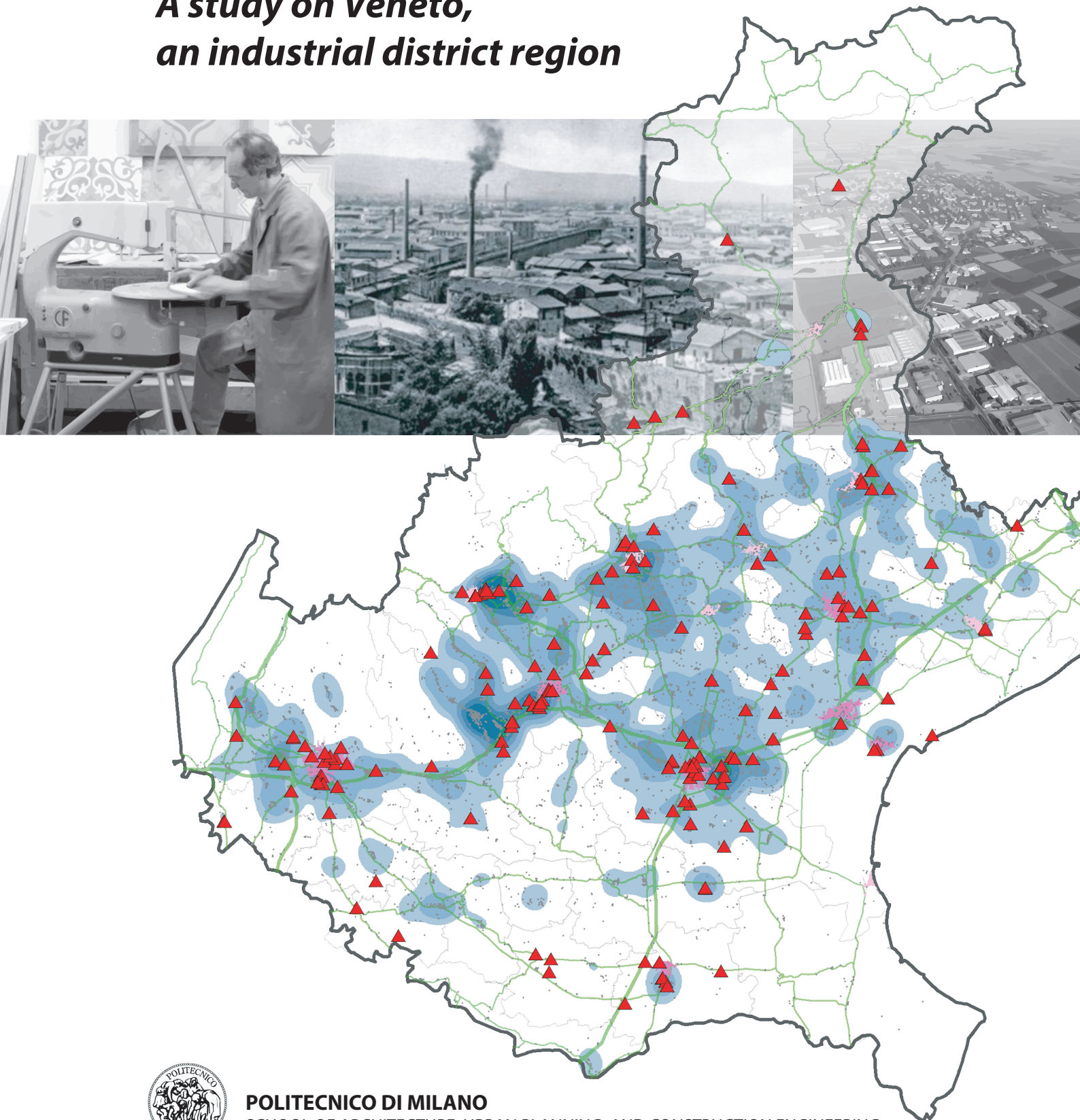


# The Location Behavior of Foreign and Local Manufacturing Firms

*A study on Veneto, an industrial district region*



POLITECNICO DI MILANO

SCHOOL OF ARCHITECTURE, URBAN PLANNING AND CONSTRUCTION ENGINEERING

# **The location behavior of foreign and local manufacturing firms**

**A study on Veneto, an industrial district region**



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## **ABSTRACT**

The Italian Industrial district is an economic model with strong geographical proximity, social proximity, concentration of small and medium size enterprises, and strong specialization in certain manufacturing sectors (Made in Italy sectors). However, entering the 1990s, the wave of globalization arouses scholars' debate on the future of the model of Italian industrial districts (henceforth, IDs), especially as concerns the impact of foreign multinational enterprises on the ID model.

Within this context, the thesis presents a twofold aim: (i) interpreting the location behavior of foreign manufacturing multinationals' affiliates (henceforth, FMNEs), and local firms (henceforth, UNINATs) in Veneto region; (ii) exploring the labor composition of the two typologies of firms, in order to provide some insights on whether FMNEs contribute to augment the region labour force's quality.

The focus on Veneto is explained by its peculiarity: it is a typical industrial district region, and it traditionally represents a world-known economic area for manufacturing production in the Made in Italy sectors.

The empirical analysis, run by means of descriptive statistics and mapping, is based on a dataset of 180 foreign multinational firms (FMNEs), and 8,344 Italian local firms (UNINAT) located in Veneto in 2014. Data come from three sources: 1) AIDA database provided by Bureau Van Dijk; 2) Reprint, compiled by the Politecnico di Milano and sponsored by the Italian Institute for International Trade (ICE); 3) Informative Veneto Labour System (SILV) by the public research institute Veneto Lavoro. The following three location factors: agglomeration density (including the IDs), urban areas (cities), and motorway infrastructure are adopted to analyze the firms' location behavior, as they proxy agglomeration economy (localization and urbanization economies), and transport accessibility. Besides, the three Made in Italy sectors (clothing and textile, furniture and machinery) characterizing the Veneto's IDs are analyzed. It results that all the three location factors play a key role in firms' location choice, and FMNEs in high value added sector, such as machinery, exploit more agglomeration economies. Moreover, the skill composition of UNINATs and FMNEs is analyzed, and it results that latter are more willing to hire skilled labour force, thus augmenting the labour force's quality.

## **ABSTRACT**

Il distretto industriale italiano è un modello di agglomerazione di imprese basato sulla prossimità geografica, la prossimità sociale, la concentrazione di piccole e medie imprese e la forte specializzazione dell'area in alcuni settori manifatturieri (settori tradizionali del Made in Italy) . A partire dagli anni Novanta, la globalizzazione dell'economia ha avuto un impatto significativo sui distretti industriali e i distrettologi hanno iniziato a interrogarsi sul futuro del modello distrettuale ponendo particolare attenzione all'impatto della presenza delle imprese multinazionali estere (IMNE) sulla tenuta del modello distrettuale.

In questo contesto, la tesi si pone il duplice obiettivo di: (i) analizzare le scelte localizzative delle imprese manifatturiere distrettuali - IMNE e imprese locali – della regione Veneto; (ii) esplorare la composizione occupazionale delle due tipologie di imprese per capire se, e in quale misura, le IMNE contribuiscono ad aumentare la qualità del capitale umano della regione.

L'analisi si concentra sul Veneto che tradizionalmente rappresenta un'area riconosciuta per la produzione dei settori distrettuali del Made In Italy. L'analisi empirica si compone di una statistica descrittiva e di una mappatura relativamente a 180 affiliate di IMN estere e 8.344 imprese italiane uninazionali (imprese che non hanno effettuato investimenti esteri e che non sono state acquisite da IMN estere nel periodo di analisi), localizzate nella regione Veneto nell'anno 2014. I dati provengono da tre fonti: 1) la banca dati AIDA di Bureau Van Dijk; 2) il database Reprint, sviluppato dal Politecnico di Milano and sponsorizzato dall'Istituto Commercio Estero (ICE); 3) la banca dati SILV (Sistema Informativo Lavoro Veneto) di Veneto Lavoro.

La localizzazione delle imprese è studiata sulla base dell'analisi di tre determinanti localizzative: a densità dell'agglomerazione (ad includere i distretti industriali), area urbana (città) e prossimità alla rete autostradale. Questi fattori approssimano le economie di agglomerazione (economie di localizzazione e urbanizzazione) e l'accessibilità ai trasporti. Vengono, inoltre, studiati i tre settori del Made in Italy (tessile e abbigliamento, arredamento e macchinari) in cui sono specializzati i distretti industriali veneti. Dall'analisi si evince che i tre fattori giocano un ruolo rilevante nella scelta localizzativa delle imprese e che le IMNE specializzate nei settori a maggiore valore aggiunto (macchinari) sembrano avvantaggiarsi maggiormente delle economie di agglomerazione. Inoltre, l'analisi della composizione occupazionale delle due tipologie di imprese mette in luce come le IMNE siano più propense ad assumere lavoratori qualificati rispetto alle imprese uninazionali, contribuendo così ad aumentare la qualità della forza lavoro e i cosiddetti local commons.

# **1 INTRODUCTION**

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## Preface

The 1970s witnessed the miracle of the 'Third Italy': when large companies were experiencing adverse conditions during the global economic crisis, small enterprises in the northeastern and central region of Italy still kept their high growth rate and drawn the world's attention to the Industrial District economic model (Scott, 2011; Becattini, 1990). Because of its brilliant performance in the stage of economic crisis, many academic studies have been carried out about the definition of industrial district, its mechanism, and its contribution to national or regional economy. Among them, the Veneto region has represented the model to study the industrial district since the beginning of "Third Italy" prosperity, and traditionally it represents a world-known economic area for manufacturing production in the Made in Italy sectors.

However, entering into 1990s, when facing the wave of globalization, extraordinary changes happened to the industrial district. Scholars' debate and a number of empirical studies arouse people's worry about the future of the industrial district model, especially as concerns the impact of foreign multinational enterprises on the ID model (De Marchi & Grandinetti, 2014).

As extensively stated in the literature, four main features characterize the industrial district: geographical proximity, social proximity, concentration of SMEs (small and medium size enterprises) and strong specialization of the area on certain manufacturing sectors (Capello, 2007). The official selection of Italian industrial districts by ISTAT is also based on these four features, and refers to the unit of local labor market area, which represents the intensely connected community in the social context (Becattini et al., 2009). Although the ISTAT classification perfectly reflects the concept of industrial district, scant is the evidence on the mapping of the location of district firms and their agglomeration. Specifically, the mapping of firms visualizes their agglomeration, which is actually the core component or "soul" of industrial districts, and would help to analyze the agglomeration intensity, firms' locational preferences, labour density, and will allow to compare the different spatial agglomerating pattern among sectors.

Moreover, the location of FMNEs within the industrial districts is becoming an inevitable trend (among the others, Amin and Thrift, 1992; Harrison, 1994; De Marchi, 2014). Although there are many empirical studies about IDs under globalization, especially about the relationship between IDs and FMNEs, most of them are based on general economic data, which can hardly offer an image of their location and interaction.



## **Aim, research questions and main results**

Within this context, the thesis sets a twofold aim. First, the location of UNINATs and FMNEs, within the Veneto region, is mapped. In order to explore firms' location behavior, specific attention has been placed to the following three factors: agglomeration density (including the IDs), urban areas (cities), and motorway infrastructure. These three factors represent agglomeration economies (localization and urbanization) and accessibility. Besides, it is investigated whether differences in the agglomeration phenomena occur according to the Made in Italy sectors. The second aim is to analyze the skill composition of UNINATs and FMNEs to speculate the effects of the foreign presence on the local context. This analysis mainly refers to the results of the econometric study (counterfactual model) by Mariotti and Barzotto (2017), and provides additional evidence by means of descriptive statistics and geographical mapping of the density of skilled labour force of both FMNEs and UNINATs.

The main research questions are the following:

1. Where are manufacturing FMNEs and UNINATs more willing to locate (within the IDs, in large urban areas, or close to motorway infrastructure)?
2. Are there differences in the agglomeration patterns by UNINATs and FMNEs according to the sector of specialization?
3. As concerns the role of labour composition, is the availability of skilled labour force a pull factor for the location of FMNEs and UNINATs? Do FMNEs hire a larger share of high skilled employees than UNINATs?

Specifically, the present analysis will take Veneto as case study, and it is based on the location and employment statistics of 8,344 UNINATs (Italian firms<sup>1</sup> that don't have affiliates abroad), and 180 affiliates of FMNEs. The data sources are: 1) AIDA database provided by Bureau Van Dijk allowing us to identify the UNINAT located in Veneto; 2) Reprint, which has been compiled by the Politecnico di Milano and sponsored by the Italian Institute for International Trade (ICE), provides a census on MNEs; 3) The SILV (Informative System Veneto Labour) dataset by Veneto Lavoro, which registers the employment composition and registered information of the firms active in Veneto at the year 2014. Merging the three databases we were able to

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<sup>1</sup> As it will be explained in section 5, data only concerns the uninternational firms that is Italian firms that have never invested abroad, while Italian MNEs are excluded by the analysis because of lack of data.

identify the active manufacturing FMNEs and UNINATs in Veneto in 2014.

ArcGIS is used to locate and analyze all these active FMNEs and UNINATs. After mapping and systemizing the dataset, we could answer the research questions by the following main results:

1. FMNEs have strong preference to both localization economies and urbanization economies. While UNINATs exploit less urbanization economies. Besides, more than 90% of both typologies are located close to the main roads, exploiting good accessibility.
2. Firms specialized in Indirect Made-in-Italy sectors, which are more value-added (i.e. machinery), show a higher inclination to agglomerate within the IDs, and to take advantage of urbanization economy.
3. The thesis confirmed Mariotti and Barzotto (2017) study and demonstrated that FMNEs employ, on average, more skilled workers than UNINATs. FMNEs are located in areas where there is a concentration of high skilled labour force, and at the same time, augment the local labour force quality.

## **Structure of the thesis**

The remaining of the thesis is structured in to the following 7 sections.

- 1) Statement of context
- 2) Definition of agglomeration economies, and agglomeration typologies with a focus on the concept of industrial district.
- 3) The debate about industrial district in the globalization process. This section mainly focuses on the effects (positive and negative) of internationalization on industrial districts.
- 4) The location preferences of FMNEs, and the interaction between FMNEs and UNINATs.
- 5) Description of data and methodology.
- 6) Empirical analysis on the UNINATs and FMNEs located in Veneto and specialized in the Made in Italy manufacturing sectors. This analysis consists of: (i) general understanding of Veneto industrial districts and the investment of FMNEs; (ii) mapping FMNEs and UNINATs within the IDs, large cities, and motorway infrastructures, describing and interpreting their spatial

configuration and locational preferences, and comparing the location behavior of different sectors of specialization; (iii) mapping the density of employees as well as skilled workers for both uni-national and multinational firms.

#### 7) Conclusion and policy implications

## 2 STATEMENT OF CONTEXT

For the developing countries such as China, which is still at the beginning of prospering manufacturing industry, the Italian industrial district model keeps being the best example to learn from, especially for the traditional manufacturing sectors.

However, there is a severe problem of outdated information in Chinese academic study about the Italian IDs. Italian IDs have already experienced great evolution and firm relocation since the second half of the 1980s because of the process of globalization. In the same wave of globalization, Chinese economic geography scholars are seeking ways to understand the mechanism of clusters and regenerate the existing clusters in a better way. When they turn to the Italian IDs, they recognize the similarity of agglomeration of SMEs, specialization on certain sector of industry, local labor pool, cultural homogeneity and strong linkage between entrepreneurs. Meanwhile, they usually mark the continuous innovation, complete service system and high technical capability as the key to survive and win the global competition. However, on the one hand, we are not indeed understanding the configuration of Italian industrial districts. On the other hand, when the local community and social-economic basis is shocked by globalization, and more and more foreign forces into the local economy, we don't know current agglomeration phenomenon in the globalization context, as well as the interaction between the local firms and foreign investment.

From my personal perspective, it is especially interesting that the interpretation of industrial district never stopped changing because of the different stage of economic development. No matter from the Marshall's first description of industrial district to the reinterpreting of Becattini, who believes the former as a means of interpreting economic change. Academic studies always go along with the world development, same as the definition and feature of certain notion, such as industrial district and clusters. Within all these variable theories with the notion of agglomeration, it's fundamental to form the basic interpretation of the phenomenon itself to get into further analysis and critics on present theories.

Given these, the paper aims at describing of Italian industrial districts, by mapping the phenomenon of locational agglomeration of firms (both UNINATs and FMNEs) themselves, which are the core component of IDs. As a student major in urban planning coming from developing countries, studying on this geography economy topic enable me to build a connection of economic activities and locations in a territory, get better understanding of contemporary industrial clusters phenomenon as well as the regional strategy plan on economic development.

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### **3.1 The creation of industrial district concept**

#### **Marshall's concept of industrial district**

The first scholar who focused on the role played by proximity in economic activity and in theorizing the industrial district was Alfred Marshall. As one of the most important economist of neoclassic economy theory, he explained the externalities which attribute to firms locating as clusters. The fundamental advantages lie on four aspect: the source of skilled labor; the growth of supporting and ancillary trades; knowledge and informational spillovers; specialization of different small firms. It is thought all these factors determine cumulative mechanisms that may perpetuated the advantage of the cluster area over others. (Guerrieri, Iammarino, Pietrobelli, 2001) And Marshall's description and characterizing of industrial district is still the base of all the study on this phenomenon and also the Italian IDs nowadays.

#### **Beccatini's reinterpretation of industrial district**

Although the Marshall's theory nestled the industrial district concept, all his study didn't provide the definition of industrial district neither as an investigation object or a kind of model. The real definition—turning from conception to a model of production—was conducted by the Italian scholar Beccatini.

After the decline of Fordism, the Marshallian concept of industrial district regained scholar's attention, partly because of the changes Italian manufacturing system acted to the crisis. Indeed, in the late 1960s, when large companies collapsed, Italy experienced a bloom of small and medium sized firms concentrated in some specific areas, which was called "the Third-Italy". The conditions that allowed the rise of industrial districts in Italy were: on the supply side, a peculiar cultural complexity of values and knowledge and a credit system that could finance new initiatives; and on the demand side, a large middle class who asked for new high quality products (Beccatini, 2002).

