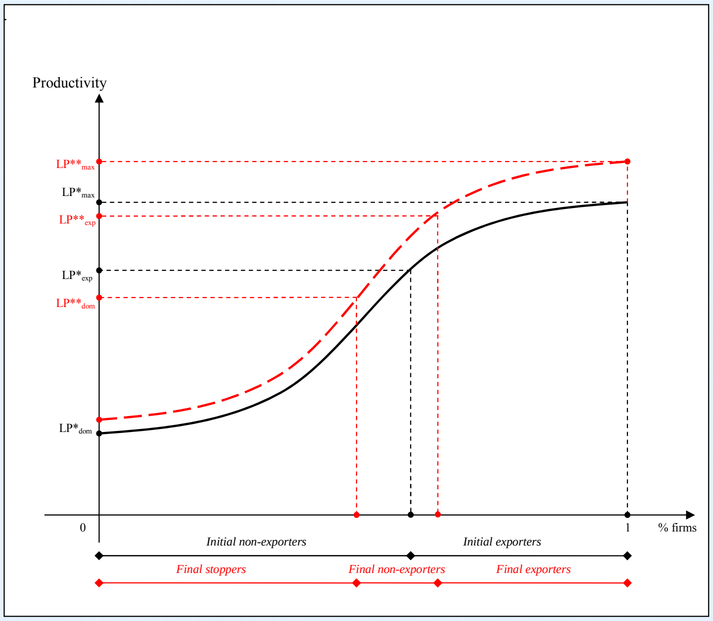

Figure 3 – Trade integration: from *open economy* to *partially integrated economy*

This depicts a further step: the ***trade integration process***, i.e. the passage from 'Open Economy' to 'Partially Integrated Economy', through for example, the complete and reciprocal removal of tariff and non-tariff trade barriers. It entails again a generalized rise in firms' productivity associated with an increase in LP_{dom} – due to more intensive foreign competition within the domestic market – on the one hand, and a smaller increase in LP_{exp} – due to the combination of two contrasting effects: a fall in trade costs (implying a decrease in LP_{exp}) and an enhancement in foreign competition in more integrated international market (implying an increase in LP_{exp}) – on the other hand. All mechanisms mentioned above heighten, causing a further increase in average productivity, a decrease in export-productivity premium – by assuming the same foreign competition intensity inside and outside the domestic market – and a relatively higher proportion of exporters

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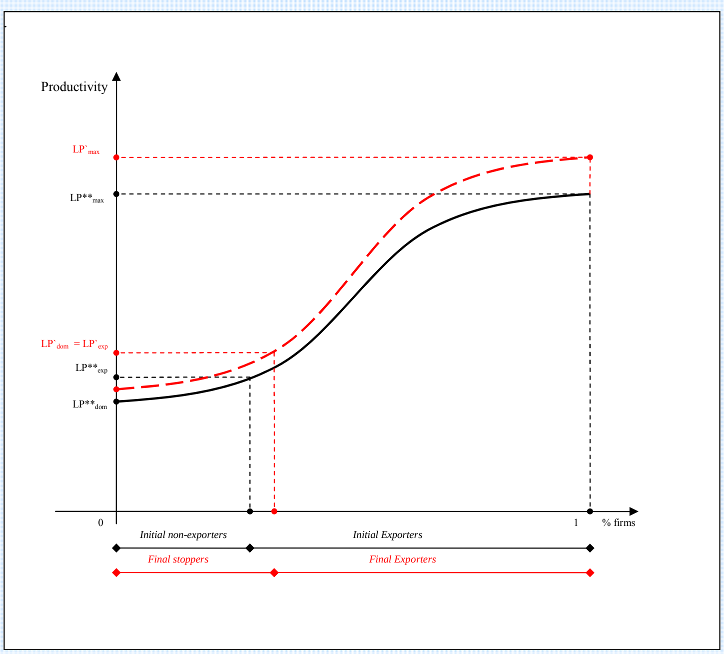

Figure 4 – Economic integration: from *partially integrated economy* to *totally integrated economy*
(equivalent to an increase in domestic market size)

This describes the ***economic integration process***, i.e. the shift from 'Partially Integrated Economy' to 'Totally Integrated Economy', occurring when each kind of barrier between countries is removed, for example, by imposing the free movement of inputs (capital and labour) across countries, the introduction of a single currency, etc.. The cutoffs shifts – with the related mechanisms and effects – described in the previous figure, amplify further until when they exactly coincide with a single cutoff, stressing that all existing firms will tend to serve also the foreign market, which together with the domestic one, constitute a single larger market.

Considering the Melitz-Ottaviano model and firm-level panel data of 11 EU countries, Del Gatto, Mion and Ottaviano (2006) study the impact of trade integration on aggregate productivity in the presence of firm selection. They explore two scenarios:

i) the productivity losses associated with autarky *(cost of non-Europe)* – where they find out that following an increase in trade barriers to prohibitive levels in 2000, average productivity would decrease by 13 percent, average markups and prices would rise rise by 16 percent and average profits would drop by 23 percent – and

ii) the productivity gains stemming from further integration *(gains from freer trade)* – where they notice as a 5 percent fall in trade barriers in 2000, would cause a rise in average productivity and profits by 2 percent and 5 percent respectively, and falls in average markups and prices by 2 percent.

More generally, they argue that productivity gains vary considerably across countries and sectors relying on market accessibility and trade costs: '*the Darwin selection of the best firms is an important effect of trade liberalization'*.

Corcos, Del Gatto, Mion and Ottaviano (2007) attempt at quantifying the gains from trade in EU countries, deriving from the complete removal of their 'behind-the-border' trade barriers (BTBs)[14], beyond what the Single Market Program (SMP) has already achieved in terms of non-tariff barriers (NTBs). They calibrate and simulate the Melitz-Ottaviano model (2008) by using firm-level panel data from 11 EU countries, where a country (France) has been broken up into 21 regional economies. In particular, they explore three different scenarios:

i) *Costs of non-Europe*, where productivity losses linked to international autarky are highlighted. The related simulation and results are similar to the previous study.

ii) *Costs of non-France*, where they find that if in 2000, trade had been inhibited amongst French regions and between each French region and EU countries, average regional productivity would have dropped by 25 percent and 8 percent respectively. Thus, 'non-France' generates larger productivity losses than 'non-Europe' for an average French region[15].

[14] BTBs are related to domestic regulations about government procurement, product standards, inward foreign investment, competition law, labour standards and environmental norms.

[15] For a large country (as France) intra-national competition is thus more important than competition arising from its main international partners in determining firm survival, selection and productivity. However, the results could be different for small countries (like Belgium and Netherlands), and/or whether the effect of total international trade is considered.

iii) United Europe, where they document that if BTBs among EU countries were removed, by setting the thickness of borders between EU countries at the same level as between French regions, average trade costs would fall by 34 percent. This in turn would imply an increase in average productivity and profits by 20 percent and 60 percent respectively, and a fall in prices and markups by 13 percent. In addition, the productivity gain for the average French region would round on 9 percent[16].

They reach the conclusion that the further behind-the-border integration in the EU – through the removal of BTBs – would imply relevant benefits, firstly, in the form of substantial productivity gains.

Lileeva and Trefler (2007) participate in the debate about the causality link between exporting and productivity growth and the role of regional integration, using panel data from Canadian manufacturing plants related to the years 1984 and 1996 (all of which did not export in the first year, whereas almost half resulted to be exporters in the second year), and therefore, considering the impact of U.S. tariff reductions under the Canada-U.S. Free Trade Agreement (FTA), went into effect in 1989. The two authors find that the tariff cuts encourage lower-productivity firms to export and invest in economic performance enhancement, simultaneously – indeed, as a result, they are also able to increase their domestic market share at the expense of non-exporters – unlike higher-productivity firms, which are solely induced to export without investing further (as in Melitz, 2003).

De Hoyos and Iacovone (2006) study the impact of economic integration on the trade-productivity linkage, by analysing Mexican manufacturing firms – discriminated according to a different 'integration status': i.e. firms involved in two-way trading, solely in exporting, only in importing intermediate inputs and exclusively in domestic market – in the context of NAFTA reforms, over the period 1993-2000. They notice that the increased industry productivity linked to NAFTA reforms is mainly due to changes in economic performance within firm – rather than market share reallocation across firms – remarking a certain firm heterogeneity, on the basis of dissimilar integration status.

[16] There is a considerable heterogeneity in terms of productivity gains across countries, from 1,17% (Portugal) to 60,18% (Germany). With regard to France, the productivity gain deriving from international trade would be around 17% (actual 9% + hypothetical 8%), much closer to 25% productivity gain coming from intra-national trade: thus, for a large country, like France, international trade is likely to become the main channel through which competition and selection stimulate productivity growth.

3 Data description

The empirical study is based mainly on a balanced panel of Italian manufacturing firms used and provided by Morone, Petraglia and Testa (2007), which is the result of a combination of two data sources: Capitalia[17] surveys and AIDA[18] database. In particular, the 8th and 9th Capitalia surveys concern the periods 1998-2000 and 2001-2003 respectively and deal with all firms with more than 500 employees and a sample of firms with 11-500 employees – which has been determined using a random selection procedure by allowing for firm size[19], location[20] and sectors[21] – within the Italian manufacturing sector: therefore, not all firms appear in both surveys. Despite the loss of some observations, the matching procedure has been executed, in order to have the continuity of observations over time. Next, AIDA data on further economic and financial characteristics have been added[22].

Nevertheless, the composition of the resultant balanced panel – made up of 1070 firms – fairly reflects that of samples observed by both Capitalia surveys, which in turn, reasonably reproduce the characteristics of the Italian economy on the whole. As we can see from the **Table 1**, almost half of firms (about 47.8%) are concentrated in *traditional sectors*, while about 30 percent are included in *specialized suppliers sectors*. The remaining 25 percent are firms operating in *scale-intensive sectors* (about 17.6%) and *high-tech sectors* (about 4.7%). On the firm size side: about 70 percent of our sample is composed of small firms (no more than 50 employees) and about one-fourth is represented

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[17] Capitalia was an Italian banking group which agreed to be taken over by the Unicredit group, in may 2007.

[18] AIDA is a Bureau Van Dijk's databank which provides economic and financial data of about 500.000 firms operating in Italian territory.

[19] Five dimensional categories were distinguished: a) 11-20 employees, b) 21-50 employees, c) 51-250 employees, d) 251-500 employees and finally e) more than 500 employees.

[20] Four geo-economic locations were discerned: *a) North West* (Valle d'Aosta, Piemonte, Lombardia and Liguria); *b) North East* (Trentino Alto-Adige, Veneto, Friuli Venezia Giulia and Emilia Romagna); *c) Center* (Toscana, Umbria, Marche and Lazio); and *d) South* (Abruzzo, Molise, Puglia, Campania, Basilicata, Calabria, Sicilia and Sardegna).

[21] Four sector categories were identified by considering the Pavitt (1984) taxonomy: *a) Traditional sector* (textiles, footwear, food and beverages, wood, paper and printing); *b) Specialized suppliers sector* (machinery and equipment; office, accounting and computing machinery; medical, precision and optical instruments); *c) Scale-intensive sector* (basic metals; motor-vehicles, trailers and semi-trailers); and *d) High-tech sector* (chemicals; pharmaceuticals and electronics). The first two industry categories are basically composed of small-medium enterprises and are connected to one another, since the first one acquires innovative tools essential to carry out its activities from other sectors, whereas the second one is involved in producing innovative tools aimed to satisfy the needs in other sectors. Whereas, the last two industries include mainly medium-large firms characterized by highly-standardized productive processes with relevant economies of scale and high intensity of R&D activities, respectively.

[22] For more details about the dataset construction, see Morone, Petraglia and Testa (2007).

by medium enterprises (no more than 250 employees); finally, the large firms (more than 250 employees) are just around 8.3 percent. Furthermore, they are especially located in Northern Italy (around 67%), the residual one-third is predominantly situated in the Center of Italy (about 21%): indeed, just 12.1 percent are Southern firms. Hence, our sample is exactly in line with the Italian economic reality, where the manufacturing sector is mainly made up of small-medium firms operating in Traditional and Specialized suppliers industries and located in North of the Country.

