

Mariotti, Ilaria; Micucci, Giacinto; Montanaro, Pasqualino

Conference Paper

Internationalisation strategies of Italian district SMEs: an analysis on firm-level data

44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Mariotti, Ilaria; Micucci, Giacinto; Montanaro, Pasqualino (2004) : Internationalisation strategies of Italian district SMEs: an analysis on firm-level data, 44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/117157>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Internationalisation strategies of Italian district SMEs: an analysis on firm-level data

Ilaria Mariotti [♦], Giacinto Micucci [♦] e Pasqualino Montanaro [♦]

[♦] University of Groningen - Faculty of Spatial Sciences, The Netherlands, i.mariotti@frw.rug.nl

[♦] Banca d'Italia - Filiale di Ancona, Nucleo per la Ricerca Economica, *The opinions expressed in this paper do not necessarily reflect those of the Bank of Italy.*

micucci.giacinto@insedia.interbusiness.it e montanaro.pasqualino@insedia.interbusiness.it

Key words: Industrial districts; Internationalisation; Subcontracting; Immigrant labour force.

JEL Classification: F20, J15, M55

1. Introduction

Traditionally, scholars describe Italian industrial districts¹ (IDs) as closed manufacturing systems of SMEs embedded in local contexts, able to interact with the outside only at the two ends of the value chain and where well-identified firms were in charge of managing the relationships with final markets (Becattini, 1989; 2002; Piore and Sabel, 1984). However, at the end of the nineteen-eighties and during the nineties, even local systems of SMEs (IDs) perceived the importance of increasing their contacts with firms outside the local district area. The emerging delocalisation process carried out by Italian district SMEs highlights their abilities to globalise not only by selling products manufactured locally in international markets (export-based perspective), but also in terms of the international reorganisation of local supply chains.

Italy, as other industrialised countries, is experiencing a fragmentation of the production chain: firms tend to shift high labour-intensive manufacturing activities to areas

¹ Developing along the path set by the Marshallian tradition at the end of the 1970s (Marshall, 1896), a group of Italian scholars introduced a new definition of industrial district as ‘*a socio-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge*’ (Becattini, 1990). The distinctive factors of an industrial district appear to be: the concentration of production and innovative activities, both at the geographical and the sectoral level; the common social and cultural backgrounds; and the organization of linkages among business and non business actors in formal and informal networks (Guerrieri *et al.*, 2001).

characterised by an abundance of low-cost labour (i.e. Central Eastern Europe, India, South East Asia, Latin America, Russia and Central Asia). The internationalisation strategy mainly adopted by district firms is international subcontracting rather than foreign direct investment (FDI).

The purpose of the paper is twofold. First, we investigate whether the internationalisation strategies by district SMEs are independent or complementary to each other. Second, we test if they are due to low-skilled labour shortage that characterizes labour intensive activities in specific district areas. The questions will be addressed using data-sample of about 700 district firms (1998 Bank of Italy database). The paper is organised as follows. A general introduction is followed by a discussion of the internationalisation strategies by Italian SMEs and by the ID itself. Section three describes the data employed for the analysis. The empirical results are presented in sections four and five and the hypotheses are tested. In section six, the conclusions for the relationships of the internationalisation strategies are discussed.

2. Firm internationalisation strategies

Firms that face the global scenario can adopt the following internationalisation strategies: (i) export; (ii) foreign direct investments (FDIs); (iii) international strategic alliances.

Exporting is the most common form of internationalisation. In the case of Italy, exporting is not necessarily the most important or most fundamental internationalisation way: Italian firms have recently begun to develop other, more advanced forms of foreign expansion, mainly of *non-equity* type (Basile *et al.*, 2003).

FDI represents the main tool of internationalisation for medium - and large - sized firms and multinationals. FDI is an investment realised abroad ('active' or 'outward' investment) or from abroad ('passive' or 'inward' investment) in plants, and can take place either through the opening of branch plants ('green-field' investment), or through the acquisition of or financial participation in existing firms ('brown - field' investment).²

By contrast, small and medium size firms extend their supply chains abroad through international strategic alliances that can come in various forms (Dunning, 2001). The first type is the *non-equity* strategic alliance that is formed through sub-contracting agreements between a firm and one (or more) of its suppliers to supply, produce, or distribute a firm's goods or services without equity sharing. They include, e.g., licensing, franchising, subcontracting. Because they do not involve the forming of a separate venture or equity investments, non-equity alliances are less formal and demand fewer commitments from partners than joint-ventures and strategic alliances (Hitt *et al.*, 2001; Gemser *et al.*, 2004). The second type is *equity* strategic alliance which is an alliance in which partners own different percentage of equity in a new venture or project, or an existing firm. The third type is the *joint venture* where two or more firms create a separate corporation whose stock is shared by the partners.

Traditional statistical sources mainly refer to the amount of FDIs without taking into account other forms such as subcontracting or joint ventures that are more difficult to

² For an overview of the internationalisation determinants see the Eclectic Paradigm of the International Production (OLI framework) (Dunning, 1977, 2001). According to the OLI framework, a multinational firm invests abroad through FDIs in order to gain *Ownership advantages* (which the firm wishes to exploit in several markets), *Locational factors* (implying that production in more than one country is efficient) and *International considerations* (conferring an advantage to having the production done within a single firms rather than by many firms) (see, for example, Ethier and Markusen, 1996).

monitor. This raises the probability that the internationalisation process is underestimated.

The internationalisation strategy mainly adopted by Italian SMEs is the international subcontracting.³ It can take two forms (Germidis, 1980):

- industrial subcontracting
- commercial subcontracting

Industrial subcontracting takes place between independent units (the principal and the subcontractor) located in different countries and concerns the manufacture of intermediate products (parts, components or sub-assemblies) to be incorporated into a product which the principal will sell. Such orders may also include the treatment, processing or finishing of materials or parts by the subcontractor at the principal's request. In the case of the *Made in Italy* sectors, the industrial subcontracting ensures that the products keep the brand mark of the principal firm.

The commercial subcontracting takes place between two independent units located in different countries and concerns the manufacture of finished products (without assembly or finishing) that will be exported either via the principal or directly by the subcontractor.

The delocalisation of phases of the production cycle is one of the ways in which the value chain is opening up. If in the past the intermediate goods and services markets have been *captive* for the firms within the ID, recently "leader" firms⁴ started transferring part of the production segments to low-wages countries, through subcontracting relationships or *joint ventures*.⁵ The delocalisation of specific segments is more frequent for those IDs characterized by a division of the production phases. In particular, district firms operating in the fashion industry started delocalising towards

³ Subcontracting corresponds to '*outsourcing*' a productive process, i.e. the process is done by a non affiliate company (outside the firm). In literature, however, the term 'international outsourcing' is sometimes referred to as simply transferring the production segments outside the country, either to a non-affiliate or an affiliate company (Federico, 2002). To avoid any misunderstanding, in this paper we always use refer to international subcontracting.

