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Industrial Districts, Inter-firm networks and Internationalisation. Evidence from Italy

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Introduction

This thesis is composed of three chapters developed within international business, industrial districts and network theories. The debate on internationalisation and location of manufacturing activities has been widely analysed in the literature, however I think there is still room for improvement by adapting the general scenario to the specific context of industrial districts or networks as well. Furthermore, firms should be considered not just as single entities isolated from the local context, but regional and local factors could influence their behaviours and their profitability. For these reasons, it is important to take into consideration the surrounding environment where social capital and value creation through innovation might impact firm's performances (domestically and internationally). The framework of industrial districts and local characteristics is commonly recognised as a key feature of the Italian scenario, where small and medium size firms are closely located and can take the advantages of sectoral specialisation to foster productivity and knowledge spillovers. After revising the literature on these themes, the Thesis aims to deeper investigate the link between the location of manufacturing activities at the national and global scale and its effects over firm's performances, empirically testing this relation for industrial district firms and networks in Italy.

The first chapter is titled “Does it pay to be international? Evidence from industrial district firms”. This chapter is co-authored with Marco Bettiol, Maria Chiarvesio (University of Udine), and Eleonora Di Maria. In this study, we investigate how location of manufacturing activities is a relevant phenomenon in the debate on offshoring and backshoring. On one side, following the smile curve of value creation proposed by Mudambi, many small and medium enterprises (SMEs) in industrial districts (ID)—local manufacturing systems where innovation and production are tightly coupled—invest in offshoring strategies, transforming local supply chains. On the other side, current research on backshoring highlights the relevance of domestic

control of manufacturing for firm competitiveness. This chapter explores ID firms' location choices of manufacturing activities in a sample of 259 Italian ID firms with international or only domestic production activities. The results show that the international production of components and high-quality goods is not associated with higher profitability for firms (as measured by return on assets), while it could be a profitable strategy for low-quality goods.

The second chapter is titled "Regional determinants and social capital: what boost export intensity? Evidence from Italy and Spain", and is joint work with Luis Martínez-Cháfer and Francesc Xavier Molina-Morales (Universitat Jaume I). This study, developed during my visiting period at the University Jaume I (Castellón, Spain), analyses the impact of social capital and innovation intensity on firms' export intensity. We consider simultaneously firm's level and province level variables, for 342 industrial district firms located in Italy and Spain. Using a generalized linear model and multilevel model, with a logit transformation, our empirical analysis shows the positive impact of social capital and innovation intensity (at firm level) and the importance of Marshallian externalities and trade openness (at province level) over the propensity for firms to export. These results, carried out with two-levels econometric technique, highlight that the more a firm is able to create relationships with the surrounding environment, the more it acquires knowledge to reach foreign markets. Moreover, consolidate the importance of Marshallian externalities for closely located firms facing the international markets.

The third chapter is single-authored, and is titled "Inter-firm network and firm performance: the case of Italy". Starting from the literature on hybrids firms, which can be defined as a form of alliances or networks, this chapter aims to understand which is the relationship between inter-firm networks and firm performances. The empirical analysis, conducted over a sample of Italian IFN, is divided in two parts: firstly, applying a "difference-in-difference" technique, is analysed the impact over firm's performance of being a member of an inter-firm network. Secondly, with cross-section analysis, is measured the different effect of

inter-firm network's determinants over firm's profitability and growth. Both the analyses are carried out using the Chamber of Commerce database on inter-firm network agreements and the financial and structural information are extracted from the AIDA Bureau van Dijk database. Results demonstrate that belonging to an inter-firm network has a positive impact on firms' economic growth. Moreover, industry heterogeneity of member and internationalisation scope (rather than innovation) turn out to be the key features of these networks.

Within the three chapters, this Thesis hope to enrich the existent literature by evaluating how factors associated with industrial districts and regional characteristics are determinant for firm's economic performances both nationally and abroad. In particular, I would like to highlight three main results. First, the relevance of the district dimension within the debate on offshoring and back-shoring phenomena in advanced countries. Secondly, the positive impact of social capital and innovation over firm's internationalisation process (explored at a multiscale level of analysis). Finally, the positive effects of a different network, i.e. the inter-firm network, as an alternative for of firms' organization beyond the boundaries imposed by the geographical proximity of industrial district firms.

Introduzione

Questa tesi è composta da tre saggi focalizzati principalmente sui temi di Internazionalizzazione, Distretti Industriali e Reti di Imprese.

Il dibattito sull'internazionalizzazione e la localizzazione delle attività manifatturiere è stato scrupolosamente approfondito dalla letteratura, ma risultano di interesse, sia a livello teorico che empirico, studi relativi all'adattamento della teoria generale al contesto specifico dei distretti industriali e delle alleanze tra imprese. Le imprese non devono essere considerate solamente come strutture atomistiche isolate dall'ambiente circostante. Caratteristiche regionali e locali possono interessare il loro comportamento e la loro profittabilità. Per questo motivo, è importante considerare anche alcuni fattori a livello locale come il capitale sociale e la creazione di valore (attraverso l'innovazione) e il loro impatto sulla performance di impresa, sia sul mercato domestico che internazionale.

I distretti industriali, così come alleanze e gruppi di impresa, sono riconosciuti su scala internazionale quali peculiarità del panorama economico Italiano, dove piccole e medie imprese condividono lo stesso territorio e specializzazione industriale. Alla prossimità geografica e settoriale sono a loro volta legati l'aumento della produttività di impresa e una più rapida diffusione della conoscenza.

Dopo aver approfondito la letteratura relativa ai temi appena riportati, l'obiettivo che questa Tesi si pone è di investigare la connessione tra la localizzazione delle attività manifatturiere sia a livello locale che globale, cogliendo l'impatto di questa sulla performance aziendale delle imprese dei distretti industriali e di quelle aderenti ai contratti di rete.

Il primo capitolo, si intitola "Quanto paga essere internazionali? La localizzazione delle attività manifatturiere dei distretti industriali nella catena globale del valore" ed è co-autorato con Eleonora Di Maria, Marco Bettiol, e Maria Chiarvesio. In questo articolo, viene investigata

l'importanza della localizzazione della attività manifatturiere all'interno del dibattito di delocalizzazione e ri-localizzazione di queste attività. Da un lato, seguendo la curva del valore proposta da Mudambi (2008), le imprese medio piccole nei distretti industriali, definiti come sistemi locali in cui l'innovazione e la produzione manifatturiera sono strettamente collegati, investono in strategie di delocalizzazione della catena del valore, mutando così la composizione delle catene a livello locale. Dall'altro lato, la letteratura sulle pratiche di ri-localizzazione, enfatizza invece la rilevanza del controllo domestico dei processi manifatturieri, al fine di aumentare la competitività delle imprese. Questo capitolo analizza le scelte di localizzazione delle attività manifatturiere per un campione di 259 imprese distrettuali italiane caratterizzate da produzione sia a livello nazionale che internazionale. I risultati dimostrano che la produzione internazionale di componenti e di prodotti di alta qualità non è correlata con una più alta profittabilità delle imprese, al contrario i prodotti di medio bassa qualità sembrano beneficiare dell'apertura produttiva a livello globale.

Il secondo capitolo, intitolato "Determinanti regionali e capitale sociale: cosa incoraggia l'intensità di esportazione? Evidenza dall'Italia e Spagna" è co-autorato con Francesc Xavier Molina-Morales e Luis Martínez-Cháfer, ed è stato sviluppato durante il mio periodo di studio all'estero, presso l'Università Jaume I (Castellon, Spagna). Questo studio analizza l'impatto del capitale sociale e dell'innovazione sulla capacità di esportazione delle imprese. Vengono considerate contemporaneamente sia variabili a livello di impresa che a livello regionale, per 342 imprese dei distretti industriali Italiani e in Spagnoli. La parte empirica si avvale dell'uso di un modello lineare generalizzato multilivello, con trasformazione logistica; i risultati dimostrano un impatto positivo a livello di impresa sia del capitale sociale che dell'innovazione sulla propensione all'esportare. Inoltre viene dimostrata l'importanza delle esternalità di tipo Marshalliano e dell'apertura commerciale a livello regionale. Questi risultati, rafforzati dall'analisi condotta a due livelli (tra impresa e regione), enfatizzano l'importanza per le

imprese di costituire relazioni con l'ambiente circostante, e come questo tipo di relazioni facilitino la creazione di conoscenza necessaria alle imprese per espandersi nel mercato estero. Inoltre, viene rafforzata l'importanza delle esternalità di agglomerazione, derivante dalla vicinanza con altre imprese, come uno tra i fattori chiave per affrontare le sfide della concorrenza internazionale.

Il terzo capitolo, "Impatto sulla performance e determinanti del contratto di rete: il caso dell'Italia", è a firma singola. Partendo dalla letteratura sulle cosiddette imprese ibride, definite come una forma di alleanza strategica o rete, questo capitolo si pone come obiettivo quello di approfondire la relazione tra reti di imprese e performance aziendale. Infatti, la letteratura esistente su questo tema, ha approfonditamente studiato il rapporto tra meccanismi di cooperazione, innovazione e crescita economica. La parte empirica, che si sviluppa su un campione di imprese italiane aderenti al Contratto di Rete, è suddivisa in due parti: nella prima analisi, attraverso l'uso del modello "difference-in-difference", viene testato l'impatto del contratto di rete per quelle imprese che decidono di aderirvi. Nella seconda parte, il focus si sposta sulle determinanti della rete che impattano in modo positivo sulla performance delle imprese, in particolare per quelle che hanno aderito al contratto nell'anno 2103. Entrambe le analisi sono state sviluppate partendo dai dati forniti dalla Camera di Commercio Italiana, uniti ai dati sulle performance finanziarie e sulle caratteristiche di impresa messi a disposizione dal database AIDA-Analisi Informatizzata delle Aziende Italiane. L'analisi empirica conferma l'impatto positivo del contratto di rete nel promuovere l'associazione tra imprese, enfatizzando l'importanza di questo strumento su cui le politiche di sviluppo locale dovrebbero investire per stimolare la crescita delle imprese italiane.

Questa Tesi spera di contribuire alla letteratura esistente nel dimostrare come fattori associati ai distretti industriali e alle caratteristiche regionali siano importanti per la crescita economica delle imprese, sia sul mercato nazionale che internazionale. Si evidenziano di

seguito i tre maggiori risultati: la rilevanza della dimensione distrettuale all'interno del dibattito tra off-shoring e back-shoring nelle economie avanzate; l'impatto positivo del capitale sociale e dell'innovazione come fattori di spinta nel raggiungimento dei mercati esteri (esplorato con un'analisi multilivello); infine, l'effetto positivo di un nuovo strumento di aggregazione tra imprese, quale il Contratto di Rete, come alternativa al modello distrettuale tradizionale.

**Does it pay to be international?
Evidence from industrial district firms.***

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Abstract: In the debate on offshoring, the smile curve emphasises the limited value of manufacturing compared to service-based activities. Many small and medium enterprises (SMEs) in industrial districts (ID)—local manufacturing systems where innovation and production are tightly coupled—also invest in offshoring strategies, transforming local supply chains. Current research on backshoring highlights the relevance of domestic control of manufacturing for firm competitiveness. This paper explores ID firms' location choices of manufacturing activities in a sample of 259 Italian ID firms with international or only domestic production activities. The results show that the international production of components and high-quality goods is not associated with higher profitability for firms (as measured by return on assets), while it could be a profitable strategy for low-quality goods.

Keywords: backshoring, manufacturing, global value chains, competitiveness, performance, industrial districts

JEL classification: F23, L6, R12

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1.1 Introduction

Many authors have entered the debate on internationalisation processes of manufacturing activities from various perspectives in recent years (Bausch & Krist 2007; Dunning 1979; Kotabe & Mudambi 2009; Tate, Ellram, Schoenherr and Petersen 2014). Scholars stress the need for firms to compete in global markets to reduce costs (the efficiency perspective), gain access to knowledge (explorative strategies) and develop new foreign markets (exploitation paths) (Contractor, Kumar, Kundu & Pedersen 2010; Hätönen 2009). Within the theoretical debate on offshoring, a new strand of literature concerns back-shoring or reshoring trends (Bailey & De Propris 2014; Bals, Daum & Tate 2015). Despite the benefits of productive internationalisation, being multinational also offers firms the advantage of returning to their domestic markets and fostering a presence in their home countries (Arlbjørn & Mikkelsen, 2014; Kinkel & Maloca, 2009). For many reasons, back-shoring is usually linked to more effective management of innovation processes due to the co-location of research and development (R&D) and production; to the need for more efficient customer relationship management and speedier reactions to market requests; and to exploitation of country-of-origin effects (Fratocchi et al. 2016)

This framework bears asking if it really pays to be international amid the emerging re-definition of location choices concerning manufacturing activities. This topic is analysed by approaching firms in industrial districts (IDs) as local manufacturing systems, which is a specific model of organisation of economic activity (Becattini, Bellandi, & De Propris, 2009; Belussi, 2015). On the one hand, large multinational enterprises (MNE) exploited IDs as new forms of local development in developing and emerging countries (Bellandi & Lombardi, 2012) or as manufacturing platforms to benefit from cheap labour costs and manufacturing specialisation (Bair & Gereffi, 2001; Corredoira & McDermott, 2014). On the other hand, following MNEs' internationalisation strategies, small and medium-sized enterprises (SME) from IDs of advanced countries have progressively offshored production processes in recent

years due to saturation in their home markets and to pursue cost saving strategies (Chiarvesio, Di Maria, & Micelli, 2010). This also had implications for the local configuration of supply chains (Camuffo & Grandinetti, 2011) and the governance of global value chains (Crestanello & Tattara, 2011).

The aim of the paper is to understand the relationship between firm performance and the location of manufacturing activities. In the context of back-shoring and manufacturing revamp, assumptions that led to the internationalisation of manufacturing activities may be reconsidered, and local production could be a competitive resource with positive impacts on firm performance (De Treville, Ketokivi & Singhal 2017). To address this research question, this study analyses the performance of ID firms that have internationalised manufacturing production and those that produce domestically.

1.2 Theoretical framework

1.2.1 Offshoring, manufacturing, and organisation of the value chain

Firms' offshoring decisions have received increasing attention over the years and are the subject of analysis from multiple perspectives. The literature on Foreign Direct Investments (FDIs) considers the motivation for and the impact of those investments on firms' internationalisation strategies. Regarding motivation, the eclectic paradigm identifies three main internationalisation processes: cost-driven (focusing on efficiency), resource-based and market-seeking internationalisation (Dunning, 1979). Other studies stress the knowledge implications of the internationalisation process, exploring the opportunities for the firm to gather new knowledge from different locations and to organise knowledge flows in different contexts within its organisational borders (headquarters–subsidiaries) (Cantwell, 2004) and with suppliers (Peter Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007).

Recent studies on offshoring describe the dynamic scenario the firm faces when organising its value chain activities at the international level. According to Contractor et al. (2010), offshoring and outsourcing decisions are interconnected: the firm structures its internationalisation process while viewing the value chain from a fine-grained perspective, in other words, taking into account single activities rather than aggregated functions (i.e. operations). Additionally, offshoring and specifically, outsourcing decisions attract great attention due to their increasing relevance to firms, especially in the context of efficiency-driven opportunities related to low-cost countries (Kusaba, Moser, & Rodrigues, 2011).

In the literature on upstream internationalisation based on the global value chain approach, Mudambi's (2008) simple but very powerful Smile model has become a popular reference. Mudambi (2008) proposes the Smile curve of value creation to investigate the location strategies of value chain activities and to explain the rationale for offshore manufacturing, especially in developing countries and emerging economies. The increased offshoring by MNEs in low-cost countries that characterises the globalisation process and gives rise to new forms of governance of global value chains (Contractor et al., 2010; Gereffi, Humphrey, & Sturgeon, 2005) is captured by the growing international trade flows between advanced and emerging countries and by the growing total number of FDIs made by Western companies (UNCTAD 2016). This relocation trend, however, has not only reduced the scale of manufacturing firms and the number of employees in manufacturing but has also weakened the national and local competencies and the industrial commons of advanced countries (Pisano & Shih 2009).

There is no general consensus on how the firm can disaggregate its value chains and determine the location of its component production while maintaining its competitive advantage over time (Contractor et al. 2010). There is no best way to structure the value chain at the global level (Mudambi & Venzin 2010) due to the firm's resources, the risks and the

uncertainty of the location choice (transaction costs) and the knowledge management implications.

