



UNIVERSITÀ DEGLI STUDI DI PADOVA
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“M. FANNO”
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**THE ECONOMIC CONSEQUENCES OF CRIMINAL
ORGANIZATIONS IN ITALY: AN EMPIRICAL ANALYSIS
OF THEIR INTERACTION WITH INDUSTRIAL DISTRICTS**

RELATORE:
CH.MO PROF. Fabrizi Michele

LAUREANDA:
Sala Francesca
MATRICOLA N. 1155334

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INTRODUCTION

This thesis aims to contribute to the literature of industrial districts, through an investigation of their interaction with organized crime in Italy: in this sense, it provides empirical evidence of the role played by district areas in the process of recovery of non-criminal firms operating in an area which, for a period, has been characterized by the presence of mafia.

The idea comes from the awareness that both industrial district and mafia criminal organizations do have an impact on the economy of our country, and that they share some features, such as the attachment to the territory, and the strong network of relations which is at the basis of their survival and development.

To properly conduct the empirical analysis and interpret the results obtained, it was first necessary to deeply explore both these phenomena.

Chapter 1 provides a literature review about mafia organized crime and the industrial district model. First, the phenomenon of mafia is analyzed: its origins and characteristics are explored together with its expansion and its impact on the economy and on the performance of the companies operating in the surrounding area. Secondly, the industrial district as an organization model is presented: the theory behind the concept of industrial district, its characteristics and its influence on the performance of companies but also the recent changes and the current situation of industrial districts in Italy (as depicted by the Census of 2011 provided by Istat) are illustrated. Chapter 1 ends with the research question of this thesis; the idea is to study if and to what extent district areas represent a more favorable context in the recovery of non-criminal companies, after the removal of a criminal firm in the area where they operate rather than non-district areas.

In chapter 2, the methodology is presented. This chapter starts with the illustration of the two samples used: one sample is made of criminal firms to assess the presence of mafia and the other one is composed of non-criminal companies operating in those areas. Then the regression model is displayed; a description of the variables of the model is provided, together with the assumptions and justifications of the model. Lastly, chapter 2 presents the empirical results of the analyses conducted.

The thesis ends drawing conclusions about the analyses carried out; moreover, some limitations of the analyses are highlighted along with some recommendations for future work.

1. MAFIA AND INDUSTRIAL DISTRICTS: A LITERATURE REVIEW

1.1. MAFIA

1.1.1. MAFIA AS PART OF THE HISTORY OF ITALY

The history of mafia is a history made of close relations with social, economic and political powers; this is the reason why it is still nowadays an important player in the society.

Having its origins at the beginning of XIX century, during the Kingdom of the two Sicilies, mafia consolidated its power during the unification of Italy (1861).

In fact, in order to obtain the support of South Italy's landowners, the newly formed national government not only unofficially recognized and legitimized mafia, which guaranteed private protection to landowners, but it also made mafia an influent actor in the political national equilibrium of Italy from its birth (Sales 2015).

It is unrealistic considering the criminal phenomenon of mafia as a local issue, due to a specific mentality and culture; if mafia was reduced to an anthropological phenomenon it could have been faced and solved for a long time (Sales 2015).

In reality, the success of mafia is due to both internal and external factors, as mafia is capable to adapt its model to different times and to different political, economic and social frameworks, creating persistent relations with institutions and members of the society (Sciarrone 2009).

Without close relations with the external world, the history of mafia couldn't have lasted for more than 200 years and it is thanks to the permeability of territories that mafia can expand in areas far from those in which it originated, both at a national level – through the expansion in the North of Italy – and at an international level (Sales 2015).

Along time, mafia has also proved to be a solver of conflicts and it has been able to coexist with the legal system, without proposing itself as an opponent to it, and to cooperate with institutions.

In 1989, after an attempt to his life, the judge Giovanni Falcone affirmed his concern about the bond between political and criminal interests; he furthermore pointed out the need to know his political enemies to protect himself from mafia. From the words of the judge, who would be killed by mafia in 1992, it is clear how mafia succeeded – and still succeeds – to merge with official institutions.

For the purpose of this study, it is essential to get to the heart of the reason why this phenomenon exists, that is the profit. General Dalla Chiesa, who was murdered by mafia in 1982, defined a mobster as “a person who makes money off to have prestige he can benefit from in every sector and a person who makes money off is also ready to kill”¹.

¹ From the last interview made by Enzo Biagi to Generale Dalla Chiesa in 1981.

Indeed, this is the real essence of mafia: using violence as an economic power and making this economic power a factor able to influence the economic development (Sales 2015).

It is the power that gives wealthy and the whole capitalization process of mafia is based on violence; there is no mafia if not linked to money or economic activities but at the same time what distinguishes mafia from other criminal groups is the pursuit of power (Sciarrone and Storti 2014).

Mafia has two levels of organization: the former deals with the control of the territory, achieved becoming the monopolist in the industry of protection – the so called *power syndicate*, while the latter deals with the control of the illicit traffic – the so called *enterprise syndicate*; indeed, mafia criminal organizations not only aim at a financial gain but they also propose themselves as a factor of social transformation (Dalla Chiesa in Lodetti 2018).

The power syndicate involves all the tools used by mafia to exercise its political authority on a limited area: the money collected through extortions, threats and violence by mafia is perceived as a fee due to the criminal organization. The enterprise syndicate is the complex network of economic relations and businesses set by mafia; in this sense, mafia acts as an economic entrepreneur and it has no virtual boundaries (Mete 2010).

It is not a case that the legitimacy of which mafia benefits is an economic legitimacy; for the territories for which the presence of mafia is perceived as given, dealing with mafia (which means mostly paying fees such as ‘pizzo’² to the criminal organization) is something already considered when starting a business, while for new areas of expansion, the interaction with mafia seems to be a way to stay competitive in the market. Indeed, the economic legitimacy is due to the proximity to the business network and to the protection provided by mafia organized groups (Belloni and Vesco 2018).

In fact, although it is generally assumed that mafia has negative externalities on the whole society, it is also proved that the collaboration with mafia is sometimes imposed and sometimes looked for, as it appears to be advantageous for both parties.

The history of mafia is a history of false beliefs and of erroneous expectations; the reality is that mafia lowers the level of trust between actors and towards institutions in the areas where it operates, getting the reputation of being the guarantor of every economic transaction (illegal and legal) (Sciarrone 2009).

An investigation conducted by the journalist Gianluigi Nuzzi in 2013 about Blue Call, a company which was seized by the State due to mafia association and then dissolved, points out how mafia is able to shape people’s mind: during their interviews, the employees of Blue Call

² ‘Pizzo’ is the name of the tax extorted by Cosa Nostra. The name comes from the Sicilian word ‘capizzu’ which literally means ‘bedside’ and it is intended as a place where to find peace and safety.

rationality say that, at least, mobsters were able to guarantee them a job, while the State didn't manage to keep the company alive once mafia was out of the picture. These words reflect the way mafia proposes itself: as a problem solver, whatever the problem is, which is able to provide solutions quickly.

Moreover, mafia appears to be a market regulator as it represents an intermediary able to connect different players; in this way it succeeds in creating horizontal and vertical cooperation regulating the economic activity and it controls the interdependence among actors while keeping them separate (Sciarrone 2009).

Although mafia has been there for a long time, it has been insufficiently investigated until 1980s, when the Parliamentary Commission to Investigate the Mafia Phenomenon in Sicily (created in 1963 but dismissed after two days) was re-established under the name of Parliamentary Commission of inquiry about mafia and other similar associations (Paoli 2004). Since then, every legislation has renewed the Commission; the just established government has approved the law and at the moment Italy is waiting for the composition of the body of inquiry of mafia.

In 1982, the phenomenon of mafia was recognized and specifically addressed by the Italian law for the first time, with the introduction of article 416 bis in the Italian Penal Code; up to that moment, mafia organized crime was considered among the criminal organizations of article 416 of Italian Penal Code. Besides defining what a mafia criminal organization is, which are the crimes linked to it and the corresponding penalties, Article 416 bis also introduces the institute of seizure of assets that is applied to all belongings of a person condemned for mafia crimes.

The introduction of this article was necessary to face mafia with specific tools, along with the creation of some inquiry bodies; in 1980 the Antimafia Pool³, in 1991 the Antimafia Investigative Directorate (DIA) and the National Antimafia Directorate (DNA) were established.

In addition to instruments provided by the State, many members of the civil society promote the antimafia culture; for example, Libera – born in 1995 - is a cartel of associations against mafia which operates all over the territory of Italy, and abroad too, and it is committed in the public and social reuse of seized assets as provided for by the Law 109/96.

The impact of mafia criminal organizations has been recognized both at European level – with the European Union Agency for Law Enforcement Cooperation (Europol) periodically editing reports about organized crime - and at international level; the phenomenon is more than ever articulated and it requires diversified but integrated antimafia policies (Mete 2010).

³ In Italy, the term 'Pool' indicates a group of magistrates working on the same investigation.

In this thesis, the focus is on the economic consequences of mafia criminal organization presence rather than on the actual and possible measures to face the phenomenon; this theme is deeply faced in other researches (Mete 2010). In general, we can affirm that a culture of legality together with a set of rules which aim at making inconvenient to install relations with mafia criminal organization can really help in harming the connective tissue which mafia's spread and strength are made of.

1.1.2. ITALIAN MAFIAS: A SIMILAR BUT VARYING MODEL

The traditional areas where mafia started to operate are Eastern Sicily (Cosa Nostra), Campania (Camorra) and Southern Calabria ('Ndrangheta).

Although in my analysis the criminal firms are not classified depending on the mafia type, I find important to provide a more detailed description of the just mentioned three manifestations of mafia:

- *Cosa Nostra*. Together with Stidda, Cursoti and Landani clans, it makes part of the Sicilian mafia. Cosa Nostra ('Our thing') is the most powerful manifestation of mafia in Sicily: the name of the organization has been revealed by men of honour turned State witnesses during the police operation Pizza Connection (1984-1987) (Europol 2013b). Setting itself from the very beginning as a regulator of social, economic and political power in Sicily, Cosa Nostra continues to consider Sicily as its main area of interest; although it emigrated also to the USA, Cosa Nostra doesn't seem to have a strategy of expansion as other Italian mafias have.

Starting with businesses in alcohol traffic, moving then to drugs traffic, Cosa Nostra now deals with building trade, usury and smuggling. It is a pyramidal organization, where relationships of vertical integration and a relative unitary structure predominate (Sciarrone and Storti 2014).