⁴ District "leader" firms tend to ensure quality, genuineness and visibility of the *Made in Italy* products through planning, design, advertising campaign and the improvement of trade network. These firms adopt specific policies to promote trade mark achievement. They are mainly located at the edge of the value chain and sell directly goods to the customers. In some cases, suppliers that produce autonomously, without specific requests, can be labelled "leader" firms.

⁵ The *outsourcing* strategies, adopted by the most dynamic leader firms, consist of production and 'intangible assets' delocalisation (technological innovation, computerization, quality management, product planning and design, advertising, marketing, managerial advice, financial services). The latter are supplied by qualified tertiary firms located outside the ID, in the main Italian cities (Micucci, 2003).

South Eastern European countries (SEECs) and the Far East, in the second half of the 1980s.

Recent studies show that Italian district SMEs exhibit a higher degree of internationalisation in terms of foreign trade and a lower degree in terms of delocalisation in comparison with firms that do not belong to a district (see among others, Centro Studi Unioncamere-Assocamere Estero, 2002; Federico, 2002). This pattern confirms their embeddedness to the local context (see among the others, Granovetter, 1985; Markusen, 1996). According to the survey by Centro Studi Unioncamere (2002), international subcontracting is preferred by district firms respect to FDIs, presumably because of the high sunk costs associated with the latter. Generally speaking, it can be stated that the small volume of Italian FDIs is due to the fact that in Italy there is a smaller number of multinational firms; Italian firms are smaller compared to the European average and present internal decentralising networks that have in some cases substituted the FDIs (Viesti, 2002).

Tab. 1: Internationalisation strategies of Italian firms (%)

Internationalisation type	District firms	Other firms
Industrial subcontracting	38.5	17.4
Commercial subcontracting	22.2	16.5
Joint ventures	15.4	22.4
Supply contracts	12.8	22.2
FDIs	11.1	21.4
Total	100.0	100.0

Source: Centro Studi Unioncamere-Assocamere Estero (2002) on Unioncamere data.

The transfer of production abroad by Italian SMEs is part of the ‘international fragmentation of production’ as labelled by Jones and Kierskowski (2000).⁶ This can take the shape of vertical or horizontal integration processes (Markusen *et al.*, 1996).

In the first case, the production process, initially realised by the parent company, is fragmented and relocated elsewhere through FDIs or “lighter” internationalisation forms (i.e. delocalisation, subcontracting relationships, joint ventures) with firms in other areas that offer lower production costs. The vertical integration process is a *cost-saving* strategy that is driven by the need to save on labour costs and, in the case of Northern Italian provinces, by the scarcity of skilled and unskilled workers and industrial areas to expand production capacity. The vertical process is directed towards less developed or developing countries (e.g. SEECs and the Far East) where the subcontractor’s costs for

⁶ On the international fragmentation of production, see, among the others, Venables (1999).

certain operations (production or processing) are considerably lower.

Italian SMEs adopt an horizontal integration process when the production structure of the parent company is reproduced in other geographical contexts through FDI in order to gain a better access to new local markets. Horizontal investments are driven by *market-seeking* strategies and are directed towards more advanced countries (e.g. Western Europe and USA).⁷

Although in the last five years there has been an increasing interest on the internationalisation of production by Italian SMEs, there is a lack of micro level studies. The use of firm-level data presents the advantage to explore individual characteristics of firms.

Among the variables adopted by the empirical research to explain firm relocation patterns, firm size received much attention. According to recent studies (Bugamelli *et al.*, 2000; Van Dijk and Pellenbarg, 2000; Brouwer *et al.*, 2004), firm size is one of the key factors influencing firm relocation, because moving costs and the organizational problems associated with relocation are considerable for large firms.⁸ Further, smaller firms are more willing to move because (1) they have less demanding premise requirements and less capital investment to write off; (2) small firms make a series of small locational adjustments and select the first minimum requirement site which they find, while large firms make infrequent large locational changes; (3) small firms are much more affected by redevelopment; (4) large firms have more flexibility in accommodating expansion (Mason, 1980; Brouwer *et al.*, 2004).

Firm's age is significant in the relocation choice because older firms are more embedded in the spatial environment; they are embedded in networks that are established through long term trust-based relations which are likely to be facilitated by spatial proximity (see among others, Granovetter, 1973; Putnam, 1993).

Besides, firms that are more export oriented and exhibit significantly wider spatial patterns of customer linkage are more mobile (Keeble, 1978). A larger market has a positive impact on the relocation decision because when a firm serves a larger market, part of its activity can be relocated, by opening new plants, without incurring sunk costs

⁷ A recent qualitative survey based on *face to face* interviews to a sample of entrepreneurs of leading firms producing shoes and footwear in Montebelluna district (North Eastern Italy), shows different managerial strategies to the internationalisation process and emphasises that the motivations can evolve over time, from originally cost-saving to increasingly market-oriented or global strategies (Mariotti, 2004).

⁸ We refer to large single-site firms that are less willing to move. On the other hand, large multiplant firms show an higher propensity to move because they have more plants that can be relocated (Pennings and Sleuwaegen, 2000).

which are a barrier to relocation (Caves and Porter, 1976). Besides, service sectors show a smaller probability to relocate because they are primarily market oriented and need a close connection with customers (Pennings and Sleuwaegen, 2000).

Some studies showed a positive relationship between relocation, from one side, and innovation and the availability of “intangible assets” (patents, R&D, advertising and marketing), from the other side (Pennings and Sleuwaegen, 2000; Antràs, 2003; Federico, 2003). Intangible assets are foot-lose; they can be easily transferred from plants in one country to plants in a different country, they can act as a *joint input*.

As concerns the relationship between FDIs and export the literature shows that they are independent of each other.⁹ In some circumstances, FDI can constitute a substitute for exports, but in other cases, a complement (see among the others Mori and Rolli, 1998; Fontagnè, 1999; Head and Ries, 2001; Basile *et al.*, 2001). However, it has been acknowledged that the nature of this relationship is not certain *a priori* and is dependent on the type of production undertaken, the maturity of the firms and the level of development of the host country (Cantwell, 1994) or is closely related to internationalisation ways and scopes (e.g. serve local market, transfer production activities in low-wages countries, reinforce the foreign distribution activities, guarantee a privileged access to specific resources) (Mariotti *et al.*, 2003).¹⁰

⁹ See Onida (2001) for a literary review.

¹⁰ According to the Heckscher-Holm-Samuelson paradigm, FDIs and export present a substitutive relationship. This result is supported by Mundell (1957). On the other hand, Helpman (1984) and Helpman and Krugman (1985) state that FDIs induce complementary effects on export flows. Finally, some studies show that in particular circumstances, FDIs and exporting can be, at the same time, complementary or substitute (Markusen, 1995; Markusen and Venables, 1998).