*'A social-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge' (Beccatini, 1990, p38)*

The same features of Marshall's theory was recognized in the Italian production system. And Beccatini with the state academic institution started officially turned the concept into IDs. According to Fabio Sforzi's study, Beccatini have two concept of industrial district, one as a 'unit of investigation', one as a 'model of production' . The

concept of “model of production” is proved to be more commonly used because of its important policy implications to support industrial development.

However, despite of the joint reasons for different use of the notion, both concepts share the same characteristics of Italian industrial districts, which emphasis most the homogeneity in culture and social background of the workers and entrepreneurs, the continuous interaction between small and medium sized firms, and the entire value chain with specialization on certain sectors. All these characteristics ensure the economic and social structure flexibility and rapid adjustment to market volatility (Capello, 2007). The social basis of internal connection is the soul of Becattini’s concept, while it is also the target of criticism about the continuity of the notion in this era.

### **Porter’s cluster theory**

The cluster theory is embedded in a wider theory on competition. He indicated that proximity of firms and the locational agglomeration contributes to the knowledge spillover, innovation which stimulates the regional competitiveness. In underlining the benefits of co-location for firms, Porter (2000) cites three key factors: the local labour market, a more effective relation input-output and technological spillovers occurring among firms. Moreover, for explaining the importance of locational concentration, a fundamental aspect is stressed that the local knowledge spillover relies on face-to-face interactions among actors in the cluster. (Storper and Venables, 2004; Bathelt and Turi, 2013) Four different properties of face-to-face interactions have been identified: 1) the co-presence stimulate communication and exchange of information on new technologies. 2) repeated interactions help in reducing free-rider and coordination problem, and improving transparency and clarity in the transmission of information. 3) the concentration of all firms lower the cost of screening competitors. 4) beyond the visual and verbal communication, co- presence allows a measure of the performance and provides motivation.

However, there also lies debate on the cluster’s real dynamics and its determination role leading to regional competitiveness. For instance, Simmie(2004) states that the firms especially high-technology firms, benefit more from relationships with firms on national and international scale rather than on the regional scale. Some scholar also point out the political function of the cluster theory which made the popularity but actually exaggerated the role of clusters .Because of the advantage of making region more competitive, being directly related to business strategy and easier to conduct, Porter’s concept is more adaptable to policy makers. (Martin and Sunley, 2003)



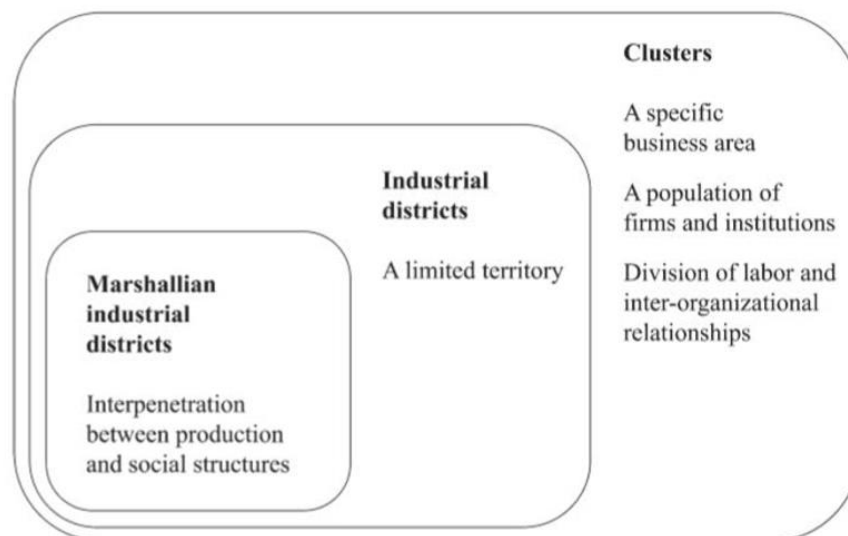
### 3.2 Interpretation of different agglomeration models

Despite that the definition of industrial district, in this article, will strictly follow the official one of the handbook of industrial district committed by ISTAT generated by Becattini's theory, there are many assimilation between industrial district and cluster and fuzzy use of the notion. Thus before using industrial district as the object of analysis, it's crucial to identifying different interpretation of the notion.

In many Chinese literatures, scholars regard Marshall's theory about industrial district and Porter's cluster as two branches of industrial agglomeration.(Wang,2010). In Marshall's description of this geographic economy phenomenon, he use the phrase "the concentration of specialized industries in particular localities". While Porter describe the cluster as "geographic concentrations of interconnected companies and institutions in a particular field". The former, which is also the base of Becattini's interpretation, emphasis the whole industry value chain with firms, local community and workers come from it. And the latter is more focused on the interconnection between firms which will prompt the regional innovation ability and make the region more competitive than those without clusters (Porter, 1998).

Otherwise, some scholars regard clusters as a more general notion describing the set of agglomerated firms and economic activities (De Marchi& Crandinetti, p.74, 2014) with the industrial districts as a subset, and Marshallian industrial districts as an even more specific notion.

**Figure 1: Marshallian ID, industrial districts and Clusters**



*Source: De Marchi & Grandinetti, p.74, 2014*

Industrial districts are formed by firms of different dimensions, but the division of labour among them gives rise to a numerically marked prevalence of smaller businesses (De Marchi and Grandinetti, 2014) which is usually accompanied with the feature of SMEs centralization and specialization of manufacture. In addition, in many cases especially the Italian context, the notion of industrial district have an official territory defined by LLMA(local labor market area) and selected by series of calculation and comparison, which narrowing the definition compared with clusters.

Meanwhile, because of the similarity of characteristics described by Marshall and Italian cases, the Italian industrial districts are often recognized as Marshallian industrial districts (Markusen,1996; Knorringa and Meyer Stamer, 1998; De Marchi& Grandinetti,2014) with a strong emphasis on the internal social-economy attribute.

This concept is accepted by most scholars. Based on Markusen's cataloging 5 typologies of industrial clusters, Peter Knorringa and Jerg Meyer Stamer (1998) divided clusters as Italianate, Satellite and Hub-and-spoke. The main features of the Italianate cluster, which is Italian industrial district, are consisting of mainly SMEs, strong specialization, strong local rivalry and networking, and trust-based relationships. And Fabio Sforzi, one of the most important scholar of Italian IDs, when criticizing on Markusen's division, he exclude 3 kinds from the "real industrial districts" and stress again the importance of cultural base and internal social connection.

However, there is the third voice pointing out that in many cases industrial district and cluster can be considered synonymous, representing the same local system (Belussi, 2006). He also stated that the industrial district described by McCann (2006), following Markusen (1996) is an Italianate stereotype of a cluster, just for emphasizing the "social" factor in the system.

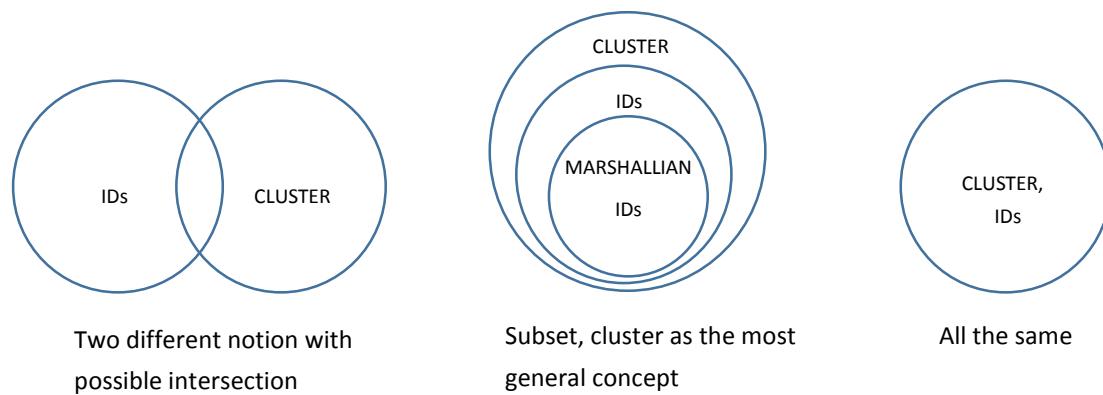
*"An alternative theoretical view could maintain that these phenomena can occur with different intensity both in clusters and/or in industrial districts, but they are typically studied by researchers interested in developing a socio-economic analysis (Becattini, 1990 and 2003), away from the neoclassical paradigm of perfect rationality."* (Belussi, 2015)

Another scholar who support the assimilation of different notions is Bennett Harrison(1991), who is convinced that the function of ID or SMEs clustering in a specific location is overrated. He argued that the extent to which the district as a contemporary theoretical construct cannot explained by conventional neoclassical economic categories of 'agglomeration' and 'externality'. Besides that, he thinks the benefits of share of infrastructure, flexibility among sectors, knowledge and labours,

could also be gained by big firms with their specialized sectors, even without the limit of gathering in the same place. The concept of Marshall's external economies—outside the firm, but inside the district system in which the firm operates(Asheim,1996) can now be gained also inside the firm.

To sum up, all the discussion and interpretation of different notions can be summarize as figure 2. Because of the different interpretation through different theoretical approach, it is extremely necessary to analyze the phenomenon from an objective angel with descriptive approach.

**Figure 2: interpretation of different definition and clarification**



*Source: graph by author*

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Globalization refers to the free movement of goods, capital, services, people, technology and information beyond the national borders. And when speaking of the economic globalization along with the industrial district, we usually target at the corporations outsourcing manufacturing for getting comparative advantages, which named MNEs (multi-national enterprises) and with FDIs (foreign direct investment). The FDIs can be divided into two typologies: inward FDIs and outward FDIs. In the context of globalization, industrial districts are experiencing both the phenomena, while in the present thesis, inward FDIs, represented by the affiliates of FMNEs, will be the key object of analysis.

It's generally accepted that most industrial districts and clusters are connected within global value chains (Amin and Thrift, 1992; Harrison, 1994; etc). Although industrial districts are often described as locally self-contained, they are undoubtedly more and more involved in the globalization and benefit from it (Belussi, 2015). According to Belussi's study, in his 22 samples of IDs, half of them adopted off-shoring strategies with success, developing international subcontracting chains. However, by studying the impact of globalization and FMNEs on industrial district, scholars demonstrate both positive and negative perspectives.

### **POSITIVE PERSPECTIVES**

According to literatures, the positive effect of inward FDIs on the HOST COUNTRY mainly concern: 1) knowledge spillover and skills spillovers to domestic firms; 2) exports and introduction of new industries; 3) wages; 4) employment; 5) host country growth (see Lipsey, 2002; Ietto-Gillies, 2012; Barba Navaretti and Venables, 2004).

From the positive perspectives, it's usually taken as a mutual gain for both local firms and FMNEs in the context of globalization. On the one hand, inward FDI or global value chain would promote the level of local industrial districts. On the other hand, the agglomeration of local firms or the connection within local firms could also benefits the MNEs. The external linkages or foreign connections bring the source of knowledge to the relatively self-centered industrial districts. (Bathelt et al., 2004). And thus the external linkages are knowledge-changing mechanisms which expand and upgrade the cluster's existing capabilities (Bell and Albu, 1999), which complements and get combined with the local buzz.

As a result, the following positive processes are engendered in local economies by the presence of multinationals (Capello, 2007):

- 1) A strengthening of the productive system in areas with scant entrepreneurship

- 2) Enhancement of industrial agglomeration effects
- 3) Job creation at the local level
- 4) Stimulus for new industrial investments upstream and downstream from the multinational firms
- 5) The creation of new firms upstream and downstream from the multinational
- 6) Increased managerial and technological expertise in the area
- 7) Localized technological spillovers
- 8) Cross-fertilization between firms and local institutions in the provision of vocational training

Among all the empirical studies on this topic, the analysis developed by Mariotti and Barzotto (2017) finds that FMNEs located in Veneto hire more skilled workers than UNINATs thus positively affecting the local industrial commons. The thesis will adopt the same data used by Mariotti and Barzotto (2017) and will try to corroborate the results of their econometric analysis (counterfactual analysis) by mapping and analyzing the density of skilled labour force of FMNEs and UNINATs.

#### **NEGATIVE PROSPECTIVES**

However, even negative impact of FDIs on the industrial district may occur, and they mainly concern: 1) reduce firm population of districts; 2) break original social structure between enterprises; 3) entrepreneurship decline; 4) lower the diversification of the local production structure; 5) lower concentration of the turnover and workforce (see De Marchi & Grandinetti, 2014). After studying Eighty-five papers and books, De Marchi and Grandinetti concluded six phenomenon happening in industrial districts because of globalization, and they concluded that the Marshallian features of the Italian IDs are disappearing (2014). In other words, the common argument states that both outward FDIs, and inward FDIs break the local value chain. Fast growth involves disruptions and the destruction of the value of old techniques of production and old skills as well as the firm's social and cultural connection, thus leading to the reduction of local firm population and workforce.

Moreover, with the argument on the flexibility of industrial district raised by Harrison (1991, see chapter 3.2), the debate also arises where the function of social characteristic itself is doubted in the context of globalization. In recent studies, by using statistic of share of entrepreneurs from 2006 to 2011 academics proved the strong interaction between the firms in IDs will amplify the response to shocks such as the 2008 recession. (Brunello and Langella, 2016)





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## **5 THE LOCATION BEHAVIOR OF FOREIGN MNEs**

For UNINATS, especially those located in the industrial districts, the starting of business is mostly related to family skills and as a result locating with the settlements. Undoubtedly, the relocation of UNINATs and location choices of entrepreneurship also depends on the market size, labour factors, agglomeration economies and transport infrastructures (Stam, 2007). Thus most studies focus on the location choices of foreign MNEs, which also attribute to MNEs' potential contributions to regional economic development and political demand (Mccann, 2004).

For FMNEs' locational choices, the literature tries to find their location behavior. In the international business literature the most quoted study is Dunning's (1977) OLI framework, which focuses on the nature, role, and behavior of MNE. The framework posits that multinational activities are driven by three sets of advantages, namely ownership (O), location (L), and internalization (I) advantages. However, most study is based on the context of country, not suitable for explaining the location behavior in micro level or with a single region.

The location patterns can be grouped into five main macro factors: 1) traditional location factors such as labour, skills, transport cost and so on 2) Infrastructures, services and intangible assets 3) Environmental and social context 4) policy framework 5) information costs (Mariotti et al. 2012). They also marked the key factors that influence FDI location preferences, such as market size and growth potential, labour factors (cost and quality), agglomeration economies, transport infrastructures and facilities, FDI penetration and transaction costs reduction, government incentives, political stability, and cultural and geographical proximity. (Mariotti et al. 2012)

**Table 1: the key factors that influence FDI location preferences**

Categories	Factors
Traditional location factors	<i>Labour</i> Labour costs and availability Labour skills and labour unionization <i>Market</i> Market size and market potential Competitiveness level and density <i>Land</i> Land costs and availability <i>Agglomeration economies</i> Localisation economies Urbanisation economies <i>Transport costs</i> Other costs Taxes and financing
Infrastructures, services and intangible assets	Presence of and accessibility to infrastructures Utilities' quality Business services (banking and financial services) Scientific and technological assets
Environmental and social context	Social cohesion and sense of legality Economic, political and social stability Legal system Intellectual property right protection Bureaucratic efficiency
Policy framework	Competition policy Trade policy Tax policy Environmental policy
Information costs	Geographical distance from the core (of city, region, nation) Geographical proximity to the home country Cultural proximity between the home and the host countries FDI penetration

Source: Mariotti et al. (2012)

In this thesis, since the study is conducted by visualized approach by mapping, and is based on location data, the geographic factors will be analyzed. Therefore, the main focus will be comparing the attractiveness of localization economy and urbanization economy. In addition, the accessibility of FMNEs and UNINATs (motorway infrastructure) will also be analyzed as one of the most important factor affecting firms' location behavior.

According to Capello (2007), the advantages that induce firms to opt for concentrated location can be grouped into three broad categories: 1) economies internal to the firm, also called economies of scale, such as large firms with all plants concentrated; 2) economies external to the firm but internal to the sector, called localization economy; 3) economies external to the firm and external to the sector, called urbanization economies. The localization economies together with the

urbanization economies are defined as agglomeration economies.

The locational economies refers to firms located in an area densely populated by firms operating in the same sector. The locational economies are determined by the size of the sector in a particular area with a wide range of specialized suppliers and in which skilled labour and specific managerial and technical expertise are available.

The urbanization economies refer to high density and variety of productive and residential activities in an area; features which typify urban environments. The advantaged in this category accrue from the presence of large-scale fixed social capital (urban and long-distance transport infrastructures, advanced telecommunication systems), and a broad and diversified intermediate and final goods market. These advantages increase with the physical size of the city (Capello, 2007).

Regarding the difference between localization economy and urbanization economy, one empirical study on the new firms in Spain (Monseny et al, 2015) indicates that urbanization effects are high in knowledge-intensive industries, suggesting that firms locate in large cities to benefit from knowledge spillovers. While localization effects are high in industries that worker's skills are more industry-specific, suggesting that industries locate in specialized economic environments to share a common pool of specialized workers

The literature on FMNEs' location behavior according to: localization economy, urbanization economy and accessibility is as follow can be summarized as follows.

### **1) Localization economy**

Although the role played by location might have declined due to the development of ICT, most economists and economic geographers believe that location concentration still or even more counts in the global economy (Porter, 2000). In other words, the origin local system on regional level is a factor attracting foreign investment (Cantwell and Piscitello 2002; Nachum and Wymbs 2002). For example, Nachum (2000) examined FDI in US in the professional services industry pointing out that "agglomeration economies and location advantages together shape the location choice of MNEs in the US".