- *Camorra*. It is the mafia organization born in Campania region, whose action is mainly focused on the economic sector; the term 'Camorra' means the revenue coming from the extortion (Bondi 2018). Outside Campania, clans operate with high mobility, high propensity for economic criminal activities, low structure and flexible businesses (Belloni and Vesco 2018). From the organizational point of view, the Camorra is "a horizontal cluster of Clans and Families" (Europol 2013b), more fragmented when compared to the other Italian mafias: the deregulation of the organization on one side limits the threat represented by the organization as a whole, while on the other side it allows an extreme use of the violence which increases the criminal burden on the society. Crucial for the drugs traffic, Camorra also plays a relevant role in the gambling

management; furthermore, while spreading, it is able to create close relationships with local entrepreneurs (Bondi 2018). Last, mobsters of this organization like to have high level lifestyles; showing off their wealthy, they try to set themselves as models to be imitated.

- *'Ndrangheta*. It is the Calabrian mafia and it represents one of the most powerful organized crime groups internationally; its name comes from the blood linkages (*'ndrine*) which characterized it. It operates in several traffics - drugs, weapons, immigration, laundering, extortion, gambling, prostitution and traffic of toxic chemicals – and it is also involved in corruption of public administration and in procurements procedures. The structure of the organization is horizontal among the different *'cosche'*⁴ and vertical within each *'cosca'*; thanks to this more flexible structure, *'Ndrangheta* was able to adapt more easily to places different from those it originated from.

The organization is nowadays characterized by a holding structure, with the headquarters located in Reggio Calabria, a twin company set in Catanzaro area, a finance company in Milan and other subsidiaries spread in different countries (Bondi 2018).

In all the presented manifestations of mafia there is a tension between organizational centralization and diffusion and this makes them assume a network configuration (Sciarrone and Storti 2014). This network takes the form of a secret society which aims at profit, reputation and security (Sciarrone 2009) and which benefits from internal cohesion while having its strength in the relation with the external framework.

From a cultural point of view, in all its manifestations, mafia presents initiation rituals to get into the organization: these represent the boundary between the internal and secret organization (*'honoured society'*), which has its own rules and codes, and the outside society. Through these rituals, mafia groups tend to create a structured organization where there are not only blood bonds but also other formal affiliations (Sciarrone 2015).

Lastly, the two powers of mafia - power syndicate and enterprise syndicate- are executed with two different logics; the first one is made of actions managed in a centralized way (e.g. extortion) and it follows the logic of belonging to the organization, while the latter follows a business logic for which individual mobsters act in a more discretionary way and they benefit from profits of their companies (Sciarrone 2015). It is the business logic which is at the basis of the spread of the phenomenon in non-traditional areas, as it is easier to penetrate in the economic fabric through investments and infiltration in illicit traffic.

⁴ *'Cosche'* is the plural of the Sicilian word *'cosca'* used to indicate a mafia clan, gang. Along time, it has been used for mafia organization outside Sicily too.

In the last years Camorra and 'Ndrangheta play a more relevant role on national and international level, while Cosa Nostra has decreased its power and influence after the massacres of 90s and the consequent government crackdown.

The expansion of mafia in Italy is analyzed in the next section.

1.1.3. EXPANSION OF ORGANIZED CRIME IN ITALY

Mafia adapts to times and places where it wants to operate and it represents one of the main historic-social urgencies of our times (Dalla Chiesa 2017).

As pointed out before, considering mafia as a local phenomenon is self-defeating. In this sense, denying the possibility for criminal organizations to become active in the so called 'immune' areas and, consequently, ignoring the fact that the territories traditionally characterized by mafia operate in an open economy (so they have always been making transactions on national and international scale) has given an advantage to mafia in its expansion process (Sales 2015).

There are no immune areas; mafia relies on power, convenience and economic opportunities, so it has no limit of expansion if not in the relations with social, economic and political actors. For long time, the North of Italy has been commended for its economic prosperity, while mafia was penetrating consistently in its entrepreneurial fabric; indeed, mafia adapts to the local framework where it wants to expand, so that it can exploit resources already available. In this regard, the expansion of mafia varies from area to area as mafia interacts with the actors which are recognized by the society as contributors to the identity of a specific territory; for example, in the Veneto of 'making business' mafia relates primarily with entrepreneurs, and this may be due to the fact that the role of politics in this territory is not decisive, while in some other regions (for example Lombardy), where the institutions and the authority of the State is recognized to set the rules of the game, mafia interacts with politicians too (cf. Gianni Belloni in *Rimuovere non serve. Il ruolo della corruzione, dei cartelli collusive e delle mafie nello sviluppo e nella politica a Nordest*, 24th September 2018, Padova).

The expansion process of mafia is determined both by agency and context factors; the agency factors of mafia are the ways mafia behaves in illegal and legal economy while the context factors are distinguished in social-economic, cultural-relational and political-institutional dimensions. The way these factors interact determines the expansion of mafia; for example, where illicit practices already create cohesion among players they can be used by mafia to penetrate in a territory.

Undoubtedly, the increasing economic insecurity of the last years made informal relations stronger and stronger despite formal relations; companies more always rely on collusive cartels, while mutual trust and cooperation diminishes.

Consequently, in the economic framework of today there are multiple compact networks based on reciprocity of favors; this seems to be the ideal world where to operate for criminal organizations, that often found their relationship with entrepreneurs on collusion rather than on subordination. Indeed, not only mafia presence is not perceived as a problem but sometimes it is considered a resource (Lodetti 2018); it becomes a catalyst of illegal practices already in place, used by companies to survive or to stay competitive in a fast changing and always more international framework.

There are cases in which the first connection between a non-criminal business and mobsters is proposed by professionals, who offer their clients the financial illegal services of the criminal organization.

For example, in December 2010 the call center company Blue Call accepts the entrance of new partners in the society on advice of their business consultant Emilio Fratto; the company was in need of protection from other criminal groups, and the criminal authority of mafia was proposed by their business consultant as a solution. The consequences of opening the doors to mafia are severe; mafia is not a benefactor; its action is always guided by the opportunity of profit from a situation and its goal is to expand wherever it can. In the case of Blue Call, mobsters started withdrawing cash, paying fake wages to raise resources for the criminal organization till aiming to get control of the company. The company would be later seized by the State for mafia infiltration and closed.

In the actual economic framework, along with cases in which mafia imposes its power and it subordinates other companies, there are cases in which entrepreneurs rationally and voluntarily address mobsters, creating a collusive relation which both parties benefit from.

Mafia created – and still creates - relationships with entrepreneurs providing win-win situations; it seems reasonable to accept extortion in exchange for private protection; or paying for black work in order to lower the labor cost; or, again, accepting high interest rates when there's no credit provided by other institutions.

Moreover, mafia provides these solutions in a short time, while bureaucracy delays almost every official practice, and this makes even more convenient for entrepreneurs to work in the mafia protected system rather than relying on official institutions.

In the legal economy there are some sectors more exposed to mafia infiltration and these are the sectors with low technological level and with predominance of small enterprises (such as construction) and the sectors where public procurements and public financing are present (Sciarrone and Storti 2014).

Mafia criminal organizations spread also through direct investment in legal companies; for organized crime these companies represent the perfect tool to reach gains, to launder money, to enter the local community and to gain consensus (Transcrime 2013b).

Mafia moves where it can exploit resources, when the land of origin has nothing left to offer or when it becomes to be hostile to mafia mechanisms; in general, criminal groups are attracted by areas of high development which can mean an opportunity to grow for the organization (Sciarrone and Storti 2014). In these cases, the expansion of mafia is intentional and basically it is rooted in the will to find new areas to invest, to increase the presence in illicit traffic or to become more relevant inside the criminal organization (Sciarrone and Storti 2014).

Sometimes, the expansion of mafia in new areas is unintentional, finding its reason in external change of the environment, for example a mafia war or a crackdown by law enforcement (Sciarrone and Storti 2014). Moreover, in some cases a new area of expansion has been simply suggested by the coerced stays (forced resettlements) of mobsters; indeed, the preventive measure of coerced stays – linked to the false belief that mafia is a local issue – acted as an acceleration factor for its expansion.

It has been shown that analyzing the expansion process means considering at the same time different aspects: the possible influence of coerced stays, the potential illicit traffic, the attractiveness of growth areas and the ease to get social consensus and to exploit already existing illicit practices.

The crucial point to successfully spread is social capital, both in terms of relations mobsters already have in a new territory (due to a prior presence of friends or members of the criminal organization) and in terms of relations they can activate; moreover, collaboration with local criminal organizations help mafia to get a reputation (Sciarrone and Storti 2014).

It is the permeability of economic and political worlds that makes mafia the biggest threat of our times; in the areas of expansion the power syndicate, conceived as the political power of the organization, is due to the enterprise syndicate which is related to the creation of a network of businesses, while in the areas of origin the opposite situation is valid (Sciarrone 2009); this is consistent also with the fact that the power syndicate is built on a long term basis and it requires many conditions (Sciarrone 2015).

Thanks to the available social capital, mafia organized crime groups act as intermediaries which link different networks of the society, creating interdependence among them, while keeping them separate and controlling the flows of information among them.

The ‘grey area’, where mafiosi⁵, politicians, entrepreneurs, public agents and professionals operate and where alliances and relations take form, is critical for the expansion of mafia as it guarantees the social capital to have support and legitimization from the society (Sciarrone 2015); it represents the most high level of rootedness of mafia groups (Sciarrone 2015). In this area, different actors are present, and mobsters are not always the ones setting the rules of the game; it is an area where players recognize each other, share their resources and competencies, along with some views, where they do favors, and they receive favors. In particular, the resources offered by mafia are the use of violence, the function of connecting different networks and their ability to create and to use social capital (Sciarrone 2015).

Moreover, mafia finds an easy path to penetrate especially where there is lack of trust in institutions and where loopholes in legislation are present; where the authority of the State and, consequently, its capacity to protect from organized crime are not recognized.

There are different ways in which mafia expands; they depend on the relation with the territory of origin and they are not mutually exclusive processes but, on the opposite, the configuration of expansion can move from one to another. These are (Sciarrone and Storti 2014):

- Transplantation, when strong connections are maintained with the “mother house” while colonizing a new area. In this process mafia succeeds in reproducing all its characteristic in a non-traditional territory.
- Infiltration, when there is still subordination and dependence on the original mafia groups but only some features of mafia will be reproduced in the territory.
- Imitation, when local criminal group structure their organization based on mafia models, but with no linkages to it.
- Hybridization represents the case in which the connection to the home organization is present and it is functional to the initial expansion but, then, a new mafia organization is created, and it is independent from the original one (Sciarrone and Storti 2014). The case of Apulia and Basilicata represents an example of hybridization process: the local criminal groups, in a first moment exploited by ‘Ndrangheta, are able to organize themselves in some new forms of mafia, ‘Basilichi’ in Basilicata and ‘Sacra Corona Unita’ in Apulia (Pinotti 2011).

