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The economic consequences of organized crime: are negative externalities produced by criminal companies mitigated by the presence of industrial districts?

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Firma dello studente

Ai miei genitori…

Non sono più quella di ieri,
non so come sarò domani.
Ma posso dirti come sono oggi, con i miei ieri.

Alda Merini

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Introduction

The topics of organized crime and industrial districts have been deeply studied in all their aspects during the last decades, becoming relevant research agendas. However, they have never been investigated in combination, with the exception of the recent literature provided by Ganau and Rodríguez-Pose (2018).

The aim of this master's thesis is to analyse how the local context in which Italian companies operate can affect their economic performance and behaviour. In particular, the research is focused on the economic effects of both organized crime and industrial districts on firms' performance, examining in depth whether the negative externalities produced by criminal companies could be partially mitigated by the positive externalities linked with the presence of industrial districts in the whole Local Market Area.

The idea behind this research work is to understand whether and how the positive effects associated with industrial districts can be extended beyond the district itself, embracing the whole Local Market Area where the industrial district is located through more efficient local institutions and stronger relations.

In this respect, the empirical analysis makes use of a final sample of 107,112 companies located in a criminal Local Market Area in the Central and Northern Italy, in turn obtained through the combination of other two datasets, the first one presenting a list of the 649 criminal companies considered, and the second one illustrating all the firms situated in the North and Centre of Italy for which the data about performance was available in the years taken into account. The empirical investigation exploits the year of removal of the criminal companies observed in order to implement a multiple regression analysis similar to a difference-in-difference model. In this way, it's possible to observe whether and how the firm's performance in terms of ROA, ROE and ROI will change once the criminal company is removed, distinguishing first between district Local Market Areas and non-district Local Market Areas, and then between district areas and non-district areas, trying to assess whether there is a causal effect among these differences. In other words, the analysis aims to verify both whether there is an effect after the removal of the criminal company, and whether this effect changes considering different territorial units of investigation, trying to provide reasonable explanations to the results obtained. Secondly, this thesis aspires to verify if this causal effect changes considering

different types of industrial districts' trajectories and different geographical areas in which they are located.

The research is organized in two chapters.

The first chapter presents an overview of the literature on organized crime and industrial districts, describing their traditional characteristics and focusing on the negative and positive externalities connected with these phenomena. In particular, the effects and consequences of organized crime on firms' profitability are described, as well as the sources of competitive advantage and the main challenges of industrial districts. Moreover, it outlines the research design, illustrating the starting hypothesis which combines the two lines of research studied.

The second chapter illustrates the empirical analysis carried out, describing the units of observation, the assumptions made, and the sample of companies considered. Finally, it defines the statistical approach adopted and the regression model implemented to perform the empirical research, discussing the main results obtained.

The last part of the thesis is designed to conclude, trying to summarize the insights obtained, to highlight the limitations of the analysis carried out and to suggest further developments of the topics addressed.

Chapter 1

Organized crime, industrial districts and their effects on firms' performance

This chapter aims to retrace the main contributions about the themes of organized crime and industrial districts in Italy, providing first of all a comprehensive overview of each topic.

The final objective of the first section is to highlight the negative economic effects of organized crime on firms' performance, and in particular on firms' profitability. Organized crime represents a relevant negative externality for firms operating in Italy (Ganau and Rodríguez-Pose, 2018) and it is often identified as a crucial obstacle to the economic development of a country (Pinotti, 2011). As a matter of fact, organized crime negatively affects the institutional environment in which Italian companies operate, that in turn affects the economic outcomes obtained by local firms, producing a vicious cycle that undermines both the socioeconomic context and the firms' efficiency (Ganau and Rodríguez-Pose, 2018). Within this framework, as stated by Lasagni, Nifo and Vecchione (2015), local institution quality matters in explaining the firms' productivity differentials by encouraging and consolidating a favourable business environment.

On the other hand, the second section of this chapter aims at providing an overall overview of the literature concerning industrial districts, mainly focusing on the positive externalities due to their presence in the geographic area in which they are located. Indeed, the peculiar characteristics that set out the Marshallian industrial district model, namely a specific territory, a given business sector, a population of firms and a network of relationships among the local players (De Marchi and Grandinetti, 2014), realize economies of scale that are external to the firm itself, but internal to the district area (Asheim, 1995), generating a source of competitive advantage for the firms operating inside the district in comparison with the firms operating outside. Also in this context, the role of local institutions is decisive in promoting the competitive advantage of both firms belonging to industrial districts (De Marchi, Di Maria and Gereffi, 2018) and firms operating in the same District Local Market Area, even if outside the district itself (Fabiani and Pellegrini, 1998).

1.1 Organized crime and firms' performance

1.1.1 Identification and characteristics of organized crime and criminal companies

Organized crime has become an important research agenda in the last decades, deeply studied by both national and international scholars and researchers. Indeed, criminal companies, and more in general organized crime, constitute one of the major problems to be faced and opposed these days by government institutions. It represents a multifaceted phenomenon that heavily affects both the political, economic and institutional life of a country, and the social capital of it (Dalla Chiesa, 2015).

According to Pinotti (2011), organized crime is traditionally considered the principal obstacle to the economic growth of several countries because of its pervasive economic consequences and conspicuous social and psychological costs. The presence of criminal organizations is harmful for the areas where they are established since their main objective is the one of monopolizing the market, killing all the principles of natural competition (Cesqui, 2017). As claimed by Tarantola (2012), organized crime benefits from a high capability of infiltration in the economic, social and political environment, being able to establish relationships with the civil society and to become stronger and stronger with collusion and corruption. The result is that the social capital of a given territory is compromised, damaging the individual behaviour, the trust and the networks of relationships of all the people living there. The civil legal society often intertwines with criminal organizations, that reveal themselves as a substantial and structured enemy, able to adapt itself every time the external conditions change. Consequently, it's necessary to deeply investigate the main features, mechanisms and dynamics of this phenomenon in order to be aware of it and to provide the appropriate instruments and resources to fight it.

1.1.1.1 Origins of mafia phenomenon and of organized crime

The origins of mafia in the South of Italy date back to the Kingdom of the Two Sicilies, governed by the dynasty of the Bourbons, and to the particular historical, social and political conditions that ruled at the time. The consolidation and the strengthening of mafia occurred, instead, after the Italian unification under the Kingdom of Italy. Mafia organizations were able to survive and to get stronger and stronger because of the relations and interactions between the state and the mafia politicians, able to change and manipulate the political and economic

equilibria existing at the time. Government institutions, instead of fighting against mafias, were often willing to please them, not to lose their protection and their political support, and they were dramatically influenced through the means of violence and electoral votes (Sales, 2016).

As reported by Santino (2017), the condition that characterized Southern Italy, and in particular Sicily, in the 19° century was completely dramatic: widespread poverty, high level of criminality, extensive presence of banditry, intense practicing of extorsion and kidnapping, employment of criminals as guardians because of their ability to use violence, and involvement of offenders into the police and the army. In Sicily, the only sectors that were present at the time were agriculture and pastoralism, without any development of the secondary and tertiary sectors. Moreover, as declared by Bonfadini in the report over the conditions of Sicily in 1875, education was not sufficient, taxes were too high, credit institutions were in crisis, the system of infrastructures was completely absent, the government was powerless and the public security was totally inefficient (Bonfadini *et al.*, 1876). There were not credible and solid justice and law enforcement systems, and a general feeling of distrust towards the authorities ruled (Gambetta, 2000). In this context of abandon, weak institutions and dissention, the first forms of criminal groups emerged, characterized by a specific organization, a hierarchical structure, protection from the authorities, the intensive use of violence, deception and intimidation, and a complex network of relations based on common interests and familiar relationships. These primitive groups turned quickly into real criminal organizations, being protected from authorities and providing protection to the authorities, exploiting a large social consensus and benefitting from the impunity (Santino, 2017).

The literature about the origins of mafias is very rich. Among the researchers interested in this theme, Bandiera (2003) asserted that mafia in Sicily grew "to protect land from predatory attacks" in a period characterized by an inefficient provision of public security and a strong spread of banditry. Her findings were based on the idea that mafia arose in order to provide what the state was not able to ensure, namely protection of lands and enforcement of specific institutions, such as property rights. According to Bandiera, the abrogation of feudalism caused a sharp increase of landowners, determining an extensive land fragmentation that, in turn, extended the demand and the competition for demand protection. Consequently, the activity of mafias proliferated, receiving a surplus higher and higher with the level of land fragmentation. What distinguishes mafia from other criminal groups is its twofold behaviour: on one hand, an enforcer role to obtain consensus and legitimacy, on the other hand, an extorter role to threat other landowners and to collect rents. The emergence of mafia was possible, once again, because of the weak law enforcement and the lack of coordination among the government

bodies. An important insight arising from this research is that the establishment of private property rights has always to be matched with an appropriate law enforcement, otherwise the gap is filled by other, usually illegal, organizations.

According to Dimico, Isopi and Olsson (2012), instead, mafia developed as a consequence of the "need to protect citrus production from predation by thieves", connecting the presence of mafia with the cultivation of oranges and lemons. These markets were characterized by high fixed costs of production, imperfect competition and could guarantee high profits, making the farmers the natural targets for thieves. In a scenario where government institutions were absent, weak and powerless in guaranteeing the protection of property rights, lemon producers were obliged to rely on mafia organizations to be protected from external attacks.

Finally, another perspective concerning the development of mafia is the one of Buonanno *et al.* (2015), which argued that in a background characterized by weak or absent law enforcement institutions, the availability and abundance of natural resources, in particular sulphur, can trigger the emergence and consolidation of mafia organizations, attracted by opportunities for rent control and usurpation, provoking persistent socio-economic effects on the economic outcomes of a country. Indeed, criminal organizations arose in order to control and monopolize the sulphur protection market, that represented one of the most profitable market at the time. Another interesting finding emerged from this study is related to the pervasive and persistent effect of early mafia on today's mafia: mafia entails long-lasting effects, undermining the efficiency of the economic and political institutions.

In this context, the words of Giovanni Falcone are meaningful in summarizing all these findings: "The mafia is, essentially, nothing but the expression of a need for order, for the control of a State."

1.1.1.2 Definition of organized crime

The definition of organized crime has been long discussed among scholars since it's difficult to summarize in few words a phenomenon that is inherently complex, structured, and for certain aspects, undisclosed.

The Italian Penal Code, in article 416-*bis (*"*associazione a delinquere di stampo mafioso"),* introduced starting from 1982, regulates explicitly crimes related to mafia as follows:

> "Mafia-type organizations are made of members that make use of the power of intimidation that the association gives them and the consequent condition of subjection and 'omertà' in order to commit crimes, to acquire directly or indirectly the management

or the control of economic activities, concessions, authorizations, procurements, public services, or to realize profits or unfair advantages for themselves or for others".

According to this definition, oriented to safeguard the public order, the mafia method disregards the effective use of actual threats or violence, but it's sufficient to own a peculiar fame of violence and oppression, developing in the surrounding environment a concrete and stable power of intimidation, that in turn generates the phenomenon of 'omertà', a behaviour of non-collaboration and aversion towards public authorities. The existence of the criminal organization represents itself a danger for the public order, regardless of its purposes and of the economic activity pursued. Indeed, in this respect, the final objective of the mafia-type organization could also be a legal economic activity.

One of the first definitions given to the mafia phenomenon is the one attributed by Franchetti and Sonnino (2006, p. 22), in their inquiry about the social, political and administrative conditions of Sicily in 1876, after the Italian unification:

> "Mafia is a medieval sentiment; 'mafioso' is who believes to be able to provide protection and safety to his own and to his possessions thanks to his value and to his personal influence regardless of the measures taken by the authorities and by the law".

They stated that mafia-related people are both ministers and instruments of violence, together with people that are in a close relation with them, with the common purpose to promote their mutual interests. Calderoni (2011, p. 6), instead, in his attempt to measure the presence of mafia in Italy with a number of indicators and variables, adopted the following operational definition of mafia:

> "[Mafia is] a criminal system characterized by the presence of criminal groups providing illicit goods and services, using violence, threat or intimidation, and infiltrating the political and the economic system."

According to Finckenauer (2005), finally, the reference framework for defining organized crime is based on the following dimensions: ideology (or lack of it), structure/organized hierarchy, continuity (self-perpetuating groups), violence/force/threat of force, restricted membership, illegal enterprises, penetration of legitimate businesses and corruption of public representatives. In his opinion, what identifies organized crime is the reputation of using violence and the ability of threating the use of violence in order to implement criminal operations and to gain the control over specific markets. Moreover, another element to be taken into consideration to precisely frame the organized crime phenomenon, is the employment of corruption of public officials as instrument to protect the members of the criminal organization

and the regular fulfilment of their economic activities. The sectors where corruption and criminal companies are more related are the following: public works and services, waste disposal, healthcare and financial activities (Canonico *et al.*, 2010).

1.1.1.3 Characteristics of organized crime

The main difference between organized crime and traditional criminal behaviours lies into the fact that the first one is aimed at gaining, and then maintaining, the monopoly over the production and distribution of specific goods and services traded in legal and illegal markets (Albanese and Marinelli, 2013). Indeed, two of the most relevant characteristics that define criminal organizations are the following:

- the use of violence, to guarantee them a monopoly influence over legal and illegal markets, which they use to collect rents from other economic agents (Pinotti, 2015b);
- the nature of organization, that allows them to take advantage of an outsize amount of resources to pursue their criminal objectives and to be involved into extremely complex and profitable illicit activities, such as drug trafficking, money laundering, kidnappings, corruption, frauds, illegal waste disposal, and others (Pinotti, 2015a).

In their paper regarding the macroeconomic impact of organized crime, Astarita, Capuano and Purificato (2018) identified the typical crimes performed by criminal organizations (extortion, trade of criminal goods, corruption and money laundering), and listed the peculiar features that frame and delineate them:

- they act in areas where an institutional vacuum is present in order to provide to the society what government institutions are not able to provide, such as the protection and enforcement of property rights. Indeed, as stressed by Finckenauer (2005), mafias are more likely to develop in countries where governments are weak, inefficient and ineffective; on the contrary, they find more difficulties in establishing themselves in countries that are stable and with robust and well-functioning institutions;
- they manage very different activities, economic and non-economic, legal and illegal. The connection between legal and illegal activities lies in the practice of money laundering, that allows them to clean the proceeds arising from criminal activities and to reinvest them in the legal economy;
- they establish various structures to manage their subsidiaries, both hierarchical and flexible depending on the activities implemented;
- they exploit their reputation of being able to use violence or the threat of violence in performing their activities, showing their ‘anti-state’ nature.

The illegality connected with organized crime consists of practicing the business of extorsions in mutually agreed confined areas and collaborating with representatives of the political, economic, entrepreneurial and social life in order to manage procurements and to exploit opportunities of protection, impunity and profits (La Spina and Lo Forte, 2006). Mafia members, active both in illegal markets (drug trafficking, arms trafficking, kidnapping, waste disposal, usury, etc) and in legal markets (in order to reinvest the proceeds coming from the illicit activities and to make them clean), are so successful in managing their criminal organizations because of their hierarchical structure, internal rules, intimidatory attitude, stringent behavioural codes and the collaboration with individuals that are not part of the criminal organization, but are interested in establishing relationships with it so to obtain a vast range of advantages. As underlined by La Spina and Lo Forte, mafia-type criminal organizations have the fundamental purpose of affecting and manipulating the legal economic and entrepreneurial environment, making use of both members belonging to the organization itself and of external people that are available and willing to perform some essential activities for the organization. Moreover, thanks to the phenomenon of "omertà", individuals having to do with criminals usually adopt an attitude of aversion towards any kind of judicial and government authority. The main reason why organized crime is so powerful and effective, that is also one of the main problems of today's societies, is its expectation of low punishment, its expectation of low enforcement of penalties, its expectation of inadequate sanctions, and its expectation of an attitude of collusion from some public institutions' members. Moreover, because of this lack of credibility of the central state, people that are averse to mafias tend to move themselves far away, diminishing in this way the level of opposition against mafias, and unintentionally increasing their strength (Gambetta, 2000).

According to Sciarrone (2006), mafia groups pursue two different objectives: an economic one, namely the search of economic profits, and a political one, that is the search of power. He argued that the second one prevails over the first one, expressing itself through the control over the territory using the mechanism of extortion-protection. In his opinion, mafia-type organizations avail themselves of each form of power in order to obtain the obedience of other individuals, starting from the force (exclusion of any other possible alternative different from the preferred one), the coercion (modification of the relative desirability of the potential alternatives available), the manipulation (structure of the options and conditions of the agents) and the influence (impact on the beliefs and desires of people so to affect their willingness).

The strength and persistency of criminal organizations are based on the accumulation and employment of social capital, defined as a system of internal and external relations exploitable

by both criminal members and by individuals external to the organization, such as the members of the ruling class interested in satisfying their strategical aims. The two social categories are bonded by a relation of interdependence, reciprocity and mutual appreciation, not of subordination (Sciarrone, 2006). Ultimately, criminal organizations are interested in obtaining social consensus, cooperation, legitimacy and institutionalization of their power in order to build, maintain and enlarge their network of social relationships, influencing how people think, feel and act. Indeed, mafia people can be defined as experts in building social relationships, creating internal cohesion and external consensus. In this context, Sales (2016, p. 2) wrote:

> "Mafia-related violence can't be associated with violence of opposition or collision with the state, nor can be considered as a violence external to the institutions and to the society. It can be defined as internal, intergovernmental, in relation with the state. Nowadays, any form of power can assert itself and be successful and permanent without being in relation with the official and institutional power. […]. As a consequence, since mafia was founded two centuries ago, the logical implication is that it represents a power related with the official power, not alternative or contrasting with it. […]. The strength behind criminal organizations resides exactly in the relations with whom who should have had to contrast them. Without these relations, mafias would not be like they are, would not have lasted a so long period of time and they would not have affected the past, the presence and the future of Italy".

Mafia networks of relationships are extremely complex to be undone, in particular the one with the ruling class since they are elusive and difficult to be identified, isolated and, as a consequence, counteracted and prevented (Sciarrone, 2006). In this context, Franchetti and Sonnino (2006, p. 95) wrote:

> "It's very difficult, once drawn into relations with criminal organizations, to get out of them […]. This […] happens, at different levels and in different ways, to anyone of the ruling class willing to take advantage of his position. Some of them are not aware of the consequences that they will have to face, others are completely aware of them."

Sciarrone, in his work, defines the mafia network as a dense and firm cluster, with a multitude of nodes full of weak links towards the external environment. Here, the power equilibrium is cooperative, and continually fluctuates in different positions. The only way to break the network is to disable the most important nodes, that are exactly the one associated with relations between criminal members and ruling class representatives. Mafia is described as a "successful cluster or coalition of clusters" also by Gambetta (2000), which asserted that the core business of

mafias is to create monopolies through the mean of violence, exploiting the sentiment of distrust widespread among people.

Another distinctive characteristic of criminal organizations is represented by their ability and will to continuously adapt to environmental changes, taking into consideration also the reactions and expectations of other individuals in their decision-making process. They change the structure of the incentives on the basis of the specific context considered (Sciarrone, 2006). Indeed, as confirmed by Catanzaro (1985), the persistence of the mafia comes from its capability to continuously adjust its codes of conduct and internal values to the ongoing changes and challenges induced by the surrounding social, economic and political environment. Historical changes represent opportunities to reach new purposes, employing new institutions or modifying the old ones, always maintaining the traditional values at the basis of the mafia organizations. This constant adaptation was, in Catanzaro's opinion, the secret of mafia's persistency and strength.

1.1.1.4 Characteristics of criminal companies

Criminal companies invest their money following the most profitable and remunerative opportunities offered by the market. They operate both in illegal markets (drug trafficking, kidnapping, waste management, arms trafficking, usury, etc), proving themselves to be flexible, resilient and proactive, and in legal markets, appearing as clean businesses. As stated by Canonico *et al.* (2010), criminal firms represent a tool employed by criminal organizations in order to collect money, make profits, perform money laundering and reinvest the money in totally clean activities, maintaining at the same time a respectable and reputable identity. These "clean" companies operate regularly in the market, using the most sophisticated and updated strategies, so they are not objectives of investigations and are not constantly monitored by the legal judicial system.

Criminal organizations have strong convenience to establish a positive relationship with apparently legal firms, and also the contrary is true: firms can exploit the opportunity to enter new markets, pay workers at minimum wages, establish harmonious relationships with unions, decrease internal bureaucratic issues and save a lot of money by implementing a more efficient organizational system; criminal organizations, on the other hand, can benefit from the money laundering activity, the control over different territories and the diversification of the portfolio of investments that allows in turn to reduce the risks incurred (Canonico *et al.*, 2010). Consequently, it's very difficult to map out the border that divides and links the legal and illegal

dimension taken into consideration, since mafia organizations are intertwined and perfectly combined with the state.

In this context, as suggested by Alessandri (2016), it would be necessary to make a distinction between the "mafia-entrepreneur" and the "colluded-entrepreneur". The first one is not originally an entrepreneur, but assumes this role in order to carry out his illegal activities and to pursue his organization's interests. The second one, on the other hand, is an entrepreneur operating in the legal environment that, at a certain point of his career, is obliged or decides autonomously to come into contact with a criminal organization, creating a mutual relationship that satisfies different interests and needs.

A recent research carried out by Fabrizi, Malaspina and Parbonetti (2017) investigates the main characteristics and the modus operandi of the companies connected with organized crime that are located in the Central and Northern Italy. First of all, they reported some features of criminal companies that are already well-known in the literature:

- They are used for money laundering practices realized by investing money acquired illegally;
- They operate in low-tech and highly labour-intensive sectors, with a low level of external openness, characterized by a significant deregulation, a high level of local specificity, deep attractiveness of public resources and a high involvement of public authorities;
- They exploit low-cost financial resources, low cost of labour and they are used to tax evade;
- Their balance sheets usually show a strong prevalence of current assets, both cash and current financial claims.

Their analysis is carried out by comparing the financial statements of criminal companies with the financial statements of non-criminal companies, capturing in this way the main differences between the two categories. What emerges from the study are the following insights regarding the firms' size, performance and debt ratio:

- considering both the dimensions of revenues and total assets, criminal companies are on average larger than non-criminal companies and are able to move substantial financial resources;
- considering the performance dimensions of ROE and EBITDA over total assets, on average there are no significant differences between criminal companies and non-

criminal companies, even if one could expect the opposite result in light of the low-cost money and workforce;

- considering the level of indebtedness, criminal companies tend to have higher debt-ratios in comparison with non-criminal companies, although one could expect the opposite. As far as the liquidity ratio is concerned, criminal companies have access to a lower amount of cash with respect to non-criminal companies.

They revealed that there are three groups of criminal companies, which correspond to three different modes of use of them:

- criminal companies defined "di Supporto", small companies characterized by revenues equal to zero, a high percentage of costs of services, low level of profitability, high non-operating profits and high levels of liquidity. They are aimed at directly supporting the needs of the criminal organization, by providing assets, tools, services and cash;
- criminal companies defined "Cartiere", small and medium companies characterized by a strong correlation between revenues and operating costs and a high volatility of revenues. They are used in order to practice the money laundering activities, which allow to reinvest the money acquired through illicit dynamics;
- criminal companies defined "Star", large companies characterized by a high level of profitability and high performances. They are employed by criminal organizations to create connections with the politic, social and institutional environment and to establish relationships with non-criminal companies and public officials.

As underlined by Transcrime (2013), the mafia-method of managing a company can be associated with the following typical behaviours: pressure on suppliers, pressure on workers in order to reduce the salary, low-cost raw materials and services, reduction of competition, collusion with the administrative system, corruption, tax evasion and falsification of accounting documents.

1.1.1.5 Sectors and activities of criminal organizations

Criminal organizations are interested both in operating in illegal markets, with the main objective of collecting significant amounts of resources, and in legal markets, in order to ensure themselves a way to reinvest the proceeds obtained illegally.

Traditional illegal activities performed by organized crime (sexual exploitation, illicit trafficking of firearms, illicit trafficking of drugs and tobacco, counterfeiting, gambling, illegal waste management, extorsions and usury) guarantee to criminal organizations, at national level and on average, an amount of revenues equal to € 10.5 billion (Transcrime, 2013). The main

source of revenues is represented by extorsions, representing a percentage equal to 45% of the total, and then the drugs follow, amounting to 23%. The highest amount of illegal revenues is provided by the region Campania, where the criminal organization of Camorra is established, followed by Sicily, the birthplace of mafia-related organizations.

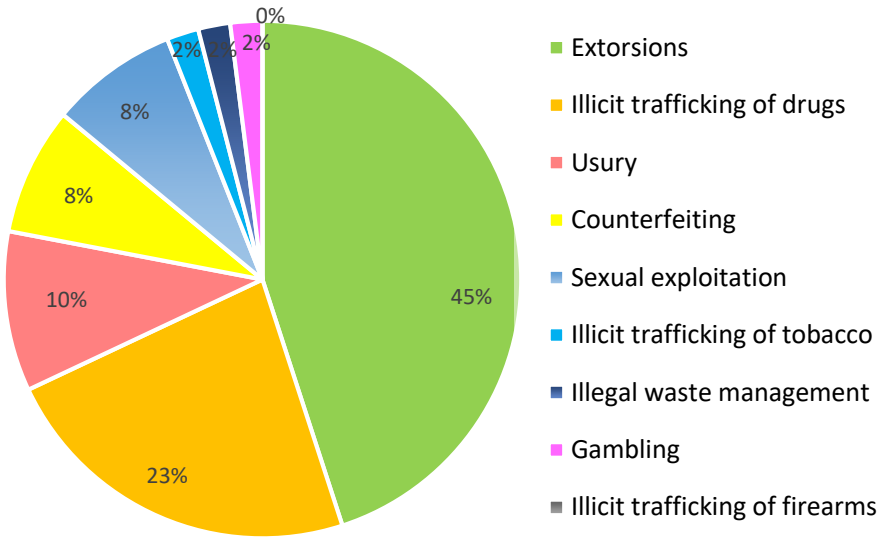

Figure 1.1 - Average revenues of criminal organizations by activity. Source: Transcrime (2013).

