Determinants of exports: firm heterogeneity and local context

Abstract

The new-new international economics literature argues that firm characteristics have a primary impact on their ability to export. But a parallel strand of literature points to the role of the context where firms operate. We study the export performance of about 4,300 Italian manufacturing firms between 2000-2013. Our results show that, controlling for firms' characteristics, features of the local context where firms operate, such as the level of social capital, the efficiency of the public sector and the degree of financial development, have a significant direct impact on firms' export.

Keywords: export decision, export share, local context, firm heterogeneity

JEL classification: D22; F10; F14; F18

1. Introduction

Two well-established facts in the international trade literature are that firms are extremely heterogeneous within countries and industries, and that internationalization is an endogenous process, with firms self-selecting into exporting depending on their characteristics. Several studies also argue that firms benefit from the geographic environment and the surrounding industrial context in which they operate (Dunning, 1998; Robertson and Chetty, 2000; Giovannetti et al., 2013). Differences between and within regions, countries, cultures and societies have not been attenuated with globalization (Rugman, 2003; Meyer et al., 2011) and the local context – i.e., factors such as institutions, human and infrastructural resources, culture, etc. – continues to be a key factor affecting firms' ability to become international.[1] Location advantages, such as a higher level of human and social capital and better functioning institutions, have a significant impact in shaping the firms competitiveness and, in turn, their export performance (Bougheas et al., 1999; Levchenko, 2007; Benfratello and Bronzini, 2010; Francois and Manchin, 2013).

Local characteristics can affect firms' export performance both directly or indirectly. On the one hand, they can make it easier for a firm with given characteristics to access foreign markets, for example because transportation or paperwork costs are lower. This is what we define a direct effect. On the other hand, the local context can impact on the characteristics of the firms operating there in such a way to make them more likely to export. The most obvious example is an environment that favors firms to become larger and more productive, for example providing a highly skilled and dedicated workforce and adequate financial support, and therefore make them more likely to be able to sustain the costs of accessing foreign markets. We define this as an indirect effect of the local context.

Ascertaining the presence of a direct effect of the local context on firms' exports beyond the indirect effect can have important policy implications. However, this can only be done using firm level data matched with a set of characteristic of the local context where they operate. The literature studying the determinants of firms' internationalization typically emphasizes the role of specific features at the national level. It is not only country level characteristics that affect firms' competitiveness, but also the impact of the local environment where firms operate should be taken into consideration.

[1] Meyer et al. (2011, p. 243) argue that "local context are themselves embedded in broader regional context: issues may pertain to, for example, cities, provinces, nation states, or even supra-national units".

Despite its relevance, the empirical evidence on the impact of local characteristics on firms' export performance is still lacking. In fact, most of the literature studying firms' internationalization often adopts a regional or macro-regional perspective, for example controlling for the impact of local factors on the export performance of firms through geographical dummies, even in presence of substantial differences in terms of economic and social characteristics of different areas within a country.[2]

In this paper we present the empirical results of an analysis of the impact of the local context on firms' exports, where the geographical unit of observation is at the level of Italian provinces. Italy is a good case study to analyze the role of local characteristics. Italian provinces are indeed characterized by substantial differences in terms of their economic and social development. As it has been argued by Sestito (2011), for example, the localism of the network of relationships in which firms are entrenched may have a strong influence on their performance. This notwithstanding, the only local characteristic that has been thoroughly analyzed as a determinant of firms' internationalization is the role of local spillovers within industrial districts, following the seminal work of Becattini (1990).[3] Indeed, to the best of our knowledge, the only noticeable exception is Giovannetti et al. (2013), who include in their analysis specific measures of infrastructure endowment at the province level, in addition to considering the impact of industrial districts.

We conduct our analysis on a sample of more than 4,300 Italian manufacturing firms over the period 2000-2013. The data are of very high quality and come from the "*Indagine sulle imprese industriali e dei servizi*" (*Invind*), an annual survey managed by the Bank of Italy on a stratified sample mimicking the structure of the Italian manufacturing sector and its geographical characterization. Our aim is to examine the direct determinants of export performance, controlling for firm-level characteristics. Our contribution to the previous literature is the focus on the characteristics of the economic and social environment where firms operate. In particular, we concentrate on four sets of characteristics for which adequate measures are available: the distance from foreign destination markets, the level of social capital, the efficiency of the public sector and the development of banking markets.

[2] For instance, Minetti and Zhu (2011) argue that differences among the South, Centre and the North of Italy, in terms of infrastructure, institutions and closeness to the most important markets where firms can export, motivate the inclusion of dummy variables indicating where the firm is headquartered.

[3] Bronzini (2000), for example, finds a significant industrial district effect on export performance at the province level. Similarly, Bagella et al. (1998) show that benefits of geographical agglomeration in terms of export intensity and export participation are decreasing in firm size and higher in sectors where competition is based on product differentiation. Gola and Mori (2000) argue that trade specialization of the Italian manufacturing sector depends on factor endowments (human and physical capital, labor), as well as on other location advantages.

Our results confirm that characteristics of the local context have a statistically and economically significant impact on the export performances of firms, that goes beyond that of influencing the characteristics of firms in such a way to make them more likely to be able to sustain the costs of internationalization. This is true both at the extensive margin, i.e. the likelihood that a firm access foreign markets, and at the intensive margin, i.e. the incidence of exports on a firm's total sales. Several checks confirm the robustness of our results with respect to different econometric specifications and alternative measures of the degree of internationalization.

The rest of the paper is organized as follows. Section 2 reviews the recent literature on the determinants of firms' export performance that is relevant for our analysis, focusing in particular on variables describing the local context. Section 3 describes the data used and their sources. Section 4 presents the empirical methodology and illustrates the main results of the econometric analysis. Section 5 concludes.

2. Related literature

A first strand of literature related to our analysis studies the importance of economies of localization on firms exports. Francois and Manchin (2013) explore and confirm the influence of infrastructure and institutional quality on the pattern of bilateral trade of developing countries. Similarly, Portugal-Perez and Wilson (2012) estimate the impact on the export performance of developing countries of indicators of 'soft' infrastructures (border and transport efficiency, business and regulatory environment), and 'hard' infrastructures (physical capital and the diffusion of information and communication technology), finding an impact on the extensive and the intensive margins. On a partially related ground, Méon and Sekkat (2008) and Levchenko (2007) show that an improvement in institutional quality would result in an increase of exports.

Farole and Winkler (2014) study the impact of average country characteristics on firms' export performance while also controlling for their individual characteristics. Studying a cross-section of more than 35,000 manufacturing and services firms in 76 low- and middle-income countries, they show that both regional investment climate (such as, trade facilitations and infrastructures) and agglomeration factors have a significant impact on export participation, also accounting for firm specific characteristics.

Focusing on Italy, Bugamelli et al. (2000) and Basile (2001) argue that firms located in the southern regions suffer from locational disadvantages, attributable at least in part to institutional and context variables that go beyond specific firm characteristics. More interestingly, in a paper focusing on leading Italian exporting firms before and during the 2007-2008 financial crisis, Bugamelli and Gallo (2012) argue that context specific macroeconomic policy measures inducing

firms to increase their size are a way to increase the competitiveness in the foreign markets. Among such measures, they include improvements in: quality of school, market regulations, efficiency of transport and infrastructure endowments, efficiency of the public sector, better relationships between firms and public administration. These factors are indeed likely to increase firm competitiveness and favor large exporting firms. Finally, Giovannetti et al. (2013) use a multilevel econometric framework to estimate the impact of geographical and context characteristics (physical infrastructures and district effects) on the propensity of Italian firms to export between 2001 and 2003, controlling for firm individual characteristics. They find that small firms benefit from operating in industrial districts, whereas the internationalization performance of large firms is not much affected by context variables.