Table 1 – Sector, geographical and dimensional composition of the sample (N=1070)

SECTORS	
Traditional (or supplier dominated)	*47.8%*
Scale intensive	*17.6%*
Specialized suppliers	*29.9%*
High-tech (or science based)	*4.7%*
Total	***100.0%***
LOCATION	
North-West	*35.8%*
North-East	*31.4%*
Center	*20.7%*
South	*12.1%*
Total	***100.0%***
SIZE	
11--20	*32.3%*
21--50	*37.5%*
51--250	*21.9%*
251--500	*4.2%*
more than 500	*4.1%*
Total	***100,0%***

The dataset described above provides information about several firms` characteristics and balance sheet data, but for the purpose of our study we utilize specifically: sales, number of employees, exporter status, geo-economic destination of exports (distinguishing between EU-25[23] – and alternatively EU-15[24] – respect to the Rest of the World (RoW)), engagement in R&D activities, net fixed assets, total labour cost, cost of materials, industry and geographical location. Finally, trade data at a 3-digit sector-level collected by Istat[25] (total exports and exports according to geo-economic destination: EU-25, EU-15 and EMU-12[26]) have also been used.

Different data sources have different systems of industry classification: in particular, the firm-level panel data of Capitalia merged with AIDA data are classified by *5-digit Ateco 1991*, whereas Istat data are classified by *3-digit Ateco 2002*. In order to make them compatible, Ateco 1991 codes have been converted in Ateco 2002 ones using a conversion table (source: Istat), taking into account that we use the 3-digit level aggregation and at this level, the two Ateco classifications are very similar (the only changes are listed in the **Appendix – Table A**).

In addition, where necessary, the data have been converted from Lira to Euros and from Euro-thousands to Euro-units in order to have a homogenous unit of measurement. Finally, all variables expressed in current prices have been transformed into constant prices by using value added industry output deflators of Southern and Northern Italy (source: SVIMEZ[27]): thus, we handle real data.

However, since the knowledge of whether the firm exports or not – relevant information for our analysis – is known just for the last year of each Capitalia survey, we were compelled to focus our attention only on the years 2000 and 2003. From **Table 2**, we can see that in both years the percentage of exporters is around 72.5 percent, and consequently that of non-exporters is around 27.5 percent. More specifically, 67.6 percent of sample firms are always involved in export activities, whereas 22.7 percent are always

[23] EU-25 can be defined as 'Enlarged Europe' since it includes the Members States (MSs) of European Union until 2003 and the next MSs joined in 2004 (Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom). This information at the firm-level is precise for the year 2003 and approximate for the year 2000, since across the options related to the question of the exports' geographical destination we have '*15 MSs of European Union*' and '*EU's new entrants in 2004*' in the 9th Capitalia survey, and '*European Union (15 MSs)*' and '*Russia and East-Central Europe*' in the 8th Capitalia survey.
[24] EU-15 is the European Union in 2003 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom).
[25] Italian National Institute of Statistics.
[26] EMU-12 is the Eurozone in 2003 (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain).
[27] SVIMEZ is an Italian association for the industry development in South of Italy.

domestic-market-oriented, in both years. The remaining share (9.7%) appear to have changed exporter status: one-half were exporters in 2000 and no longer in 2003, conversely the other half result to be exporters in 2003 but were not in 2000.

Table 2 – Export status of the sample (N=1070)

exporters in 2000	*72,5%*
non-exporters in 2000	*27,5%*
Total	***100,00%***
exporters in 2003	*72,4%*
non-exporters in 2003	*27,6%*
Total	***100,00%***
always exporters	*67,6%*
always non-exporters	*22,7%*
entrants in export market	*4,8%*
firms exiting from export market	*4,9%*
Total	***100,00%***

For the purpose of the current study, we can split the exporters into two categories, by allowing for the geo-economic destination of their sales abroad: Europeanized Exporters and Globalized Exporters. The former includes all firms exporting exclusively to countries within the borders of Enlarged Europe (European Union, alternatively), whereas the latter comprises all firms exporting also or exclusively to the other countries (Rest of the World). As we can see from the **Table 3**, a little more than half of our sample are Globalized Exporters, whereas Europeanized Exporters are a little less than 20 percent in both years, by showing apparently a certain persistence in the exporter status. Actually, it is worth noting that solely 9.5 percent of firms keep exporting exclusively towards Enlarged Europe – *Always Europeanized Exporters* – and about 45.1 percent keep selling globally – *Always Globalized Exporters*. Hence, on the one hand, part of firms lose the Europeanized Exporter status, by either extending their market horizons to the Rest of the World – *Globalizing Europeanized Exporters* (7.6%) – or stopping completely their international activity – *Homeward Europeanized Exporters* (2.1%) – on the other hand, some firms gain it, since some exporters decide to restrict their interest to European markets – *Europeanizing Globalized Exporters* (5.4%) – or some non-exporters decide to start selling abroad, but exclusively towards Enlarged Europe – *Europeanized Export Starters* (3.1%).

Table 3 – Dynamics in firm categories over time: 'Enlarged Europe perspective'

Total firms (1070) 100%	Europeanized Exporters in 2003 18.0%	Globalized Exporters in 2003 54.4%	Non-Exporters in 2003 27.6%
Europeanized Exporters in 2000 19.2%	Always Europeanized Exporters 9.5%	Globalizing Europeanized Exporters 7.6%	Homeward Europeanized Exporters 2.1%
Globalized Exporters in 2000 53.3%	Europeanizing Globalized Exporters 5.4%	Always Globalized Exporters 45.1%	Homeward Globalized Exporters 2.8%
Non-Exporters in 2000 27.5%	Europeanized Export Starters 3.1%	Globalized Export Starters 1.7%	Always Non-Exporters 22.7%

Finally, only 1,7% of firms start to export directly targeting the global market – *Globalized Export Starters* – whereas about 2.8% of our sample decide to stop completely their worldwide export activity – *Homeward Globalized Exporters*. A similar analysis can be repeated by considering the European Union perspective (see the **Table B** in **Appendix**). Thus, we can observe that we have actually a higher persistence in the international status for both Globalized Exporters and Non-Exporters, compared with Europeanized Exporters, almost half of which extend their market to Extra-European countries: in other words, competing within European market might be considered as a springboard to serve Worldwide market.

4 Econometric methodology

The following empirical methodology basically derives from methods proposed by International Study Group on Exports and Productivity (2008) and Machin (1996).

Firstly, it is aimed at exploring the connection between firm-level labour productivity and the 'relative industry export propensity' towards Enlarged Europe, as well as whether there are some differences between exporters and non-exporters through the estimation of the *exporter productivity premium* ($\hat{\beta}_2$)[28], assuming a log-lin functional form[29] and allowing for the balanced panel of just two years distant over time (2000, denoted $t=0$, and 2003, denoted $t=1$) at our disposal.

$$\ln LP_{ijt} = \hat{\beta}_0 + \hat{\beta}_1 T_t + \hat{\beta}_2 EXPORTER_{ijt} + \hat{\beta}_3 EU25_{jt} + \hat{\beta}_4 CONTROLS_{ijt} + \varepsilon_{ijt} \qquad (1)$$

for $t = 0, 1;\ i = 1,\ldots,n;\ j = 1,\ldots,m$

where

i is the index of firm, *j* is the index of sector (or industry) and *t* is the index of year.

T is a time dummy to allow for changes in lnLP over time (1 if the year is 2003, 0 else).

LP is the firm's labour productivity, measured as sales per employee.

EXPORTER is a dummy variable which assumes the value 1 if the firm exports and 0 otherwise.

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[28] In this context, the problem of causality between firm productivity and exporter status has been neglected: thus the export productivity premium – productivity gap between exporters and non-exporters – could be due to pre-entry and/or post-entry differences, i.e. self-selection and/or learning-by-exporting hypotheses. However, this problem was faced in the first chapter, by using the same dataset and similar econometric model.

[29] This is the semilog model where the regressand Y appears in the logarithmic form and the regressors X are expressed in linear form: lnY = a + b X. It is considered the natural form for models with dummy variables and the most appropriate model, when we want to know the rate of growth of a certain economic variable (as productivity) respect to the other variables. The related slope coefficient b measures the relative change in Y for a given absolute change in X: indeed, by using differential calculus, we can show that b = d(lnY)/dX = (1/Y)/(dY/dX) = (dY/Y)/dX. By multiplying b by 100, we will obtain the percentage change in Y for an absolute change in X, namely the *instantaneous rate of growth* (known also as the semielasticity of Y with respect to X). Finally, if we want to know the *compound rate of growth*, we should use the following formula: $(e^b-1)*100$.

EU25 measures the *Industry relative export propensity towards Enlarged Europe* and has been computed as the ratio between 'the share of exports oriented to Enlarged Europe in total exports in each sector' and 'the share of exports oriented to Enlarged Europe in total exports in the whole manufacturing sector':

Industry relative export propensity towards Enlarged Europe

$$EU25_{jt} = \frac{(\text{EU25 exports}/\ \text{World exports})_{jt}}{\sum_{j}\text{EU25 exports}_{t} \Big/ \sum_{j}\text{World exports}_{t}} \qquad (2)$$

CONTROLS are control variables at a firm level:

- R&D is a dummy variable which assumes the value 1 if the firm is involved in R&D activities and 0 otherwise;
- (K/L) is the capital-to-labour ratio of firm (measured as net fixed assets per employee);
- (w/L) is the pro-capita labour cost (quantified as total labour cost per employee) to proxy for the human capital.

Finally, ε_{ijt} is the error term, which is assumed to follow the classical assumptions: basically, $\varepsilon_{ijt} \sim N(0,\sigma^2)$.

When we use OLS estimators, we assume that we do not have problems of omitted variables and that the error term is not correlated with our explanatory variables, in order to have consistent estimators. This is of particular concern when we include data from both years in a *Pooled model*, where basically, intercept and slopes are assumed time-invariant and constant across individual units, while the error term simultaneously captures both individual and time differences.

Moreover, we investigate whether the exports-productivity link differs at increasing levels of market integration – from custom union (or simply, association agreement) to single market and finally monetary and economic union – since as we have seen before, not only the market size but also the extent of market integration matters in the positive relationship between exporting and firm performance: indeed, Melitz and Ottaviano (2008) theoretically show as larger, more trade integrated markets exhibit larger and more productive firms (as well as, more product varieties, lower markups and lower prices).

In our specific case-study, after having investigated whether Italian manufacturing sectors whose exports are more oriented towards the European integrated markets have higher productivity firms – stressing the LP gap between exporters and non-exporters – we focus on whether an increasing degree of market integration has a larger effect on firm productivity.

For this purpose, we will also study the relationship between firm labour productivity and industry export orientation towards European Union (EU15) and Eurozone (EMU12), alternatively and respectively, since the market becomes smaller but more integrated as we move from Enlarged Europe area (EU25) to Eurozone one. Therefore, we should run the model (1) again, simply by substituting the '*relative industry export propensity*' towards geo-economic area originally considered (EU25) with those towards the new areas of interest alternatively (EU15 and EMU12):

Industry relative export propensity towards European Union

$$EU15_{jt} = \frac{\left(\text{EU15 exports/ World exports}\right)_{jt}}{\sum_{j}\text{EU15 exports}_{t} \Big/ \sum_{j}\text{World exports}_{t}} \qquad (3)$$

Industry relative export propensity towards Eurozone

$$EMU12_{jt} = \frac{\left(\text{EMU12 exports/ World exports}\right)_{jt}}{\sum_{j}\text{EMU12 exports}_{t} \Big/ \sum_{j}\text{World exports}_{t}} \qquad (4)$$

In the estimations, we will be interested to compare the coefficients of the three industry relative export propensity variables – (2), (3) e (4) – within the respective equations, taking into account that the economic integration mechanism would matter more than the market enlargement process in the export-productivity relationship if we obtained $\hat{\beta}_2^{EU25} \leq \hat{\beta}_2^{EU15} \leq \hat{\beta}_2^{EMU12}$, and vice versa: in fact, Eurozone is a smaller but more integrated area (12 Member States in Economic and Monetary Union) than European Union (15 Member States in Single Market), which in turn is less large and more integrated compared with Enlarged Europe ('25 Member States in Custom Union').

Furthermore, as we have seen before, it is possible to split the exporters within our dataset into two categories according to the geographical destination of their exports. In particular, we can distinguish between exporters exclusively oriented towards Enlarged Europe – *Europeanized exporters* (EXP^{EU25}) – and other exporters, i.e. firms exporting also or solely to the Rest of World – *Globalized exporters* (EXP^{ROW1}).