Over the past few years, the power of criminal organizations largely spread across the social fabric, significantly affecting the legal economy through the phenomenon of corruption, especially in sectors directly or indirectly connected with the State mediation (Centorrino and Ofria, 2008). The reasons that justify this behaviour (from mafia-traditional organizations to mafia-entrepreneurial organizations) can be found in the following needs (Transcrime, 2013):

- Money laundering, in order to hide the criminal proceeds and to reinvest them. Money laundering, as stated by Ferrara and Mavilia (2011), is defined as the transformation of potential purchasing power into effective purchasing power, available for choices of consumption, saving and investment. It increases the mimicry level, contaminating the social fabric, the financial system and the real economy, and increasing the level of inefficiency;
- Search for high profits, by exploiting the connections with the political and economic environment and discouraging the competition. A criminal, apparently legal, organization can obtain contracts and win tenders threating criminal acts, without following the normal procedures of competition and imposing barriers to entry for not-

affiliated companies. This represents a source of inefficiency and a negative pecuniary externality;

- Need of social consensus, by providing employment opportunities and income to the local citizens through labour-intensive production processes. Furthermore, criminal groups seek to gain the consensus of other entrepreneurs, public officials and local politicians so to strengthen the network of relationships with these agents and to create a respectable and clean identity;
- Strategic control over the territory, both in traditional areas and in new non-traditional areas.

The infiltration of mafia-related organizations into the legal economy is concentrated on some specific sectors, chosen on the basis of their intrinsic characteristics and considering the reasons that push the criminal organization to invest there. Depending on the specific intention followed, the sectors object of investment usually are the following (Transcrime, 2013):

- If the main aim of criminal organizations is to hide criminal activities, they usually prefer to invest in emerging and poorly regulated sectors characterized by a legislation that simplifies the money laundering practices and in small non-listed companies so to reduce the provision of information required;
- If the main aim of criminal organizations is to maximise profits and to minimize risks, they are more interested in investing in lands, plants and apartments and in sectors characterized by subsidies (sector of renewable energy), tenders (sectors of waste management, healthcare, public sectors and transportation), limited competition (sectors of large-scale distribution, catering and constructions) and in traditional sectors that do not require peculiar skills or technological innovation;
- If the main aim of criminal organizations is to increase the social consensus, they aim at providing new employment opportunities by investing in sectors like the large-scale distribution, supermarkets and shops. In order to consolidate their identity, they could be interested in investing in public services, such as healthcare, public transport and communication sectors;
- If the main aim of criminal organizations is to enhance the control over the territory, strategic sectors where to invest are the touristic one and the public procurement one.

Summarizing, the infiltration of organized crime appears more concentrated in areas with limited provision of infrastructures, high presence of mafia-related organizations and low level of investments abroad, and in sectors characterized by low labour productivity, high incidence of workforce, low technology level, small and medium-sized enterprises, high level of

deregulation and a strong involvement of the public administration authorities (Transcrime, 2013; Belloni and Vesco, 2018).

Sector	Percentage
Mining	45.16
Healthcare	5.31
Constructions	4.85
Hotels and restaurants	4.07
Provision of electricity, gas and water	3.84
Transportation, storage and communication	3.29
Wholesale trade and retail trade; maintenance of motor vehicles	2.90
Public, social and personal services	2.68
Financial activities	2.05
Real estate business, rental, data-processing	1.81
Agriculture, hunting and fishing	1.18
Manufacturing activities	0.53
Others	0.05

Table 1.1 - Ratio between seized companies and registered companies by economic sector at national level. Ratio every 10,000 registered companies. Source: Transcrime (2013)

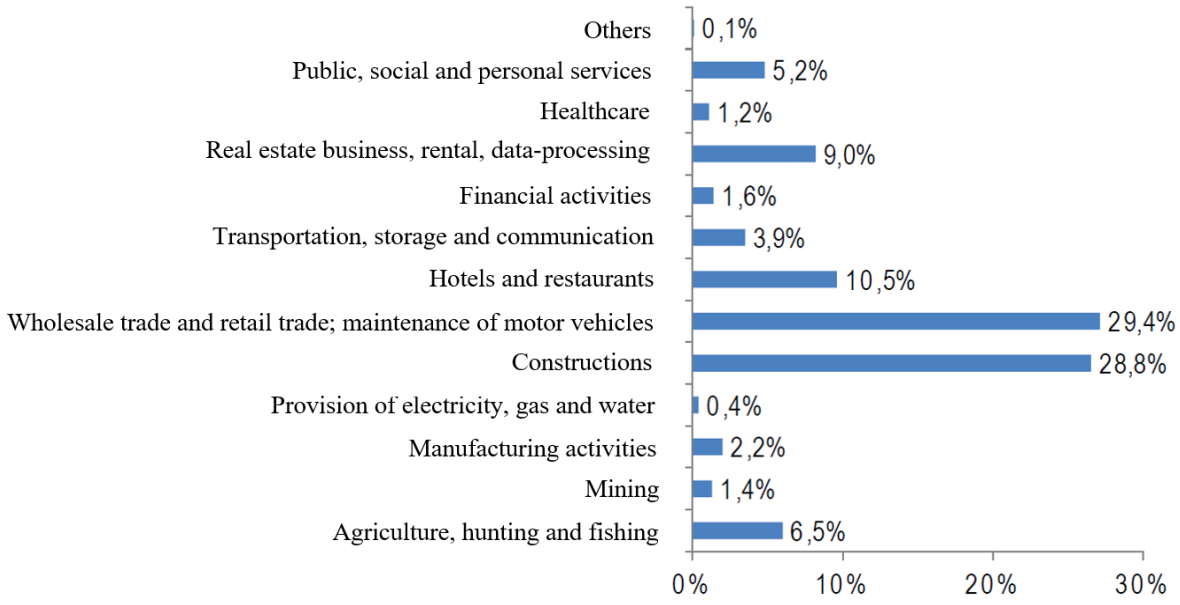

Figure 1.2 - Seized companies in Italy (1983 - 2012) by economic sector ATECO 1 digit. Source: Transcrime (2013)

1.1.2 Expansion of organized crime in the North of Italy

Organized crime has become an international phenomenon, expanding its borders both in the Central and Northern Italy and in other countries, far beyond the traditional territory of origin. Its presence is no longer limited to a specific and geographically restricted area, but pervasively embraces non-traditional regions, seriously affecting their economic, political and administrative systems. As highlighted by Catanzaro (1985), mafia is becoming more and more dangerous because it "can no longer be seen as a special group, but asks to be interpreted as a social sub-system which articulates its own presence in most of the vital nerve-centres of society". As already stated, the real strength of mafia-type organizations and their ability to spread also in non-traditional areas are based on the external relationships, namely on the social capital built and maintained to create a connection between the legal and illegal world (Cusin, 2015). In this context, according to Merlati (2015), transnational organized crime is nowadays a complex and consolidated actor belonging to the international system, able to choose the countries where it's less risky to carry out criminal acts considering the different law enforcement strategies (Ponti, 2015).

The reasons that explain the phenomenon of mafia migration into the Northern regions of Italy can be identified in two key factors (Buonanno and Pazzona, 2014): huge migration flows from the South to the industrialized North during the economic prosperity from early '60s to early '70s, and a peculiar policy measure implemented in the same period by Italian politicians called "confino", or forced resettlement, consisting in the mandatory displacement of all those people seriously suspected of taking part of criminal organizations connected to mafia. This policy, originally aimed at breaking, or at least weakening, the network of relationships and connections of criminal organizations, ended up with the opposite result: the strengthening and the diffusion of organized crime also in non-traditional areas. As pointed out by Calderoni (2011), the Mafia-Index scores confirm the presence of mafia-type associations both in the traditional southern regions of Sicily, Calabria, Campania and Apulia, and in the Central and Northern Italy, underlining that mafia constitutes a national problem, extended also to the more developed and industrialized areas (see Figure 1.3).

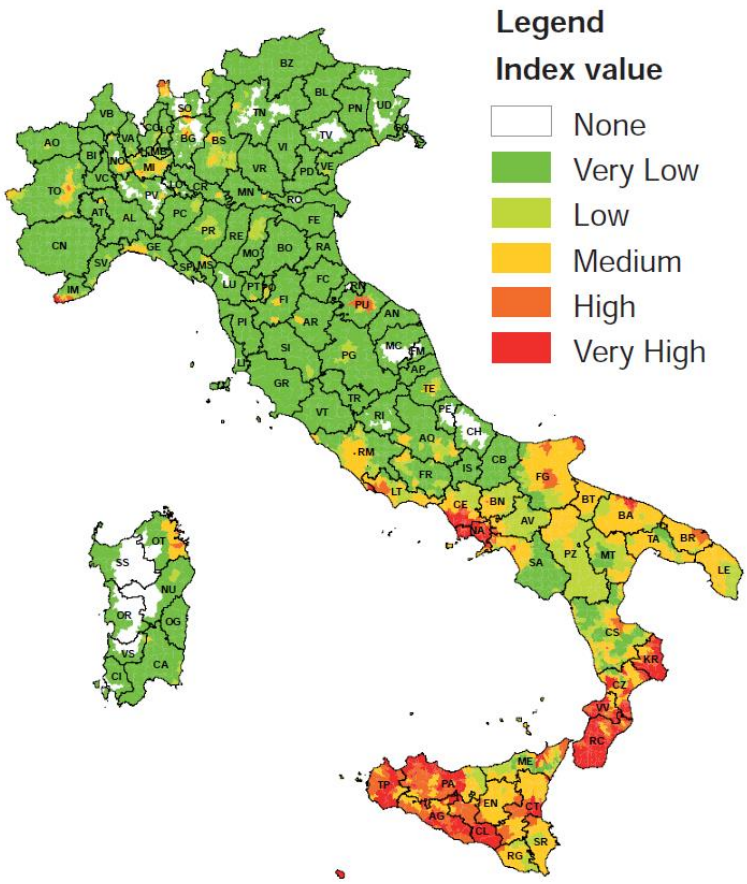

Figure 1.3 - Mafia presence index 2000 – 2011. Source: Transcrime (2013)

Mafia infiltration in the North of Italy happened gradually, exploiting non-traditional approaches and different types of crime with respect to their modus operandi in the South. They had to blend into the legal environment, without making them identifiable by the judicial authorities. Indeed, as highlighted both by Fabrizi, Malaspina and Parbonetti (2017) and by Cusin (2015), criminal organizations tend to infiltrate especially in small and medium municipalities since there are the ideal conditions for their establishment and diffusion: weak supervision by public authorities, lower attention of the national press, easier access to local administrations and better opportunities to control the territory, acquire monopoly positions and affect the institutional environment by establishing dense networks of relationships.

The distribution of criminal companies in the Northern regions of Italy (see Figure 1.4) highlights how the mafia phenomenon is mainly concentrated in some particular areas, even though the infiltration is pervasive and largely widespread almost everywhere. The largest part of criminal companies is situated in Lombardy (especially in the provinces of Milan, Lecco and Brescia), Piedmont (mostly in the province of Turin), Liguria (in particular in the province of Savona), Emilia Romagna (in the province of Bologna), Veneto (mainly in the provinces of Padua and Venice) and in Lazio (in the province of Rome). Criminal companies in the North

of Italy present differences among the different regions in terms of size, profitability, level of indebtedness, level of concentration, type of company and industrial sector infiltrated (Fabrizi, Malaspina and Parbonetti, 2017).

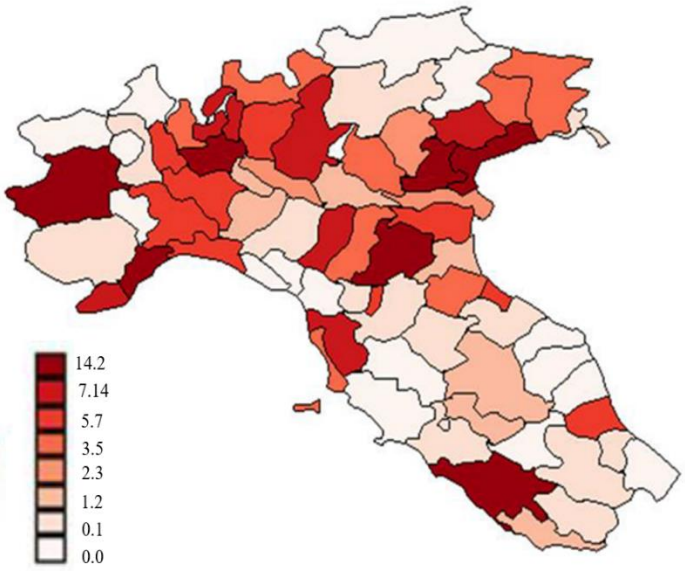

Figure 1.4 - Criminal Organizations' distribution by province. Source: Fabrizi, Malaspina and Parbonetti (2017)

In these non-traditional areas, the presence of a specific typical organization can be registered (Mafia, 'Ndrangheta, Camorra, or Sacra Corona Unita), but at the same time it could happen that more than one organization simultaneously stabilises in a specific territory. Relationships among different mafia-type organizations exist whenever the activities and the operations to be carried out go beyond the regional boundaries or invade the particular areas controlled by a specific group. As a consequence, it's very complex and demanding for police authorities to trace all these connections and relationships, and problems of competence in the judicial context are often difficult to be solved. The high road to be followed when investigating in the field of mafia is a capital investigation aimed to follow the money flow arising from illegal operations, since it represents the only way to build a network of objective, documentary, unbiased and unique evidence. The sectors able to provide the highest amount of probative results can be found in the banking, corporate, fiscal and real estate investigations (Falcone and Turone, 2015).

Differently from what happens in the South, characterized by permanent forms of establishment of organized crime, in the Central and Northern Italy it is more appropriate to make reference to the concept of infiltration, implying a lower level of stability, a silent presence, a high capability of adaptation, a systemic interlocution with the political and local society and a lower

possibility to exert a control over the territory because of the different social, political, economic and civil environment (Smuraglia, 2015; Belloni and Vesco, 2018). Anyway, it is worth to underline that the control over the territory is only one of the possible forms and features of the mafia-type organizations' behaviour, sometimes deliberately avoided in order to prevent the attention of the authorities.

Non-traditional areas infiltrated by criminal organizations show the development and the diffusion of all the activities performed in the Southern areas of origin. The profitability arising from the illegal trafficking of drugs has reached impressive amounts, the illicit trafficking of firearms largely widespread reaching dramatic dimensions, the markets of prostitution, gambling, extorsions, kidnapping and usury are well-developed, and the acquisition of companies undermining the legal environment has the twofold objective of realizing economic advantages and of reinvesting the money illegally obtained. (Smuraglia, 2015). Activities of money laundering and the attempt to enter in the economic and financial world require an organization much more sophisticated than a simple local one, with numerous connections, references, social relationships, professionals' support and technical skills required (Smuraglia, 2015).

Whereas in the '60, '70s and '80s criminal organizations were mainly active in illegal markets, starting from the second half of the '90s they began to invest also in some sectors of the legal economy, providing themselves the possibility of obtaining economic advantages and the strategic opportunity of establishing relationships with the whole society (Belloni and Vesco, 2018). Mafia infiltration in the economic scenario manifests its presence in all the traditional investment areas of criminal organizations, namely the sectors of constructions, real estate activities, waste management and water provision. Moreover, as reported in Figure 1.5, criminal organizations are involved transversely in almost all the economic activities, blending in with the surrounding environment and infiltrating themselves in the economic fabric (Fabrizi, Malaspina and Parbonetti, 2017). Another form of infiltration in the economic scenario is represented by the interest in obtaining procurements of public works, with methods substantially different from the ones used in the South. Indeed, the main tool exploited in order to achieve this purpose is the corruption, proposing unusual and suspicious offers characterized by very low prices in order to win every kind of competition. The recovery, then, will be pursued through the black economy, the reduction of security measures, the saving on materials and finally with price variations imposed in a second moment (Smuraglia, 2015).

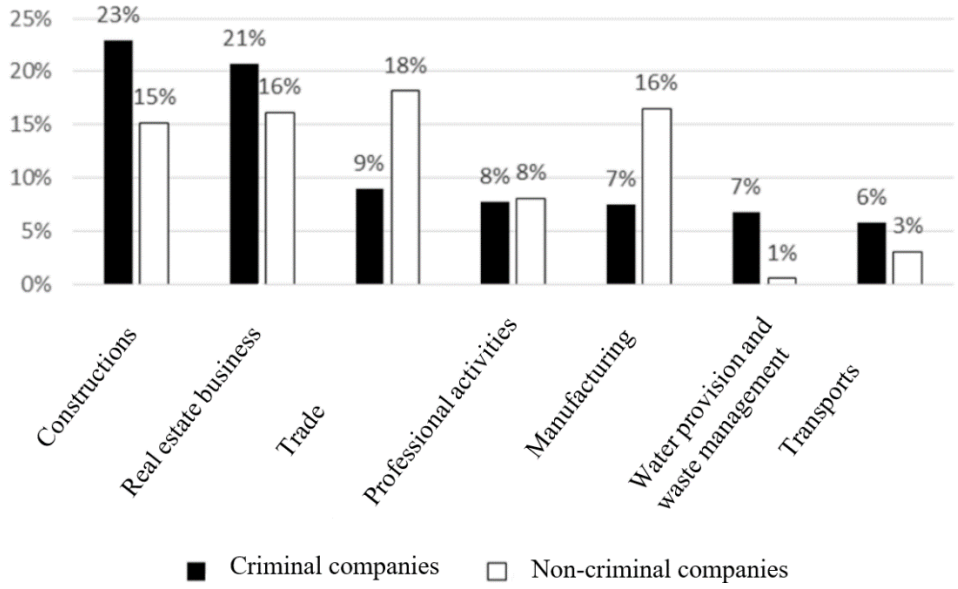

Figure 1.5 - Criminal Organizations' distribution by sector. Source: Fabrizi, Malaspina and Parbonetti (2017)

Criminal organizations in the North of Italy, not differently from what happens in the traditional Southern areas, have established strong relationships with the political, administrative, economic and civil world, since their development and diffusion would not have been possible without protections, supports and collaborations with public and law enforcement officials, employees of local and judicial authorities and the banking system (Smuraglia, 2015). Indeed, as stressed by Belloni and Vesco (2018), criminal organizations' members build networks and establish relationships of complicity with entrepreneurs, professionals and local politicians, weaving and mixing up the criminal world, the business fabric and the political sphere, making it difficult to distinguish the legal environment from the illegal one. The interaction between all these actors assumes different characteristics depending on the context where it happens. Often, the relationship between entrepreneurs and mafia members takes the form of collusion, namely of collaboration mutually satisfactory. As a matter of fact, in some cases collusive agreements are perceived as the only way to economically survive, in a context where the economic crisis has represented an element of acceleration of all the illicit mechanisms offered by criminal organizations. As a consequence, illegal practices are well accepted by entrepreneurs as long as they have the possibility to stay into the market (Belloni and Vesco, 2018).

1.1.3 Negative effects and consequences of organized crime

The pervasive nature of organized crime constantly risks to contaminate the most important sectors of the economy, damaging the competitiveness of a country and the quality of the

political class, and subtracting wealth and resources to the legal sector. Mafia-type organizations and criminal firms, indeed, cause inefficiencies and distortions in the socio-institutional, political and business environment (Fabrizi, Malaspina and Parbonetti, 2018), producing both direct and indirect effects and influencing the quality of institutions.

As stated by Pinotti (2015a), organized crime has serious economic consequences, since it increases the riskiness and the uncertainty of the surrounding environment and reduces the opportunities for growth of a country. Moreover, it produces dramatic social and psychological costs, destroying part of the human capital stock and provoking distortions in the allocation of resources. The presence of criminal organizations tend to bring about negative consequences both for the socio-economic environment, by reducing the level of security and legality of the territories where they are established, and for firms' performance, by imposing the payment of bribes (the so called "pizzo" in mafia-related language) as condition for staying in the market, and by damaging the market rules, the traditional long-lasting relationships of cooperation and competition existing among local companies and the competitive processes among firms (Ganau and Rodríguez-Pose, 2018).

The incidence and the diffusion of organized crime today strongly depend on the institutional conditions existing when mafia grew: weak institutions, inefficient law enforcement mechanisms and fragile government constitute a breeding ground for the growth and the development of mafia-type organizations. Indeed, one of the main purposes of criminal companies is exactly the one of affecting the institutional system, increasing corruption and distorting the resource allocation (Albanese and Marinelli, 2013). As a matter of fact, the negative effects of organized crime on the society, on the economy and on the politics could be mitigated through the implementation of good institutions, which represent, with their positive long-lasting effects, the main instrument in order to prevent and fight the mafia phenomenon.

1.1.3.1 Socio-economic effects of organized crime

The presence of mafia-type criminality has profound socio-economic effects, altering the regular functioning of the markets and the normal behaviour of individuals and firms. It increases risk and uncertainty in the business environment, making it riskier, less dynamic and less competitive, and minimizing trust and collaborations among individual agents, increasing in this way transaction costs and inefficiencies (Ganau and Rodríguez-Pose, 2018).

Organized crime, GDP per capita and corruption

Organized crime is negatively correlated with the level of economic output per capita, of the order of 35% for a one standard deviation increase in the index of organized crime, and it is

positively correlated with the level of corruption of politicians, which are more exposed to the threat of violence, bribes and intimidations where the presence of criminal organizations is pervasive and widespread, decreasing the level of political stability (Pinotti, 2015a). In particular, by distinguishing the components of the real GDP per capita in human capital, capital stock and Total Factor Productivity, the final result remains confirmed: they are negatively associated with the presence of mafia-type organizations. Indeed, the five Southern regions of Italy (Calabria, Sicily, Campania, Apulia and Basilicata), characterized by a widespread presence of criminal organizations, are the poorest of the country, showing a slowdown of economic development and confirming empirically the above-mentioned negative correlation (Pinotti, 2011).

Organized crime and the propensity to consume and to invest

The presence of organized crime negatively influences both the propensity to consume and the propensity to invest for the society as a whole and for firms. In this case, the cost of mafia represents a social cost with a considerable economic impact, since part of the demand is moved from the legal sector to the illegal one, without reintroducing the proceeds arising from the economic activity in the productive mechanism (Ferrara and Mavilia, 2011).

Criminal organizations as parallel taxation subjects

Mafia organizations, in addition to the other negative effects on the socio-economic environment, assume the role of "parallel taxation subjects", since the levy of resources that they carry out on the legal economy represents a form of taxation in addition to the one imposed by the state. Mafia taxation constitutes an efficient, individualized and personalized system, able to hit the different economic subjects on the basis of their maximum fiscal capacity, producing distortions and a welfare loss for the whole country. As a matter of fact, the taxation imposed by criminal organizations can be translated in a higher level of taxation for all the citizens of a country, which will suffer from a lower level of disposable income and will be incentivized to perform evasive and elusive behaviours. At the same time, at national level, the government budget will suffer a reduction in the amount of tax revenues (Ferrara and Mavilia, 2011). In this context, as confirmed by Albanese and Marinelli (2013), criminal organizations usually tend to elude both the labour market and the fiscal legislations, obtaining unfair competitive advantages with respect to their legal competitors.

1.1.3.2 Effects of organized crime on firms' profitability

The literature on the macroeconomic effects of organized crime is rich and full of contributions, including the topics of growth rate of GDP per capita, employment rates, labour productivity

(Centorrino and Ofria, 2008), foreign direct investments and public transfers. On the other hand, the microeconomic effects of mafia-type criminality, namely the effects of such phenomenon on firms' performance, have been so far investigated with a lower emphasis and attention. What is well-know and generally accepted is the awareness that organized crime behaves as a tax for firms' accounts, decreasing the turnover and increasing the costs in their final income statement, reducing the investments and provoking inefficiencies in the allocation of financial, human and material resources (Ganau and Rodríguez-Pose, 2018).

Organized crime and firms' performance

As discussed in Gaviria (2002), corruption and crime significantly decrease sales growth and firm competitiveness, by depressing both domestic and foreign investments, decreasing innovation and entrepreneurship, increasing the operating costs of firms, preventing companies the possibility to enter new businesses and new markets and, more in general, limiting their growth opportunities.

When criminal organizations are strongly rooted into the local environment, their interest moves to the managerial operative aspects of individual companies, influencing their ability to select human resources and their freedom to choose suppliers and customers according to market strategies. In this way, the resulting operating income will be very far from the objectives fixed ex ante since their entire cost structure will be negatively affected: lower revenues, higher operating costs, lower input productivity and lower efficiency, which in turn reduce the profit margin, the amount of products offered by the company to the market and the productive activity as a whole (Ferrara and Mavilia, 2011). Moreover, if legal companies and illegal ones coexist within a particular sector, the second ones will benefit from a clear competitive advantage over the first ones, since they will pay lower salaries and will save the costs deriving from the respect of labour, environmental and security legislations (La Spina and Lo Forte, 2006). Finally, as highlighted by Tarantola (2012) and by Di Gennaro and La Spina (2016), organized crime imposes to each entrepreneur other costs in addition to the operating ones:

- "anticipation costs": insurance and security costs sustained by individuals or organizations in the hypothesis that any form of crime could take place;
- "consequence costs": direct costs deriving from being actually affected by a criminal act, such as the payment of the "pizzo" or bribes, the loss of income, the emotional impact and bureaucratic costs;

- "reaction costs": investigation, law enforcement, judicial and social costs to combat mafia activities.