A second strand of literature related to our work deals with geographical and socio-economic characteristics of the context in which firms operate. Gravity models developed by Tinbergen (1962), Pöyhönen (1963) and Anderson and van Wincoop (2003) explain bilateral trade flows based on the economic size and distance between two countries. Accordingly, several country-level studies suggest that geographic localization, as well as transport and communication infrastructures determine the ability of countries to participate to the global production network (Bougheas et al., 1999; Limao and Venables, 2001).

Finally, our contribution is also related to the vast literature on the links between firms' characteristics and their export performance. According to the seminal paper by Melitz (2003), only the most productive firms find it profitable to export, due to the significant sunk costs of entering foreign markets. A large number of empirical contributions have shown that the characteristics of exporting and non-exporting firms are indeed different, even within the same industry: exporters are more productive, larger, have a higher share of skilled workers, pay higher wages, have more years of activity and a higher innovative capacity than non-exporters (Bernard and Jensen, 2004).[4] Indeed, there is a fundamental relationship between productivity, firm size and export performance, since more productive firms are larger and therefore find it profitable to sustain the costs of internationalization, extend their market and exploit scale economies that allow them to further increase their size (Krugman, 1979).[5]

Firms' internationalization is also associated with a higher capital intensity, reflecting a firm's technology (Wakelin, 1998; Basile, 2001; Egger and Kesina, 2013), and a stronger propensity to innovate (Damijan et al., 2010; Becker and Egger, 2013), both in terms of inputs (intensity of R&D)

[4] See Bottasso and Piccardo (2013) for a detailed survey of the literature on firm heterogeneity and exports.
[5] Wagner (2007a) provides a survey of the literature on the impact of productivity and export performance.

and outputs (product and process innovation).[6] And a recent strand of literature has also shown that credit availability has a significant impact on export performance.[7] In general, working in foreign markets entails fixed and variable costs well in addition to those necessary to serve the domestic market. This has the important implication that internationalization raises the financial needs of firms, making them more dependent on external sources of financing. The theoretical and empirical literature has confirmed this link (Chaney, 2013; Manova, 2013). On a partly related ground, older firms have easier access to the funding means that are necessary to enter foreign markets and have a longer experience in the business and therefore higher productivity (Majocchi et al., 2005).

The ample international evidence on the link between firms' characteristics and export performance is confirmed also in the case of Italy. Castellani (2002) and Serti and Tomasi (2008) provide evidence that productivity positively affects both the intensive and the extensive margins of exports of Italian firms. Minetti and Zhu (2011) confirm that the extensive and intensive propensities to export are smaller for credit rationed firms. Sterlacchini (2001), Basile (2001), Becchetti et al. (2007) and D'Angelo (2012) find that innovation and agglomeration of firms in geographically restricted areas are very important competitive factors explaining firm-level heterogeneity in the export performance of Italian firms.

3. Data and descriptive statistics

3.1. Location and firm characteristics

Data on exports and other firm characteristics are obtained from the *Invind* survey, conducted every year by the Bank of Italy, and covering a representative sample of Italian firms operating in manufacturing industries with more than 20 employees. *Invind* collects qualitative and quantitative information, including: workforce, gross fixed investment, total and export sales, production capacity and financing. Each year, the survey contains also single-subject sections on specific phenomena, such as the propensity to innovate, internationalization and sub-contracting.[8]

[6] Wang and Lin (2013) argue that firm attributes interact with regional environment and inter-firm relations to shape innovation, but that firm characteristics have a prominent role.

[7] Wagner (2007b) provides a survey on firm-level studies analyzing the impact of credit constraints on export. It concludes that (i) less constrained firms self-select into exporting since financial constraints are important for the export decisions of firms; (ii) exporting firms are less financially constrained than non-exporting firms and (iii) exporting does not improve financial health of firms.

[8] The target population is stratified in terms of sectors of economic activity, number of employees and regional location and for each layer a number of firms is randomly drawn. The number of firms to be contacted each year is not determined in proportion to the total population as in a proportional sample, but to obtain reliable estimates of the aggregate dynamics of investment, employment and total sales. The original sample is a pseudo-panel, since firms identified in the previous survey are always contacted in the next survey, if they are still part of the population of interest, while those no longer willing to cooperate are replaced by other similar firms. A firm is considered out of the sample when it is liquidated, it is bankrupt, it is the object of a merger, or simply when it ceases to be representative of

For the purpose of our analysis, we construct the extensive margin as a dummy variable (*du_export*) taking the value of 1 if the firm exported at time *t* and zero otherwise. Moreover, we construct the intensive margin of exports (*share_exp*) as the share of exports over total sales at time *t*, over the same period. Different control variables at firm-level are included in the empirical model. According to the literature reviewed in Section 2, we include standard firm's characteristics such as: (i) *employees*, measuring firm size by the average number of employees in the current, previous and following year, (ii) *age*, measured by the years of activity, since firms foundation, (iii) *productivity*, measured by total sales over the number of employees at the end of the year, (iv) *capital intensity*, expressed as investment in tangible assets over the number of employees at the end of the year, (v) the share of white collars over blue collars (*share of white collars*) and (vi) the legal status of the firm, i.e. a dummy indicating whether the firm is a limited liabilities corporation (*legal status*).

Our selection of the province determinants of exports is based on the existent theoretical and empirical literature, within the limits of data availability on the characteristics of Italian provinces.

The first characteristic of Italian provinces that we consider in our analysis is the geographical distance from foreign destination markets, weighted by the GDP of main destination countries of Italian exporters (*distance*).[9] Data on distance has been obtained by Fratianni and Marchionne (2012), whereas data on GDP of foreign markets is from the *World Economic Outlook*.[10]

A second set of characteristics concerns social capital. We consider a number of alternative measures: the average age of population (*population age*), collected by *Tagliacarne Institute*, because different generations typically share different values; the level of opportunism in '50 and '60 (*opportunism*), a measure constructed by Arrighetti and Lasagni (2003) as the principal component of the number of protests for promissory notes and checks and patrimony crimes, the number of blood bags donated per million inhabitants (*donation*), from Guiso et al. (2004).[11]

Next, we consider some measures of the efficiency of the public sector: the number of days needed to complete a first degree trial in the courts located in the province (*judicial efficiency*), obtained from *Italian National Institute of Statistics* (Istat); the amount of trade credit of private

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the aggregate behavior. For a detailed description of the methodological issues related to the *Invind* survey, see Banca d'Italia (2014).

[9] Main destination markets of Italian exports are: Australia, Austria, Belgium, Bulgaria, Canada, Switzerland, Czech Republic, Germany, Denmark, Spain, France, United Kingdom, Greece, Hong Kong, Hungary, Japan, Netherlands, Norway, Poland, Sweden, Tunisia, Turkey, United States of America, South Africa.

[10] Distance could have been introduced in our regression as a continuous explanatory variable. However, estimation of a precise measure of elasticity of exports with respect to the distance from foreign destination markets implies a degree of precision that goes beyond our interests. In fact, we prefer to consider provinces at a "similar" distance as having a "similar" local context.