3. Data and description of the sample

The data set used for the analysis is the 1998 Bank of Italy Survey on the industrial district firms.¹¹ The survey is based on a standardised questionnaire sent to manufacturing firms operating in four sectors (leather and footwear, textile and clothing, mechanical industry, furniture) and belonging to 15 IDs. These IDs have been selected on the basis of the Sforzi-Istat algorithm (Signorini, 2002).¹²

The firms of the sample have 40 employees, on average, but small and very small firms are prevailing (Tab.2). In total the dataset consists of 706 observations. The survey aimed to investigate demographic (size, sector, age, location) and managerial aspects (manufacturing process, supplying and products distribution, production and labour organization). The internationalisation strategies that have been adopted are: international subcontracting and FDIs. Information on the employment of non-EU immigrants¹³ are also available. Hiring non-EU workers cannot be considered as an internationalisation strategy however, it can be related to the internationalisation ways by substitute or complementary relationships.

The 41.2% of the total amount of services and products purchases of the firms is subcontracted. Most of the firms make use of local district suppliers (69.7% of the sample) while the 36.7% of suppliers are located in the rest of the country (Tab.5). 81 firms out of 706 buy on subcontract from foreign firms (11.5%) (Tab. 4). International subcontracting covers about 4.7% of the total amount of products and services purchases (Tab.2).

Firms located in the South of Italy show a lower propensity to subcontract productions abroad, however, once they decided to do it, the phenomenon seems to become significant (7.1% of the total amount of purchases). Firms in the furniture sector are more willing to buy through subcontracting (6.7%; Tab.2).

In addition, 135 firms out of 399 (19.1%), that subcontract semi-processed products, serve foreign markets (Tab.5).

¹¹ The survey has been carried on in 1997.

¹² The Sforzi-Istat algorithm identifies the district areas by turning the qualitative information, borrowed by the industrial district theory, into quantitative data. Italy has been divided into local labor systems (LLSs) that include 199 industrial districts (see Sforzi, 1989). This permitted a comparison of the many different characteristics that distinguish district areas from non-district areas (see Becattini, 2002; Signorini, 2000).

¹³ These are immigrants from a country outside the European Community.

District firms are less willing to internationalise through FDIs: only 13 firms out of 706 declared to have establishments abroad. These are large firms (100 and more employees) and have about 7% of the employees working abroad (Tab.2). The amount of jobs in the foreign establishments is higher in the mechanical industry sector than in the leather and footwear sector.

About one fifth of the firms employs non-EU workers (145 firms out of 706; Tab.4). The influence of non-EU workers in the Italian establishments of the 706 firms is equal to 2.8% of the total employment (Tab.2 and 3). It is unusual that a firm employs a small number of immigrants. In case a firm decides to hire immigrants the incidence of non-EU workers on the total employment reaches the 9.4%. This might be due to: (i) fixed costs in the human resource management; (ii) comparative advantages in the integration process that firms have faced during earlier experiences; (iii) easier introduction of the immigrants thanks to the cooperation of employers coming from the same country and working in the same firm; (iv) role of the ethnic networks in steering labour demand and offer. The non-EU mainly fill low-skilled positions. Rarely entrepreneurs offer them high-skilled and qualified positions that are held by people belonging to the same local labour system.

In general, southern IDs are less willing to hire immigrants because of the abundant labour availability of these areas. However, the following 'mature' southern districts show a higher propensity to employ immigrants: the footwear IDs in Civitanova Marche (8.4% of the total employment); the furniture district in Pesaro (5.3%) in Marche region; the IDs of Thiene (4.9%) in Veneto region and that of Santa Croce sull'Arno (4.3%) in Tuscany. In the centre of Italy the impact is higher than in the North (5.0 and 3.8, respectively).

4. The model and the empirical findings. International subcontracting as dependent variable

In this section we turn to an econometric analysis to investigate the characteristics of the Italian manufacturing district firms that delocalise through international subcontracting. The decision to undertake international subcontracting is modelled within a Logit model relating the probability to adopt this strategy to a set of explanatory variables x_i .

The factors that according to the literature are supposed to influence the decision to delocalise are: firm specific (demographic and managerial characteristics of the firms) and area specific (Van Dijk and Pellenbarg, 2000). The area specific factors include: the characteristics of the areas of origin (*push* factors) and the factors attracting firms in the new location (*pull* factors).

Because of data restrictions, the analysis only focuses on firm specific characteristics and *push* factors. The latter are limited to the characteristics of the labour market.

The estimated model is as follows:

$$\pi_{DELOC} = f(\text{AREA}, \text{SECT}, \text{SIZE}, \text{AGE}, \text{DEMAND}, \text{INNOV}, \text{IMM_AMOUNT}, \text{EMPLOYM_RATE})$$

where:

π_{DELOC} is the probability to subcontract activities abroad (consumer goods and services);

AREA is the *dummy* category concerning the area of location (North, Centre-South);

SECT is the *dummy* category of the sector (leather and footwear, textile and clothing, mechanical industry and furniture);

SIZE is the logarithm of the number of employees;

AGE is the logarithm of firm age (age in years);

DEMAND is a category grouping indicators of stability and demand concentration;

INNOV is a category of business managerial variables (export propensity, production of final goods, use of planning and design services, advertising and market researches);

IMM_AMOUNT is the amount of non-EU workers;

EMPLOYM_RATE is the employment rate of the reference Local Labour System (LLS).

The independent variable is assumed to be correlated to the explanatory variables by means of a non linear relation $P(y=1)=F(\beta'x)$, that is expressed by a logistic function as

follows: $\pi = \frac{\exp^{\beta'x}}{1 + \exp^{\beta'x}}$, where $\beta'x$ is the linear function beneath, x is the vector of the

explanatory variables and β' is the vector of coefficients (Greene, 1997).

Empirical studies on firm internationalisation patterns mainly find a positive correlation between subcontracting and firm size by arguing that the outsourced activities are characterized by economies of scale and by sunk costs (cfr. Par. 2). The estimated parameter of the variable AGE can show either a positive or a negative correlation: old firms could compete on the foreign markets with the same strength than larger firms. On the other hand, a young firm subcontracts production segments abroad in order to compete with well-established and older firms by means of cheaper production costs.

We expect that the probability to delocalise through subcontracting is more significant for firms operating in the most traditional sectors and having higher labour costs. These firms transfer labour intensity activities to low-wages countries to reduce production costs.

The category DEMAND also includes the share of turnover for the first three customers. As stated in par. 2, firms with exclusive market agreements are supposed to show a lower propensity to delocalisation.

The innovation degree and the intangible assets of the firm might be positively related to the delocalisation (cfr. Par.2). As proxies for innovation we use two kinds of *dummy* variables: the former concerning planning and design services, the latter marketing and advertising activities.