Another interesting result is the one obtained by Fabrizi, Malaspina and Parbonetti (2018) that, in order to investigate the negative effects of organized crime on the performance of non-criminal competitors, exploited the exogenous shock arising from police operations that eliminated, in a given year and in a given territory and industry, the presence of firms connected with criminal organizations. She found that, after the removal of such firms, the performance of non-criminal competitors improved significantly, in terms of EBITDA over total assets and of ROA, and their costs of raw materials substantially diminished, especially considering smaller firms. This conclusion confirms the already well-known fact that organized crime harms the local business and institutional environment, producing distortions and invalidating the transparency of the market.

Organized crime and firms' productivity

As shown in Ganau and Rodríguez-Pose (2018), organized crime implies both negative direct effects and negative indirect effects on firms' performance. They found that mafia-type criminality negatively influences the productivity growth of an individual firm, independently from the firms' size and sector. This result is more robust considering small firms, since they base their activities on local relationships and they experience more difficulties in fulfilling the illegal payments imposed by criminal organizations. The same conclusion was reached by Albanese and Marinelli (2013), who found a significant negative impact of mafia criminality on firms' productivity, regardless from firms' size and sector. Their contribution highlighted how the firms' size does not represent a guarantee of protection against organized crime, and the distinction between industrial and service firms is not statistically significant for the results obtained.

Organized crime and investments

One of the negative consequences deriving from the presence of organized crime is represented by the fact that criminal organizations decrease capital productivity, discouraging private entrepreneurs to invest (Pinotti, 2011; Tarantola, 2012; Astarita, Capuano and Purificato, 2018). Of course, as highlighted by La Spina and Lo Forte (2006), local and foreign investors, when they have to decide where to invest, look for a favourable business climate, which depends, among the other factors, on the quality of the social and institutional environment, considering also the presence of illegality and corruption. Indeed, criminal companies often impose firms to buy over-priced raw materials or to hire specific workers because of their links with the

criminal organization, increasing in this way the production costs and the inefficiencies within the private firm. As a direct consequence, the private investment is gradually substituted by the less efficient public investment, which represents the best scenario in which criminal organizations can exploit profit opportunities by affecting the allocation of procurement contracts and the execution of tendering procedures, and by distorting the use of public funds (Pinotti, 2011). As already stated, organized crime negatively affects the costs that firms have to sustain in order to develop their investment projects, provoking at the same time also serious phycological costs for entrepreneurs (Ferrara and Mavilia, 2011). In fact, their reaction to the presence of organized crime could be "accommodating", supporting the criminal organization in order to mitigate the costs arising from its imposition, "resistant", sustaining the direct and indirect costs of the material and psychological damages, or "conniving", offering a service to the criminal organization in order to exploit favourable supply and market conditions with respect to the other competitors. In this way, individual preferences are altered, as well as the price mechanism and the efficiency conditions deriving from competition.

Organized crime and the cost of credit

Organized crime, among the other negative effects, reduces the access to credit and influences the cost of short term credit, inducing banks to ask for numerous guarantees to be safeguarded, such as the request for collaterals and the differentiation of the composition of credit in numerous types of loans (Albanese and Marinelli, 2013). Borrowers, indeed, pay higher interest rates in a situation characterized by higher crime rate, and have to pledge more collaterals (Bonaccorsi di Patti, 2009). Moreover, in addition to these direct effects on credit, organized crime indirectly reduces investments, since the availability of loans is lower and the credit terms and conditions are distorted (Bonaccorsi di Patti, 2009). Especially in the case in which banks do not know deeply the local market where they operate, credit rationing is a common practice in presence of asymmetric information issues and high levels of risks (Bonaccorsi di Patti, 2009). In fact, in a precarious and insecure context as the one created by the presence of criminal organizations, banks encounter difficulties in correctly assessing the quality of the subjects who ask for loans and have to sustain higher operating costs to preserve their security and protection. As a matter of fact, as remarked by Moretti (2014), the socio-institutional environment constitutes a fundamental factor in achieving productivity returns arising from a higher credit availability. From an empirical point of view, a study carried out by the Bank of Italy in 2009 shows that legal companies operating in areas characterized by high levels of criminality pay higher interest rates of about 30 basis points in comparison with the ones paid by companies established in areas with low levels of criminality (Tarantola, 2012). In this context, the anti-

money laundering legislation assumes relevance, in order to regulate the behaviour of financial intermediaries in their relationship with criminal organizations (Ferrara and Mavilia, 2011).

1.2 Industrial districts and firms' performance

1.2.1 Identification and characteristics of the Marshallian industrial district

Industrial districts represent one of the cornerstones of the Italian manufacturing industry, featuring one of its most distinctive characteristics (Cucculelli and Storai, 2018). For this reason, they have always been deeply studied for decades, with the main objective of understanding and analysing the evolution of the Italian economy. They played a central role in explaining the recent success achieved in the "made in Italy" industries, although nowadays they are suffering profound changes and facing global challenges (De Marchi and Grandinetti, 2014).

1.2.1.1 Historical background and definition of industrial district

Alfred Marshall (1842-1924), one of the most influential English economists of his time and father of the intellectual cornerstone of the industrial district, in his major composition *Principles of Economics,* delineated the distinctive characteristics of a district model, highlighting the importance of the concentration of specialized industries in specific and delimited territories. He defined the localization of an industry as (Marshall, 1961, p. 245):

> "groups of skilled workers who are gathered within the narrow boundaries of a manufacturing town or a thickly peopled industrial district. When an industry has thus chosen a locality for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighbourhood to one another. […] localized industry gains a great advantage from the fact that it offers a constant market for skill."

In these lines, Marshall underlined two relevant features of the district itself, namely the advantages arising from a localized industry and the presence of skilled workers inside of it. In the subsequent passages, he pointed out other typical aspects of industrial districts, that are the tacit transfer of knowledge inside of it, the process of creation and diffusion of innovation, the

combination of social and economic dimensions and the strong relationship among workers, even between employers and employed. In this regard, he wrote (Marshall, 1961, pp. 245, 246):

> "The mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. […] if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas. […] Social forces here co-operate with economic: there are often strong friendships between employers and employed".

Starting from the '20s, Marshall's theory about industrial localization and district organization was progressively abandoned, since large vertically integrated firms were dominating the international scenario, marginalizing more and more the role of small companies. However, during the '60s, '70s and '80s, large corporations were threatened by the emergence of new organizational models, much more cooperative and socially embedded than the first ones. These new forms, categorized as industrial districts, were characterized by high levels of efficiency and labour productivity, strong effectiveness in the use of materials and in the implementation of quality controls, significant valorisation of skilled workers, flexible specialization and production methods, and a considerable diffusion of knowledge and innovation (Konzelmann and Wilkinson, 2017). They offered differentiated and personalized products and services, much more attractive to the emerging middle class with respect to the standardized goods produced by large companies (Becattini, 2002). In this context, the real definition of industrial district took shape, thanks to the contribution of the Florentine economist Giacomo Becattini, which in the '60s proposed an innovative interpretation of the concept already formulated by Marshall (Sforzi, 2008). He revived the Marshallian industrial district theory in order to provide an answer to the rapid industrialization process that hit the Central and North-eastern Italy in the '60s and '70s, where the majority of companies, characterized by a small and medium size and by a high specialization in different phases of the same production process, had been able to attain scale economies of the same magnitude of the ones realized by large firms (Giuliani and Rabellotti, 2018). He defined the industrial district as a (Becattini, 1990, p. 38):

> "Socio-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge".

According to the above-mentioned definition, the "district is an amalgamation of firms and people", where firms interact and communicate with people within the same spatially-defined

area and where the majority of the residents is able to find or to change its job (Sforzi, 1990). Indeed, the Marshallian industrial district is a geographically circumscribed production system, made of a large number of independent small and medium enterprises operating in the same business area, generally coinciding with the single productive phases, which have relationships with suppliers, customers and workers inside the district itself (Becattini, 1989; Becattini, Pyke and Sengenberger, 1990; De Marchi and Grandinetti, 2014). Therefore, the distinctive elements identifying an industrial district are the following: a specific and circumscribed territory (territorial dimension), a particular business sector and a set of small firms (economic dimension), a network of relationships and interdependencies among these firms and a dense interconnection between the social and economic environments (social dimension) (De Marchi and Grandinetti, 2014). Moreover, the representative products of each particular district should be identifiable with respect to similar goods produced elsewhere for their specific characteristics, their qualitative standards or for some peculiar features of the productive process (Becattini, 1990). The growth and the development of an industrial district represent the local result of the meeting of certain specific socio-cultural traits of a community, including shared values and institutions, historical and natural features of a geographic area, technical characteristics of the productive process and dynamic interactions between the division of labour inside the district and the expansion of the products' market (Becattini, 1990).

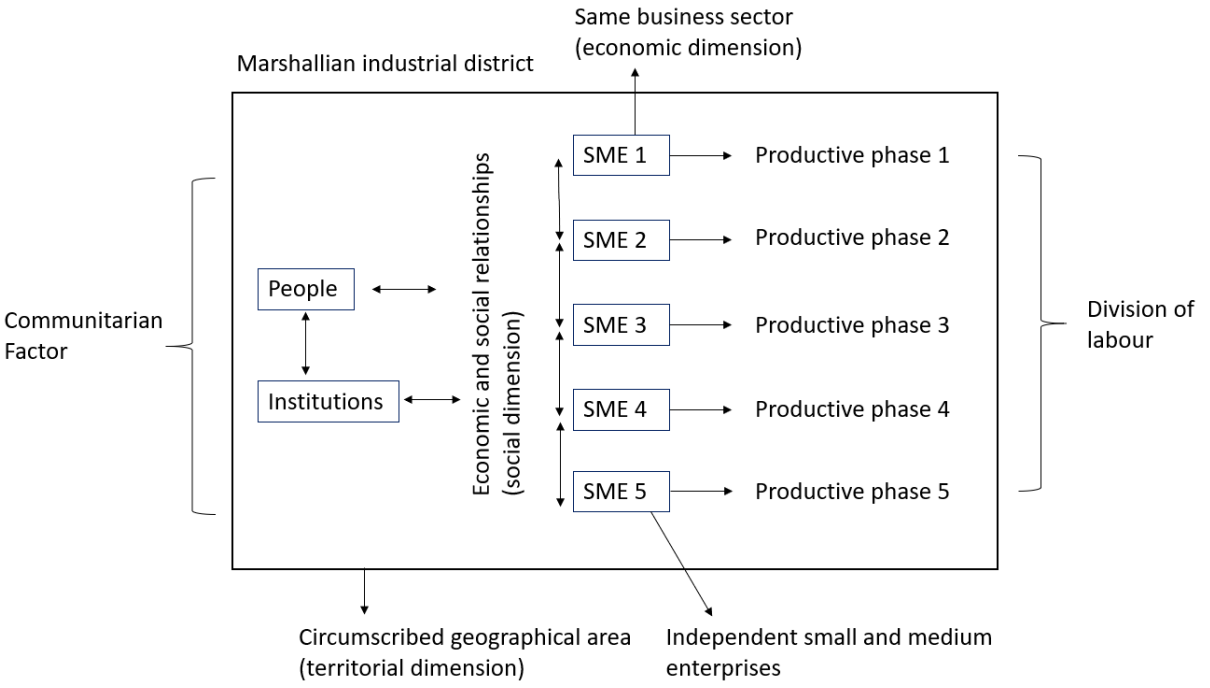

Figure 1.6 - The configuration of the Marshallian industrial district. Source: Author's elaboration

Although in the literature the terms “industrial district” and “cluster” are often used as synonymous, they present substantial differences in their meanings. First of all, clusters overlook the spatial dimension, which, on the contrary, represents one of the most relevant elements of industrial districts. Even if clusters are defined by Porter as geographical concentrations of firms and institutions that are interlinked in a specific sector, they constitute groups of firms that are more heterogeneous in comparison with industrial districts, and are distributed across larger areas. Therefore, industrial districts can be considered as subcategories or special cases of clusters, and the Marshallian industrial district represents, in turn, a subcategory of industrial districts, since it identifies a district marked by the communitarian factor (De Marchi and Grandinetti, 2014), that is the socio-cultural and institutional environment where the population of firms and the community of people operate (Sforzi, 2008).

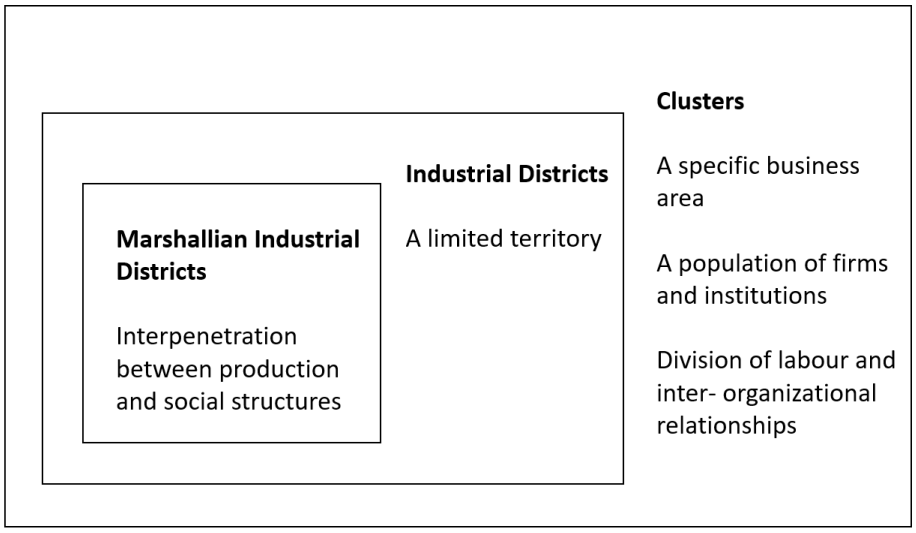

Figure 1.7 - Clusters, industrial districts and Marshallian industrial districts. Source: De Marchi and Grandinetti (2014)

1.2.1.2 Distinctive characteristics of industrial districts

Considering the definition of Becattini, the main characteristics describing an industrial district are summarized in the following paragraphs.

The manufacturing activity

The dominant activity in industrial districts is the manufacturing one (Becattini, 1990), especially in low technology sectors. In particular, the majority of districts are specialized in fashionwear industries, namely textiles, footwear, clothing, leather goods and tanneries, and wooden furniture. A lower number of industrial districts is specialized in producing metal goods, ceramic goods, musical instruments, toys, or is focused on the mechanical and electrical

sectors. The specific configuration of industrial districts includes both the dominant manufacturing industry and other complementary or subsidiary industries, which, although belonging to different sectors, are as well involved in the same final production process (Sforzi, 1990).

The network of relationships with the local supply chain's actors

The network of firms constituting the district represents a breeding ground for the development of relationships, which will result in higher profits and in a considerable competitive advantage based on the possibility to exploit external economies of scale (Fabiani and Pellegrini, 1998). Indeed, industrial districts are characterized by a strong network of connections through vertical relationships, including suppliers of raw materials and customers of final products, and horizontal relationships, involving channels, technology procedures, common infrastructures, skilled and specialized labour force, common educational and training facilities and common capital markets (Becattini, 1990; Morosini, 2004; Konzelmann and Wilkinson, 2017). The most important and basic relationships that take place in industrial districts are the one between suppliers and buyers, and the one between workers and entrepreneurs (Mistri and Stefano, 2000). The real source of competitive advantage lies into the fact that the relationships among local actors incorporate a high level of trust, which is considered both from a social perspective and from an economic point of view, including the sharing of information and knowledge, the possibility to renegotiate agreements, the reduction of production costs and the willingness to actively cooperate (Konzelmann and Wilkinson, 2017). It can be derived that industrial districts' configuration allows to benefit of relational rents, defined by Dyer and Singh (1998) as supernormal returns realized in an exchange relationship that can't take place in an isolated firm, but have to be developed through the specific contributions and collaboration of the alliance partners, which have to invest in idiosyncratic and strategic assets, specialized resources and capabilities, specific knowledge and efficient governance models, able to decrease transaction costs and to produce a real competitive advantage. In the case of industrial districts, alliance partners correspond to the different firms composing the supply chain, each one associated with a specific productive phase which fosters the specialization and the formation of niches (Fabiani and Pellegrini, 1998).

The community of people and the communitarian factor

Industrial districts are made of communities of people, which absorb a homogeneous system of values in term of ethics and reciprocity. This set of values represents the fundamental requisite for the formation of the district and one of the crucial conditions for its reproduction. Indeed,

in order to guarantee, spread and communicate these values from a generation to the other, it's necessary that a shared system of rules and institutions – such as the market, the firm, the family, the church, the school and the public administration - is developed, supported and respected among the districts' members (Becattini, 1990). Therefore, industrial districts should be intended as socio-economic concepts, where the social and institutional dimensions are equally important as the economic one, thanks to the interaction and interdependence between the social, economic, political and institutional environments (Becattini, Pyke and Sengenberger, 1990). As a matter of fact, districts' decision processes are always carried out considering both economic and social aspects. By way of example, the decision between the internalization and the externalization of a specific phase of the production process is taken considering the economic costs and the control that a firm is able to exercise over the process and over the workers (Becattini, 1990). As underlined by Morosini (2004), economic relations are embedded in the social context, constituting a form a social capital that enhances the sharing of knowledge and facilitates the exchange of information. Private and public institutional players which operate in industrial districts usually realize positive externalities for local firms, by issuing regulatory measures, implementing projects and providing infrastructures and services, supporting in this way their competitive advantage and ensuring behavioural standards which continually reinforce trust and cooperation (De Marchi and Grandinetti, 2014; Konzelmann and Wilkinson, 2017). With the term institutions, reference is made to formal institutions and also to informal institutions, which represent social norms, moral codes, interconnected self-enforcing rules able to address ways of thinking and behaviours, and a common system of beliefs that identifies the specific culture of the district (Mistri and Stefano, 2000) and is aimed at reducing uncertainty and coordinating people (Serarols I Tarrés, Jesselyn Co and Spohn, 2008).

What distinguishes the Marshallian industrial district variant is the so called "communitarian factor", defined as the strong connection between the economic and social dimensions of the district, able to reduce the transaction costs between the district players, to simplify the circulation and the production of knowledge, to improve the reciprocal understanding among people, to generate feelings of trust, loyalty and reputation, and to grant a unique competitive advantage to the single enterprises, ensuring in this way the replicability of the Marshallian district economies (Mistri and Stefano, 2000; Cucculelli and Storai, 2018). It implies a context where people trust each other and share values, meanings, tacit behavioural rules, languages, feelings, attitudes, a common industrial culture and atmosphere, a common approach to develop human capital and a common approach to face the competitive dynamics and to measure the performance, that is a geographical area basically homogenous from the socio-cultural point of

view (Morosini, 2004; De Marchi and Grandinetti, 2014). In this respect, trust represents one of the most important tools to decrease transaction costs and uncertainty, reducing at the same time the risk of opportunistic behaviours by other firms, in order to preserve the long-term relationship and their reputation (Serarols I Tarrés, Jesselyn Co and Spohn, 2008). Moreover, it requires homogeneity also in terms of production structure: the manufacturing activities specific of the district should represent the largest part of the area's production and the resources should be distributed among the numerous small firms. In this context, geographical proximity corresponds to social proximity and to cultural proximity (De Marchi and Grandinetti, 2014). The consequent implication of the communitarian nature of industrial districts is that district players operating in small firms both share and perform a system of values, behavioural rules and attitudes, surrounded by a set of institutions that can't be separated from the district local culture (Mistri and Stefano, 2000).

The population of firms and the division of labour

Each company that composes the population of firms is specialized in one or few phases of the same production process, provoking in this way a mechanism of division of labour. Indeed, district companies generally belong to the same industrial sector, widely defined as supply chain. As a consequence, each production process included in the above defined sector has to be broken down in spatially and temporarily separable phases (Becattini, 1990). However, Dei Ottati (2002) distinguished among three different types of district firms on the basis of their activity and purpose: final firms, specialized in the design and marketing of the goods produced; phase firms, specialized in a specific phase of the production process of the main industry of the district, and finally service firms, which belong to the district but are not specialized in the principal industry. The intensive division of labour, and consequently the high level of specialization among district's players, positively affects the economic performance and competitiveness achieved by each district firm, increasing significantly their levels of efficiency and productivity through a reduction of transaction costs (Tattara, 2001; Dei Ottati, 2002; De Marchi, Di Maria and Gereffi, 2018). Anyway, division of labour represents a source of competitive advantage only if associated with an effective and efficient coordination of all the specialized activities performed by each small firm, otherwise the risk of opportunistic behaviour becomes real and dangerous (Dei Ottati, 2002).

The importance of the geographical proximity

Industrial districts, as already stated, represent socio-territorial agglomerations of small and medium enterprises that are localized in a specific and delimited geographical area, where the

supply chain is contained within the district itself (Chiarvesio, Di Maria and Micelli, 2010). Geographical proximity constitutes one of the most important elements which characterize the particular industrial district's configuration, and determines an essential condition for its existence and reproduction. Firms, from getting closer geographically, derive a set of advantages and benefits which can be traduced in the development of highly skilled specialized labour force, in the experience of external scale economies through the exploitation of the same infrastructures, machineries, distribution channels and technologies, in the maximum sharing of knowledge, ideas and information and in the generation of innovation (Morosini, 2004). Moreover, geographical proximity allows to enjoy a remarkable reduction of transaction costs, traduced in a reduction of transportation, communication, control and coordination costs, and the proximity to suppliers makes it easier just in time manufacturing practices, obtaining productive factors only when they are needed. Finally, the closeness between suppliers and buyers allows them to operate directly together and to communicate more easily since they know and trust each other and they share a common language, increasing the efficiency, boosting collaborative behaviours and reducing uncertainty (Serarols I Tarrés, Jesselyn Co and Spohn, 2008; Chiarvesio, Di Maria and Micelli, 2010).

External economies

The multitude of small firms constituting the district enjoys the benefits of the large-scale production thanks to the external economies of scale, which can be guaranteed by the particular industrial district's configuration (Sforzi, 1990) and can be generated by the simultaneous social, cultural and geographical proximity (De Marchi and Grandinetti, 2014). Such economies are external with respect to firms, but internal with respect to the district unit of analysis, generating in this way a parallel alternative to the internal economies of scale characterizing large companies (Asheim, 1995). The substitution of a single large vertically integrated firm with a multitude of complementary and competing enterprises allows to obtain the maximum flexibility, to reduce the overall sector's risk and costs and to introduce continuous innovation, providing a remarkable competitive advantage (Mistri and Stefano, 2000). Moreover, large firms usually find difficulties in adopting automatic efficiency control mechanisms of each single phase constituting the production process; on the contrary, the system of values permeating the districts allows to implement such types of controls because of their flexibility and capability to adapt to new environmental circumstances (Becattini, 1990). District external economies allow district firms to reach higher levels of efficiency with respect to the other companies since they use technologies capable of obtaining a greater amount of output keeping the labour and capital input constant (Tattara, 2001).

The flexible specialization of workers

The district labour market is substantially and inherently different from the one established in other organizational systems. Inside a district, the set of jobs and positions offered is extremely wide, varying from homeworking, part-time job, full-time job, dependent employment, occasional work, self-employment and entrepreneurial activities, with a continuous process of reallocation of human resources in order to guarantee the productivity, the reproduction and the competitiveness of the district itself and to maintain the typical entrepreneurial spirit inside of it. As a matter of fact, as explained by Becattini and Musotti (2003), when the first years of apprenticeship and training are over, the average level of wage increases substantially, giving the opportunity to the workers who acquired better capabilities and more experience to start working as individual entrepreneurs or on a self-employed basis, moving from a subordinate work position to a managerial one. Indeed, as underlined by Dei Ottati (2002), what really matters to start a new business is human capital, composed by skills, know how, expertise and experience. This does not mean to lose the specialization acquired by each worker, which, on the contrary, is more valued thanks to the recognition of his skills and experiences. This all contributes to create the "industrial atmosphere" as defined by Marshall, who wrote that the secrets of the industry are spread in the air (Becattini, 1990), recognizing the physical and social space covered by districts (Konzelmann and Wilkinson, 2017). Indeed, one of the most distinctive characteristics of industrial districts is given by the flexible labour-force, namely the "flexible specialization" of workers, who can benefit from a high degree of autonomy, space and social mobility (Becattini, Pyke and Sengenberger, 1990). The higher mobility of workers among local firms in industrial districts is connected to the so called "on the job training" and "learning by doing" concepts, which ensure that the district-specific knowledge accumulated over the years will not be lost at district level (Becattini and Musotti, 2003). Changing frequently job internalizes the career path of each worker beyond the relationship established between the employer and the employee, materializing a district career stronger than the single enterprise career, which highlights the presence of scale economies external with respect to the firm, but internal with regard to the district itself (Tattara, 2001). Another competitive advantage arising from the high level of labour-flexibility is connected to the ability of district firms to adapt to sudden changes in the production demand, resorting to overtime, sub-contractors and cottage industry if the demand increases, and responding by not renewing contracts in the opposite case (Becattini and Musotti, 2003). As asserted by Fabiani and Pellegrini (1998), in this context, each form of rigidity or constraints imposed to firms could result to be strongly counterproductive.