The most important interaction between MNEs and local firms concentrate on three topics: local labour pool, reduction of liability of foreignness by entering local network and access to the local tacit knowledge. For instance, study conducted by Nachum and Keeble (2003b) resulted the co-location of MNEs attribute to the large labour pool within the agglomeration and the process is a virtuous circle of

promotion. The importance of network is stressed by Johanson and Vahlne(2009):a firm's success in accessing overseas markets requires to be established in one or more networks, becoming and insider to develop its relationships to build trust and commitment in order to learn, avoiding being an outsider and thus suffering from the liability of outsidership and foreignness. In this sense, recent empirical evidence has revealed that firms can learn by participating in their customers' networks and thus overcoming information asymmetries (Fjeldstad and Sasson, 2010). Moreover, for getting access to the local tacit knowledge, evidence are found that foreign affiliates are dependent upon local linkages in a similar manner to indigenous firms (Nachum and Keeble 2003a) accessing knowledge is not available from the head- quarters meaning that the affiliate needs to rely on local specific resources, implying a strongly embedded behaviour (Prahalad and Doz, 1987; Barlett and Ghoshal, 1989; Birkinshaw and Hood, 2000)

## **2) Urbanization economy**

Unlike industrial clusters that base their competitive advantage on industrial specialization, global cities enjoy an advantage because of their economic and social diversity (Jacobs 1969), thus enable firms to be close to the market and more growth potential. In addition, the FDI's preference of location near global cities also attribute to the lower cost of liability of foreignness (Nachum 2003, Goerzen et al. 2013).

Concerning the different behavior of service firms and manufacturing firms, study are found explaining coordination and support activities and supplier-driven activities' different preferences confronting the global cities. For coordination and support activities, they have indeed an advantage in locating within global cities because they can enjoy agglomeration economies and broaden the global distribution of their service provision. The service complex in urbanized area offer them great technological advances in computing and communications. While the supply-drive activities, most manufacturing firms belonging to, are more sensitive to congestions costs and high tax payments caused by high density of economic activities (Duranton and Puga 2003, Egger et al., 2013, Voget 2011). But for the supplier-driven activities, the metropolitan areas could be a good option for lower cost.

In this paper, the study object is manufacturing firms, mostly referring to the supply-drive activities. But for the FMNEs, most of the data address are the

location of headquarters, which may have the same preferences as the support activities.

### **3) Transport infrastructure (accessibility)**

The term accessibility expressed the facility with which activities may be reached from a given location by using a certain transport system (Morris et al,1978). And good accessibility enable individuals and companies to reach those places in which they carry out their activities with lower cost (Linneker and Spence, 1992), thus being a major factor for the social and economic development of a region (Wegener and Bokemann, 1998; Urata and Kawai, 2000). Empirical studies have done in Spain proved that region with better accessibility can be more competitive (Gutiérrez et al, 2010). And industrial concentration is more likely to happen with a good accessibility because of lower cost on trade and logistics (Vickerman, 1989, 1990).

Given all these, most studies are related to outsourcing location choices in the context of national or regional competitiveness, while little study focuses on the locational preferences of manufacturing firms in micro level, including both UNINATs and FMNEs in the same region, which would be the second part of my study.

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## 6.1 Data sources

The paper adopts 5 sources of data<sup>2</sup>:

1) ISTAT 9° Censimento dell'industria e dei servizi

The industrial district classification is provided by the report of industrial district 2011. The geographic data is downloaded from ISTAT website as the polygon shapefile.

2) SILV (Informative System Veneto Labour)

The SILV dataset by Veneto Lavoro, which registers the employment composition( age, gender, citizenship, professional activity, educational qualification, type of contract, new hirings/dismissals) and registered information(fiscal code, name, address, NACE code) of the firms active in Veneto at the year 2014.

3) AIDA

AIDA database is provided by Bureau Van Dijk. This database allowed us to identify the UNINAT located in Veneto and exclude all the multinational firms.

4) REPRINT

Reprint data, which has been compiled by the Politecnico di Milano and sponsored by the Italian Institute for International Trade (ICE), provides a census on both the foreign affiliates of Italian firms, and on Italian affiliates of foreign firms (in terms of number of employees and sales) since 1986, and it is yearly updated (for details, see Mariotti and Mutinelli, 2016). Data on the affiliates of FMNEs (Inward FDI) located in the Veneto's IDs come from the Reprint database.

5) The WFS service of GEOPORTALE NAZIONALE

The open data offers geographic data of Corine land cover which I can pick out the urban areas of big cities, and the polyline of motorway infrastructure.<http://land.copernicus.eu/pan-european/corine-land-cover>

Merging AIDA data with Reprint data we were able to identify the FMNEs and UNINATs. And for getting the complete information of employees and skilled labor force, we need to also combine the SILV dataset.

The mapping of UNINATs and FMNEs is based on the address and firm name according to the reprint and AIDA. The matching of the firm address and employments data is based on firms' fiscal code. The classification of sectors the firms belonging to

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<sup>2</sup> The data from AIDA, Reprint and SILV have been provided by Mariotti and Barzotto (2017).

strictly obeys the classification in report of industrial district and the NACE Rev.2 (statistical classification of economic activities in the European community, or Codici ATECO 2007 in Italian)

After cleaning up the dataset, as well as selecting all the valid location point. The sample of Veneto active firms in consists of 180 FMNEs and 8,344 UNINATs with valid location data, not include any Italian firms with affiliates abroad (see Mariotti and Barzotto, 2017).

According to the Reprint database, 257 FMNEs invested in Veneto with 299 manufacturing affiliates. Since we had complete data on 180 out of 256, we gained 70.3% of the total number of FMNEs, therefore the analysis will be valid and sufficient to describe and explain the agglomeration phenomenon of FMNEs. In addition, it is important to state that the address data refers to the headquarters of the FMNEs. The table also shows FMNE are larger on average than the UNINATs, 58% FMNEs in Veneto having 10 to 49 employees and 20% having more than 50 employees. (Table 2)

According to the ISTAT data (2011), in 2011 there were 47941 active manufacturing firms in Veneto (including FMNEs and Italian multinational firms). Because of the limit of database, we cleaned it up and got 8344 UNINATs and 180 FMNEs (8524 in all) in Veneto, which is 17.78% of the total number. Despite that it's just a 1/5 part of the total, the firms we analyze in the study are mainly small and medium sized firms (4008 micro size firms with 1 to 9 employees, 11.38%; 3821 firms with 10 to 49 employees, 40.75%), and medium-large firms (49-249 employees, 35.7%), which are the most important components of industrial districts and firms contribute most to economy and labor pool. (Table 2).

**Table 2: composition of the 8344 UNINATs and 180 FMNEs' sample and comparison with overall statistics of Veneto region**

	1-9	10-49	50-199	200-249	250-	total
Active manufacturing firms in Veneto	35446	9617	1399	66	166	47941
Chosen UNINATs	4008	3821	463	8	10	8344
Chosen FMNEs	24	98	48	4	6	180
Total chosen	4032	3919	511	12	16	8524
Total chosen by all	11.38%	40.75%	36.53%	18.18%	9.64%	17.78%

*Source: author's elaboration on ISTAT data*

Given all these, we believe the data we adopted in this study are valid to describe the agglomeration phenomenon of firms, location preferences of FMNEs and the labor

## 6.2 Methodology

In the present thesis firm agglomeration is described through the use of geographical mapping.

Different from the economic method, the geographical method pay more attention on the location and regional objects, thus include a certain geographical territory and spatial configuration, such as using location quotient to recognize the industrial district, or EG index to do empirical study on the intensity of agglomeration.

However, all those methods are cluster-based approach, whose unit is municipal boundary or LLMAs in the ID case. The problem of this method is the possible distortion caused by different scale of geographical unit which could be solved by minimize the scale of unit. Although the data of large unit is much easier to get comparing to micro data, the direct study on the firm location with point data is obviously the most accurate method to describe the locational agglomeration of firms.

Moreover, with the geographic analysis software such as ArcGIS, we can get visualized image of all the mapping and analysis, which enable us more comprehensible interpretation about the spatial relationship between all the factors.

Given these, the study will adopt micro-data-based approach to mapping uni-national firms and foreign MNEs according to two location factors: proximity to industrial district, big city and motorway infrastructure, availability of skilled labour force. Besides, a specific analysis on the three 3 sectors will be run.

The methodology consists of 3 steps:

- 1) Locating all the firms in ArcGIS.

First the software Xgeocoding allowed to transfer the location into coordinates. Next step consisted in the double check with GIS. After transforming the data into shapefile, we could clearly see them on the map of Veneto. Most of them are within the correct city, while some are not, which I also need to manually check with the firm name and location.

- 2) Evaluate the correlation with three factors

The correlation with three factors (IDs, big city and motorway infrastructure) was analyzed by visualizing the location of firms and location of three factors. The shapefile data of industrial districts were from ISTAT and the shapefile data of big city and motorway infrastructure are selected from Corine land cover database.

For getting more accurate result of their location relation, the function “select by location” in ArcGIS was used to select firm points within different criteria: 1) localization economy: high density of firm agglomeration and medium density of firm agglomeration; 2)urbanization economy: inside the city and within 5km buffer from city; 3)accessibility: 1 km and 5km from the motorway. As a result, both the numerical calculation of proportion and the maps enabled us to interpret the location preference of FMNEs and UNINATs and their spatial configuration.

### 3) Evaluate the intensity of firm and employment density

The approach to evaluate the intensity of firm density is K-density, Kernel density function developed by Silverman (1986). The estimator of the density of bilateral distances(K-density) at any point d is:

$$\hat{K}(d) = \frac{1}{n(n-1)h} \sum_{i=1}^{n-1} \sum_{j=i+1}^n f\left(\frac{d - d_{i,j}}{h}\right)$$

$d_{i,j}$ : the Euclidian distance between establishments

$n$ : number of establishments

$h$ : the bandwidth (seted according to Silverman(1986))

$f$  : the kernel function

However, the process was automatically done by ArcGIS and exporting the density and visualized maps, according to which we could interpret the intensity of agglomeration and analysis the impact of FMNEs on skilled labour force by testing the change of density of skilled labors with and without FMNEs.



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The empirical analysis will be divided into three parts:

- 1) The general introduction of IDs in Veneto region and some statistics of firms and inward FDIs
- 2) Location preference of FMNEs and UNINATs.
- 3) The skill composition of UNINATs and FMNEs to speculate the effects of the foreign presence on the local context.

As concerns the first section, the 28 industrial districts of Veneto are described and their sectors of specialization is presented.

Next, the analysis of locational preferences allows to understand whether and how Uninational firms (UNINAT) and FMNEs agglomerate within the IDs, focusing on two questions: i) Where are FMNE headquarters more willing to locate (within the IDs or in the large urban areas)? ii) Are there differences in the agglomeration phenomena by UNINATs and FMNEs according to the sector of specialization?

The location choice of UNINATs is mainly considered as a comparison with FMNEs due to their different demand and preferences. The analysis will be divided into three parts according to the three possible factors: IDs, urban areas and motorway infrastructures. All the analyses will be conducted into two steps, first is the mapping of all FMNEs and UNINATs, second the comparison between three sectors of specialization: textile, furniture and machinery, which also represent the direct Made-In-Italy sectors(textile, furniture) and the indirect Made-In-Italy sectors(machinery).<sup>3</sup>

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<sup>3</sup> The analysis of the specialization sector is based on the classification in three macro-sectors, according to the Pavitt classification (see the Appendix):

1 Direct Made-in-Italy (i.e. textile, footwear and leather) are sectors characterized by innovation mainly provided by suppliers, and the majority of their technology is given by other sectors.

2 Indirect Made-in-Italy (i.e. machinery and equipment) depend on specialized suppliers, with engineering knowledge and competencies.

3 Other sectors are mainly scale-intensive and science-based sectors. These are based on science (i.e. pharmaceutical and electronics), with insourced R&D.

## 7.1 Industrial districts in Veneto region

Regarding Italian industrial districts in Italy, there are 141 industrial districts specialized into eleven macro sectors selecting from the 611 LLMA (local labor market area), according to the ISTAT 9° Census of industry and services (ISTAT, 2015), and Becattini's classification (see appendix the official classification of sectors). Although the total number of industrial districts have declined from 181 in 2001 to 141 in 2011, the industrial district still present one-fourth of the Italian productive system in terms of LLMA<sup>4</sup>. And the ID's manufacturing employment is more than one third of the total Italian employment (ISTAT,2011).

Among all 20 regions in Italy, the thesis focuses on Veneto region to study the Italian industrial district and describe locational agglomeration of manufacturing uni-national firms and foreign FMNEs. Veneto is one of the 20 regions of Italy, belonging to North Italy. Its population is 4,865,380 (2012), ranking fifth in Italy. For more than 50 years ,Veneto region has been world known for its industrial districts in Made-in-Italy sectors.

According to the 2011 ISTAT census, the North Est macro-area, which traditionally represents the reference area of the Italian industrial district model, hosts the majority of them (45; 31.9%), with Veneto region hosting 19.9% (28 IDs) of the Italian IDs, which employed 26.7% of the total workers, reflecting high share of Veneto industrial district in Italian economy. The region own 28 Industrial districts (2011) in 43 LLMA, 34 LLMA in manufacturing (see Table 4), taking the highest share of IDs by LLMAs.

**Table 3: The geographical distribution of the Italian industrial districts at 2011**

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<sup>4</sup> The decreasing number of industrial districts form 2001 to 2011 can be attributed to the decline of LLMA from 683 to 611 that experienced a size increase in the period. In addition, there was also an increase of employees in IDs from 4802081 to 4887527.

The employment growth is mainly in the service rather than manufacturing sectors. According to the statistics, there were 16.7% rise of employees working in service within IDs, and 10.4% rise of firms in services. The reduction of employees in manufacture is 21%, following with the 21.6% reduction on firm establishments. Actually, the decreasing rate within industrial district is similar to the national one, which could be a reflection of the globalization impact that fostered firms to relocate production activities to low wage countries.



	Industrial districts		Employees	
	n.	%	n.	%
<i>North-West</i>	37	26.2	1,812,392	37.1
<i>North-East</i>	45	31.9	1,788,770	36.6
<b>- Veneto</b>	<b>28</b>	<b>19.9</b>	<b>1,278,439</b>	<b>26.2</b>
<i>Center</i>	38	27.0	959,537	19.6
<i>South &amp; Islands</i>	21	14.9	326,828	6.7
ITALY	141	100.0	4,887,527	100.0

*Source: Mariotti and Barzotto (2017)*

**Figure 3: Location of Veneto and its 7 provinces**



*Source: author's elaboration on ISTAT data*

**Table 4: The geographical distribution of IDs and LLMAs**

	north-west	north-east	VENETO	centre	south	island
IDs	37	45	28	38	17	4
LLMA manufacturing	63	67	34	53	31	6
LLMA total	106	119	43	105	171	110
share of total IDs	26.20%	31.90%	19.90%	27%	12.10%	2.80%
share of IDs by LLMA manufacturing	58.70%	67.20%	82.40%	71.70%	54.80%	66.70%
share of IDs by LLMA total	34.90%	37.80%	65.10%	36.20%	9.90%	3.60%

*Source: author's elaboration on ISTAT data*

Among all 11 sectors, IDs in Veneto are specialized in 6 of them: textile, leather and footwear, furniture, jewelry/sports/musical instruments, food and drink, machinery. There are 5 IDs specialized in textile, 7 in furniture, and 12 in machinery, all taking a dominated share of north east. Among the Italian regions, Veneto registers the higher percentage of IDs in machinery and equipment (31.6%), and wood and home furniture (29.2%). It also hosts one fourth of the Italian IDs in jewelry, 11.8% in leather and footwear, and 15.6% in textile and clothing. (Table 5)

Thus in the following comparing analysis, this three sectors will also be taken as the comparing objects.

**Table 5: The geographical distribution of IDs and LLMAs**

	North-west	North-east	-VENETO	center	South & islands	Total
textile	11	6	5 (15.6%)	6	9	32
Leather and footwear	6	2	2	7	2	17
forniture	5	13	7 (29.2%)	5	1	24
jewellery	2	1	1	1	0	4
food	2	3	1	2	8	15
machinery	18	19	12 (31.6%)	1	0	38
chemical	3	1	0	0	0	4
transport	4	0	0	0	1	5
paper	1	0	0	1	0	2
total	52	45	28	23	21	141

*Source: author's elaboration on ISTAT data*

**Figure 4: IDs in Veneto and their sectors of specialization**



*Source: map by author*

Meanwhile, the Veneto region shows a significant attractiveness towards foreign multinational enterprises (FMNEs). According to Mariotti and Barzotto's (2017) study on the reprint data, FMNEs in Veneto region is four times higher than the Italian average, and five times higher than those of Lombardy region, which can be considered the Italian economic and financial hub.

According to Reprint, 257 FMNEs invested in Veneto with 299 manufacturing affiliates, which represent 11% of the total foreign affiliates in Italy. And the analysis in this paper adopted 180 FMNEs after merging all the data sources.