Several studies on high technological activities, such as R&D, information and communication technology (ICT), have been published while there is a lack of research on marketing policy – concerning, among the others, planning, design and advertising costs. These *intangibles assets* present a lower technological degree if compared to R&D and ICT, but they are crucial for the sustainability of the competitive advantage of the Italian production. Although the Italian specialization model is open to the competitive pressure of developing countries (from Latin America to Eastern European countries and the Far East) the *Made in Italy* production still excels for the higher quality levels of the Italian manufactures. The competitiveness of these products is not based on price levels but on investments in planning and design, trademark success and retail trade modes.

Finally, *international subcontracting* and export are supposed to be positively correlated because firms export raw materials or semi-finished products to countries where they will be processed and/or assembled (Capriati, 2003; Viesti, 2002). In addition, as stated in par. 2, foreign investments promote export markets.

Estimation results for the model explain the 19% of the total variability, expressed as

likelihood ratio index (LRI), also labelled *pseudo R-square*. Table 6 shows the LRI as calculated by leaving out the variables one by one. This let us estimate the contribution of each variable to the explanation of the phenomenon. By taking all the variables into account, the *dummy* area North adds about 40% to the explained variability. The contribution of SIZE, SECTOR and DEMAND stability is similar, while the amount of variability explained by firm age is rather weak.

Table 7 presents the estimates based on the Logit model. The variable AREA is very significant. This emphasises that northern IDs are more willing to subcontract abroad.

The variable SECTOR is significant. Firms in the leather and footwear industry have an higher propensity to subcontract than the other sectors. The propensity by mechanical industry– where investment or intermediated goods are produced- is smaller but not significantly.¹⁴

The effect of SIZE is very significant and presents the expected sign. Having 10 additional employees increases the probability to delocalise abroad of about one percentage point. This also suggests that sunk costs influences not only the propensity to invest abroad but also to adopt *international subcontracting*.

Firm's AGE is negatively correlated and is significant at 5 per cent: old firms show a smaller propensity to enter into production agreements.

Among the variables concerning the demand characteristics, the turnover share for the first three costumers has a negative sign and it is highly significant.

The *dummy* variable *PASSIVE_DELOC* has been included in the model in order to control whether the turnover concentration in the first customers indicates an higher propensity to the “passive” delocalisation. A 1 value is assigned to this variable if the firm produces and sells goods through subcontracting; a zero value if it does not.

The turnover share of the first three customers shows a coefficient that differs significantly from zero. An increase of 10 percentage points reduces the delocalisation probability of 1 percent point.

The production of consumer goods and the use of product planning and design services show a positive effect on the dependent variable. If the two components are considered jointly, the significance increases. It follows that the probability to delocalise is higher (5-6 percentage points extra) if the firm plans, develops and directly produces consumer goods. This supports the assumption that more competitive and innovative firms tend to transfer abroad *labour-intensive* activities, while high value-added activities continued to be located in Italy.

The positive sign of EXPORT (that is significant at 11 percent) seems to support the

¹⁴ This has been calculated by adjusting for a *dummy* that identifies the production of consumer goods.

assumption that exporting is the first step towards internationalisation.

There is no evidence about the incidence of local labour conditions on delocalisation propensity. The employment rate of the LLSs is not significant at geographical level.

The foreign labour force availability shows a negative sign but it is not significant. This suggests that the choices to delocalise and employ immigrants are independent from each other.

In addition to the probability that the delocalisation occurs, our aim is to evaluate the impact of the analysed factors on the delocalisation propensity. This sample does not allow us to use the OLS estimates because of the small number of observations showing a dependent variable that differs from zero and because these variables cannot be chosen randomly.¹⁵ The presence of several invalid values (*left censoring*) suggested us to adopt a Tobit model. The estimates based on the Tobit model presented in tab. 8, confirm the Logit results. The delocalisation propensity is negatively correlated as to firm demographic variables as to the concentration of customers' turnover share. On the other hand, it is positively correlated to an higher ability of producing final goods and innovating. In the Tobit model, the use of planning and design services gains a greater significance in comparison to the Logit estimates. This suggests that these factors affect as the decision to transfer activities abroad, as the intensity of delocalisation.

¹⁵ The OLS estimates are not consistent and distorted.

5. The model and the empirical findings. Employing non-EU labour force as dependent variable

The Bank of Italy survey allows to test the effect of explanatory variables on the propensity to employ non-EU workers.

The Logit model is as follows¹⁶:

$$\pi IMMIG = f(AREA, SETT, SIZE, AGE, DEMAND, INNOV, SUBCONTR_AMOUNT, EMPLOYM_RATE)$$

The variable *SUBCONTR_AMOUNT*, that measures the amount of subcontracting (in total or only towards the foreign countries) has been included to the model.

The relationship between immigrants' employment and the indicators of innovation propensity and competitiveness is particularly interesting. The expected sign is not certain *a priori*. Some studies show that immigrants work in sectors that have difficulties in innovating or delocalising to reduce labour costs. Therefore, these firms employ immigrants, often as illegal work. This phenomenon is common in the agricultural and tertiary sectors (Reyneri, 1996). The same is not proved for the manufacturing sector that is characterised by strong supplying agreements and partnerships with other firms.

Technological innovations can induce needs of low skilled as well as high skilled labour force. The positive contribution of the non-EU labour force to the innovation and modernization processes has been presented in studies on the Italian regions (Ambrosini, 1992). On the other hand, recent analyses (Gavosto, et al. 1999; Brandolini et al. 2003) underline that non-EU employees tend to accept the low-skilled positions that are refused by Italians. In other words, Italian workers do not compete with immigrants. In general, recent studies suggest that the probability to employ foreign labour is higher for firms with lower wages, lower technological production content, lower qualitative level and lower products' visibility.

It is relatively easier to test the relation between the employment non-EU labour force and the introduction of innovation in vertically integrated firms than for the district SMEs. District firms hiring immigrants and showing a low innovation degree might be part of a value chain 'ruled' by high tech firms. Moreover, our database only includes firms belonging to the Made in Italy sectors that are traditional sectors and show a weak propensity to innovation and intangible assets availability.

The explained variance of the model exceeds the 25 per cent. Contrary to the subcontracting propensity, the employment rate of the reference LLS shows a high explanatory capacity (tab.9).

¹⁶ The results of the Logit model have been confirmed by the Tobit model (tab. 11).

The results of the analyses show a moderate significance for the *dummy* AREA. District firms located in the North are more willing to hire immigrants of 10 percentage points if compared to the other firms in the rest of the country (tab. 10).

The SECTOR *dummies* are significant: the probability to recruit immigrants is higher in the furniture, leather and footwear sectors. Firm SIZE is relevant and assumes a positive sign. The coefficient related to the AGE does not differ significantly from zero.

The DEMAND variables are not relevant in this case.

It is highly significant if the firm produces consumer goods and the sign is negative: producing for the final market involves a reduction of 9 percentage points of the probability to employ non-EU workers.