The importance of the district specific know how

One of the most valuable competitive advantages of industrial districts is the acquired know how, developed through implicit and explicit processes of knowledge flows among the actors of the district: the importance attributed to professional skills, knowledge, technological and market-related information, district specific expertise and experience is extremely high (Becattini and Musotti, 2003; De Marchi, Di Maria and Gereffi, 2018). Indeed, this contextual knowledge or human capital is critical for the development of the production process, for the innovation of firms and for the competitiveness of the district itself. Knowledge sharing inside the district is undoubtedly enhanced by the role of local institutions, which with their initiatives, projects and actions ensure the functionality and the competitiveness of the district (De Marchi, Di Maria and Gereffi, 2018). An efficient knowledge creation and diffusion requires local relationships and specialized economic connections, since they combine existing and new know how with the final objective of creating superior outputs for the final customer. Moreover, it needs the development of regular and explicit mechanisms for sharing technological expertise and business procedures, such as benchmarking task forces, universities, research centres, R&D functions and trading organizations (Morosini, 2004). It is largely proved that a higher level of knowledge integration, associated with a higher propensity to invest and compete globally, ensures a better performance for industrial districts, traduced in higher innovation, stronger results and higher capability to adapt to environmental changes and challenges (Morosini, 2004). In the context of knowledge diffusion, Dahl and Pedersen (2004) highlighted the role of personal informal contacts and social networks as strategic channels of knowledge flow and communication, ensuring clear advantages in terms of innovation and performance to each firm belonging to the industrial district. They argued that geographical proximity is crucial for a smoother circulation of information and know how, since it generates knowledge spillovers, also defined as Marshallian technological externalities, even if other scholars criticized this standpoint by sustaining that only general knowledge is transferred from one firm to the other through informal contacts.

Cooperation and competition

Industrial districts are characterized by the contrasting combination of proactive competition and unintentional cooperation among their members (Becattini, 1990). Indeed, as stressed in Becattini, Pyke and Sengenberger (1990), competition usually takes place among firms operating in the same field or phase, while cooperation arises when firms have to deal with different things, namely different phases of the same production process. Cooperative behaviours among local actors and institutions are connected with the establishment of long-

lasting relationships which address individual behaviours by reducing and punishing the presence of free-riders (Fabiani and Pellegrini, 1998). Cooperation among firms is encouraged by well-functioning mechanisms of coordination and allows to achieve better results in comparison with non-cooperating companies, obtaining also additional benefits and synergies (Dyer and Singh, 1998; Morosini, 2004). Competition, on the other hand, is not only based on prices, but regards also the workforce and the resources, since workers, within the district, are used to move from one firm to the other in order to valorise their skills and capabilities (Serarols I Tarrés, Jesselyn Co and Spohn, 2008). In this context, De Marchi and Grandinetti (2014) highlighted the twofold dimension characterizing industrial districts, namely the horizontal one, which includes firms that are in competition with one another since they produce the same output, and the vertical one, that encompasses firms which operate in different stages of the supply chain and produce different types of inputs. This mix of simultaneous competition and cooperation boosts innovation and knowledge diffusion and creation (De Marchi, Di Maria and Gereffi, 2018), and represents the necessary condition for making district effects long-lasting and cumulative (Konzelmann and Wilkinson, 2017). As a matter of fact, a balance between competition and cooperation is needed, since both contribute, even if in different ways, to the functioning of the district: cooperation facilitates the integration of the system, while competition helps in maintaining it flexible, efficient, creative and innovative, encouraging continuous improvement (Asheim, 1995).

The introduction of technological progress

Inside a district, the introduction of technological progress is lived as a gradual social process, usually accepted by both the community of people and the population of firms. The fact of being technological updated is generally seen as an opportunity to improve one's condition in the future thanks to the system of values and attitudes endorsed by the districts' members. On the contrary, in large firms, workers usually resist to radical changes induces by technical developments, as they are not involved in such decisions and are not able to understand the reasons behind drastic choices that are not in line with their interests and long-term expectations (Becattini, 1990).

Innovation and adaptability

Two characteristic traits of industrial districts are represented by their ability to innovate and to adapt to rapid or unexpected changes in product demands or market requirements thanks to their flexible productive networks, the coordination of human and material resources and the particular characteristics of the social environment where they are established (Becattini, Pyke

and Sengenberger, 1990; Dei Ottati, 2002). Adaptation and innovation are possible thanks to the continuous negotiation among the principal district's actors, and make it possible the realization of a real competitive advantage for industrial districts (Dei Ottati, 2002). Innovation, considered as an essential characteristic of industrial districts and as a prerequisite for their growth and development (Asheim, 1995), is guaranteed and fostered by the particular atmosphere permeating the district: although the research and development unit constitutes a key function for the vitality and reproduction of the district, the tacit and informal dynamics of learning by doing, learning by using, on the job training and social interaction among local actors play the most critical role in explaining the superior success of industrial districts with respect to other organizational systems, allowing to generate incremental innovations through a gradual introduction of adjustments and improvements of products and processes (Asheim, 1995; De Marchi, Di Maria and Gereffi, 2018). Indeed, as asserted by Asheim (1995), the "industrial atmosphere" that pervades the district and the presence of mutual trust represent critical vehicles of creation, imitation and diffusion of innovative techniques and procedures, able to decrease transaction costs and to form informal connections among small firms. Hence the sociological perspective of the innovation process, which moves from the intrinsic technological innovation for entering in a more social dimension, where interactive learning assumes a fundamental role. Cooperation and collaboration between firms, among the other factors, constitute other strategic tools in order to incentivize innovations, representing key ingredients of success and critical factors for obtaining a global competitive advantage (Asheim, 1995).

The access to credit

Notwithstanding small enterprises usually encounter difficulties in the access to credit, industrial districts can rely on the so-called local bank, a district typical institution highly connected with local entrepreneurs and strongly involved in the local life of the district. Considering the traditional structure of the district, characterized by a dense network of interrelationships inside of it, a potential crisis or a bad management of the local bank could trigger a series of negative effects highly concentrated inside the district (Becattini, 1990).

1.2.2 Sources of competitive advantage of industrial districts

The environmental context in which firms are located, namely the social, cultural and institutional background of which a specific area can benefit, strongly affects their efficiency, performance and competitiveness. Indeed, as underlined by Lasagni, Nifo and Vecchione

(2015), the quality of local institutions represents one of the main variables in explaining the long-run productivity of firms, since institutions, regulating how a society works, delineate the set of incentives at the basis of individual and collective choices, reducing uncertainty and coordinating behaviours and interactions (Serarols I Tarrés, Jesselyn Co and Spohn, 2008). Institutions, in fact, help firms in exploiting development opportunities, by creating a positive and beneficial environment which promotes the competitiveness, the performance and the efficiency of each firm operating in the surrounding area. The impact of good-quality institutions emerges through their role in stimulating firms to innovate, to accumulate physical and human capital, to pursue their objectives with a long run perspective, to adopt new technologies able to keep them up to date and to invest in research and development and in knowledge creation and diffusion. On the other side, poor-quality institutions and an adverse business environment lead to a weaker competitiveness and to a negative performance of Italian firms, undermining substantially also the investment climate (Lasagni, Nifo and Vecchione, 2015). In this context, industrial districts' environment, considered as a socio-economic concept where institutions play a dominant role, represents by itself a source of competitive advantage with respect to isolated firms, generating positive externalities able to sustain the growth and to improve the performance of each district firm. As a matter of fact, the advantages arising from being part of a district result higher and statistically more significant for firms operating in the district sector of specialization, where all the typical characteristics of districts are present, but these effects are not negligible, although less significant, also for firms belonging to a district but not specialized in its core business. In this case, indirect effects induced by strong institutions play an important role, acting through a favourable business climate, a large and flexible labour market and the presence of simultaneous cooperative and competitive behaviours (Fabiani and Pellegrini, 1998).

1.2.2.1 The district effect on the profitability

Many contributions highlighted a superior performance of district firms in comparison with non-district firms, claiming a higher profitability in terms of ROI (Return on Investment) and ROE (Return on Equity) thanks to lower labour costs, lower passive interest rates towards banks and other financial intermediaries (Becattini and Musotti, 2003) and their decisive contribution in achieving an active trade balance through a high share of exports (Becattini and Dei Ottati, 2006). Consistently, Fabiani and Pellegrini (1998), pointed out a clear district effect over the productivity and the profitability of firms, showing values persistently higher of ROI and ROE for district firms, regardless of their size and sector. The authors underlined that these results referred to all district firms, including both the ones specialized in the specific district sector of

specialization, and the ones located in an industrial district, but not belonging to the district sector of specialization, highlighting how the literature was not comprehensive about whether the positive externalities produced by industrial districts were able to influence also this second group of companies. They hypothesized that the socio-cultural factors should affect each entrepreneur and worker of the surrounding area, whereas the variables related to the production and the commercialization of the specific district products should weakly influence the companies not specialized. Anyway, they repeated the analysis considering only specialized firms belonging to the district industry and they found that the district effect was confirmed, even if less strong, highlighting the relevance and the pervasiveness of the role played by institutions in all the geographical area of interest. The district effect over the profitability gets stronger at sectoral level for specialized companies, especially if their size is small, and as far as the district companies not specialized in the specific district sector is concerned, profitability measures place themselves in the middle between specialized firms and totally isolated firms (Fabiani and Pellegrini, 1998). The higher profitability of district firms, both specialized and not specialized, could arise from a lower labour cost in comparison with the one sustained by isolated enterprises, regardless of their dimension. This is probably due to the higher number of apprentices and flexible work positions in district firms, paid with a substantially lower salary, since the average wage of district highly skilled workers is generally higher in industrial districts (Fabiani and Pellegrini, 1998). Another advantage stemming from the district configuration is represented by the lower cost of capital, since district companies are valued less risky by the banking system with respect to firms operating in an isolated context (Giordano *et al.*, 2016). The major performance of industrial districts derives from the numerous external economies of which they can benefit, which cause the district effect to be positive and statistically significant (Becattini and Musotti, 2003):

- Economies of organization, which allow and foster the division of labour process and a high level of specialization. Such economies lead, in turn, to economies of specialization, since district firms are highly specialized in specific phases of the same production process, maintaining in this way their structure lean with lower coordination costs and problems (Dei Ottati, 2002). Indeed, specialization reduces both production and transaction costs, giving rise to economies of scale and scope (Serarols I Tarrés, Jesselyn Co and Spohn, 2008);
- Economies of knowledge and learning, which arise from the network of relationships permeating the district and boost innovation, which in turn allows to decrease costs and to increase prices through differentiation;

- Economies of concentration, which allow district's players to obtain better prices in the markets of intermediate inputs as they act as collective buyers;
- Economies of training, for which the accumulation of human capital in terms of skills, knowledge and expertise benefits from the high degree of specialization;
- Economies of transaction, which allow to reduce significantly information asymmetries, thanks to cooperative behaviours, trust-based relationships and continuous interaction among the districts' actors;
- Economies of adaptation to change, strictly connected to the socio-cultural and political configuration of the district.

Belonging to an industrial district is associated with a higher level of efficiency, in turn connected with a lower use of capital, keeping constant the output obtained (Tattara, 2001). District firms, indeed, are able to save in material fixed assets since they are usually built as production units which are not required to sustain storage costs or commercial costs, or they assembly products physically produced elsewhere, reducing in this way some of the typical general expenses. Tattara (2001), in fact, stated that firms inside a district can rely on an immaterial social capital widespread in the whole district area, whose cost would not be sustained by the single companies that, on the contrary, would benefit of tangible economies internal with respect to the district unit. Moreover, the labour productive factor hides an immaterial capital able to enhance the firms' fixed assets, thanks to the employment of highly skilled workers operating with a strong level of expertise and professionalism.

1.2.3 The identification of industrial districts

The first methodology used for the identification of industrial districts was presented by Fabio Sforzi in 1985, convincing ISTAT to approve it as tool for dividing Italy into different Local Market Areas. Consequently, in 1991, the national institute of statistics, with the crucial contribution of Sforzi, divided Italy into 784 Local Market Areas, which included 199 industrial districts (Becattini, 2002; Becattini and Musotti, 2003). The Local Market Area unit of analysis, defined as local system within which families and firms establish mutual relationships (Sforzi, 1990), represented the prerequisite for the definition of the industrial district, partitioning the whole national territory on the basis of the daily commuting flows from house to workplace (Tattara, 2001). At the time, a Local Market Area, the operative tool used to define the local community as unit of investigation (Sforzi, 2008), was classified as an industrial district if it was more industrialized than the national average, if it was specialized in a manufacturing

activity and if it was made of small and medium-sized enterprises with a high concentration of workers (Fabiani and Pellegrini, 1998).

In 2001, through the 8th Industry and Service Census, as shown in Figure 1.8 (a), ISTAT identified 686 Local Market Areas, of which 156 were represented by industrial districts, 43 less with respect to the 199 identified in 1991, even if with a larger economic and socio-demographic extension and characterization (ISTAT, 2005). Ten years later, in 2011, on the occasion of the 9° Industry and Service Census, ISTAT determined 141 industrial districts over 611 Local Market Areas (see Figure 1.8 (b)), downward of 40 units in comparison with the number detected in 2001 (which was recalculated with a new method that ensures a better quality of the final results, increasing the number to 181 industrial districts over 683 Local Market Areas in 2001), but recording also in this case an increase in the demographic and economic dimension of them (ISTAT, 2015a). These data highlight the combined effect of the crisis and of the historical process of development of the tertiary sector in the Italian economy, influencing the territorial configuration of the Italian district model through a reduction of the number of districts and a higher concentration in the areas where they were historically present. Among the 141 industrial districts spread in the Italian territory, 130 are represented by *Made in Italy* districts, mainly operating in the mechanical, textiles and clothing, household goods, and leather and foot-wear sectors (ISTAT, 2015a).

Local Market Areas	**2001**	**2011**	**Variation**
Number of Local Market Areas	683	611	-72
of which District Local Market Areas	*181*	*141*	*-40*
of which Non-District Local Market Areas	*502*	*470*	*-32*

Table 1.2 - Differences among Local Market Areas 2001-2011. Source: Author's elaboration

Industrial districts	**2001**	**2011**
Number of municipalities	2,275	2,121
Resident population	12,276,845	13,326,320
Number of local companies	1,104,663	1,152,429
Number of workers of local companies	4,802,081	4,887,527
Number of local manufacturing companies	210,081	164,737
Number of workers of local manufacturing companies	1,904,066	1,504,490

Table 1.3 - Differences among industrial districts 2001-2011. Source: Author's elaboration

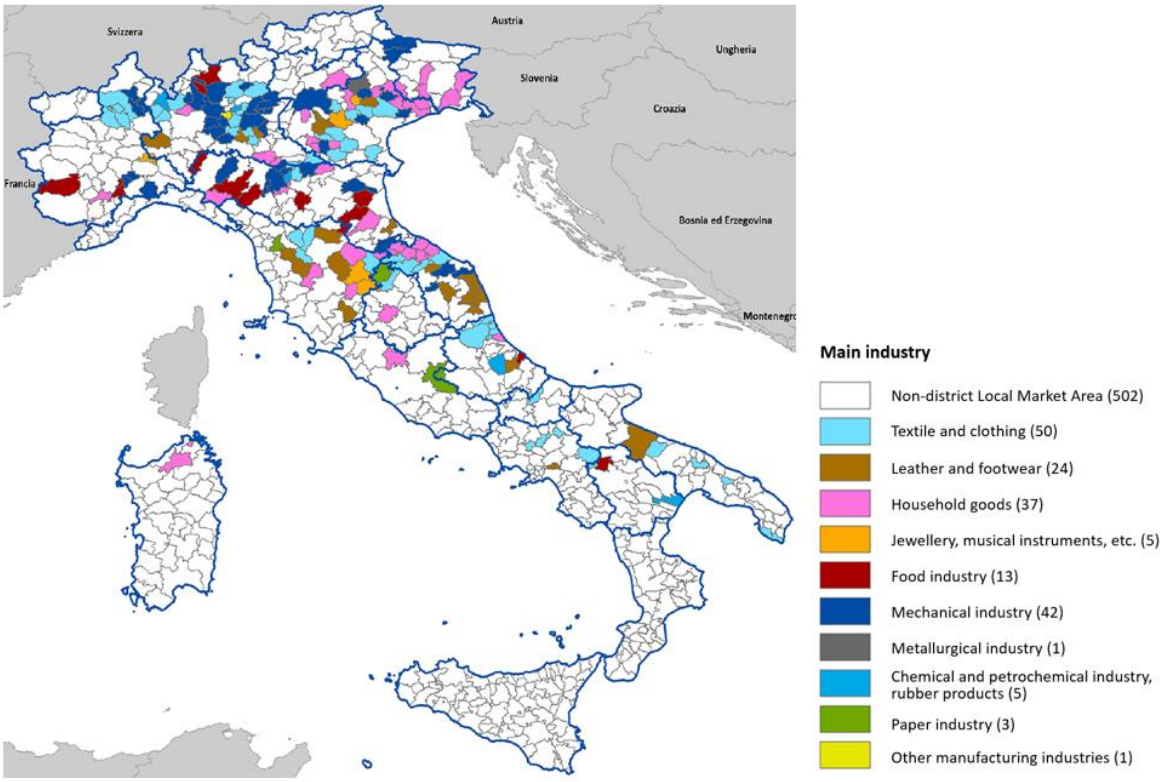

Figure 1.8 (a) - Industrial districts (2001). Source: ISTAT elaboration

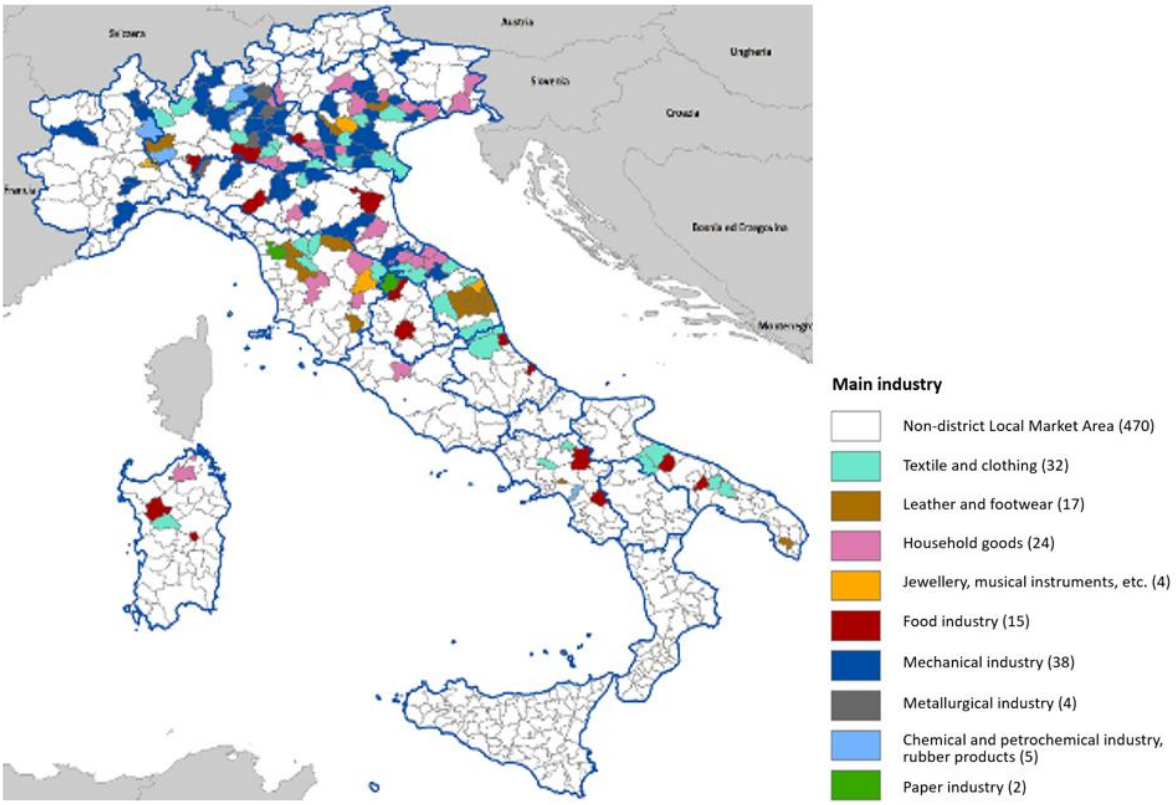

Figure 1.8 (b) - Industrial districts (2011). Source: ISTAT elaboration

The methodology used in 2011 to identify industrial districts selects the Local Market Areas characterized by the presence of numerous micro (with less than 10 workers), small (from 10 to 49 workers) and medium (from 50 to 249 workers) sized enterprises with a high territorial concentration of manufacturing employment focused on a principal industry (ISTAT, 2015a). The procedure is hierarchical and is made of four steps aimed at (ISTAT, 2015c):

- Identifying Local Market Areas that are mostly manufacturing;
- Identifying Local Market Areas that are mostly manufacturing with small and medium enterprises;
- Identifying the main industry of the Local Market Areas that are mostly manufacturing with small and medium enterprises;
- Identifying industrial districts.

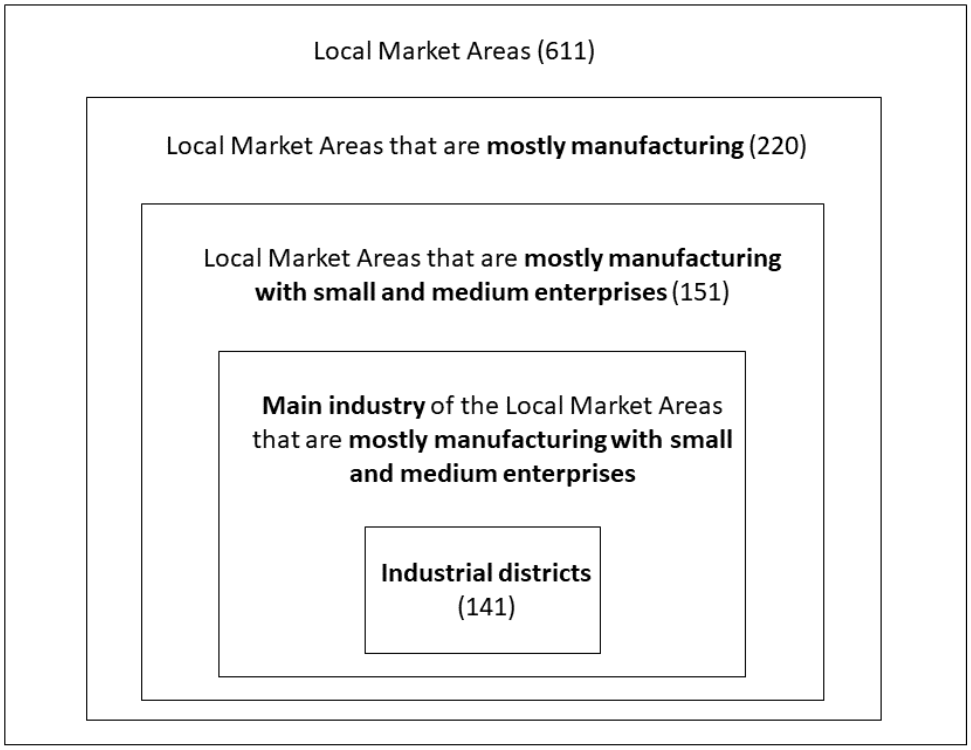

Figure 1.9 - Procedure for the identification of industrial districts (2011). Source: Author's elaboration

Nowadays, the majority of industrial districts is located in the North-Eastern Italy, each one specialized in different final products (Becattini, Pyke and Sengenberger, 1990), confirming this territorial area as the traditional reference point for the Italian district model (ISTAT, 2015a), even if they are spread in all the Italian territory and also outside Italy, establishing themselves all around the world (Giuliani and Rabellotti, 2018). In particular, as shown in Figure 1.10, in the Italian North-eastern regions (Trentino-Alto Adige, Veneto, Friuli-Venezia

Giulia and Emilia-Romagna), there are 45 district Local Market Areas, in the North-west (Piedmont, Valle d'Aosta, Lombardy and Liguria) there are 37 district LMA, in the Central regions (Tuscany, Umbria, Marche and Lazio) 38 district LMA, in the South 17 district LMA, and finally in the islands, but only in Sardinia, there are 4 district LMA (ISTAT, 2015b).