**Table 6: FMNEs in Italy and Veneto in 2013. Manufacturing industry**

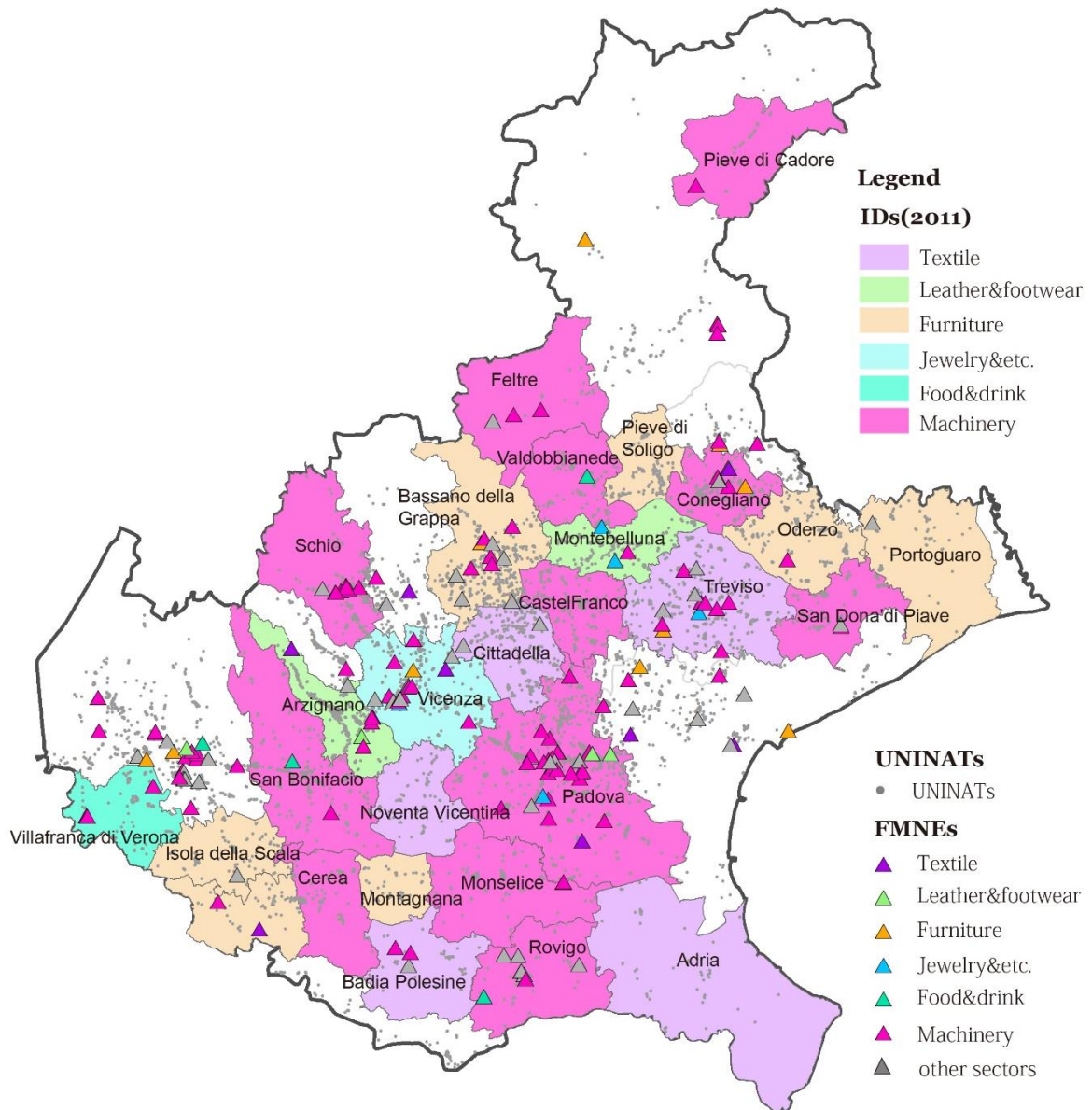
	FMNEs in Italy (tot)	FMNEs in Italy (control)	FMNEs in Veneto (tot)	FMNEs in Veneto (control)
Investing MNEs	1,673	1,552	257 (15.4%)	226 (14.6%)
Affiliates of MNE	2,723	2,425	299 (11%)	258 (10.6%)
Employees-affiliates	484,784	430,676	35,053 (7.2%)	30,134 (7%)
Foreign affiliates' turnover (ml Euros)	211,484	180,003	10,815 (5.1%)	8,956 (5%)

*Source: Reprint data*

## 7.2 The location behavior of FMNEs and UNINATs

### 7.2.1 The location within industrial districts

Figure 5: 180 FMNEs and 8344 UNINATs with industrial districts



Sources: map by author

As presented in Chapter 6, the study focuses on 180 FMNEs and 8,344 UNINATs. For all 180 FMNEs, 129 of them (71.6%) are located in the Industrial districts; for all 8344 UNINATs, 6357 of them (76.2%) are inside Industrial districts. Therefore, higher is the percentage of UNINATs within IDs comparing to FMNEs. This is consistent with the importance of the IDs for the local firms.

Nevertheless, the sections of UNINATs and FMNEs do not always correspond to the IDs specialization, implying that other factors may affect firms' location choice, especially FMNEs' location choices. As is shown in the Table 7, for FMNEs in direct Made-in-Italy sectors, the corresponding rate is very low. This is partly because the total number of FMNEs is too little due to their comparatively lower value-added production. For UNINATs, the sectors of leather& footwear and jewelry have a medium rate in locating in corresponding IDs, 45.5% and 47.8%. While the textile and furniture industries are comparatively less corresponding to related IDs. And food companies have the least rate 2.8%, showing an obvious random location preferences because the food demand have no difference by location.

However, both FMNEs and UNINATs have a high corresponding rate in machinery sector with the rate of 71% and 76.7%, which indicates that the indirect Made-in-Italy sectors have higher inclination to agglomerate. For foreign companies, the firms in the machinery sector might have higher demand of reducing liability of foreignness. However, some IDs in machineries are very close to urban agglomeration like Padova, thus it is hard to define explicitly whether they concentrated themselves or attracted by big cities.

**Table 7: FMNEs' and UNINATs' sectors corresponding to the IDs' sectors**

ID sectors	FMNE (tot)	FMNEs (located in IDs)*	%	UNINATs (tot)	UNINATs (located in IDs)*	%
textile	9	0	0%	542	87	16.05%
Leather and footwear	4	1	25%	411	187	45.50%
furniture	10	1	10%	1401	369	26.34%
jewellery	5	1	20%	186	89	47.85%
food	4	0	0%	499	14	2.81%
machinery	97	69	71%	3806	2921	76.75%
total	129	72	56%	6845	3667	53.57%

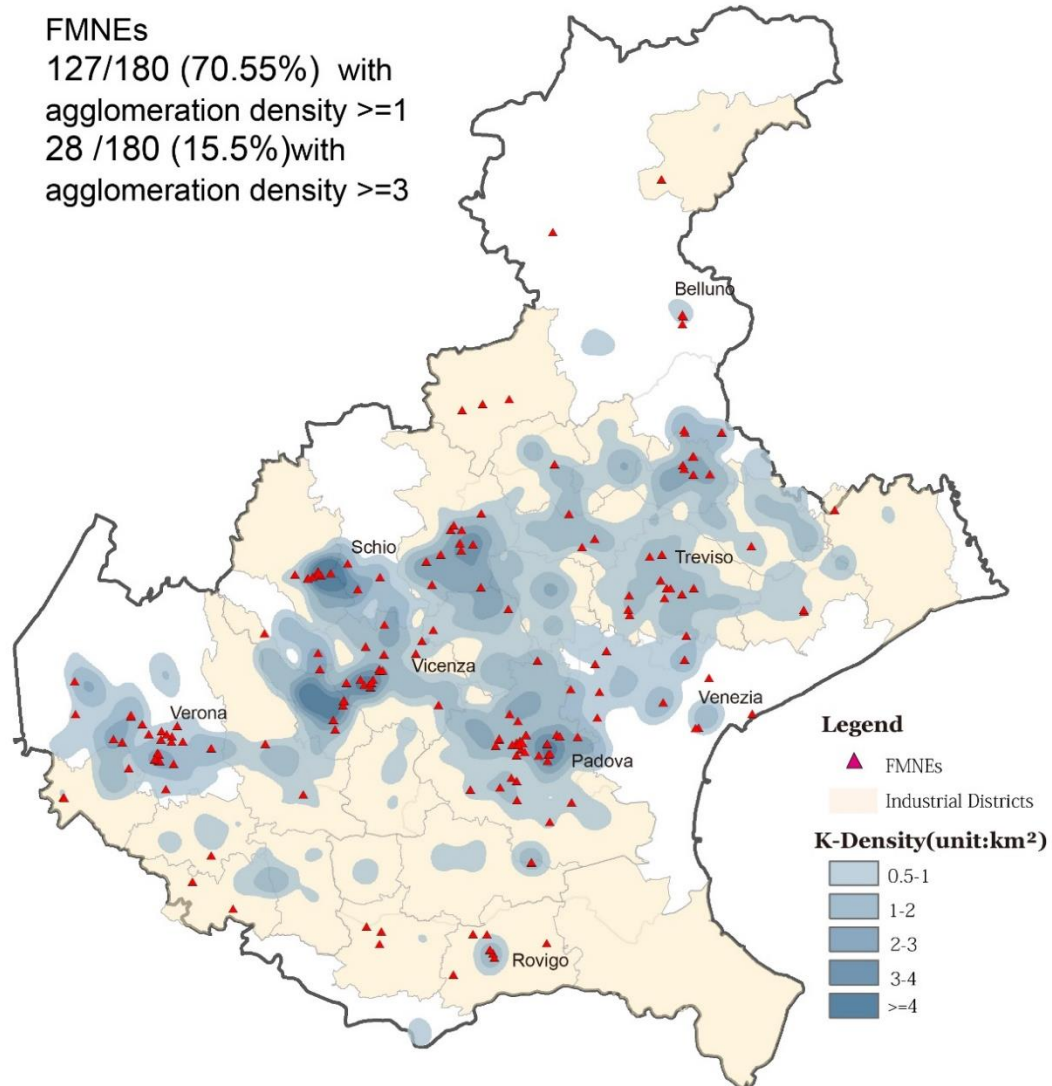
*\*: Located in industrial district specialized in the same sector*

*Source: author's elaboration on merging data and GIS mapping*

Moreover, the density of agglomeration of firms is mapped to get more accurate and explicit understanding of the FMNEs' location preference to localization economies. Because the industrial districts cannot accurately describe the geographic agglomeration on maps since their units are so big, including not only agglomeration of firms but also urban area, rural area and even mountains.

Therefore, in order to identify whether FMNEs locate spatially close to local firm's agglomeration, the mapping of FMNEs with UNINATs agglomeration is also conducted. The UNINATs agglomeration is reflected by the K-density of firm point data. To get more readable and accurate reflection of agglomeration, the search radius of K-density analysis is set 7000. And the unit of density is firms per kilometer square. (see detail in Chapter5.2)

**Figure 6: 180 FMNEs with UNINATs agglomerations**



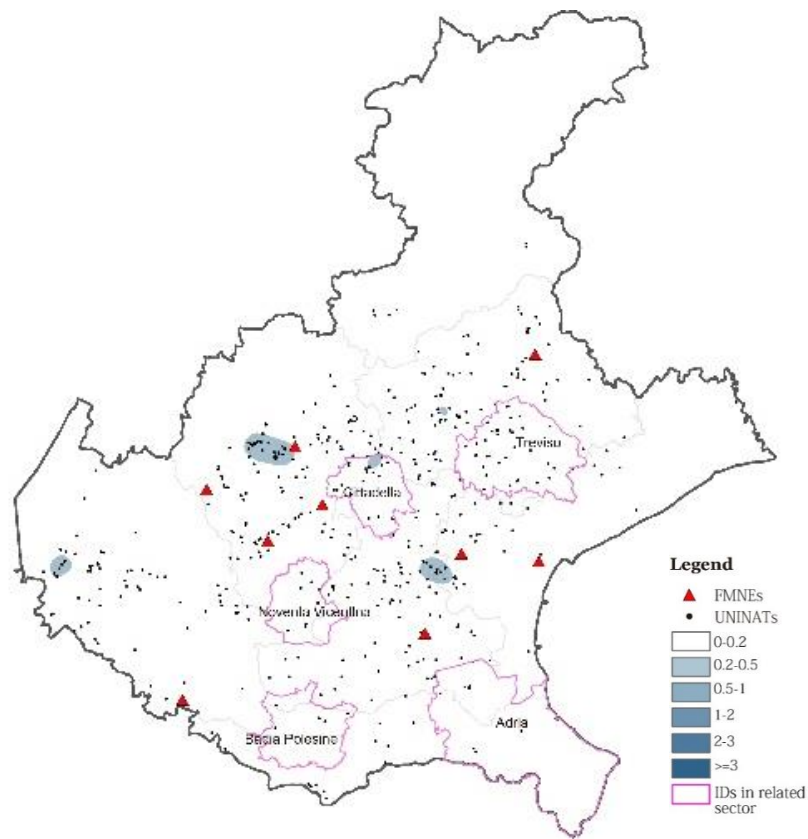
*Sources: map by author*

Figure 6 better visualizes the agglomeration of firms. Among the 180 FMNEs, 53 (29.45%) are not located inside agglomerations, 99 FMNEs are located within a low-medium agglomerations ( $3 > K\text{-density} \geq 1$ ), 28 FMNEs locating with strong agglomerations ( $K\text{-density} \geq 3$ ), showing high rate of correspondence to the high density of UNINATs, especially in Verona, Vicenza, Treviso, Padova and Schio. For these four cities (Verona, Vicenza, Treviso and Padova), along with their identity of

localization economies, the urbanization economies also attract FMNEs which will be explained in the following chapter. Especially in the Verona province, a strong concentration of FMNEs can be noticed while the agglomeration of UNINATs is not as intense as in the other industrial districts. Meanwhile, the case of Schio underlines the FMNE's preference in locating within the manufacturing UNINATs agglomeration. In this case urbanization economies seem less important.

The analysis of the IDs' sectors further shows the different firms' location preferences and spatial configuration of the agglomeration. The maps show that there are few FMNEs in textile and furniture, while higher is the presence of FMNEs in value-added (machinery) sector. Besides, stronger is the agglomeration of UNINATs in machinery, and furniture than in textile. This trend is explained by the strong internationalisation process undertaken by Italian firms in textile, that relocated to low wage countries the production activities, on the other hand, the machinery sector that is higher value added attract foreign investments from high technological and innovative countries.

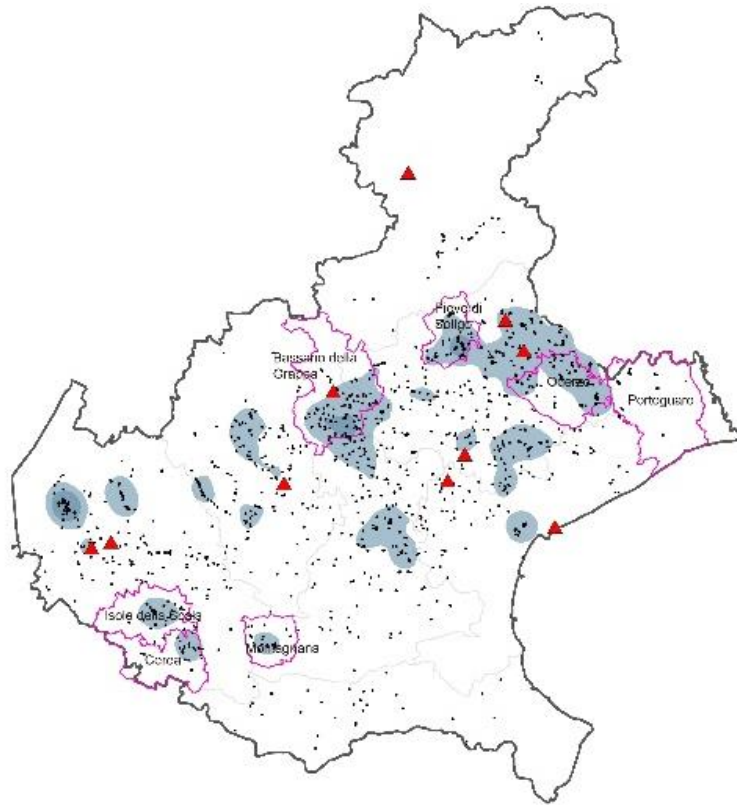
**Figure 7: Textile FMNEs with textile UNINATs agglomeration**



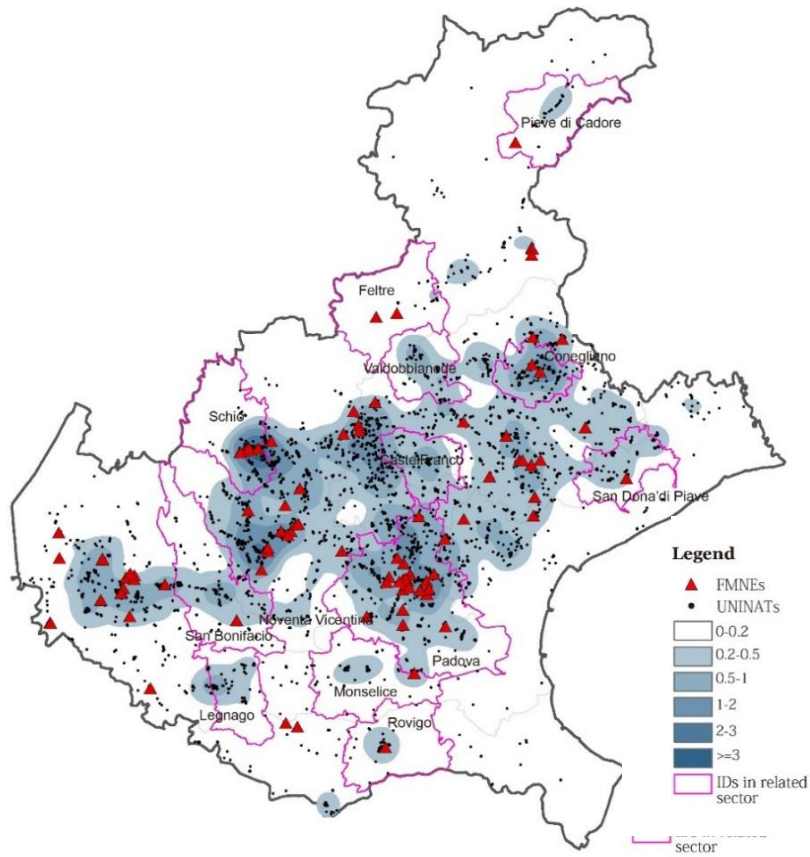
Sources: map by author



**Figure 8: Furniture FMNEs with furniture UNINATs agglomeration**



**Figure 9: Machinery FMNEs with machinery UNINATs agglomeration**



Sources: map by author

### 7.2.2 Location within urban areas

The data on urban area come from the open data source Corine land cover. The urban area of Veneto region is divided into two levels. First there is the **city level (14)**, selected according to the municipality population. The city with more than 30,000 inhabitants will belong to the city level. They are: Belluno, Gonese, Bassano del Grappa, Montebelluna, San Dona'di Piave, Treviso, Venezia, Castelfranco, Schio, Vicenza, Padova, Chioggia, Rovigo and Verona (see the appendix the detailed data from Istat).