The use of *intangible assets* reduces the probability to hire non-EU workers. The exporting propensity is not significant. In general, district leader firms do not show an higher propensity to employ foreign workers.

The labour market characteristics of the LLS present a significant and consistent effect. The employment rate is the variable that mainly explains the phenomenon: an increase of one point percentage makes rise the probability to employ immigrants of more than 3 per cent points.

In the literature the presence of non-EU employees immigrants is negatively correlated as with the workers' wage level as with wage differential between blue and white collars. However, these information are not available in our survey on district SMEs. By contrast, the ratio between the net salary of the apprentices and of the qualified blue collars with 20 years of work experience (*SALARY*) is available. This can approximate a crucial aspect of wage policies and human resource management: the earning opportunities due to the carrier progression within the firm. Smaller is the *proxy* variable, higher are the career opportunities.

The introduction of the variable *SALARY* leads to a reduction of the number of valid observation for the estimates of about 500. The positive sign assumed by *RETRIB* suggests that the propensity to employ immigrants is lower in firms promoting carrier rising opportunities. These opportunities are supposed to be more appreciated by the local labour force.

The purchasing rate in subcontracting, in general as well as from abroad, takes a negative sign but it is slightly significant (it is not significant in the regression without *SALARY*). In this analysis, like in the previous one (cfr. par. 4), it is not easy to establish a relationship between employing immigrants and *subcontracting*.

The hypothesis of complementarity or of substitution of these two options can be strictly tested through a *tetracorica* 2x2 table (cfr. tab. 12).

If the choices are complementary it results:

$$n_{1,1} \times n_{2,2} > n_{2,1} \times n_{1,2}$$

and *vice versa* in the case of alternative choices.

The odd's ratio is defined as:

$$n_{1,1} \times n_{2,2} / n_{2,1} \times n_{1,2}$$

this allows us to discriminate the two situations. There is complementarity when the odd's ratio is > 1 and replaceability if it is < 1 .

The obtained odd's ratio does not statistically differ from 1 (tab. 12). There is a high frequency of cases in which the firm does not choose any of the two options while there are few cases in which both the options are carried out. In the latter case, the odd's ratio value is reduced to non statistically significant levels. Consequently, the data suggest a relationship of substantial independency between delocalisation and immigrants employment.

6. Conclusions

The internationalisation of Italian firms is a phenomenon of growing interest. This study offers an empirical contribute to the literature on the internationalisation of the IDs, by means of firm level data on 706 district firms (Bank of Italy database).

The firms of the sample rarely invest abroad through FDIs while there is an higher percentage of delocalisation through subcontracting with foreign firms. According to the estimates, delocalisation is mainly influenced by *firm specific* factors and in a second stage by the local labour market characteristics.

It has also been analysed the employment of immigrants in order to emphasise relationships of complementarity or substitution with delocalisation. The choice to employ non-EU workers is more significant in the areas characterised by labour shortage. The decisions to internationalise through *subcontracting* and to employ immigrants seem independent to each other and are explained by different factors.

An overall evaluation supports the following interpretation. The employment of immigrants allows the firm to overcome the specific local labour market conditions, such as the lack of low-skilled duties that are discarded by Italian workers, especially in areas with low unemployment rate. Firms that are less willing to promote career rising opportunities are more favourable to hire immigrants. The delocalisation through subcontracting, in order to reduce labour-intensive activities' costs, is mainly related to firm specific factors rather than to area factors. This strategy is adopted by leader firms that export, have diversified final customers and show a considerable capability to introduce innovation and to ensure the visibility of their products.

References

- Ambrosini M. (1992), Il lavoro degli immigrati. Analisi del caso lombardo, *Studi Emigrazione*, n. 29.
- Antràs P. (2003), *Firms, Contracts and Trade Structure*, NBER Working Paper, no. 9740.
- Barba Navaretti G. B., Falzoni A. e Turrini A. (1999), *L'impatto della delocalizzazione nelle imprese italiane del tessile-abbigliamento e della meccanica*, Centro Studi Luca d'Agliano, Milano.
- Basile R., Giunta A., Nugent J.B. (2003), *Foreign expansion by Italian manufacturing firms in the Nineties: an ordered probit analysis*, paper presented at the Conference "Clusters, Industrial districts and firms: the challenge of globalisation, Modena, 11-12 September.
- Becattini G. (1989), *Modelli locali di sviluppo*, Bologna, Il Mulino.
- Becattini G. (1990), The Marshallian District as a Socio-Economic concept, in Pyke F., Becattini G. and Sengerberger W., Eds, op. cit.
- Becattini G. (2002), From Marshall's to Italian "Industrial District". A brief critical reconstruction, in Quadrio Curzio A. and Fortis M., op. cit.
- Becattini G. e Rullani E. (1993), Sistema locale e mercato globale, *Economia e Politica Industriale*, n. 80.
- Brandolini A., P. Cipollone and A. Rosolia (2003), *Immigrazione e mercato del lavoro in Italia*, paper presented at the seminar: "L'incidenza economica dell'immigrazione", Florence, 11-12 December.
- Brouwer A.E., Mariotti I., van Ommeren J.N. (2004), The firm relocation decision: an empirical investigation, *Annales of Regional Science*, n.38, 2, forthcoming.
- Brusco S. and Paba S. (1997), Per una storia dei distretti industriali italiani dal secondo dopoguerra agli anni novanta, in F. Barca (Eds.), *Storia del capitalismo italiano dal dopoguerra a oggi*, Donzelli, Rome.
- Bugamelli M., Cipollone P. and Infante L. (2000), L'internazionalizzazione delle imprese negli anni '90, *Rivista Italiana degli Economisti*, n. 3, 2000.
- Cantwell J. (1994), The relationship between the international trade and international production, in Greenaway D. and Winters A. (Eds), *Surveys in international trade*, Blackwell, Rome, pp. 303-327.
- Capriati M. (2003), L'economia dei paesi balcanici: variabili reali, movimenti di capitali e sviluppo umano, in Botta F. and Capriati M, (Eds.), *Transizione nei Balcani e reti trasadriatiche – il valore della prossimità*, Cacucci Editore, Bari.
- Caves R. E. and Porter M E (1976), *Interfirm profitability differences*, Harvard institute of Economic Research, no 474.
- Centro Studi Unioncamere - Assocamere Estero (2002), *Internazionalizzazione, imprese e territorio*, II Rapporto, Rome.
- Corò G. (2000), La delocalizzazione: minaccia, necessità o opportunità?, *Rapporto Fondazione Nord Est 2000*, Venezia.
- Dijk J. van and Pellenbarg P.H. (2000), Firm relocation decisions in the Netherlands: An ordered Logit approach, *Regional Science*, 79 (2).
- Dunning F. H. (1977), Trade, location of economic activity and MNE: A search for an eclectic approach, in Ohlin B., Heselborn P.O and Wijkman P.M., Eds., *The international allocation of economic activity*, Mcmillan, London.