Recently, scholars stress the advantages of controlling manufacturing processes through insourcing decisions and through co-location of R&D and manufacturing, benefiting from geographical (and cognitive) proximity (Alcácer & Delgado 2013; Buciuni & Finotto 2016). Studies on back-shoring emphasise the multiple drivers pushing Western firms to relocate their manufacturing activities closer to or within their domestic countries: costs, quality, time, flexibility, skills, knowledge, risks, market (i.e. the made-in effect) and other factors (Fratocchi et al. 2016; Stentoft, Olhager, Heikkilä, & Thoms 2016). Some companies are not satisfied by earlier offshoring decisions (Bals et al., 2015; Lewin & Volberda, 2011) due to the quality and performance of suppliers and due to various competitive reactions. Similarly, the value of manufacturing may be linked to the tacit knowledge and inimitable, locally based capabilities (i.e. craftsmanship in IDs) that push firms to locate where such manufacturing competencies are available (Bettiol & Micelli 2014). Market-driven motivations are also crucial. For instance, in the case of country-of-origin effect, a growing number of consumers explicitly compare the countries of design and production (Hamzaoui & Merunka 2006; Moradlou & Backhouse 2016).

These research streams and the ongoing debate on the future of manufacturing, particularly in the context of advanced countries (De Treville et al., 2017), open new perspectives on the relationship between manufacturing internationalisation and firm performance. Relocation of manufacturing activities in advanced countries, especially in home countries, is emerging as a viable, competitive solution for firms (Ketokivi, Turkulainen, Seppälä, Rouvinen, & Ali-Yrkkö, 2017), in addition to or in substitution of offshoring in low-cost countries, which were the principal offshoring sites in recent decades (Cattaneo, Gereffi, & Staritz, 2010; Feenstra, 1998). In this scenario, further knowledge is needed to better

understand how the organisation of manufacturing activities between the local and the global is linked to firm performance.

1.2.2 Local and global location strategies of industrial district firms

The development of this debate is especially interesting from the perspective of firms in IDs. IDs are characterised by high levels of manufacturing specialisation by SMEs operating in selected industries. In selected and well-limited geographical areas, geographical proximity creates positive agglomeration externalities, such as knowledge spillover and labour market pooling (Becattini et al., 2009). ID firms benefit from agglomeration economies to manage their manufacturing processes.

Since the 1990s, many IDs have undertaken downstream and upstream internationalisation (Becchetti, De Panizza, & Oropallo, 2007; Camuffo & Grandinetti, 2011; Chiarvesio et al., 2010; Pla-Barber & Puig, 2009). The internationalisation of manufacturing activities through the offshoring strategies of leading ID firms in advanced countries modifies the internal structure of IDs as local manufacturing systems, affecting the organisation of the local supply chain *vis-à-vis* the global supply chain (Corò & Grandinetti, 1999; De Marchi & Grandinetti, 2014). In this scenario, the ID firm's location of manufacturing activities within the district is not taken for granted but results from a strategic process in which the firm's strategic orientation influences the steps of the value chains located within the ID (and domestically) or internationally, as well as the related form of governance (Brancati, Brancati, & Maresca, 2017; Chiarvesio, Di Maria, & Micelli, 2013). On the one hand, ID firms can benefit from new knowledge related to international processes about innovation opportunities linked to foreign sources (Belussi & Sedita, 2009; Morrison, 2008). On the other hand, upstream internationalisation may weaken local innovation and manufacturing capabilities in

the case of progressive substitution of local and foreign suppliers (Camuffo & Grandinetti, 2011).

In this context, the aim of this study is to explore the link between ID firms' performance and location (domestic or international) of manufacturing activities. The main research question, therefore, is whether internationalisation of production pays off in performance, given the debate on the advantages and shortcomings of this strategy.

1.3 Data and methodology

This research focuses on eight IDs in north-eastern Italy (in the regions of Veneto and Friuli Venezia Giulia) specialising in the so-called made-in-Italy industries (furniture, mechanics and fashion): the Treviso, Pordenone and Manzano (Udine) furniture districts, the mechanics districts in Vicenza and Pordenone, the sports system in Montebelluna, the shoes district in Riviera del Brenta and the eyewear district in Belluno. These two regions have a high concentration of IDs, and the selected IDs represent important areas of specialisation in their industries and have strong relevance at both the national and international levels.

The firm population is extracted from Bureau van Dijk's AIDA database by selecting companies in the ID municipalities that perform the appropriate activities (according to the Italian Institute of Statistics' classification). The sample includes the firms in each district with a turnover of more than 1 million euros, yielding a final population of 1,002 firms. A survey was conducted between April and June 2016 by computer-assisted telephone interviewing of company operation managers, entrepreneurs or employees in charge of production management. The final number of respondents is 259 (25.8per cent response rate), with firms equally distributed among the three sectors and representative of the entire population: 33.2 per cent in the furniture industry, 36.3per cent in the mechanics industry and 30.5per cent in fashion (eyewear, sports system and shoes). The survey is divided into three parts: 1) general

information about the firm; 2) the organisation of the firm's production and the location of its suppliers and plants; 3) the firm's back-shoring processes and business relationships with emerging countries. The firms' balance sheets are extracted from the AIDA–Bureau van Dijk database to obtain data on how firms performed from 2011 to 2015.

An econometric model is developed using Ordinary Least Squares (OLS) regression models with robust standard errors. The dependent variable is the *return on assets* (ROA) in 2015 (as a robustness check, the mean of ROA for 2011–2015 is used, and the results do not vary). ROA is chosen instead of return on equity or 'Tobin's q' as it is used more frequently in internationalisation studies and is less sensitive to the firm's capital structure (Camisón & Villar-López 2010; Majocchi & Zucchella 2003; Miller, Lavie & Delios 2016).

The independent variables are a set of indicators related to the firm's organisation of production, geography (local vs. international) and overall strategy. The first variable considered is related to the level of the internalisation of the firm's activities. As a proxy for the firm's *vertical integration*, the number of activities performed inside the firm is used (without taking into account if the same activities are also outsourced to suppliers). Not all the activities of each district are considered; instead, a more fine-grained approach is adopted, splitting the value chain into four production activities (the same across industries): 1) production of components; 2) production of semi-finished goods; 3) production of high-quality products (i.e. luxury eyewear); and 4) production of low-quality products (i.e. cheap furniture). Vertical integration is represented by a continuous variable that takes the value of zero if the firm outsources all the activities considered, four if it performs all the activities internally, and one–three if the firm performs one to three of the activities (mix).

The same four activities can be performed either domestically or abroad (offshoring decision). This leads to the two sets of geography-related variables: the number of activities done domestically (*Domestic activities*) and the number done abroad (*Foreign activities*)

whether internally within the firm or externally through suppliers. To capture the degree of internationalisation, suppliers' location is also a variable. Four dummy variables consider the location of firm' suppliers: one dummy counts 1 if the firm has suppliers located in the ID (*District suppliers*) 0 otherwise; one dummy counts 1 if the firm has suppliers located in the same region as the ID (*Regional suppliers*) 0 otherwise; one dummy counts 1 if the firm has suppliers located in Italy (*Italian suppliers*) 0 otherwise and the last dummy counts 1 if the firm has suppliers located in other countries (*Foreign suppliers*). The four dummies are not mutually exclusive, in the way that the same firm could have more than one suppliers' location. Finally, we add an additional control dummy variable for *outsourcing* that takes the value of one, if the firm outsources at least one activity, and zero otherwise (Antonietti, 2016).

To mitigate potential omitted variable bias, a set of controls is added: the ratio of foreign sales to total sales (FSTS); four dummy variables for innovation (product, process, organisation and marketing); a dummy for firm investment in communication strategies; and firm age and size (number of employees). A set of dummy variables is also introduced to consider industry and province fixed effects. Table 1.1 shows the variables used in this study and provides details about the measures. Summary statistics and the correlation matrix are included in the Appendix.

[INSERT TABLE 1.1 ABOUT HERE]

1.4 Results

Before discussing the econometric analysis, the internationalisation strategies adopted by the firms are reviewed. The sample is representative of the typical structure of IDs: the firms are mostly SMEs, with an average turnover of 9.8 million euros and 44 employees on average in 2015. Despite the small firm size, as evidenced in Table 1.1 the export intensity is quite high,

with 46 per cent of turnover (on average) realised through foreign markets (FSTS). The firms obtain these results primarily by investing in product quality and innovation, the two most important drivers of competitive advantages identified by the respondents.

Turning to the organisation of production, outsourcing is a common practice: 84.6 per cent of the companies outsource at least some activities in the production process, and another four per cent outsources all production activities. Considering the geography of supplier relationships, 39.4 per cent of the companies have suppliers abroad. Regarding the overall supplier portfolio – in terms of location of suppliers taken 100% the total number of suppliers - 58.7 per cent of the suppliers are located in the ID, 18.6 per cent in the region of the ID, 13.3 per cent in Italy and 9.3 per cent abroad. The foreign suppliers are mostly located in the European Union (56.5 per cent of firms with foreign suppliers report that they are present there), Eastern Europe (47.5 per cent) and the Far East (40.3 per cent) In addition to foreign suppliers, approximately seven per cent of the firms also have productive FDI in Eastern Europe (50 per cent), the Far East (31.6 per cent), South America (21.1 per cent), the European Union (11.1 per cent), the United States and Canada (10.5 per cent)

When did these internationalisation strategies take place, and what are the future trends? Of the companies with international production, 41 per cent started global sourcing before 2000, and another 32.3 per cent decided on global sourcing between 2000 and 2007. Most FDIs, most were made after 2000. Internationalisation of production appears to be not only a persistent but also a quite stable trend: approximately 72 per cent of the firms have not modified their internationalisation organisation of their value chains in recent years, and only five companies operating in emerging countries have back-shored some activities. In fact, of the 59 companies, only 17 have considered back-shoring strategies for market reasons (e.g. to produce a 100 per cent made-in-Italy product or to improve customer service) or to overcome a lack of competence among suppliers. Most have not planned any such actions.

[INSERT TABLE 1.2 AND 1.3 ABOUT HERE]

The correlation matrix reported in Table 1.3 (and summary statistics reported in Table 1.2) shows relatively mild correlations among the variables used in the analysis, thus reassuring on possible multi-collinearity problems, while 1.4 presents the econometric relations between the location strategies and firm performance, controlling for a number of firm, location and industry characteristics.

[INSERT TABLE 1.4 ABOUT HERE]

Column 1 includes the variables related to the location of activities in the domestic market. In this specification, the index for vertical integration has a negative, statistically significant coefficient, in accordance with the literature on ID and supporting the effect of vertical disintegration on firm competitiveness. The coefficient associated with outsourcing is negative and highly statistically significant, and outsourcing of manufacturing activities is associated with approximately 6 per cent lower ROA. This result is quite counterintuitive and needs further analysis. It could indicate that outsourcing contributes to deteriorating performance, but it cannot be excluded that it may reflect a reverse causality so that less profitable firms self-select outsourcing. Future research should investigate these causal relations.

The variables for domestic suppliers and the dummies for domestic activities are not significant, but the impact of foreign suppliers is negative and statistically significant. Supplying part of production abroad increases the transaction and coordination cost the firm bears and can explain the negative link with performance among ID firms. However, as noted,

it is also possible that this result reflects self-selection. Concerning firms' characteristics, process innovation and communication investments are positive and highly significant, revealing their importance to firms' profitability. In column two of Table 1.4, the type of activities carried out abroad is controlled for. Also, for this specification, vertical integration is negative and highly significant, although the coefficients associated with outsourcing and the share of foreign suppliers become insignificant. This result is consistent with the idea that ID firms mostly carry out foreign operations through outsourcing contracts rather than internalisation. The international production of components and high-quality finished products seems to negatively affect firms' ROA.

More interesting are the results reported in column three, which includes all the variables and activities. Vertical integration consistently has a negative association with ROA, as in previous models. Some differences concerning foreign activities arise. The international production of components and high-quality finished products negatively affects ROA, as in the previous model, while international production of low-quality products is associated with an approximately seven per cent increase in firms' ROA. This result suggests that low-quality and cheap products are well suited to be located abroad, but this is not the case for products related to ID competencies and manufacturing specialisation, including made-in-Italy products.

1.5 Discussion and Conclusion

This paper contributes to the debate on offshoring and back-shoring by exploring how the location (at home or abroad) of different activities along the value chain affects the performance of SMEs from IDs in advanced countries. Studies on internationalisation processes document different paths and open new questions about the relationships between firm performance. In particular, a new research stream on back-shoring is enriching the debate on the gains for the firm to locate production activities abroad or to keep them in (bring them

back to) the home country. Recent policy measures in major developed economies support re-internalising and keeping production activities in the home country. This paper specifically investigates whether upstream internationalisation is rewarding for firms, especially for SMEs, in the context of Italian IDs.

The overview of ID firms' internationalisation strategies shows that, despite the emphasis on the opportunity to offshore production, the firms in this research, even leading firms, have never completely abandoned the local context. To the contrary, ID firms demonstrate the capability to balance cost savings with the search for manufacturing quality. Analysing how the process took place over time confirms that these firms seem to have achieved a balanced configuration of local and global production activities. Most companies did internationalise production in the past but have also invested in domestic manufacturing activities in the value chains. In most cases, firms have not changed this strategy over time; indeed, they have conducted limited back-shoring.

Given this picture, the aim of this research is to understand how these strategies are related to economic performance. More specifically, the objective is to explore the impact of the internationalisation of production on firm performance. The results show that the international production of components is not associated with higher profitability (as measured by ROA) from high-quality goods but could be a profitable strategy for low-quality goods. These results support a more complex approach to manufacturing and the location of production activities by overcoming the idea that manufacturing makes a limited contribution to value generation and involves mainly low-cost countries (the smile curve). These outcomes answer the recent calls for research to understand not only whether manufacturing matters but also, in which manufacturing advanced countries should specialise (De Treville et al., 2017). Moreover, from a managerial perspective, the analysis suggests that—at least in industries

related to made-in-Italy products—firms have to carefully consider offshoring strategies based on their market positioning and innovation strategy.

The results also contribute to the literature on IDs, showing that IDs have not disappeared over these years but instead demonstrate a high level of resilience, although not homogeneously and with different levels of performance (Belussi, 2015; Boschma, 2015). These results are in line with some evidence from more qualitative studies done by the authors (Bettiol, Chiarvesio, Di Maria and Micelli 2018, forthcoming) that show a trend towards increasing specialisation of manufacturing activities more related to quality than quantity. In particular, the present study investigates the relative importance of being located abroad, extending the work of Bettiol et al. (2018, forthcoming) with an in-depth analysis of the relationship between firm performance and the division of manufacturing activities between local and global locations.

The results are also relevant from a policy perspective: policy makers should evaluate how to sustain firms that maintain domestic production, often in addition to foreign production. Considering the strong impacts of economic crises on the global economy, politicians should develop tailored plans for firms that survive domestically, boosting their economic activities and preventing entire areas from facing new economic and employment shocks (Pike, Rodríguez-Pose & Tomaney 2017).

One limitation of this study is the focus on selected industries and regions. Further research should be aimed at better understanding whether the obtained results are driven by firms' geographic context, for example, whether other Italian IDs face the same circumstances. Moreover, it would be interesting to collect data from other non-ID firms to test whether the findings are consistent for firms that do not benefit from agglomerative forces and advantages. Finally, the empirical analysis could benefit from disentangling the selection effects on production offshoring from the causal effects of offshoring on firm performance. The analysis

could then focus on heterogeneous firm behaviour and look at the two tails of the distribution of firms. From a more qualitative perspective, this analysis could examine to what extent the best and the worst performers face international competition.