[11] The original variables for the *opportunism* indicator measure, respectively, the number of protests and the number of patrimony crimes every 1,000 inhabitants in 1996. The normalized number of protests ranges from 55 to 517, while the normalized number of crimes ranges from 0 and 2.

manufacturing firms towards the public administration (*trade credit public administration*), constructed at provincial level from *Invind* data as the average share of firm-level trade credit over their total sales; the share of household waste that is recycled (*recycling*), produced by Istat; two indexes measuring, respectively, the efficiency of public sector on spending in *education* and childcare and healthcare (*child and health care*), produced by Giordano and Tommasino (2011).[12] These latter indices on education and childcare efficiency are built following the methodology on X-efficiency measures (Fried et al. 2008), given by a comparison between actual and potential performance of a public entity.[13]

Finally, we consider two measures of the development of the banking sector: the share of deposits over GDP (*deposits/GDP*) and the number of bank branches per million inhabitants (*bank branches*), both provided by the Bank of Italy. Details on the sources of data are reported in Table 1.

[Insert Table 1 here]

3.2 Summary statistics

Our sample includes 4,326 firms observed over the period 2000 and 2013. On average, we have 9 observations per firm. Around 33% of firms in our sample have between 20 and 49 employees (small firms), whereas the remaining 67% is medium-sized firms with more than 50 employees.

Table 2 reports the average values of location specific characteristics, distinguishing between provinces where the incidence of exports over total sales is below and above the sample median.

[Insert Table 2 here]

The figures reported in the table confirm that firms have a higher incidence of exports if they are located in provinces that are closer to markets of destination, so that they incur in lower transportation costs. The average weighted distance from foreign markets is 4,002 kilometers for provinces with less export oriented firms as opposed to 3,474 kilometers for provinces with more

[12] The variable *child and health care* has been constructed taking the average values of child care and health care indicators from Giordano and Tommasino (2011), in order to cover also the provinces with missing values on one of them.

[13] For *education*, the input measure is the number of teachers per pupil in the primary and first three years of secondary school and the output measure is the performance of 6th and 9th grade students in tests carried out by *Invalsi* (the public institute in charge of evaluating the Italian educational system). For child care the input is expenditure for child daycare provided by municipalities in 2007 and the output is given by the number of children in daycare in 2007. For health care, the input measure is the per capita public health expenditure adjusted for the age structure of the population and health performance is change in life expectancy between the years 1981-1983 and 2003-2005. See Giordano and Tommasino (2011) for details.

export oriented firms, and the difference is statistically significant at the 1% level. A higher degree of internationalization is associated also with higher levels of social capital, measured by the incidence of blood donors (39 bags per thousand inhabitants as opposed to 18), and the index of opportunism described above (-0.30 as opposed to 0.28). Also a more efficient public sector, where the share of household waste that is recycled is higher (25% as opposed to 9%) education and child and health services are more efficient (1.04 as opposed to 9.6 and 1.06 as opposed to 0.95, respectively), the judicial system takes less time to take the final decisions (263 days as opposed to 360), is associated with a higher degree of internationalization. Finally, a more developed local banking sector, with a higher incidence of deposits over GDP (38 as opposed to 34) and a higher number of branches per inhabitant (6.73 as opposed to 4.23), is also associated with a stronger propensity to export.

Table 3 focuses instead on firm level characteristics.

[Insert Table 3 here]

Consistent with the literature, exporters are larger, more experienced, display a much higher labor productivity and a higher share of white collars over blue collars than non-exporters. In particular, exporting firms show a higher average number of employees (349) compared to that of non-exporting firms (108). Exporting firms are 9 years older that non-exporting ones, whereas labor productivity is about 30% higher. All these variables differ between the two samples and are statistically significant at least at the 1% level. Finally, non-exporters also have a 10% higher level of capital intensity, but the difference with exporters in this case is not statistically significant.

Tables 4 and 5 presents the pairwise correlations between our variables.

[Insert Table 4 here]

[Insert Table 5 here]

The figures reported confirm the evidence of Tables 2 and 3. Exporting firms and those with a higher share of exports on total sales have: a negative correlation with distance from foreign destination markets (-0.81 and -0.79, respectively); higher social capital, with correlations ranging from 0.46 to 0.49 depending on the index considered, except for the opportunism indicator which is negatively correlated; a more efficient public sector (with correlations ranging from 0.29 to 0.69), with the only exception of the amount of trade credit towards the public administration and judicial efficiency, which are negatively correlated. The degree of internationalization is also positively

correlated with firms' size (0.09 and 0.10, respectively for the extensive and intensive margins) and age (0.13 and 0.06), while the evidence with respect to productivity, capital intensity and the share of white collars is less clear. Being a limited liabilities firm increases both margins of exports.

However, Table 4 also shows that many province characteristics have a very high degree of bilateral correlation, suggesting that they proxy for very similar phenomena. Since this simple correlations do not take into account their interrelations and the fact that some firms show industrial and localization specificities different from others, we then turn to a multivariate analysis.

4. Econometric analysis

4.1. The econometric specification

To test the hypotheses that location characteristics affect firms' export performance, we estimate two econometric models: one for the extensive margin (i.e., the probability that a firm exports), and one for the intensive margin (i.e., the share of a firm's exports over total sales). In addition to the baseline specification, to better control for potential omitted variable problems and to test additional hypotheses, we also present the results of some specifications including a set of firm-level and time-varying characteristics.

For the extensive margin, the dependent variable is dichotomous and only takes values zero if firm *i* has not exported at time *t* and 1 if it has exported. We therefore estimate a binomial model, where *i* indexes for firm, *p* for province, *s* for sector of activity of the firm, and *t* for time:

$$du\_export_{ipst} = \alpha + (\sum_k \beta_k province\_char_{kp}) + \left(\sum_j \gamma_j firm\_char_{jit}\right) + (\sum_s \delta_s du\_sector_s) + \\ +(\sum_t \theta_t du\_time_t) + \varepsilon_{ipst} \qquad (1)$$

where: du_export_{ipst} is a dummy taking the value of one if firm *i* located in province *p*, of sector *s*, exported in year *t*, and zero otherwise; the set of province characteristics ($k = 1,\ldots, K$) are those discussed above; the set of time-varying firms specific characteristics ($j = 1,\ldots, J$), when included, are also those discussed above; and the error term ε_{ipst} is a residual with the usual properties for binomial choice models. In the specifications we include sector dummies, defined in terms of 2-digits Ateco-2007, and year dummies. We estimate equation (1) by using a probit model.

For the intensive margin of exports we adopt a similar specification, substituting the dependent variable with $share\_exp_{ipst}$, the share of exports over total sales, and estimating it using

both a standard OLS model and a tobit model, to account for the fact that the dependent variable is bounded between 0 and 1.[14]

$$share\_exp_{ipst} = \alpha + (\sum_k \beta_k province_{char_{kp}}) + \left(\sum_j \gamma_j firm_{char_{jit}}\right) + (\sum_s \delta_s du\_sector_s) + \\ +(\sum_t \theta_t du\_time_{st}) + \varepsilon_{ipst} \quad (2)$$

Since we have repeated observations on provinces and years, the standard errors are clustered at the year and province level (Javorcik, 2004).

In addition to the two baseline specifications described above, we also conduct a number of robustness checks distinguishing between firms that have different degrees of internationalization, as described below.

4.2 The econometric evidence

Table 6 presents the results of the estimate of equation (1) on the impact of local-context and firm characteristics on their probability to export. Column (1) presents the results including a larger set of local-context characteristics. This first specification is estimated on a sample of 27,675 firm-year observations and includes sector and time dummies. The pseudo-R^2 is 0.21. Consistent with the high degree of pairwise correlation, not all the coefficients of these local-context characteristics are statistically significant. In particular, blood donations among measures of social capital, the amount of trade credit towards the public administration among measures of the efficiency of the public sector, and the number of bank branches per inhabitant among measures of the development of the banking sector do not have a statistically significant effect on the probability that a firm is an exporter. The *F*-test of the null hypothesis that these variables can be excluded from the specification cannot be rejected with a *p*-value of 0.35.