- Dunning F.H. (2001), The Eclectic (OLI) Paradigm of International Production, *International Journal of Economics of Business*, Vol. 8, No. 2.
- Ethier W.J. and Markusen J. R. (1996), Multinational firms, technology diffusion and trade, *Journal of International Economics*, 41, pp.1-28.
- Federico S. (2002), *Producing abroad: evidence from Italy*, Banca d'Italia, Mimeo.
- Federico S. (2003), L'internazionalizzazione produttiva italiana e i distretti industriali: un'analisi degli investimenti diretti all'estero, Paper presented at the Seminar "Economie locali, modelli di agglomerazione e apertura internazionale. Nuove ricerche della Banca d'Italia sullo sviluppo internazionale", Bologna, 20 November.
- Ferragina A. and Quintieri B. (2002), I processi di frammentazione produttiva dell'Italia verso l'area mediterranea e l'Est europeo, in Galli G. and Paganetto L. (Eds.), *La competitività dell'Italia*, Centro Studi Confindustria, Il Sole 24 Ore, Milan.
- Fontagné L. (1999), *Foreign direct investments and international trade: complements or substitutes?*, STI Working Papers, n.3
- Garofoli G. (2003), Distretti industriali e processo di globalizzazione: trasformazioni e nuove traiettorie, in Garofoli G., Eds., *Impresa e territorio*, Il Mulino, Bologna.
- Gavosto A., A. Venturini and C. Villosio (1999), Do Immigrants Compete with Natives?, *Labour*, vol. 13.
- Gemser G., Brand M.J., Sorge A. (2004), Exploring the internationalisation process of small businesses: a study of Dutch oland and new economy firms, forthcoming in MIR, Issue 2.
- Germidis D. (1980), *International subcontracting: a new for of investment*, OECD.
- Granovetter M. (1973), The strength of weak ties, *American Journal of Sociology*, 78, 6.
- Granovetter M. (1985), Economic action and social structures: the problem of embeddedness, *American Journal of Sociology*, 91, pp.481-510.
- Greene W H (1997) *Econometric analysis*. Prentice Hall, London.
- Guerrieri P. and Iammarino S. (2001), The dynamics of Italian industrial districts, in Guerrieri P., Iammarino S., Pietrobelli C. (2001), (Eds.), *The global challenge to industrial districts*, Edward Elgar, Cheltenham.
- Head K. and Ries J. (2001), Overseas investments and firm exports, *Review of International Economics*, 1.
- Helpman E. (1984), A simple theory of international trade within multinational corporations, *Journal of Political Economy*, 93.
- Helpman E. and Krugman P. (1985), *Market structure and foreign trade*, MIT Press, Cambridge.
- Hitt M.A., Ireland R.D., Hoskisson R.E. (2001), *Strategic management: competitiveness and globalisation*, South-Western College Publishing, Cincinnati.
- Keeble D (1978) *Industrial location and planning in the United Kingdom*. Methuen & Co., London.
- Jones R. W. and Kierzkowsky H. (2000), *A framework for fragmentation*, Tinbergen Institute Discussion paper, 56, Amsterdam.
- Mariotti I. (2004), The internationalisation strategies of Italian district SMEs, in Wever E. and van Vilsteren G.(Eds.), *Borders and economic behaviour in Europe; a geographical approach*, Van Gorcum, Assen, *Forthcoming*.

- Mariotti S., Mutinelli M. and Piscitello L. (2003), Home country employment and foreign direct investment: evidence from the Italian case, *Cambridge Journal of Economics*, 27.
- Markusen A. (1996), Sticky places in slippery space: a typology of industrial districts, *Economic Geography*, 72.
- Markusen J. (1995), Incorporating the multinational enterprise into the theory of international trade, *Journal of Economic Perspectives*, 9.
- Markusen J. R., Konan D.E., Venables A. J. and Zhang K. H. (1996), *A Unified Treatment of Horizontal Direct Investments, vertical Direct Investments and the Pattern of Trade in Goods and Services*, Working paper 5696, Cambridge, National Bureau of Economic Research.
- Markusen J. and Venables A. (1998), Multinational firms and the new trade theory, *Journal of International Economics*, 46.
- Marshall A. (1896), *Principles of economics*, London, Macmillan.
- Mason C M (1980) Intra-urban plant relocation: a case study of greater Manchester. *Regional Studies* 14: 267-283.
- Micucci G. (2003), L'utilizzo e l'outsourcing dei servizi alle imprese nei distretti industriali, *Rivista di Politica Economica*, n. 3-4.
- Mori A. and V. Rolli (1998), Investimenti diretti all'estero e commercio: complementi o sostituti?, Banca d'Italia, *Temi di Discussione del Servizio Studi*, n. 337.
- Mundell R. (1957), International trade and factor mobility, *American Economic Review*, 47, pp.321-335.
- Omiccioli M. and Signorini L.F. (2002), L'efficienza dei distretti industriali: una risposta, *Economia e società regionale*, n. 1-2.
- Onida F. (2001), IDE: su cosa fare ricerca?, *Economia e Politica industriale*, n. 111.
- Onida F. (2003), Investimenti diretti esteri ed esportazioni: complementi o sostituti?, in Banca d'Italia – Università degli Studi di Roma La Sapienza, *Il commercio con l'estero e la collocazione internazionale dell'economia italiana*, Roma.
- Pennings E. and Sleuwaegen L. (2000), International relocation: firm and industry determinants, *Economics Letters*, n. 67.
- Pyke F., Becattini G. and Sengerberger W. (1990), Eds, *Industrial districts and inter-firm co-operation in Italy*, Geneva, International Institute for Labour Studies.
- Piore M. and Sabel C. (1984), *The second industrial divide*, Basic Book, New York.
- Reyneri E. (1996), *Sociologia del mercato del lavoro*, Il Mulino, Bologna.
- Putnam R (1993) *Making democracy work: civic traditions in modern Italy*. University Press, Princeton.
- Schiattarella R. (1999), La delocalizzazione internazionale: problemi di definizione e di misurazione, *Economia e Politica Industriale*, n.103.
- Signorini L. F. (2000), Eds., *Lo sviluppo locale*, Meridiana Libri, Corigliano Calabro (CS).
- Tattara G. (2001), L'efficienza dei distretti industriali: una ricerca condotta dal Servizio Studi della Banca d'Italia, *Economia e società regionale*, n. 4.
- Venables A. (1999), Fragmentation and multinational production, *European Economic Review*, n.43.
- Viesti G. (2002), *I vicini sono tornati. Italia, Adriatico, Balcani*, Laterza, Bari.

Sforzi F. (1989), The geography of industrial districts in Italy, Goodman E., Bamford J., Saynor P. (Eds.), Small firms and industrial districts in Italy, Routledge, London, pp. 153-173.