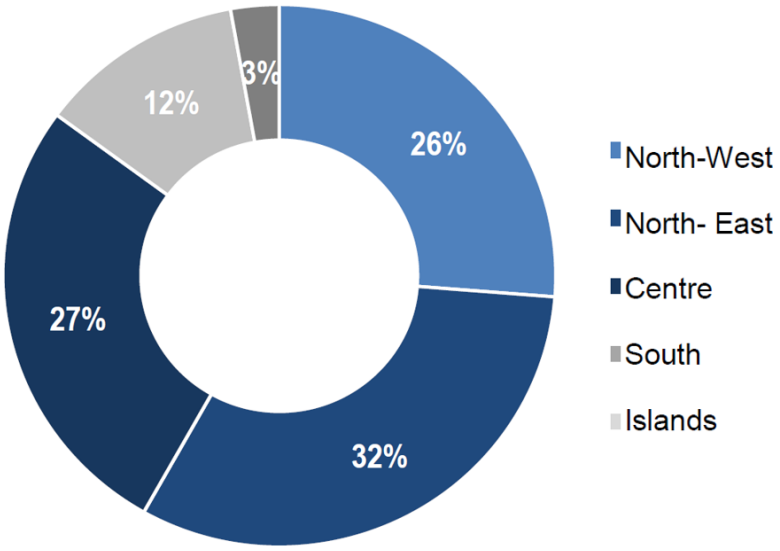

Figure 1.10 - Industrial districts by geographical area (2011), percentage shares. Source: ISTAT (2015)

1.2.4 The evolution of the industrial district in recent years

Starting from the '70s until the first half of the '90s, industrial districts represented a dynamic and successful component of the Italian economy (De Marchi and Grandinetti, 2014), boosting sales, exports and profits (Giuliani and Rabellotti, 2018) and featuring as a symbol of the *Made in Italy* products in the international scenario (De Marchi, Gereffi and Grandinetti, 2018). However, over the past few years starting from the '90s, industrial districts have suffered important transformations which have given rise to demanding challenges and have modified significantly their traditional characteristics (Cucculelli and Storai, 2018). Indeed, they have been strongly criticized by many scholars, which sustained that they were inadequate to deal with the challenges introduced by the globalization phenomenon and by the new information technologies (Giuliani and Rabellotti, 2018). As long ago as 1990, when Pyke, Becattini and Sengenberger wrote their contribution, districts were seen as living phenomena, subject to challenges and changes. The most worrying threats considered at the time were represented by the dominance of large firms, especially multinational corporations, the new international competition driven by the globalization phenomenon, and the difficulties that districts could

have experienced in maintaining their standards of efficiency and the local control over their traditional values (Becattini, Pyke and Sengenberger, 1990).

Recent studies highlighted how the traditional characteristics of the Marshallian industrial district are gradually vanishing, and in some cases have totally disappeared, weakening the advantages of geographical proximity and profitability typical of district companies. They identified the following factors as responsible of this negative trend:

- The phenomenon of globalization and its consequences on industrial districts' firms and on their network of social relationships: industrial districts, in the last 15 years, have seen an impressive intensification of the competitive pressure on a global scale because of the emerging role of developing countries in global supply chains (De Marchi, Di Maria and Gereffi, 2018), provoking a higher firm mortality and lower firms birth rates, with the natural consequence of a reduction in the number of companies composing the district itself (De Marchi and Grandinetti, 2014). Moreover, the development of global value chains and the opportunity to exploit production cost's savings led many district companies to relocate their production facilities and their relationships outside Italy, internationalizing the supply chain process and reducing the social interactions within the district. Considering the industrial districts' standpoint, these changes have remarkably undermined their inherent characteristics, weakening the strength of the communitarian factor because of the socio-cultural distance (De Marchi and Grandinetti, 2014);
- The strong impact of the world crisis begun in 2008 (De Marchi and Grandinetti, 2014): the recent economic recession has brought about an internal reorganization of the districts' configuration in order to allow districts to be prepared to exploit opportunities on an international scale (Chiarvesio, Di Maria and Micelli, 2010). During the 2008-2009 crisis, the role of developing economies in overcoming the dramatic downturn was essential, and this helped them to emerge in the global scenario (De Marchi, Di Maria and Gereffi, 2018). For this reason, as stressed by Iuzzolino and Micucci (2011), the impact of the crisis was definitely stronger in industrial districts;
- The effect of immigration, observable through the establishment of a multi-ethnic community inside the district: one of the most distinctive characteristics of the Marshallian industrial district is represented by the communitarian factor, for which the community of people belonging to the district shares common values and attitudes and feels part of the same group, showing a relevant socio-cultural homogeneity. With the phenomenon of immigration, substantially increased in recent years, industrial districts

have seen a significant increase in the number of foreign workers, undermining the socio-cultural identity that featured the district until the end of the last century and the network of relationships among district employees (De Marchi and Grandinetti, 2014);

- The discontinuity generated by the generational turnover: industrial districts, in the same measure of isolated firms, especially if small sized and family-run, have to face the problem of succession, since young people are not like their parents and they are subject to a cultural change that makes it not predictable the choice of investing their future in the family activity (De Marchi and Grandinetti, 2014);
- The increasing industry heterogeneity and diversification which defines the production structure: the definition of the Marshallian model requires that the district specialization activity prevails in the production structure of the system, but a recent trend has underlined the development of a set of activities which does not have any link with the main industry of the district, without reflecting its sector of specialization. This phenomenon, even if could be considered positive for the growth of the territories involved, undermines the reproducibility of the Marshallian characteristics of industrial districts (De Marchi and Grandinetti, 2014);
- The introduction of new production and data technologies, able to reduce the competitive advantage arising from the social and geographical proximity and to create new organizational forms (Serarols I Tarrés, Jesselyn Co and Spohn, 2008);
- The extensive diffusion of service industries based on the exploitation of knowledge channels (Serarols I Tarrés, Jesselyn Co and Spohn, 2008).

In their research, De Marchi and Grandinetti (2014) selected four potential scenarios which aimed at describing the future evolution of industrial districts that can't be labelled anymore as Marshallian. Indeed, industrial districts' firms are becoming more and more heterogeneous, especially regarding their strategies about internationalization and their relationships with the emerging role of large, vertically integrated, leading firms (De Marchi, Di Maria and Gereffi, 2018). In proposing these four trajectories of change, they considered the number of companies in a district, the number and the level of relationships among district firms, the presence or not of a leading firm and the presence or not of other dynamic district companies operating on a global scale. Indeed, as stressed by De marchi, Gereffi and Grandinetti (2018), the most dangerous threats to the survival of the traditional features of industrial districts are represented by the decreasing number of firms within districts, and by the emergence of large firms, able to be competitive in the global scenario. The evolutionary scenarios finally obtained are the following:

- Decline: it includes industrial districts at the end of their life cycle, since they do not have access to the resources needed to counteract this decline. They present a sizeable reduction in the number of companies, their relational network is disconnected, and their competitive capacity is not enough to face the global challenges.
- Oligopolization: it involves industrial districts characterized by a strong depletion of the number of district firms, a weakening of the web of relationships, and the presence of few leading firms which are dynamic in the global environment, but not particularly interconnected with the other district firms.
- Hierarchization: it describes industrial districts that tend to reproduce themselves in a smaller form, with few leading firms that choose a set of local suppliers. The district is essentially a local network, and the leading firms inside of it act as glocal players.
- "Glocal" reproduction: it comprises industrial districts able to reproduce themselves through numerous dynamic players and leading firms which boost their capability to enter global value chains. Given the considerable competitive pressure, they are affected by a slight reduction of firms. They are called "glocal" districts since they are open local networks which, despite their external relationships in global networks, are able to maintain their internal interconnections as well. There is, in other words, a strong interdependency between the global and local dimensions (De Marchi, Di Maria and Gereffi, 2018). Indeed, as stressed by Chiarvesio, Di Maria and Micelli (2010), the open network represents a model which links local production systems with global value chains, where leading firms play a key role in the globalization dynamics, by selecting suppliers abroad and by acquiring knowledge in the global environment. Certainly, these global strategies may undermine the internal equilibrium and the social relationships of industrial districts, even if, on the other hand, they could offer new opportunities in terms of innovation and business strategies. In this context, Chiarvesio, Di Maria and Micelli (2010) underlined how the performance of district firms is positively correlated with the investment in technology innovation and R&D, in design and product innovation and in the adoption of network technologies, but there is not a strong correlation between commercial and manufacturing internationalization and firms' profitability if they are not associated with innovation processes.

	Number of firms	Presence of leading firms	Presence of other dynamic players	Internal relationships
Decline	Collapse	No	No	Depletion
Oligopolization	Collapse	Yes	No	Depletion
Hierarchization	Contraction	Yes	No	Selection
Glocal reproduction	Contraction	Yes	Yes	Selection

Table 1.4 - Four evolutionary trajectories of industrial districts. Source: De Marchi and Grandinetti (2014)

Another framework used to set out the actual configuration of industrial districts on the basis of their capacity to face simultaneously local and global challenges was developed by De marchi, Gereffi and Grandinetti (2018), who designed a model made of both internal and global elements aimed at documenting the heterogeneous landscape which describes industrial districts today. In building their model, they identified three possible evolutionary trajectories of industrial districts (decline, hierarchization, resilience), which describe their reaction to three recurrent changes that have interested them in the last 15 years, in a more or less severe way: the reduction of district firms' population, the increase of resource concentration and the reduction of the ability of industrial districts to produce value. The three trajectories representing industrial districts' evolution are described as follows:

- Decline: it includes industrial districts characterized by a high reduction of firms' population, a high reduction of the ability to generate value measured in term of turnover and a moderate increase of resource concentration, namely the absence of few large leading firms. The relationships and the connections among local producers have become weaker and weaker and the district institutions, even if present, do not play a key role as in the past, leaving industrial districts unable to be competitive in the global environment. This trajectory has interested, among the others, the textile industrial district of Como, the clothing district of Vibrata-Tordino-Vomano, the cutlery district of Maniago, the footwear district of Barletta and the gold jewellery district of Vicenza.
- Hierarchization: it identifies industrial districts characterized by both a strong reduction of firms' population and a strong increase of resource concentration. The presence of leading firms vertically integrated, where the largest part of employment and revenues is concentrated, generates the major part of the value produced inside the district itself, even if often they are not embedded in the local context since they exert a role of leaders in the international scenario, showing to measure up to the global initiatives. Examples

of industrial districts belonging to this trajectory are the Sassuolo ceramic tile and the Belluno eyewear ones.

- Resilience: it characterizes industrial districts which have not seen a strong reduction of firms' population and neither a strong increase of resource concentration, maintaining alive their ability to generate value thanks to the support provided to small and medium-sized companies and to the emergence of numerous dynamic actors (such as specialized suppliers and active local institutions), able to valorise the relationships inside and outside the district and to establish a connection between the knowledge arising from the global context and the knowledge embedded in the local environment. The mechanics industrial district of Pordenone, the Arzignano leather district, the Riviera del Brenta footwear district and the Montebelluna sport system district belong to the resilience trajectory, the most dynamic one able to respond to global challenges and to adapt to external stimulus.

	Decline	**Hierarchization**	**Resilience**
Reduction of district firms' population	High	High	Moderate
Increase of resource concentration	Moderate	High	Moderate
Reduction of district value generation	High	Negligible	Negligible

Table 1.5 - Three evolutionary trajectories of industrial districts. Source: De Marchi, Gereffi and Grandinetti (2018)

What can be derived from this classification is that industrial districts, not to fall in the decline category, must be able to address global challenges and, to be successful in global value chains, they must develop global leading firms, which might have grown inside the district or could have invested in the district from abroad. In addition to global leading firms, that are essential elements of both hierarchization and resilience trajectories, the presence of local dynamic actors features the resilience trajectory thanks to their ability to link the global and local dimensions, while retaining value at a local level (De Marchi, Gereffi and Grandinetti, 2018).

In this context, as signalled by Cucculelli and Storai (2018), although the first studies investigating the district effect obtained a significant and positive result, recent contributions reported how the district premium in terms of productivity and profitability has strongly decreased, and in some cases has completely disappeared, depending on the specific characteristics of the single company and on its size and specialization. They found that, considering firms of all sizes operating in the district sector of specialization, the district effect

on firms' performance was generally negative, and the coefficients considered in the empirical model were never statistically significant, confirming a considerable decline in the district impact. Another interesting finding was that, by breaking down the sample of companies by size, the effect of the district affiliation was negative for small companies, which experienced a strong reduction of profitability with respect to non-district companies, and positive and statistically significant for medium-sized companies, which revealed themselves as best actors inside the industrial district in terms of exploitation of district economies and company-specific resources, management of high-level assets and of complicated market transactions, and capability to place themselves within global value chains, expanding their network of suppliers also in other countries for market or cost purposes. For all these reasons, medium-sized companies were more able to face the increasingly stronger competition of international markets than smaller enterprises, that, on the contrary, could rely on a lower amount of resources losing their competitive power. The authors, finally, investigated the role of younger districts, which suffered lower competitive threats, with respect to mature districts, more prepared in facing and winning competitive pressures. They found out that the negative effect arising from belonging to a district affiliation was mostly related to younger districts, within which only medium firms were able to show positive results, since the size could be exploited as a source of market power. On the contrary, mature districts boasted a positive district effect, regardless of the firms' size. In this scenario, the competitiveness of industrial districts, and in particular their survival in the long run, risk to be undermined by small firms, depending on the behaviour adopted by medium-sized firms: if the last ones behave in a predatory way, exploiting the district resources only at their advantage, the effect on the competitiveness of industrial districts will result negative; on the other hand, if medium firms act to benefit the district as a whole, the competitiveness of the entire systems could not only be maintained, but also reinforced. The increasing relevance of medium firms, the driving force behind industrial districts, is strongly highlighted also by the diffusion of leading companies in some districts, much more adequate in adopting stable mechanisms of coordination and in dealing with globalization challenges and innovation changes (Iuzzolino and Micucci, 2011; Osservatorio nazionale distretti italiani, 2015; Giordano *et al.*, 2016; Cucculelli and Storai, 2018; De Marchi, Gereffi and Grandinetti, 2018). In parallel, the relative loss of weight of small enterprises is consistent with the diffusion of strategies of relocation and with the weakening of the internal division of labour of industrial districts (Iuzzolino and Micucci, 2011).

Other important findings stemming from recent studies highlighted a weakening of the relationships between district firms and the specific territory in which they are located and the gradual reduction of the traditional sectoral specialization within industrial districts, provoking

in turn structural changes regarding the division of labour between small and large enterprises (Iuzzolino and Micucci, 2011).

As far as the credit situation is concerned, during the economic and financial crisis of 2008 the creditworthiness of district companies worsened in a more pronounced way in comparison with non-district companies: the share of bad loans in relation to the total amount of loans granted at the beginning of the period was lower in industrial districts before the crisis, reflecting the lower level of risk of district firms, and then it significantly worsened during the recession phase, highlighting a higher risk-level because of the sectoral composition (Iuzzolino and Micucci, 2011). More in general, district companies suffered more intensively the recession with respect to non-district companies, showing a stronger weakening of the credit quality and a higher reduction of the turnover because of the dense network of social and commercial relationships which connects the firms inside the district itself.

Even though, as argued above, it is demonstrated that the district premium has strongly decreased in the last years, a recent report (Intesa San Paolo, 2017) highlighted how in 2016 district companies reached a new increase in turnover and labour productivity, showing a higher growth and a stronger profitability in terms of ROE with respect to non-district companies. This path of economic recovery was even more intensive in 2017, leading one to believe that, in spite of all the difficulties recently met, industrial districts could still represent a point of strength in the Italian economy. Evidence of this finding is provided by the good reaction of district companies to the recent economic and financial crisis, the high propensity to serve foreign markets further and further, the higher presence abroad with productive and commercial branches, the interest of foreign investors towards Italian district assets and the excellence of some Italian district industries. As a consequence, industrial districts have been actually rediscovered as sources of competitive advantage and of positive externalities, driven by large enterprises and ready to face the new challenges emerged these days. This positive trend is confirmed also by another report (Osservatorio nazionale distretti italiani, 2015), which documented an increase in the performance of the Italian economic fabric and of industrial districts, committed in reshaping and redefining their market and organizational strategies. The district effect, even if downsized, is confirmed to be present, and still represents a valuable resource to be preserved. Anyway, the context in which industrial districts are recovering their competitiveness is characterized by totally different dynamics in comparison to the ones of the ‘70s and ‘80s, mainly due to the two emerging phenomena of globalization and digitalization, which have substantially modified the network of relationships typical of the district organizational model (Osservatorio nazionale distretti italiani, 2015). Indeed, on one hand the

local dimension has been strongly combined with the global one, with a strong increase in exports, and on the other hand the original informal methods of production have been integrated with a new formal and highly-defined organization of the productive and distributional processes, reducing at the same time the links with the territory of origin, although it still facilitates the formation of more effective and stronger networks (Osservatorio nazionale distretti italiani, 2015).

1.3 Research hypotheisis

The final objective of this master's thesis is to put together the literature on organized crime and on industrial districts in order to investigate how the local institutional context in which firms operate is able to affect their economic outcomes. Combining these two lines of research emphasises their common features: their strong and pervasive impact on the institutional environment and the importance which they attribute to the so-called social capital, namely the set of interpersonal relationships, shared values and attitudes, common ways of thinking, trust, reciprocity and collaboration, which represent the basis of their existence and persistency through time. The institutional and social environment, indeed, plays a major role in addressing the performance and the behaviour of local actors (enterprises, families, individuals, etc.): organized crime negatively affects the surrounding environment and the quality of institutions, producing in this way an indirect effect over the performance of firms; industrial districts, on the other hand, constitutes socio-economic concepts, where the social and institutional dimensions are considered as important as the economic one, positively affecting also the outcomes of firms. Both phenomena are socially embedded and rely on a set of relationships which are vital for their regular functioning: criminal organizations are interested in building, maintaining and reinforcing their web of social relationships in order to influence how people think, feel and act and to create internal cohesion and external consensus; industrial districts, instead, benefit from a social capital that facilitates the sharing of knowledge and information, encourages an active cooperation and an efficient coordination among local actors, boosts innovation practices, produces supernormal returns, reduces the transaction costs and allows to spread feelings of trust in the whole district territory.

This research, in particular, is addressed to answer the following question: "are negative externalities produced by organized crime mitigated by the presence of positive externalities associated with industrial districts"? More specifically, by exploiting a sample of 107,112

companies located in a criminal Local Market Area in the Central and Northern Italy, this research work aspires to investigate through a multiple regression similar to a difference-in-difference model, whether and how, once a criminal company is removed from a specific territory, the change in firms' performance in terms of ROA, ROE and ROI is different by moving from a non-district Local Market Area to a district Local Market Area, and then by moving from a non-district territory to a district agglomeration, showing how the district effect could influence the performance of the surrounding area's companies through the effects of stronger institutions and relations. Indeed, the initial argument at the basis of this research hypothesis starts from the fact that the removal of a criminal company is intrinsically expected to produce benefits in the surrounding area, but in order to exploit such benefits it is necessary to be provided with a positive and social-cohesive institutional context, made of strong relationships among actors and firms. In this context, the role played by social capital proves to be crucial in creating an interrelation between the topics of organized crime and industrial districts, acting in two different directions, both addressed to create the conditions which allow district territories, once the criminal firm is removed, to benefit from a higher performance with respect to the other areas. On one hand, since social capital represents one of the distinctive characteristics of industrial districts, it acts as an amplifier of the effect produced by criminal organizations, facilitating, thanks to the typical district network of social relationships and interrelations, their establishment ex ante and provoking significant damages. As a consequence, the effect of the removal of the criminal company is expected to be more pervasive and stronger in district territories in comparison with other areas where the role of social capital is less intensive. On the other hand, social capital allows, once the criminal company is definitively removed, to recover more quickly the negative impact generated by organized crime, accelerating the process of value creation and growth. Therefore, industrial districts' social capital plays a critical role along the whole process of establishment, development and removal of the criminal company, encouraging its infiltration and helping the district area to recover after its removal. All things considered, the empirical analysis of this thesis aims to verify whether these hypothesis could be confirmed, expecting a real improvement, after the removal of the criminal firm, of the performance of all the companies operating in a district Local Market Area and, more specifically, in a district territory.

Secondly, after having identified districts in decline, hierarchization and resilience within the final sample of companies, the thesis aims at verifying whether the combined effect above described is different considering only districts belonging to one of the three trajectories with respect to the whole sample. Indeed, as already explained in the previous paragraph, industrial

districts have suffered important changes in the last 15 years, which have hardly tested their traditional Marshallian characteristics.

The same analysis is carried out considering geography as the main reference variable: since the largest part of industrial districts is located in the North-eastern Italy, which is considered the traditional point of reference for the Italian district model, it would be interesting to ascertain whether the organized crime-district effect is stronger in this area in comparison with North-western and Central Italy.

Chapter 2

Empirical analysis

This chapter aims at describing the analytical procedure through which the final sample was obtained, specifying all the assumptions made and all the limitations encountered in this phase. Secondly, it illustrates the empirical method adopted, outlining the multiple regression analysis to provide an answer to the research question. Finally, it shows the results obtained from the regression model implemented, discussing in detail the implications which arise from them.

2.1 Sample selection and data collection

To empirically investigate my research hypothesis, I developed a sample of 107,112 companies located in a criminal Local Market Area in the Central and Northern Italy. This final database was obtained by combining other two datasets: the first one presenting a list of 649 criminal companies, and the second one including all the firms situated in the North and Centre of Italy for which the data about performance was available in the years taken into account.

The first dataset was built starting from an excel database containing a list of 649 criminal companies located in the North and Centre of Italy, used in a recent study carried out by Fabrizi, Malaspina and Parbonetti (2017) that was focused on the characteristics and the modus operandi of criminal firms. They defined a criminal company as:

- a company confiscated by the Italian judicial authorities since it was connected with mafia-type organizations;
- a company where a member of the board of directors or a shareholder with a stake of at least 10% was arrested and sentenced because of mafia-related crimes.

Therefore, this sample includes both companies confiscated to mafia organizations and companies connected to them through a shareholder or a director sentenced because of *art. 416 bis*. In order to identify these criminal companies, they started from official documents such as pre-trial detention orders and judgements of the related processes, collecting information on police operations in the Central and Northern Italy in the period 2005-2014 (Fabrizi, Malaspina

and Parbonetti, 2017). For each criminal company, the database shows the fiscal code, the ISTAT code of the municipality's registered office when the company was removed, the year of the operation of removal of the criminal firm, and other secondary data. With respect to the geographical concentration of this sample of criminal companies, they are located in the Central and Northern Italy, responding in this way to two needs of the authors: the opportunity to study how criminal organizations were able to infiltrate different territories from the origin ones and the possibility to assume, since the presence of mafia-criminality is less pervasive in the Northern regions, that each company not involved in police operations was not connected with criminality (Fabrizi, Malaspina and Parbonetti, 2017). This choice perfectly fits with my analysis, since industrial districts are mainly diffused in the Centre and North of Italy, and the North-East is commonly considered the traditional reference point for the Italian district model.

I subsequently downloaded this list of 649 criminal companies from the database *Aida*, offered through Bureau Van Dijk, in order to collect other essential information for my analysis. Where the database *Aida* did not return me a specific company, I made use of the Chambers of Commerce on-line service *Telemaco*, which provides official data from the Italian Business Register. In particular, I selected the six-digit ATECO code, which precisely identifies the sector in which each company operates, and the current ISTAT code of the municipality's registered office. Therefore, I associated to each criminal company the Local Market Area to which it belongs, distinguishing between district and non-district. This association was performed making reference to the ISTAT code of the municipality's registered office when the company was removed in order to identify the effect of the removal of the criminal company in that specific geographical area. Indeed, a company could have moved its registered office to a different municipality in the last years, or could have been cancelled from the Business Register and then set up again in a different place.

Having at disposal all the necessary information, I could check whether, within the criminal companies located in a district Local Market Area, some of them were also belonging to the same sector of specialization of the industrial district of that area. As a matter of fact, companies have to respect two essential conditions in order to be classified as part of industrial districts: the territorial dimension (belonging to a district Local Market Area) and the industry dimension (operating in the sector of specialization of the industrial district with reference to the ATECO code), as can be understood in Figure 2.1. Indeed, in each district Local Market Area there are companies operating inside the industrial district (if their ATECO code corresponds to the district sector of specialization), and companies operating outside the industrial district (if their ATECO code is different from the one of the district sector of specialization). Therefore, I

associated to the main industry of each industrial district its ATECO code of reference on the basis of Table 2.1, provided by ISTAT (ISTAT, 2015c).