The second level is the **large city (6)**. These are 6 cities that are province capitals, and are ranked among the first 6 positions. I excluded Belluno—mostly mountain region—because of low population density that places it in the 12<sup>th</sup> place. The chosen large cities are therefore: Venice, Verona, Padova, Vicenza, Treviso and Rovigo.

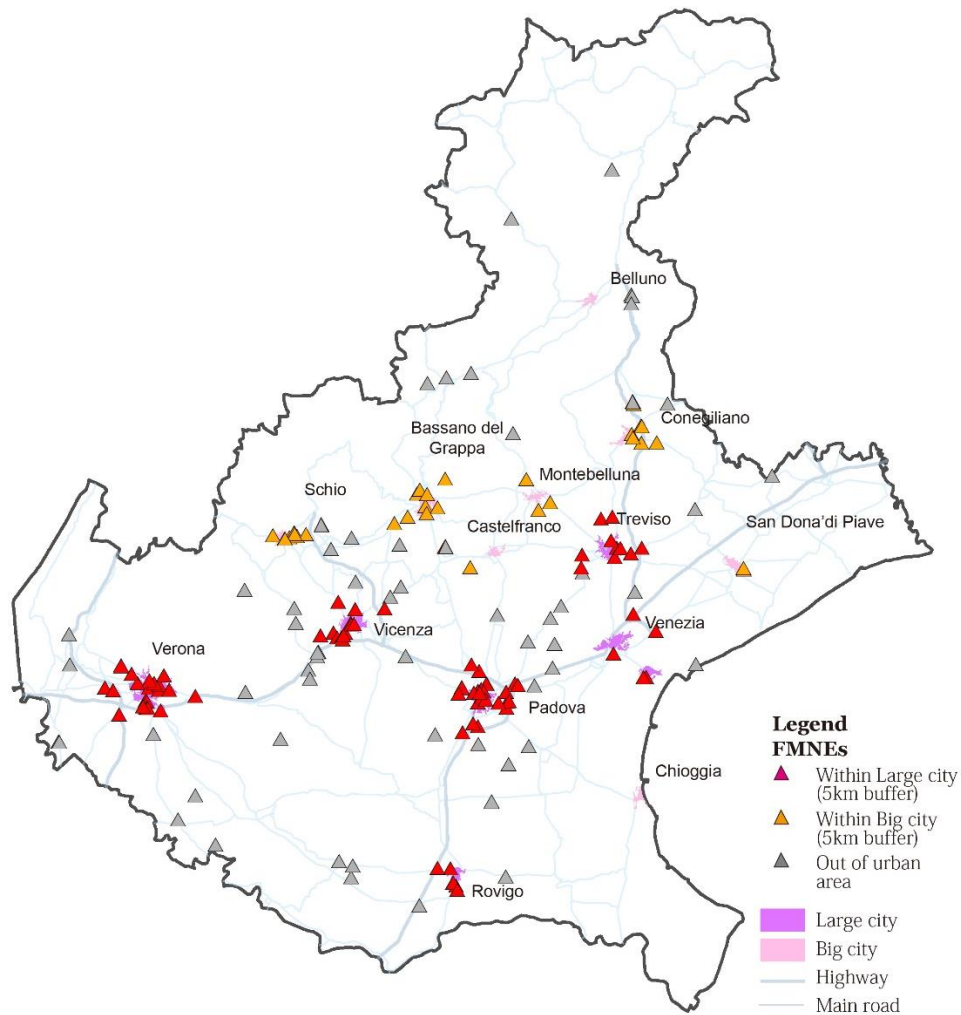
**Table 8: the population and rank of capital cities of 7 provinces in Veneto**

Rank in population	Municipality	Inhabitants (inh.)	Area (km <sup>2</sup> )	Density (inh./km <sup>2</sup> )	Province
1	Venice	268,741	412.54	651.4	VE
2	Verona	262,403	206.63	1,269.9	VR
3	Padua	209,696	92.85	2,258.4	PD
4	Vicenza	113,969	80.54	1,415.1	VI
5	Treviso	81,665	55.50	1,741.4	TV
6	Rovigo	51,378	108.55	473.3	RO
12	Belluno	36,112	147.18	240	BL

*Source: data from Wikipedia*

The buffer that is considered is about 5 km from the boundary of the city urban area, this allows to take into account areas with lower land rent, but still included in the urbanized area. Despite some headquarters of FMNEs are able to locate in the city or even in the city center, most manufacturing firms would choose the peripheral area for lower rent. Thus the 5 kilometer buffer is set because within certain distance from the urban area they still could enjoy the benefits from closed market, knowledge spillover and so on.

**Figure 10: FMNEs with Cities**



*Sources: map by author*

**Table 9: Statistics of FMNEs and UNINATs located within cities**

	FMNE	FMNEs %	UNINATs	UNINATs %
Inside city	28	15.56%	292	3.50%
Inside large city	21	11.67%	178	2.13%
Within city(5km)	118	65.56%	2916	34.95%
Within large city(5km)	87	48.33%	1610	19.30%
Total	180	100.00%	8344	100.00%

*Source: author's elaboration on merging data and GIS mapping*

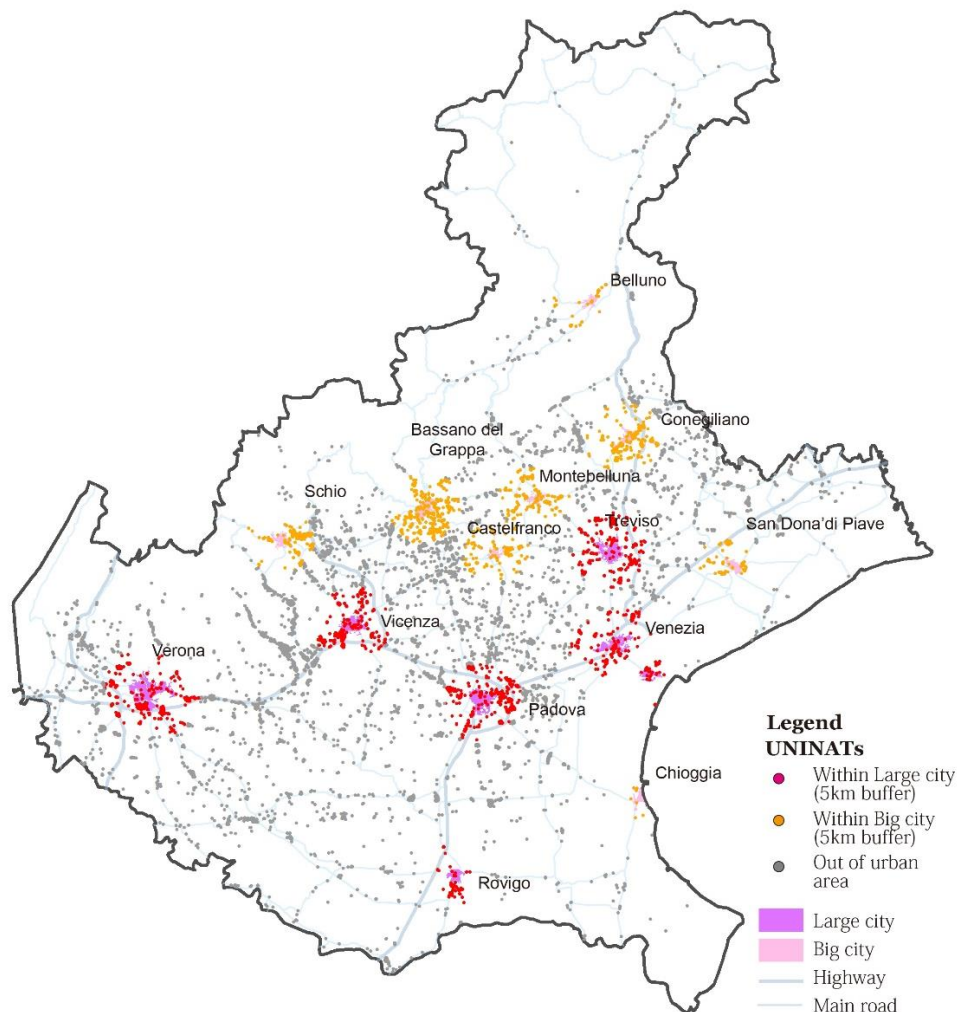
The map of FMNEs located within cities shows a strong concentration of FMNEs in these areas. The attractiveness of cities increases with its population, which to some extent reflects the intensity of urbanization. 87 FMNEs (48.33%) are within the six largest cities of Veneto and 118 (65.56%) within the cities of more than 30,000 population. Specifically 15.56% of FMNEs (headquarters) are located in the urban area of cities. The large cities host 11.67% of FMNEs, which demonstrates the strong

magnet of city center for headquarters (Henderson and Ono 2008; Dunning, 1998).

Regarding UNINATs, they are located more homogenously around the urban area, not only in the city, but also in the periphery. 19.3% UNINATs are located within large cities, and only 3.5% are located inside the cities. There are 34.95% UNINATs located within 5km from the cities. In addition, the map of agglomeration density within cities shows that the localization economies of local manufacturing firms usually happen outside the city. Some agglomeration shaped close to the city to exploit urbanization benefits. On the other hand, some agglomerations developed independently and showed their own locational attractiveness towards FMNEs, as discussed in last chapter (location with IDs and agglomeration economies). Therefore, compared to FMNEs, UNINATs are less attracted by urban area.

Given this, it could be concluded that the FMNEs have much higher locational preferences to urbanized area than UNINATs. And the larger city is more attractive for foreign headquarters than medium size cities.

**Figure 11: UNINATs with Cities**



*Sources: map by author*

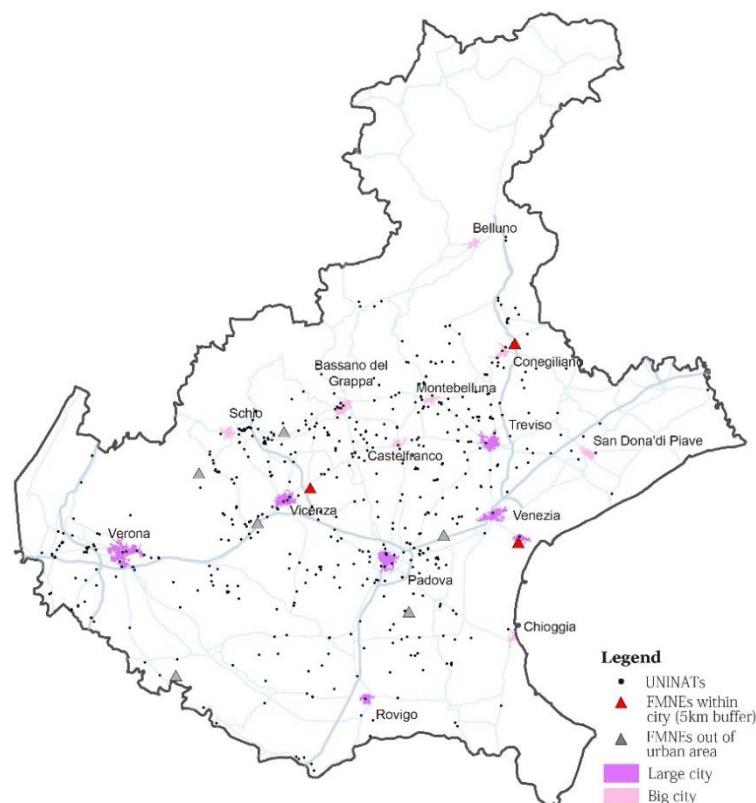
Next, the comparison of the location of FMNEs and UNINATs specialized in textile, furniture and machinery, shows that the location preference towards cities or large cities does not differ greatly by sectors. There are 2 FMNEs in textile (22.22%), 3 in furniture (30%), and 45 in machinery (46.39%) that are located within large cities (within 5km buffer from city boundary). Meanwhile, there are 98 UNINATs in textile (18.08%), 204 in furniture (14.56%), and 721 in machinery (18.94%) within large cities. The location preference of the different sectors towards urban areas does not differ as much as towards localization economies. The proportion of firms in machinery sector is subtly higher than the other two sectors, which proves again the higher preference of machinery firms to agglomeration economies.

**Table 10: Textile, furniture and machinery FMNEs and UNINATs located within cities**

		Total	Within city(5km)	%	Within large city(5km)	%
FMNEs	Textile	9	3	33.33%	2	22.22%
	Furniture	10	6	60.00%	3	30.00%
	Machinery	97	62	63.92%	45	46.39%
UNINATs	Textile	542	184	33.95%	98	18.08%
	Furniture	1401	391	27.91%	204	14.56%
	Machinery	3806	1349	35.44%	721	18.94%

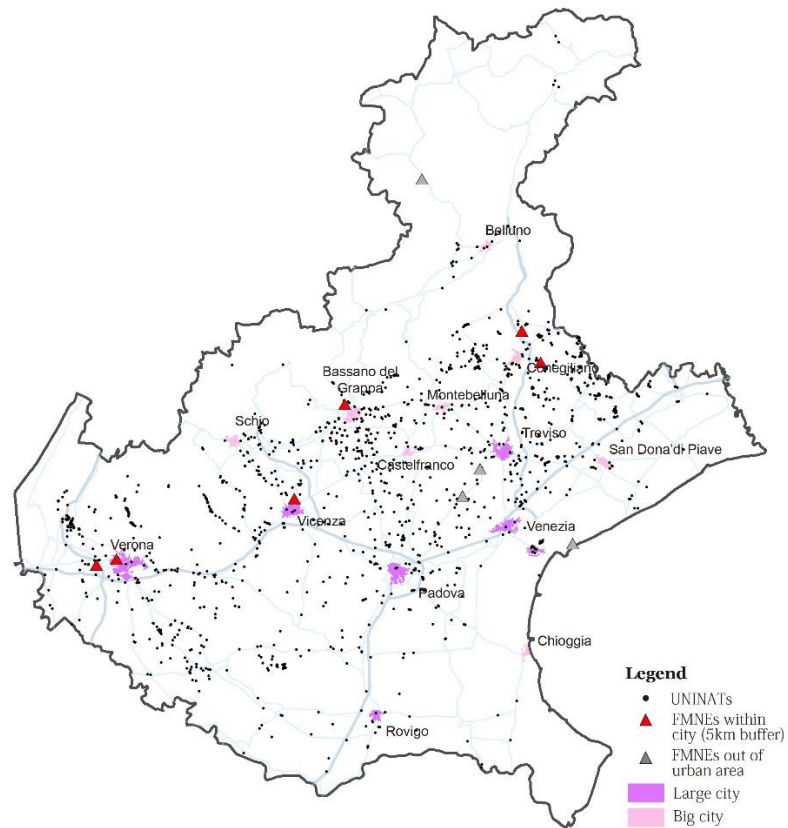
*Source: author's elaboration on merging data and GIS mapping*

**Figure 12: Textile FMNEs and UNINATs with cities**

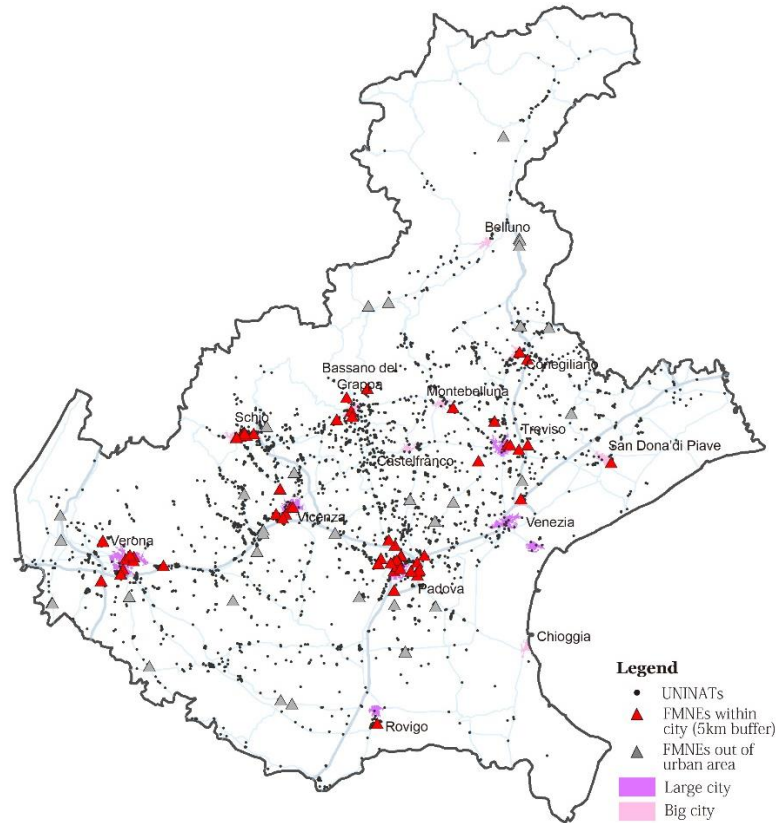




**Figure 13: Furniture FMNEs and UNINATs with cities**



**Figure 14: Machinery FMNEs and UNINATs with cities**



*Sources of figure12-14: map by author*

### 7.2.3 Location close to motorway infrastructure

The motorway infrastructure refers to “autostrade” (highway) and “strade statali” (national roads) in the Italian context. These two kinds of roads take most regional transportation in Veneto and play very important role in logistics for manufacturing firms.