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Tables and figures

Table 1.1: Variable description

Variable	Measure	Type
<i>Dependent variable</i>		
ROA	Return on assets in 2015	Continuous
<i>Independent variables</i>		
Vertical Integration	Number of activities performed internally by the firm independent of their geographic location considering 4 activities: production of components, production of semi-finished products, production of high-quality finished products and production of low-quality finished products.	Continuous (0–4)
Outsourcing	1 if at least one activity is outsourced, zero otherwise	Dichotomous
<i>Foreign activities</i>	Activities performed <i>abroad</i> (both inside and outside the firm):	
F_components	- components	Dichotomous
F_Semi-finished	- semi-finished products	Dichotomous
F_HighQ	- high-quality finished products	Dichotomous
F_LowQ	- low-quality finished products	Dichotomous
<i>Domestic activities</i>	Activities performed <i>domestically</i> (both inside and outside the firm):	
D_components	- components	Dichotomous
D_Semi-finished	- semi-finished products	Dichotomous
D_HighQ	- high-quality finished products	Dichotomous
D_LowQ	- low-quality finished products	Dichotomous
District suppliers	1 if a firm has at least one district supplier, 0 otherwise.	Dichotomous
Regional suppliers	1 if a firm has at least one regional supplier, 0 otherwise.	Dichotomous
Italian suppliers	1 if a firm has at least one Italian supplier, otherwise.	Dichotomous
Foreign suppliers	1 if a firm has at least one foreign supplier, 0 otherwise.	Dichotomous
<i>Controls</i>		
FSTS	Foreign sales over total sales	Continuous (0–1)
Product innovation	Product or service innovations	Dichotomous
Process innovation	Innovation in logistics and distribution	Dichotomous
Organisational Innovation	Innovation in lean production and supply chain management	Dichotomous
Marketing innovation	Innovation in prices and packaging	Dichotomous
Communication investments	Investments in advertising, public relations and sponsorships	Dichotomous
Size	Firm size, measured as total number of employees	Continuous
Age	ln of firm age (2015–foundation year)	Continuous
District	8 dummies for belonging to each district under investigation	Dichotomous
Province	6 dummies for belonging to each province where the industrial district is located	Dichotomous

Table 1.2: Summary statistics

		Obs	Mean	S.D.	Min	Max
[1]	ROA15	253	4.91	9.60	-64.24	42.61
[2]	Vertical integration	258	2.45	1.03	0.00	4.00
[3]	Outsourcing	258	0.85	0.36	0.00	1.00
[4]	D_Components	258	0.90	0.29	0.00	1.00
[5]	D_Semi-finished	258	0.91	0.28	0.00	1.00
[6]	D_HighQ	258	0.93	0.26	0.00	1.00
[7]	D_LowQ	258	0.64	0.48	0.00	1.00
[8]	F_Components	258	0.15	0.36	0.00	1.00
[9]	F_Semi-finished	258	0.14	0.35	0.00	1.00
[10]	F_HighQ	258	0.03	0.18	0.00	1.00
[11]	F_LowQ	258	0.01	0.12	0.00	1.00
[12]	District suppliers	258	0.87	0.34	0.00	1.00
[13]	Regional suppliers	258	0.59	0.49	0.00	1.00
[14]	Italian suppliers	258	0.5	0.50	0.00	1.00
[15]	Foreign suppliers	258	0.39	0.49	0.00	1.00
[16]	FSTS	251	0.46	0.33	0.00	1.00
[17]	Product innovation	258	0.83	0.37	0.00	1.00
[18]	Process innovation	258	0.68	0.46	0.00	1.00
[19]	Organizational innovation	258	0.69	0.46	0.00	1.00
[20]	Marketing innovation	258	0.57	0.49	0.00	1.00
[21]	Communication investments	258	0.37	0.48	0.00	1.00
[22]	Size	254	49.63	115.76	3.00	1.54
[23]	Age	254	32.27	21.02	2.00	189.00

Table 1.3: Correlation matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	
[1]	1.00																							
[2]	-0.06	1.00																						
[3]	-0.08	-0.16	1.00																					
[4]	0.01	0.37	0.15	1.00																				
[5]	0.06	0.36	-0.01	0.46	1.00																			
[6]	0.04	0.32	0.29	0.46	0.39	1.00																		
[7]	-0.04	-0.01	0.25	0.29	0.29	0.19	1.00																	
[8]	-0.09	-0.17	0.18	-0.12	-0.14	-0.05	0.12	1.00																
[9]	-0.03	-0.21	0.17	-0.09	-0.08	-0.01	0.07	0.39	1.00															
[10]	-0.04	-0.12	0.08	-0.15	-0.16	-0.11	-0.03	0.21	0.29	1.00														
[11]	0.12	-0.02	-0.03	-0.17	-0.07	-0.08	-0.04	0.12	0.22	0.31	1.00													
[12]	-0.04	0.20	-0.17	0.29	0.25	0.07	0.15	-0.19	-0.01	-0.05	-0.04	1.00												
[13]	0.08	0.00	-0.36	-0.01	0.17	-0.03	0.05	0.07	0.04	0.03	0.04	-0.02	1.00											
[14]	0.03	0.01	-0.43	-0.12	0.08	-0.10	0.01	0.12	0.09	0.11	0.06	-0.09	0.58	1.00										
[15]	0.02	-0.05	-0.53	-0.19	-0.09	-0.19	-0.11	0.52	0.47	0.23	0.15	0.01	0.32	0.43	1.00									
[16]	0.05	-0.03	0.12	0.05	0.04	0.09	0.11	0.18	0.22	0.09	0.07	0.07	0.03	0.02	0.14	1.00								
[17]	-0.07	0.01	-0.01	0.06	-0.06	-0.05	0.07	0.04	0.09	0.08	-0.03	-0.02	0.07	0.05	0.06	0.18	1.00							
[18]	0.08	0.17	-0.06	0.11	0.06	0.09	-0.05	0.03	0.03	-0.05	0.02	0.05	0.05	0.03	0.06	0.12	0.34	1.00						
[19]	-0.03	0.08	0.01	0.09	0.09	0.09	0.03	-0.02	0.03	0.08	0.02	0.08	0.03	0.02	-0.07	0.02	0.21	0.2	1.00					
[20]	-0.00	-0.01	-0.06	0.01	-0.04	-0.00	0.02	0.14	0.14	0.08	0.04	0.01	0.09	0.06	0.18	0.13	0.27	0.25	0.35	1.00				
[21]	0.14	-0.03	0.06	0.03	0.03	0.06	0.04	0.15	0.18	0.21	0.10	0.08	0.05	-0.01	0.14	0.40	0.17	0.10	0.08	0.38	1.00			
[22]	0.07	0.03	0.03	-0.19	0.02	0.02	0.05	-0.02	0.16	0.33	0.49	0.03	0.05	0.06	0.08	0.07	0.03	0.05	0.04	0.06	0.09	1.00		
[23]	-0.05	0.01	-0.03	0.03	0.13	0.02	0.06	0.05	0.05	0.07	0.02	0.21	0.11	0.05	0.08	0.06	0.04	0.06	0.06	-0.06	0.05	0.07	1.00	

Table 1.4: Location of activities along the value chain and firm performance by ordinary least squares regression.

<i>Dependent Variables:</i> Return On Assets	(1)	(2)	(3)
Vertical Integration	-1.680** [-2.37]	-1.490** [-2.38]	-1.692** [-2.44]
Outsourcing	-5.900*** [-2.65]	0.678 [0.20]	-0.084 [-0.02]
<i>Foreign activities</i>			
F_Components		-6.514** [-2.48]	-6.337** [-2.30]
F_Semi-finished		-2.031 [-0.88]	-1.989 [-0.85]
F_HighQ.		-6.806** [-2.51]	-6.243** [-2.24]
F_LowQ.		7.591 [1.55]	7.841* [1.71]
<i>Domestic activities</i>			
D_Components	0.649 [0.29]		0.147 [0.06]
D_Semi-finished	1.617 [0.68]		0.999 [0.43]
D_HighQ.	2.291 [1.17]		1.612 [0.82]
D_LowQ.	-0.323 [-0.17]		0.101 [0.05]
District suppliers	-0.470 [-0.20]	-0.356 [-0.18]	-0.720 [-0.30]
Regional suppliers	0.296 [0.20]	0.288 [0.20]	0.098 [0.07]
Italian suppliers	1.551 [1.02]	2.128 [1.32]	2.008 [1.25]
Foreign suppliers	-3.563** [-2.06]	1.970 [0.64]	1.831 [0.58]
Foreign Sales on Total Sales	0.013 [0.01]	-0.518 [-0.25]	-0.571 [-0.27]
Product Innovation	-2.552 [-1.49]	-2.365 [-1.46]	-2.263 [-1.28]
Process Innovation	2.737* [1.87]	2.570* [1.76]	2.559* [1.81]
Organizational Innovation	-0.789 [-0.47]	0.012 [0.01]	-0.144 [-0.08]
Marketing Innovation	-1.030 [-0.50]	-1.148 [-0.57]	-1.070 [-0.51]
Communication investments	3.033* [1.73]	3.577** [2.03]	3.496* [1.95]
Size	0.000 [1.62]	0.000 [0.19]	0.000 [0.15]
Age	-0.030 [-1.09]	-0.021 [-0.74]	-0.022 [-0.79]
Constant	17.156*** [2.77]	12.989** [2.00]	12.191* [1.81]
Observations	242	242	242
R-squared	0.187	0.216	0.218
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Standard errors clustered at firm level; t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.10

Regional determinants and social capital: what boost export intensity? Evidence from Italy and Spain.*

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Abstract: This study analyses the impact of social capital and innovation intensity on firms' export intensity. We consider simultaneously firm's level and province level variables, for 342 industrial district firms located in Italy and Spain. Using a generalized linear model and multilevel model, with a logit transformation, our empirical analysis shows the positive impact of social capital and innovation intensity (at firm level) and the importance of Marshallian externalities and trade openness (at province level) over the propensity for firms to export. These results, carried out with two-levels econometric technique, highlight that the more a firm is able to create relationships with the surrounding environment, the more it acquires knowledge to reach foreign markets. Moreover, consolidate the importance of Marshallian externalities for closely located firms facing the international markets.

Keywords: Internationalisation; Industrial district; Social capital; Multilevel GLM

JEL classification: F23, L6, R12

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2.1 Introduction

Over the last decades, firms' exporting activities have been subjected to an extensive theoretical and empirical research, which has been commonly welcomed in the academic arena (Bradley, 2005; Rosson & Reid, 1987). However, the internationalization process models should be subjected to a critical evaluation (Andersen, 1993). Internationalization is a process in which the firms gradually increase their international involvement. A number of studies of internationalization assume that, within the frame of economic and business factors, the characteristics of this process influence the pattern and pace of internationalization of firms (Johanson & Vahlne, 1977). The aim of this paper is then to contribute to the existing literature by analysing the effects of regional determinants and firms' social capital on export intensity, in the particular setting of industrial districts (IDs) in Spain and Italy.

Industrial districts, according to the definition of Becattini (1979; 2009), are socio-economic entities bounded in a geographic area, where spatial and cognitive proximity facilitate the exchange of knowledge and capabilities between firms. These flows give rise also to the so-called Marshallian agglomeration economies (Marshall, 1920), which a firm can benefit to increase its performance and resources (Cainelli, 2008; Ruiz-Ortega, Parra-Requena, & Garcia-Villaverde, 2016). Agglomeration economies are characterized by the presence of strong relationships between agents that belong to different firms in the same district. Districts can be viewed as networks since they are groups of interconnected entities or actors concentrated in space. Their emergence as networks could be the implication of the economic activity localization. Clusters are networks of organizations highly interconnected where proximity and sense of belonging facilitate trust, reciprocity and other common values (Antonelli, 2000). So, relationships and trust constitute what Naphiet and Goshal (1998) define as social capital. The intensity of social capital varies between agents and firms in the same district (Li, de Zubieta, & O'Connor, 2015; Molina-Morales & Martínez-Fernández, 2004). In turn, heterogeneity is

reflected on performance differentials and, for those firms that are able to open up to foreign markets, on export intensity differentials (Laursen, Prencipe, Masciarelli, & Prencipe, 2012; Valdaliso, Elola, Aranguren, & Lopez, 2011).

Besides firms' intrinsic characteristics, also regional factors determine the amount and quality of social capital and international openness. Many studies document the importance of the presence of local institutions that increases the level of firms' social capital (Molina-Morales, 2005), and other factors such as infrastructures, regional level of human and social capital (Di Liberto & Sideri, 2015; Laursen et al., 2012).

Considering the above arguments, this paper aims to empirically test within the district and regional perspective, if social capital indicators and some regional characteristics drive export intensity, as a key indicator of firms' internationalization. To achieve our aim, we compare nine industrial districts based in Spain and Italy. One of these districts is the ceramic tile located in the Province of Castellón (Spain) while the remainings are located between Veneto and Friuli Venezia-Giulia in the North-East Italy. We select these districts because of their similar characteristics: they belong to low-tech and traditional sectors, they are shaped as the typical Marshallian industrial district, and they are involved in the internationalisation process to strength their position in foreign markets (Chiarvesio, Di Maria, & Micelli, 2010; Hervas-Oliver & Albors-Garrigos, 2011; Molina-Morales & Martínez-Cháfer, 2016).

The empirical analysis has been developed on a firm-level dataset that comprehends around 342 firms, as a result of two surveys carried out in Spain and in Italy in 2016. Additionally, other complementary information on regional characteristics from Italian and Spanish National Institutes of Statistics (ISTAT and INE, respectively) were considered.

Combining diverse nature and level of factors, this paper expects to contribute to the internationalization literature, focusing on firm external and internal factors determining exporting intensity. We also expect to contribute to the district literature, shedding light about

the interaction between social and economic regional indicators, and their role in the internationalization process.

The paper is organised as follows: Section 2 outlines the theoretical framework of social capital, regional externalities and internationalisation process; in Section 3 we describe our dataset and the empirical analysis; results and discussion are then proposed in Section 4. Finally, Section 5 is devoted to the conclusion and the policies implications.

2.2 Theoretical background

2.2.1 Firms Internationalization in industrial districts

The debate on internationalization processes has been deeply investigated both by scholars and practitioners, and due to the turmoil that characterizes the whole economic scenario, it is still relevant to find new solutions for firms to cope with globalization challenges. Following Porter (2000), one possible answer could be the competitive advantage a firm gain from its location and from the set of relationships established within a specific context (Alcácer & Chung, 2014). This will enable the firm not only to compete in the domestic market, but also in foreign ones (De Martino, Mc Hardy Reid, & Zyglidopoulos, 2006). In particular, very interesting is the case of industrial districts (ID) (Becattini et al., 2009); in fact a district involved in the international scenario could react to economic downturns and to new global challenges that are affecting the worldwide economy (De Marchi & Grandinetti, 2014). The industrial district model has been widely recognized as a form of economic organization alternative to the large firm, where the high level of specialization of small and medium-sized firms (SMEs) and the agglomeration economies support the location of manufacturing activities in selected and well-limited geographical areas (Becattini et al., 2009). While district firms may rely on advantages of agglomeration economies to manage their manufacturing processes, ID have also experienced a process of internationalization over the years (Camuffo & Grandinetti, 2011; De

Marchi & Grandinetti, 2014). Through internationalization processes, ID firms can benefit from additional sources for innovation purposes (Belussi & Sedita, 2009; Morrison, 2008) that enrich and often enhance the traditional mechanisms of knowledge transfers related to localized and socially based learning processes.

International strategies could be light (export) or strong (Foreign Direct Investment- FDI) according to the firm productivity differentials (Helpman, Melitz, & Yeaple, 2004). For the aim of this paper we are going to consider just export strategies, as far as for small and medium size firms that characterize the structure of industrial district, this strategy could be the more achievable with respect to FDIs (Belso-Martínez, 2006; Bertolini & Giovannetti, 2006; Johanson & Vahlne, 1977). Following the internationalisation path, moreover, is useful for firms to avoid the over-embeddedness effect (McEvily & Zaheer, 1999; Molina-Morales & Martínez-Fernández, 2009; Poudier & John, 1996) or the stickiness on a ground that is no more fertile to increase firm's productivity. For these reasons, it is good if a firm could open up to the international market to develop new resources and capabilities. In their internationalisation process, district firms get in touch with international actors that increase the magnitude of their social relationships and knowledge exchanges that in turn boost their propensity to be innovative (Pla-Barber & Puig, 2009; Valdaliso et al., 2011).