Column (2) presents a more parsimonious specification that includes only those variables that have a statistically significant effect on the probability to export. The number of observations is unchanged as is the pseudo-R^2. The results confirm the findings of the descriptive statistics, showing that the characteristics of the local context where firms operate have a significant impact on their probability to export. All estimated coefficients are statistically significant at the 99% level, with the only exception of that of the share of household waste that is recycled and the population age, that are statistically significant at the 95% level.

[14] Export intensity is motivated by the literature (see Katsikeas, et al., 2000; Majocchi et al., 2005; D'Angelo, 2012) and is by far the most widely used indicator in empirical research, even if it has been subject to some criticism.

[Insert Table 6 here]

In addition to be statistical significant, the impact of the characteristics of the local context on the probability to export is also economically significant. A reduction of the distance from foreign destination markets from the level at the 90th percentile to that at the 10th percentile determines an increase in the probability to export of 17.4%. Other characteristics have smaller effects, but still not negligible. Local financial development has a relevant impact: an increase from the level at the 10th to the level at the 90th percentile of the sample distribution of the share of bank deposits to GDP augments the probability to export by 5.5%. Similar results are found for the measures of social capital: opportunism (4.7%) and average age of the population (2.6%). The efficiency of the public sector also has an economically significant impact: 3.8% for the efficiency of education services, 2.5% for the productivity of the child and health service sectors, 2.6% for the share of recycled waste, and 3.1% for the length of judicial trials.

Overall, these results provide a sound confirmation that the characteristics of the local context where firms operate influence their propensity to export. However, as we have already argued above, a criticism that can be moved to this analysis is that local-context characteristics do not affect directly the probability that a firm exports, but they are more in general favorable to the development of larger and more productive firms, that are well known to have a higher propensity to export.

To test the hypothesis that the local context has a direct effect on the probability that firms export that goes beyond the indirect effect through the impact on firms' features, we therefore include in our specification firm-level information on size, age, labor productivity, capital intensity, the share of white collars over total workforce, and whether the firm is a limited liability company. While we do not claim that our results on firm's characteristics can be interpreted in a causal way, due to potential reverse causality effects, we include these variables with one year lag (Columns 3 and 4). The number of observations drops in this case to 20,815, while the pseudo-R^2 of the regression rises to 0.26. The estimated coefficients on firm characteristics are in line with the ample empirical evidence already available: firms that are larger, older, more productive and have a higher capital intensity have a higher probability to export, while the share of white collars in the workforce does not have a statistically significant effect. The impact of firm specific characteristics on the probability to export is substantial: an increase from the value at the 10th percentile to that at the 90th percentile of the sample distribution augments the probability to export of 13.6% in the case of size, of 4.4% in the case of age, 7.3% in the case of productivity, and 2.2% in the case of capital

intensity. Limited liability corporations have, *ceteris paribus*, a probability 7.4% higher of being exporter than unlimited liability corporations.

Interestingly, and reassuringly, the coefficients of the variables describing the local context where the firm operates are (almost) all still statistically significant, confirming our claim that the local context has a direct effect on the probability that firms export that goes beyond the indirect effect through the impact on firms' features. Controlling for firm characteristics, the economic impact of the local context slightly shrinks, as it was to be expected since in this case we are not including the indirect effect of the local context on firms' characteristics. But it remains substantial.

The next step in our analysis is to analyze the intensive margin of exports. Accessing foreign markets typically involves sunk costs that need not be sustained twice. The determinants of the degree of internationalization measured on the extensive margin can therefore differ from those measured on the extensive margin. Table 7 reports the results of investigating the impact of provincial characteristics on the intensive margin of exports, controlling as usual for firm-level characteristics. The structure of the table mimics that of Table 6, with the inclusion of tobit estimates: Columns 1-3 include only local-context characteristics, while Columns 4-6 also include firm-level features.

[Insert Table 7 here]

The specification in Column 1 includes sector and time dummies, is estimated on 27,691 firm-year observations and has an R^2 of 0.22. As with the extensive margin, local context characteristics have an impact on the share of firms' exports over total sales. However, the set of characteristics that have a statistically significant effect and their economic magnitude are partly different in the case of the intensive margin. Column 1 shows that a larger number of features of the local context have no statistically significant effect on the share of exports, including some that had a significant impact on the extensive margin, such as the average age of the population, a measure of social capital, and proxies for the efficiency of the public sector, such as the share of recycled waste and the length of judicial trials. The *F*-test of the null hypothesis that these and the other features of the local context that had no statistically significant effect also on the extensive margin can be excluded from the specification cannot be rejected with a *p*-value of 0.41. The second specification, presented in Column 2, includes only four characteristics of the local context, one for each of the major groups of determinants: geographical distance for transportation costs, the degree of opportunism for social capital, the efficiency of education services, and the ratio of bank deposit to GDP for financial development. The number of observations and the R^2 of the regression are unchanged with respect

to the previous specification. Interestingly, features of the local context have an economically significant impact also on the intensive margin of exports. With a change from the level at the 10th percentile to that at the 90th percentile of the sample distribution we estimate an increase in the share of exports over total sales of 14.5% when reducing geographical distance, of 1.8% when increasing the efficiency of education services, of 2.4% when abating opportunism, and of 4.2% when augmenting the share of bank deposits. The tobit estimates, reported in Column 3, confirm the results of the OLS model.

Also in this case, adding firm level characteristics does not alter the previous picture. The number of observations drops to 20,828 and the R^2 is 0.26 (Columns 4 and 5). All firm specific characteristic have a statistically significant effect, with the only exception of the age of the firm. From an economic perspective, the effects are relevant. An increase from the level at the 10th percentile to that at the 90th percentile of the sample distribution augments the share of exports over total sales of 13.8% in the case of firm size, of 2.4% of productivity, and of 3.6% in the case of capital intensity. Limited liability corporations have a 7.7% higher share of exports over total sales. Only changes on the share of white collars over total workforce has an economically insignificant effect. In the case of local context variables, the economic impact is only marginally smaller than that estimated without including firm level characteristics. Also in this case, tobit estimates, reported in Column 6, broadly confirm the findings of the OLS specification.

Overall, these results are in line with most part of the empirical literature, giving support to many views underlying the importance of location assets in determining firm competitiveness (Dunning, 1998; D'Angelo, 2012; Giovannetti et al., 2013), in addition to firm characteristics.

4.3 Robustness checks

In addition to the baseline econometric specifications, we also conducted a number of robustness checks aimed at controlling for the sensitiveness of our results to the index used to measure the degree of internationalization of each firm. First, since about 50% of the exporting firms in our sample have a share of exports over total sales below 30%, we first adopt a stricter definition of exporters, including only those firms that have an export share above 30%. Second, since about 30% of the firms in our sample do not export every year, we focus on those firms that have always exported throughout our sample period. We do so in two different ways: estimating the binomial specification of equation (1) defining as exporters only those firms that have always exported during our sample period; and estimating a multinomial regression model in which we treat non-exporters, temporary-exporters and always-exporters as three different groups. Third, since our

baseline model is estimated on a pooled sample of firms, but local-context variables are time invariant and firms that export in general tend to continue doing so, we average our observations across our entire sample period and replicate the previous analysis on the cross-section of observations obtained in this way.

Table 8 reports the results of the specifications using alternative definitions of the export intensity, both for the extensive and the intensive margins. Columns 1 and 2 replicate columns 2 and 3 of Table 6 defining exporting firms as those that have a share of exports over total sales above 30%. While the coefficients for the features of the local context maintain the same sign as in the baseline specification, those of the average age of the population, of the length of judicial trials, of the degree of opportunism, and the efficiency of the public child care and health sectors become in some cases statistically insignificant. Similarly, among firm specific variable, the coefficient of age of the firm also looses statistical significance. The economic relevance of the effects of the variables that maintain their statistical significance remains broadly unchanged.