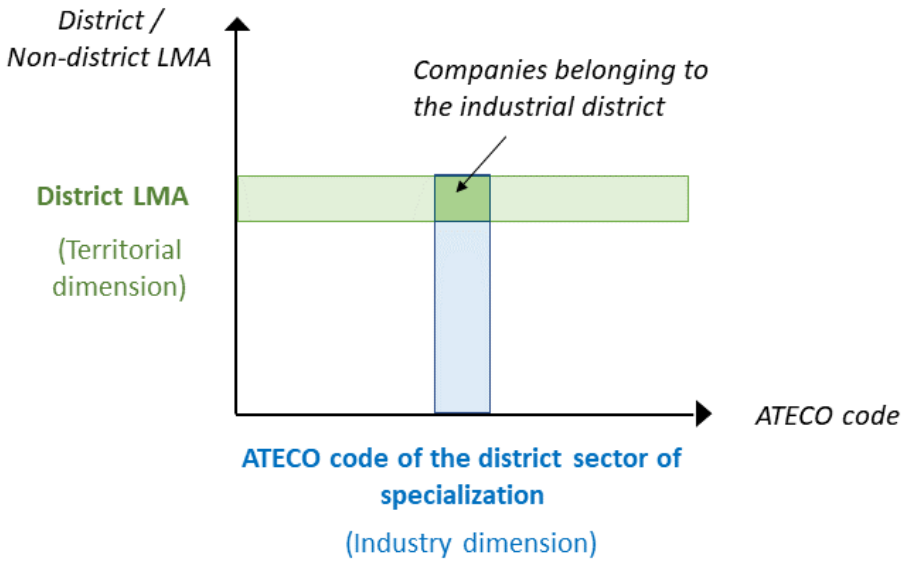

Figure 2.1 - Territorial and industry dimensions of industrial districts. Source: Author's elaboration

Main industry of specialization	ATECO codes 2007
Textile and clothing	13, 14
Leather and footwear	15
Household goods	16, 23, 31, 3291, 32994, 9524, 9529
Jewellery, musical instruments, etc	264, 3211,3212, 322 - 324
Food industry	10, 11, 12
Mechanical industry	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
Metallurgical industry	241 - 243, 2441 - 2445, 2451, 2452
Chemical and petrochemical industry, rubber products	19, 201 - 204, 2052 - 2060, 21, 22, 2446, 268, 2733, 32991
Transportation industry	291, 292, 29320, 301 - 303, 30911, 30912, 30921 - 30923, 30990, 3315 - 3317, 38312
Paper industry	17, 181, 581, 59201, 59202
Other manufacturing industries	20510, 30924, 3213, 32992, 32993, 32999, 3319, 38311, 3832

Table 2.1 - Match between the main industry of specialization of industrial districts and their ATECO codes 2007. Source: ISTAT

What emerged from my classification was that, considering the whole sample of 649 criminal companies, 111 of them belonged to a district Local Market Area (for a total of 38 district Local Market Areas containing a criminal firm) and 538 of them belonged to a non-district Local Market Area. Only 2 companies, as shown in Figure 2.2, instead, belonged to an industrial district, satisfying both the requisites of the territorial dimension and the industry dimension. Consequently, since 2 criminal companies belonging to an industrial district are not enough to verify whether there are differences in performance between industrial districts within a criminal area and industrial districts outside a criminal area, I decided to focus only on criminal areas, investigating whether, once removed the criminal company from the Local Market Area of reference, there could be differences in firms' performance by moving from a non-district Local Market Area to a district Local Market Area, and then by moving from a non-district territory to a district agglomeration.

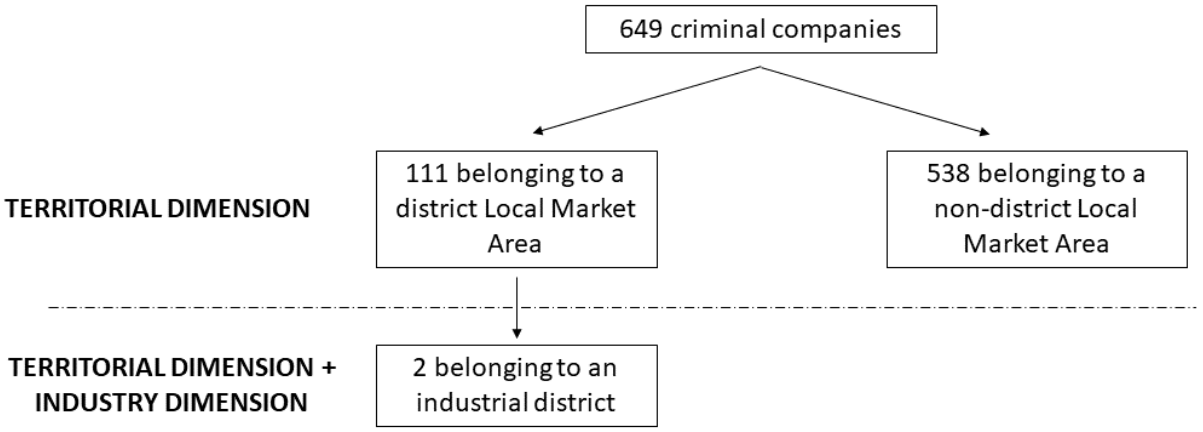

Figure 2.2 - Classification of the whole sample of criminal companies. Source: Author's elaboration

In a second stage, I associated to each criminal company, both belonging to a district Local Market Area and not, the year of the operation of removal, creating a dummy variable with value 1 in the case in which at least 75% of the criminal companies belonging to the same Local Market Area were associated with the same year of removal. When the minimum threshold of 75% was not satisfied, the Local Market Area of reference was removed from the sample, since it did not allow to investigate the effect pre and post removal of the criminal company. Overall, as shown in Figure 2.3, excluding the Local Market Areas where it was not possible to associate the year of removal, the final sample was made of 320 criminal companies, 68 of them in a district Local Market Area, and 252 in a non-district Local Market Area. As far as the number of Local Market Areas is concerned, the sample included 30 district Local Market Areas and 51 non-districts Local Market Areas.

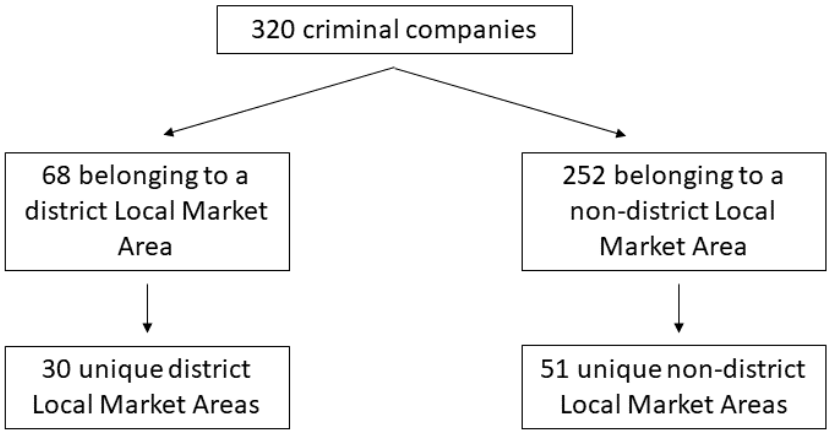

Figure 2.3 - Classification of the final sample of criminal companies. Source: Author's elaboration

The second database used in order to build my final sample of 107,112 companies was developed by downloading from *Aida* the financial information of all the Central and Northern limited liability companies. An important limitation of this research is represented by the fact that partnerships are excluded from the model, since their balance sheets and financial data are not available, losing in this way important information regarding the world of small manufacturing enterprises. I selected, for each company, the registered office, the operative headquarters, the 6-digit ATECO code, the main indicators of performance (ROA, ROE, and ROI) to be used as dependent variables in my regression analysis, and other economic-financial information (revenues and debt-to-equity ratio), from 2008 (the first year for which information was available) to 2016. In addition to the years 2008-2016, I selected also the year 2017 if available. With reference to the geographical location of the companies considered, I downloaded all the companies belonging to the regions of the Centre and North of Italy, since I am interested in investigating the effect pre-and-post removal in the specific Local Market Area where the criminal firm was located. Table 2.2 shows the regions of the North-east, North-west and Centre of Italy considered in my analysis and the number of companies which respond to the above defined criteria of selection.

Geographical area	Region	Number of companies
North-east	Veneto	46,847
	Friuli Venezia Giulia	9,024
	Emilia Romagna	44,873
	Trentino Alto Adige	7,918
North-west	Liguria	9,940
	Lombardia	113,273
	Piemonte	27,069
	Valle d'Aosta	892
Centre	Lazio	52,684
	Marche	13,591
	Toscana	34,903
	Umbria	5,914
Total		**366,928**

Table 2.2 - Number of companies considered for each region of the North-east, North-west and Centre of Italy. Source: Author's elaboration

For each of the 366,928 companies downloaded, I associated:

- the ISTAT code of the municipality's operative headquarters if available in *Aida*;
- the Local Market Area of reference;
- the number of companies operating in each district Local Market Area both in 2011 and in 2001 and the variation;
- the number of companies operating in each Local Market Area, calculated as the average between the total number of firms operating in 2012, 2013, 2014 and 2015.

The dataset obtained was imported in the statistical program Stata, in order to carry out the empirical analysis through a statistical approach similar to a difference-in-difference model.

First of all, I cleaned the sample keeping only the criminal Local Market Areas, defined on the basis of the previous sample of criminal companies. In this way, the sample was only made of companies operating in a district or non-district territory contaminated, directly or indirectly, by criminal organizations. Secondly, I eliminated from the database all the companies belonging to a Local Market Area for which it was not possible to associate the year of removal, since at least 75% of the firms were not associated with the same reference year. Within this restricted sample, I deleted all the companies belonging to a Local Market Area for which it

was associated a year of removal lower than 2011, since I am interested in assessing the effect pre-and-post removal of the criminal firm three years before the removal and three years after. Lastly, I eliminated all the enterprises with the operative headquarters located in a region of the South of Italy. This could have been possible considering that each Central and Northern company was related to the ISTAT code of the municipality's operative headquarters, and this could have been located anywhere in Italy. The procedure through which I obtained the final sample is illustrated in Figure 2.4.

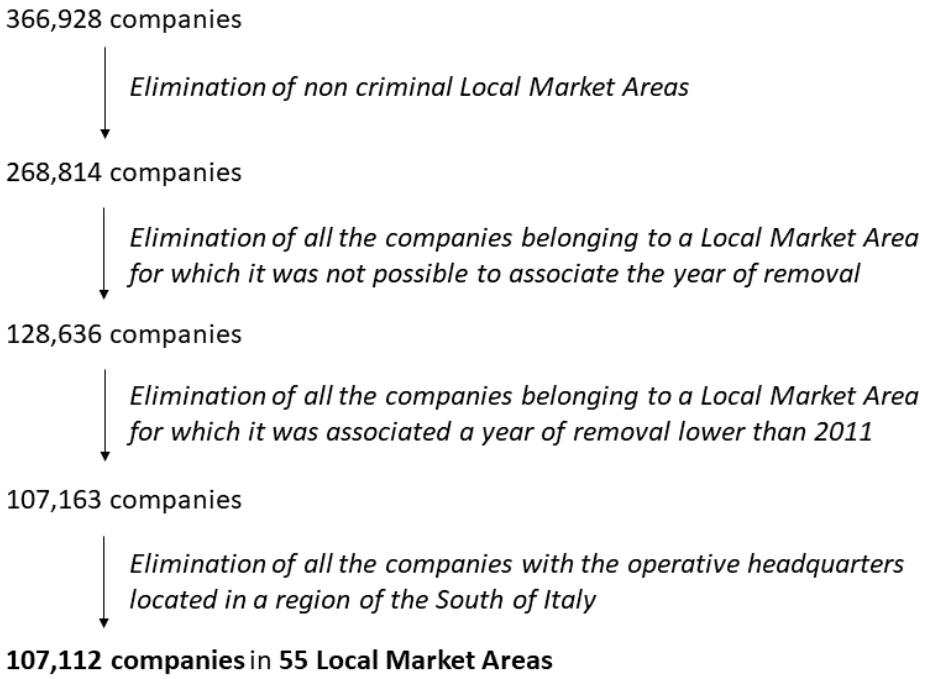

Figure 2.4 - Procedure through which I obtained the final sample. Source: Author's elaboration

After having introduced all these restrictions and conditions, I obtained a final and definitive sample made of 107,112 companies located in a criminal Local Market Area, each one associated with a specific year of removal ranging from 2011 to 2014, for a total of 27,205 companies belonging to a district Local Market Area and 79,907 companies belonging to a non-district Local Market Area. As far as the number of Local Market Areas is concerned, the sample is made of 55 of them, including 18 district Local Market Areas and 37 non-district Local Market Areas. The final sample is illustrated in Figure 2.5.

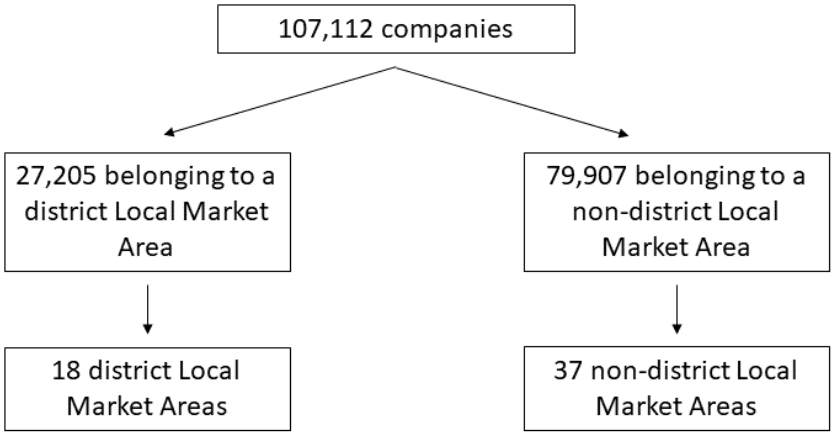

Figure 2.5 - Final and definitive sample of companies and Local Market Areas. Source: Author's elaboration

2.2 Empirical methods

2.2.1 Multiple regression analysis

The empirical analysis implemented in this thesis does not directly compare the performance of district Local Market Areas with the one of non-district Local Market Areas once the criminal company of that specific territory is removed, since problems of endogeneity could arise, undermining the accuracy of the results obtained and not allowing to infer any causal effect. On the contrary, I made use of a statistical strategy similar to a difference-in-difference model, a technique widely used in econometrics and quantitative analysis that aims at replicating an experimental research using observational data, trying to minimize the endogeneity and the selection bias issues. This technique uses panel data, where firms are observed for multiple time periods, in order to examine the differential effect of a treatment group with respect to a control group. Indeed, it makes use of both cross-sectional differences and time differences, allowing to capture the effect object of the study, cleaned from any external factor that could affect the results obtained and the implications that arise therefrom.

In particular, I exploited as natural experiment the removal of the criminal company from a specific Local Market Area, analysing how the performance of firms belonging to district Local Market Areas changes in comparison with the one of non-district Local Market Areas, three years before and three years after the removal itself. As a consequence, in this first analysis, the territorial unit of investigation is represented by the Local Market Area, as can be seen in Figure 2.6.

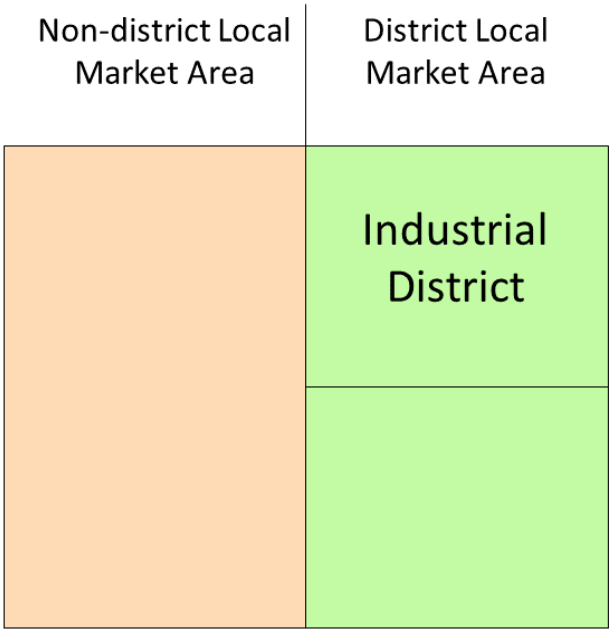

Figure 2.6 - Comparison of firms' performance of district Local Market Areas with the one of non-district Local Market Areas. Source: Author's elaboration

The treatment group is made of companies operating in a criminal and district Local Market Area, which in a particular year experienced the removal of a criminal company from that specific territory. The control group, on the other hand, is constituted by firms operating in a criminal and non-district Local Market Area, which experienced the shock of the removal in that specific geographical area as well. In this context, it is not possible to apply a real difference-in-difference statistical approach, since the whole sample is made of criminal Local Market Areas and each Local Market Area is affected by the shock of the operation. Anyway, the model is a multiple regression analysis structured as a panel data, combining at the same time cross sectional data and time series data: a sole cross sectional comparison would not allow to capture the effect of the district's institutions in the whole Local Market Area, and a sole time series analysis would not fit with this type of research, since it would not be possible to distinguish between the treatment group and the control group.

The analysis is carried out over a sample of 55 criminal Local Market Areas, of which 18 district Local Market Areas and 37 non-district Local Market Areas, for a total of 330 observations, since each Local Market Area is observed three years before and three years after the year of removal of the criminal company.

2.2.2 The regression model

In order to investigate whether and how the firms' performance in terms of ROA, ROE and ROI will change once the criminal company is removed, moving from non-district Local

Market Areas to district Local Market Areas, I implemented the following regression model (firm and year subscripts are omitted):

$$Performance = \beta_0 + \beta_1\, dLMA + \beta_2\, Post + \beta_3\, dLMA{*}Post + \sum Controls + \sum Year\ fixed\ effects + \sum Geographical\ fixed\ effects + \varepsilon \quad (1)$$

In the above described model, where the unit of observation is represented by the Local Market Area, the meaning of each single variable is the following:

- *Performance* is represented, in three different regression models, by ROA (Return on Assets), ROE (Return on Equity) and ROI (Return on Investments) calculated, respectively, as the *Operating Income/Total Assets*, *Net Income/Equity* and *Operating Income/Invested Capital.* They are calculated as average values for Local Market Areas and they measure the profitability of each company, namely the capability of remunerating in an appropriate way all the productive factors employed in the production and the risk capital provided by the owners of the company's assets (Sostero *et al.*, 2014);
- *dLMA (district Local Market Area)* is a dummy variable which assumes value 1 for the treatment group (companies belonging to a criminal and district Local Market Area) and value 0 for the control group (companies belonging to a criminal and non-district Local market Area);
- *Post* is a dummy variable which takes value 1 for the 3 years that follow the police operation of removal of the criminal company, and value 0 for the 3 years which precede it. The exact year of removal of the criminal company is eliminated from the sample in order to precisely identify the pre-and-post effect of the operation;
- *dLMA*Post* represents the interaction term, which combines the effects of *dLMA* and *Post,* and tests my research hypothesis, providing an answer about whether and how the performance of the companies considered changes once the criminal company is removed and by distinguishing between district Local Market Areas and non-district Local Market Areas;
- ∑ *Controls* represents a vector of variables of control, including the *Number of companies* in each Local Market Area, calculated as the average between the total number of firms operating in 2012, 2013, 2014 and 2015; *LnRevenues,* calculated as the log transformation of the average revenues for each Local Market Area, which controls for differences in size that could influence the operating profitability; *Leverage,* calculated as the debt over equity ratio in order to consider the average capital structure

for each Local Market Area; *Herfindahl_dummy*, a dummy variable representing the level of competitiveness in a specific industry considering the average degree of concentration of the revenues for each Local Market Area[1] (this dummy takes value 1 if the Herfindahl-Hirschman concentration index is higher than 0.18, otherwise it assumes value 0);

- ∑ *Year fixed effects*, a dummy variable introduced in order to control for the common macroeconomic shocks in different time periods that affect each Local Market Area. In this way, specific time trends are eliminated, and it is possible to control for the effect of the financial and economic crisis of 2008;
- ∑ *Geographical fixed effects* (at region level), introduced in order to control for all the fixed, specific and unobservable characteristics of each region which could corrupt the final estimations. In this way, the variability in the data exploited with the aim of estimating the parameters of the regression is the within-region variability, which allows to obtain unbiased results since institutions could be very different considering different regions.

In order to eliminate the potential outliers, the dependent variables ROA, ROE and ROI and the control variables *LnRevenues* and *Leverage* have been winsorized at the 1st and 99th percentile. The standard errors of the regression's coefficients are robust, dealing in this way with the problem of heteroskedasticity, which occurs when the variance of the errors is not constant across all the observations, making the statistical inference biased and the t-statistics and F-statistics inappropriate.

[1] Herfindahl-Hirschman concentration index on turnover calculated as the sum of the squared turnover of each company over the total turnover of the Local Market Area of reference. The higher the index, the higher the concentration of revenues in few enterprises and the lower the competitiveness among firms within a specific industry (in this case Local Market Area).
Its value ranges from 0 to 1:

- If the HHI index is lower than 0.15, the marketplace is really competitive;
- If the HHI index is comprised between 0.15 and 0.25, the marketplace is moderately concentrated;
- If the HHI index is higher than 0.25, the marketplace is highly concentrated.

	Pre-operation	Post-operation	Difference
District Local Market Area	$Y = \beta_0 + \beta_1 1 + \beta_2 0 + \beta_3 0 = \beta_0 + \beta_1$	$Y = \beta_0 + \beta_1 1 + \beta_2 1 + \beta_3 1 = \beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_2 + \beta_3$
Non-district Local Market Area	$Y = \beta_0 + \beta_1 0 + \beta_2 0 + \beta_3 0 = \beta_0$	$Y = \beta_0 + \beta_1 0 + \beta_2 1 + \beta_3 0 = \beta_0 + \beta_2$	β_2
Interaction term			$\boldsymbol{\beta_3}$

Table 2.3 – Multiple regression model: meaning of the coefficients. Source: Author's elaboration

2.3 Multiple regression results

As previously specified, the regression analysis is implemented over a sample of 55 criminal Local Market Areas, of which 18 district Local Market Areas and 37 non-district Local Market Areas. Considering that each Local Market Area is observed three years before the year of removal of the criminal company and three years after, the regression model is carried out over 330 observations, namely 55 Local Market Areas multiplied for 6 observations each one.

Table 2.4 and Table 2.5 illustrate, respectively, the descriptive statistics and the correlation matrix for the final sample of companies obtained through the various passages.

As can be noticed, on average sample firms are profitable: their average values for ROA, ROE and ROI, considered at Local Market Area level, are respectively 2.13%, 3.03% and 4.85%. Average revenues are 3,815 thousand, median revenues are 3,754 thousand, and the average Leverage (debt/equity) is 3.5%, all calculated at Local Market Area level. The average Herfindahl index is very low (5%), highlighting how the level of competitiveness in the firms' sample is weak: there are no firms, on average, with a strong and noteworthy concentration of revenues with respect to the others. As far as the number of companies is concerned, the average value is 17,984 companies for Local Market Areas.

Considering both ROA, ROE and ROI, the performance of the companies of the sample improves for larger firms in comparison to smaller ones (the performance is positively correlated with the log transformation of the revenues). With reference to ROA, the higher the leverage the higher also the performance, whereas considering ROE and ROI the opposite happens: the higher the leverage the lower the performance.

*	N	Mean	SD	p25	p50	p75
ROA (%)	330	2.1302	1.6315	1.2181	2.3584	3.2624
ROE (%)	330	3.0295	2.4150	1.4851	3.0186	4.4650
ROI (%)	330	4.8522	.9744	4.2496	4.7864	5.3891
Revenues (/000)	330	3,815.57	1,718.39	2,489.60	3,754.97	4,645.54
LnRevenues	330	6.2918	.2834	6.1111	6.2798	6.4662
Leverage (%)	330	3.4966	1.9160	2.2681	3.2409	4.2520
Herfindahl index	330	.0541	.05	.02226	.03508	.0673
N. of companies	330	17,984.27	42,598.97	4,992	7,308	15,916

** Average values for Local Market Areas*

Table 2.4 - Descriptive statistics for the final sample of companies.

*	ROA (%)	ROE (%)	ROI (%)	LnRevenues	Leverage (%)	Herfindahl index	N. of companies
ROA (%)	1						
ROE (%)	0.5407	1					
ROI (%)	0.4574	0.6985	1				
LnRevenues	0.4075	0.4421	0.3997	1			
Leverage (%)	0.1434	-0.0480	-0.1411	0.0212	1		
Herfindahl index	0.0294	0.0547	0.0693	0.0532	-0.0949	1	
N. of companies	-0.1320	0.0047	-0.0497	-0.2838	-0.0516	-0.1076	1

** Average values for Local Market Areas*

Table 2.5 - Correlation matrix for the final sample of companies.

Table 2.6 presents the regression results for the model with ROA as indicator of performance, considering it in its base form without any control variable (column 1), with geographical and time fixed effects (column 2) and with all the control variables included in the model, that are the number of firms, the log transformation of revenues, the leverage and the Herfindahl dummy (column 3). As previously stated, the variable of interest of my research is the interaction term between *dLMA* and *Post* (*dLMA*Post*), which provides an answer about whether and how the performance of the companies considered changes once the criminal company is removed, distinguishing between district Local Market Areas and non-district Local Market Areas. Consequently, my research hypothesis is tested by studying both the sign and the statistical significance of the parameter β_3. The same comments are valid also for the models which consider ROE and ROI as indicators of performance, presented subsequently in Table 2.7 and 2.8.

Regardless of the specification considered, the coefficient β_3 is always statistically significant and positive (at 1% considering the regression with all the control variables), confirming in this way that, once the criminal company is removed from a specific Local Market Area, the performance of the companies located in that territory improves by moving from a non-district Local Market Area to a district Local Market Area. In particular, as can be noted in the regression model with all the control variables and the fixed effects, in the three years after the removal of the criminal company from its Local Market Area of reference, the ROA increases of 0.68% by moving from non-district Local Market Areas to district Local Market Areas. Considering ROE and ROI, instead, they respectively improves by 1.21% and 0.55% approximately. As already explained, the fact that β_3 is positive and statistically significant means that, once the criminal company is removed from a specific Local Market Area, the performance of the companies belonging to district Local Market Areas is better with respect to the one of non-district ones, highlighting in this way how there is not only a mere district effect in the industrial district territory, but there is also a strong and pervasive effect of the district institutions in the whole surrounding area, ensuring benefits and advantages also for the companies operating outside the borders of the district itself. In other words, the value of the social capital developed thanks to the particular district configuration represents an inestimable immaterial resource, which generates positive spillovers in the whole neighbouring geographical area, producing an evident differential between district and non-district Local Market Areas. This represents a confirmation that institutions' quality matters, creating a favourable and beneficial environment which promotes the competitiveness, performance and efficiency of firms, and regulates social behaviours and interactions. In this context, it can be stated that social capital represents the main driver in explaining and justifying these findings: on one hand, since it acts as an amplifier of the effect produced by organized crime, it could facilitate the infiltration ex ante of criminal companies in district areas, provoking larger damages and a consequent more pervasive and stronger effect in district territories after the removal of the criminal company; on the other hand, it helps district areas, once the criminal company is definitely removed, to recover more quickly the negative impact generated by organized crime.