2.2.2 Social capital and institutional factors in industrial districts.

When social relationships are concerned, it is necessary to select among the different definitions of social capital. Following the one proposed by Putnam (1993), he defines social capital as “those features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions”. Later on, Nahapiet & Ghoshal (1998) define three types of social capital: structural (based on informal interaction), relational (based on trust and credibility), and cognitive (based on codes and language). It is easy to note from

these definitions how industrial districts are the perfect environments to develop social capital. In fact, industrial districts are built upon a system of mutual relationships based on trust and shared norms (Becattini, 1979; Camuffo & Grandinetti, 2011; Dei Ottati, 1994). In this context, knowledge and resources can flow from one agent to another thanks also to the geographical and cognitive proximity that characterize these areas (Boschma, 2005; Boschma & Ter Wal, 2007; Breschi & Lissoni, 2001; Cainelli & De Liso, 2005; P. Maskell & Malmberg, 1999; Nooteboom, 2004). The increase of knowledge spillovers, give rise to the possibility to be more innovative inside the districts. As far as innovation is the results of knowledge exchanges and R&D activities, the stronger are the relationships between firms, the higher will be the innovation intensity, as demonstrated by Boix and Trullén (2010) and Landry et al. (2002), for Spain and Canada respectively.

Furthermore, as reported by the literature, the amount of social capital does not uniquely depend on the magnitude of the relationships a firm has with other agents inside the district, but also on the collaborations a firm is able to establish with local institutions such as universities and research centres (Drejer & Østergaard, 2014; Molina-Morales, 2005; Molina-Morales & Martínez-Cháfer, 2016). In this case, regional knowledge base covers an important role in the creation of firms' social capital (Almeida & Kogut, 1999; Boschma & Iammarino, 2009; Breschi & Lissoni, 2001). Moreover, firms belonging to a region with high degree of social capital will be more prompt to face international markets (Laursen et al., 2012; Ruiz-Ortega et al., 2016).

Another aspect that should be considered is the performance differentials between firms of the same districts, and between district and non-district firms. In the first case, firms in the same district show performance heterogeneity because of the position that each single firm occupies inside the network. In fact, as pointed out by Molina-Morales and Martínez-Fernández (2009) a firm could be located in the core or in the periphery of the network. If it is in the core,

it could benefit from the so-called Coleman's rent (1988): this is the results of strong ties with other actors, that increase the number of knowledge exchanges that in turn affect firm's productivity. On the contrary, if a firm is located in the periphery of the district, social capital and knowledge relationships will be lower and weaker, giving rise to lower performances. In this way, there will be heterogeneity among firms in the same districts (Li et al., 2015). If we consider the relation between district and non-district firms, also in this case we can assist to performance heterogeneity as documented by Molina-Morales (2001) and Molina-Morales et al. (2010). In both their studies, authors assert that firms in industrial districts perform better than firms outside the district due to high-order resources and capabilities and higher degree of social capital and innovation.

In line with the theory presented so far, we expect that for ID firms:

H1: The export intensity will be positively affected by the magnitude of social capital, both at ID-firm and regional level.

H2: The export intensity will be positively affected by the innovation intensity, both at ID-firm and regional level.

2.3 Methodology

In this paper, we investigate how social capital and regional characteristics affect the internationalization process, with particular attention to export, experienced in the last decade by eight districts located in Veneto and Friuli – Venezia Giulia (Northeast of Italy) and one in the Province of Castellon (Valencia-Spain). We choose these three regions because they can be considered highly district – intensive regions for traditional sectors (De Propris, Menghinello, & Sugden, 2008; Grandinetti, Nassimbeni, & Sartor, 2009; Nassimbeni & Sartor, 2005).

For what concerns the Italian side, we use data collected by the University of Padova, in collaboration with University of Udine, on industrial district firms in 2016 (Bettiol, Burlina,

Chiarvesio, & Di Maria, 2017). In particular, we take into account: furniture district in the provinces of Treviso and Pordenone, and chair district in Manzano (Udine); fashion districts, such as the sport one in Montebelluna (Treviso), the eyewear in Belluno, and the luxury shoes in Riviera del Brenta (Padova- Venezia); mechanic district of industrial machinery in Vicenza and of products and components in Pordenone (Bettiol, Burlina, Chiarvesio, & Di Maria, 2017). On the Spanish side, we have data of the ceramic tile district that is located in the province of Castelló in Spain. This tile manufacturing industry represents about 95% of the total tile production in Spain. A high concentration of manufacturers is gathered around an area that comprises around 20 kilometers or radius where final tile producers are established alongside with raw materials developers and machinery manufacturers, among other members of the district value chain.

With regards to the Ceramic tile district, questionnaires and interviews were carried out in 2015. With an estimated population of about 238 companies, the survey comprehends 166 (69,5%) valid questionnaires of companies involved in different industrial activities such as: ceramic floor and wall tiles (83), decorative pieces (16), chemical additives (4), glazes and frits (21), machinery and equipment (36), and atomized clay producers (6). Of these, just the 83 firms for finished products were kept in the empirical analysis.

The final number of firms in the sample is then 342, divided according to the characteristics reported in Table 2.1.

[INSERT TABLE 2.1 ABOUT HERE]

Regional and province level data were extracted from ISTAT and INE databases, that are the two major national statistic institutes for Italy and Spain. We select data for the year 2010, to avoid biases in the empirical part. The data are selected to take in consideration the aspect of governance, infrastructures, and concentration indexes to understand if Marshallian

externalities are still relevant in the propensity to internationalize for district firms (see Table 2.2 to better understand which is the value of these variables at regional level on the total of Italy and Spain respectively).

[INSERT TABLE 2.2 ABOUT HERE]

Our dependent variable is a continuous variable measuring the probability of export intensity of the firms in the sample. Figure 2.1 highlights how export intensity is distributed among firms in the sample.

[INSERT FIGURE 2.1 ABOUT HERE]

Export intensity takes value 0 if the firm does not export, greater than 0 up to 1 if a firm based its turnover just on export:

$$ExpInt = \begin{cases} = 0 & \text{if no export} \\ > 0 & \text{if export} \end{cases}$$

Because of the nature of our dependent variable, we were both interested to understand first the probability of a firm to export or not, and secondly which are the factors that impact the magnitude of export activity. For these reasons, we use a generalized linear model with logit transformation, as follows:

$$y = \frac{1}{1 + \exp(-X\beta)} \quad (1)$$

with a transformed response variable given by:

$$y^* = \log\left(\frac{y}{1-y}\right) = X\beta + \epsilon \quad (2)$$

The regressors in β are a set of variables divided between two categories: firm and province level. The two levels of analysis induce us to apply a multilevel technique within the generalized linear model of equation (2) (Rabe-Hesketh, Skrondal, & Skrondal, 2008), when firm and province's variables are taken together.

For what concerns firm's level characteristics, we have:

- social capital (*Social Capital*), measured by the intensity of relationships a firm has at local level with university, institutions, research centres, other firms, design studios;
- innovation intensity (*Innovation Intensity*), measured by the number of innovations a firm has among product, process, organization, and marketing;

Social capital and innovation intensity are measured at province level as follows:

- the number of patents registered at the European Patent Office over one million inhabitants (*Patents*) (Acs, Anselin, & Varga, 2002) ;
- the number of employees in cooperative firms over the number of all industries' employees (*Cooperative firms*) (Di Liberto & Sideri, 2015).

Moreover, we add a set of variables to control for firms and regional characteristics. For the first group firm's labour productivity and age, and geographic concentration¹ (Cainelli & Iacobucci, 2012) and trade openness² (Laursen et al., 2012 at province level).

Table 2.3 and 2.4 report some descriptive statistics and the correlation matrix.

[INSERT TABLE 2.3 ABOUT HERE]

[INSERT TABLE 2.4 ABOUT HERE]

¹ The geographic concentration index of firms at a province level (*GC*) captures for Marshallian externalities, a typical characteristic of industrial district areas. This index is computed following Cainelli and Iacobucci (2012), as the share of firms in a sector for each province over the area of each province. This index is then normalized at country level.

$$GC = \ln \frac{\left(\frac{N_{ik}}{A_k}\right)}{\left(\frac{N_i}{A}\right)}$$

² Trade openness is measured as the ratio of import plus export over the value added.

2.4 Results

The econometric analysis is performed through generalized linear model with logit transformation when just a unit of analysis is considered (firm or regional level), while when the two levels are considered together, we use multilevel GLM approach. Results are reported in Table 2.5. Column 1 reports the results when only firm's social capital is considered: the coefficient is positive and highly significant; therefore, the baseline model confirms our expectations about the positive role of firm social capital over export intensity. In Column 2 we add also the innovation intensity variable, and both social capital and innovation intensity are positive and significant. This means that the higher the relationships of a firm with other agent, the greater its propensity to open up to the international market will be. In Column 3 and 4 we shift our attention at the Province level, to understand the role of local social capital and innovation *per se*. The coefficient for the number of employees in cooperative firms (i.e. the social capital at province level) is highly significant but negative in both columns, while the innovation intensity, represented by the number of patents, doesn't play any effect on export intensity. The negative impact of our variable on firm's export intensity means that firms located in regions where social capital is high have a lower propensity to export. This is probably linked to the fact that social capital emerging in these contexts is more related to an increase in the performance at the local level rather than on the international scale. The remaining two columns of Table 2.5 consider firm and province level variables together. In Column 5, coefficients for firm's social capital and innovation intensity are still positive and significant, confirming the results of the previous models, while nothing could be added for the variables at local level. In Column 6 we add the remaining control variables. Geographical concentration, which proxies for Marshall externalities, is positive and statistically significant supporting the idea that being located in an area where firms are more concentrated increases the probability of exporting, due to the spillovers and knowledge transfers among firms. Export

intensity is also affected by trade openness, meaning that a firm has greater propensity to export in provinces already opened to international markets. Despite the robustness of our results, supported by the correlation matrix in Table 2.4, we are aware that these two last variables could be subjected to reverse causality bias. Unfortunately, we can not add information on firm's level controls.

[INSERT TABLE 2.5 ABOUT HERE]

2.5 Discussion and Conclusions

This paper has empirically analysed the key factors explaining the internationalization through exporting activity of Italian and Spanish manufacturing firms. A generalized linear model with logit transformation was applied to a representative sample of firms located in nine industrial districts across regions of the aforementioned countries. Further than simply comparing districts, our research enriches the literature by evaluating how factors associated with firms' social capital and regional characteristics are determinant for their export activity. This comprehensive approach provides valuable insights as, to the best of our knowledge, just very few studies examine internationalization, regional characteristics and social capital together.

Our results suggest that firms' social capital exerts a significant positive effect on the export activities of firms located within the analysed industrial clusters. So firms' relational activity towards a set of other companies and agents has a positive impact on the exporting performance of ID firms partially confirming our first hypothesis. The industrial district model widely known to be characterized by a particular kind of relationships that are often based on reciprocity, mutual confidence, cooperation and trust. Our findings show that the intensity of these relationships that ID firms have with universities, institutions, and research centers or other firms, enhance their international expansion. These results are clearly aligned with the relevance of these relationships in an ID. Moreover, we find also support for innovation

activities, measured as the intensity to carried out different innovation in terms of product, process and organization. These results are in line with the literature, and strength our finding on social capital variable. Hypothesis 2 is then confirmed taking into consideration firm's level characteristics.

Besides the internal factors, we have also obtained interesting results concerning the regional characteristics of the analysed ID. Among these, we see how our results emphasize the role that Marshallian externalities (Geographic Concentration index) and the degree of the regional internationalization that have also a positive and significant effect on firms' exportation activities. On the other side, unfortunately, we can not add further information for social capital and innovation intensity when these two indexes are studies both at firm and local level. These results are probably driven by the indicators used to compute the two measures, but we hope to solve this limitation in the future with more precise indices.

There are some implications derived from this research that deserve to be mentioned. On the regional level we believe that our results show how location matters. The characteristics of the regions where the ID are based are important when it comes to firms concentration and propensity to foreign commerce. Together with this, the intrinsic network dynamics of ID that foster the necessary relationships to enable the social capital are also relevant for foreign expansion of firms. This is interesting for managers and future entrepreneurs that need to be aware of the possibilities that location and social capital offers in the ID contexts. In fact, these factors can result on great allies to obtain a better international expansion of firms. However, relaying just on location or resources related to relational activities can be misleading. In this sense, managers should also be aware of the efficiency importance on their industrial activities as productivity reveals as a relevant indicator to look at when internationalization activities are deployed.

Apart from the implications that affect to managers and entrepreneurs there are also a set of implications that are potentially relevant for policymakers and institutional administrators. Internationalisation policies can benefit from the analyses of certain characteristics focusing on those firms that exhibit appropriate levels of social capital and /or innovation propensity to obtain some institutional help. In this sense policymakers can go beyond the boundaries of simple stimulating exports and enhance the effectiveness of their initiatives by taking location and firms characteristics into account.

Finally, this research presents some limitations that can be summarized in: first, our sample is built upon manufacturing firms located in Spain and Italy that belong mainly to traditional sectors, therefore we are aware that also other sectors and contexts should be analysed; second, it would be interesting to better investigate the relationships not only within the dedicated research centres and universities, but also with the suppliers and other actors participating in the firms' supply chain; third, the amount of ID analysed is not compensated between Spain and Italy so and extension of the sample on the Spanish side is advisable or future research. In this sense, we believe that this research can be enlarged in the next efforts by adding more districts that enrich its conclusions and implications.

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Tables and Figures

Table 2.1: Main characteristics of interviewed companies.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sector	Forniture		Mechanics			Fashion		Ceramic	
Industrial District	Forniture	Chair	Forniture	Mechanics	COMET	Eyewear	Sport	Shoes	Ceramic Tile
Region/Country	Veneto/IT	Friuli Venezia-Giulia/IT	Veneto/IT	Veneto/IT	Friuli Venezia-Giulia/IT	Veneto/IT	Veneto/IT	Veneto/IT	Comunitat Valenciana/Spain
Province	Treviso	Udine	Pordenone	Vicenza	Pordenone	Belluno	Treviso	Venezia	Castellon de la Plana
N. of firms	36	24	26	39	55	30	19	30	83
Turnover in € (mean) ¹	10,000,161	4,751,825.1	6,250,983.5	18,984,560	31,478,052	2,491,307.7	4,937,083.1	3,969,136.4	26,727.542
N. Employees (mean) ¹	53.29	24.58	34.62	65.38	82.98	37.53	26.9	24.83	140.54
Export Intensity (mean) ¹	35%	62%	35%	67%	39%	51%	46%	47%	63%

¹The mean is computed as the mean for the firms in each Industrial District.

Table 2.2: Regional and Country characteristics.

	Veneto	Friuli Venezia-Giulia	Italy	Comunitat Valenciana	Spain
<i>Population</i>	4,907,883	1,218,450	60,592,547	4,980,689	46,439,864
<i>Surface (km²)</i>	18,264	7,845	301,340	23,255	504,645
<i>Population Density (inhab/km²)</i>	266.63	155.32	201.32	214.18	92.08
<i>Openness Degree (mean)</i>	0.62	0.61	0.44	0.57	0.57
<i>Patents (per 1 mln inhabitants)</i>	723.84	261.16	4494	116.33	1507.87
<i>Cooperative firms</i>	21.95	12.14	477.62	2.21	38.90
<i>Graduated people on the population (mean)</i>	0.0031	0.0044	0.029	.0066	0.097

Table 2.3: Sample descriptive statistics.

Variables	Obs	Mean	Std. Dev.	Min	Max
[1] <i>Export Intensity</i>	280	.501	.311	0	1
[2] <i>Social capital</i>	342	1.467	1.792	0	7
[3] <i>Innovation Intensity</i>	342	2.847	1.260	0	4
[4] <i>Cooperative firms</i>	342	.025	.0122	.006	.0566996
[5] <i>Patents</i>	342	1.812	98.307	55.255	356.552
[6] <i>Trade Openness</i>	342	.616	.123	.392	.899
[7] <i>Geographic Concentration</i>	342	.758	.494	-2.301	1.415
[8] <i>Productivity</i>	309	10.195	3.097	3.688	13.661
[9] <i>Age</i>	338	33.887	19.714	3	190
[10] <i>NUTS3</i>	342	4.257	2.659	1	8

Table 2.4: Correlation matrix.