[Insert Table 8 here]

Columns 3 and 4 present the results defining as exporters only those firms that continually exported during the whole sample period considered. The results are in this case very similar to those of the baseline specification, with the only exception of the average age of the population, and of the share of recycled household waste, whose effect becomes statistically insignificant in the case of the specification including firm-level characteristics (Column 4). The economic impact of all variables remains in all cases relevant. Columns 5 and 6 report the results of the estimates of the determinants of the intensive margins, where firms with a share of exports below 30% have been conventionally classified as non-exporters. The results are in this case very similar to those reported in Columns 2 and 4 of Table 7, with the only exception of the coefficient of education that becomes statistically and economically insignificant.

Table 9 present the results of the multinomial probit regression model, that is unaffected by potential problems due to the implicit hypothesis of independence of irrelevant alternatives, on the three categories of firms: non-exporters, temporary exporters, and firms that exported every year in our sample period.

[Insert Table 9 here]

Finally, Table 10 presents the results of the baseline estimates conducted on a sample of time averages of our original data, replicating Columns 2 and 4 of Tables 6 and 7. In the case of the extensive margin, our estimates are conducted on a sample of 4,326 observations, the specification includes sector dummies and the pseudo R^2 is 0.27. Standard errors are clustered at the province level. The results again broadly confirm the findings of the baseline specification, although in some specifications the impact of some local-context characteristics such as average age of the population, education and productivity in the public child and health care sectors become statistically, and in the second case also economically, insignificant. Results on the intensive margin also confirm those of the baseline specification, although in the case of education and opportunism the coefficients are estimated with less precision and therefore turn out to be statistically insignificant. Reassuringly, the economic significance is broadly unchanged.

[Insert Table 10 here]

5. Concluding remarks

Our empirical analysis shows that the characteristics of the local context where firms operate, measured at the province-level, have a statistically and economically significant impact on their export performance. This is true both at the extensive and intensive margins and, most interesting, also controlling for firm-level characteristics. This last result is notably important from a policy perspective. It shows that an adequate environment for entrepreneurial activities not only helps firms to increase their productivity and grow, therefore helping them to control the incidence of the costs of accessing foreign markets and indirectly favoring their internationalization, but it also provides a direct sustain to exporting activities that is shared by all firms, independent on their characteristics.

In fact, even after controlling for specific characteristics of firms, a large part of the heterogeneity in export behavior is explained by the context in which they operate. While confirming the results of the new-new trade theory, that stresses the role of firm characteristics, our results provide strong support to the common wisdom that local characteristics have a crucial role in determining the export performance of a given geographical area. These include distance from foreign markets, social capital, the efficiency of the public sector, and the development of financial markets.

As far as firm-level characteristics are concerned, the results of our analysis confirm the main findings of the previous literature, revealing that size, experience in business, labor productivity and capital intensity positively impact on the decision of firms to export and the exports ratio.

Bibliografia

Anderson J.E., van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review*, 63, pp. 881-892.

Arrighetti, A., Lasagni, A., and Seravalli G. (2003),Capitale sociale, associazionismo economico e istituzioni: indicatori statistici di sintesi. *Rivista di Politica Economica*, *7*, 47-87.

Bagella M., Becchetti L., and Sacchi S. (1998). The positive link between geographical agglomeration and export Intensity: The engine of Italian endogenous growth? *Economic Notes*, Banca Monte dei Paschi di Siena SpA, 1-34.

Banca d'Italia. (2014). Indagine sulle imprese industriali e dei servizi. Anno di riferimento 2013. Supplemento al Bollettino Statistico, n. 40, Anno XXIV, 24 luglio 2014.

Basile, R. (2001). Export behaviour of Italian manufacturing firms over the nineties: the role of innovation. *Research policy*, 30(8), 1185-1201.

Becattini, G. (1990). The Marshallian industrial district as a socio-economic notion, in G. Becattini, F. Pyke and W. Sengenberger, *Industrial Districts and Inter-Firm Cooperation in Italy* (International Labor Studies: Geneva), pp. 37-51.

Becchetti, L., De Panizza, A., Oropallo, F. (2007). Role of industrial district externalities in export and value-added performance: evidence from the population of Italian firms. *Regional studies*, 41(5), 601-621.

Becker, S. and Egger, P. (2013) Endogenous product versus process innovation and a firm's propensity to export. *Empirical Economics*, 44(1), 329-354, February.

Benfratello L., Bronzini R. (2010). "L'internazionalizzazione dell'economia italiana: determinanti, effetti e implicazioni per lo sviluppo del Mezzogiorno" in: L'internazionalizzazione delle piccole e medie imprese. Aspetti economici e giuridici (a cura di: A. Nifo). Edizioni Scientifiche Italiane, Università degli Studi del Sannio.

Bernard, A., Jensen, B. (2004). Why some firms export. *Review of Economics and Statistics*, 86, 561–569.

Bougheas, S., Demetriades, P. O., and Morgenroth, E. L. (1999). Infrastructure, transport costs and trade. *Journal of International Economics*, 47(1), 169-189.

Boschma, R., Marrocu, E., and Paci, R. (2016). Symmetric and asymmetric effects of proximities. The case of M&A deals in Italy. *Journal of Economic Geography*, 16, 505-535.

Bottasso, A., Piccardo, C. (2013). Export activity and firm heterogeneity: a survey of the empirical evidence for Italy. *Economia e Politica Industriale*.

Bronzini R. (2000). "Sistemi produttivi locali e commercio estero: un'analisi territoriale delle esportazioni italiane" in: Lo sviluppo locale. Un'indagine della Banca d'Italia sui distretti industriali (a cura di: L.F. Signorini). Service editoriale Donzelli editore s.r.l., 101-122.

Bugamelli, M., Cipollone, P., and Infante, L. (2000). L'internazionalizzazione delle imprese italiane negli anni Novanta. *Rivista italiana degli economisti*, (3), 349-386.

Bugamelli, M., Gallo, M. (2012). I grandi esportatori in Italia: caratteristiche, strategie e performance. *Economia e Politica Industriale*, 39(1), 119-137.

Castellani, D. (2002). Export behavior and productivity growth: evidence from Italian manufacturing firms. *Review of World Economics* 138(4), 605-628.

Chaney, T. (2013). Liquidity constrained exporters. National Bureau of Economic Research, wp n. 19170.

Damijan, J. P., Kostevc, Č. and Polanec, S. (2010) From Innovation to Exporting or Vice Versa? *The World Economy*, Wiley Blackwell, vol. 33(3), pages 374-398, 03.

D'Angelo, A. (2012). Innovation and export performance: a study of Italian high-tech SMEs. *Journal of Management & Governance*, 16(3), 393-423.

Dunning, J.H. (1998). Location and the multinational enterprise: A neglected factor? *Journal of International Business Studies*, 29(1), 45–66.

Egger, P., and Kesina, M. (2013). Financial constraints and exports: evidence from Chinese firms. *CESifo Economic Studies*, 59(4), 676-706.

Farole, T., and Winkler, D. (2014). Firm location and the determinants of exporting in low-and middle-income countries. *Journal of Economic Geography*, 14(2), 395-420.

Francois, J. and Manchin, M. (2013). Institutions, Infrastructure, and Trade. *World Development*, 46, 165-175.

Fratianni, M., and Marchionne, F. (2012). Trade costs and economic development. *Economic Geography*, 88(2), 137-163.