Hence, we can run the following regression, in order to verify whether there is effectively heterogeneity between exporters oriented towards differently integrated markets, by also considering the industry export orientation index (EU25):

$$\ln LP_{ijt} = \hat{\beta}_0 + \hat{\beta}_1 T_t + \hat{\beta}_2 EXP^{EU25}{}_{ijt} + \hat{\beta}_3 EXP^{ROW1}{}_{ijt} + \hat{\beta}_4 EU25_{jt} + \hat{\beta}_5 CONTROLS_{ijt} + \varepsilon_{ijt} \qquad (5)$$

EXP^{EU25} is a dummy variable taking value one if the firm is an Europeanized Exporter, and zero otherwise. While EXP^{ROW1} is a dummy variable assuming value one if the firm is a Globalized Exporter, and zero else. Thus, the related coefficients represent the *Europeanized export productivity premium* ($\hat{\beta}_2$) – i.e. the average productivity gap between Europeanized exporters and pure domestic firms – and the *Globalized export productivity premium* ($\hat{\beta}_3$) – i.e. the average performance differential between Globalized exporters and home-oriented firms – respectively.

Now, it is really important to understand the nature of these productivity differentials across these firm groups. Globalized exporters are expected to be more competitive than Europeanized exporters, on the one hand – since the former should pay relatively higher fixed costs to entry international markets, due to higher trade barriers, longer distance, and so on – and vice versa, on the other hand – given that the latter however contend within a relatively higher competitive market. In other words, we would expect that: *i)* Globalized export starters already exhibited higher performance respect to Europeanized export starters (since *self-selection in Globalization would be harder than self-selection in Europeanization*); while *ii)* Permanent Europeanized Exporters tend to grow in productivity terms more than Permanent Globalized Exporters (given that *Europeanization would generate larger benefits in productivity terms than Globalization*).

The former hypothesis (*i*) may be tested by investigating whether some productivity differentials already existed before any 'treatment' (Europeanization or Globalization in our case), through the following equation:

$$\ln LP_{ij0} = \hat{\beta}_0 + \hat{\beta}_1 DOMEXP^{EU25}{}_{ij0} + \hat{\beta}_2 DOMEXP^{ROW1}{}_{ij0} + \hat{\beta}_3 EU25_{j0} + \hat{\beta}_4 CONTROLS_{ij0} + \varepsilon_{ij0} \quad (6)$$

where $DOMEXP^{EU25}{}_{ij0}$ is a dummy variable assuming value one if a non-exporter in time 0 turns out to be Europeanized exporter in time 1, and zero otherwise; $DOMEXP^{ROW1}{}_{ij0}$ is a dummy variable taking value one if a home-oriented firm in time 0 turns out to be Globalized exporter in time 1, and zero else; while the control group is that of permanent domestic firms (*alwaysDOM*). Therefore, $\hat{\beta}_1$ and $\hat{\beta}_2$ capture the '*pre-entry Europeanized export productivity premium'* – i.e. how much more productive a firm should be in order to enter in European markets – and the '*pre-entry Globalized export productivity premium'* – i.e. how much higher the economic performance should be so that a firm is able to enter in Global markets – respectively, and we expect that $0 \leq \hat{\beta}_1 \leq \hat{\beta}_2$. All the variables are related to the year 0.

The latter hypothesis (*ii*) can be verified by exploring whether some differentials in productivity growth occur across firm categories subject to a different 'treatment' (Europeanization and Globalization, alternatively) throughout the whole period considered, controlling also for changes in other variables. Thus, the following equation is to be estimated:

$$\Delta \ln LP_{ij} = \hat{\gamma}_0 + \hat{\gamma}_1 alwaysEXP^{EU25}{}_{ij} + \hat{\gamma}_2 alwaysEXP^{ROW1}{}_{ij} + \hat{\gamma}_3 \Delta EU25_j + \hat{\gamma}_4 \Delta CONTROLS_{ij} + \varepsilon_{ij} \quad (7)$$

where $alwaysEXP^{EU25}{}_{ij}$ is a dummy variable assuming value one if the firm exports exclusively towards European market throughout the whole period (i.e. it is a permanent Europeanized exporter), and zero otherwise; $alwaysEXP^{ROW1}{}_{ij}$ is a dummy variable taking value one if the firm also or exclusively serves extra-European markets over the whole period (namely, it is a permanent Globalized exporter); while the control group is still that of permanent non-exporters (*alwaysDOM*). Therefore, since $\hat{\gamma}_1$ represents the productivity growth differential between always-Europeanized exporters and always-non-exporters (*Europeanized export productivity growth premium*), and $\hat{\gamma}_2$ shows the difference in productivity growth between always-Globalized Exporters and permanent home-oriented firms (*Globalized export productivity growth premium*), we would expect that $\hat{\gamma}_1 \geq \hat{\gamma}_2 \geq 0$ following the above-mentioned hypothesis (*ii*).

In addition, we can repeat the same regressions, by allowing for the European Union (EU15) perspective, rather than the Enlarged Europe (EU25) one. Following the theoretical predictions depicted above (see again the Box 1), we would expect that in more integrated markets the average firm productivity is higher, although the export productivity premium is smaller. In other words, by allowing for the equation (5), firm performance should on average be higher within sectors relatively more trade-oriented towards more integrated markets ($0 \leq \hat{\beta}_4^{EU25} \leq \hat{\beta}_4^{EU15}$), although the productivity differential between exporters oriented to more integrated markets and non-exporters would tend to be smaller as a higher degree of market integration is considered ($\hat{\beta}_2^{EU25} \geq \hat{\beta}_2^{EU15} \geq 0$). While, by allowing for the equations (6) and (7), we expect that $\hat{\beta}_1$ is further smaller respect to $\hat{\beta}_2$, and $\hat{\gamma}_1$ is further larger respect to $\hat{\gamma}_2$, respectively.

Finally, we can investigate whether an increase in industry-level trade integration due predominantly to the fall in *tariff* trade barriers – since Enlarged Europe Perspective is equivalent to Custom Union view – affects differently productivity across firms subject to a different 'treatment' throughout the whole period considered (i.e. Permanent Europeanized Exporters, Permanent Globalized Exporters and Permanent Domestic Firms), by using some interaction dummies:

$$\ln LP_{ijt} = \hat{\beta}_0 + \hat{\beta}_1 T_t + \hat{\beta}_2 alwaysEXP^{EU25}{}_{ijt} + \hat{\beta}_3 alwaysEXP^{ROW1}{}_{ijt} + \hat{\beta}_4 EU25_{jt} + \\ + \hat{\beta}_5 \left(alwaysEXP^{EU25}{}_{ijt} * EU25_{jt} \right) + \hat{\beta}_6 \left(alwaysEXP^{ROW1}{}_{ijt} * EU25_{jt} \right) + \hat{\beta}_7 CONTROLS_{ijt} + \varepsilon_{ijt} \quad (8)$$

We expect as before that exporters are more productive than non-exporters, but now we can notice whether trade integration within industry generates different effects across various firms, determining convergence in performance terms ($\hat{\beta}_4 \geq 0$, $\hat{\beta}_5 \leq 0$ and $\hat{\beta}_6 \leq 0$) – as depicted in the Box 1 – or further divergence ($\hat{\beta}_4 \geq 0$, $\hat{\beta}_5 \geq 0$ and $\hat{\beta}_6 \geq 0$).

Once again, we replicate the same regression by assuming the EU15 Perspective (equivalent to the Single Market view), in order to see whether something changes as further trade integration within industry – due mainly to the removal of *non-tariff* trade barriers, as well as other obstacles related to the movement of people (labour) and capitals – is considered.

5 Empirical results

In this section, we will report all the results from the previous regression models taking into consideration that robust standard errors have been used where needed because of the heteroskedasticity problem [30].

Firstly, we focus on the results of equation (1) on the ***linkage between firm productivity, exporter status and industry export orientation towards Enlarged Europe***. Before interpreting the related results shown in the **Table 4**, it is worth explaining the reason why the Pooled model has been preferred, rather than the Fixed Effect (FE) and Random Effect (RE) models.

We should consider that the RE model turns out to be theoretically the most appropriate for a case like ours, given that it treats firm's unobserved heterogeneity as a random variable and our sampled firms have been drawn from a large population. Anyhow, the results of the Breusch-Pagan test (514.00 [p-value 0.000]) and the Hausman test (67.65 [p-value 0.000]) lead to reject the RE model in our case. Hence, the choice is restricted between FE and Pooled model. As we can note the fixed effects are jointly statistically significant (7.16 [p-value 0.000]) and almost not correlated at all with explanatory variables ($corr(\lambda_i, X_{ijt}) = 0.0162$), i.e. the unobserved time-invariant firm characteristics – such as technology and managerial capability – result to exert a certain influence on the firm productivity (dependent variable) without affecting almost at all the other observed firm traits. Thus, there would be all the requirements leading to prefer the FE model rather than the Pooled one.

However, we should bear in mind that in the former model, all firm-specific characteristics that are time invariant will be captured in the fixed effect, regardless of the fact that they have been observed or not. Thus, it would be impossible to study the impact of a dummy variable which assumes the same value over time, since it would be automatically dropped, e.g. the impact of firm location on firm performance. Now, if we consider the case where the dummy variable is quasi-time-constant – i.e. it does change from one period to the other, but solely for a very small portion of the observed sample – a

[30] The problem of serial correlation concerns data very close over time: thus, it is negligible in our case, since we handle with enough distanced periods (2000 and 2003).

coefficient will be estimated, but it is likely to be not very informative, given that most of the related effect will be captured by the fixed effect. This problem could concern our analysis since it is mainly aimed to unveil the relation between firm productivity and exporter status (dummy variable), and in our dataset only about 9% of firms change exporter status in the period considered (as the Table 2 shows). This is the reason why we have decided to focus on the Pooled model.

Table 4 – Exports, productivity and market integration: Enlarged Europe (panel models)

lnLP (dependent variable)	*Pooled*	*FE*	*RE*
T	-0.05	-0.049	-0.046
	(2.06)**	(3.92)***	(3.69)***
EXPORTER	0.081	-0.07	0.026
	(2.82)***	(-1.76)*	(1.16)
EU25	0.147	-0.287	0.085
	(2.38)**	(-1.53)	(1.16)
R&D	0.077	0.02	0.054
	(2.98)***	(0.82)	(2.57)***
K/L	0.002	0	0.001
	(9.07)***	(0.48)	(4.72)***
w/L	0.022	0.02	0.021
	(14.67)***	(10.93)***	(15.22)***
Constant	4.117	4.810	4.289
	(52.45)***	(24.31)***	(48.02)***
F-test for fixed effects		7.16 [0.000]	
corr(u_i, Xb)		0.0162	
BP test			514.00 [0.000]
Hausman test			67.65 [0.000]
Observations	2060	2060	2060
R-squared	0.17	0.1	

Absolute value of t statistics (or z statistics) in parentheses
P-value in squared brakets
* significant at 10%; ** significant at 5%; *** significant at 1%

As we can observe from the **Table 4**, all the coefficients are statistically significant at a 5 percent level both individually and jointly – although R^2 is not very high, indeed it suggests that about 17% of the variation in LP is explained by the included regressors – and the signs are consistent with our expectations.

Firms relatively abundant in physical capital and high-skilled human capital are more productive: indeed, firm's labour productivity rises by 0.2%[31], if the capital-to-labour ratio goes up by one percentage point, on average and *ceteris paribus*; and by 2.2% following a one percentage point increase in wage per employee – which proxies the presence of highly-qualified workers – on average and *ceteris paribus.* Firms involved in R&D activities turn out to be more competitive, in particular, they gain 8.0% more in labour productivity, on average and *ceteris paribus*.

Now, we concentrate on the export-related coefficients: first of all, exporters turn out to be more productive than non-exporters and the *exporter productivity premium* is around 8.5%. Moreover, we can observe as the firms' productivity increases if they operate in the sectors relatively more export-oriented towards European markets – in particular, by 15.8%, on average and *ceteris paribus,* as a consequence of a one percentage point increase in the relative export propensity of their industry towards Enlarged Europe.

Hence, the results are exactly in line with theoretical expectations. The significance of the positive export productivity premium confirms that firms *self-select* into international markets (and/or *learn by exporting*). Furthermore, a higher export propensity towards European area within a sector, implies a higher economic performance of the firms belonging to that sector: this could be due to the fact that a fall in trade barriers leads the low-productivity firms to die, the high-productivity non-exporters to start serving foreign markets, and the existing exporters – already highly competitive – to increase their sales abroad, causing the reallocation of economic activities in favour of the best firms.