My study is focused on Central and Northern Italy, considered as non-traditional areas where mafia has succeeded to expand; in Nord West Italy situations similar to rootedness are present, while for Central and North East Italy the main model of expansion is infiltration.

⁵ ‘Mafiosi’ is the plural for the Italian word ‘mafioso’ which means mobster.

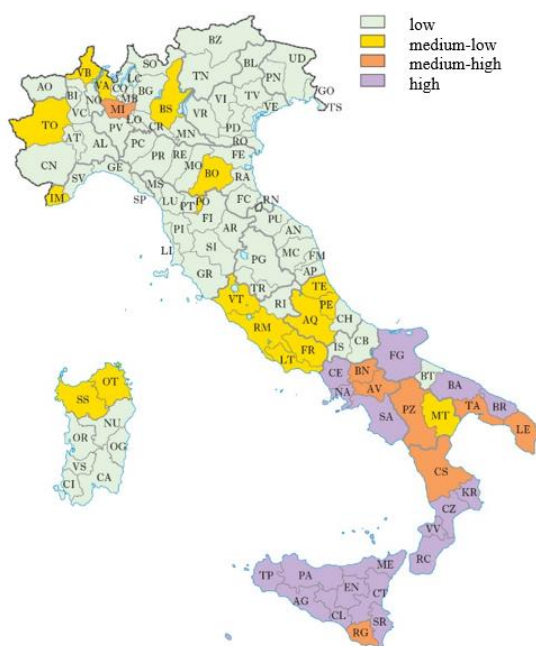
To map the actual presence of mafia in Italy, I decided to rely on the results provided by Sciarrone (2015). In order to assess the expansion of mafia, Sciarrone creates two indexes for the period 2012-2015: the first one for the power syndicate and the second one for the enterprise syndicate.

The power syndicate index is calculated as criminal quotient (crimes for 100,000 inhabitants) of mafia crimes, mob hits and extortions plus the number of seized assets to mafia and companies dissolved for mafia infiltration, standardized to mean national value (Italy = 100) and synthesized by an additive index which gives back for every province the mean of selected indicators (Sciarrone 2015). As expected, the map (Figure 1) shows a concentration of power syndicate index in the areas where mafia originated (East Sicily, South Calabria and Campania) and in some provinces in Apulia while it has low presence in Central and Northern Italy, except for some metropolitan areas (Milan, Turin, Rome).

The enterprise syndicate index is based on the average of criminal quotient (crimes for 100,000 inhabitants) of criminal associations crimes, breach of drugs law, bank and post office robberies, usury and exploitation of prostitution. In this case too, data are standardized to the average national value (Italy = 100) and an additive index on provincial basis is created.

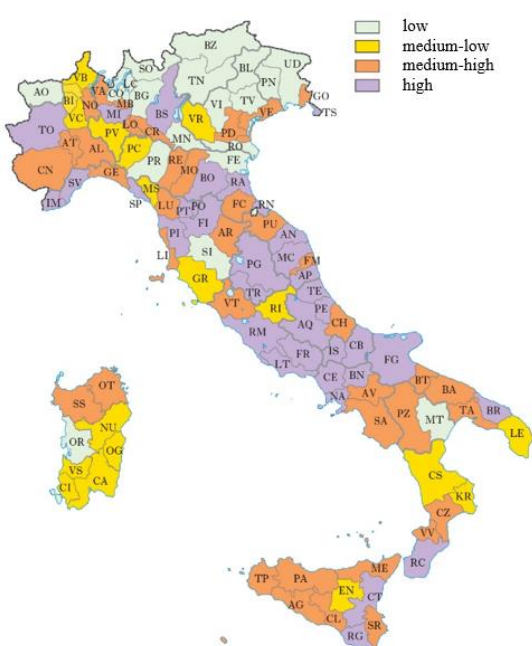
The situation represented in the map (Figure 2) is different from the previous one: indeed, the enterprise syndicate distribution on the national territory is irregular, and this is due also to the fact that the index considered includes illicit activities of organized crime groups (but not exclusively mafia crimes).

Figure 1. Power syndicate index



Source: Sciarrone (2015)

Figure 2. Enterprise syndicate index



Source: Sciarrone (2015)

Focusing on Central and Northern Italy, 'Ndrangheta's presence is predominant in North West, Camorra is more active in North East and Central Italy, while Cosa Nostra is less spread in Central and Northern Italy, consistent with the strong repressive action it has been subjected to for the last decades (Sciarrone 2015).

It is worth mentioning that Italian organized crime is not only a national issue as it has been expanding beyond national borders; this trend entails the need of strong cooperation among different countries.

With this aim, in 2013 a new project called 'Focal Point' was opened at Europol to fight against organized crime more efficiently at European and international level; through a secure Europol platform all partners can share information and learn from the experience of Italian authorities in the investigation of mafia (Europol 2013a).

Moreover, in an economy always more centered in international flows mafia can become even more silent than in the past; anti-trust authorities need to play a significant role in granting the competition of the markets and the fairness of contracts as well as mechanisms of traceability of money need to be introduced at a global level (Sciarrone and Storti 2014).

1.1.4. CRIMINAL ORGANIZATIONS AND THEIR IMPACT ON THE ECONOMY: NEGATIVE EXTERNALITIES

The impact on the economy of mafia organized crime has been for long time underestimated; this is certainly due to the difficulty in understanding the border between legal and illegal economy, as mafia establishes informal networks with local communities (Sciarrone 2009), but also to the fact that, to some extent, mafia has been considered 'not so bad' for the economy.

The narrations of the facts, instead of the facts themselves, have caused a minimization of the mafia question, especially in non-traditional areas; this sometimes leads to a superficial investigation not to destroy the identity (or its idea) of a territory, which doesn't allow to find the truth. For example, there are cases of companies involved in illegal and illicit practices where the association with mafia seems natural, but it is actually not proved - see the MOSE case in Venice province (Belloni and Vesco 2018).

Mafia criminal organizations are defined as companies seized by Italian authorities due to their connection with mafia organizations or companies where a person arrested and condemned for mafia crime has an official position - as part of the Board of Directors or as a shareholder owning at least 10% shares (Fabrizi, Malaspina, and Parbonetti 2017).

It is not a secret that mafia criminal groups are involved both in illegal and legal activities; in the last years, legal activities seems to provide a less risky and higher profitable environment for mafia (Sciarrone 2015).

At the time of my research, the most recent report on the Italian non-observed economy (NOE) issued by Istat is the one published in 2017 which analyzes data for the period 2012-2015.

The non-observed economy includes the underground economy (where legal activities are conducted with unofficial practices so that they are linked to fiscal and contributory fraud) and illegal activities (goods for which the state has banned the production and sale such as drugs trafficking, prostitution and tobacco smuggling).

In 2015 the value of Italian non-observed economy was 208 billion Euro (Figure 3), with a corresponding incidence on GDP of 12.6% (Figure 4), which entails a reduction both in the amount and in the incidence on total economic activities respect to the previous year.

This reduction is due to the underground economy, as the incidence of illegal activities (production of illegal goods and production of legal goods without authorization) remains the same as 2014. Moreover, there is a difference in the composition of the underground economy, with an increased role of black work and a decrease of sub-declarations of taxable income for enterprises.

Figure 3. Underground economy and illegal activities. Data in million Euro.

	YEARS			
	2012	2013	2014	2015
Underground economy	189,190	189,941	196,005	190,474
From sub-declaration	99,080	99,444	99,542	93,214
From irregular work	71,509	72,299	78,068	77,383
Other	18,601	18,199	18,396	19,877
Illegal activities	16,430	16,548	16,884	17,099
Non-observed economy	205,620	206,490	212,889	207,573
Value Added	1,448,021	1,444,106	1,457,859	1,485,086
GDP	1,613,265	1,604,599	1,621,827	1,652,153

Source: Istat

Figure 4. Incidence of Non-Observed Economy on added value and GDP. Percentage values.

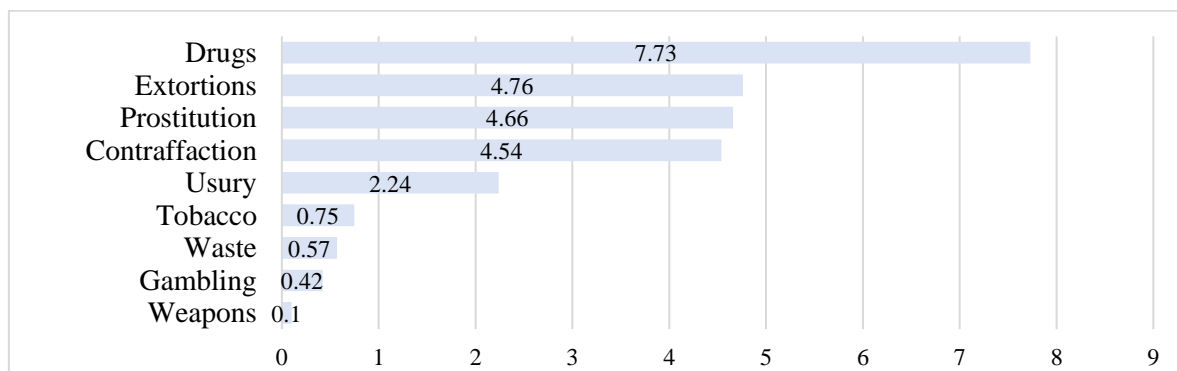
	YEARS			
	2012	2013	2014	2015
Underground economy	13.1	13.2	13.4	12.8
From sub-declaration	6.8	6.9	6.8	6.3
From irregular work	4.9	5.0	5.4	5.2
Other	1.3	1.3	1.3	1.3
Illegal activities	1.1	1.1	1.2	1.2
Incidence of non-observed economy on Value Added	14.2	14.3	14.6	14.0
Incidence of non-observed economy on GDP	12.7	12.9	13.1	12.6

Source: Istat

The sectors more affected by the underground economy are: other service activities; wholesale and retail trade, transports, inventory, accommodation and catering services; construction; professional, scientific and technical activities. These sectors highlight that the diffusion of the underground economy is due more on the type of market and on the relation among client and supplier than on the kind of service offered.

According to a report elaborated by Transcrime (Transcrime 2013a), which studies the investment strategies of mafia in a project proposed and financed by the Operative National Plan (PON) ‘Security for development – convergence objective 2007-2013’, mafia does not have the monopoly of illegal activities but it retains a percentage between 32% and 51%, which has been estimated as annual revenues varying from a minimum of 8.3 to a maximum of 13 billion Euro, coming from extortion (45%), drugs trafficking (23%), usury (10%), prostitution and counterfeiting (both 8%). Figure 5 shows the total illegal activities in Italy in 2010, as reported in the study conducted by Transcrime.