Tables

Table 2: Characteristics of the sample of analysis

	Number of firms	Number of workers (1)	Average jobs (1)	Export share on the total turnover	Jobs in foreign establishments out of total (2)	Non-EU workers* out of total (1)	Share of goods and services purchases in subcontracting		Share of goods and services sales in subcontracting	
								of which: from abroad		of which: from abroad
Geographical Areas										
North	251	9.678	39	46,5	5,7	3,8	50,3	3,0	37,8	12,7
Centre	251	7.536	30	36,9	5,5	5,0	34,0	3,7	25,1	6,3
South	204	8.762	43	61,1	1,7	0,1	39,4	7,1	10,7	0,4
Size classes										
1-9	145	854	6	43,4	-	2,1	60,2	1,5	31,2	6,9
10-19	178	2.440	14	41,3	-	2,4	42,4	1,5	34,4	10,8
20-49	242	6.732	28	47,7	-	2,8	40,4	3,1	33,5	9,7
50-99	66	4.292	65	50,3	-	2,9	39,6	0,3	26,9	5,9
100 or larger	75	11.658	155	49,6	6,9	3,1	37,9	7,5	15,9	5,0
Sectors										
Tanning, leather and footwear	180	6.384	35	55,0	2,1	4,0	32,6	4,4	20,9	5,8
Clothing and textile	228	8.178	36	25,8	4,7	2,1	39,5	2,9	28,6	4,7
Mechanical industry	107	4.312	40	37,7	6,4	3,3	35,1	1,5	50,9	13,7
Furnitures	191	7.102	37	60,9	3,4	2,5	50,1	6,7	15,4	5,8
Total	706	25.976	37	48,2	4,1	2,8	41,2	4,7	25,1	6,8

Source: Bank of Italy Survey on the IDs. Data referring to 1997.

* Immigrants from a country outside the European Community. (1) Employees of the establishments located in Italy - (2) The total refers to all establishments belonging to the firm or to the business group, even if located abroad.

Table 3: Characteristics of the sample of analysis (bis)

Industrial Districts	Number of frims	Number of jobs (1)	Average jobs (1)	Export share out of total turnover	Jobs in the foreign establishments out of total (2)	Non-EU workers out of total (1)	Share of goods and services purchases in subcontracting		Share of goods and services sales in subcontracting	
								of which: from abroad		of which: from abroad
<i>North</i>										
Udine	61	1.907	31	68,8	14,4	2,9	69,4	4,1	30,5	17,8
Thiene	46	2.837	62	37,1	-	4,9	32,8	0,7	21,3	7,3
Pieve di Cadore	47	1.227	26	46,5	-	2,9	56,2	0,7	42,9	4,4
Reggio Emilia	60	3.085	51	35,7	10,1	3,4	30,7	1,7	52,8	15,8
Carpi	37	622	17	27,2	-	1,9	60,7	9,3	39,5	7,2
<i>Centre</i>										
S. Croce sull'Arno	55	927	17	38,0	-	4,3	28,3	2,1	42,1	16,7
Poggibonsi	52	942	18	35,0	-	2,8	28,8	0,1	20,0	6,8
Civitanova Marche	44	2.574	59	48,8	-	8,4	25,4	8,4	21,8	3,7
Pesaro	51	1.745	34	27,0	-	5,3	47,6	0,3	14,5	1,0
Ascoli Piceno	49	1.348	28	20,2	19,8	0,3	57,5	7,3	24,8	0,0
<i>South</i>										
Teramo	50	2.431	49	5,2	4,3	0,2	15,5	0,4	44,0	1,9
Barletta	42	1.858	44	68,8	-	-	28,2	5,6	6,6	0,0
Martina Franca	42	903	22	25,2	-	0,2	32,4	0,0	18,5	2,3
Altamura-Matera	27	2.508	93	76,5	-	-	43,2	11,8	2,9	0,0
Solofra	43	1.062	25	74,0	-	0,1	55,2	0,0	3,6	0,0
Total	706	25.976	37	48,2	4,1	2,8	41,2	4,7	25,1	6,8

Source: Bank of Italy Survey on the IDs. Data referring to 1997.

(1) Employees in the establishments located in Italy

Table 4: Internationalisation strategies of the district SMEs (%)

- Internationalisation type	North		Centre		South		Total	
	Yes	No	Yes	No	Yes	No	Yes	No
Employing immigrants (A)	33,1	66,9	23,1	76,9	2,0	98,0	20,5	79,5
International Subcontracting (B)	20,3	79,7	6,0	94,0	7,4	92,7	11,5	88,5
Esporting (C)	78,9	21,1	65,7	34,3	59,3	40,7	68,6	31,4
FDIs (D)	2,4	97,6	2,0	98,0	1,0	99,0	1,8	98,2
A+B	6,4	93,6	1,6	98,4	-	100,0	2,8	97,2
A+C	25,1	74,9	15,9	84,1	1,0	99,0	14,9	85,1
A+D	0,8	99,2	0,4	99,6	-	100,0	0,4	99,6
B+C	18,7	81,3	5,6	94,4	6,9	93,1	10,6	89,4
B+D	1,2	98,8	0,4	99,6	-	100,0	0,6	99,4
C+D	2,0	98,0	0,8	99,2	0,5	99,5	1,1	98,9
A+B+C	6,0	94,0	1,2	98,8	-	100,0	2,5	97,5
A+B+D	0,4	99,6	-	100,0	-	100,0	0,1	99,9
A+C+D	0,8	99,2	-	100,0	-	100,0	0,3	99,7
B+C+D	1,2	98,8	0,4	99,6	-	100,0	0,6	99,4
A+B+C+D	0,4	99,6	-	100,0	-	100,0	0,1	99,9

Source: Bank of Italy Survey on the IDs. Data referring to 1997.

Table 5: District SMEs that acquire and sell in subcontracting

	Firms that acquire in subcontracting		Firms that sell in subcontracting	
	n° firms	out of total	n° firms	out of total
From and towards the district	492	69,7	279	39,5
From and towards the rest of Italy	259	36,7	261	37,0
From and towards foreign countries	81	11,5	135	19,1
Total (1)	546	77,3	399	56,5

Source: Bank of Italy Survey on the IDs. (1) the Total refers to all firms acquiring or selling in subcontracting. A firm can adopt one or more outsourcing ways at the same time.