Finally, the time dummy appears to be statistically significant and has a negative sign: thus, firm's labour productivity decreases by about 4.9% over the three-year period considered. This could be linked to some macroeconomic changes affecting the Italian economy altogether: for example, it could easily be connected to the introduction of the Euro currency taken place in 2000. For this reason, now we move to comment the results of the same equation (1) with alternative industry export orientation indexes – EU15 and EMU12 respectively, in substitution of EU25 – in order to explore the relationship between firm performance, exporting and the different levels of market integration. For the

[31] All coefficients have been transformed through $b = (e^{\beta}-1)*100$ in order to derive the compound rate of productivity growth respect to each single explanatory variable.

explanations discussed in relation to the Table 4, we have just run the Pooled model and examined the related results shown in the **Table 5**.

Table 5 – Exports, productivity and market integration (Pooled models)

lnLP (dependent variable)	*Enlarged Europe* (1)	(2)^	*European Union* (1)	(2)^	*Eurozone* (1)	(2)^
T	-0.05	-0.056	-0.05	-0.056	-0.051	-0.057
	(-2.06)**	(2.35)**	(-2.04)**	(2.33)**	(-2.10)**	(2.38)**
EXPORTER	0.081	0.123	0.081	0.122	0.083	0.123
	(2.82)***	(3.93)***	(2.84)***	(3.92)***	(2.88)***	(3.95)***
EU25	0.147	0.117				
	(2.38)**	(1.87)*				
EU15			0.16	0.119		
			(2.87)***	(2.10)**		
EMU12					0.159	0.129
					(2.91)***	(2.29)**
R&D	0.077	0.142	0.079	0.142	0.079	0.143
	(2.98)***	(5.27)***	(3.04)***	(5.28)***	(3.04)***	(5.29)***
K/L	0.002	0.002	0.002	0.002	0.002	0.002
	(9.07)***	(2.99)***	(9.03)***	(2.99)***	(9.04)***	(2.99)***
w/L	0.022	0.025	0.022	0.025	0.022	0.025
	(14.67)***	(12.81)***	(14.72)***	(12.81)***	(14.69)***	(12.86)***
Constant	11.024	10.991	11.009	10.987	11.01	10.987
	(140.56)***	(123.82)***	(149.66)***	(128.54)***	(152.11)***	(128.54)***
Pavitt sector dummies		yes		yes		yes
Geographical location dummies		yes		yes		yes
Firm size dummies		yes		yes		yes
Observations	2060	2060	2060	2060	2060	2060
R-squared	0.17	0.21	0.17	0.21	0.17	0.21

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

We should mind the coefficients of EU25, EU15 and EMU12 in the respective columns – taking into account anyhow that all estimators are statistically significant and with right signs – which reflect the firm labour productivity if we just allow for the relative industry export propensity towards Enlarged Europe-25, European Union-15 and Eurozone-12, respectively. By comparing these coefficients, we can notice that:

$$0 \leq \hat{\beta}_{EU25} \leq \hat{\beta}_{EU15} \cong \hat{\beta}_{EMU12}$$

i.e. Those firms whose industries are relatively more export-oriented towards more integrated markets have on average higher productivity.

In particular, as we have seen above the firm's labour productivity rises by 15.8%, on average and *ceteris paribus*, if the relative sector propensity to export towards Enlarged Europe increases by one percentage point. Now, we can observe as the firm's labour productivity growth turns out to be higher when we consider the relative industry tendency to serve European Union's markets (around 17.3%). Whereas, when we allow for the relative industry export propensity towards Eurozone, the productivity change fairly remains the same as the one reported in the European Union case (17.2%) – probably because three years from the introduction of Euro currency is not enough to show the 'Euro-effect'. However, as we control for fixed effects across sectors, locations and firm size categories, the last effect becomes more evident, whereas the coefficients related to EU25 and EU15 become closer.

In addition, in all the three cases, the exporters turn out to be more productive than non exporters, by 8.5% (13.1% if sector, geographical and firm size dummies are included) on average and *ceteris paribus*. Thus, the 'relative export productivity premium' (the LP gap respect to the firm average productivity) tends to be lower as we focus on more integrated markets, stressing that the domestic productivity cutoff grows more rapidly than the export productivity cutoff, respect to the respective original points, when the market becomes more integrated. In fact, the former is pushed solely upwards, through the further competitive pressure from foreign agents (pro-competitive effect). Whereas, the latter is pushed both downwards (due to the fall in trade costs) and upwards (because of the increased competition within the international market) simultaneously, and the net effect depends on the combination of these two mechanisms: i.e. we can even hypothetically see a decrease in export productivity cutoff – if the first mechanism prevails – or conversely, an increase if the second mechanism is predominant, which will somehow be to a smaller extent compared with the rise in domestic productivity cutoff. In other words, the two-cutoffs come progressively near as the extent of market integration further increases, until they will exactly coincide with a single value (European cutoff) within a single totally integrated international market (European market), which will take on the same characteristics as a larger domestic market (like US market) (see again the *Box 1*).

This story is further confirmed if we allow for the results shown in the **Table 6** related to the equation (5), where we also consider the heterogeneity across exporters according to the geo-economic destination of their exports.

Table 6 – Heterogeneous exporters, productivity and market integration (Pooled models) – the whole sample

lnLP (dependent variable)	*Enlarged Europe* (1)	(2)^	*European Union* (1)	(2)^
T	-0.05	-0.056	-0.05	-0.056
	(2.06)**	(2.35)**	(2.04)**	(2.33)**
EXP^{EU25}	0.086	0.109		
	(2.32)**	(2.88)***		
EXP^{ROW1}	0.079	0.129		
	(2.58)**	(3.89)***		
EXP^{EU15}			0.084	0.103
			(2.14)**	(2.64)***
EXP^{ROW2}			0.08	0.129
			(2.68)***	(3.93)***
EU25	0.145	0.12		
	(2.35)**	(1.93)*		
EU15			0.16	0.122
			(2.85)***	(2.16)**
R&D	0.079	0.14	0.08	0.14
	(2.98)***	(5.14)***	(3.03)***	(5.16)***
K/L	0.002	0.002	0.002	0.002
	(9.06)***	(2.98)***	(9.02)***	(2.99)***
w/L	0.022	0.025	0.022	0.025
	(14.64)***	(12.76)***	(14.67)***	(12.75)***
Constant	4.117	10.988	4.101	10.985
	(52.45)***	(123.79)***	(55.73)***	(128.41)***
Pavitt sector dummies		yes		yes
Geographical location dummies		yes		yes
Firm size dummies		yes		yes
Observations	2060	2060	2060	2060
R-squared	0.17	0.21	0.17	0.21

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

As we can note from the first column (Enlarged Europe perspective), an increase in industry-level export intensity towards Enlarged Europe by one percentage point entails an increase in firm productivity by 15.6%, on average and *ceteris paribus*, while Europeanized exporters exhibit a higher performance than non-exporters – to the extent of 9.0 percent – and also compared with Globalized exporters – whose the export productivity premium is around 8.2 percent. When we move from Enlarged Europe (column 1) to European Union view (column 3), we can observe as the industry-level European exports' coefficient is bigger (around 17.3%), whereas the Europeanized export productivity premium is, although slightly, smaller (around 8.7%) and anyhow remains larger than Globalized one (which is now around 8.3%). Hence, the market integration mechanism seems to be much more relevant than the market enlargement process, since the former benefits further the positive relationship between exports and productivity, especially when we shift from 'shallow' to 'deep' integration.

However, as we control for fixed differences across sectors, regions and firm size groups, we reach different results: industry ratios of both perspectives are closer (as already stressed before), Europeanized export premium is relatively larger within Enlarged Europe perspective respect to European Union view, and in both cases it is always smaller than Globalized export premium.

Now, let's see whether performance differentials across firm groups arise from pre-existing productivity gaps before starting any international activity (self-selection mechanism) and/or differences in productivity growth during exporting period.

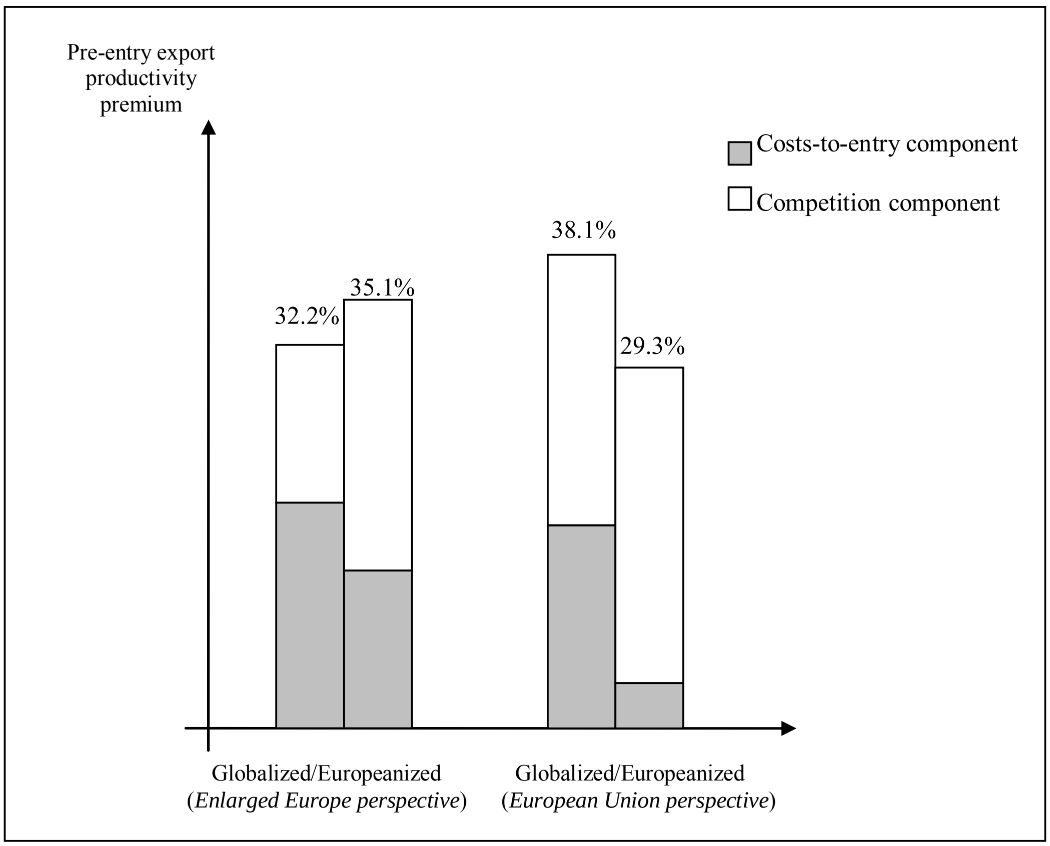
Table 7 – Self-selection in international markets (Europeanization versus Globalization)

$\ln LP_0$ (dependent variable)	*Enlarged Europe* (1)	(2)	*European Union* (1)	(2)
$DOMEXP^{EU25}_0$	0.301	0.34		
	(2.83)***	(3.20)***		
$DOMEXP^{ROW1}_0$	0.279	0.33		
	(1.99)**	(2.30)**		
$DOMEXP^{EU15}_0$			0.257	0.296
			(2.21)**	(2.54)**
$DOMEXP^{ROW2}_0$			0.323	0.374
			(2.64)***	(3.00)***
$EU25_0$	0.396	0.277		
	(2.52)**	(1.66)*		
$EU15_0$			0.379	0.279
			(2.65)***	(1.85)*
$R\&D_0$	0.032	0.064	0.028	0.06
	(0.37)	-0.71	(0.32)	(0.67)
K/L_0	0.005	0.005	0.005	-0.005
	(5.94)***	(5.65)***	(5.91)***	(5.64)***
w/L_0	0.02	0.016	0.02	0.016
	(4.81)***	(3.63)***	(4.80)***	(3.64)***
Constant	3.745	10.803	3.768	10.804
	(19.16)***	(48.47)***	(20.67)***	(51.37)***
Pavitt sector dummies		yes		yes
Geographical location dummies		yes		yes
Firm size dummies		yes		yes
Observations	288	288	288	288
R-squared	0.24	0.29	0.25	0.29

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

The **Table 7** displays as exporters were already more productive than pure domestic firms before starting to serve international markets, supporting the Self-selection hypothesis, as well as a certain heterogeneity across exporters according to their destination market. In particular, we can notice that Europeanized Export Starters already outperformed Globalized Export Starters before beginning any foreign activity within the Enlarged Europe perspective; whereas under the European Union Perspective this statement reverses, i.e. the latter firms already turned out to be more productive than former ones[32]. These results are confirmed – although with different magnitude – as fixed effects across Pavitt industries, locations and firm size groups are taken into account.