Fried, H. O., Knox Lovell, C. A., Schmidt, S. S. (2008). "Efficiency and productivity", in: Fried, H. O., Knox Lovell, C. A., Schmidt, S. S. (eds), The measurement of productive efficiency and productivity growth, Oxford University Press, Oxford.

Giovannetti, G., Ricchiuti, G., and Velucchi, M. (2013). Location, internationalization and performance of firms in Italy: a multilevel approach. *Applied Economics*, 45(18), 2665-2673.

Giordano, R., and Tommasino, P. (2011). Public sector efficiency and political culture. Working Papers, n. 786, Banca d'Italia.

Gola, C. and Mori, A. (2000). "Concentrazione spaziale della produzione e specializzazione internazionale dell'industria italiana" in: *Lo sviluppo locale. Un'indagine della Banca d'Italia sui distretti industriali* (a cura di: L.F. Signorini). Service editoriale Donzelli editore s.r.l., 67-100.

Guiso, L., Sapienza, P., Zingales, L. (2004). The Role of Social Capital in Financial Development. *The American Economic Review*, 94(3), 526-556.

Javorcick, B.S. (2004). Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. *The American Economic Review*, 94(3), 605-627

Katsikeas, C. S., Leonidou, L. C., & Morgan, N. A. (2000). Firm-level export performance assessment: Review, evaluation and development. *Journal of the Academy of Marketing Science*, 28(4), 493–511.

Krugman, P. R. (1979). Increasing returns, monopolistic competition, and international trade. *Journal of international Economics*, 9(4), 469-479.

Levchenko, A. A. (2007). Institutional quality and international trade. *The Review of Economic Studies*, 74(3), 791-819.

Limao, N., and Venables, A. J. (2001). Infrastructure, geographic disadvantage, transport costs, and trade. *The World Bank Economic Review*, 15(3), 451-479.

Manova, K. (2013). Credit constraints, heterogeneous firms, and international trade. *The Review of Economic Studies*, *80*(2), 711-744.

Majocchi, A., Bacchiocchi, E., and Mayrhofer, U. (2005). Firm size, business experience and export intensity in SMEs: A longitudinal approach to complex relationships. *International Business Review*, 14(6), 719-738.

Melitz, M.J. (2003). The impact of trade on intra-industry reallocation and aggregate industry productivity. *Econometrica* 71(6), 1695-1725

Méon, P. G., & Sekkat, K. (2008). Institutional quality and trade: which institutions? Which trade?. *Economic Inquiry*, 46(2), 227-240.

Meyer, K. E., Mudambi, R., and Narula, R. (2011). Multinational enterprises and local contexts: the opportunities and challenges of multiple embeddedness. *Journal of Management Studies*, 48(2), 235-252.

Minetti, R., and Zhu, S. C. (2011). Credit constraints and firm export: Microeconomic evidence from Italy. *Journal of International Economics*, 83(2), 109-125.

Portugal-Perez, A., and Wilson, J. S. (2012). Export performance and trade facilitation reform: hard and soft infrastructure. *World Development*, 40(7), 1295-1307.

Pöyhönen, P. (1963). A tentative model for the volume of trade between countries, W*eltwirtschaftliches Archiv*, 90, pp. 93-99.

Robertson, C., and Chetty, S. K. (2000). A contingency-based approach to understanding export performance. *International Business Review*, 9(2), 211-235.

Rugman, A. (2003). Regional strategy and the demise of globalization. *Journal of International Management*, 9, 409–17.

Serti, F., and Tomasi, C. (2008). Self-selection and post-entry effects of exports: Evidence from Italian manufacturing firms. *Review of World Economics*, 144(4), 660-694.

Sestito, P. (2011) "I diversi concetti di capitale sociale: Differenze e Similarità" in De Blasio, G., Sestito, P., (2011), *Il capitale sociale*, Donzelli. Roma.

Sterlacchini, A. (2001). The determinants of export performance: a firm-level study of Italian manufacturing. *Review of World Economics*/*Weltwirtschaftliches Archiv*, 137(3), 450-472.

Tinbergen, J., 1962. Shaping the world economy. Suggestions for an international economic policy, The Twentieth Century Fund, New York.

Wagner, J. (2007a). Exports and productivity: A survey of the evidence from firm-level data. *The World Economy*, 30(1), 60-82.

Wagner, J. (2007b). Credit constraints and exports: A survey of empirical studies using firm level data. Working Paper Series in Economics n. 287, University of Lüneburg. http://www.leuphana.de/fileadmin/user_upload/Forschungseinrichtungen/ifvwl/WorkingPapers/wp_287_Upload.pdf

Wakelin, K. (1998). Innovation and export behaviour at the firm level. *Research policy*, 26(7), 829-841.

Wang, C. C., and Lin, G. C. (2013). Dynamics of innovation in a globalizing china: regional environment, inter-firm relations and firm attributes. *Journal of Economic Geography*, 13(3), 397-418.

Table 1 – Variables and sources

Definition	Description	Source
Provincial indicators		
distance	weighted average distance to main foreign markets	Fratianni and Marchionne (2012) and *WEO*
population age	average age of population (age)	Tagliacarne
opportunism	indicator of opportunism in '50-'60 (principal component)	Arrighetti and Lasagni (2003)
donation	blood bags/million inhabitants (number)	Guiso et al. (2004)
judicial efficiency	number of days to complete a first degree trial in the courts located in the province	Istat
trade credit public sector	trade credit toward the public administration/total sales	Invind (2009-2012)
recycling	share of domestic waste that is recycled	Istat, Sistema di indicatori territoriali
education efficiency	indicator of efficiency constructed using the number of teachers per pupil in the primary and first three years of secondary school (school year 2005-06) as input measure and the performance of 6th and 9th grade students in tests carried out by Invalsi (the public institute in charge of evaluating the Italian educational system) during the school year 2005-06 as output measure	Giordano and Tommasino (2011)
child and health care efficiency	indicator of efficiency constructed using the expenditure for child daycare provided by municipalities in 2007 and the output is given by the number of children in daycare in 2007 and for the health indicator on the per capita public health expenditure adjusted for the age structure of the population and health performance is change in life expectancy between the years 1981-1983 and 2003-2005.	Giordano and Tommasino (2011)
deposits/GDP	share of bank deposits over GDP	Banca d'Italia, Istat
bank branches	number of bank branches per million inhabitants	Banca d'Italia, Istat
Firm-level characteristics		
export	export turnover	Invind (2000-2013)
du_export	dummy equal to 1 if firm exported at time *t*	Invind (2000-2013)
share_exp	export turnover/total sales	Invind (2000-2013)
employees	average number of employees in the current, previous and next year	Invind (2000-2013)
age	years of experience from foundation year	Invind (2000-2013)
productivity	total sales/number of employees at the end of the year	Invind (2000-2013)
capital intensity	investment in tangibles/number of employees at the end of the year	Invind (2000-2013)
white collars/blu collars	share of white collars/blue collars	Invind (2000-2013)
legal status	dummy variable equal to 1 for limited liabilities firms and zero otherwise	Invind (2000-2013)

Table 2 – Descriptive statistics of provincial-level indicators

Variable	Low export intensity					High export intensity					ttest	
	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max		
distance	53	4,002	344	3,276	4,523	50	3,474	155	3,232	3,947	10.14	***
population age	53	42.36	2.22	38	47	50	44.32	1.68	40	48	-5.07	***
opportunism	53	0.28	0.91	-1.53	2.39	50	-0.30	0.96	-1.49	4.08	3.15	***
donation	53	18.10	15.98	0	69.26	50	39.31	20.97	0	105.21	-5.75	***
judicial efficiency	53	360.21	115.69	145	616	50	263	91.80	100	504	4.74	***
trade credit public administration	53	0.01	0.02	0	0.09	50	0	0.01	0	0.02	1.17	
recycling	53	0.09	0.09	0.01	0.38	50	0.25	0.11	0.05	0.50	-8.37	***
education	53	0.96	0.08	0.77	1.10	50	1.04	0.06	0.86	1.13	-6.15	**
child and health care	53	0.95	0.30	0.48	1.79	50	1.06	0.31	0.59	2.40	-1.76	**
deposits/GDP	53	0.34	0.05	0.25	0.44	50	0.38	0.05	0.24	0.50	-3.68	***
bank branches	53	4.23	1.48	2.22	7.81	50	6.73	1.22	3.38	10.25	-9.34	***

Notes: Summary statistics are calculated at the provincial-level over the period 2000-2013. *Low export intensity* and *high export intensity* indicate, respectively, provinces where the incidence of exports over total sales is below and above the sample median. *t*-test indicates the value of the mean-difference test where *H0*: mean(*low export intensity*) - mean(*high export intensity*) = 0. The approximate degrees of freedom for the *t*-test are obtained from Welch's formula (1947). * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Table 1 for variable definitions.