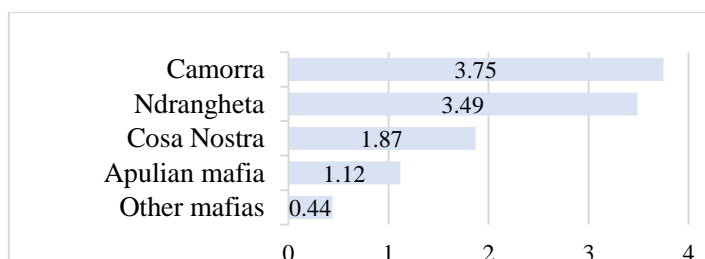
Figure 5. Illegal activities in Italy in 2010. Data in billion Euro.



Source: Transcrime elaboration

Data about the distribution of revenues coming from illegal activities (Figure 6) among the different mafia groups confirm the fact that Camorra and ‘Ndrangheta are nowadays the most important organizations, followed by Cosa Nostra.

Figure 6. Illegal activities of mafia criminal groups in 2010. Data in billion Euro.



Source: Transcrime elaboration

Using seized assets to localize mafia investments, the report of Transcrime points out that mafia criminal organizations invest more on real estate (houses and land) in South Italy, while they invest more on companies in North Italy, preferring low technological sectors (wholesale and retail trade, construction, hotels and restaurants, real estate), with low openness to foreign markets, which are highly labor intensive, with a large number of small and medium enterprises (SMEs), and characterized by high deregulation, high involvement of public resources and public administration (Transcrime 2013b).

In the context of this project, Transcrime elaborated the Mo.Vu.S model to evaluate the risk of penetration of mafia in economic sectors: the model gives a score (0 minimum risk, 100 maximum risk) depending on territorial and sectorial characteristics that can facilitate the penetration of criminal organizations (Transcrime 2013b).

As mentioned before, the economic crisis exacerbated illicit practices and it increased informal relations, providing a perfect environment for mafia organized groups: they connect suppliers and clients, they provide the liquidity needed by entrepreneurs, giving something today to have it back with interests tomorrow. The costs of cooperating with mafia have sometimes been considered as a condition to operate in some territories; these costs, though, are 'paid' only in part by the company itself but actually they weigh on the society as a whole (Sciarrone 2015). There are three main situations where external actors cooperate with mafia; the first one is a situation of complicity, which is driven by an instrumental logic based on an economic exchange; the second one is collusion, where continuative and varying exchanges are present between mafia and non-mafia actors to reach some specific common goals; and the last one is interpenetration, where there are organic relations and identification with the mafia criminal organization.

Moreover, the influence of mafia in public procurements has been proved for long time and there are two different roles played by the criminal organization. The first one deals with the fact that mafia criminal organizations operate as subcontractors who are not paid by the contractors; the contractors, colluded with the criminal organization, claim not to have received the payment from the principal (even if they have); in this way, the principal will pay more than previously established (Lodetti 2018). The second role deals once again with the intermediation: mafia acts as supervisor in the allocation of public procurements, granting profits to companies (which obtain the procurement with a low bid), granting bribes to politician and providing an income inflow to the criminal organization as a percentage on the profits of the companies (Spartà 2016).

In the case of public procurements, the reciprocity of favors overpasses violence and intimidation: moreover, the low level of accountability together with the high level of discretion

given to companies winning the bid conducts to a lower level of transparency in the allocation of resources, thus impacting the competition mechanisms of the economy (Spartà 2016).

The common adversary to mafia has been for long time a matter of opposition to the cruelty of the criminal organization; the truth is that violence for mafia is only a tool to reach its economic goals and what we see and know about mafia is the tip of the iceberg.

Mafia organized crime is one thing: collaborating with mobsters at an economic level – accepting money from them and allowing them to become investors of one's business, asking for black labor, accepting imposition on supplies and clients – means being associated with the same criminal organization which has murdered judges, policemen, and everyone who tried to shed some light on the true mechanisms that lead its action.

Thinking that the collaboration with mafia will be occasional is a mistake as well as thinking that it will have low impact on the society and on the economy. Moreover, blaming legal institutions' inefficiency to justify the use of criminal services is unfair; it is an individual decision and, as every decision, it is based on personal conscience and considerations.

The key concept that made mafia become what it is nowadays is the social capital, which relates to the strong and large network of relations in which mafia has been involved and it is involved. Indeed, the social capital is composed by the social relations owned by an individual, which represent resources that can be used to pursue its objectives; for sure, not all relations make part of social capital but only those for which the identity of the players is recognized and where there is some kind of solidarity or reciprocity (Pizzorno 1999). These relations are massively used by mafia and they exploit the short-term opportunism of external actors (Belloni and Vesco 2018); the network structure makes available social capital not only to mobsters but also to external actors external who enter in exchange and cooperation relations with the criminal organization (Sciarrone 2015).

Mafia criminal organizations sometimes play the role of guarantor of economic transactions; they constitute the third player which regulates transactions, linking two parties which don't know the reciprocal identity, but which rely on the reputation of the criminal organization to conclude the transaction. This is the social capital 'of solidarity' typical of groups: the fact that two different actors belonging to the same group have solidarity duties (internal trust) or that one player belongs to a cohesive group which rewards it or punishes it based on the expected behavior (external trust) grants the identity of the other party (Pizzorno 1999).

Mafia criminal organizations, especially in the non-traditional areas, rely more on social capital 'of reciprocity'; it is generated in lasting relations with weak linkages based on cooperation to reach some common objectives, on the will to enlarge the customer base and to widen the awareness of its reputation, or on the deferred reciprocity (Pizzorno 1999). In this sense, mafia

helps people and companies through immediate solutions (providing liquidity, creating jobs, supplying money) to some critical situations, but this action is always conducted on the basis of a future return, not determined at the time in which the other party receives help from mafia criminal organization. There are several cases in which the entrepreneurs approach a criminal organization presuming they can benefit from its action to solve a situation and then they can just end the relation with mafia, giving back some reward to the criminal organization.

In reality, interacting with mafia is a point of no return: the ability of mobsters to shape transactions and create long lasting reciprocal relations is evident and, as mentioned before, social capital is the lifeblood of mafia criminal organizations. The non-criminal enterprise becomes an operative tool in the hands of the criminal organization while an organic affiliation between the two is generated, based on a shared system of codes and behaviors (Lodetti 2018). To better understand the negative externalities of mafia presence, it is crucial to start from the types of income inflow for a criminal organization, which are: extortion, trade in criminal goods and corruption (Astarita, Capuano, and Purificato 2018). It is straightforward to think about the negative impact on a company of extortion: acting as a 'protection tax' (Paoli 2004) to be paid to the criminal organization that controls the area where the company is, it represents a reduction of resources for the company. Extortion can be a transfer of money, an imposition to take supplies from companies affiliated to mafia or to pay a payroll to a mafia member (Paoli 2004); in these last cases the extortion crime is well withheld behind some legal formal relations (Lodetti 2018).

Through the income generated by the trade in criminal goods mafia criminal organizations meet the demand for criminal goods; this demand is increasing and it takes part of the effective demand from the legal sector (Astarita, Capuano, and Purificato 2018).

Last, corruption acts as a reward for the function of mediator: mafia, using violence and personal contacts, acts as a mediator between politicians and citizens during political elections, but also as a mediator between producers and market in the economy (Sales 2015).

Besides the negative impact just analyzed, in order to assess the overall impact of mafia organized groups on Italian economy, we need to consider the positive impact of laundered criminal income when used for the consumption of legal goods and for investments in legal activities. Thus, the impact of criminal income on the economy can be positive or negative depending on the ability of the laundered money to increase in effective demand in a way that offsets the decrease in effective demand due to extortion, criminal trade and corruption; for the Italian economy this impact has been measured and it has come out to be negative (Astarita, Capuano, and Purificato 2018).

Although in many studies criminal organizations are found to present high liquidity and private equity, consistent with the idea that criminal firms are established to launder black money, a recent study (Fabrizi, Malaspina, and Parbonetti 2017) finds out that criminal organizations also resort to loans and, as they have strong relations with banks, they benefit from a privilege channel to financing.

Consequently, when it comes to credit, a double negative externality is caused by mafia's presence: on one side, the rationing of available credit for non-criminal firms, on the other side, a high interest rate due to the perception of the area as riskier.

Moreover, other negative spillovers on the local economy of the presence of the criminal organization are: the higher mortality of local companies; the replacement of local companies with mafia criminal organizations; the decrease of resources due to extortion; the reduction in the freedom competition of markets entailing recession; stagnation; unemployment (although mafiosi appear to be job creators at first) (Lodetti 2018). Furthermore, the presence of mafia criminal organizations increases the riskiness and uncertainty of the business environment thus lowering the long-run growth rate of the economy.

Although for a long time the phenomenon of mafia has been investigated using a social and juridical perspective, in recent times more quantitative studies have been developed to verify its economic consequences.

A research conducted on the area of Mantua (Lodetti 2018) quantitatively assess the impact of the mafia presence on the economic local fabric. It presents a regression model to estimate the interaction between the balance of local companies (dependent variable) and the balance of Calabrian companies (independent variable), which are used as a proxy for mafia criminal organizations, operating in Mantua area; the classification between local and Calabrian companies is made thanks to the data on the company owners available from the Italian Chamber of Commerce. The linear regression model developed by Lorenzi collects data on a monthly basis for those sectors of interest to explicit the relation (building and construction, commerce, services to the person) where at least one Calabrian company was active in the last 16 years. Finding that the balance of the Calabrian had a direct strong and statistically significant impact on the balance of the local companies, this model empirically assesses a negative impact on the local economy of mafia presence.

Another study conducted in India (Nanda and Pareek 2016), in which the impact of corruption (measured by the election of criminal candidates) on firms investments is assessed, gives some insights for our analysis too, as politics plays a role in the economic framework of a territory. In that research, the regression model used to investigate the interaction among the election of criminal politicians and the firms' capability to invest (measured using capital expenditure

projects from CMIE CapEx database) presents some important results: non-local projects (projects outside the district a company belongs to) are negatively and significantly influenced by the election of a criminal politician, while this influence is insignificant for local projects (i.e. projects located where the firm is headquartered); this matches with the supposition that local politician interact with local companies. Moreover, in firms where there is a lower level of Foreign Institutional Ownership the impact of criminal politicians is more negative, due to the lower level of transparency in this type of ownership structure; again, the high insider ownership would probably focus on the protection of the assets. Lastly, corrupt politicians favor publicly held firms and discourage private firms; the study shows a decline in private sector investment when a corrupt candidate wins while an increase in investments of publicly held firms. These opposite trends offset each other, as in both cases the influence is not significant. Although this study is referred to a country very different from Italy, I find this approach used interesting and I try to see if, with the difference of the case, it could be used also in our analysis: the decision is, then, to investigate not only the performance of the companies in the area where a mafia criminal organization was present but also the effect on its investments. Thinking about investments, the impact of mafia presence seems to be double: the diminution of resources, due to extortion, and the general disincentive to invest, considering that part of the future return will go into mafia's pocket.