Figure 5– Pre-entry export productivity premiums: a comparison



These findings could be due to the fact that firms decide to serve the various foreign markets, by allowing for the fixed costs to entry, as well as the degree of market

[32] In other words, the *pre-entry Europeanized export productivity premium* (around 35.1%) appears to be larger than the *pre-entry Globalized export productivity premium* (around 32.2%) under the Enlarged Europe perspective, and vice versa under the European Union perspective (about 38.1% versus 29.3%).

competition: in fact, European Markets exhibit lower fixed costs to entry (entailing a lower export productivity cutoff), but at the same time, are on average more competitive (implying a higher export productivity cutoff) respect to Global ones. Therefore, as we move from Enlarged Europe (Custom Union – removal of *tariff* barriers) to European Union (Single Market – removal of *non-tariff* barriers) point of view, it is more likely that the 'competition component' relatively rises, but the 'costs-to-entry component' drastically falls within *pre-entry Europeanized premium* and also respect to *pre-entry Globalized premium* – even making the former premium (initially the largest premium) smaller than latter one (see the **Figure 5**).

Table 8 – Heterogeneous exporters, productivity and market integration (Pooled models) – the sub-sample of non-switchers

lnLP (dependent variable)	*Enlarged Europe*		*European Union*	
	(1)^	(2)	(1)^	(2)
T	-0.055	-0.062	-0.052	-0.058
	(2.00)**	(2.32)**	(1.94)*	(2.22)**
alwaysEXP^{EU25}	0.138	0.157		
	(2.86)***	(3.38)***		
alwaysEXP^{ROW1}	0.134	0.2		
	(3.78)***	(5.80)***		
alwaysEXP^{EU15}			0.151	0.161
			(3.09)***	(3.27)***
alwaysEXP^{ROW2}			0.134	0.196
			(3.85)***	(5.87)***
EU25	0.115	0.096		
	(1.75)*	(1.42)		
EU15			0.106	0.09
			(1.83)*	(1.5)
R&D	0.06	0.125	0.067	0.131
	(1.96)*	(4.05)***	(2.24)**	(4.35)***
K/L	0.004	0.005	0.004	0.005
	(11.73)***	(11.94)***	(11.47)***	(11.88)***
w/L	0.021	0.024	0.02	0.023
	(10.63)***	(12.79)***	(10.57)***	(12.72)***
Constant	4.091	10.925	4.107	10.925
	(44.74)***	(116.51)***	(48.50)***	(124.18)***
Pavitt sector dummies		yes		yes
Geographical location dummies		yes		yes
Firm size dummies		yes		yes
Observations	1591	1591	1630	1630
R-squared	0.2	0.25	0.2	0.25

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%;***significant at 1%

Let's move to analyze whether some post-entry effects of exporting on firm productivity occur, by distinguishing again the exporters according to their trade orientation. More specifically, we will compare both Permanent Europeanized Exporters (firms subject to Europeanization over the whole available period) and Permanent Globalized Exporters (firms subject to Globalization over the whole considered period) to Permanent Domestic firms (firms subject to no direct effect from Europeanization/Globalization) in terms of productivity growth, as foreseen by the equation (7). Before discussing the related results, we run again the equation (5), by taking into account the above-mentioned sub-sample – i.e. firms which do not change their export status over time (non-switchers) – in order to highlight differentials in terms of productivity level: Permanent Europeanized exporters are always – although slightly – more productive than Permanent Globalized Exporters (in a more relatively accentuated manner within European Union perspective respect to Enlarged Europe one), which in turn outperform Permanent non-exporters (see the **Table 8**). However, as sector, geographical and firm size dummies are included, the former exporters would exhibit a lower performance than the latter exporters.

Harking to the results concerning the equation (7) – as displayed by the **Table 9** – we can note that all the exporters grow less than pure domestic firms, especially Globalized exporters compared to Europeanized ones (-10.8% versus -7.7%, on average and *ceteris paribus*), if we consider the Enlarged Europe Perspective; whereas, if we adopt the European Union Perspective, we can observe as solely Globalized exporters exhibit a relatively lower productivity growth (-8.5%, on average and *ceteris paribus*). Thus, we can reach the conclusion that Europeanization would provide relatively more benefits than Globalization. However, these results could be due to the fact that Globalized Exporters were already more productive than Europeanized Exporters at the beginning of considered period (one good reason why the former relatively grow less than the latter). Because of that, we introduce the initial level of labour productivity ($\ln LP_{ij0}$) amongst the explanatory variables in the equation (7): in this way, we can control the impact of initial productivity level on productivity growth. Now, as we can see from the Table 9, solely Globalized Exporters actually grow in performance terms less than pure domestic firms (by about 8.5%), whose productivity growth seems to be statistically not different from Europeanized exporters one, in both perspectives. These results are further confirmed as divergences across Pavitt industries, locations and firm size groups are controlled for.

In other words, *Globalized export productivity growth premium* is smaller than *Europeanized export productivity growth premium*, which in turn is not statistically different from zero. Hence, we can definitely state that firms benefit from Europeanization more than Globalization.

Table 9 – Post-entry effects of exporting (Europeanization versus Globalization)

ΔlnLP (dependent variable)	Enlarged Europe				European Union			
	(1)^	(2)^	(3)^	(4)^	(1)^	(2)^	(3)^	(4)^
$lnLP_0$			-0.116	-0.117			-0.128	-0.127
			(4.82)***	(4.86)***			(5.16)***	(5.22)***
$alwaysEXP^{EU25}$	-0.08	-0.084	-0.063	-0.066				
	(1.74)*	(1.94)*	(1.4)	(1.54)				
$alwaysEXP^{ROW1}$	-0.114	-0.128	-0.089	-0.099				
	(3.45)***	(3.94)***	(2.75)***	(3.10)***				
$alwaysEXP^{EU15}$					-0.042	-0.04	-0.029	-0.025
					(0.88)	(0.9)	(0.61)	(0.58)
$alwaysEXP^{ROW2}$					-0.118	-0.129	-0.09	-0.097
					(3.58)***	(4.03)***	(2.79)***	(3.10)***
ΔEU25	-0.167	-0.133	-0.117	-0.069				
	(1.06)	(0.81)	(0.74)	(0.41)				
ΔEU15					-0.055	-0.067	-0.004	-0.012
					(0.41)	(0.5)	(0.03)	(0.09)
ΔR&D	0.029	0.027	0.028	0.025	0.033	0.032	0.031	0.029
	(1.18)	(1.08)	(1.18)	(1.03)	(1.39)	(1.29)	(1.35)	(1.22)
Δ(K/L)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(3.03)***	(3.06)***	(3.09)***	(3.12)***	(2.74)***	(2.81)***	(2.84)***	(2.89)***
Δ(w/L)	0.018	0.017	0.017	0.017	0.018	0.018	0.017	0.017
	(7.06)***	(7.20)***	(6.82)***	(6.99)***	(7.29)***	(7.45)***	(7.05)***	(7.24)***
Constant	0.03	0.004	0.591	1.371	0.032	0.024	0.65	1.51
	(1)	(0.09)	(4.71)***	(4.70)***	(1.05)	(0.51)	(5.02)***	(5.12)***
Pavitt sector dummies		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes
Observations	766	766	766	766	785	785	785	785
R-squared	0.16	0.18	0.19	0.21	0.17	0.19	0.2	0.22

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Furthermore, it is worth noting that as solely the sub-sample of non-switchers is considered, the EU15 ratio's coefficient becomes smaller than EU25 ratio's coefficient, unlike the case where the whole sample is allowed for (see the Tables 6 and 8). We may shed light on this 'reverse' change by examining the findings about the equation (8) – based again on the sub-sample of non-switchers – in the **Table 10**, which highlights possible heterogeneous effects of industry-level trade integration on firms' productivity.

Table 10 – Heterogeneous impact of industry-level trade integration on firm productivity

lnLP (dependent variable)	*Enlarged Europe* (1)^	(2)	*European Union* (1)^	(2)
T	-0.054	-0.061	-0.052	-0.061
	(1.97)**	(2.28)**	(1.93)*	(2.30)**
$alwaysEXP^{EU25}$	0.468	0.477		
	(1.81)*	(1.97)**		
$alwaysEXP^{ROW1}$	0.552	0.59		
	(3.64)***	(3.92)***		
$alwaysEXP^{EU15}$			0.612	0.68
			(2.68)***	(2.87)***
$alwaysEXP^{ROW2}$			0.485	0.583
			(3.63)***	(4.41)***
EU25	0.371	0.341		
	(3.36)***	(2.99)***		
$alwaysEXP^{EU25}$ * EU25	-0.316	-0.308		
	(1.31)	(1.35)		
$alwaysEXP^{ROW1}$ * EU25	-0.41	-0.384		
	(2.88)***	(2.66)***		
EU15			0.328	0.341
			(3.40)***	(3.55)***
$alwaysEXP^{EU15}$ * EU15			-0.445	-0.506
			(2.09)**	(2.25)**
$alwaysEXP^{ROW2}$ * EU15			-0.344	-0.384
			(2.75)***	(3.04)***
R&D	0.059	0.123	0.065	0.124
	(1.93)*	(4.01)***	(2.18)**	(4.04)***
K/L	0.005	0.005	0.004	0.005
	(11.90)***	(12.20)***	(11.62)***	(12.35)***
w/L	0.02	0.023	0.02	0.023
	(10.39)***	(12.59)***	(10.35)***	(12.64)***
Constant	3.825	10.669	3.878	10.668
	(29.10)***	(79.39)***	(33.09)***	(90.57)***
Pavitt sector dummies		yes		yes
Geographical location dummies		yes		yes
Firm size dummies		yes		yes
Observations	1591	1591	1630	1591
R-squared	0.2	0.26	0.2	0.26

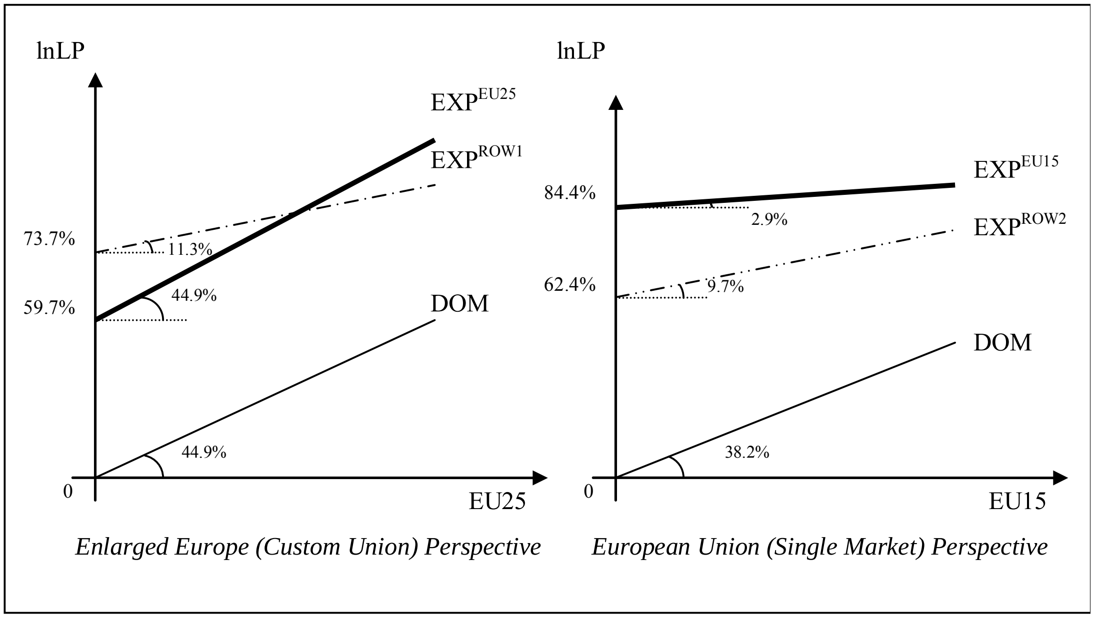
Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Let's start from Enlarged Europe view[33] (i.e. Custom Union Perspective based mostly on the removal of *tariff* trade barriers). Europeanized Export Premium is positive, but smaller than Globalized Export Premium (59.7% and 73.7% respectively): probably because at this stage, the fall in costs-to-entry is much more relevant respect to the increase in market competition and any performance-enhancing effect within European markets.

[33] All trade variables are statistically significant at the 10% level – except for the interaction $alwaysEXP^{EU25}$ * *EU25* – which in turn are also jointly significant at the 1% level (the F-statistic is about 5.20 [0.0001]).