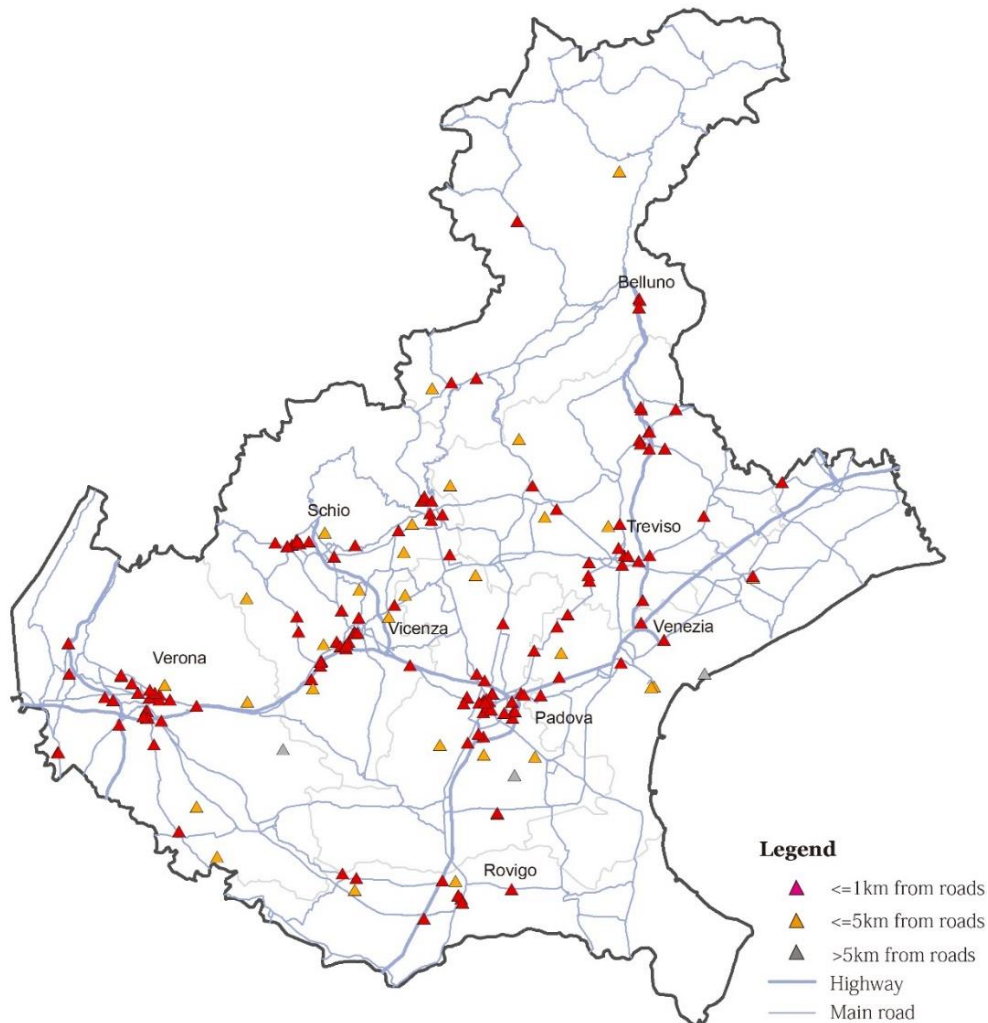
There are 98.33% FMNEs and 94.98% UNINATs located within 5 kilometer from the main motorway infrastructures. Because firms have basis demand of convenient transportation and logistical services.

**Table 11: Statistics of FMNEs and UNINATs located with roads**

	FMEs	FMNEs %	UNINATs	UNINATs%
Within 1km from roads	147	81.67%	5341	64.01%
Within 5km from roads	177	98.33%	7925	94.98%
Total	180	100.00%	8344	100.00%

*Source: author’s elaboration on merging data and GIS mapping*

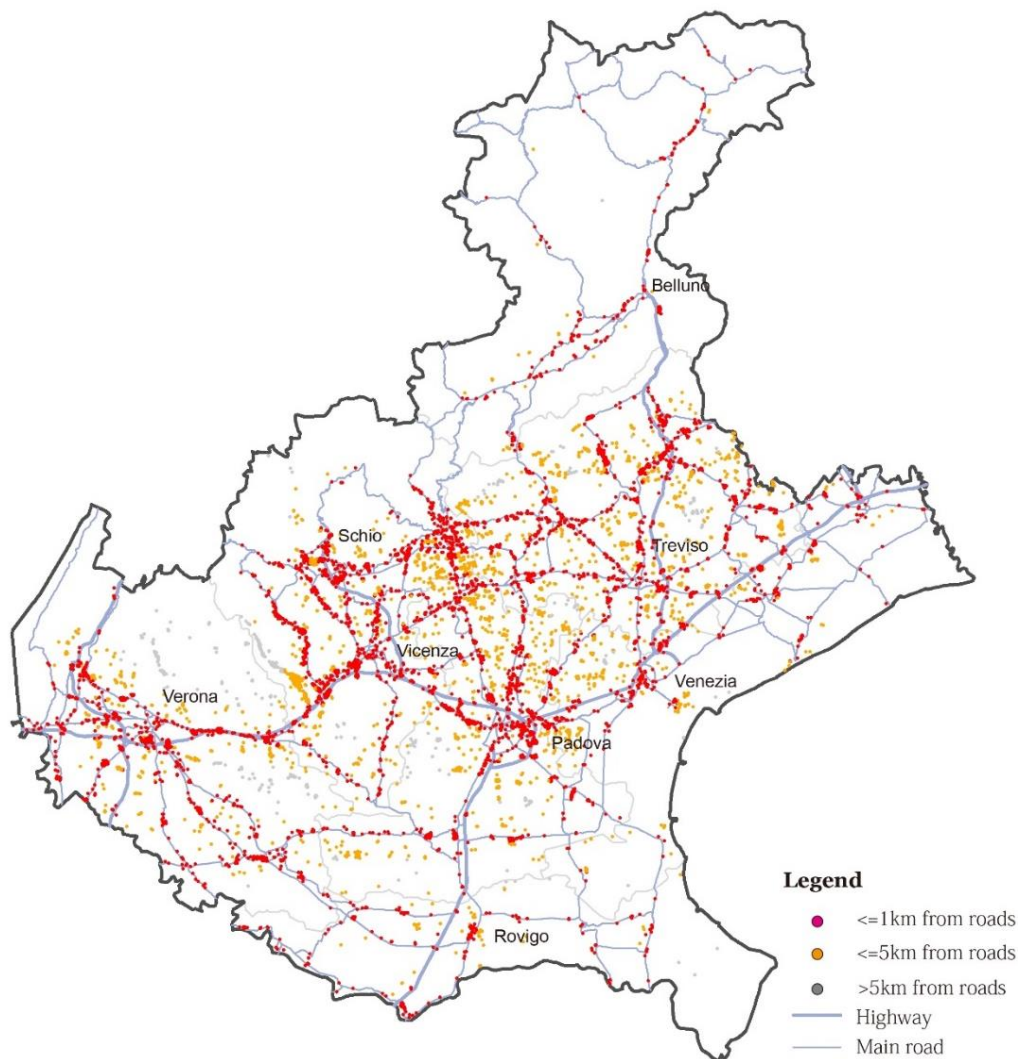
**Figure 15: FMNEs with motorway infrastructure**



*Sources: map by author*

Meanwhile, the 1km buffer enables us to find out the different location behavior between FMNEs and UNINATs. There are 147(81.67%) FMNEs located within 1 kilometer from the main motorway, still taking a high rate, while there are 5341(64.01%) UNINATs located close to motorway, about 20% lower than FMNEs. The difference might be attributed to the fact that FMNEs choose their location positively, while there are many different or historical reasons to the location of UNINATs. For instance, a lot of Made-in-Italy firms are developed within their living town and depend on the family-succeeded skills (Bagnasco, 1988). Other reason such as the higher land cost near the main road may also influence the location of local firms.

**Figure 16: UNINATs with motorway infrastructure**



*Sources: map by author*



**Table 12: Textile, furniture and machinery FMNEs and UNINATs  
located with roads**

		total	within 5km from roads	%	within 1km from roads	%
FMNEs	textile	9	8	88.89%	4	44.44%
	furniture	10	9	90.00%	9	90.00%
	machinery	97	96	98.97%	85	87.63%
UNINATs	textile	542	513	94.65%	351	64.76%
	furniture	1401	1294	92.36%	814	58.10%
	machinery	3806	3661	96.19%	2554	67.10%

*Source: author's elaboration on merging data and GIS mapping*

The location behavior of firms belonging to different sectors also shows higher heterogeneity in the 1km buffer category. Machinery firms show more preference to good accessibility than textile firms. There are 4 (44.4%) textile FMNEs and 351 (64.76%) textile UNINATs located within 1 km from the motorway. Meanwhile, there are 85 (87.63) machinery FMNEs and 2554 (67.1%) machinery firms located within 1 km from motorway. The furniture FMNEs could be an exception with 9 in 10 (90%) firms within 1 km from roads while furniture UNINATs have lowest rate both in 5km buffer and in 1 km buffer.

### 7.2.4 Conclusion on firms' location behavior

The descriptive analysis showed a different location behavior by FMNEs and UNINATs located in Veneto. The main finding can be summarized as follows:

- 1) The preference to motorway infrastructure (good accessibility) is the highest among the three factors. More than 90% of FMNEs and UNINATs are located within 5km from roads. FMNEs and UNINATs show little difference in exploiting good accessibility to lower the cost of transportation and logistics.
- 2) Agglomeration economies play key role in firms' location behavior. And by comparing the localization economy and urbanization economy, we found that firms exploit the former more than the latter. In other words, firms are more willing to settle within agglomerations of local firms than in urban area. Two methods have been adopted to analyze the impact of localization economies: firms inside IDs, and firms located in medium agglomeration density (K-density  $\geq 1$ ). The analysis shows that more than half firms exploit the localization economy. There are more UNINATs located inside the IDs because the IDs occupy a larger geographical area, and are mostly constituted by UNINATs. However, these result confirm the strength of agglomeration economies in firms' location behavior.
- 3) FMNEs exploit more urbanization economy than UNINATs. From the table, the proportion of UNINATs within 5km from cities (34.95%) is almost half of the FMNEs (65.56%). This is related to their different ownership, and their business typology: FMNEs are (Italian) headquarters of foreign affiliates, and on average they are larger than UNINATs, which explains the higher preference to urbanization economies.

**Table 13: Analysis on location behavior of FMNEs and UNINATs**

			FMNE	FMNE (tot)	FMNEs %	UNINATs	UNINATs (tot)	UNINATs %
Agglomeration economies	Localization economy	Inside IDs	129	180	71.67%	6357	8344	76.19%
		Within medium agglomeration density	127		70.56%	5419		64.94%
	Urbanization economy	Within city (5km)	118		65.56%	2916		34.95%
Accessibility		Within 5km from roads	177		98.33%	7925		94.98%

*Source: author's elaboration on merging data*

Generally speaking, all these three factors play very important role in firms'

location behavior. In order to reduce liability of foreignness, FMNEs tend to locate in larger cities to exploit urbanization economies. They also located within the agglomeration of Italian firms and inside the industrial districts, to exploit localization economies. Similarly, UNINATs are located inside the industrial districts to exploit the agglomeration advantages, specifically, localization economies.

However, the causality of these three factors is not explored since these three factors are interrelated. For instance, agglomeration economies characterize urban areas and large cities, which show better infrastructures. And localization economy grows near infrastructure to lower the cost of transportation. Therefore, a more strict analysis of three factors are also considered (Table 14) to find out more independent impact of localization economy, urbanization economy and accessibility. For example, in order to find out firms that exploit most urbanization economy, the criteria is narrowed from ‘within 5 km buffer around large cities’ to ‘inside the large cities’.

**Table 14:**

**Analysis on location behavior of FMNEs and UNINATs using different criteria**

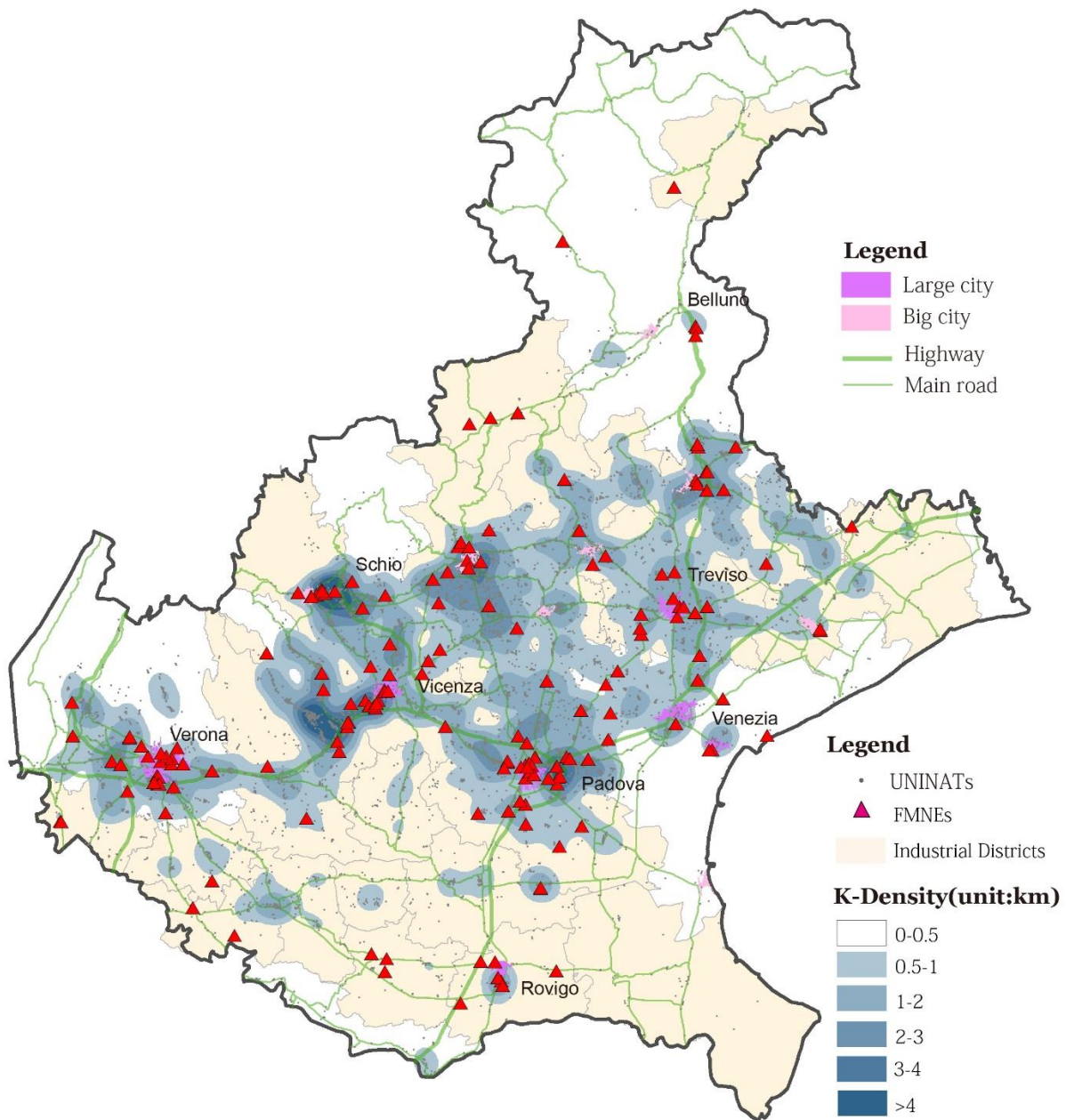
Localization economy			Urbanization economy			Accessibility		
FMNEs			FMNEs			FMNEs		
High density	28	15.56%	Inside large city	21	11.67%	Within 1km from roads	147	81.67%
Medium density	127	70.56%	Within large city	87	48.33%	Within 5km from roads	177	98.33%
UNINATs			UNINATs			UNINATs		
High density	1078	12.92%	Inside large city	178	2.13%	Within 1km from roads	5341	64.01%
Medium density	5419	64.94%	Within large city	1610	19.30%	Within 5km from roads	7925	94.98%

*Source: author's elaboration on merging data*

As shows in Table 14, there are 15.56% FMNEs located in high-density agglomeration ( $k\text{-density} \geq 3$ ), and 11.67% located inside large city (Venezia, Verona, Treviso, Vicenza, Rovigo, Padova). The result corresponds to the previous conclusion that localization economies attract more FMNEs in manufacturing than urbanization economies. Despite the overlapping of agglomeration happen in the urban area, we could find more location preferences of manufacturing firms to be located close to urban areas. In other words, the urbanization economy is not playing its role

independently. When the heterogeneity services benefit firms within urban area, they are also forming the localization economy to shape the scale economy of specialization. Along with these two factors, good accessibility is undoubtedly considered by all the firms. Even if the criteria is narrowed to 1km from roads, there are still more than 50% firms within the criteria.