To assess the impact on investments, my analysis, presented in chapter 2, is centered on budget headings rather than on firms' Capex, as there is no database about capital expenditure projects of Italian firms.

To broadly explore the economic negative impact of mafia, it is worth mentioning a study conducted on the Italian regions Apulia and Basilicata (Pinotti 2011) which empirically proves that the organized crime expansion (measured by the murder rate) causes a worsening in the GDP per capita due to the decrease of private investments and the replacement of private resources with public capital, which has a lower productivity. Mafia criminal organizations appear to discourage private investments while granting profit opportunities in public procurements, as already highlighted. In the specific case of Apulia and Basilicata, these regions remain growing areas until the end of 1970s when they experience a sharp decrease in growth; the decrease is explained by the expansion of mafia, which finds in these regions strategic points for the market of tobacco and which is able to penetrate in the area, through the involvement in public contracts, after the earthquake of November 1980 in Basilicata.

In the labor market, mafia is also able to use immigration as an opportunity to make profits; indeed, mafia acts as a labor mediator providing companies low cost workers while guaranteeing a residency permit to immigrants. At the beginning of the century, when the

increased globalization was a real threat for many companies, in Veneto – considered as a prosperous area – mafia companies cooperate with institutions which first authorize the posting of workers for a company (shell company actually) and then issue the residence permit to immigrants (Belloni and Vesco 2018). This is a case in which mafia demonstrates its high capability of twisting the law riding the discretion allowed in its application; leaving gaps and freedom of action represents an open door to illicit practices.

In a framework of irresponsibility towards the local community, illicit practices act as socializing factors; they unite different companies which themselves find a justification of their behavior seeing they are not the only ones.

It is important to say that the costs of organized crime are not only an obstacle to the fair market competition but organized crime represents a threat to the competitiveness of Italy as a whole; it creates a system where the availability of criminal capitals to be invested in legal activities can set a criminal monopoly in certain areas (Riccardi, Milani, and Campedelli 2016). In general, infiltrated companies have a competitive advantage with respect to legal companies (lower labor/raw material costs, concurrence limitation) (Riccardi, Milani, and Campedelli 2016) and sometimes legal companies decide to resort to illicit practices (such as avoiding taxes) to recover the competitiveness.

It is crucial that an efficient intelligence system is built to face the so called ‘entrepreneur mafia’; in Italy, the platform INSIDER represents a first step towards this direction. It is a tool created by the Chamber of Commerce of Crotona (Calabria) and Vibo Valentia (Calabria) which matches complementary data coming from different players of the society thus providing new leads in the investigation and fight against mafia; the more tools like this become integrated at a national level, the more efficient the fight against the expansion and diversified mafia activities will be.

1.2. INDUSTRIAL DISTRICTS

1.2.1. DEFINITION AND ORIGINS

Industrial districts (IDs) are a typical model of the Italian economy and they are defined by article 36 of Law 5th October 1991, n. 317 as “territorial local areas characterized by high concentration of small enterprises, with a reference to the relationship between the presence of the enterprises and the resident population and to the productive specialization of the bunch of enterprises”.

From this definition the nature of IDs is clear: they represent areas with high concentration of SMEs with the same productive specialization (Istat 2011a). Moreover, the aforementioned law highlights the relation between firms and local population; in the strongest sense, IDs end to represent first a local community, a local framework, which is the scenario where enterprises operate, as Becattini (1990) believed.

The first one to define some industrial agglomerations of small and medium enterprises as industrial districts was Marshall: his basic insight is that working in close relationships, in a limited area, being close one to each other, can lead some positive effects to small firms (Paniccia 2002).

Becattini (1987) is known for his rediscovery of the concept of industrial district; as a matter of fact, in 1987, he analyses the study conducted by Marshall considering the industrial organization from the point of view of the local community (and not of the companies that decide to set their activity in a certain area).

Besides the differences in defining industrial districts and their characteristics along time, it seems that still nowadays one shared view is that the rationale of the existence of an industrial district lies in external economies.

Then, for some scholars the positive spillovers are generated by the geographical proximity of firms and households while some other scholars, whose the pioneer is Becattini, argue that the common values of a local community drive the external economies (Paniccia 2002).

In 1990 Becattini defines ID as “a socio-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area” (Becattini 1990); Becattini himself defined this theoretical construct as Marshallian industrial district, recognizing the point of start of his reasoning.

The Marshallian ID differs from an industrial district due to the presence of the communitarian factor: in this sense, the competitive advantage is due not only to the geographical proximity to suppliers and clients, but to a cultural and social proximity too (Dei Ottati, 2003 in De Marchi and Grandinetti 2014).

In Marshallian IDs the industry becomes defined by the local community and not by the technology (Sforzi 2008); Marshallian industrial district introduces the local community as a unit of analysis of the economy and this is the reason why they are also defined as communitarian industrial districts. Indeed, with Marshallian IDs we deal with local communities specializing in a certain product, while with IDs we refer to a group of companies in a limited territory focusing on a specific production. In this model, the local community becomes a factor that modifies the productivity; the idea is that of starting from the place – where the lives of people go on – towards its industrialization, not the opposite. Consequently, the competitive advantage provided by Marshallian IDs is immediately explained; the communitarian factor “facilitates mutual understanding between people activating and managing any interorganizational relationship within the district, and this, in turn, reduces the transaction costs and improves the transfer and co-production of knowledge” (De Marchi and Grandinetti 2014).

Becattini applied his theory of Marshallian IDs into the practical case of the region Tuscany, where in different areas the local communities specialized in different productions; these areas (until that moment considered as clusters) have been found to be examples of industrial districts. In order to define the local community as unit of analysis, a new tool – the LLSs (Local Labor Systems – Italian classification corresponding to LMAs) – and a new mapping of the Italian productivity landscape were created.

It is important to stress that, even if the first empirical evidence of the existence of Marshallian industrial districts has been provided by the Italian case, this does not entail that industrial district is a theoretical concept created ad hoc to describe the Italian economy (Sforzi 2008). Sometimes in literature it is possible to run into the use of the terms ‘district’ and ‘cluster’ as synonyms, but they actually are not; the distinction stays in the different size of the area considered. In the case of industrial district, the area is represented by a limited territory, while when we talk about clusters the area is broader and consequently the firms more heterogenous (De Marchi and Grandinetti 2014).

In the next sections the characteristics of IDs and a deeper analysis of the actual framework in Italy are presented.

1.2.2. CHARACTERISTICS OF INDUSTRIAL DISTRICTS

Starting from the definition provided by Becattini (1990), I now try to explore more deeply the characteristics of industrial districts.

First, industrial districts are different from ‘economic regions’, as their dominant activity is an industrial one (Becattini 1990); the self-containment and the division of labor which are at the core of the industrial district environment lead to a surplus of final products (Becattini 1990).

The ID is both vertically and horizontally articulated: vertically, in the sense that each firm collocates its business in a specific stage of the production process of the district, so that technical interdependence among firms is generated (Paniccia 2002) and horizontally, as there are several firms for each step of production, making the industrial district framework competitive and boosting in this way learning and innovation processes.

The population of firms of IDs belong mainly to the same industrial branch and industrial districts appear to be the ideal environment of production for those products which present a variable final demand (Becattini 1990). The surplus generated by an ID is not represented by a cost advantage – for example determined on low labor costs of a specific area or low cost for raw materials – but it is “rooted in some qualitative characteristic or organizational or technological factor” (Paniccia 2002); this surplus is placed in the outside market, so that it becomes critical for the industrial district’s survival to create and maintain a permanent network with suppliers and clients (Becattini 1990).

The ID structure and composition makes possible for firms to operate in a non-contestable local market, as the district generates a product surplus, while at the same time the ID’s internal market is competitive, due to the presence of multiple firms handling the same phase of the production process (Paniccia 2002). As a matter of fact, in the industrial district environment, there is a division of labor with respect to both complementary and substitutable activities; consequently, local competitive markets for each specialization are generated (Dei Ottati 1994). Competition is crucial in order to keep the efficiency of the industrial districts; local customs together with formal institutions (associations of artisans, local government, local politicians) are important to guarantee constructive forms of competition (Dei Ottati 1994). In this sense, competition based on innovation, or based on other inducements (such as higher quality of the supply, shorter delivery time, higher level of technical assistance) encourages relations of trust and loyalty among companies of the industrial district, thus contributing to the cooperation necessary to create economic integration in the industrial district (Dei Ottati 1994). Again, in industrial districts the coexistence of competition and cooperation is made efficient by formal and informal institutions which guarantee that both competition and cooperation manifest themselves in constructive forms and not in destructive forms; the first making the industrial

district an innovative and flexible system, the latter contributing to its integration (Dei Ottati 1994).

As mentioned before, the Marshallian ID is also defined as communitarian ID; indeed, for Becattini an ID is a 'community of people'; people who share some values, beliefs, who have relations with each other (Paniccia 2002).

Thinking about the impact that culture has on IDs it could be erroneously assumed that IDs represent static realities; on the contrary, according to the socio-economic approach, IDs are an organizational form incorporated in a network of social relationships in a given territory, so they can change along with the context. As a matter of fact, assuming that only one set of values and views is in line with the district environment and its evolution through time could lead to consider ID as an area of social stagnation, which is not (Becattini 1990).

A critical role in order to spread the values typical of the industrial environment is played by social, economic and political institutions; the school, the family, the church, but also trade unions, local councils, consortia act as intermediaries and they shape a new local framework which reflects the features of the local community. In this sense, institutions help in supporting SMEs in order to offset their diseconomies, they strengthen local competencies and they foster innovation. The institutional structure is made of social norms, market and technical regulations provided by collective or public actors and it has an influence on local transaction costs (Bellandi and Santini 2018).

The fact the industrial districts have their own institutions and rules does not make IDs closed systems; on the contrary, industrial districts represent a territory where some common values and rules are functional to the economic activity of the area and where continuous exchange of people is presented, as it is needed for the development of the district itself (Becattini 1990). For sure, the social integration of people from outside is a challenge, depending on the 'cultural distance' between the alien and the local and on the 'power of assimilation' of the district (Becattini 1990).