Table 3 – Descriptive statistics of firm-level characteristics

Variable	Exporters					Non-exporters					ttest	
	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max		
export	23,028	59.036	403.566	0.001	20,900	4,759	0	0	0	0	-22.20	***
share_exp	23,028	0.40	0.29	0	1.10	4,759	0	0	0	0	-2.10E+02	***
employees	23,028	349.31	1,115	20	45,936	4,759	107.82	287.74	20	5540	-28.56	***
age	23,028	37.57	27.06	0	282	4,759	28.34	19.73	0	157	-27.40	***
productivity	23,028	327.23	759.78	0.38	41,089	4,759	246.51	451.10	0.09	15,085	-9.80	***
capital intensity	23,028	10.97	21.31	0.01	601.30	4,759	11.38	27.02	0.01	822.91	0.99	
share of white collars	23,028	1.93	23.77	0	1713	4,759	1.04	5.75	-0.14	175	4.10	***
legal status	23,028	0.96	0.19	0	1	4,759	0.91	0.29	0	1	-12.670	***

Notes: Summary statistics are calculated at the firm-level over the period 2000-2013. *Exporters* are firms showing a positive value of exports for at least one year over the sample period. *Non-exporters* are firms showing always a zero value of exports for the entire sample period. e*xport*, *productivity* and *capital intensity* are in thousand euros. *t*-test indicates the value of the mean-difference test where *H0*: mean(*non-exporters*) - mean(*exporters*) = 0. The approximate degrees of freedom for the *t*-test are obtained from Welch's formula (1947). * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Appendix 1 for variable definitions.

Table 4 – Correlations between provincial-level indicators

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	du_exp	1												
(2)	share_exp	0.85	1											
(3)	distance	-0.81	-0.79	1										
(4)	population age	0.46	0.47	-0.62	1									
(5)	opportunism	-0.34	-0.28	0.35	-0.06	1								
(6)	donation	0.48	0.49	-0.57	0.33	-0.32	1							
(7)	judicial efficiency	-0.47	-0.41	0.52	-0.42	0.12	-0.45	1						
(8)	trade credit public adm.	-0.01	-0.04	0.01	0.03	0.14	-0.05	-0.01	1					
(9)	recycling	0.68	0.69	-0.80	0.31	-0.29	0.56	-0.39	-0.07	1				
(10)	education efficiency	0.48	0.51	-0.54	0.45	-0.19	0.32	-0.28	-0.11	0.48	1			
(11)	child and health care efficiency	0.29	0.30	-0.20	0.02	0.16	0.22	-0.23	0.11	0.23	0.16	1		
(12)	deposits/GDP	0.47	0.42	-0.42	0.32	0.09	0.34	-0.33	-0.01	0.35	0.25	0.34	1	
(13)	bank branches	0.72	0.67	-0.82	0.57	-0.34	0.61	-0.56	-0.12	0.68	0.51	0.21	0.48	1

Notes: See Table 1 for variable definitions.

Table 5 – Correlations between firm-level indicators

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	export	1								
(2)	du_exp	0.06	1							
(3)	share_exp	0.11	0.49	1						
(4)	employees	0.70	0.09	0.10	1					
(5)	age	0.04	0.13	0.06	0.07	1				
(6)	productivity	0.15	0.04	-0.01	0.04	0.02	1			
(7)	capital intensity	0.09	-0.01	-0.03	0.04	0.01	0.25	1		
(8)	share of white collars	0.01	0.02	0.00	0.03	0.01	0.02	0.00		
(9)	legal status	0.02	0.10	0.12	0.03	-0.04	0.00	-0.05	0.01	1

Notes: See Table 1 for variable definitions.

Table 6 – Baseline estimates on the extensive margin of exports: the impact of provincial-level and firm-level indicators

	(1) prob1	(2) prob2	(3) prob3	(4) prob4
distance	-0.173***	-0.174***	-0.121***	-0.122***
	(0.02)	(0.01)	(0.01)	(0.01)
population age	-0.027**	-0.026**	-0.022**	-0.023**
	(0.01)	(0.01)	(0.01)	(0.01)
opportunism	-0.048***	-0.047***	-0.040***	-0.040***
	(0.01)	(0.01)	(0.01)	(0.01)
judicial efficiency	-0.031***	-0.031***	-0.019*	-0.019**
	(0.01)	(0.01)	(0.01)	(0.01)
deposits/GDP	0.055***	0.055***	0.049***	0.050***
	(0.01)	(0.01)	(0.01)	(0.01)
education efficiency	0.037***	0.038***	0.035***	0.035***
	(0.01)	(0.01)	(0.01)	(0.01)
child and health care efficiency	0.027***	0.025***	0.002	
	(0.01)	(0.01)	(0.01)	
recycling	0.027**	0.026**	-0.003	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)
trade credit public adm.	-0.002			
	(0.00)			
donation	-0.013			
	(0.01)			
bank branches	0.011			
	(0.01)			
L.employees			0.136***	0.137***
			(0.01)	(0.01)
L.age			0.044***	0.044***
			(0.01)	(0.01)
L.productivity			0.073***	0.074***
			(0.01)	(0.01)
L.capital intensity			0.022***	0.022***
			(0.01)	(0.01)
L.share of white collars			0.000	
			(0.00)	
legal status			0.074***	0.074***
			(0.01)	(0.00)
Observations	27,675	27,675	20,815	20,815
pseudo R^2	0.21	0.21	0.26	0.26

Notes: Marginal effects of probit estimates conducted on *Invind* data pooled over the period 2000-2013. Standard errors, calculated with the Delta method, are reported in parentheses. Marginal effects are computed as variation of the probability of exporting after a variation between 10th and 90th percentile of explanatory variables. Industry and year dummies are included in all specifications. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Table 1 for variable definitions.