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[1] <i>Export Intensity</i>	1.000									
[2] <i>Social Capital</i>	0.2091	1.000								
[3] <i>Innovation Intensity</i>	0.1661	0.3275	1.000							
[4] <i>Cooperative firms</i>	-0.2689	-0.5721	-0.0846	1.000						
[5] <i>Patents</i>	-0.2225	-0.1993	-0.0300	0.4873	1.000					
[6] <i>Trade Openness</i>	0.1369	-0.1336	0.0354	-0.0045	0.0529	1.000				
[7] <i>Geographic Concentration</i>	0.2562	0.3425	0.0378	-0.5881	-0.4235	0.2099	1.000			
[8] <i>Productivity</i>	-0.1576	-0.6221	-0.0667	0.8668	0.4237	0.2861	-0.5578	1.000		
[9] <i>Age</i>	0.0796	0.1457	0.0672	-0.0411	-0.0209	-0.0373	0.0166	-0.0544	1.000	
[10] <i>NUTS3</i>	-0.2683	-0.4315	-0.0968	0.7908	0.7036	-0.3336	-0.7341	0.6954	-0.0086	1.000

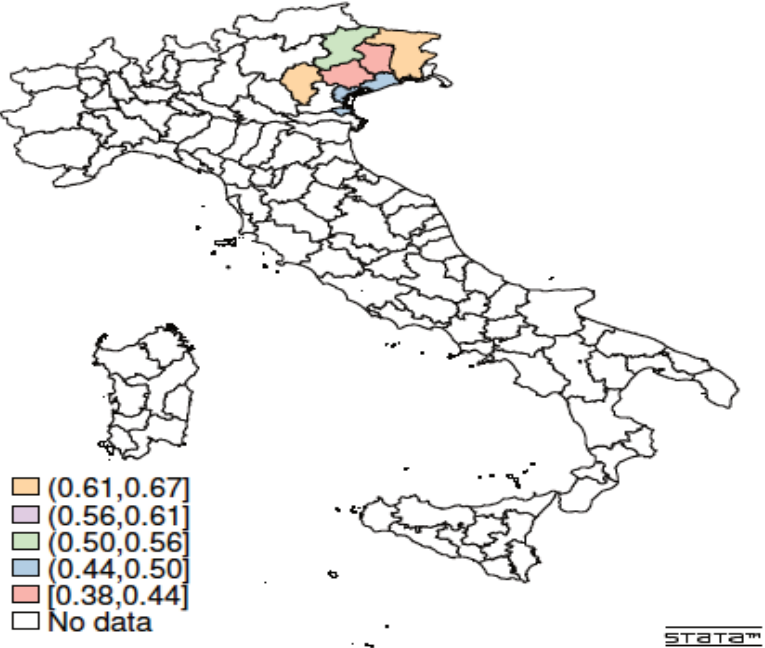
Table 2.5: Results of the multilevel model regression.

<i>Dependent variable:</i> <i>Export Intensity</i>	(1)	(2)	(3)	(4)	(5)	(7)
<i>Social Capital</i>	0.154*** (3.98)	0.129*** (3.25)			0.307*** (2.90)	0.452*** (4.11)
<i>Innovation intensity</i>		0.115* (1.86)			0.222* (1.89)	0.236* (1.85)
<i>Cooperative firms</i>			-0.497*** (-5.23)	-0.423*** (-3.77)	-1.272 (-1.17)	-0.108 (-0.07)
<i>Patents</i>				-0.198 (-1.11)	0.0531 (0.06)	-0.651 (-1.59)
<i>Geographic Concentration</i>						0.790* (1.86)
<i>Trade Openness</i>						6.905** (2.29)
<i>Productivity</i>						-0.0466 (-0.12)
<i>Firm's age</i>						-0.0105 (-1.35)
_cons	-0.213** (-2.17)	-0.509*** (-2.70)	-1.870*** (-4.85)	-0.577 (-0.48)	-2.792 (-0.39)	0.981 (0.10)
var(_cons[NUTS3])						
_cons					0.516 (0.98)	1.16e-33 (0.00)
N	280	280	280	280	280	276
Cluster variable					NUTS3	NUTS3
Model	GLM	GLM	GLM	GLM	MEGLM	MEGLM
BIC	310.957	315.334	308.909	313.929	163.068	163.637

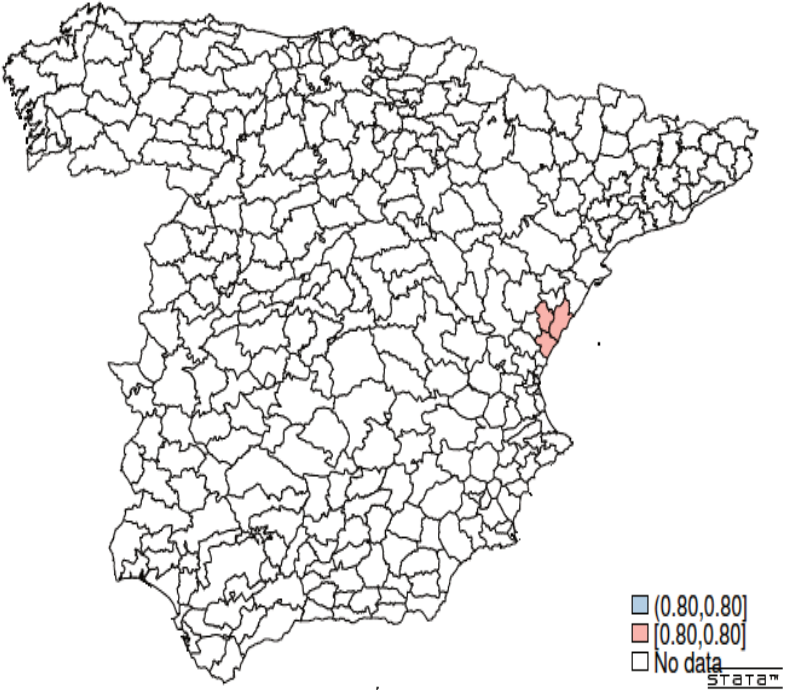
t statistics in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Figure 2.1: Export intensity of the firms in the sample for Italy (a) and Spain (b).



(a)



(b)

Inter-Firm Networks and Firm Performance: The Case of Italy.³

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Abstract: This study investigates a particular type of network, the inter-firm network (IFN), and its impact on performances of Italian firms between 2010-2015. After revising the literature on alliances and networks for what concerns the geographical and industrial dimension, I focus my attention on networks' performance and innovation propensity. The empirical analysis, based on a sample of about 4,000 firms, is divided in two parts: firstly, applying a “difference-in-difference” technique, is tested the impact of being in an IFN; secondly, focusing on year 2013, are measured the different effects of IFN characteristics. Results demonstrate that belonging to an IFN has a positive impact on firms' growth. Moreover, industry heterogeneity of members and internationalisation scope (rather than innovation) turn out to be the main factors increasing firm's profitability and economic growth.

Keywords: Inter-firm network; Alliances; Performance; Difference-in-Difference; Innovation

JEL classification: C3, L25, P25, R12

3.1 Introduction

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In the last twenty years, the attention of researchers and experts of many different fields moved from the classical economic scenario of market and hierarchy (Coase, 1937; Williamson, 1991), to a new category in between the two extremes: the hybrid form (Hodgson, 2002; Ménard, 1995; Zenger, 2002). Despite the debate on how hybrids are defined, some authors suggest they correspond to networks or alliances (Powell, 1990). In this paper, embracing both the organization or management literature (Grandori & Soda, 1995; Gulati, 1998; Gulati, Nohria, & Zaheer, 2000) and the economic perspective (Huggins, 1998; Ménard, 2004), one type of hybrids form, i.e. the inter-firm network (IFN), is analysed, in particular for what concerns the Italian scenario. Italy is an interesting case because it has been for a long time the cradle of a different form of networks, the Industrial Districts (IDs) (Becattini, 1990; Dei Ottati, 1994), characterised by geographical proximity of firms and industrial specialisation. These two features allowed the spreading of innovation and knowledge creation between firms in the ID. Instead in IFN, firms do not necessarily belong to the same regions or sectors, but it is however possible to cooperate and to increase firms' innovative capacity. In fact, already existent literature on innovation stresses the advantages of the openness of innovation processes including multiple and different sources of knowledge (Charron, Dijkstra, & Lapuente, 2014; Huggins & Johnston, 2010). However, to date to the best of my knowledge, just very few contributions investigate the importance of IFN networks on firm's economic performance (Gulati, Lavie, & Madhavan, 2011; Lechner & Dowling, 2003; Powell, Koput, & Smith-Doerr, 1996; Stuart, 2000).

Starting from the definition of IFN, and revising the literature on innovation and network characteristics, this paper aims to shed new light on the impact of IFN over firms' economic performance. The empirical analysis takes into consideration a recently ruled network phenomenon in Italy called *Contratto di Rete*, and defined by the Italian law (n. 33/2009) as: “[...] two or more firms in which the owners share together the same project, or economic

activities, aiming to implement their innovative and competitive capacity in the market”. This agreement allows the juridical independence and the retention of the individual identity between firms, and it boosts the size of the network allowing firms to compete in the globalized market or to achieve other shared goals, such as innovation. Thanks to these two aspects, this kind of contract may be very useful for Italian firms (mostly small and medium size enterprises) to enhance their competitiveness in a market dominated by large and internationalized companies.

The econometric part is divided in two steps: firstly, I apply a “difference-in-difference” approach to empirically test if Italian firms benefit, in terms of performance differentials, of being a member of an IFN over the period 2010-2015. Secondly, the attention shifts on the determinants of IFN, by investigating the characteristics of firms and networks for the year 2013. Thanks to these two types of analysis, it is possible to have a comprehensive overview of the effects of IFNs in Italy and suggest some *ad hoc* policy interventions. Results show that belonging to an IFN has a positive impact on firms’ performance, fostering the need for Italian firms to group together in new form of alliances, different from the traditional ID. The findings on network characteristics point out to the importance of having industry heterogeneity among firms in the network as a repository of diversified knowledge. Finally, is highlighted the positive effect of internationalisation oriented contracts, rather than innovation oriented, for firms’ overall performance. These results are interesting for firms and policy maker, because IFNs agreements could constitute a good instrument for small firms to face international trade challenges and foster the diversification of firm’s portfolio activities.

The paper is structured as follows: Section 2 investigates the literature behind the concepts of hybrids, IFNs, and innovation; Section 3 describes the methodology used for the data collection and the variable under investigation; in Section 4 are highlighted the main

results; finally, in Section 5 is presented the discussion and conclusions with some suggestions for practitioners and policy makers.

3.2. Related Literature

Among the scholars studying the networking phenomenon, Ménard (2004) emphasizes the characteristics of IFNs as hybrid organizational forms. In his work, he starts from the literature proposed by Coase (1992) and Williamson (1991, 1996) on the micro-analytical aspects and the trade-off between market and hierarchies. But, why IFNs can be considered as a hybrid form? From an organizational point of view, among the other authors, Grandori and Soda (1995) define the network as a system of relationships, “a mode of organizing economic activities through inter-firm coordination and cooperation” (p. 184). The main variables that characterize a network are: (i) the degree of differentiation between units (both from a negative side linked to the coordination costs, and from a positive side linked to the innovation and complementary resources); (ii) the intensity of inter-firm interdependences (that is in turn affected by asset specificity, uncertainty, resource exchanges); (iii) the number of units to coordinate; (iv) the complexity of interdependent activities; and (v) the asymmetries between resources of different firms in the network, such as knowledge flows and information (Grandori and Soda 1995, p.187). Among different organizational forms are IFN, called also hybrids, because they are considered as organizational arrangements distinct from hierarchies and markets (Ménard, 2012). To make a network operative coordination mechanism and other systems of cooperation have to be applied. Thus, IFNs are structured following resource pooling and relational contracting criteria, which help these networks to face competitive pressure. For what concerns the resource dimension, firms involved in the hybrid share their activities under an inter-firm coordination perspective to generate common rents, without caring for precise bundle definition or individual resource and capabilities endowments. To do so, firms are

involved in relational contracts to be protected from collusive behaviours between firms in the agreement, and to create “transactional reciprocity” (Ménard, 2004). Relational contracts can be considered a good instrument because, in the way they are arranged, they are less influenced from the common problems related to risk and transaction costs, and moreover it is easier to monitor other partners or solve misalignments without renegotiations and fines (Lafontaine & Slade, 2007). Finally, IFN are efficient tools to face competition: firms not only compete in the market under the same agreement, but also compete against each other and with other hybrids for the activities that are not included in the contract. For all these reasons, IFNs have better chances to survive in highly competitive markets and to face the related uncertainties thanks to resource sharing.

Despite the literature on hybrids seems to look at these contracts as a good option to lay between market and hierarchies, Hodgson (2002) states that is better to refer to them as networks or alliances (Powell, 1990). In fact, there is no clear consensus on how hybrids should be defined. Studies on networks and their very different features are unbounded, and IFNs are mostly related to strategic alliances, rather than other types of firms’ groups, for two main reasons: first, firms decide to enter an alliance in a voluntary way (Inkpen & Tsang, 2005); secondly, once they take part of an IFN, firms are characterized by horizontal or lateral pattern of exchanges of resources, ideas, and knowledge (Thorelli, 1986). Another relevant characteristic to be considered is the network composition, explained both in terms of industry and size heterogeneity. For what concerns the size aspect, networks can be composed of firms with similar dimensions (i.e. same number of employees or economic performance), or it is possible to identify a leader firm among the members. This latter is the case where a central actor coordinate the other firms, similarly to what happens in some IDs and business groups (Boari, 2001; Cainelli, Iacobucci, & Morganti, 2006; Zaheer & Bell, 2005). Related to industry heterogeneity, following Baudry and Chassagnon (2012), there are vertical or horizontal

networks. The former are organisations where the network is composed by firms of different industries that are along the same value chain, and production coordination is linked to complementary and specialised resources; the latter are related to networks with members of the same sector. As recognised by the literature, is firm's heterogeneity that push firms to get together to increase the inter-sectoral diffusion of advanced knowledge (Álvarez, Marin, & Antonio, 2009; Cassiman & Veugelers, 2002) and combining different overlapping information to achieve better output solutions (Balland, De Vaan, & Boschma, 2013; Hakansson & Lind, 2004). Therefore, different actors with different resources can add value and knowledge to the IFN they belong to, enhancing the probability for firms to increase their productivity and profitability. Also horizontal networks are recognised as a solid network structures: in fact, firms of the same industry increase the production of a particular step in the value chain, or implement research and development activities, for example in R&D oriented contracts (Bentivogli, Quintiliani, & Sabbatini, 2013).

With respect to other organizational forms (such as ID firms and business groups), firms in an IFN do not need the geographical proximity to exchange information and ideas (Álvarez et al., 2009; Mowery, Oxley, & Silverman, 1996). Many scholars already explored the relationship between networking and innovation without taking into account necessarily the geographical dimension of networks (Ahuja, 2000; Dhanaraj & Parkhe, 2006). Following the open innovation paradigm (Chesbrough, 2012), collaborations among firms which are not geographically proximate, are able to transfer complex knowledge across local boundaries, giving raise to high performing networks (Gertler & Levitte, 2005; Huggins & Johnston, 2010). The link between collaboration and network's performance, related to innovation aspects, has been deeply investigated by the literature (Hagedoorn & Schakenraad, 1994). Following the study proposed by Huggins and Johnston (2010) over a sample of knowledge-intensive firms in Northern England, the authors demonstrate that firms are used to set linkages also with actors

of other regions to foster complex knowledge exchanges. These transfers across spatial boundaries, provide a high performing network structure combined with innovation-driven growth. Also Zeng et al. (2010) investigate the relationship between Chinese cooperation network and innovation performance. Focusing on small and medium size enterprises, they found inter-firm cooperation networks, and in particular vertical cooperation (i.e. with different partners), to be positively related with innovation outcomes, thanks to the amount and variety of knowledge shared. The heterogeneity of networks' members has been reported as a relevant characteristic of IFN, as demonstrated by Nieto and Santamaría (2007) for Spanish inter-firm collaborations. Having different partners in the same network increases the possibilities to create new combinations of technologies and knowledge, that in turn affects the degree of innovation and the exploitation of various technological paths. Therefore, open innovation within heterogeneous firms in the network, is a relevant feature to foster firm's performances (Laursen & Salter, 2006).