Anyhow, following to one percentage point increase in industry export propensity towards European area (EU25) – due predominantly to a fall in *tariff* trade barriers – the productivity increases for all firms, although at a lower extent for Globalized Exporters (11.3% (= 44.9% - 33.6%) versus 44.9%, on average and *ceteris paribus*).

Figure 6 – Heterogeneous impact of Industry-level trade integration on firm productivity



Let's move on European Union view[34] (i.e. Single Market Perspective based mainly on the removal of *non-tariff* trade barriers, in addition to other obstacles regarding inputs – capital and labour – movement). Europeanized exporters appear to be now more productive than Globalized ones (by 22.0% (= 84.4% - 62.4%), on average and *ceteris paribus*) which in turn display higher performance compared with non-exporters (by 62.4%, on average and *ceteris paribus*). While, following one percentage point increase in the industry export propensity towards European area (EU15) – due particularly to a fall in *non-tariff* trade barriers – productivity increases again for all firms, especially for non-exporters (by 38.2%, on average and *ceteris paribus*), but unlike before: Europeanized Exporters change at a lower rate than Globalized ones (2.9% versus 9.7%, on average and *ceteris paribus*). Anyway, in both perspectives, firms' productivity converges upwards

[34] All trade variables are statistically significant at the 5%, which in turn are also jointly significant at the 1% level (the F-statistic is about 5.68 [0.0000]).

(See the **Figure 6**). We achieve the same results again, although with a different magnitude, as industry, location and firm size dummies are accounted for.

Hence, we can conclude that trade integration in all its forms – i.e. through removal of both *tariff* and *non-tariff* barriers – produces relevant productivity gains for 'surviving' permanent non-exporters, probably because of a higher chance to benefit from productivity spillover arising from exporting. In fact, on the one side, the number of exporters and exporters' experience tend to increase, and on the other side, the pure domestic firms which are able to compete within home market despite trade liberalization/integration means that they are productive – or better, they have got an absorptive capacity – to such an extent that they can take advantage of knowledge spillover from exporters. As regards the impact of trade integration on Permanent Europeanized Exporters' productivity, it is positive, but the related magnitude depends on the phase of trade integration: it is relatively larger – respect to always-Globalized exporters – if a further fall in tariff trade barriers occurs (under Custom Union), and might become even relatively lower – respect to always-Globalized exporters – following a fall in non-tariff trade barriers (under Single Market). In fact, the *tariff*-related trade policies are advantageous for both export-starters and (especially) permanent exporters oriented to European markets, whereas the *non-tariff*-related trade policies could generate benefits (only) for the former – which can start to sell abroad without any investment to adapt their production to foreign standards – and (even) damages for the latter – given that they make their previous investments in foreign standards adaptation ineffective[35]. Finally, Permanent Globalized Exporters always grow at a relatively low rate, following an enhancement in European-level trade integration, since the related measures do not directly concern (or concern only partially) them, but only indirectly and negatively: in fact, they lose part of market shares within both Home and European markets – due to the increase in performance of both Europeanized exporters and home-oriented firms.

In practise, the removal of tariff trade barriers – such as through the constitution of a *Custom Union* – makes the international market more attractive and thus, induces the most productive domestic firms to consider the chance to become exporters or to intensify their exports towards new and/or old foreign markets, which in turn, leads them to improve

[35] Given that they entail the whole loss of their previous investments in adaptation to foreign standards.

further their performance (according to the Self-Selection hypothesis). At the same time, the least productive firms are forced to stop activity, being unable to contend with foreign competitors (import competition effect). Thus, business reallocation from low-performance firms to highly-productive firms occurs, causing an increase in average aggregate productivity. In addition, we must not neglect the positive externalities from exporters to non-exporters through knowledge transfer and business backward and forward linkages (the so-called export-related productivity spillovers). All these effects will tend to enhance if further obstacles related to the movement of goods (such as non-tariff trade barriers) as well as impediments linked to the movement of capital and people are removed – for instance, through the creation of a *Single Market* – since that would allow a more competitive environment and more efficient and effective allocation of resources (such as capital and labour) across borders according to the peculiar productive vocations of several territories. Finally, this ongoing process of productive specialization makes firms and territories increasingly interdependent and interrelated amongst them, therefore, the need of common policies is progressively more felt through, for instance, the establishment of an *Economic and Monetary Union* – implying the introduction of a single currency, and thus the removal of further barriers – which will tend over time to move closer to distinctive traits of an out-and-out *Political Union*.

6 Robustness check

In order to check the robustness of our results, we repeat all the regressions with alternative measures of productivity: i.e. the total factor productivity (TFP) computed by several estimation techniques (Ordinary Least Squares (OLS), Fixed Effect (FE) and Levinsohn-Petrin (L-P)). In particular, the related production function – in the form of $\ln Output_{it} = \delta_0 + \delta_1 \ln Labour_{it} + \delta_2 \ln Capital_{it} + \xi_{it}$ – has been estimated separately for each Pavitt sector, by allowing for all available 1998-2003 data, and the respective results are shown in **Table C** in the Appendix[36].

[36] See the Chapter 1 for a brief discussion about the different estimation methods of productivity.

As we can see from the **Table 5 bis** in Appedix, TFP export premium (within a range of 9.5% - 30.0%) always appears to be positive, statistically significant and larger than LP export premium (around 8%) and it is highly confirmed that industries relatively more oriented to more integrated markets exhibit more productive firms, if we allow for European Union and Eurozone perspectives: in fact, only the EU25's coefficient always turns out be statistically insignificant as TFP measures are used. However, if we move to the **Table 6 bis** in Appendix (in particular the FE column), we can notice further evidence that a more intensive industry trade propensity towards Enlarged Europe entails a higher average firm performance, which would turn out to be slightly higher as European Union perspective is adopted. Moreover, Europeanized exporters would always present a lower TFP than Globalized ones (unlike LP case), and the related premium would tend to fall as we shift from EU25 view to EU15 one (like LP case). Therefore, labour productivity plays a strategic role when firms wish to serve European markets, whereas when they aim at exporting to global markets, also other factors' productivity (e.g. capital productivity) assumes a more relevant function. As differences across Pavitt industries, geographical locations and firm size categories are accounted for, all arguments connected to export premium heterogeneity and dynamics are robustly confirmed. With regard to the industry trade ratios' coefficients, they always seem to be statistically insignificant now; however, an evidence for their significance, through the various TFP measures, can be noted in the **Table 7 bis** in Appendix.

At first glance, Globalized exporters would already outperform Europeanized exporters – in TFP terms (regardless of the used estimation method) – before starting any international activity (see the Table 7 bis), supporting the idea that more productive firms can start to export to European markets, but solely the best ones will be actually able to serve Global markets. Furthermore, the *Europeanized pre-entry export premium* always falls as we move from Enlarged Europe to European Union perspective, stressing further the fact that firms have to cover some relevant costs to entry foreign markets, especially when the latter are relatively less integrated with home economy. However, as we control for differences across firms according to their Pavitt sector, location and size, the results go back to be exactly in line with the labour productivity findings: the Europeanized pre-entry export premium seems to be larger than the Globalized one under Enlarged Europe perspective[37], and viceversa, under European Union view.

If we focus on the sub-sample of non-switchers (see the **Table 8 bis** in Appendix), we can observe as Europeanized exporters are always less TFP productive than Globalized ones, and the linked export premium would tend to decrease when we move from Enlarged Europe to European Union view (similarly to what we have already seen in the Table 6 bis). Furthermore, through examining the results in the **Table 9 bis** in Appendix, the permanent Globalized exporters always display a lower productivity growth rate respect to permanent non-exporters, irrespective of whether we control for the initial productivity level. While, as regards permanent Europeanized exporters, the findings are mixed: under EU25 perspective, they show either no difference or a lower productivity growth rate compared with non-exporters, and anyway less low than permanent Globalized exporters[38], whereas under EU15 view, the productivity growth premium is always statistically insignificant. This situation does not change so much, as region, industry and firm size dummies are included.

Finally, if we consider the role of trade integration policies, in both under analysis perspectives, permanent Globalized EXPs are almost always more productive than permanent Europeanized ones, which in turn would exhibit higher performance or no difference in TFP terms respect to DOMs. However, while the former EXPs' performance decreases, the productivity of both Europeanized EXPs and DOMs correspondingly increases following a further trade integration towards European markets. This heterogeneous impact of trade integration – not always confirmed – finds more robustness as differences across sectors, regions and firm size groups are considered. Nevertheless, we can highlight that a certain convergence in productivity terms occurs amongst various firm categories, following an increase in trade integration (see the **Table 10 bis** in Appendix).

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[37] Apart from the case where TFP is estimated by Fixed Effect model.

[38] Except for the case where TFP has been estimated through Levinson-Petrin model and simultaneously the initial productivity level has been controlled for.

7 Conclusion

This paper participates in the intense debate about the relationship between trade and firm performance, taking into account firm heterogeneity and the role of trade policy. In detail, we have analyzed the exporting-productivity linkage and how it may be affected by the increasing and apparently unstoppable process of international economic integration, through a recent literature review, and a new empirical evidence on Italian manufacturing sector. In general, our empirical results have turned out to be coherent with theoretical predictions emphasized by Meltiz-Ottaviano model (2008).

First of all, by considering the whole sample (both switchers and non-switchers), we have documented that exporters outperform firms oriented solely to the domestic market – i.e. the existence of the so-called *export productivity premium* – highlighting that Europeanized exporters are relatively more productive than Globalized ones at first glance. Later, as differentials across industries, locations and firm size groups have been controlled for, *Europeanized export premium* has actually appeared lower than *Globalized export premium*.

Second, we have found that firm productivity on average increases as the relative industry exports rise towards more and more integrated – although progressively smaller – markets, despite Europeanized exporters' productivity premium seems to be – although slightly – smaller as the perspective of the more integrated European market is adopted. Indeed, Italian firms' average productivity assumes higher value in the industries with the highest export propensity towards Eurozone (Economic and Monetary Union – 12 MSs) and European Union (Single Market – 15 MSs). Whereas, it is lower as the market borders are extended to further geographical areas but less interrelated, i.e. when the industry export tendency towards Enlarged Europe (Custom Union – 25 MSs) is considered. At the same time, the Europeanized export premium becomes slightly smaller as the European Union perspective, rather than Enlarged Europe one, is adopted.

Third, we have found that firms are more likely to self-select in international market by allowing for not only the fixed costs to entry, but also the level of market competition: indeed, export starters already displayed higher productivity respect to permanent non-exporters, before starting any foreign activity. In particular, future

Europeanized export starters already outperformed future Globalized export starters under Enlarged Europe view, and viceversa under European Union perspective: this ‘patterns inversion’ may be due to the fact that the drastic fall in trade barriers prevails on the competition enhancement effect, as we move from the first perspective to the second one.

Fourth, by focusing only on the sub-sample of non-switchers, we have highlighted that permanent Globalized exporters grow in performance terms less than permanent Europeanized exporters, which in turn would exhibit a lower or even no difference in productivity growth compared with always-non-exporters (under both perspectives).

Finally, we have provided evidence of a heterogeneous impact on firm productivity of industry-level trade integration. It has turned out to be always positive for all firms in both Enlarged Europe (Cutom Union) and European Union (Single Market) points of view, but through a different magnitude: always high for permanent non-exporters – probably because of productivity spillovers from exporting – always low for permanent Globalized exporters – probably because of markets shares loss within both Home and European markets – and ‘variable’ for permanent Europeanized exporters. In particular, the latter firms’ performance has appeared to be lower (higher) than permanent Globalized exporters, but increasing at a higher (lower) rate in industry-level trade integration, under Enlarged Europe (European Union) perspective. The underlying reason could be the fact that the fall in *tariff* trade barriers (predominantly under Custom Union) is profitable for both Europeanized export starters and permanent Europeanized exporters, whereas the removal of non-tariff trade barriers (mostly under Single Market) benefits exclusively the former and even harms the latter – since the further investments in adaptation to foreign standards are not necessary anymore. Therefore, we can highlight a certain convergence upwards in performance terms across the different firm categories, following an increase in trade integration.

Our results seem to be in line with findings achieved by Bernard et al. (2006) – who have empirically highlighted as a fall in trade costs within industry would imply intra-industry business reallocation, and thus an increase in industry average productivity – and Corcos et al. (2007) – who have shown that further EU integration would entail relevant benefits in terms of firm performance.