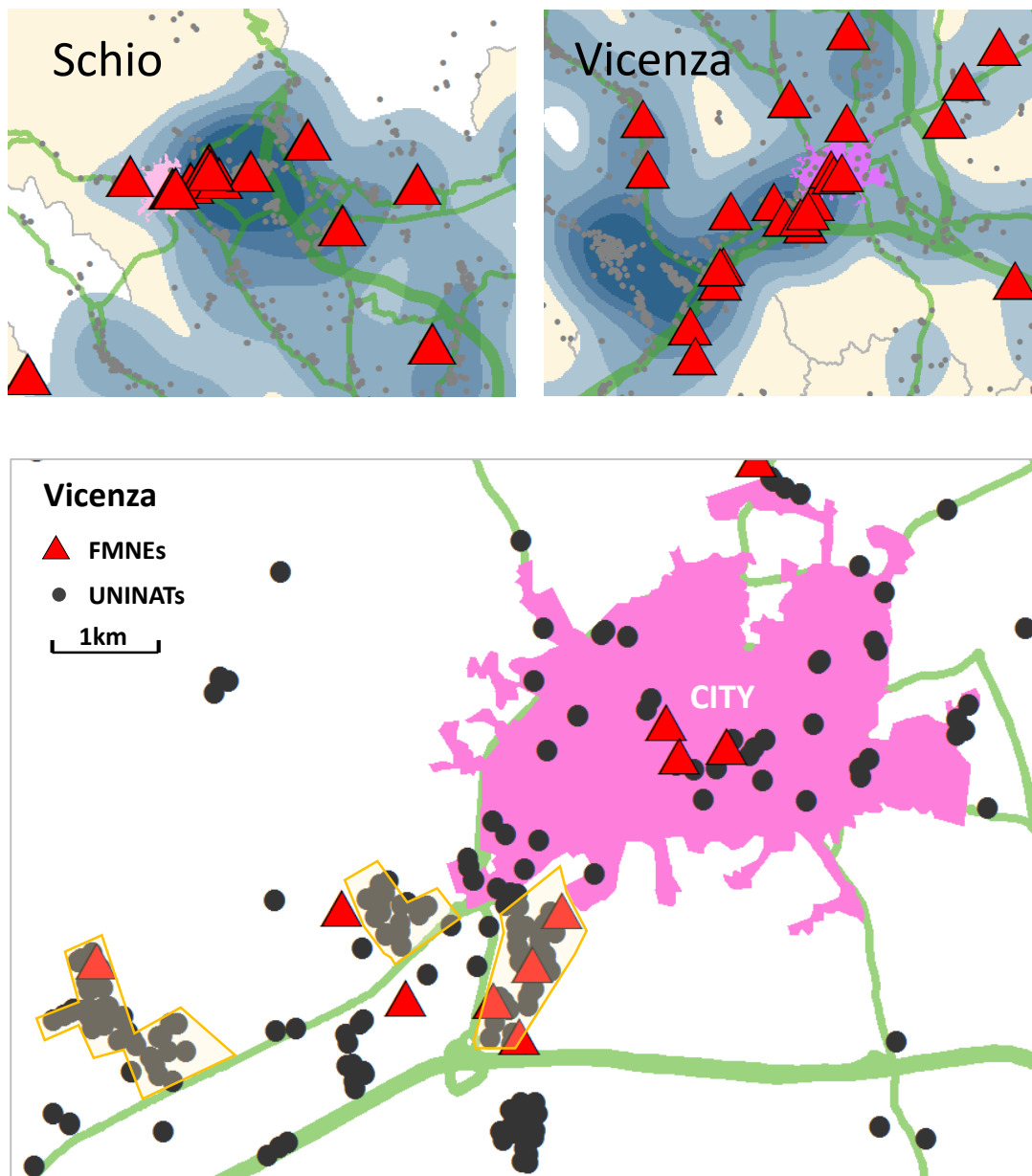
**Figure 17: FMNEs and UNINATs with all three factors**



Sources: map by author

As a result, all these three factors are interrelated and together affect firms, and especially FMNEs' location behavior. The enlarged detail of FMNEs located within urban area, firm agglomeration and motorways, underlines the interaction of three factors. The high-density agglomeration appears outside but close to the urban area. And the maps clearly show the different location behavior of FMNEs according to the three factors.

**Figure 18: FMNEs and UNINATs with all three factors (Schio and Vicenza)**



*Sources: map by author*

Last but not least, we compared the location behavior among three sectors. The analysis shows that the machinery sector is more attractive for FMNEs (mainly from advanced countries) because they are more high value added production, which shows a higher demand of knowledge spillover, skilled labour, larger market and services availability that industrial districts in Italy could provide. However, the lower value added sectors do not attract as many foreign affiliates as machinery because foreign multinational firms from advanced countries (the majority of inward FDIs in Italy come from advanced countries) are mainly specialized in high value added industry and they are more innovative and technologically advanced. Besides, Italian firms in textile and furniture have relocated production activities in lower wage countries to reduce production cost.

In addition, compared to textile and furniture, both location behavior of MNEs and FMNEs in machinery show higher preference to urbanized area and agglomeration industry. Therefore we can conclude that indirect Made-in-Italy sectors have higher inclination to agglomerate and to taking advantage of urbanization economy, than the other sectors.

### **7.3 Skill composition of UNINATs and FMNEs**

As Pisano and Shih (2012: 23) claim, there is a close connection between the competitiveness of companies and the competitiveness of workers located where firms are settled. If a worker is not endowed with appropriate skills (education and training), then the enterprise's competitiveness will be threatened (Mariotti and Barzotto, 2017). Conversely, dense concentrations of highly skilled workers in geographically localized clusters trigger virtuous processes of economic growth (Moretti, 2012). Skilled workforce together with supply networks, manufacturing culture, and social capital are the set of external economies of localization, or "industrial commons", necessary to support manufacturing (Pisano and Shih, 2009; 2012). Specifically, Mariotti and Barzotto (2017) studied the impact of inward FDI on host country labour market in Veneto, finding that foreign multinational firms hire more skilled workers, thus positively affecting the local industrial commons. The authors run an econometric analysis (ATT counterfactual) to compare FMNEs and UNINATs' labour composition in Veneto in 2014 and found that the share of high skilled workers in FMNEs is 0.293, higher than in UNINATs (0.177). The present thesis aims at corroborating the skill composition of UNINATs and FMNEs in a visualized approach, analyzing whether the spatial configuration of skilled labours could draw the same conclusion as Mariotti and Barzotto (2017).

The data on skilled labour and employment come from the SILV dataset (Informative System Veneto Labour), which registers the employment composition( age, gender, citizenship, professional activity, educational qualification, type of contract, new hiring/dismissals) and registers information(fiscal code, name, address, NACE code) of the firms active in Veneto at the year 2014.

The skilled labour force refers to the managers and technicians working in a firm, while low skilled are clerks. Besides that, the skilled workers are 30 years old, with enough experience and capability, and they are less willing to be foreign (Mariotti and Barzotto, 2017). Thus the skilled workers hired by FMNEs are all workers from the local labour pool.

According to Table 15), the average employment of FMNEs is about 3 times that of UNINATs. FMNEs are on average larger than UNINATs because they are affiliates of multinational firms that are on average larger than uninational firms (firms that have not internationalized). Besides, they come mainly from advance countries and invest in Italy to exploit knowledge, technological spillover and to expand their market.

The average skilled labour of FMNEs is 15.1 against 3.3 of UNINATs. Specifically, the rate of skilled labour force by total employment also proved that FMNEs hire more skilled labours than UNINATs, comparing 30.15% (FMNEs) with 19.61% (UNINATs).

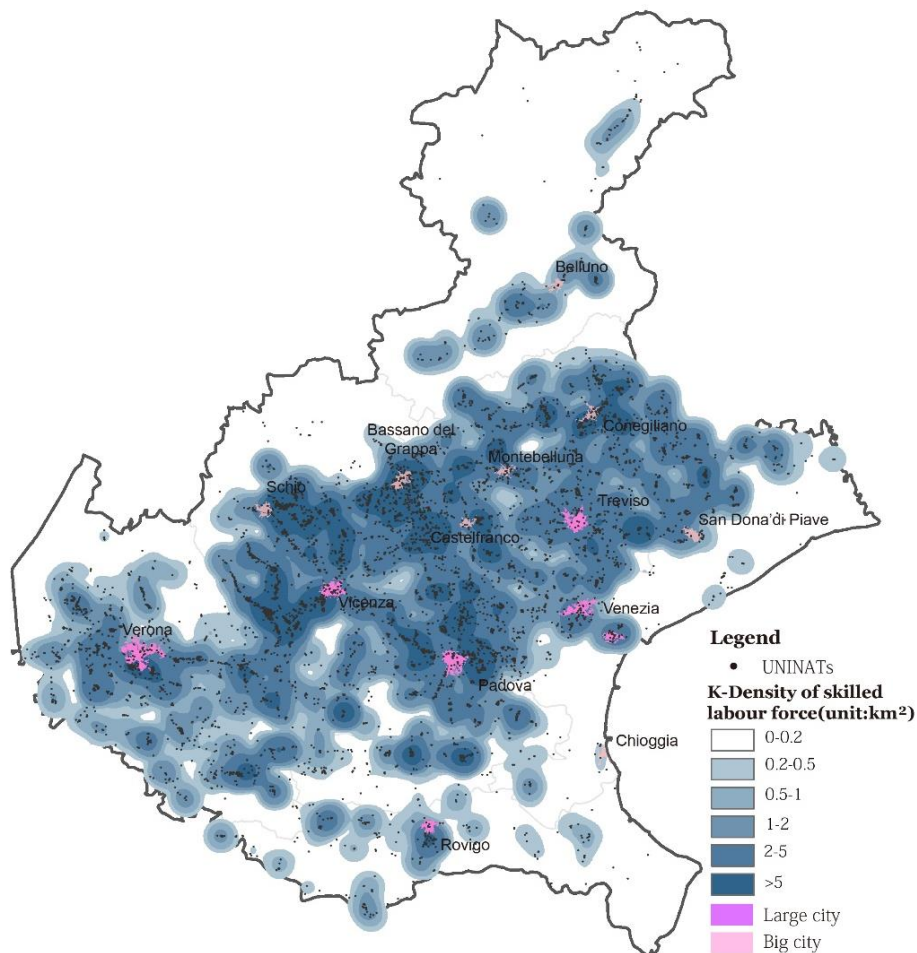
**Table 15: Skill labours of FMNEs and UNINATs**

	FMNEs	UNINATs	total
Average employment	58	17	18.
Average skilled labour	17	3	3
Total employment	10444	139576	150020
Total skilled force	3149	26275	29424
Skilled labour (%)	30.15%	18.82%	19.61%

*Source: author's elaboration on merging data*

Secondly, we mapped the density of skilled labour force of manufacturing FMNEs and UNINATs in Veneto. The search radius is set 5000. Two maps are compared to better understand the role of FMNEs in skilled composition of manufacturing firms. First is the density of skilled labour force of UNINATs without FMNEs. Second shows the density of all skilled labour force and the location of FMNEs.

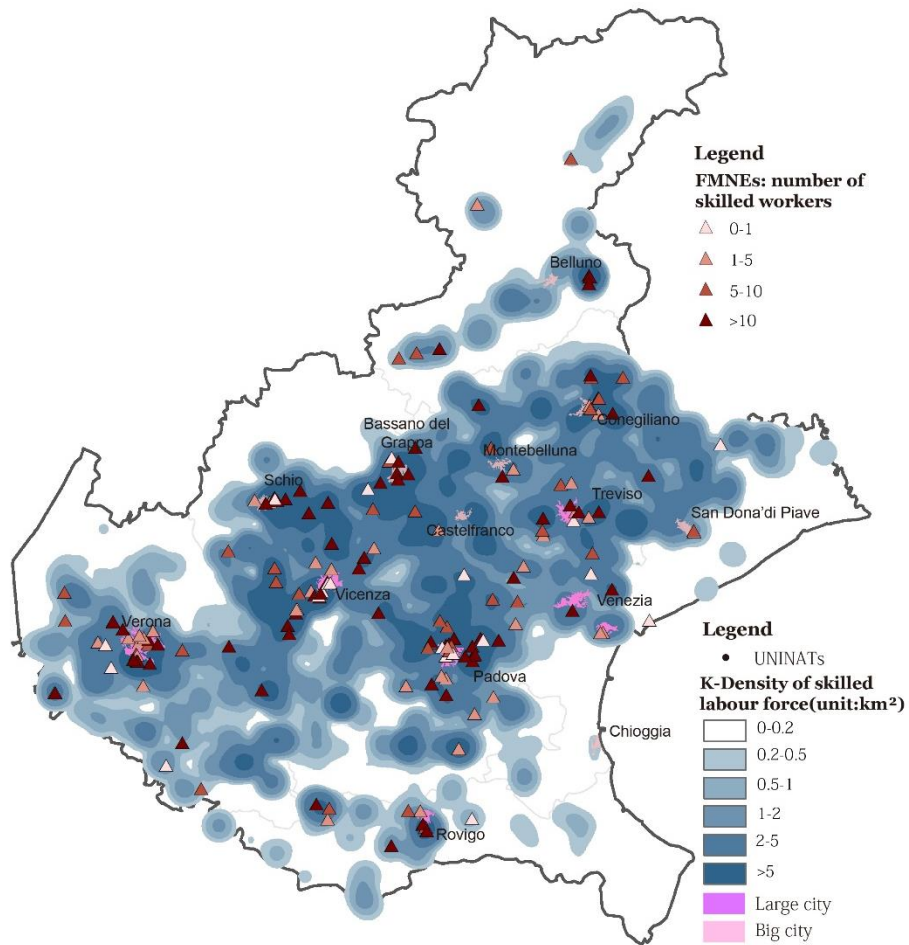
**Figure 19: Skilled labour force density of UNINATs without FMNEs**



*Sources: map by author*



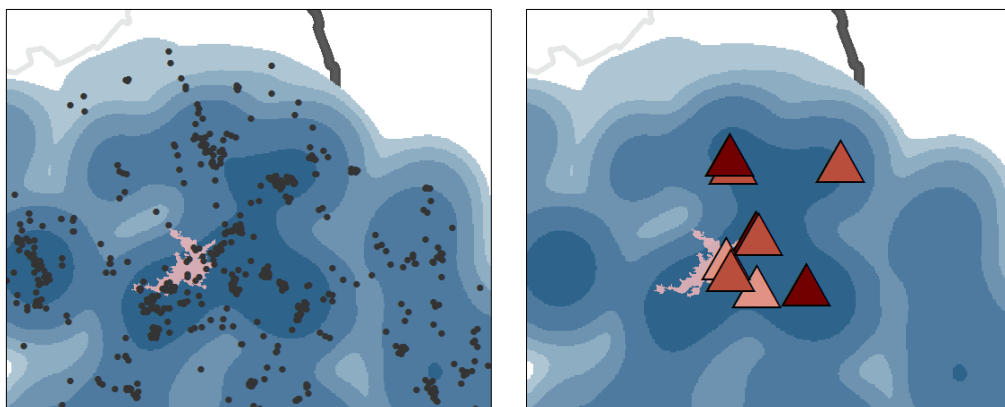
**Figure 20: Skilled labour force density of all firms and FMNEs**



*Sources: map by author*

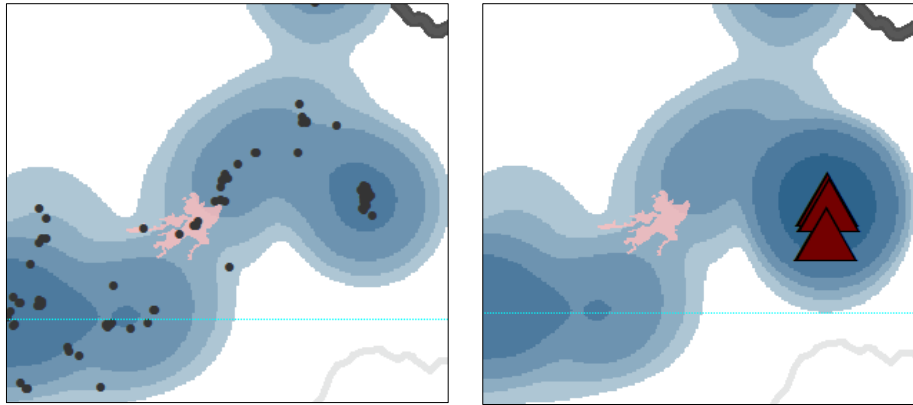
From the two maps and the enlarged examples, FMNEs show strong preference to the place with more skilled labour force (figure 21, the case of Conegliano). Meanwhile, in many cases FMNEs hire more skilled labour force of the area, and play a very important role in augmenting the quality of local labour pool (figure 22, the case of Belluno).

**Figure 21: Skilled labour force density (the case of Conegliano)**



*Sources: map by author (the legend is same as figure 19 and 20)*

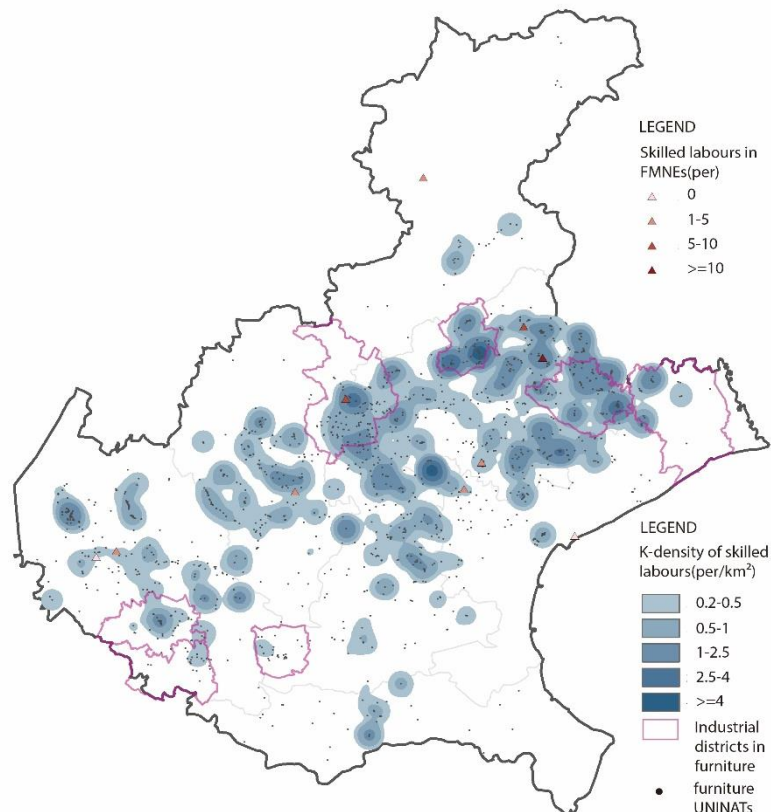
**Figure 22: Skilled labour force density (the case of Belluno)**



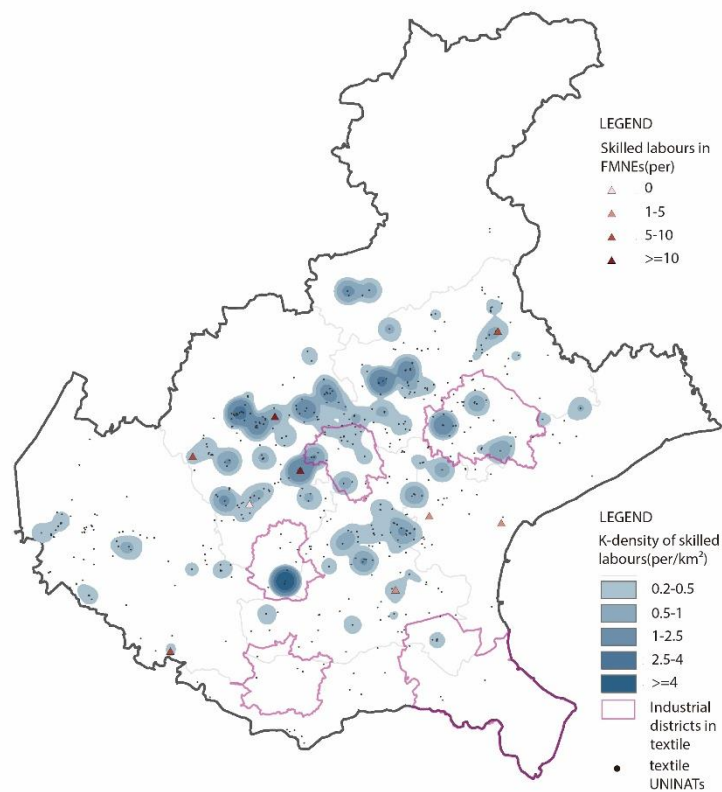
*Sources: map by author (the legend is same as figure 19 and 20)*

The skilled labour density of textile sector, furniture sector, and machinery sector are next analyzed to understand the skill composition of the different sectors. The data indicate that FMNEs in all the sectors hire much more skilled worker than UNINATs. The average of skilled labours of FMNEs in machinery sector is 16.4, higher than the other two sectors (12.4 in textile and 5.1 in furniture). The same advantage of machinery sector also exists in UNINATs. The average of skilled labours of UNINATs in machinery is 3.6, while there are only 3 skilled workers on average in textile and 2.6 in furniture.