The IFN, as an example of strategic alliance related to innovation, is not far away from the concept of ID. In this latter, firms operate in the same markets and share geographical proximity (Becattini, Bellandi, & De Propris, 2009; Camuffo & Grandinetti, 2011; Dei Ottati, 2002). Widespread literature on IDs, and other networks rooted in local contexts, supports the idea that knowledge and innovation spread also outside the boundaries of clustered areas. Belussi et al. (2006) document the effect of mixing resources and capabilities inside and outside IDs. The process of exploiting external resources is linked to the absorptive capacity of local firms (Belussi, Pilotti, & Sedita, 2006). For what concerns knowledge transfers, these are possible if actors inside the districts possess the capabilities to absorb knowledge coming from outside the districts, re-elaborate and exploit it inside the cluster. What is important to highlight is not just the development of new process and product with the resources embedded in an area, but also the exploration and exploitation of new knowledge coming from outside the

boundaries. These capabilities turn out to increase firms' competitive advantage in the global scenario, which boosts its productivity and profitability.

Related to other collaborations inside and outside bounded industrial areas, Cainelli et al. (2006) analyse the effects of business groups, as another type of network structure. Business groups are defined as different firms belonging to the same owner (Cainelli et al., 2006), and they originate from the evolution of some industrial districts' firms in leading firms with bigger dimension. The growth of these firms is due to innovation upgrading and product differentiation that characterise the later stages of the firm's evolutionary path. Thanks to these two aspects, business group's firms show a higher profitability and productivity rates.

Another example for what concerns relations inside and outside IDs has been reported by De Marchi et al. (2014) for what they define "district oligopolization". The authors show that as far as globalization is increasing in the last few years, is no more possible to take the district aside the global context, thus the higher is the number of relationships district's firms could have with other actors outside the district, the higher will be the survival threshold in a globalized economy. Again, the geographical proximity and resources embedded in a district are not enough for the prosperity of the district itself, and we could assist to an open up process of the boundaries of networks self-contained in IDs⁴.

Notwithstanding the magnitude of studies related to IFN and innovation performance, to date to the best of my knowledge, just very few contributions explore how IFN have an impact on firm's economic performance. Powell et al. (1996) show how employment growth rate, among other variables, is positively related with the number of alliances firms are involved in. Also sales growth and firm's size are influenced by the IFN, as demonstrated by Stuart (2000) in a longitudinal sample of high-tech alliances in advanced economies. Finally, Lechner and

⁴ Other relevant contributions can be linked to the concept of business innovation models (Parrilli & Alcalde Heras, 2016), to the regional innovation systems (Isaksen & Karlsen, 2012) and open innovation within SMEs (Lee, Park, Yoon, & Park, 2010).

Dowling (2003) highlight the importance of external knowledge and inter-firm interactions to foster firm's economic growth in the information technology cluster in Munich region.

Despite previous studies on networks and innovation, interesting issues concerning the use of IFN and their effects on firm's economic growth remain to be addressed. This paper addresses this gap by testing the following hypotheses:

H1. Belonging to an IFN has a positive effect for firm's performance.

H2a. Innovation-oriented networks positively affect firm's performance.

H2b. Industry heterogeneity among firms in the network positively affects firm's performance.

3.3 Methodology and Sample

In order to test the three hypotheses, I carried out a quantitative analysis on networking processes of manufacturing and services firms focused on Italy. Italy is a particularly interesting setting due to the large presence of IDs that characterized the economic success of the country at the international level (Becattini et al., 2009; Piore & Sabel, 1984). Moreover, due to the high number of small and medium size enterprises (SMEs), Italian policy makers have encouraged aggregation of firms through a specific Law (n.33/2009) that put at its heart the creation of IFNs. My initial sample comprehends the IFN agreements in Italy from 2010 to 2017. According to the above mention Italian Law, IFNs comprehend independent firms entering arrangements to achieve a common aim or develop new economics activities, through cooperation and coordination. Firms in an IFN agreement commit themselves to: a) collaborate for purposes relevant to those firms (for example open to international markets or developing new products); b) exchange information and industrial/technological services (linking together firms belonging to different sectors); c) share one or more economic activity belonging to each individual process (closer to buyer-supplier relationships). Italian IFNs development is a gradual process, starting from the sharing of a project or by investing the same amount of capital

among firms (Tiscini & Martiniello, 2015). The two main positive aspects that characterise an IFN are: (i) the firms that get into the network could benefit from the dimension that the network reach by being formed of small and medium size firms; (ii) each firm of the agreement could benefit from the organizational flexibility and adaptability to the economic cycle that are typical aspect of small firms.

The main features of Italian IFNs are linked to the variety of industries that are grouped under the same agreement (both agro-food and tourism industry can co-exist under the same contract), to the presence of small dimension enterprises (less than 10 employees), to the participation of at least five firms on average (without any constraints in terms of geographical distance), and to the prevalence of Ltd. Companies (Negrelli & Pacetti, 2016).

According to the industry-classification of firms in each in the agreement, it is possible to distinguish among: vertical networks, where firms belong to different sectors; and horizontal networks, where firms belong to the same industry (Bentivogli et al., 2013).

The dataset used for the analysis comprehends 18,556 firms and 3,697 agreements, collected by the Italian Chamber of Commerce in May 2017. Of these firms, 16,759 are involved in contract without the juridical responsibilities, while the other 3,745 with (see Figure 3.1 for the evolution of the contracts over the last 8 years). Both for the first group of firms and the second one, the database reports the industry code (following the ATECO 2007 classification⁵), the Province and Region, the date and the number of the firms' establishment contract, the fiscal code for each firm, and the main purpose of the contract.

[INSERT FIGURE 3.1 ABOUT HERE]

⁵ The ATECO 2007 classification is based on the NACE Rev2 classification, proposed by Eurostat and elaborated by the Italian Statistical Institute.

For the empirical analysis, I consider the agreements without juridical responsibility, because, as far as the juridical responsibility requires more time to be implemented because of bureaucratic procedures, there are fewer observations for this type of contract, as reported in Figure 3.1. From this figure, it is interesting to note that even though they can be considered still a rare phenomenon with respect to the diffusion of the industrial districts, IFN contracts are spreading over the last 7 years, with an increasing trend despite the recent economic turmoil. To test the first hypothesis, I use a “Difference-In-Difference” (DID) approach, to understand the impact on firms’ performance before and after joining an IFN contract. To do so, I select the firms that sign a contract in 2013, to have financial and performance information for at least two years before and two years after the beginning of the agreement. In year 2013 were signed 589 contracts which involve 2,719 firms in the whole Italian peninsula. After some standard cleaning procedures, the final database on IFNs consists of 2,095 firms, grouped in 529 contracts with a minimum of two and a maximum of 33 firms in each contract.

Financial and performance indices were then extracted from AIDA Bureau van Dijk database, to collect information for each single firm on profits (total turnover, EBITDA-Earnings Before Interest, Taxes, Depreciation and Amortization), relative profitability (ROI- Return on Investments, ROE-Return on Equities, ROA-Return on Assets), size (number of employees), and other indicators related to R&D activities. However, because of the high number of missing data, not all these measures were then adopted for the econometric analysis.

To use the DID approach, are necessary two subsamples of observations: the first one is related to the treated firms, in this case the ones which join an IFN contract in 2013; the second one, the control sample, is represented by the firms that are not involved in this contract. Therefore, I build the second sub-sample, with a stratified random sample selection among all the Italian firms registered in AIDA database. The selection has been made following three criteria: the size of the firms in the treated sample (represented by the number of employees); the industry

classification (by ATECO 2007 at two-digit level); and the region at NUTS 2 level (Italian Regions). Respecting these three criteria allows me to have a control sample as close as possible to the treated one, to perform a correct DID analysis (Istat, CDC, & Retimprese, 2017). Also for these firms, I select the same performance indicators as for the treated sample, to have all the information from 2010 to 2015. The control sample amount on 1,938 observations. Therefore, the final sample of both treated and non-treated firms consists of 4,033 firms.

The DID model is developed over a 5-year panel data (2010-2015), estimated through the following equation:

$$y_{it} = \beta_0 + \beta_1 treat_i + \beta_2 time_t + \beta_3 treat * time_{it} + \beta_4 X_{it} + \alpha_i + \varphi_t + u_{it} \quad (1)$$

where y_{it} is the dependent variable measuring the performance of the firms. In our case the selected measures are the turnover growth and EBITDA (both in natural logarithm to flatter the variance); $treat_i$ is a dummy variable taking value 1 if the firm signs a network contract in 2013, 0 otherwise; $time_t$ is a dummy variable taking value 1 from the year of the treatment effect (2013), 0 otherwise; and $treat * time_{it}$ is the interaction term between treated and time variables. X_{it} is a vector of covariates, which includes the ID membership at firm level, and other dummies to control for firm's size and geographical location. α_i and φ_t are respectively year and industry fixed effects captured using a series of dummies, and u_{it} the error terms. Equation (1) is estimated through a random effect model with GLS estimator (Wooldridge, 2013). Finally, to test if there is also a pre-trend component or a treatment intensity after the firm join these agreements, I estimate also other two equations that constitute a robustness check for the baseline results⁶.

⁶ The pre-trend equation adds to the three components (*Treat*, *Time*, and *Treat*Time*), two other variables measured as an interaction between the treatment dummy and the two separate dummies for the two years before the treatment. In this way, it is clear how was the trend of the treated and control sample before the treatment. The second equation, related to treatment intensity, is composed by the variables *Treat* and *Time*, but in place of the interaction term, there is a variable called treatment intensity, which is an interaction between the post-treatment period and the treat variable, and it measure if the treatment is worth also in the years after it takes place.

To test the second and third hypotheses, i.e. the impact of network determinants on firm's performances, I consider just the treated group, i.e. those firms which belong to an IFN (2,095 observations). Being aware of the possible sample selection bias, in the very first phase of the analysis has been applied a two-step Heckman selection procedure (Heckman, 1976, 1979). However, the results of the second step estimates are not biased, therefore simple Ordinary Least Squares (OLS) equations have been implemented⁷.

The OLS equation is computed as follows:

$$y_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \beta_3 K_i + \delta_i + \theta_j + \varepsilon_{ij} \quad (2)$$

where y_i represents the two dependent variables (EBITDA and turnover) at year 2014, and at year 2015 as a robustness check. X_i is the vector to define network type (Bentivogli et al., 2013):

- *horizontal* if the contract is full horizontal, i.e. all the firms belong to the same ATECO industry at two-digit level;
- partially horizontal (*horizontal mix*) if at least 60% of the firms in the contract belong to the same ATECO industry (this threshold has been computed observing the variability of industry classification for each IFN);
- *vertical* if firms belong to different industries but there are vertical relationships among these firms (see Figure 3.2).

[INSERT FIGURE 3.2 ABOUT HERE]

Z_j is the vector controlling for the aim of the contract: for each IFN, there is a column in the database which expresses the purpose firms try to pursue in the agreement. So, I look for the

⁷ The selection variable for the first stage of the Heckman procedure has been computed as a composite social capital index suggested by Cartocci (2007). Previous papers (Antonietti & Cainelli, 2008; Crescenzi, Gagliardi, & Percoco, 2013) applied this index as a reliable measure to proxy for aggregation propensity related to social capital at Province level. Both the results using Heckman procedure and OLS equations are robust and reliable.

words related to innovation, internationalisation, commercial, and various mix of these, to build a set of dummies to proxy for each different aim (see Figure 3.3). K_j is a vector controlling for other network's characteristics, such as: the structure of the contract (*Network Structure*) computed as the weight average of the network turnover in 2013: if there is a presence of a leader firm in the network (so the turnover is above the weighted average) network structure take values 1, 0 otherwise (Boari, 2001; Carbonara, 2002); and the ID presence in the network (*Network-ID*) if at least more than 60% of the firms belong at the same time to an industrial district and an IFN (see Figure 3.4 and 3.5). δ_i and θ_j are the controls at firm and network level, and industrial and geographical fixed effects, and ε_{ij} is the error term.

[INSERT FIGURE 3.3 ABOUT HERE]

[INSERT FIGURE 3.4 ABOUT HERE]

[INSERT FIGURE 3.5 ABOUT HERE]

Summary statistics and the correlation matrix of the variables are reported in Table 3.1 and 3.2, while Table 3.3 describes the variables of the two models.

[INSERT TABLE 3.1 ABOUT HERE]

[INSERT TABLE 3.2 ABOUT HERE]

[INSERT TABLE 3.3 ABOUT HERE]

3.4 Results

Results of the DID model are reported in Table 3.4. The first Column show the results where the dependent variable is the EBITDA. Unfortunately, even if both the Network and Time coefficients are positive and statistically significant, their interaction is still positive but not

significant. So being part of an IFN does not have any effect in terms of firm's profitability. For what concerns turnover growth, Column (2), the interaction term is positive and highly statistically significant, meaning that being in an IFN is related to an increase in turnover growth equal to around 14%. This result is in line with the literature and the juridical definition of IFN: in fact, as being grouped in a network, firms can reach bigger dimension, which in turn increase their turnover. To be sure that there are no pre-trend components, in Column (3) I analyse the impact of IFN contracts on firm's turnover adding the pre-trend dummies. As it is easy to note, the *Network*Time* variable is still positive and highly significant, and the two variables (*Network*2011* and *Network*2012*) are positive and not significant (the significance at 10% level in *Network*2012* is negligible, given that one year before joining a contract a firm could already plan some procedures related to the entrance), concluding that there are no pre-trend behaviours between the treatment and control group. This analysis reinforce the robustness of the baseline model in Column (2). The very interesting result is related to Column (4). In this column is tested the treatment intensity, so the effect of the treatment in the years after its application. The *Treatment Intensity* variable is positive and highly statistically significant, meaning that firms which join an IFN could reach a turnover growth of 6% in the two years after their entry. Even though the time span of the post-treatment period is not so long, it is worth nothing that the effect lasts also over time and it is a good incentive for firms which decide to choose this kind of network agreement.

It is possible to conclude the first part of the analysis partially supports the first hypothesis: joining an IFN has a positive effect on firm's performance, even though results are relevant for what concerns firm's economic growth but not its profitability.

[INSERT TABLE 3.4 ABOUT HERE]

Hypotheses 2a and 2b are tested with OLS regression in Table 3.5. In Column (1) and (2) are reported the results for the two dependent variables computed at time t (2014), while in Column (3) and (4) the results referred to the year 2015, so $t+1$ period. Starting from the EBITDA variable in column (1), estimates show that the intermediate form of industry heterogeneity (*horizontal mix*) positively impacts firm's profitability (with respect to baseline category *vertical* type of networks, so totally heterogeneous firms in the agreement). This result is valid not only in terms of profitability, but also for what concerns firm's growth, as reported in Column (2). Moreover, these coefficients are also robust taking into consideration one-year lead variables. Therefore is preferable for firms belonging to heterogeneous networks, rather than fully specialised ones; this is probably due to the possibility for firms in such agreements to expand and reinforce their value chain activities, without losing the individual firm's specialisation (Carbonara, Giannoccaro, & Pontrandolfo, 2002; Dyer, 1997; Jarillo, 1988).

But the very surprisingly result of the second part of the analyses is related to the aim of the IFN. In fact, in all the four columns is internationalisation orientation that has a positive impact over the different performances, rather than innovation purpose. This could be explained in very different ways: firstly, innovation projects have a long-term horizon, so given the nature of the dependent variables, they are able to measure profitability and revenues just in the short-term, without having data of longer time span; collect the magnitude of innovation; secondly, the proxy for innovation is probably too weak to measure this aim, and a good implementation could be to add R&D expenditure at firm level or other indicators, such as number of patents or collaboration with research centres to control for innovation activities. Despite this, looking at the internationalisation oriented networks, the results are supported by previous studies, in fact internationalisation is achievable with an increase in the size of the firm, and this is one of the major aim of the IFN (Hsu, Lien, & Chen, 2015; Johanson & Vahlne, 1977; Sui & Baum, 2014). Moreover, internationalisation could be linked also to diversified strategies to achieve

foreign markets, and this finding is reinforced by industry heterogeneity of firms in the network (Batsakis & Mohr, 2017; Lu & Beamish, 2004). Therefore, hypothesis 2a is not confirmed within the innovation objective, while it turns out that internationalisation-oriented networks have a better impact on firm's performance both in terms of profitability and growth. Hypothesis 2b is confirmed, supporting previous studies where industry heterogeneity is considered helpful for the growth of firms in a network (Goerzen & Beamish, 2005; Hawawini, Subramanian, & Verdin, 2003). Unfortunately, nothing could be added for the remaining variables, for example *Network Structure* is negative and significant just for some model specifications, therefore this results is not robust enough to drive conclusion about the effect of having a leader firm in the network and firm's overall performance.