There are two regulating mechanisms of the ID's model; the first one is cooperation and the second one, which can be intended as a result of cooperation, is trust (Paniccia 2002). Cooperation, intended from an economic point of view, becomes the most influent factor in determining the success of the ID model; as a matter of fact, it sustains the ID dynamics, it boosts innovation, it facilitates flexibility (Paniccia 2002).

Cooperation in industrial districts plays a relevant role in coordinating many different and independent firms; it is actually thanks to the coordination through cooperation that companies in the industrial districts can benefit from the advantages of the division of labor (Dei Ottati 1994). In general, according to Dei Ottati (1994), cooperation, by means of reciprocal

agreements, reduces the risks linked to a new activity or investment; local business customs of IDs make possible for agents to predict the quality and terms of goods exchanged. Moreover, if, on one side, social sanction is present when business customs are not respected (Dei Ottati 1994), on the other side, thanks to the possibility of relying on a community, in an ID the sanction associated with an unsuccessful project is lower and entrepreneurs are not afraid to invest again as they are helped by the local community (Paniccia 2002).

Moreover, the informal relationships of trust help in cutting the transaction costs, as there is no need for drawing complete and complex contracts, and less time is spent searching for external suppliers. The reputation of trustworthiness represents real personal capital and it is costly to build but also to recognize it; in industrial districts, preferential economic transactions are incentivized (Dei Ottati 1994).

Industrial districts represent an environment where hiring costs are less due to knowledge of skilled labor force and to cooperation with other entrepreneurs; in this sense, the evaluation of the personal and professional qualities of a worker is easier, and this entails the reallocation of human resources to become a critical feature of the productivity and competitiveness of the district itself (Becattini 1990). The specialization of the worker represents a sort of 'public good' of the district, so that it is not lost when moving from a firm to another (Becattini 1990). In IDs there are many interdependent relationships based on common competencies, which are related to a dominant industrial specialization; proximity, together with shared competencies, generates social cohesion in IDs, as there are continuous interactions and homogeneous behaviors able to create interdependence among individuals, firms and institutions. Furthermore, the proximity of firms and population fosters the flows of information and this made for long time IDs the cradle for start-ups too.

In organizational studies, IDs are considered a network form; they are between the hierarchy and the market and they constitute a pure organizational form governed by trust and informal codes of communication. In industrial districts, the control of the phases of production is made possible thanks to the internal competition (Becattini 1990); moreover, technological progress finds a more favorable context in industrial districts as it is introduced gradually, through a process of self-awareness on the workforce and population of the district, and it is seen as a way to reaffirm the position of the district (Becattini 1990).

IDs have been considered crucial in explaining the success of Italian goods on the international market until the mid-1990s, contributing massively to the manufacturing sector and representing the backbone of the 'Made in Italy' reputation abroad, while in recent years they have adapted to new and challenging scenarios.

To react to the external changes, some strategies are adopted by IDs: product upgrading, renewal of business models (focusing on upstream and downstream functions of transformation processes), increase in investments in intangible assets and reshaping of outsourcing networks and participation in global value chains (Cucculelli and Storai 2018).

Industrial districts are not only a local result of socio-cultural, historical, geographical features of the area and of technical characteristics of the production process, but they find their lifeblood in the permanent link between the district and the external markets (Becattini 1990). Nowadays the scenario is more complex and competitive than in the past; in the next section some insights about the evolution and changes of Italian IDs in the last years is provided together with the description of the current Italian picture.

1.2.3. INDUSTRIAL DISTRICTS IN ITALY TODAY

Economic changes of the last 15 years made some of Marshallian features disappearing in Italian IDs; as a matter of fact, a model that truly described the Italian industrial world in the past, has been changing recently (De Marchi and Grandinetti 2014), in a way that, sometimes, a ‘new industrial district’ is depicted by a different set of characteristics; these new features have been driven by some major catalysts.

First of all, globalization. It has a consistent impact on the competitive external market of IDs; when the market becomes global, IDs, which are used to act in a non-contestable local market, need to face a more competitive scenario. The competition coming from abroad made, on one hand, the number of firms in IDs decrease and, on the other hand, it made some districts grow more, also through the acquisition of small firms belonging to the same ID (De Marchi and Grandinetti 2014); this double change leads to higher concentration within the IDs of both turnover and workforce (De Marchi and Grandinetti 2014).

In this international scenario, many firms start to consider the opportunity to access to new areas characterized by a lower labor cost or lower cost of raw materials compared to local areas; this weakens trust and cooperation within the IDs and this trend has intensified after the financial crisis of 2008, with a consistent reduction in the number and value of the supply relationships (De Marchi and Grandinetti 2014). In this way, leading firms succeed to defend their competitive advantage thanks to their ability to extend the channels to access knowledge while smaller firms keep on operating only on a local context; this, for sure, creates a distance among members of the same community (the industrial district) weakening the social cohesion typical of the Marshallian ID.

Furthermore, considering the communitarian nature of IDs, it is crucial to analyze the impact of immigration on their fabric, both from the perspective of low skilled labor force provided by

immigrants and in terms of entrepreneurs operating in IDs (for example in the district of Prato Chinese companies created a sort of ‘district within the district’) (De Marchi and Grandinetti 2014). The workforce of an ID is not more a local workforce, but it involves people coming from different cultures and countries; the interaction among different communities becomes limited, while continuous interactions are the core features of the Marshallian ID.

Another phenomenon that really impacts the way ID are today is the generational turnover; as new ventures are better educated, it is not to be taken as granted the fact that they will continue with the family business (De Marchi and Grandinetti 2014).

The concentric diversification typical of Marshallian IDs has converted into non-concentric diversification; the activities involved in the business area of the district have decreased and some other sectors rather than the one of the district’s specialization have been developed. Consequently, the dominance of the district specialization in the local production structure has been threatened and integrated (De Marchi and Grandinetti 2014).

According to De Marchi and Grandinetti (2014), IDs in Italy today have a different configuration than Marshallian ID; different scenarios are present in our country so that it is no more possible to talk about one unique model, namely the Marshallian ID, but we need to insert each ID in the global value chain framework. In the new context, there are two types of IDs which succeed in staying competitive in a globalized world: the first one is the hierarchized model, where some leading firms act as anchors for suppliers and other firms in the districts; the second model is characterized by many dynamic local firms which are interconnected among each other and which also support interorganizational relationships with other external actors (global networks). In this scenario, firms belonging to IDs present heterogenous strategies and IDs appear to be open learning systems where, due to the presence of MNE, local and international knowledge is exchanged and the cluster becomes more connected with activities in the GVCs of which it is part (De Marchi, Di Maria, and Gereffi 2017).

This thesis considers the 141 industrial districts identified by Istat based on the Industry and Service Census of 2011 and on the classical concept of ID, that is “LLSs with high manufacturing employment focused on a main industry, the other industries being secondary, complementary (from the point of view of employment) or auxiliary (from the point of view of production)” (Istat 2011a).

From 2001 to 2011 the number of IDs decreased from 181 to 141; in general, the municipalities belonging to district areas have diminished, while the number of municipalities for each IDs has increased together with the population per ID. When compared to 2001, only 19.6% of IDs kept the same configuration in terms of number of municipalities while the rest has changed its

territorial extension (with more than a half with higher number of municipalities composing the LLS of the district).

The employment effect⁶ of industrial areas is still positive thus the average number of employees per district and the average number of local units (LUs) for district has increased, enhanced by the non-manufacturing employees and LUs. In industrial districts, there are the 65.8% of manufacturing industry workers and the 22% of the Italian population (Schilirò 2017). Recently, the manufacturing industry has been mostly driven by manufacturing non-district LLSs; in the Census of 2011 28 LLSs of big companies with district characteristics are identified (in 2001 they were 29). In these LLSs, the performance from an employment perspective, is much better than the performance of non-district and district manufacturing LLSs, with manufacturing employment growing of 12% and non-manufacturing employment increasing of 51.3%.

Both the financial crisis and the process of tertiarization of Italian economy have affected the territorial configuration of industrial districts, with a concentration in the territories where the industrial district model was historically present (Schilirò 2017); as shown in Figure 7 and Figure 8, these territories are in Central and Northern Italy, the area my thesis is focused on.

In particular, the North East Italy encloses the 31.9% of total industrial districts, the Central Italy the 27% and North West Italy the 26.2 %. The remaining 14.9% of total IDs is distributed in the South and in the Islands.

Analyzing the sector of specialization of IDs, in 2011 the main sectors are: mechanic sector (27% of total IDs), textiles and clothing (22.7%), household goods (17%), leather goods and footwear (12.1%) and food industry (10.6%). The numbers prove that many districts in recent time have moved to mechanical industry and metallurgical industry, while household goods, leather and footwear present negative dynamics (Schilirò 2017); industrial district are thus moving from final good specialization, which suffers from cost-based competition, to capital goods' specialization (Giuliani and Rabellotti 2017).

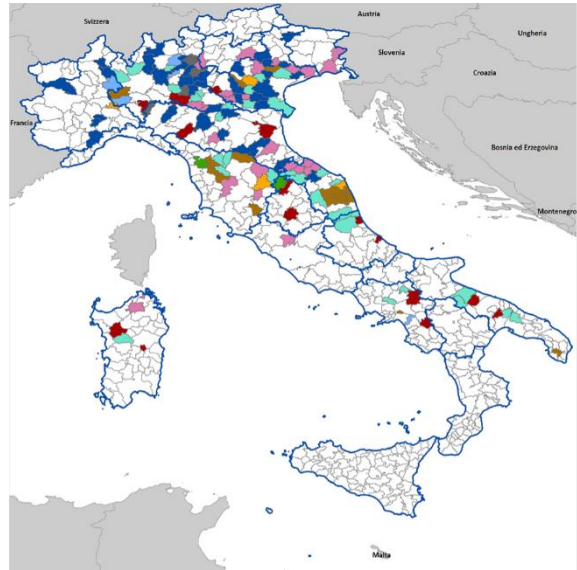
⁶ Employment effect: difference between the employees of the previous period (2001) and employees of the period considered (2011).