Table 6: Logit model - Likelihood ratio index

	Without dummy area	Without size	Without dummy sector	Without demand variables	Without intangible assets	Without employment rate	Total
Likelihood ratio Chi-Square	73,2	78,0	82,4	81,9	81,3	90,0	90,0
Akaike criterion	430,5	425,8	417,3	422,6	420,7	413,7	415,7
<i>Number of parametres</i>	<i>15</i>	<i>15</i>	<i>13</i>	<i>13</i>	<i>13</i>	<i>15</i>	<i>16</i>
Likelihood ratio index	0,155	0,165	0,174	0,171	0,171	0,190	0,190

Source: Bank of Italy Survey on the IDs

Table 7: Logit model with International subcontracting as dependent variable

Independent Variables and Estimates	Estimated Value	Marginal effect
Intercept	-3,400 *	-
North	1,844 ***	0,144
Textile and clothing	-1,070 **	-0,054
Mechanical industry	-0,859	-
Furniture	-1,241 ***	-0,058
Firm size	0,514 ***	0,037
Firm age	-0,374 **	-0,018
Amount of regular customers' turnover	-0,233	-
Sale of goods in subcontracting	0,186	-
Share of the first three customers' turnover	-1,898 ***	-0,001
Production of consumer goods	0,611 *	0,034
Use of planning and design services	1,082 *	0,050
Use of advertising and marketing services	-0,124	-
Share of non-EU workers out of total	-3,352	-
Export propensity	0,745	-
Employment rate in the reference LLS	-0,131	-
Likelihood ratio index (LRI)	0,190	
Likelihood ratio Chi-Square	90,044 ***	
Number of observations	653	
of which: firms delocalising	77	
<i>firms not delocalising</i>	576	

Source: Elaboration on the Bank of Italy Survey on the IDs. * = significant at 10%; ** = significant at 5%; *** = significant at 1%.

Table 8: Tobit model with International subcontracting as dependent variable

Independent Variables and Estimates	Estimated value	Marginal effect
Intercept	-0,644 **	-
North	0,253 ***	0,156
Textile and clothing	-0,199 **	-0,081
Mechanical industry	-0,160 *	-0,073
Furnitures	-0,224 ***	-0,093
Firm size	0,084 ***	0,053
Firm age	-0,062 **	-0,017
Amount of the turnover of the regular customers	-0,015	-
Sale of goods in subcontracting	0,049	-
Share of the turnover of the first three customers	-0,286 ***	-0,093
Production of consumer goods	0,124 **	0,073
Use of planning and design services	0,229 ***	0,171
Use of advertising and marketing services	-0,042	-
Share of non-EU workers out of total	-0,586	-
Export propensity	0,022	-
Employment rate in the reference LLS	0,187	-
Scale (σ)	0,279	-
Log Likelihood	-116,929	
Number of observations	609	
of which: <i>left censored</i>	537	

Source: Elaboration on the Bank of Italy Survey on the IDs. * = significant at 10%; ** = significant at 5%; *** = significant at 1%.
The marginal effect is only reported for the variables significant at least at 10%.

Table 9: Logit model - Likelihood ratio index (bis)

	Without dummy area	Without size	Without dummy sector	Without demand variables	Without intangible assets	Without employment rate	Total
Likelihood ratio Chi-Square	165,6	144,3	138,9	169,2	157,3	134,7	171,6
Akaike criterion	536,4	558,6	559,0	548,3	552,9	567,2	532,3
<i>Number of parametres</i>	<i>15</i>	<i>15</i>	<i>13</i>	<i>13</i>	<i>13</i>	<i>15</i>	<i>16</i>
Likelihood ratio index	0,246	0,214	0,207	0,245	0,230	0,201	0,255

Source: Elaboration on the Bank of Italy Survey on the IDs.

Table 10: Logit model with non-EU workers employment as dependent variable

Independent Variables and Estimates	Logit 1		Logit 2	
	Estimated value	Marginal effect	Estimated value	Marginal effect
Intercept	-16,849 ***	-	-18,519 ***	-
North	0,866 **	0,098	0,933 **	0,104
Leather and footwear	1,896 ***	0,274	1,800 ***	0,251
Mechanical industry	0,417	-	0,431	-
Furnitures	1,982 ***	0,285	1,967 ***	0,277
Firm size	0,670 ***	0,088	0,568 ***	0,070
Firm age	0,149	-	0,308 *	0,034
Amount of the turnover of the regular customers	-0,406	-	-0,945 *	-0,001
Sale of goods in subcontracting	0,596 **	0,059	0,806 **	0,078
Share of the turnover of the first three customers	0,752	-	0,860	-
Production of consumer goods	-1,095 ***	-0,120	-1,858 ***	-0,090
Use of planning and design services	-0,504 *	-0,057	-0,292	-
Use of advertising and marketing services	0,356	-	0,137	-
Share of purchases in subcontracting	-0,540	-	-0,716 *	-0,001
Export propensity	0,271	-	0,220	-
Employment rate in the reference LLS	25,338 ***	0,028	28,061 ***	0,031
Firm wage differentials	-	-	0,966 **	0,001
Likelihood ratio index (LRI)	0,255		0,287	
Likelihood ratio Chi-Square	171,615 ***		152,791 ***	
Number of observations	661		502	
of which: <i>firms employing non-EU workers</i>	136		112	
firms that do not employ non-EU workers	525		390	

Source: Elaboration on the Bank of Italy Survey on the IDs. * = significant at 10%; ** = significant at 5%; *** = significant at 1%.
The marginal effect is only reported for the variables significant at least at 10%.

Table 11: Tobit model with non-EU workers employment as dependent variable

Independent Variables and Estimates	Estimated value	Marginal effect
Intercept	-1,644 ***	-
Nord	0,064 *	0,037
Leather and footwear	0,147 ***	0,088
Mechanical industry	0,017	-
Furnitures	0,185 ***	0,114
Firm size	0,034 **	0,022
Firm age	0,018	-
Amount of the turnover of the regular customers	-0,101 **	-0,035
Sale of goods in subcontracting	0,054 *	0,030
Share of the turnover of the first three customers	0,066	-
Production of consumer goods	-0,100 ***	-0,037
Use of planning and design services	-0,044	-
Use of advertising and marketing services	0,020	-
Share of purchases in subcontracting	-0,062	-0,029
Export propensity	0,018	-
Employment rate in the reference LLS	2,760 ***	2,760
Firm wage differentials	0,079 *	0,048
Scale (σ)	0,176	-
Log Likelihood	-69,093	
Number of observations	498	
of which: <i>left censored</i>	112	

Source: Elaboration on the Bank of Italy Survey on the IDs. * = significant at 10%; ** = significant at 5%; *** = significant at 1%.
The marginal effect is only reported for the variables significant at least at 10%.

Table 12: Frequencies of complementarity or replaceability of the international strategies

	Firms employing non-EU workers		Firms that do not employ non-EU workers		Total
Firms delocalising	$n_{1,1}$	20 0,028	$n_{1,2}$	61 0,087	81 0,115
Firms not delocalising	$n_{2,1}$	125 0,177	$n_{2,1}$	500 0,708	625 0,885
Total		145 0,205		561 0,795	706 1,000
		value		95% Confidence limits	
Case control value (odds ratio)		1,31		0,76	2,25