[INSERT TABLE 3.5 ABOUT HERE]

3.5 Discussion and Conclusions

This paper provides some empirical evidence on a new network contract that took place in Italy from 2009. The novelty of the IFN is to allow firms that are not geographically proximate to cooperate and develop specific economic projects. Among the benefits of an IFN contracts, is the share of new ideas and the acquisition of knowledge among partners, both from the same or different industries. The aim of this study was to shed some light on these new form of alliances, and to better understand if it is worth for firms, in terms of performance, to aggregate under these contracts. Moreover, if this was the case, which are the elements of the network that influence the profits of the firms.

The results of the “difference-in-difference” approach show that an IFN agreement has a positive impact on firm performance, in terms of economic growth, while the profitability

aspect is not supported by the empirical evidence. This finding is in line with one of the benefits of IFN, that is reaching bigger size typical of large companies, without losing the flexibility and adaptability of small and medium firms. Moreover, has been demonstrated that the effect of these agreements lasts also for the period after the entrance, promoting IFN as a valid instrument for firm's growth.

For what concerns the analysis of the characteristics of an IFN, and the role of innovation, results are not in line with the presented literature. In fact, while contract with innovation as first aim seems to do not play a role over firms' performance, internationalisation oriented contracts positively affect profitability both in terms of turnover and EBITDA. This result is interesting, also from a policy perspective, because small firms, such as the one involved in IFNs, achieve the possibility to open up to international markets. Moreover, the internationalisation aspect is also supported by the diversification of the value chain activities, and the heterogeneity of firms participating in the network.

From a theoretical point of view, the paper aims to shed some new light on performance implications for IFN, regarding not only innovation, but also financial and operative indicators, that are usually neglected in the already existent literature. Despite the vast and numerous contributions on networks, business innovation models (Isaksen & Nilsson, 2013; Parrilli, Dahl-Fitjar, & Rodríguez-Pose, 2016) and the role of proximity and innovation (Boschma, 2005), IFN can be seen as a new instrument to foster inter- and intra-regional growth. The major policy implications about the creation of IFN are connected to the financial incentives firms can afford getting together with these agreements. In fact, as far as internationalisation processes and new product development require high amount of capital and resources, it could be easier for firms to obtain funds through IFN contracts. Furthermore, policy makers should be aware that IFN contracts could be a vehicle to foster not only regional economic growth for neighbourhood regions, but also inter-regional growth, increasing the knowledge transfers and

social capital among collaboration and cooperation practices (Fitjar & Rodríguez-Pose, 2015; Huggings, 2001).

This work is not free of limitations. The study is based on year 2013. I would like to consider also other years, to understand if the results are robust also for different periods. Moreover, by having more years concerning the balance sheet data, it allows to extend the post-treatment effect in the difference-in-difference analysis, and therefore to understand if these contracts are worth in a long-time span. The control sample has been set through an *ad hoc* procedure: I might be able to refine it by using a propensity score matching technique. Finally, it might be important to test the results obtained in this paper on contracts with juridical responsibility, to understand if the level of juridical formalisation plays a role for this type of alliances.

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Tables and Figures

Table 3.1: Summary statistics: a) complete sample and b) treatment sample

Variable	Mean	Std. Dev.	Min.	Max.	N
Turnover14	6393.671	29291.875	0	690588.625	3899
EBITDA14	412.834	2086.608	-19134.854	47281.406	3879
Network Type	0.304	0.669	0	2	4037
Network Aim	1.593	2.226	0	7	4037
Network Structure	0.385	0.487	0	1	4037
Network ID	0.137	0.344	0	1	4037
District	0.295	0.456	0	1	4011
Network Size	6.313	6.233	2	33	2095
Firm's Age	2.366	1.021	0	4.771	3796
Firm's Size	31.79	118.434	0	3292	3793
North-West	0.29	0.454	0	1	4037
North-East	0.26	0.438	0	1	4037
Centre	0.205	0.404	0	1	4037
South	0.245	0.43	0	1	4037

a)

Variable	Mean	Std. Dev.	Min.	Max.	N
Turnover14	7097.706	31597.75	0	645793	1961
EBITDA14	428.339	2109.539	-19134.854	47281.406	1947
Network Type	0.586	0.835	0	2	2095
Network Aim	3.069	2.24	0	7	2095
Network Structure	0.741	0.438	0	1	2095
Network ID	0.265	0.441	0	1	2095
District	0.308	0.462	0	1	2085
Network Size	6.313	6.233	2	33	2095
Firm's Age	2.391	1.011	0	4.727	2033
Firm's Size	34.331	134.425	0	3292	1994
North-West	0.29	0.454	0	1	2095
North-East	0.258	0.438	0	1	2095
Centre	0.207	0.405	0	1	2095
South	0.245	0.43	0	1	2095

b)

Table 3.2: Correlation matrix: a) complete sample and b) treatment sample

a)

Variables	Turnover14	EBITDA14	Network Type	Network Aim	Network Structure	Network ID	District	Network Size	Firm's Age	Firm's Size	North-West	North-East	Centre	South
Turnover14	1.000													
EBITDA14	0.684	1.000												
Network Type	0.026	0.020	1.000											
Network Aim	0.023	0.005	0.275	1.000										
Network Structure	0.030	0.015	0.430	0.550	1.000									
Network ID	-0.001	0.019	0.181	0.246	0.286	1.000								
District	0.004	0.008	0.011	0.012	0.009	0.493	1.000							
Network Size	0.029	0.019	-0.007	0.195	0.259	-0.085	-0.065	1.000						
Firm's Age	0.135	0.126	0.057	0.006	0.048	0.030	0.076	0.108	1.000					
Firm's Size	0.614	0.447	0.023	0.024	0.047	0.010	0.016	0.015	0.137	1.000				
North-West	0.023	0.014	-0.025	-0.073	-0.024	0.081	0.108	-0.187	0.037	-0.012	1.000			
North-East	0.015	0.022	0.039	-0.027	0.051	0.057	0.091	0.111	0.070	0.025	-0.378	1.000		
Centre	0.018	0.007	-0.010	0.015	-0.014	-0.010	-0.011	0.118	-0.018	0.052	-0.324	-0.301	1.000	
South	-0.057	-0.043	-0.004	0.089	-0.013	-0.134	-0.197	-0.028	-0.095	-0.062	-0.365	-0.338	-0.290	1.000

b)

Variables	Turnover14	EBITDA14	Network Type	Network Aim	Network Structure	Network ID	District	Network Size	Firm's Age	Firm's Size	North-West	North-East	Centre	South
Turnover14	1.000													
EBITDA14	0.678	1.000												
Network Type	0.023	0.027	1.000											
Network Aim	0.010	-0.000	-0.041	1.000										
Network Structure	0.024	0.021	0.166	0.055	1.000									
Network ID	-0.014	0.025	0.015	-0.028	-0.011	1.000								
District	0.025	0.042	-0.004	-0.018	-0.029	0.715	1.000							
Network Size	0.029	0.019	-0.007	0.195	0.259	-0.085	-0.065	1.000						
Firm's Age	0.140	0.119	0.071	-0.022	0.060	0.030	0.065	0.108	1.000					
Firm's Size	0.713	0.451	0.018	0.014	0.055	0.002	0.028	0.015	0.134	1.000				
North-West	0.014	0.021	-0.038	-0.138	-0.050	0.122	0.117	-0.187	0.003	-0.012	1.000			
North-East	0.024	0.029	0.063	-0.047	0.114	0.088	0.110	0.111	0.098	0.035	-0.377	1.000		
Centre	0.016	-0.013	-0.019	0.022	-0.040	-0.019	-0.021	0.118	-0.018	0.037	-0.326	-0.302	1.000	
South	-0.054	-0.040	-0.006	0.173	-0.026	-0.201	-0.216	-0.028	-0.086	-0.058	-0.364	-0.336	-0.291	1.000

Table 3.3: Variables description.

Variables	Measure	Type
<i>Dependent Variables</i>		
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization. Model 1: Natural logarithm of EBITDA Model 2: Natural logarithm of EBITDA for years 2014 and 2015	Continuous
Turnover	Model 1: Turnover growth rate in natural logarithm Model 2: Turnover in natural logarithm for years 2014 and 2015.	Continuous
<i>Independent Variables</i>		
Network	=1 if the firm belong to an IFN, 0 otherwise	Dichotomous
Time	=1 if the year is from 2013 to 2015, 0 otherwise	Dichotomous
Network*Time	=1 if a firm has an IFN from year 2013, 0 otherwise	Dichotomous
Network*2012	=1 if “Network” =1 and Year=2012, 0 otherwise	Dichotomous
Network*2011	=1 if “Network” =1 and Year=2011, 0 otherwise	Dichotomous
Treatment Intensity	=1 if year=2013 and Network=1 =2 if year=2014 and Network=1 =3 if year=2015 and Network=1	Continuous (0-3)
Network Type	Definition of network specialisation degree according to firm’s industry: - horizontal=1 if 100% of the firms in a network have the same industry code (fully specialised); -horizontal mix=1 if 60% of the firms in a network have the same industry code (partially specialised); -vertical=1 if firms in the network have different industry codes (diversified)	Dichotomous
Network Aim	Definition of network purposes: -innovation; -internationalisation; -commercial; -innovation and internationalisation; -innovation and commercial; -internationalisation and commercial; -innovation, internationalisation and commercial.	Dichotomous
Network Structure	=1 if the network has a leader firm, 0 otherwise	Dichotomous
Network ID	=1 if a network has more than 60% of the firms that belong also to an Industrial District	Dichotomous
<i>Control Variables</i>		
District	=1 if a firm belongs to an industrial district (following ISTAT classification, 2001), 0 otherwise	Dichotomous
Network Size	Number of firms for each network	Continuous
Firm’s Size	Number of employees in each firm	Continuous
Firm’s Age	Natural logarithm of firm age (2013–foundation year)	
Geographic location	Classification at NUTS1 level: -North-West; -North-East; -Centre; -South and Islands.	Dichotomous

Table 3.4: Difference-in-Difference estimates

VARIABLES	(1) EBITDA	(2) Growth	(3) Growth Pre-trend	(4) Growth Treat. Int.
Network*Time	0.044 [1.53]	0.138*** [2.68]	0.231*** [3.02]	
Treatment Intensity				0.058*** [2.68]
Network	0.281*** [5.46]	0.233*** [4.11]	0.139* [1.75]	0.244*** [4.42]
Time	0.166*** [5.50]	-2.028*** [-38.16]	-2.081*** [-33.26]	-2.047*** [-35.64]
Network * 2011			0.051 [0.60]	
Network * 2012			0.207* [2.13]	
District	-0.057 [-1.07]	-0.077 [-1.44]	-0.077 [-1.44]	-0.077 [-1.43]
Size	0.005*** [5.78]	0.005*** [6.37]	0.005*** [6.36]	0.005*** [6.37]
North-West	0.556*** [7.68]	0.480*** [6.59]	0.479*** [6.59]	0.480*** [6.59]
North-East	0.402*** [5.39]	0.210*** [2.76]	0.209*** [2.75]	0.210*** [2.76]
Centre	0.284*** [3.45]	0.263*** [3.17]	0.262*** [3.17]	0.263*** [3.17]
Constant	3.063*** [9.47]	6.106*** [9.40]	6.170*** [9.46]	6.100*** [9.40]
Observations	17,584	10,769	10,769	10,769
R-squared	0.0149	0.213	0.213	0.213
Number of ID	3,833	3,752	3,752	3,752
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.10

Clustered standard errors at ID level

Table 3.5: Network determinants estimates.

VARIABLES	(1)	(2)	(3)	(4)
	EBITDA t	Turnover t	EBITDA t+1	Turnover t+1
Network Type				
Horizontal	0.003 [0.03]	0.102 [0.98]	-0.059 [-0.54]	0.103 [0.94]
Horizontal mix	0.261** [2.52]	0.300*** [2.94]	0.289*** [2.76]	0.252** [2.38]
Network Aim				
Innovation	0.136 [0.97]	0.039 [0.32]	0.096 [0.71]	0.116 [0.87]
Internationalisation	0.350** [2.08]	0.347** [2.31]	0.306* [1.82]	0.454*** [2.81]
Commercial	0.355* [1.69]	0.098 [0.48]	0.284 [1.30]	0.056 [0.24]
Inn+Internat	0.042 [0.27]	0.044 [0.33]	-0.007 [-0.05]	0.028 [0.19]
Inn+Comm	0.248 [1.58]	0.155 [1.09]	0.203 [1.29]	0.263* [1.73]
Int+Comm	0.230 [1.00]	0.084 [0.38]	0.105 [0.44]	0.111 [0.46]
Inn+Int+Comm	0.107 [0.61]	0.042 [0.26]	0.005 [0.03]	0.188 [1.11]
Network Structure	-0.105 [-1.07]	-0.154* [-1.72]	-0.196** [-2.00]	-0.121 [-1.24]
Network ID	-0.179 [-1.55]	-0.130 [-1.11]	-0.052 [-0.41]	-0.051 [-0.41]
District	0.325*** [2.98]	0.194* [1.72]	0.120 [0.97]	0.067 [0.55]
Network Size	0.002 [0.27]	0.017** [2.33]	0.004 [0.54]	0.021*** [2.82]
Firm's Age	0.632*** [14.04]	0.664*** [14.96]	0.568*** [12.12]	0.639*** [13.47]
Firm's Size	0.004*** [3.76]	0.004*** [4.11]	0.004*** [3.33]	0.004*** [3.94]
Constant	2.613*** [7.75]	4.343*** [10.68]	2.999*** [8.61]	4.380*** [9.84]
Observations	1,564	1,813	1,497	1,708
R-squared	0.267	0.301	0.239	0.284
Industry FE	YES	YES	YES	YES
Geographical FE_NUTS2	YES	YES	YES	YES

t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.10

Standard errors clustered at firm level

Figure 3.1: Evolution of Italian IFNs.

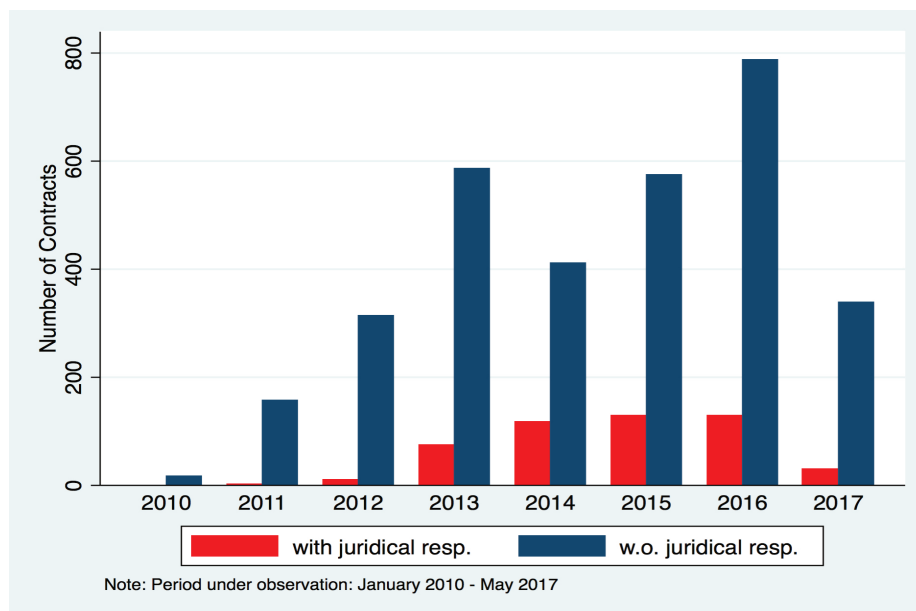


Figure 3.2: Distribution of IFNs according to the type of the network.