With reference to ROA and ROE, since the coefficient β_1 of *dLMA* is negative and statistically significant, I cannot expect a specific and positive difference in companies' performance by moving from non-district Local Market Areas to district Local Market Areas, but the recovery in performance after the removal of the criminal company is stronger and more effective in district Local Market Areas in comparison to non-district ones, namely in a more socially cohesive environment. This means that in a district Local Market Area, companies have more

possibilities and capabilities to defend themselves from external factors, since the institutional, social and relational context plays a crucial role in helping companies to exit from a situation contaminated by criminal organizations.

As far as the coefficient β_2 is concerned, it is always negative, and in some specifications also statistically significant. This could be probably due to the effect of the economic and financial crisis which started in 2008, covering in this way a large part of the years included in the sample. Indeed, as can be noted, considering time fixed effects in the regression model, the statistical significance of the coefficient *Post* reduces drastically by moving for the base specification to the fixed effect specification, both in the cases of ROA, ROE and ROI.

Variables	**(1)** **ROA (%)**	**(2)** **ROA (%)**	**(3)** **ROA (%)**
dLMA	-0.253	-0.489**	-0.595***
	(0.219)	(0.199)	(0.204)
Post	-1.984***	-0.332	-0.436*
	(0.184)	(0.258)	(0.254)
dLMA*Post	0.646**	0.675***	0.677***
	(0.320)	(0.250)	(0.249)
LnRevenues			0.713**
			(0.359)
Leverage			-0.0433
			(0.0459)
Herfindahl_dummy			0.458
			(0.469)
N. of companies			-1.56e-06
			(1.41e-06)
Constant	3.099***	4.956***	0.322
	(0.100)	(0.373)	(2.460)
Geographical fixed effects	No	Yes	Yes
Time fixed effects	No	Yes	Yes
Observations	330	330	330
R-squared	0.305	0.587	0.601

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.6 - Regression analysis with ROA as indicator of performance.

Variables	(1) ROE (%)	(2) ROE (%)	(3) ROE (%)
dLMA	-0.583	-0.628*	-1.192***
	(0.361)	(0.328)	(0.314)
Post	-1.701***	-0.0920	-0.412
	(0.317)	(0.422)	(0.365)
dLMA*Post	1.096**	1.248***	1.206***
	(0.533)	(0.394)	(0.368)
LnRevenues			3.408***
			(0.529)
Leverage			-0.108
			(0.0704)
Herfindahl_dummy			-0.733
			(0.619)
N. of companies			4.53e-06**
			(1.86e-06)
Constant	3.891***	7.111***	-15.31***
	(0.205)	(0.533)	(3.726)
Geographical fixed effects	No	Yes	Yes
Time fixed effects	No	Yes	Yes
Observations	330	330	330
R-squared	0.089	0.495	0.584

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.7 - Regression analysis with ROE as indicator of performance.

Variables	(1) ROI (%)	(2) ROI (%)	(3) ROI (%)
dLMA	-0.132	-0.0157	-0.204
	(0.155)	(0.130)	(0.127)
Post	-0.470***	-0.333**	-0.482***
	(0.126)	(0.168)	(0.155)
dLMA*Post	0.485**	0.561***	0.548***
	(0.230)	(0.166)	(0.159)
LnRevenues			1.100***
			(0.235)
Leverage			-0.0249
			(0.0248)
Herfindahl_dummy			-0.207
			(0.270)
N. of companies			-1.78e-06**
			(8.11e-07)
Constant	5.051***	6.385***	-0.877
	(0.0826)	(0.327)	(1.648)
Geographical fixed effects	No	Yes	Yes
Time fixed effects	No	Yes	Yes
Observations	330	330	330
R-squared	0.042	0.481	0.548

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.8 - Regression analysis with ROI as indicator of performance.

2.4 Additional analysis

In this section, I investigate whether the inferences about district and non-district Local Market Areas are robust by moving to a different territorial unit. Here, the unit of observation is not represented anymore by the Local Market Area, but by each single company, analysed in different aggregates. Secondly, maintaining the company as unit of analysis, I will verify whether, once the criminal company is removed from a specific Local Market Area, the change in firms' performance moving from non-district territories to district agglomerations is different considering different types of industrial districts' trajectories and different geographical areas in which they are located.

2.4.1 Changing the unit of analysis: from the Local Market Area to the company

The empirical analysis implemented considering the Local Market Area as unit of observation is replicated adopting another reference unit in order to verify whether the combined effect of organized crime and industrial districts is confirmed. Here, the unit of observation is represented by each single company (each one located in a criminal Local Market Area), which is analysed in different aggregates. In particular, once the criminal firm is removed from its Local Market Area of reference, the following cases are considered, as can be seen in Figures 2.7 (a,b,c,d):

- Case 1: comparison of the performance of companies belonging to an industrial district versus companies belonging to district Local Market Areas not included in the industrial district and companies belonging to non-district Local Market Areas (Figure 2.7 (a)). In this analysis, it is possible to derive the real district effect, verifying whether there is a difference in performance between districts' companies with all the other companies outside the district;
- Case 2: comparison of the performance of companies belonging to an industrial district versus companies belonging to non-district Local Market Areas (Figure 2.7 (b)). By comparing these two extreme aggregates, I expect to obtain a very high interaction coefficient, since the positive externalities associated with industrial districts in terms of favourable institutional environment and constructive social capital are supposed to be extended, to a lesser extent, also to district Local Market Areas not belonging to the industrial district, but not to non-district Local Market Areas. Consequently, the

difference in terms of performance between these two categories is expected to be very high;

- Case 3: comparison of the performance of companies belonging to district Local Market Areas not included in industrial districts versus companies belonging to non-district Local Market Areas (Figure 2.7 (c)). In this case, I expect to obtain a very low interaction coefficient, since district companies are excluded from the sub-sample: here the effect, if present, is totally attributable to the positive spillovers spread by the industrial district in the whole district surrounding area, highlighting the crucial role of the institutional background and of the network of socio-economic relationships;
- Case 4: comparison of the performance of companies belonging to an industrial district versus companies belonging to district Local Market Areas not included in the industrial district (Figure 2.7 (d)). Here, non-district Local Market Areas are excluded from the sub-sample, allowing to compare the difference in performance between companies operating in district Local Market Areas, inside and outside industrial districts.

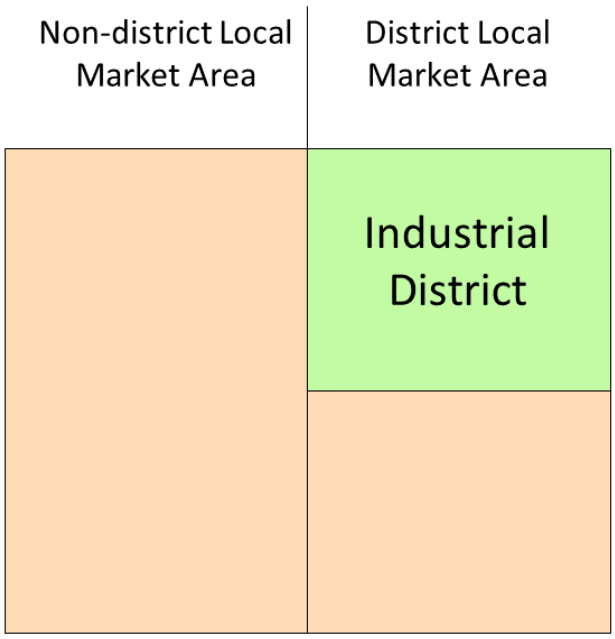

Figure 2.7 (a) - Case 1: comparison of the performance of companies belonging to an industrial district versus companies belonging to district Local Market Areas not included in the industrial district and companies belonging to non-district Local Market Areas. Source: author's elaboration

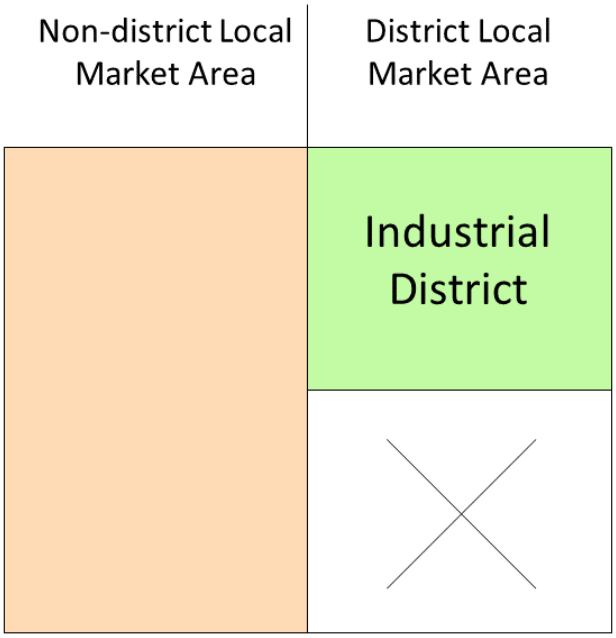

Figure 2.7 (b) - Case 2: comparison of the performance of companies belonging to an industrial district versus companies belonging to non-district Local Market Areas. Source: Author's elaboration

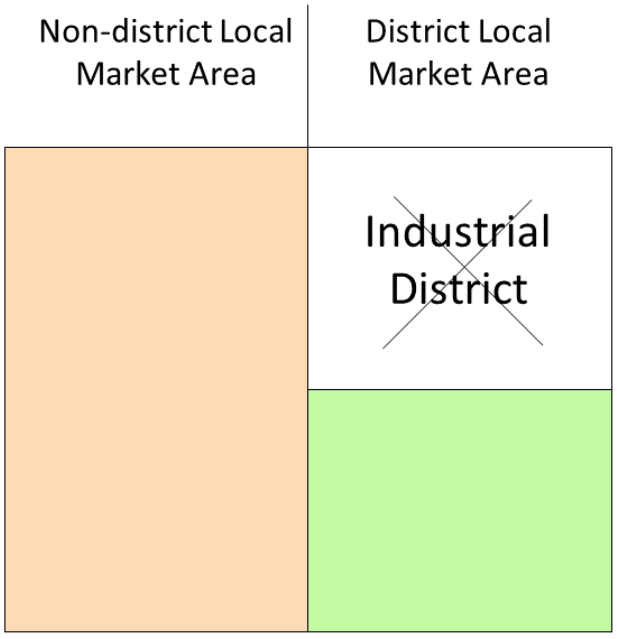

Figure 2.7 (c) - Case 3: comparison of the performance of companies belonging to district Local Market Areas not included in industrial districts versus companies belonging to non-district Local Market Areas. Source: Author's elaboration

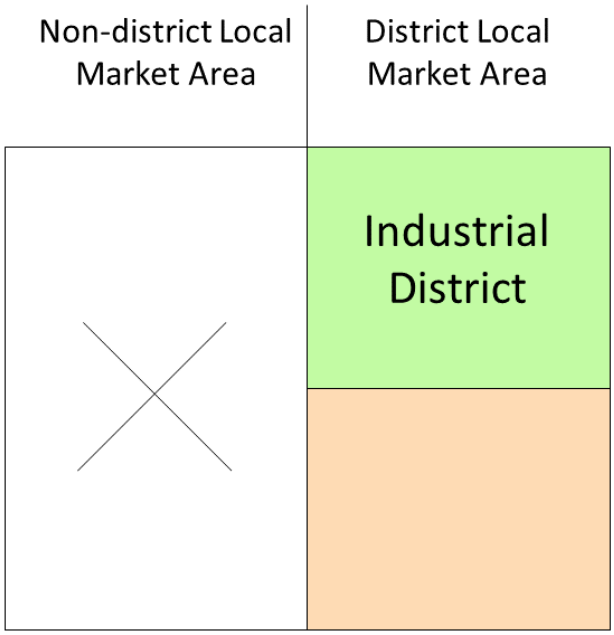

Figure 2.7 (d) - Case 4: comparison of the performance of companies belonging to an industrial district versus companies belonging to district Local Market Areas not included in the industrial district. Source: Author's elaboration

The regression model implemented in all the cases above described is the following (firm and year subscripts are omitted):

$$Performance = \beta_0 + \beta_1\, Treated + \beta_2\, Post + \beta_3\, Treated{*}Post + \sum Controls + \sum Year\ fixed\ effects + \sum Geographical\ fixed\ effects + \varepsilon \quad (2)$$

In this model, where the unit of observation is represented by each single company, the meaning of the single variables is exactly the same of the model performed at Local Market Area level (considering values for each company, and not average values for Local Market Areas), with the exception of the following variables:

- *Treated* is a dummy variable which assumes value 1 for the treatment group and value 0 for the control group. Table 2.9 illustrates the treatment group and the control group for each single case. All the companies belonging to an industrial district have been defined through a procedure which associates the territorial dimension (the belonging to a district Local Market Area through a correspondence of the municipalities' ISTAT codes) to the industry dimension (the fact that the firm operates in the same sector of specialization of the industrial district through a correspondence of the ATECO codes);
- *Treated*Post* represents the interaction term, which provides an answer about whether and how the performance of the companies considered changes once the criminal company is removed, distinguishing between the different treatment and control groups;

- ∑ *Geographical fixed effects*, included at Local Market Area level (and not at regional level as in the previous model) since the unit of measure is represented by the company itself. As a matter of fact, in this way, the variability in the data is the within-Local Market Area variability, which allows to obtain unbiased results since institutions could be very different considering different Local Market Areas, especially if they are district or non-district.

	Treatment group	**Control group**
Case 1	Companies belonging to an industrial district	Companies belonging to district Local Market Areas not included in the industrial district Companies belonging to non-district Local Market Areas
Case 2	Companies belonging to an industrial district	Companies belonging to non-district Local Market Areas
Case 3	Companies belonging to district Local Market Areas not included in the industrial district	Companies belonging to non-district Local Market Areas
Case 4	Companies belonging to an industrial district	Companies belonging to district Local Market Areas not included in the industrial district

Table 2.9 - Treatment and control groups for case 1, 2, 3 and 4. Source: Author's elaboration

With the aim of eliminating the potential outliers, the dependent variables ROA, ROE and ROI and the control variables *LnRevenues* and *Leverage* have been winsorized at the 1st and 99th percentile, as in the previous model. The standard errors of the regression's coefficients are, also in this case, robust, avoiding in this way biased statistical inferences.

Table 2.10 presents the results of the regression model for the four cases above described with ROA as indicator of performance, showing the specifications with time and geographical fixed effects and with all the control variables. Case 1 analysis is carried out over the total sample of 107,112 companies, of which 1,462 belonging to a district agglomeration and 105,650 belonging to a non-district territory. The analysis for cases 2, 3 and 4, on the other hand, are performed over reduced samples of companies. In particular, in case 2 the analysis is carried out over a sample of 81,369 companies, of which 1,462 belonging to a district agglomeration and 79,907 belonging to a non-district Local Market Area; in case 3 the analysis is implemented over a sample of 105,650 companies, of which 25,743 belonging to a district Local Market

Area, but not included inside the industrial district, and 79,907 belonging to a non-district Local Market Area; in case 4, lastly, the analysis is performed over a sample of 27,205 companies, of which 1,462 belonging to a district agglomeration and 25,743 belonging to a district Local Market Area, but not included in the industrial district itself. For this reason, the number of observations over which each regression model has been implemented is different considering each different case. Anyway, each company has been observed six times, which correspond to three years before the year of removal of the criminal company and to three years after.

As can be noted, the coefficient β_3 is always positive and statistically significant at 1% level in each case considered.

The regression model of case 1 highlights how the performance of firms remarkably improves when the criminal company is removed from its Local Market Area of reference and when we move from a non-district territory to a district agglomeration. In particular, by combining organized crime and industrial districts, ROA increases approximately of 1.28%. With reference to the coefficients β_1 and β_2, associated respectively to the variables *Treated* and *Post*, the same comments already developed for the previous model could be reported, changing of course the territorial unit of investigation.

In case 2, ROA increases of 1.34% in the three years after the removal of the criminal company and by moving from a non-district Local Market Area to an industrial district. As expected, the coefficient of *Treated*Post* is higher with respect to the situation in case 1, since the comparison is made between two extremes: industrial districts and non-district Local Market Areas, excluding companies belonging to a district Local Market Area but not included in an industrial district. As a matter of fact, as already stated, the positive spillovers generated by industrial districts in terms of favourable institutional environment and social capital are supposed to be extended, to a lesser extent, also to district Local Market Areas not belonging to the industrial district, but not to non-district Local Market Areas.

In case 3, ROA increases of 0.44%, meaning that the firms' performance, when the criminal company is removed from its specific Local Market Area of reference, improves when moving from a non-district Local Market Area to a district Local Market Area, even if outside the industrial district territory. As expected, this coefficient is lower with respect to case 2 and 1, since here the regression is implemented over a sample which does not include firms belonging to an industrial district, eliminating in this way all the positive spillovers that district agglomerations directly generate. Notwithstanding this fact, the coefficient is still positive and statistically significant, meaning that district Local Market Areas, even if not within the borders

of industrial districts, benefit in some way from the positive and favourable institutional environment which is typical of industrial districts. The positive externalities associated with the industrial district itself are spread in the whole surrounding area, creating a gap with respect to non-district Local Market Areas. The analysis of this case confirms the results obtained in the main analysis of this master's thesis, namely that the performance of district Local Market Areas is better with respect to the one of non-district Local Market Areas, once the criminal company is removed from its territory of reference, underlying the strong relevance and pervasiveness of local institutions, and the precious value of the social capital developed within industrial districts. Consequently, it can be stated that industrial districts generate positive externalities that are directly exploited within the industrial district itself, and of which also companies located outside the district but within the district Local Market Area can take advantage of.

In case 4, ROA increases of 0.99% when the criminal company is removed from the Local Market Area of reference and by moving from a district Local Market Area outside the borders of the industrial district to a district Local Market Area inside the borders of the district itself. Since non-district Local Market Areas are excluded from the sample taken into account, the coefficient are clearly higher with respect to case 3, but are lower with respect to cases 1 and 2.

Variables	Case 1 **ROA (%)**	Case 2 **ROA (%)**	Case 3 **ROA (%)**	Case 4 **ROA (%)**
Treated	-1.247***	1.818	-1.054**	-1.022***
	(0.181)	(1.761)	(0.486)	(0.184)
Post	-0.172*	-0.225*	-0.247**	0.302
	(0.103)	(0.124)	(0.106)	(0.338)
Treated*Post	1.279***	1.339***	0.442***	0.993***
	(0.258)	(0.255)	(0.0874)	(0.264)
LnRevenues	0.805***	0.840***	0.805***	0.718***
	(0.00963)	(0.0116)	(0.00968)	(0.0167)
Leverage	-0.0498***	-0.0468***	-0.0497***	-0.0579***
	(0.00117)	(0.00139)	(0.00118)	(0.00211)
Herfindahl_dummy	-0.0361	-0.0289	-0.0162	-
	(0.265)	(0.266)	(0.265)	-
N. of companies	-8.79e-07	-7.84e-07	-8.76e-07	3.55e-06
	(8.52e-07)	(8.52e-07)	(8.52e-07)	(4.20e-06)
Constant	1.115***	0.854**	1.082***	1.958***
	(0.334)	(0.344)	(0.335)	(0.643)
Geographical fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	432,260	319,013	425,243	120,264
R-squared	0.020	0.021	0.020	0.020

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.10 - Regression analysis for case 1, 2, 3 and 4 with ROA as indicator of performance.

Similar results are obtained considering ROE and ROI as indicators of performance in the regression model.

What can be derived from the main analysis carried out in this research is that, once the criminal company is removed from its Local Market Area of reference, companies located in district Local Market Areas show a better performance in terms of ROA, ROE and ROI in comparison with companies belonging to non-district Local Market Areas. The regression results performed at Local Market Area level are confirmed by the analysis conducted at company level, even if the effect is not uniformly distributed. As expected, the positive externalities associated with industrial districts are strongly present within the industrial district territory, but are diffused, even if to a lesser extent, also in all the surrounding district Local Market Area, whose companies can boast better performance results with respect to the ones of non-district Local Market Areas. This result strongly supports the line of research which emphasises the relevance, the pervasiveness and the power of local institutions in shaping behaviours, relationships and choices, influencing the way of thinking and acting of individuals, families and enterprises. The consequences of a favourable and beneficial business environment are visible in all the aspects of the economy, including the better performance of the companies that can benefit from it.

2.4.2 The three evolutionary trajectories

As anticipated in the previous chapter, recent studies have claimed how the traditional characteristics of the Marshallian industrial district are gradually vanishing, weakening the advantages of the geographical proximity and profitability typical of the companies belonging to industrial districts. The factors responsible of this negative trend are identified with the phenomenon of globalization, the impact of the economic and financial crisis of 2008, the effect of immigration, the generational turnover discontinuity, the increasing industry heterogeneity and diversification, the introduction of new production and data technologies and the extensive diffusion of service industries.

A framework used to document the heterogeneous landscape which describes industrial districts today was developed by De marchi, Gereffi and Grandinetti (2018), which identified three potential evolutionary trajectories of industrial districts: decline, hierarchization and resilience, defined on the basis of the reduction of district firms' population, the increase of resource concentration and the reduction of the ability of industrial districts to produce value. They are briefly defined as follows (De Marchi, Gereffi and Grandinetti, 2018):

	Decline	**Hierarchization**	**Resilience**
Reduction of district firms' population	High	High	Moderate
Increase of resource concentration	Moderate	High	Moderate
Reduction of district value generation	High	Negligible	Negligible

I implemented a regression analysis at company level in order to verify whether the combined effect of organized crime and industrial districts above described is different considering only districts belonging to one of the three trajectories with respect to the whole sample of companies.

First of all, I identified districts in decline, hierarchization and resilience within my sample of 107,112 companies, taking into consideration only two variables of the three above mentioned in order to simplify the analysis: the reduction of district firms' population and the increase of resource concentration. In order to calculate the variation of firms' population, I proceeded at Local Market Area level, looking at the percentage difference in the number of companies in district Local Market Areas of 2011 and in district Local Market Areas of 2001, to be used as a proxy in order to classify the trajectory of a specific district. I eliminated all the district Local Market Areas which presented an increase in number of companies, keeping only the ones with

a reduction of them. Indeed, the number of district Local Market Areas decreased of 72 units between 2001 and 2011, mainly due to an effect of enlargement of their average size, both in terms of number of municipalities and in terms of resident population (ISTAT, 2014). This represents the main limitation of considering the variation of companies looking at district Local Market Areas, since this variation is not only due to a mere increase or decrease in the number of companies, but is affected also by a variation in the average dimension of the Local Market Areas themselves. As far as the increase of resource concentration is concerned, I made reference to the Herfindahl-Hirschman concentration index on turnover (HHI), an indicator of the degree of competition between companies and of the market concentration within a specific industry, calculated as the sum of the squared turnover of each company over the total turnover of the Local Market Area of reference. The higher the index, the higher the concentration of revenues in few enterprises and the lower the competitiveness among firms within a specific industry (in this case Local Market Area). Its value ranges from 0 to 1, and generally the following thresholds identify the degree of competitiveness of an industry:

- If the HHI index is lower than 0.15, the marketplace is really competitive;
- If the HHI index is comprised between 0.15 and 0.25, the marketplace is moderately concentrated;
- If the HHI index is higher than 0.25, the marketplace is highly concentrated.

In order to identify districts in decline, hierarchization and resilience, I decided to apply the following thresholds to the two variables above explained (so far no one has applied any kind of threshold, only cases have been analysed), on the basis of the data that I had at disposal:

- Districts in decline: industrial districts which presented a reduction in the number of companies higher or equal to 25% (high reduction of district firms' population) and an HHI lower than 18% (moderate increase of resource concentration);
- Districts in hierarchization: industrial districts which presented a reduction in the number of companies higher or equal to 25% (high reduction of district firms' population) and an HHI higher than 18% (high increase of resource concentration);
- Districts in resilience: industrial districts which presented a reduction in the number of companies lower than 20% (moderate reduction of district firms' population) and an HHI lower than 18% (moderate increase of resource concentration).

Considering my restricted sample of 107,112 companies, where all the conditions and limitations above described have been applied, I obtained a sample made of 106,950 companies belonging to a territory not classified as industrial districts in one of three trajectories, 131

companies belonging to an industrial district in decline, 0 companies belonging to industrial districts in hierarchization and 31 companies belonging to an industrial district in resilience. Therefore, 162 companies could be classified as companies belonging to an industrial district in one of three trajectories, distributed in a total of 3 Local Market Areas:

- Local Market Area 309 Morbegno (Lombardia, mechanical industry): industrial district in resilience, composed of 31 companies. Moderate reduction of district firms' population: - 16%. Moderate increase of resource concentration: [4.2% - 16.8%];
- Local Market Area 529 Pieve di Soligo (Veneto, household goods): industrial district in decline, composed of 78 companies. High reduction in the number of companies: - 55%. Moderate increase of resource concentration: [4.2% - 10.3%];
- Local Market Area 535 San Donà di Piave (Veneto, mechanical industry): industrial district in decline, composed of 53 companies. High reduction in the number of companies: - 73%. Moderate increase of resource concentration: [2% - 5%].