Hence, the policy-makers of countries engaged in a Regional Trade Agreement (RTA) should rely on 'deeper integration' policies (i.e. total removal of each sort of international barrier) rather than – or before – thinking to involve new countries in RTA (enlargement market process). In this way, firms in each Member State (such as Italy, in this study) will become progressively more productive, and consequently, an increasing portion of them will also be able to compete with extra-RTA firms (*non-European firms*) both inside and outside the RTA markets (*European markets*). Of course, this mechanism will be maximized, as the involved markets will be completely integrated, i.e. when they will really merge into a single larger market (*European market*), whose – almost all – firms (*European firms*) will have all necessary requirements to face the extra-regional competition (*Extra-European competition*) both internally and externally.

Finally, we are aware that our analysis is not absolutely exhaustive, since the same topic could be explored through different approaches and econometric methodologies, different productivity and trade measures, and larger datasets including higher number of firms, more years, many more characteristics of firms under both general and internationalization profiles. These are some sufficient reasons that motivate us to deepen further our work in the future.

However, as well as confirming earlier studies about the existence the export-productivity linkage, this paper makes a contribution to the recent literature aimed at emphasizing the role of 'market integration', in addition to 'market size' one, in the relationship between international trade and economic performance. It would be really interesting to extend empirically our analysis to FDI flows – by also discriminating between multinational firms and local ones – since they play an equally important role in a context of advanced market integration, as European integration one.

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APPENDIX

Table A – Converted industry codes from Ateco 1991 to Ateco 2002 classification

FROM 4 (or 5)-digit level *Ateco 1991*	TO 3-digit level Ateco 2002
1773	*182*
1774	*182*
1775	*182*
2735	*271*
28755	*352*
29561	*292*
29562	*292*
29564	*294*
35114	*371*

Table B – Dynamics in firm categories over time: 'European Union perspective'

Total firms (1070) 100%	Europeanized Exporters in 2003 15.1%	Globalized Exporters in 2003 57.3%	Non-Exporters in 2003 27.6%
Europeanized Exporters in 2000 15.9%	Always Europeanized Exporters 7.8%	Globalizing Europeanized Exporters 6.4%	Homeward Europeanized Exporters 1.7%
Globalized Exporters in 2000 56.6%	Europeanizing Globalized Exporters 4.8%	Always Globalized Exporters 48.6%	Homeward Globalized Exporters 3.2%
Non-Exporters in 2000 27.5%	Europeanized Export Starters 2.5%	Globalized Export Starters 2.3%	Always Non-Exporters 22.7%

Table C – Production function estimations

	OLS estimation ln SALES (dependent variable) traditonal sector	Scale intensive sector	Specialized suppliers sector	High-tech sector
ln L	0.783	0.906	0.947	1.141
	(45.76)***	(30.09)***	(53.98)***	(21.92)***
ln K	0.145	0.157	0.094	-0.013
	(14.15)***	(7.83)***	(8.26)***	(0.39)
Constant	4.785	4.264	4.466	4.421
	(94.83)***	(50.15)***	(92.98)***	(36.61)***
Observations	2996	1080	1883	297
R-squared	0.6832	0.7718	0.8441	0.8722

	Fixed Effect estimation ln SALES (dependent variable) traditonal sector	Scale intensive sector	Specialized suppliers sector	High-tech sector
ln L	0.493	0.387	0.566	0.382
	(20.41)***	(4.02)***	(10.81)***	(5.59)***
ln K	0.066	0.037	0.035	0.110
	(5.32)***	(1.3)	(1.94)*	(3.67)***
Constant	6.338	6.938	6.336	6.608
	(57.25)***	(19.83)***	(29.01)***	(20.7)***
Observations	2996	1080	1883	297
R-squared	0.682	0.7697	0.8434	0.8501

	Levinson Petrin estimation^ ln SALES (dependent variable) traditonal sector	Scale intensive sector	Specialized suppliers sector	High-tech sector
ln L	0.326	0.411	0.407	0.283
	(11.36)***	(7.99)***	(12.51)***	(2.6)***
ln K	0.000	0.086	0.014	0.078
	(0)	(2.32)**	(0.29)	(0.78)
ln M	0.263	0.147	0.273	0.000
	(1.4)	(0.72)	(1.63)	(0)
Observations	2993	1080	1883	297

Absolute value of t statistics in parentheses
^ Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Note: L = Labour (number of employees); K = capital (capital assets); and M = intermediate inputs (costs of materials)

Table 5 bis – Exports, productivity and market integration (Pooled models)

lnTFP (dependent variable)			*Enlarged Europe*						*European Union*						*Eurozone*			
	TFP^{ols}		TFP^{fe}		TFP^{lp}		TFP^{ols}		TFP^{fe}		TFP^{lp}		TFP^{ols}		TFP^{fe}		TFP^{lp}	
	(1)^	(2)^	(3)^	(4)	(5)^	(6)	(1)^	(2)^	(3)^	(4)	(5)^	(6)	(1)^	(2)^	(3)^	(4)	(5)^	(6)
T	-0.034	-0.035	-0.051	-0.037	-0.032	-0.02	-0.034	-0.035	-0.051	-0.037	-0.032	-0.02	-0.035	-0.035	-0.052	-0.038	-0.031	-0.019
	(1.35)	(1.41)	(1.56)	(1.42)	(0.96)	(0.98)	(1.33)	(1.38)	(1.54)	(1.4)	(0.95)	(0.96)	(1.36)	(1.41)	(1.58)	(1.43)	(0.93)	(0.95)
EXPORTER	0.111	0.134	0.3	0.155	0.095	0.073	0.111	0.134	0.3	0.155	0.097	0.074	0.113	0.134	0.302	0.156	0.099	0.074
	(3.58)***	(4.12)***	(7.77)***	(4.86)***	(2.61)***	(2.99)***	(3.61)***	(4.13)***	(7.81)***	(4.87)***	(2.67)***	(3.02)***	(3.64)***	(4.14)***	(7.80)***	(4.89)***	(2.70)***	(3.03)***
EU25	0.075	0.054	0.128	0.063	-0.074	-0.043												
	(1.21)	(0.85)	(1.56)	(0.92)	(0.91)	(0.81)												
EU15							0.093	0.073	0.138	0.08	-0.036	-0.023						
							(1.65)*	(1.26)	(1.84)*	(1.28)	(0.47)	(0.47)						
EMU12													0.099	0.078	0.145	0.09	-0.006	-0.007
													(1.79)*	(1.35)	(1.95)*	(1.47)	(0.09)	(0.14)
R&D	0.125	0.144	0.393	0.167	0.36	0.123	0.126	0.144	0.395	0.168	0.361	0.123	0.127	0.145	0.395	0.168	0.362	0.123
	(4.71)***	(5.10)***	(11.09)***	(5.58)***	(9.83)***	(5.33)***	(4.75)***	(5.11)***	(11.11)***	(5.60)***	(9.83)***	(5.33)***	(4.75)***	(5.11)***	(11.12)***	(5.61)***	(9.84)***	(5.34)***
Constant	-0.178	-0.262	-0.469	-0.647	5.203	4.914	-0.197	-0.283	-0.48	-0.666	5.162	4.893	-0.204	-0.287	-0.488	-0.675	5.131	4.876
	(2.50)**	(3.25)***	(5.07)***	(7.43)***	(56.62)***	(73.32)***	(3.01)***	(3.68)***	(5.65)***	(8.09)***	(59.72)***	(77.17)***	(3.10)***	(3.79)***	(5.66)***	(8.36)***	(61.09)***	(78.41)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes		yes		yes		yes
Observations	2056	2056	2056	2056	2055	2055	2056	2056	2056	2056	2055	2055	2056	2056	2056	2056	2055	2055
R-squared	0.02	0.06	0.11	0.43	0.06	0.66	0.02	0.06	0.11	0.43	0.06	0.66	0.02	0.06	0.11	0.43	0.06	0.66

Absolute value of t statistics in parentheses

^ Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 bis – Heterogeneous exporters, productivity and market integration (Pooled models) - the whole sample

lnTFP (dependent variable)	*Enlarged Europe*						*European Union*					
	TFP^{ols}		TFP^{fe}		TFP^{lp}		TFP^{ols}		TFP^{fe}		TFP^{lp}	
	(1)^	(2)^	(3)^	(4)	(5)^	(6)	(1)^	(2)^	(3)^	(4)	(5)^	(6)
T	-0.034	-0.036	-0.052	-0.038	-0.033	-0.02	-0.034	-0.035	-0.051	-0.037	-0.032	-0.02
	(1.35)	(1.41)	(1.58)	(1.43)	(0.98)	(0.99)	(1.33)	(1.39)	(1.54)	(1.4)	(0.95)	(0.97)
EXP^{EU25}	0.087	0.102	0.191	0.122	0.011	0.05						
	(2.27)**	(2.63)***	(4.01)***	(3.02)***	(0.24)	(1.63)						
EXP^{ROW1}	0.121	0.149	0.347	0.171	0.132	0.085						
	(3.69)***	(4.28)***	(8.39)***	(5.03)***	(3.36)***	(3.22)***						
EXP^{EU15}							0.08	0.092	0.188	0.111	0.01	0.041
							(2.02)**	(2.30)**	(3.78)***	(2.61)***	(0.21)	(1.26)
EXP^{ROW2}							0.122	0.149	0.338	0.172	0.126	0.086
							(3.77)***	(4.35)***	(8.30)***	(5.12)***	(3.27)***	(3.33)***
EU25	0.081	0.062	0.156	0.072	-0.052	-0.037						
	(1.31)	(0.98)	(1.90)*	(1.04)	(0.64)	(0.69)						
EU15							0.098	0.08	0.158	0.087	-0.021	-0.017
							(1.74)*	(1.38)	(2.09)**	(1.4)	(0.27)	(0.35)
R&D	0.121	0.14	0.373	0.162	0.345	0.12	0.122	0.14	0.379	0.163	0.349	0.12
	(4.44)***	(4.89)***	(10.34)***	(5.39)***	(9.37)***	(5.15)***	(4.50)***	(4.92)***	(10.52)***	(5.43)***	(9.52)***	(5.17)***
Constant	-0.183	-0.27	-0.494	-0.656	5.183	4.908	-0.202	-0.29	-0.497	-0.673	5.149	4.887
	(2.58)***	(3.36)***	(5.34)***	(7.52)***	(56.40)***	(73.03)***	(3.09)***	(3.78)***	(5.85)***	(8.17)***	(59.42)***	(76.97)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes
Observations	2056	2056	2056	2056	2055	2055	2056	2056	2056	2056	2055	2055
R-squared	0.02	0.06	0.12	0.43	0.07	0.66	0.03	0.06	0.12	0.43	0.07	0.66

Absolute value of t statistics in parentheses

^ Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7 bis – Self-selection in international markets (Europeanization versus Globalization)

$\ln TFP_0$ (dependent variable)	*Enlarged Europe*						*European Union*					
	TFP^{ols}		TFP^{fe}		TFP^{lp}		TFP^{ols}		TFP^{fe}		TFP^{lp}	
	(1)^	(2)^	(3)^	(4)^	(5)^	(6)	(1)^	(2)^	(3)^	(4)	(5)^	(6)
$DOMEXP^{EU25}_0$	0.334	0.357	0.318	0.386	0.249	0.323						
	(2.41)**	(2.58)**	(2.23)**	(2.73)***	(1.81)*	(3.88)***						
$DOMEXP^{ROW1}_0$	0.374	0.345	0.716	0.468	0.461	0.287						
	(2.47)**	(2.32)**	(2.53)**	(2.89)***	(2.06)**	(2.56)**						
$DOMEXP^{EU15}_0$							0.291	0.312	0.263	0.317	0.13	0.242
							(1.99)**	(2.08)**	(1.76)*	(2.55)**	(0.92)	(2.65)***
$DOMEXP^{ROW2}_0$							0.402	0.392	0.669	0.517	0.536	0.388
							(2.72)***	(2.70)***	(2.87)***	(3.91)***	(2.83)***	(4.00)***
$EU25_0$	0.366	0.247	0.243	0.263	-0.053	0.02						
	(2.56)**	(1.76)*	(1.31)	(1.77)*	(0.33)	(0.15)						
$EU15_0$							0.355	0.258	0.286	0.264	0.02	0.032
							(2.76)***	(2.03)**	(1.68)*	(1.64)	(0.13)	(0.27)
$R\&D_0$	0.104	0.1	0.215	0.117	0.148	0.078	0.1	0.095	0.214	0.112	0.138	0.071
	(1.11)	(1.14)	(1.67)*	(1.31)	(1.28)	(1.11)	(1.06)	(1.08)	(1.65)*	(1.17)	(1.19)	(1.01)
Constant	-0.557	-0.524	-0.655	-0.899	5.141	4.802	-0.543	-0.533	-0.7	-0.896	5.067	4.796
	(3.48)***	(2.97)***	(3.20)***	(4.79)***	(28.11)***	(30.71)***	(3.78)***	(3.18)***	(3.75)***	(4.52)***	(30.16)***	(32.98)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes
Observations	288	288	288	288	288	288	288	288	288	288	288	288
R-squared	0.07	0.15	0.09	0.39	0.05	0.58	0.07	0.15	0.09	0.4	0.06	0.58