Table 7 – Baseline estimates on the intensive margin of exports: the impact of provincial-level and firm-level indicators

	(1)	(2)	(3)	(4)	(5)	(6)
	reg1	reg2	tobit1	reg3	reg4	tobit2
distance	-0.145***	-0.145***	-0.200***	-0.095***	-0.095***	-0.135***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
opportunism	-0.023***	-0.024***	-0.033***	-0.023***	-0.023***	-0.032***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
deposits/GDP	0.039***	0.042***	0.063***	0.044***	0.044***	0.064***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
education efficeincy	0.019***	0.018***	0.026***	0.013*	0.013*	0.019**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
child and health care efficiency	0.007					
	(0.01)					
population age	-0.009					
	(0.01)					
trade credit public adm.	-0.001					
	(0.01)					
recycling	-0.001					
	(0.01)					
donation	0.003					
	(0.00)					
judicial efficiency	0.009					
	(0.01)					
bank branches	0.009					
	(0.01)					
L.employees				0.138***	0.138***	0.163***
				(0.01)	(0.01)	(0.01)
L.age				-0.000		
				(0.00)		
L.productivity				0.024***	0.024***	0.041***
				(0.01)	(0.01)	(0.01)
L.capital intensity				0.036***	0.036***	0.046***
				(0.01)	(0.01)	(0.01)
L.share of white collars				-0.000	-0.000	-0.000
				(0.00)	(0.01)	(0.00)
legal status				0.077***	0.077***	0.112***
				(0.01)	(0.01)	(0.01)
Observations	27,691	27,691	27,691	20,828	20,828	20,828
Adjusted R^2	0.22	0.22	0.27	0.26	0.26	0.34

Notes: Marginal effects of OLS estimates (Columns1-2 and 4-5) and Tobit estimates (Columns 3 and 6) conducted on *Invind* data pooled over the period 2000-2013. Standard errors, calculated with the Delta method, are reported in parentheses. Marginal effects are computed as variation of the export share after a variation between 10th and 90th percentile of explanatory variables. Industry and year dummies are included in all specifications. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Table 1 for variable definitions.

Table 8 - Robustness checks: different cut-off levels of the dependent variable

	(1) prob1	(2) prob2	(3) prob3	(4) prob4	(5) reg1	(6) reg2
distance	-0.262***	-0.221***	-0.213***	-0.155***	-0.141***	-0.092***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
population age	-0.019	-0.019	-0.017	-0.021		
	(0.01)	(0.01)	(0.01)	(0.01)		
opportunism	-0.031**	-0.015	-0.065***	-0.055***	-0.019**	-0.017**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
judicial efficiency	-0.004	-0.002	-0.036***	-0.025**		
	(0.01)	(0.01)	(0.01)	(0.01)		
deposits/GDP	0.064***	0.072***	0.086***	0.083***	0.039***	0.042***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
education efficiency	0.045***	0.036***	0.037***	0.043***	0.015**	0.009
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
child and health care efficiency	0.005	-0.031***	0.030***			
	(0.01)	(0.01)	(0.01)			
recycling	-0.029*	-0.068***	0.054***	0.014		
	(0.02)	(0.02)	(0.02)	(0.02)		
L.employees		0.253***		0.164***		0.147***
		(0.01)		(0.01)		(0.01)
L.age		0.001		0.049***		
		(0.01)		(0.01)		
L.productivity		0.033***		0.090***		0.022***
		(0.01)		(0.01)		(0.01)
L.capital intensity		0.048***		0.031***		0.034***
		(0.01)		(0.01)		(0.01)
legal status		0.149***		0.116***		0.076***
		(0.02)		(0.01)		(0.01)
L.share of white collars						-0.000*
						(0.00)
Observations	27,691	20,828	27,675	20,815	27,691	20,828
Adjusted R^2	0.15	0.19	0.19	0.23	0.20	0.24

Notes: Marginal effects of probit estimates (Columns 1-4) and OLS estimates (Columns 5-6) conducted on *Invind* data pooled over the period 2000-2013. In Columns 1 and 2 the dependent variable is *du_exp* which is equal to 1 if the export share is higher than 30%; in Columns 3 and 4 the dependent variable is *du_exp* which is equal to 1 if the firm is a continuous exporters (i.e. exported every year over the period); in columns 5 and 6 the dependent variable is *share_exp* which is equal to 0 if the export share is lower than 30%. Standard errors, calculated with the Delta method, are reported in parentheses. Marginal effects are computed as variation of the probability of exporting and export share after a variation between 10^{th} and 90^{th} percentile of explanatory variables. Industry and year dummies are included in all specifications. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Table 1 for variable definitions.

Table 9 - Robustness checks: multinomial probit

	(1) mprob1	(2) mprob2	(3) mprob1	(4) mprob2
distance	0.098***	0.069***	-0.216***	-0.160***
	(0.02)	(0.02)	(0.02)	(0.02)
population age	-0.001**	0.008*	-0.025***	-0.027***
	(0.02)	(0.02)	(0.01)	(0.01)
opportunism	0.044	0.043	-0.066***	-0.055***
	(0.01)	(0.01)	(0.01)	(0.01)
judicial efficiency	0.024	0.020	-0.042***	-0.030**
	(0.01)	(0.01)	(0.01)	(0.01)
deposits/GDP	-0.070	-0.078***	0.086***	0.084***
	(0.01)	(0.01)	(0.01)	(0.01)
education efficiency	-0.008***	-0.016***	0.041***	0.042***
	(0.01)	(0.01)	(0.01)	(0.01)
child and health care efficiency	-0.018	0.004	0.028***	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)
recycling	-0.055*	-0.040***	0.049	0.008**
	(0.02)	(0.02)	(0.02)	(0.02)
L.employees		-0.107***		0.175***
		(0.01)		(0.01)
L.age		-0.016***		0.045***
		(0.01)		(0.01)
L.productivity		-0.046***		0.080***
		(0.01)		(0.01)
L.capital intensity		-0.000***		0.026***
		(0.01)		(0.01)
legal status		-0.062		0.106
		(0.01)		(0.01)
Observations	27,691	21,486	27,691	21,486

Notes: Marginal effects of multinomial probit estimates conducted on *Invind* data pooled over the period 2000-2013. Columns 1 and 2 reports marginal effects for firms that exported at least one year over the period respect to firms that never exported. Columns 3 and 4 reports marginal effects for firms exported every year over the period respect to firms that never exported. Standard errors, calculated with the Delta method, are reported in parentheses. Marginal effects are computed as variation of the probability of exporting after a variation between 10^{th} and 90^{th} percentile of explanatory variables. Industry and year dummies are included in all specifications. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Table 1 for variable definitions.

Table 10 - Robustness checks: cross-section

	(1) prob1	(2) prob2	(3) reg1	(4) reg2
distance	-0.096***	-0.051**	-0.161***	-0.109***
	(0.03)	(0.02)	(0.02)	(0.02)
population age	-0.021	-0.010		
	(0.02)	(0.01)		
opportunism	-0.042***	-0.033***	-0.031*	-0.029
	(0.01)	(0.01)	(0.02)	(0.02)
judicial efficiency	-0.046**	-0.038**		
	(0.02)	(0.01)		
deposits/GDP	0.051***	0.042***	0.038**	0.030**
	(0.01)	(0.01)	(0.01)	(0.01)
education efficiency	0.030	0.021	0.019	0.011
	(0.02)	(0.02)	(0.02)	(0.02)
child and health care efficiency	0.008			
	(0.01)			
recycling	0.074***	0.050**		
	(0.03)	(0.02)		
employees		0.129***		0.131***
		(0.01)		(0.02)
age		0.034***		
		(0.01)		
productivity		0.067***		0.043***
		(0.01)		(0.01)
capital intensity		0.045***		0.047***
		(0.01)		(0.02)
legal status		0.062***		0.052**
		(0.02)		(0.02)
share of white collars				-0.001*
				(0.00)
Observations	4,326	4,326	4,328	4,328
Adjusted R^2	0.21	0.27	0.22	0.26

Notes: Marginal effects of probit estimates (Columns1-2) and OLS estimates (Columns 3-4) conducted on *Invind* data averaged over the period 2000-2013. Standard errors, calculated with the Delta method, are reported in parentheses. Marginal effects are computed as variation of the probability of exporting and export share after a variation between 10^{th} and 90^{th} percentile of explanatory variables. Industry and year dummies are included in all specifications. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. See Table 1 for variable definitions.