As already underlined, it is not possible to carry out the regression analysis for the hierarchization, since, in my restricted sample, any company satisfied the conditions to identify this specific trajectory. Therefore, it is only possible to compare the interaction coefficients obtained regarding the decline and resilience trajectories.

Once identified the two districts in decline and the district in resilience, I performed a regression analysis in order to verify whether and how, once the criminal company is removed from its specific Local Market Area, the firms' performance in terms of ROA, ROE and ROI is different when moving from a non-district territory to a district agglomeration classified as decline or resilience.

Firstly, I implemented a regression model considering districts in decline, structured as follows (firm and year subscripts are omitted):

$$Performance = \beta_0 + \beta_1\, District + \beta_2\, Post + \beta_3\, District*Post + \beta_4\, Decline + \beta_5\, District*Post*Decline + \sum Controls + \sum Year\ fixed\ effects + \sum Geographical\ \ fixed\ effects + \varepsilon \quad (3)$$

In the above described model, where the unit of observation is represented by each single company, the meaning of each single variable is the following:

- *Performance* is represented, in three different regression models, by ROA, ROE and ROI, as in the previous models implemented;

- *District* is a dummy variable which assumes value 1 for the companies belonging to an industrial district in a criminal Local Market Area and value 0 for the companies not belonging to an industrial district in a criminal Local Market Area;
- *Post* is a dummy variable which takes value 1 for the 3 years that follow the police operation of removal of the criminal company, and value 0 for the 3 years which precede it. The exact year of removal of the criminal company is eliminated from the sample in order to precisely identify the pre-and-post effect of the operation;
- *District*Post* represents the interaction term and provides an answer about whether and how the performance of the companies considered changes once the criminal company is removed and by distinguishing between districts and non-districts;
- *Decline* is a dummy variable which assumes value 1 for the companies belonging to an industrial district which satisfies the conditions above described in terms of reduction of number of companies and Herfindahl index in order to be classified as such, and value 0 otherwise;
- *District*Post*Decline* represents the interaction term which tests my research hypothesis, giving a response about whether and how the combined effect of organized crime and industrial districts as delineated by *District*Post* is different when moving from a non-district territory to an industrial district classified as decline;
- ∑ *Controls* represents a vector of variables of control, including the *Number* of companies in each Local Market Area; *LnRevenues,* calculated as the log transformation of the revenues for each company; *Leverage,* calculated as the debt over equity ratio in order to consider the average capital structure of each company and *Herfindahl_dummy*, a dummy variable representing the level of competitiveness in a specific industry considering the average degree of concentration of the revenues for each Local Market Area (this dummy takes value 1 if the Herfindahl-Hirschman concentration index is higher than 0.18, otherwise it assumes value 0);
- ∑ *Year fixed effects*, a dummy variable introduced in order to control for the common macroeconomic shocks in different time periods;
- ∑ *Geographical fixed effects* (at Local Market Area level), introduced in order to control for all the fixed, specific and unobservable characteristics of each Local Market Area which could corrupt the final estimations.

In order to eliminate the potential outliers, the dependent variables ROA, ROE and ROI and the control variables *LnRevenues* and *Leverage* have been winsorized at the 1st and 99th percentile. The standard errors of the regression's coefficients are robust to heteroskedasticity.

The number of observations over which each regression model has been implemented is different considering different dependent variables (ROA, ROE and ROI) and different control variables, because of the presence of missing values for certain variables in specific years. This choice has been taken in order to maximise the size of the sample. In any case, each company has been observed six times, which correspond to three years before the year of removal of the criminal company and to three years after.

Table 2.11 presents the regression results considering ROA, ROE and ROI as indicators of performance (calculated, respectively, over a total number of 432,260, 400,769 and 348,967 observations), in their specification with all the control variables, geographical fixed effects and year fixed effects. As can be noted by looking at β_3 coefficient, there is a positive effect in terms of firms' performance when the criminal company is removed from its Local Market Area of reference and when we move from a non-district territory to a district agglomeration, but this effect is not different, except in the case of ROI, when moving from a non-district territory to a district classified as decline. As a matter of fact, considering ROA and ROE, β_5 is negative and not statistically significant, so it is not possible to derive any conclusion from this result. In the case of ROI, on the contrary, the effect is very different when considering an industrial district in decline: once the criminal company is removed from its Local Market Area of reference, the ROI increases of 1.53% by moving from a non-district territory to a district agglomeration, but when we move from a non-district territory to an industrial district in decline, ROI decreases of 1.8% at 5% level of significance. Clearly, these results are negatively affected by the low number of observations included in the decline configuration of industrial districts, potentially undermining the validity and the relevance of the hypothesis tested. What can be derived from this analysis is that there is evidence, even if weak, that the effect delineated by β_3 coefficient is lower considering districts in decline, and this is consistent with the theory above explained.

Variables	(1) **ROA (%)**	(2) **ROE (%)**	(3) **ROI (%)**
District	-1.153***	-3.713***	-0.436**
	(0.193)	(0.506)	(0.200)
Post	-0.172*	-0.256	-0.0802
	(0.103)	(0.242)	(0.0912)
District*Post	1.375***	4.371***	1.527***
	(0.274)	(0.667)	(0.273)
Decline	-1.121**	-2.326	-1.368**
	(0.531)	(1.566)	(0.580)
District*Post*Decline	-0.848	-3.501	-1.808**
	(0.767)	(2.157)	(0.823)
LnRevenues	0.805***	1.865***	1.003***
	(0.00963)	(0.0215)	(0.00777)
Leverage	-0.0498***	-0.429***	-0.0545***
	(0.00117)	(0.00997)	(0.00118)
Herfindahl_dummy	-0.0362	0.00487	-0.00405
	(0.265)	(0.636)	(0.247)
N. of companies	-8.78e-07	2.42e-06	7.92e-07
	(8.52e-07)	(2.03e-06)	(7.77e-07)
Constant	1.114***	-1.696**	1.143***
	(0.334)	(0.799)	(0.299)
Geographical fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Observations	432,260	400,769	348,967
R-squared	0.020	0.032	0.045

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.11 - Regression analysis for Decline with ROA, ROE and ROI as indicators of performance.

Secondly, I implemented a regression model considering districts in resilience (at company level), structured as follows (firm and year subscripts are omitted):

$$Performance = \beta_0 + \beta_1\, District + \beta_2\, Post + \beta_3\, District*Post + \beta_4\, Resilience + \beta_5\, District*Post*Resilience + \sum Controls + \sum Year\ fixed\ effects + \sum Geographical\ fixed\ effects + \varepsilon \quad (4)$$

The meaning of the single variables of the above described model is exactly the same of the model considering districts in decline, with the exception of:

- *Resilience* is a dummy variable which assumes value 1 for the companies belonging to an industrial district which satisfy the conditions above described in terms of reduction of number of companies and Herfindahl index in order to be classified as such, and value 0 otherwise;
- *District*Post*Resilience* represents the second interaction term, which tests my research hypothesis, giving a response about whether and how the combined effect of

organized crime and industrial districts as delineated by *District*Post* is different when moving from a non-district territory to an industrial district classified as resilience.

Comments regarding winsorized variables and standard errors of the regression's coefficients are valid also in this case, as well comments concerning the number of observations over which the regression model has been implemented.

Table 2.12 presents the regression results considering ROA, ROE and ROI as indicators of performance (calculated, respectively, over a total number of 432,260, 400,769 and 348,967 observations), in their specification with all the control variables, geographical fixed effects and year fixed effects. As can be understood by looking at β_3 coefficient, there is a positive effect in terms of firms' performance when the criminal company is removed from its Local Market Area of reference and when we move from a non-district territory to a district agglomeration, but this effect is not different, except in the case of ROE, when moving from a non-district territory to a district classified as resilience. Indeed, the coefficient β_5 is always positive but not statistically significant considering ROA and ROI, so any insight can be derived from these results. Looking at ROE, on the other hand, β_5 is positive and statistically significant at 10% level of significance, meaning that, once the criminal company is removed from its Local Market Area of reference, ROE improves by 3.86% when moving from a non-district agglomeration to a district configuration, and it improves even more (6.84%) when moving from a non-district agglomeration to an industrial district classified as resilience. Also considering districts in resilience as in the case of districts in decline, the regression results obtained could be undermined by the low number of observations composing the resilience configuration of industrial districts, compromising the validity and the robustness of the hypothesis tested. Anyway, consistently with the theory, there is evidence, even if weak, that the effect delineated by β_3 coefficient is stronger considering districts in resilience, which show a better performance with respect to the other areas once cleaned by criminal companies.

Variables	(1) **ROA (%)**	(2) **ROE (%)**	(3) **ROI (%)**
District	-1.188***	-3.771***	-0.522***
	(0.183)	(0.485)	(0.190)
Post	-0.172*	-0.256	-0.0802
	(0.103)	(0.242)	(0.0912)
District*Post	1.266***	3.858***	1.303***
	(0.260)	(0.644)	(0.262)
Resilience	-2.747**	-6.738**	-1.318
	(1.258)	(3.328)	(1.262)
District*Post*Resilience	0.876	6.843*	1.518
	(1.773)	(3.999)	(1.630)
LnRevenues	0.805***	1.865***	1.002***
	(0.00963)	(0.0215)	(0.00777)
Leverage	-0.0498***	-0.429***	-0.0545***
	(0.00117)	(0.00997)	(0.00118)
Herfindahl_dummy	-0.0361	0.00554	-0.00384
	(0.265)	(0.636)	(0.247)
N. of companies	-8.79e-07	2.42e-06	7.91e-07
	(8.52e-07)	(2.03e-06)	(7.77e-07)
Constant	1.115***	-1.696**	1.144***
	(0.334)	(0.799)	(0.299)
Geographical fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Observations	432,260	400,769	348,967
R-squared	0.020	0.032	0.045

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.12 - Regression analysis for Resilience with ROA, ROE and ROI as indicators of performance.

Considering only the cases in which it is possible to derive some conclusions (ROI in the case of industrial districts in decline and ROE in the case of industrial districts in resilience), it is important to notice how these results are strongly coherent with the third variable which defines the three trajectories (not included in this empirical analysis): the reduction of district value generation, high for industrial districts in decline and negligible for industrial districts in resilience. As a matter of fact, it is possible to verify that the performance in terms of ROI, once the criminal company is removed, decreases substantially when moving to an industrial district in decline, whereas the performance in terms of ROE, under the same conditions, increases remarkably when moving to an industrial district in resilience.

2.4.3 The geographical dimension

As anticipated in the previous chapter, the majority of industrial districts is located in the North-Eastern Italy, confirming this territorial area as the traditional reference point for the Italian district model (ISTAT, 2015a). As a matter of fact, as shown in Table 2.13, in the Italian North-eastern regions (Trentino-Alto Adige, Veneto, Friuli-Venezia Giulia and Emilia-Romagna), there are 45 district Local Market Areas, in the North-west (Piedmont, Valle d'Aosta, Lombardy and Liguria) there are 37 district LMA, in the Central regions (Tuscany, Umbria, Marche and Lazio) 38 district LMA, in the South 17 district LMA, and finally in the islands, but only in Sardinia, there are 4 district LMA (ISTAT, 2015b).

Geographical Area	**Number of district Local Market Areas**
North-eastern regions	45
North-western regions	37
Central regions	38
Southern regions	17
Islands	4
Total	**141**

Table 2.13 - Geographical distribution of district Local Market Areas. Source: authors' elaboration.

As a matter of fact, historically, North-east developed in a very different way in comparison with North-west from an industrial and organizational point of view (Bianchi, 2009, p. 199-202): on one hand, in North-western Italy (the so called First Italy) large enterprises operating in technologically advanced and capital-intensive sectors developed; on the other hand, in North-eastern Italy (the so called Third Italy) small and medium enterprises operating in mature and labour-intensive sectors emerged, often grouped around the same productive specialization. For this reason, industrial districts found in North-eastern regions a breeding ground to grow and develop, giving rise to an industrial and organizational system able to challenge the success of large enterprises.

Considering these factors, I implemented a regression analysis at company level in order to verify whether the combined effect of organized crime and industrial districts described in the previous sections is different considering only North-eastern regions, with the aim of testing whether, once the criminal firm is removed from its specific Local Market Area, the firms'

performance in terms of ROA, ROE and ROI changes when moving from non-district territories to district agglomerations, distinguishing between North-east and the remaining part of the sample (North-west and Centre of Italy). Clearly, once the criminal firm is removed, the expectation is to obtain a higher firms' performance when considering districts belonging to North-eastern regions in comparison to the one of the others, because of the territorial characteristics of this geographical area and the peculiar features of industrial districts which developed therein.

First of all, I classified each company of my sample of 107,112 companies in North-east, North-west and Centre of Italy, on the basis of their region's ISTAT codes, as can be seen in Table 2.14. The total number of companies belonging to North-east is 45,895 and the remaining part of the sample includes 61,217 companies.

Geographical area	Region	ISTAT code	N. of companies
North-east	Veneto	05	25,190
	Friuli Venezia Giulia	06	3,602
	Emilia Romagna	08	16,924
	Trentino Alto Adige	04	179
North-west	Liguria	07	1,125
	Lombardia	03	7,583
	Piemonte	01	4,307
	Valle d'Aosta	02	518
Centre	Lazio	12	43,469
	Marche	11	0
	Toscana	09	2,858
	Umbria	10	1,357
Total			**107,112**

Table 2.14 - Sample of companies belonging to North-eastern regions, North-western regions and Central regions of Italy.

Once identified all the companies belonging to the North-east of Italy, I performed the regression analysis which allowed me to verify the above described research hypothesis, namely whether and how, once the criminal company is removed from its specific Local Market Area, the firms' performance in terms of ROA, ROE and ROI is different when moving from a non-district territory to a district agglomeration belonging to the North-east of Italy.

The regression model implemented is structured as follows (firm and year subscripts are omitted):

$$Performance = \beta_0 + \beta_1\, District + \beta_2\, Post + \beta_3\, District*Post + \beta_4\, Northeast + \beta_5\, District*Post*Northeast + \beta_6\, District*Northeast + \beta_7\, Post*Northeast + \sum Controls + \sum Year\ fixed\ effects + \sum Geographical\ fixed\ effects + \varepsilon \quad (5)$$

In the above described model, where the unit of observation is represented by each single company, the meaning of each single variable is exactly the one described in the model delineated for the evolutionary trajectories, with the exception of:

- *Northeast* is a dummy variable which assumes value 1 for the companies belonging to North-eastern regions (Veneto, Friuli Venezia Giulia, Emilia Romagna and Trentino Alto Adige) in criminal Local Market Areas, and value 0 for the companies belonging to North-western and Central regions in criminal Local Market Areas;
- *District*Post*Northeast* represents the second interaction term, which tests my research hypothesis, providing an answer about whether and how the combined effect of organized crime and industrial districts as delineated by *District*Post* is different when moving from a non-district territory to an industrial district located in a North-eastern region of Italy;
- *District*Northeast*, a third interaction term which relates the dummy variable *District* with the dummy variable *Northeast;*
- *Post*Northeast,* an interaction term which relates the dummy variable *Post* with the dummy variable *Northeast.*

Also in this case, considerations regarding winsorized variables and standard errors are specular to those of the previous analysis, allowing respectively to eliminate potential outliers and to avoid biased statistical inferences and inappropriate t-statistics and F-statistics, as well comments concerning the number of observations over which the regression model has been implemented.

Table 2.15 presents the regression results considering ROA, ROE and ROI as indicators of performance, in their specification with all the control variables, geographical fixed effects and year fixed effects. As can be derived by looking at β_3 coefficient *District*Post*, there is a positive effect in terms of firms' performance when the criminal company is removed from its Local Market Area of reference and when we move from a non-district territory to a district agglomeration, but this effect, considering ROA and ROE, is not different when moving from a non-district territory to a district located in a North-eastern region, since the coefficient β_5 is

not statistically significant, not allowing to derive any insight from the results. Looking at ROI, on the other hand, β_5 is negative and statistically significant at 1%, meaning that, once the criminal company is removed from its Local Market Area of reference, ROI decreases of 1.67% when moving from a non-district territory to an industrial district located in a North-eastern region. This could be due to the fact that, as can be noted by looking at the coefficient *District*Northeast*, the positive effect produced by industrial districts in the North-east is so strong that it is able to mitigate to a greater extent the negative impact generated by organized crime, provoking in this way a weaker positive effect arising from the removal of the criminal company. Anyway, these results are weak and not homogeneous, not allowing to derive any significant conclusion. Another plausible explanation of the results obtained could lie into the fact that the sample of companies taken into account does not represent the real distribution of companies through the regions of North-east, North-west and Centre of Italy, since a lot of restrictions and conditions have been applied on the initial sample of firms in order to obtain only the companies with the specific characteristics that were suitable for carrying out my empirical investigation. Consequently, the regression results in this particular specification could be in some way undermined, providing different outcomes from the ones expected. The regression model has been implemented over a total of 432,260 observations in the case of ROA, 400,769 observations in the case of ROE and 348,967 observations in the case of ROI, different because of the presence of missing values for both dependent variables and control variables.

Variables	(1) **ROA (%)**	(2) **ROE (%)**	(3) **ROI (%)**
District	-2.704***	-7.849***	-2.590***
	(0.396)	(1.035)	(0.416)
Post	-0.488***	-1.101***	-0.357***
	(0.111)	(0.258)	(0.0972)
District*Post	1.633***	5.444***	2.573***
	(0.556)	(1.373)	(0.554)
Northeast	-1.220***	-2.490*	-2.397***
	(0.473)	(1.275)	(0.437)
District*Post*Northeast	-0.618	-2.265	-1.664***
	(0.628)	(1.550)	(0.627)
District*Northeast	1.830***	4.953***	2.535***
	(0.444)	(1.166)	(0.466)
Post*Northeast	0.706***	1.876***	0.622***
	(0.0863)	(0.203)	(0.0758)
LnRevenues	0.805***	1.864***	1.003***
	(0.00963)	(0.0215)	(0.00777)
Leverage	-0.0497***	-0.428***	-0.0545***
	(0.00117)	(0.00997)	(0.00118)
Herfindahl_dummy	-0.0425	-0.0177	-0.0121
	(0.265)	(0.636)	(0.246)
N. of companies	-8.85e-07	2.39e-06	7.91e-07
	(8.52e-07)	(2.03e-06)	(7.76e-07)
Constant	1.286***	-1.235	1.302***
	(0.335)	(0.801)	(0.299)
Geographical fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Observations	432,260	400,769	348,967
R-squared	0.020	0.032	0.045

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2.15 - Regression analysis for North-east with ROA, ROE and ROI as indicators of performance.

Conclusions

The main objective of this master's thesis was the one of combining two relevant lines of research, organized crime and industrial districts' literature, which have been deeply studied in all their facets separately, but never in combination, except for some recent literature provided by Ganau and Rodríguez-Pose (2018). On one hand, organized crime is usually associated with negative externalities, producing adverse consequences both for the socio-economic and institutional environment, and for firms' performance and efficiency, affecting their productivity, profitability, investments and access to credit. On the other hand, industrial districts are usually connected to positive externalities, thanks to their particular territorial and sectoral configuration, their network of relationships among local players, the crucial role attributed to institutions and to the communitarian factor, the division of labour, the high level of specialization and flexibility of workers, the importance attributed to the processes of knowledge creation, innovation and cooperation and their capability to adapt to rapid or unexpected external changes.

Both organized crime and industrial districts, even if in opposite directions, strongly affect the institutional environment in which they are located, influencing the actions and the behaviour of individuals and families, and the economic outcomes of enterprises operating in the contaminated area. Even though these two lines of research could be considered, rightly, very far apart from each other considering their distinctive characteristics and their effects on the surrounding environment, by studying them deeply it is possible to highlight their common features, which manifest themselves in their strong and pervasive impact on the social and institutional scenario and the crucial role which they attribute to the so-called social capital.

For this reason, this thesis was addressed to put together, from an empirical point of view, these two topics, trying to verify whether the negative externalities associated with organized crime could be in some way mitigated by the positive spillovers associated with industrial districts, which are supposed to be present beyond the districts' borders, embracing the whole Local Market Area where the industrial district is located. In order to reach this purpose, I made use of a sample of 107,112 companies located in a criminal Local Market Area in the Northern and Central regions of Italy observed from 2008 to 2017 and, by exploiting the year of removal of the criminal companies from their Local Market Area of reference, I implemented a multiple regression model at Local Market Area level structured in a very similar way to a difference-

in-difference statistical approach, with geographical and year fixed effects. From the results, it was possible to observe that, once the criminal company was removed from its Local Market Area of reference, the firms' performance in terms of ROA, ROE and ROI improved when moving from a non-district Local Market Area to a district Local Market Area. The same analysis was replicated using the company as unit of observation, analysing it in different aggregates with the aim of understanding whether the combined effect of organized crime and industrial districts was confirmed. The results emerging from these additional investigations corroborated the results of the main analysis, even though the effect was not uniformly distributed. Indeed, as expected, the removal of the criminal company was highly beneficial within the borders of the industrial district territory, that is the area where the traditional district positive externalities arose and developed. Notwithstanding this, they were diffused, even if to a lesser extent, also in all the surrounding district Local Market Area, whose companies could boast better performance results with respect to the ones of non-district Local Market Areas.

These results underline and confirm the relevance, the pervasiveness and the power of local institutions in shaping behaviours, relationships and choices, influencing the way of thinking and acting of individuals, families and enterprises. The role played by social capital, one of the most distinctive characteristics of industrial districts, could be considered the main driver in explaining and justifying the findings obtained. On one hand, since it acts as an amplifier of the effect produced by organized crime, it could facilitate the establishment ex ante of criminal companies in industrial districts, provoking larger damages and a consequent more pervasive and stronger effect in district territories after the removal of the criminal company. On the other hand, social capital allows, once the criminal company is definitively removed, to recover more quickly the negative impact generated by organized crime, accelerating the process of value creation and growth. Consequently, it can be stated that social capital plays a twofold role in connecting the phenomena of organized crime and industrial districts, encouraging the infiltration of criminal companies in district territories - and causing in this way a stronger impact after their removal - and helping the district area to recover after their elimination.

Secondly, since industrial districts experienced important changes in the last 15 years, potentially undermining their traditional Marshallian features, I identified, within my sample of companies, districts in decline, hierarchization and resilience in order to perform a regression analysis aimed at verifying whether, once the criminal company was removed from its specific Local Market Area, the firms' performance was different considering only districts belonging to one of the three trajectories delineated. Unfortunately, the regression model for the hierarchization trajectory could not be carried out for lack of observations, and the regression

models for districts in decline and in resilience, probably due to the low number of observations included in their configuration, did not provide significant results, with the exception of ROI for decline districts and ROE for resilience districts, respectively showing, when the criminal company was removed from its Local Market Area, a lower performance with respect to the whole sample and a higher performance. The third variable used in order to delineate the three evolutionary trajectories of districts, that is the reduction of district value generation (not included in this analysis for sake of simplicity) was totally consistent with these findings, since it was set high for industrial districts in decline and negligible for industrial districts in resilience.

Lastly, considering that industrial districts grew and developed mainly in the North-eastern regions of Italy, I decided to ascertain whether, once the criminal company was removed from its specific Local Market Area, the firms' performance in terms of ROA, ROE and ROI was different considering only districts belonging to this particular geographical area with respect to the whole remaining sample. Also in this case, unfortunately, the regression results were not significant considering ROA and ROE, not allowing to derive any conclusion from the outcomes obtained. With reference to ROI, on the other hand, once the criminal company was removed from its Local Market Area of reference, It decreased when moving from a non-district territory to an industrial district located in a North-eastern region. This result could be due to the fact that the positive effect produced by industrial districts in the North-east was so strong that it was able to mitigate to a greater extent the negative impact generated by organized crime, provoking in this way a weaker positive effect arising from the removal of the criminal company. Anyway, these results are weak and not homogeneous, not allowing to derive any significant conclusion. Moreover, another plausible explanation of this result could lie into the fact that the sample of companies taken into account does not represent the real distribution of companies through the regions of North-east, North-west and Centre of Italy, since a lot of restrictions and conditions have been applied on the initial sample of firms, providing in this way different outcomes from the ones expected.

By concluding, it is possible to state that the presence of organized crime produces negative effects on the socio-economic environment and on the economic outcomes of firms, and the benefits which arise from the removal of a criminal company are strongly higher in industrial districts and, more in general, in district Local Market Areas with respect to non-district ones.

A possible limitation of this research is identified with the fact that Local Market Areas, used as units of observations in the main analysis, are vast territorial aggregates very different from one another for several reasons other than the district or non-district specification. In the

regression analysis carried out at company level, on the other hand, only industrial districts were precisely defined on the basis of the territorial and industry dimensions, whereas the other control groups considered in the additional analysis were defined in a residual way, making uncertain the frame of reference used in the regression and not easily interpretable the results finally obtained. Moreover, since industrial districts are principally made of small and medium-sized enterprises, the fact that the analysis has been carried out over a sample made only of limited liability companies, ignoring partnerships because of lack of data, represents a strong limitation which should be in some way addressed, allowing to obtain a sample properly representative of the phenomenon object of the study.

Consequently, the continuation of this research could consist in replicating the analysis with a better definition of the control group of companies, defining their sector, their territorial localization, their profitability, their relationships with local institutions, and other reference parameters useful in delineating the main features of these firms.

A further investigation to be carried out on this topic, instead, could consist in adopting a different starting database of criminal companies in order to verify whether the results obtained in this research could be confirmed also in the presence of other data.

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