Absolute value of t statistics in parentheses

^ Robust t statistics in parentheses

Table 8 bis – Heterogeneous exporters, productivity and market integration (Pooled models) - the sub-sample of non-switchers

	Enlarged Europe						*European Union*					
lnTFP (dependent variable)	TFP^{ols}		TFP^{fe}		TFP^{lp}		TFP^{ols}		TFP^{fe}		TFP^{lp}	
	(1)^	(2)^	(3)^	(4)	(5)^	(6)	(1)^	(2)^	(3)^	(4)	(5)^	(6)^
T	-0.038	-0.039	-0.06	-0.041	-0.04	-0.022	-0.037	-0.037	-0.055	-0.038	-0.035	-0.02
	(1.32)	(1.36)	(1.65)*	(1.37)	(1.07)	(0.99)	(1.3)	(1.33)	(1.54)	(1.29)	(0.94)	(0.89)
$alwaysEXP^{EU25}$	0.132	0.144	0.198	0.164	0.007	0.085						
	(2.69)***	(2.85)***	(3.35)***	(3.17)***	(0.14)	(2.15)**						
$alwaysEXP^{ROW1}$	0.179	0.212	0.436	0.239	0.208	0.138						
	(4.87)***	(5.30)***	(9.86)***	(6.26)***	(5.16)***	(4.74)***						
$alwaysEXP^{EU15}$							0.132	0.137	0.185	0.159	0.007	0.073
							(2.68)***	(2.70)***	(3.17)***	(3.03)***	(0.13)	(1.75)*
$alwaysEXP^{ROW2}$							0.174	0.206	0.419	0.237	0.19	0.134
							(4.86)***	(5.30)***	(9.72)***	(5.82)***	(4.83)***	(4.73)***
EU25	0.09	0.083	0.114	0.085	-0.066	-0.031						
	(1.31)	(1.2)	(1.27)	(1.13)	(0.74)	(0.55)						
EU15							0.074	0.078	0.099	0.083	-0.059	-0.022
							(1.22)	(1.27)	(1.25)	(1.29)	(0.72)	(0.43)
R&D	0.11	0.137	0.326	0.147	0.296	0.105	0.117	0.143	0.345	0.158	0.315	0.112
	(3.45)***	(4.16)***	(8.12)***	(4.30)***	(7.44)***	(4.04)***	(3.74)***	(4.50)***	(8.79)***	(4.71)***	(8.00)***	(4.39)***
Constant	-0.222	-0.277	-0.488	-0.657	5.17	4.908	-0.207	-0.286	-0.479	-0.669	5.156	4.884
	(2.82)***	(3.17)***	(4.82)***	(6.86)***	(51.09)***	(67.23)***	(2.93)***	(3.51)***	(5.30)***	(7.76)***	(55.11)***	(72.12)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes
Observations	1587	1587	1587	1587	1586	1586	1626	1626	1626	1626	1625	1625
R-squared	0.04	0.07	0.14	0.42	0.07	0.66	0.04	0.07	0.15	0.43	0.07	0.67

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%;***significant at 1%

Table 9 bis – Post-entry effects of exporting (Europeanization versus Globalization)

ΔlnTFP (dependent variable)												
	Enlarged Europe											
	TFP^{ols}				TFP^{fe}				TFP^{lp}			
	(1)^	(2)^	(3)^	(4)^	(5)^	(6)^	(7)^	(8)^	(9)^	(10)^	(11)^	(12)^
$lnTFP_0$			-0.157	-0.156			-0.06	-0.101			-0.088	-0.17
			(5.93)***	(5.87)***			(3.18)***	(4.31)***			(5.89)***	(5.51)***
$alwaysEXP^{EU25}$	-0.068	-0.078	-0.042	-0.05	-0.068	-0.096	-0.076	-0.077	-0.088	-0.094	-0.081	-0.074
	(1.44)	(1.70)*	(0.9)	(1.12)	(1.44)	(2.28)**	(1.74)*	(1.83)*	(2.06)**	(2.38)**	(1.95)*	(1.92)*
$alwaysEXP^{ROW1}$	-0.112	-0.133	-0.072	-0.087	-0.112	-0.129	-0.084	-0.096	-0.108	-0.112	-0.076	-0.074
	(3.18)***	(3.78)***	(2.14)**	(2.58)**	(3.18)***	(3.96)***	(2.68)***	(3.00)***	(3.40)***	(3.66)***	(2.49)**	(2.49)**
$alwaysEXP^{EU15}$												
$alwaysEXP^{ROW2}$												
ΔEU25	-0.167	-0.128	0.008	-0.056	-0.167	-0.117	-0.111	-0.065	-0.13	-0.074	0.003	-0.006
	(1.03)	(0.74)	(0.32)	(0.33)	(1.03)	(0.74)	(0.72)	(0.4)	(0.97)	(0.52)	(0.02)	(0.04)
ΔEU15												
ΔR&D	0.007	0.006	-0.117	0.006	0.007	0.019	0.021	0.02	0.022	0.024	0.025	0.025
	(0.29)	(0.22)	(0.72)	(0.22)	(0.29)	(0.79)	(0.87)	(0.84)	(0.97)	(1.03)	(1.14)	(1.1)
Constant	0.046	0.015	0.024	-0.019	0.046	0.033	0.028	-0.027	0.061	0.048	0.514	0.871
	(1.45)	(0.29)	(0.81)	(0.38)	(1.45)	(0.72)	(1.02)	(0.59)	(2.10)**	-1.13	(5.89)***	(5.53)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes
Observations	762	762	762	762	762	762	762	762	761	761	761	761
R-squared	0.02	0.04	0.07	0.08	0.02	0.04	0.04	0.07	0.02	0.04	0.06	0.09

ΔlnTFP (dependent variable)												
	European Union											
	TFP^{ols}				TFP^{fe}				TFP^{lp}			
	(1)^	(2)^	(3)^	(4)^	(5)^	(6)^	(7)^	(8)^	(9)^	(10)^	(11)^	(12)^
$lnTFP_0$			-0.173	-0.171			-0.062	-0.106			-0.087	-0.172
			(6.23)***	(6.22)***			(3.29)***	(4.49)***			(6.07)***	(5.65)***
$alwaysEXP^{EU25}$												
$alwaysEXP^{ROW1}$												
$alwaysEXP^{EU15}$	-0.024	-0.027	0	-0.002	-0.055	-0.051	-0.04	-0.035	-0.053	-0.053	-0.047	-0.04
	(0.49)	(0.56)	(0.01)	(0.05)	(1.15)	(1.16)	(0.86)	(0.79)	(1.17)	(1.28)	(1.07)	(0.98)
$alwaysEXP^{ROW2}$	-0.12	-0.138	-0.075	-0.088	-0.126	-0.133	-0.089	-0.098	-0.112	-0.116	-0.081	-0.078
	(3.41)***	(3.98)***	(2.24)**	(2.65)***	(3.84)***	(4.16)***	(2.87)***	(3.14)***	(3.55)***	(3.87)***	(2.65)***	(2.68)***
ΔEU25												
ΔEU15	-0.066	-0.07	-0.01	0.003	-0.02	-0.039	0.005	0.004	-0.036	-0.039	0.011	0.003
	(0.47)	(0.49)	(0.07)	(0.02)	(0.15)	(0.29)	(0.03)	(0.03)	(0.31)	(0.33)	(0.09)	(0.02)
ΔR&D	0.015	0.014	0.014	0.013	0.029	0.028	0.028	0.028	0.027	0.028	0.029	0.028
	(0.62)	(0.57)	(0.59)	(0.51)	(1.25)	(1.19)	(1.23)	(1.19)	(1.23)	(1.29)	(1.36)	(1.32)
Constant	0.048	0.036	0.025	-0.006	0.052	0.048	0.03	-0.018	0.063	0.06	0.509	0.887
	(1.49)	(0.69)	(0.79)	(0.13)	(1.71)*	(1.06)	(1.07)	(0.4)	(2.14)**	(1.44)	(6.01)***	(5.74)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes
Observations	781	781	781	781	781	781	781	781	780	780	780	780
R-squared	0.02	0.05	0.08	0.1	0.03	0.05	0.04	0.08	0.02	0.05	0.06	0.09

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10 bis – Heterogeneous impact of industry-level trade integration on firm productivity

lnTFP (dependent variable)	Enlarged Europe						European Union					
	TFP^{ols}		TFP^{fe}		TFP^{lp}		TFP^{ols}		TFP^{fe}		TFP^{lp}	
	(1)^	(2)^	(3)^	(4)	(5)^	(6)	(1)^	(2)^	(3)^	(4)^	(5)^	(6)
T	-0.037	-0.038	-0.059	-0.04	-0.04	-0.022	-0.037	-0.037	-0.054	-0.037	-0.035	-0.02
	(1.28)	(1.32)	(1.64)	(1.34)	(1.06)	(0.97)	(1.29)	(1.32)	(1.54)	(1.28)	(0.93)	(0.88)
$alwaysEXP^{EU25}$	0.297	0.282	0.308	0.252	-0.211	0.035						
	(1.21)	(1.18)	(1.05)	(0.94)	(0.81)	(0.17)						
$alwaysEXP^{ROW1}$	0.611	0.609	0.61	0.566	0.27	0.297						
	(3.89)***	(3.88)***	(3.08)***	(3.42)***	(1.41)	(2.35)**						
$alwaysEXP^{EU15}$							0.402	0.386	0.319	0.289	-0.121	0.007
							(1.85)*	(1.81)*	(1.19)	(1.28)	(0.47)	(0.03)
$alwaysEXP^{ROW2}$							0.559	0.555	0.648	0.516	0.273	0.272
							(4.04)***	(4.00)***	(3.75)***	(3.50)***	(1.58)	(2.49)**
EU25	0.342	0.318	0.219	0.275	-0.054	0.052						
	(2.92)***	(2.69)***	(1.51)	(2.17)**	(0.43)	(0.54)						
$alwaysEXP^{EU25}$ * EU25	-0.158	-0.134	-0.106	-0.086	0.21	0.048						
	(0.69)	(0.59)	(0.38)	(0.34)	(0.86)	(0.25)						
$alwaysEXP^{ROW1}$ * EU25	-0.428	-0.395	-0.172	-0.324	-0.063	-0.158						
	(2.85)***	(2.65)***	(0.89)	(2.03)**	(0.34)	(1.3)						
EU15							0.304	0.289	0.234	0.247	-0.023	0.049
							(2.95)***	(2.79)***	(1.84)*	(2.23)**	(0.21)	(0.6)
$alwaysEXP^{EU15}$ * EU15							-0.259	-0.241	-0.128	-0.126	0.124	0.065
							(1.28)	(1.21)	(0.52)	(0.59)	(0.53)	(0.34)
$alwaysEXP^{ROW2}$ * EU15							-0.381	-0.346	-0.228	-0.278	-0.084	-0.139
							(2.87)***	(2.63)***	(1.35)	(1.99)**	(0.5)	(1.32)
R&D	0.11	0.136	0.326	0.147	0.297	0.105	0.115	0.142	0.344	0.158	0.315	0.112
	(3.43)***	(4.13)***	(8.12)***	(4.29)***	(7.46)***	(4.04)***	(3.69)***	(4.46)***	(8.76)***	(4.68)***	(8.01)***	(4.40)***
Constant	-0.486	-0.519	-0.599	-0.853	5.157	4.822	-0.446	-0.501	-0.619	-0.836	5.119	4.811
	(3.86)***	(3.95)***	(3.81)***	(5.96)***	(37.70)***	(44.18)***	(4.04)***	(4.28)***	(4.54)***	(6.62)***	(42.71)***	(50.81)***
Pavitt sector dummies		yes		yes		yes		yes		yes		yes
Geographical location dummies		yes		yes		yes		yes		yes		yes
Firm size dummies		yes		yes		yes		yes		yes		yes
Observations	1587	1587	1587	1587	1586	1586	1626	1626	1626	1626	1625	1625
R-squared	0.04	0.08	0.14	0.42	0.07	0.66	0.04	0.08	0.15	0.43	0.07	0.67

Absolute value of t statistics in parentheses
^ Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%