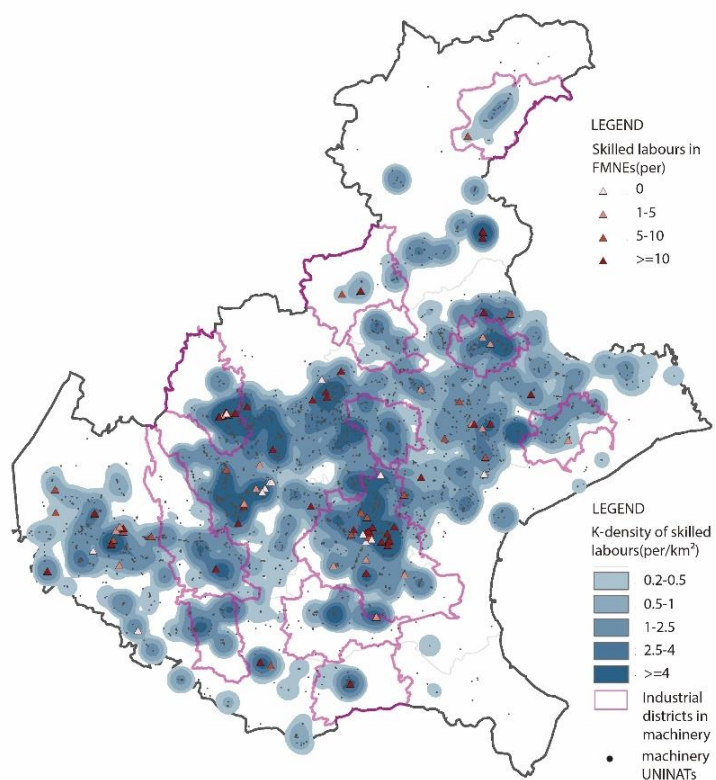
**Figure 23: Skilled labour force density of textile firms**



**Figure 24: Skilled labour force density of furniture firms**



**Figure 25: Skilled labour force density of machinery firms**



Source of figure 23-25s: map by author

In addition, the spatial skilled composition of the three sectors further shows that machinery firms have stronger skilled labour force concentrated. There are many highly dense centre of skilled labour in machinery, attributing to the agglomeration economy and urbanization economies as the chapter 7.2 discussed. While the high density of skilled labour in textile or furniture is mainly due to the contribution of one or two super firms.

**Table 16: Skill labours of FMNEs and UNINATs in different sectors**

	FMNEs	UNINATs	Total
TEXTILE			
Average employment	71.1	17.0	17.9
Average skilled labour	12.4	3.0	3.1
FURNITURE			
Average employment	18.1	14.8	14.8
Average skilled labour	5.1	2.6	2.6
MACHINERY			
Average employment	54.8	16.5	17.5
Average skilled labour	16.4	3.6	3.9
All sectors			
Average employment	58	17	18.
Average skilled labour	17	3	3

Source: author's elaboration on merging data

As a result, the analysis confirmed the conclusion made by Mariotti and Barzotto (2017), and showed that FMNEs are located in areas where there is a concentration of high skilled labour force. And higher value added sectors such as machinery show higher demand in skilled labour force.

Nevertheless, the causality of the phenomenon needs to be investigated. As an example, it is difficult to estimate whether FMNEs locate in areas with a stronger density of high skilled labour force or if they contributed to increase the high skilled labour intensity of these areas. To do so, data pre and post FMNEs location should be needed. However, what is proved is that multinationals augment the quality of labour force. This is an important effect of presence of FMNEs in industrial district that needs to be further investigated.



1 INTRODUCTION

2 STATEMENT OF CONTEXT

3 DEFINING THE CONCEPT OF INDUSTRIAL DISTRICT

4 GLOBALIZATION AND INDUSTRIAL DISTRICTS

5 THE LOCATION BEHAVIOR OF FOREIGN MNEs

6 DATA AND METHODOLOGY

7 EMPIRICAL ANALYSIS

**8 CONCLUSION**

## 8 MAIN RESULTS AND CONCLUSION

The location behavior of FMNEs became important in the economic geography studies, because of the strong competitiveness FMNEs bring to the region and country of location. Studies suggest that FMNEs are more knowledge-intensive, more productive, pay higher wages and show a more solid financial structure than domestic firms (Lipse, 2002; Barba Navaretti and Venables, 2004; Crinò and Onida 2007), thus being a key factor to enforce the development. According to literatures, three main factors that affect firms' location behavior are selected in the present thesis: localization economies, urbanization economies (together as agglomeration economies) and accessibility.

Meanwhile, with the continuous trend of globalization, the impact of FMNEs in industrial districts in Italy aroused scholars' attention. Both positive support and negative critic voice arise, either stating that foreign investments stimulate local economy or arguing that they are breaking the social bound between local firms.

As a result, the thesis used a mapping approach to visualize the location of FMNEs and UNINATs in the Veneto industrial district region to get a comprehensive picture of the spatial configuration of firms' location. Besides, the analysis corroborate the results of the econometric study (counterfactual model) by Mariotti and Barzotto (2017) who found that FMNE hire more skilled workers than UNINATs, thus positively affecting the local industrial commons.

After cleaning up all the dataset (composed by SILV dataset, AIDA database and Reprint database), we got 180 FMNEs and 8,344 UNINATs, which validly represent the main composition of active manufacturing firms in Veneto region. Mapping all these firms' location enabled us to describe their locational preference towards localization economy, urbanization economy and accessibility to infrastructures (motorway), and to analyze the skill labour force composition within FMNEs and UNINATs.

Conclusions can be drawn as follows, thus answering to the research questions.

**1 All three factors show a strong attractiveness towards manufacturing firms (in order of importance: accessibility, localization economy, and urbanization economy)**

More than half of firms are located in areas characterized by localization economies and urbanization economies, and exploit good accessibility.

- 1) The preference to be located close to motorway infrastructure (good accessibility) is the most important location factor as stressed by the literature.

More than 90% of FMNEs and UNINATs are located within 5km from roads. FMNEs and UNINATs show little difference in exploiting good accessibility to lower the cost of transportation and logistics.

2) To compare the location behavior of FMNEs and UNINATs, FMNEs have more preference to agglomeration economies, especially the urbanization economies. There are almost half FMNEs located close to large cities, while there are only about 20% UNINATs exploiting urbanization economies. This is related to their different ownership, and their business typology: FMNEs are (Italian) headquarters of foreign affiliates, and on average they are larger than UNINATs, which explains the higher preference to urbanization economies. Besides, as stressed by the international economics literature, FMNE privilege urban areas to cope with the liability of foreignness (see among the others, Johanson and Vahlne, 2009).

3) To compare the importance of localization economy and urbanization economy, both typologies show higher preference towards high local firm agglomerations (high density of UNINATs) than towards urban areas. The difference between localization and urbanization is smaller in FMNEs' location behavior, because both of them could help FMNEs to reduce the liability of foreignness. Moreover, the high cost of land and problem of congestion are inevitable obstacles for manufacturing firms to locate near the city, which could also explain their higher preference to localization economies.

One problem lying in this analysis is the interrelation between these three factors. It is hard to conclude the causality between factors and phenomena because it is hard to define an impact independent from others. However, although the intensity of impact cannot be accurately compared, the mapping of location within different spatial criteria offered us intuitive understanding of location behavior of manufacturing firms.

## **2 Manufacturing sectors: firms specialized in higher value-added sectors show a higher inclination to agglomerate with IDs and urban areas**

We compared the location behavior among the three Made in Italy sectors. The analysis shows that FMNEs are mainly investing in the machinery sector because they are higher value-added production, and demand for skilled labour forces, larger market and services availability that industrial districts and urban areas in Italy can provide. Indeed, FMNEs investing in Italy mainly come from advanced countries, which are specialized in high value added industry, are more innovative and technologically advanced. On the other hand, the lower value-added sectors do not attract as many



foreign affiliates as the high value added ones.

In addition, compared to textile and furniture, both location behavior of UNINATs and FMNEs in machinery show higher preference to urbanized area and localization economies. Therefore, indirect Made-in-Italy sectors like machinery....have higher inclination to agglomerate and to take advantage of urbanization economy.

### **3 FMNEs augment the quality of labour force**

Mariotti and Barzotto (2017) studied the impact of inward FDI on host country labour market, indicating that foreign multinational firms hire more skilled workers, thus positively affecting the local industrial commons. The thesis confirmed this conclusion and demonstrated the spatial agglomeration density of labour market.

The analysis showed that FMNEs have much higher average of skilled labour force than UNINATs. FMNEs are located in areas where there is a concentration of high skilled labour force. Although the causality of the phenomenon needs to be further investigated, multinationals augment the quality of labour force. This is an important effect of presence of FMNEs in industrial district that needs to be further investigated.

Last but not least, it cannot be denied that the present analysis presents some caveats. It is, for example, hard to conclude the causality between factors and phenomena because it is hard to define an impact independent from others. Besides, the criteria of different factors should be set more carefully. Although we can get the valid conclusion by comparing location behavior of FMNEs and UNINATs, the comparison between factors is not convincing and accurate enough. Regarding of the lack on data, this study does not consider the Italian MNEs. It should be interesting to explore their location behavior and see whether and how they augment the local commons, comparing with FMNEs and UNINATs.

However, despite all these lacks and shortage, the mapping of FMNEs' and UNINATs' location within different spatial criteria offered us an intuitive understanding of location behavior of manufacturing firms, which could be useful for further studies and provide some policy implications.

### **Policy implication**

The thesis analyzes the location behavior of manufacturing FMNEs and UNINATs by means of a visualized approach. The descriptive analysis and mapping help us to

better understand the spatial patterns of manufacturing firms within localization economies, urbanization economies and accessibility.

This analysis can be interesting not only for economic geographers and regional economist but also for urban planners. The location behavior of firms is reflected in their real location, which is driven by the merged impact of the three factors. The interpretation and conclusion on mapping could offer at least two implications for urban and regional planning.

First, FMNEs can positively influence the Italian industrial districts. Despite many scholars' concern on FMNEs breaking the traditional connection between local firms, and stealing the local firms' market share, the thesis strengthens the findings of Mariotti and Barzotto(2017), and reclaims that FMNEs are playing positive role in enhancing the local industrial commons and augmenting the local labour force quality. The thesis suggests that urban planners should pay more efforts to maximize the mutual gain between FMNEs and UNINATs. FMNEs are able to absorb the contextual knowledge that is produced locally (e.g. Belussi and Asheim, 2010), to reduce the liability of foreignness, and strengthen the knowledge spillover within the local context. Besides, FMNEs, which conduct more value-added production, hire more skilled employees, thus augmenting the local commons, and improve the international atmosphere in the industrial districts.

Second, more attention should be paid to study the joint impact of different factors to attract foreign investment. As is concluded by this study, FMNEs have much higher preference to both localization and urbanization than UNINATs. For other academic studies, what is described and interpreted in this thesis could be used as basic material and support for study on agglomeration economy, industrial districts as well as the regional strategy plan considering attracting foreign investments. Moreover, for further empirical studies on location behavior, more correlation analysis and deeper investigation into the firms are essential to draw the causality between firm locations and different factors, not only by economic data analysis, but also by the geographical data and analysis. In order to enhance the regional competitiveness in industrial districts, policy makers and regional planners could pay more attention to the joint impact of agglomeration economy, urbanization economy, accessibility and skill composition when making relevant policy to attract FMNEs.

## 9 REFERENCE & APPENDIXES

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### **Photos on the cover (From left to right)**

- <https://www.artebrotto.it/en/company/history>
- <http://www.behemothpress.com/pratocittafabbrica/node4.html>
- <http://www.gioconews.it/politica-generale/47865-mogliano-veneto-sale-giochi-in-aree-industriali-e-stretta-sugli-orari>

## APPENDIX

### ● The ISTAT method to define official industrial districts

First, the boundary of industrial districts is divided by local labour system (LLS), whose unit named as local labour market area (LLMA). The LLMA is identified on the commuters' patterns and correspond to geographic areas where people work and live. Then there are four steps to select certain LLMA as industrial district by means of specific indicators. The following is the detailed four steps quoted from *A Handbook of Industrial Districts* edited by Giacomo Becattini, Marco Bellandi, Lisa De Propris.

#### 1. identification of the manufacturing LLMAs;

This stage consists of two steps.

The first step is to measure the manufacturing specialisation of each LLMA using a location quotient (LQ) based on employment. LLMAs with an LQ greater than one in an economic activity are relatively specialised in that activity.

The next step is to compare for each LLMA the manufacturing, business or consumer services activities with an LQ higher than one to determine which of these economic activities has the largest weight of specialisation in terms of number of employees. And LLMAs with the number of employees in manufacturing higher than in services are defined as 'manufacturing'

#### 2. identification of the manufacturing LLMAs of SMEs;

Manufacturing LLMAs are examined to identify those in which there is a relative localisation of SMEs. The localisation of SMEs is measured according to the number of employees in small (up to 49 employees), medium (50–249) and large (250 or more) manufacturing firms. Manufacturing LLMAs with an LQ greater than one in small or medium-sized firms are defined as 'manufacturing LLMAs of SMEs'

#### 3. identification of the main industry of the manufacturing LLMAs of SMEs;

Manufacturing LLMAs of SMEs are examined to identify the main manufacturing industry. This stage consists of two steps.

The first step is to measure the specialisation of each manufacturing LLMA of SMEs in different types of manufacturing industry using an LQ based on employment. LLMAs with an LQ greater than one in a type of manufacturing

industry are relatively specialised in that type of industry

The next step is to compare for each LLMA the types of manufacturing industry with an LQ greater than one to determine which type has the highest number of employees. The type of manufacturing industry with the highest number of employees is defined as ‘main industry’.

#### 4. identification of IDs.

The fourth stage leads to the identification of LLMA as IDs. To be identified as an ID an LLMA needs to meet the following two conditions:

1. The employment in SMEs of the main industry is more than half the employment of the main industry in firms of all sizes:
2. The employment in small firms of the main industry is more than half of the employment of medium-sized firms, if there is only one medium-sized firm

#### ● Table: The industry typology and the corresponding NACE code

Code	Industry typology	Codici ATECO 2007
1	Textile and clothing	13, 14
2	Leather and footwear	15
3	Wood and furniture	16, 23, 31, 3291, 32994, 9524, 9529
4	jewellery,toys, musical instruments,etc	264, 3211,3212, 322-324
5	Food industry	10, 11, 12
6	Machinery and equipment	182, 2453, 2454, 25, 261-263, 265-267, 2711, 2712, 2720, 2731, 2732, 274, 275, 279, 28, 29310, 304, 325, 3311-3314, 332, 9512, 9522
7	Metallurgy	241-243, 2441-2445, 2451, 2452
8	Chemical, petrol chemical, rubber and plastic	19, 201-204, 2052-2060, 21, 22, 2446, 268, 2733, 32991
9	Transport equipment	291, 292, 29320, 301-303, 30911, 30912, 30921-30923, 30990, 3315-3317, 3831
10	Paper, printing, publishing	17, 181, 581, 59201, 59202
11	Other manufacturing (Made in Italy) industries	20510, 30924, 3213, 32992, 32993, 32999, 3319, 38311, 3832

Source: ISTAT data



● **Table: Made in Italy sectors of IDs' 11 macro sectors**

<i>Macro-sectors</i>	<i>Made in Italy sectors</i>
Wood and furniture	*
Jewelry	*
Machinery and equipment	*
Metallurgy	*
Food and beverage	*
Leather and footwear	*
Textile and clothing	*
Other manufacturing (Made in Italy) industries	*
Chemical, petrol chemical, rubber and plastic	
Paper, printing, publishing	
Transport equipment	

*Source: authors' elaboration on ISTAT data*

● **Table: The cities with more than 30,000 inhabitants**

Municipality	Province	Area	Population	Rank
Venezia	VE	416619738.3	261362	1
Verona	VR	198888492.2	252520	2
Padova	PD	93301929.21	206192	3
Vicenza	VI	80523851.52	111500	4
Treviso	TV	55514963.89	81014	5
Rovigo	RO	108530634	50164	6
Chioggia	VE	186564422.5	49735	7
Bassano del Grappa	VI	47012853.63	42984	8
San Dona' di Piave	VE	78862907.84	40646	9
Schio	VI	66209565.33	39131	10
Belluno	BL	147188604.1	35591	11
Conegliano	TV	36361417.46	34428	12
Castelfranco Veneto	TV	51321911.8	32894	13
Montebelluna	TV	49094935.3	30765	14

*Source: ISTAT 2011*