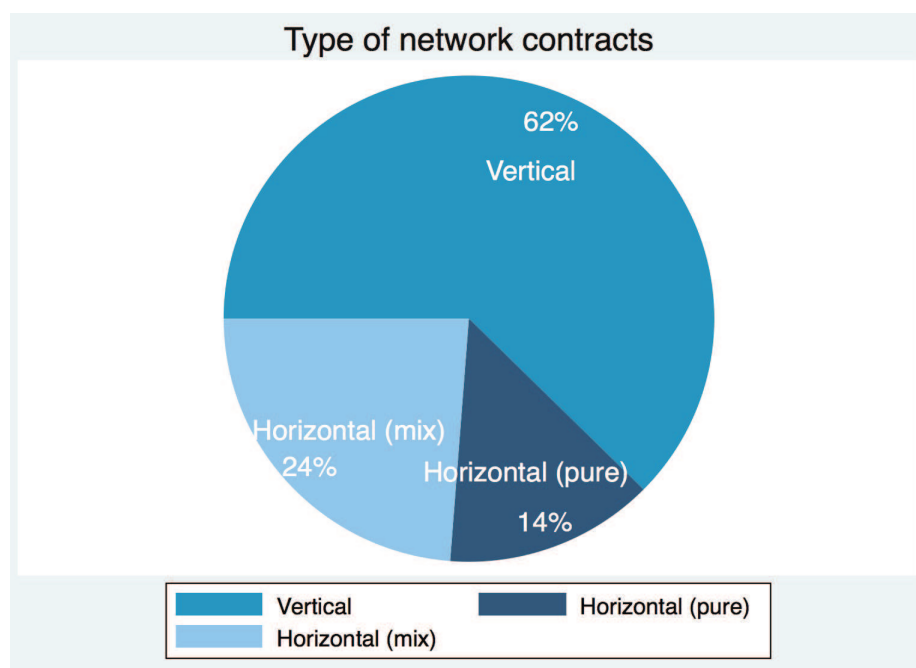


Figure 3.3: Distribution of IFNs according to the aim of the network.

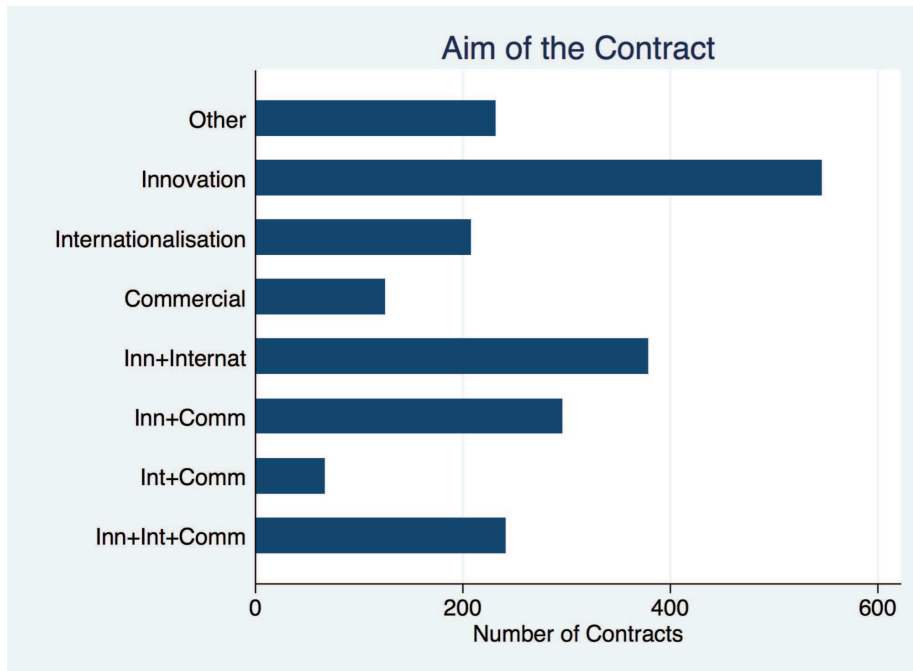


Figure 3.4: Distribution of IFNs according to the aim of the network.

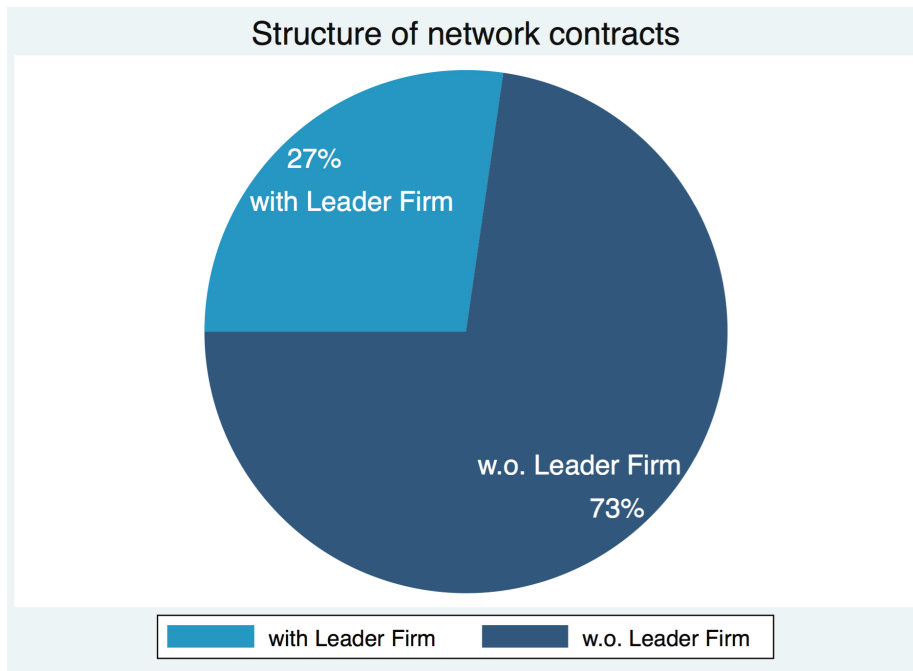
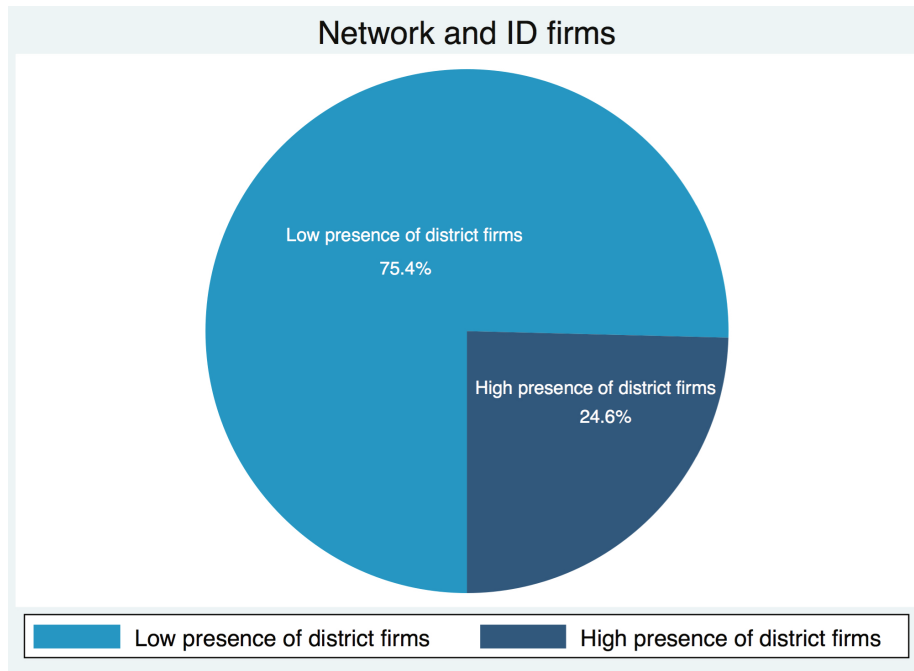


Figure 3.5: Presence of ID firms within the network boundaries.



Conclusions

This thesis is a collection of three self-contained original papers on industrial districts, inter-firm networks and internationalisation processes. The overall aim was to understand how different organizational forms behave under the pressure of international trade and if the agglomeration forces are still an attractive factor in the current academic debate, concerning domestic and foreign markets. To investigate these phenomena, I focus my attention on two examples of organizational forms for manufacturing economic activities. The first one is recognised as one of the most important system of aggregation for small and medium size enterprises., i.e. the Industrial District (ID); the second one is represented by the inter-firm networks, and in particular for those recently ruled in Italy in 2009 (*Contratti di Rete*).

ID firms benefit from the geographical proximity and sector specialisation, and are defined by the literature as perfect *milieux*, where innovation and ideas spread easily across district members (Bathelt, Malmberg, & Maskell, 2004; Becattini, Bellandi, & De Propris, 2009; Lazzeretti, Sedita, & Caloffi, 2014). However, due to the recent economic turmoil, district firms face the necessity to divide the production chain between the district (or the home market) and abroad. This raises up the need to understand which are the factors to be retained domestically, and which ones are worth to offshore to pursue not only cost saving strategies, but also to face the international challenges related to innovation and performance upgrading (Chiarvesio & Di Maria, 2009; De Marchi & Grandinetti, 2014; Giuliani, Pietrobelli, & Rabellotti, 2005).

Despite the importance of sharing same values and location specific characteristics, other types of networks are taking place between firms located far from each other, which can support collaborations or other business goals. In this thesis, I focus my attention on inter-

firm networks, defined as hybrid forms between hierarchies and markets (Ménard, 2012), being aware of the existence of other examples of organizational systems such as joint ventures, strategic alliances, and business groups (Baker, Gibbons, & Murphy, 2002; Cainelli & Iacobucci, 2011; Gulati, 1998). Inter-firm networks represent an interesting comparison with ID firms, in fact, both are aimed to foster the adaptability of firms to collaborate and cooperate for innovation and internationalisation purposes (Fitjar & Rodríguez-Pose, 2015; Parrilli, Dahl-Fitjar, & Rodríguez-Pose, 2016). Moreover, they may usually involve small and medium size companies, preserving their flexibility but at the same time enhancing their competitiveness with bigger firms.

Given the very similar features between ID and inter-firm networks, I try to answer the question: how much does geographical proximity still matter in terms of impacts on firms' performance?

The first Chapter is focused on eight IDs in Veneto and Friuli Venezia-Giulia, two regions in the North-East Italy with the highest concentration of IDs. Within this chapter, my co-authors and I were interested in understanding if producing in Italy, and in particular which steps of the firm's value chain, is still relevant for ID firms. Starting from international business theories, and embracing the smile curve of value creation (Mudambi, 2007), the global value chain framework (Gereffi, Humphrey, & Sturgeon, 2005) and the latest phenomenon of backshoring (Fratocchi, Di Mauro, Barbieri, Nassimbeni, & Zanoni, 2014), we aim to fill the gap in the literature highlighting the importance of producing locally despite the recent interest on in-flows and out-flows of manufacturing activities. Our theoretical argument has been supported through the empirical evidence based on a representative sample of 259 firms. Results highlight the importance of ID production, particularly with high quality goods, and the relevance of Made in Italy and innovation practices performed domestically.

Therefore, going back to the general question if geographical proximity matters, within the first chapter the answer is affirmative. It matters not only in terms of firm closely located (ID ones), but also in terms of preferring the Italian context rather than foreign markets to develop some parts of the value chain activities, due to the degree of innovation capacity and knowledge intrinsic of the ID atmosphere.

The second Chapter, based as well on ID firms, is devoted to investigate the role of social capital and innovation as drivers for internationalisation, in particular for what concerns export activities. Both social capital and innovation related to ID and firm's internationalisation have been widely explored by the literature (Laursen, Prencipe, Masciarelli, & Prencipe, 2012; Valdaliso, Elola, Aranguren, & Lopez, 2011). However, my co-authors and I have explored this relationship within two levels of analysis: the district/firm level and the region/province level. Taking this dual perspective help us to understand which how much importance should be given to social capital and innovation within the district and the region, highlighting the relevance of setting linkages between the local institutions and the firms embedded in a particular area (Molina-Morales, García-Villaverde, & Parra-Requena, 2014). The empirical analysis comprehends the same sample of the first chapter of the thesis for the Italian side, plus a Spanish sample for tile industry firms in the Province of Castellón, for the firm level data. Moreover, the final sample is combined with measures at province level to take into consideration specific local factors that might influence firm's export propensity. This integrative perspective might be interesting both for practitioners and policy makers: the former would prefer to locate the company in a district area where social capital and innovation can spread easily inside and outside the district borders; the latter might implement ad hoc policies to sustain a region/province in developing new collaborations among different actors in the same area.

Within the overall aim of the thesis, this chapter contributes by testing another component related to ID and cluster framework, that is social capital and the set of relationships both at firm and Province level. In this case, the geographical proximity is considered not only between firms or in terms of location of production activities, but also related to the regional concentration and regional facilities to attract firms and to increase their performances.

Finally, in the third Chapter, the study moves from the very well-known ID concept, to the inter-firm network contract. The reason behind this change in the unit of analysis, is to shift the attention from an organizational form that at least in Italy holds for many years (i.e. the ID), to something that is not new in the way is represented, but is the first attempt to formalize collaborations among firms that do not need firm's geographical proximity to take place. Moreover, it has been possible to understand how industrial districts and inter-firm networks can coexist, at least for what concerns the Italian scenario.

Revising the literature on inter-firm network and strategic alliances, innovation and innovation-oriented purposes resulted as the first objective in the vast majority of studies (Dhanaraj & Parkhe, 2006; Parrilli & Alcalde Heras, 2016), while other performance indicators, to date to the best of my knowledge, are quite neglected both theoretically and empirically. I try to fill this gap by investigating the role of inter-firm network with a more in-depth investigation. Even if the empirical setting is quite country specific, relevant results in terms of firm's performance appear in both the two steps of the analysis. The first part emphasizes the benefits, in terms of profitability and efficiency, a firm can get joining an inter-firm network. These findings might be relevant for those firms, for example, that are isolated in an area, but need some partnerships to develop a specific project or product. In the second part, the internationalisation scope, rather than the innovation one, is highlighted as supported by the literature on the internationalisation of

the network (Beamish & Lupton, 2016; Contractor & Lorange, 1989; Coviello & Munro, 1997). This result should be evaluated in terms of policy implications, for those policies aiming at financing collaborations to foster competition in foreign markets (ISTAT, 2017). While the first and the second Chapters of this thesis promote the importance of geographical proximity for firms' economic performance, in this last Chapter this concept fades away, revealing that both ID and inter-firm network can be good instruments according to the aim a firm is pursuing.

The thesis adds some relevant contributions in between the literature of management, related to the location choices in IDs, and of regional economics, related to the importance of geographical proximity and regional determinants. From a theoretical point of view, has been highlighted the role of ID in the ongoing internationalisation process. ID are still important for what concerns performance implications and to face the increasing demand for high quality and innovative products. Location of manufacturing activities turns out to be interesting not only in relation to the offshoring strategies, but also in maintaining the competitiveness in the domestic market. Moreover, the relation between firms and local institutions boost the level of social capital, that in turn, increases the possibility for more productive firms to open up to international trade. This could be an important result also in terms of managerial implications. From one side, ID firms are considered as a source of competitive advantage for some aspects related to quality and innovation. For example, in deciding the location of the company, owners and managers could prefer the ID atmosphere taking the benefits of easier knowledge creation and transfers. On the other side, within the inter-firm network perspective, firms might choose this form of networking to pursue short-term projects or to take part of alliances without losing their brand or label. Therefore, entrepreneurs should evaluate, in the location of the production activities, the importance of the quality of the production and how to choose the correct positioning of

each step in the value chain (De Marchi, Di Maria, & Gereffi, 2017). Following the fil rouge among the three Chapters, and trying to assess overall policy implications, policy makers should evaluate not only the characteristics of a particular district and the relationships between firms and other regional actors, but also they should be aware to the stage where the ID is at that moment in time (Menzel & Fornahl, 2009). Moreover, following the guidelines of Smart Specialisation policy, government should promote and finance those companies which invest in innovation and are more likely to specialised in new but related industries, such as those activities performed in the clusters analysed along the thesis (Boschma, 2014).

Some possible future research opportunities deriving this thesis might concern the evolution of both ID and inter-firm network over time. Having longitudinal data could help understanding long-term behaviours of firms involved in these two organizational features. Furthermore, it could allow to have more precise forecasts on the right paths to follow according to the different phases of the business cycle. Another possible spin-off could be to expand the borders of the analysis also to service sectors (like for example Knowledge Intensive Business Service), join with the manufacturing ones, to have an overall view of the entire economic scenario.