Figure 7. Italian IDs 2001



Source: Istat

Figure 8. Italian IDs 2011



Source: Istat

Main industry

- Non-district LLS (502)
- Textiles and clothing (50)
- Leather goods and footwear (24)
- Household goods (37)
- Jewelry and related, music instruments, etc. (5)
- Food industry (13)
- Mechanic industry (42)
- Metallurgical industry (1)
- Chemical, petrochemical industries and rubber products (5)
- Paper and polygraph industries (3)
- Other manufacturing industries (1)

1.2.4. INDUSTRIAL DISTRICTS AND THEIR IMPACT ON THE ECONOMY: POSITIVE EXTERNALITIES

Industrial districts are known to provide positive economies to firms belonging to them; thanks to the trust and cooperation among actors, IDs can decrease the transaction costs, while increasing the competitiveness of local firms (Cucculelli and Storai 2018). The competitiveness of industrial districts stays in the rooted socio-economic-institutional inter-firm relationships: IDs become places for permanent, intangible and specialized knowledge, attracting companies outside them, also for their strong export performance (Menghinello, de Propriis, and Driffield 2010).

Companies operating in the district have been found to present higher profitability and productivity when compare to firms outside the ID, and they have a lower cost of financing as

they benefit of the reputation of being less risky firms than those operating alone (G. Giordano et al. 2016).

For long time, two main approaches have been used to explain the sources of competitive advantage which are: the industry structure view and the resource-based view. The first one, mainly supported by Porter, assesses that the superior performance of a company is mostly due to the belonging to an industry with specific characteristics; on the opposite, the second perspective considers the role of resources and competences of the individual firm as the catalysts for the competitive advantage of the firm itself. Both these perspectives present some limits in understanding the competitive advantage generated by networks.

To explain the interorganizational competitive advantage generated by companies belonging to industrial districts we refer to the relational view of competitive advantage, which tries to give a contribution in explaining the rationale of better performance considering also the power of relationships among companies (Dyer and Singh 1998).

The extra profit granted by relational rent seems to have four different sources: investments in relation-specific assets, knowledge exchange, combination of scarce resources and capabilities and lower transaction costs. When dealing with specific assets, the possibility to generate a relational rent is highly affected by the length of safeguard and the volume of transactions (Dyer and Singh 1998); in the case of IDs, the volume of transactions seems to be the most important factor to affect this source of relational rent.

Moreover, superior interfirm knowledge-sharing routines are generated in IDs; these are boosted by the capacity of firms in the IDs to absorb knowledge (in terms of know-how and information) coming from another firm and by the incentives for knowledge sharing, which in industrial districts are mainly represented by informal norms of reciprocity. In IDs, firms and suppliers collaborate and this enables transfer of knowledge and processes of co-creation of knowledge to reach the same goal.

Another player in the creation of relational rent is the complementarity of resources and its synergistic value; besides strategic complementarity, organizational complementarity is necessary, intended as the compatibility in decision processes, cultures, routines. In IDs, organizational complementarity is easier than in other environments; thanks to the communitarian factor, firms share the same local culture, norms and values.

To minimize transaction costs, firms in IDs rely on self-enforcement agreements, where the informal safeguards (trust and reputation) end to be the most effective and least costly. As the parties know each other, contracting costs are avoided, monitoring costs are lower as based on self-monitoring and not third-party monitoring; self-enforcement agreements can be easily adapted and they do not have limitations in time (as contracts do) but it is undeniable that

interorganizational trust requires some time to be created and the risk of opportunism - as any risk - cannot be avoided (Dyer and Singh 1998).

A study conducted on network contracts among Italian SMEs (Villa and Taurino 2018) highlights that the typical goal of these contracts is expanding markets (38%), to collaborate to increase their innovation strength (17%) and to increase production capacity (20%) and their ability to compete (15%).

Furthermore, many studies prove the role of local institutions to sustain the competitive advantage of IDs, as they can intervene in the local context through projects, incentives, initiatives to facilitate knowledge sharing among firms (De Marchi, Di Maria, and Gereffi 2017).

In general, ID represents a model thanks to which small enterprises succeeded in being competitive in an international scenario through flexible specialization and collaboration with other firms of the similar size; these firms benefit from agglomeration effects. As firms in an ID are concentrated on the same specific industry, the efficiency at firm-level is boosted by the availability of many specialized suppliers and by the division of labor which increase both the economic performance and competitiveness; IDs become centers of high social mobility, so that workers are specialized and put in their optimal positions.

Proximity influences the innovation process too, as knowledge is more easily shared; the ID becomes an innovative milieu, where firms take information from external sources (Paniccia 2002). IDs succeed in creating knowledge due to the interaction between tacit knowledge and codified knowledge; first, tacit knowledge is shared among the different firms and it becomes codified knowledge, then firms reuse different types of codified and tacit knowledge and internalize the explicit knowledge, thus converting it in tacit knowledge (Paniccia 2002).

More than be considered as centers of innovation, IDs have been seen by some authors as centers of competencies; indeed, the innovation of IDs is an incremental one and not a radical one, even if in the last years there has been an intensification of product and process innovation also through research activities where universities, enterprises consortia and research centers collaborated (Osservatorio nazionale dei distretti italiani 2015).

For long time, IDs have distinguished themselves for the high quality of their products – they are well known to be the major contributors to the ‘Made in Italy’ reputation of Italian goods – thus avoiding direct competition with emerging markets, which presented lower quality goods. Nowadays, the challenge is even tougher, as developing markets propose higher quality products than they were used to.

As mentioned before, the economic crisis of 2008 caused a decrease in the local advantages of belonging to an ID and the changes in characteristics of IDs, mainly due to globalization and to

the attempt to cope with competitive external scenarios, make the analysis of the ‘district effect’ nowadays more complex than it used to be in the past.

Indeed, nowadays it becomes critical to analyze these global transformations using the global value chain framework to understand the recent evolution of industrial districts too (De Marchi, Di Maria, and Gereffi 2017); complex interdependences between the local and global contexts are present and understanding this nexus is necessary.

This nexus is sometimes driven by large enterprises which better understand the international scenario, thus creating hub-and-spoke districts; nowadays, one of the pillars of the ID framework, which is the size of companies that needs to be of small and medium scale, seems to be lacking and this makes the positive spillovers of the industrial districts not to be equally distributed.

It is not a case that. while the first quantitative analysis on industrial districts in Italy assesses the positive effect on profitability and productivity, in the most recent empirical studies the effect is lower if not absent; it seems that the benefit coming from belonging to an industrial district depends also on characteristics of the individual firm.

As analyzed during this section, IDs are known to provide tangible and intangible effects which together contribute to a better performance of the district firms (Ganau and Rodríguez-Pose 2018); this thesis not only presents an empirical analysis about the ‘district effect’ in Central and Northern Italy but it aims to understand whether the ID’s context can help the entrepreneurial fabric to recover from a negative shock, such as the one represented by the presence of a criminal organization.

In the next section the research question of this thesis is presented.

1.3. RESEARCH QUESTION

As previously shown, mafia and industrial districts are able to affect the economy of Italy in opposite ways.

Indeed, mafia lowers the level of trust and cooperation among the local actors and it generates deresponsibilization towards the local community, allowing companies which do business with mafia to operate in protected systems where the concurrence laws are weakened. This is a first issue that needs to be considered while trying to understand the ways in which mafia penetrates into the legal economy and negatively affects it; the environment created by mafia is one where the competitive rules of the market are not valid. Consequently, it represents a scenario where not the best companies but the companies which have the right connections survive.

Not only mafia sets the rules of the game and it supervises the economic transactions among the different players; it also extracts resources from companies through extortions and it makes the cost of credit higher for non-criminal companies, as investing in areas characterized by the presence of mafia is risky.

On the other side, I consider industrial districts, which represent one of the pillars of the Italian manufacturing industry. In IDs frameworks, human and relational capital is at the core of the competitive advantage rather than the mere financial capital; industrial districts represent an environment where entrepreneurs can learn and expand innovative ideas and processes, and a terrain where to test new ideas coming from the external markets (Corsi 1990).

In industrial districts, companies benefit not only from geographical proximity but also from social and cultural proximity which allows economies of agglomeration to be stronger; in this sense, as mentioned before, knowledge is more easily shared, workforce specialization and mobility is present, small companies can benefit from a lower cost of credit due to the good reputation of the district, as a prosperous and technologically up-to-date area.

The idea to investigate the interaction between mafia and industrial districts is particularly interesting as, although being very different, they both present a strong attachment to the territory and they both heavily rely on social capital.

Traditionally, mafia sets its control on the territory as it represents a guarantor of the social order; for long time it has not been perceived as a threat towards the State, which has considered it as a supplementary authority to solve particular situations (Sciarrone 2002). The territorial control of mafia has always been exercised through the extortion system, which has become a tool of recognition of the reputation of mafia, as well as a tool of capital accumulation (Sciarrone 2002). While expanding, mafia first gains economic legitimacy and then, thanks to it, it sometimes sets its control on the territory.

On the other side, a limited territory is at the basis for the generation of IDs, as it identifies a local community and its characteristics. In this system, local institutions play a critical role in supporting cooperation among firms; although industrial districts rely on external links to place their surplus of products, the proximity among firms and the belonging to a specific territory (which also means shared culture and values) are at the core of industrial district competitiveness.

Both mafia and industrial districts represent successful models based on a strong network of relations: the so called social capital. As a matter of fact, mafia criminal organizations can rely on active support of different players in the society, both in the legal and illegal sectors; in this sense, mafia founds its action on violence and on its relational assets. On the other side, the constant network of relations among the district firms and outside, with the external market, is the lifeblood of the industrial district framework.

Moreover, the role of institutions is relevant in both cases; for mafia criminal organizations institutions act as entry barriers – or at least they should, as sometimes they recognize mafia organizations as institutions able to control a territory (Sales 2015). In industrial districts, institutions support the competitive advantage and they guarantee the positive externalities typical of the ID.

This thesis proposes to figure out whether the positive advantages generated by industrial district model, which include the skilled workforce, the common organizational methods, the access to product facilities (Schilirò 2017), are able to mitigate the negative impact of mafia presence on the surrounding local economy. In this regard, considering areas where a criminal company used to be active, the performance of companies in district areas is compared with the performance of companies in non-district areas before and after the elimination of a criminal company.

Consequently, this study assesses whether the recovery, after the removal of mafia, is stronger and faster for companies in district areas or it is not. We can imagine that the removal of mafia criminal companies entails a restoration of the market regulation mechanisms thus leading to better performance of non-criminal companies; this thesis goes beyond this intuition, and it investigates the role played by district context in the particular situation of areas characterized by the presence of crime.

A complementary perspective – which is to check how the positive effects of operating in geographical proximity (industrial clusters) are reduced by the presence of organized crime - is used by Ganau and Rodríguez-Pose (2018); their study, conducted on Italian firms, finds out that the positive effect arising from the geographical concentration decreases when organized crime's presence increases. The indirect negative effect of organized crime – in the sense that

mafia criminal organizations alter the equilibrium and the relationships among companies along the supply chain and they lessen trust and cooperation, thus reducing the positive externalities of clusters – is even stronger for firms of smaller size rather than for those of larger size. In their aforementioned paper, Ganau and Rodríguez-Pose analyze the interaction between organized crime (measured by three types of crime which are mafia-type association, mafia-murders and extortions) and industrial clustering – measured taking into account the input-output relationships among industries both horizontally and vertically (Ganau and Rodríguez-Pose 2018).

This thesis investigates the interaction between organized crime and industrial districts as defined and listed by Istat; the presence of organized crime comes from a sample of mafia criminal organizations which have been removed during police operations.

When exploring the interaction between mafia and districts, it is reasonable to consider once again the opposite trends of these two phenomena in relation to the economic and financial crisis of 2008; the crisis accelerated the spread of mafia in the economy of the whole country, while it weakened the cooperation and trust between companies within industrial districts, whose priority was the survival.

Another phenomenon which must be kept in mind while conducting the analysis is globalization: for mafia, it represents an opportunity to diversify their business while becoming always more difficult to investigate, for industrial districts it represents a threat to the attachment to the territory (delocalization) entailing a reconsideration of its features. Nevertheless, internationalization doesn't prevent relations with local strategic partners (which are more cautiously selected) can represent an opportunity for industrial districts too, as it generates a stronger service demand thus encouraging the development of tertiary functions in the district itself (Corò and Micelli 2007).

To assess the interaction between mafia and industrial districts, the performance of companies operating in a district area is compared to the performance of companies operating in a non-district area – where in both areas a criminal company has been removed. The geographical unit considered is the Local Labor System, which is the correspondent of Labor Market Area. In this way, I estimate whether the benefits of the removal of a criminal organization are stronger in district areas or not; in other words, the basic insight that the thesis investigates is whether the industrial district's fabric contributes positively to the recovery of companies.

In the analyses presented, I assume that formal and informal institutions of the district do have an influence not only on the companies belonging to the industrial district itself but also to companies operating in its surrounding area. This is in line with the assumption that the territory plays a crucial role in the accumulation of technical specialized knowledge typical of the

district, which can be hardly transferred through typical formal communication channels (Corò and Micelli 2007). The aforementioned positive externalities of industrial districts depend also on extra-local structural conditions; these are represented for example by a final market with a heterogenous and flexible demand, a political and legal context that can support the development of SMEs networks and the availability of production technology which can decompose the production process (Bellandi and Ruiz-Fuensanta 2010). Moreover, the territorial proximity represents a way to have continuous relations with scientific institutions, such as universities, research centers, at the basis of the creation of knowledge and innovation (Corò and Micelli 2007).

This thesis proposes first an analysis on performance measured in terms of ROA, ROI and ROE. A first regression model assesses the different performances on LLS basis, comparing district LLS (where at least one industrial district is present) to non-district LLS, before, with the criminal organization, and after the police operation, which means without the criminal organization. In this case, the district LLS includes both the industrial district and the area outside it but belonging to the same LLS; consequently, the 'district effect' on the recovery is measured on the area as a whole, not considering the two parts that compose it.

Then, four different cases are investigated taking the single company as unit of analysis; thanks to the analysis of these different situations it is possible to verify how the recovery changes considering companies operating in an industrial district or companies operating in district areas (which don't present the same specialization of the industrial district).

An additional analysis on investments is provided; in this way it is examined how the level of investments changes before and after the removal of mafia and whether the district fabric represents also in this case the ideal environment for a company to recover.

Part of the Euro area, Italy too experienced a downfall in gross fixed capital formation both in 2008-2009 and during the sovereign debt crisis of 2012. If up to 2007 total investment expenditure in Italy increases year by year, the effects of the shock of the financial crisis of 2008 on investments are particularly pervasive in our country (C. Giordano, Marinucci, and Silvestrini 2016).

It becomes interesting to investigate if in the context of exacerbated uncertainty of the financial crisis of 2008, IDs act as frameworks where this uncertainty is mitigated by mutual trust and cooperation among companies. In general, in IDs the monetary returns are likely to be reinvested in the local framework (Corsi 1990) and companies are more willing to invest rather than to keep their resources unused. For sure, in the decade 2008-2017 the industrial district framework has suffered from the financial crisis too; as the last report by the Observatory of Industrial Districts assesses, the investment dynamic in IDs is still weak and it needs to be

monitored, although in the last years the district model has shown some signs of recovery after the crisis of 2008 which presents the main effects in 2011-2012 (Osservatorio nazionale dei distretti italiani 2015).

At the same time, the analysis is conducted on criminal areas only. As previously shown, the presence of organized crime can affect the level of investments of a company in different ways; entrepreneurs, conscious of the fact that part of the profit of their investment will go to mafia, are less motivated to invest; the quality of investments can decrease as mafia imposes investment projects which are not necessarily the best ones, and in general, mafia's presence discourages those willing to invest in the area.

In the following chapter the methodology is presented; first the sample is displayed, then the regression model and its assumptions are described, last the empirical results are shown.

2. METHODOLOGY

2.1. SAMPLE

The analysis is carried out using two datasets: first, a dataset of criminal firms is used to assess the presence of mafia; then, a dataset of non-criminal firms is used to assess the impact of mafia on the performance of companies. Moreover, these datasets are merged with the Italian Local Labor Systems' (LLSs) and the industrial districts' (IDs) identification made by Istat, as the aim is to verify whether the district environment provides a more favorable terrain for companies to recover. The territory considered is Central Northern Italy in the period 2008-2017.

2.1.1. WHAT I STARTED FROM: THE SAMPLE OF CRIMINAL FIRMS

In this thesis, the presence of mafia is given by the sample of criminal organizations used by Fabrizi, Malaspina, Parbonetti in their paper on the characteristics of criminal firms (2017); it is made of 649 criminal companies which used to operate in Central and Northern Italy and which have been removed after police operations from 2004 to 2014.

For the aim of this study, a firm is considered criminal when:

- It has been seized by the Italian authorities because linked to mafia organizations;
- A person arrested and sentenced for mafia association is part of the Board of Directors of the company;
- A person arrested and sentenced for mafia association is a shareholder of the firm with at least 10% ownership.

The sample provides the following information about the criminal companies: the company name; the fiscal code; the Istat code of the municipality of the legal seat; the Ateco 2007 code (2 digits); and the year of the police operation.

These data are integrated by associating for each criminal company: the correspondent LLS, the classification of the LLS (district or non-district), and the full Ateco 2007 code (6 digits).

2.1.1.1. THE LLSs SCHEME APPLIED TO THE SAMPLE OF CRIMINAL FIRMS

As already mentioned, the Local Labor System (LLS) is a territorial unit which indicates the place where a person has his or her habitual residence and place of work; consequently, it represents the place where a person carries on the most part of the social and economic relationships (Istat 1981 in Istat 2011c). A Local Labor System aggregates two or more municipalities, trying to maximize the level of interactions among municipalities belonging to it (Istat 1981 in Istat 2011c).

LLSs do not represent administrative borders, instead they define economic borders: in fact, some of them include different provinces and in some cases different regions too.

Local Labor Systems are defined following some common guidelines, which have been decided at European level to have a harmonized definition of Labor Market Area (Istat 2011d). In particular, the common principles to create Local Labor Systems (Figure 9) refer to: scope, as any LLS represents a labor market; relevance, as LLSs allow statistical information spread; completeness, as LLSs are a partition of the whole national territory; unity, as each municipality can belong to one and only one area; proximity, as each LLS is made of contiguous municipalities; coherence, as each area is made of a group of unsplit municipalities; compliance, as LLSs can disregard administrative borders; homogeneity, as LLSs are not too much extended areas or too populated in terms of employees (Istat 2011d).

Figure 9. Principles to be followed to create the Local Labor Systems



Source: personal elaboration

Local Labor Systems are crucial to properly analyze the labor market in Italy; to create them, the algorithm used by Istat starts from the daily commuting flows for job reasons, where for daily commuting movements we refer to people who go to work and return to their habitual abode, as it is detected by the 15th National Census (Istat 2011d).

Then, the algorithm used is called EURO, as it aims to reach a harmonization at European level of the identification of labor market areas - LMAs.

It takes into consideration two dimensions, which are: the number of resident employees and the self-containment index; this is an index elaborated both on the offering side (SCO) and on the demand side (SCD) of job places, computed as (Istat 2011d):

$$SCO = \frac{f_{ii}}{f_{i\cdot}}$$

$$SCD = \frac{f_{ii}}{f_{\cdot i}}$$

Where f_{ii} are the employees who live and work in location i

$f_{i\cdot}$ are the resident employees

$f_{\cdot i}$ are the job places of location i

Up to 2001, in order to create Local Labor Systems which respect the dimensional and self-containment constraints, one unique threshold is used on resident employees and self-containment functions, while with the EURO algorithm this constraint is overpassed (Istat 2011d).

As a matter of fact, a local system in order to be classified as local labor system needs to satisfy a trade-off between resident employees and self-containment functions. In this sense, two thresholds are established for each variable (resident employees and self-containment): a minimum threshold and a target threshold, where the minimum threshold for the self-containment is the minimum between the self-containment from the offer side and self-containment from the demand side (Istat 2011d).

The parameter of the minimum threshold defines the least value that needs to be met in order to accept the local system as local labor system while the target threshold indicates the minimum level of the considered dimension to accept a reduction in the level of the other variable (up to the minimum value) (Istat 2011d).

In practice, LLSs which present a high value for the self-containment (higher than the target threshold) can have a smaller size (the size being above the minimum threshold), while LLSs which are bigger (number of employees higher than the target threshold) can present a lower level of self-containment functions (accepting values above the minimum threshold) (Istat 2011d).

Consequently, the EURO algorithm establishes a new constraint that must be satisfied, and it refers to both the minimum threshold of self-containment (from a demand and offer perspective) and the dimension of the LLS (indicated by the number of employees).

In this way, small LLSs need to present a higher self-containment index while medium and large LLSs benefit from an increased flexibility (Istat 2011d).

The Local Labor Systems are identified by Istat every 10 years and they represent the territorial dimension at the basis of the identification of industrial districts; naturally, changes in number, dimension and composition – in terms of people and municipalities involved – of LLSs impact the industrial district framework (Istat 2011a).

Nowadays, in Italy there are 611 LLSs and 141 industrial districts identified by the National Census of Economic Activities of 2011; comparing with the previous LLSs' identification made in 2001, the number of LLSs has decreased while their dimension – both at municipality level and at population level – has increased (Istat 2011b); industrial districts moved in the same direction.

Industrial districts are listed by Istat and they are defined as a combination of a specific local area (namely: the LLS) and a specific productive specialization, indicated by the Ateco 2007 classification of economic activities.

The Ateco 2007 classification assigns a 6-digits code to every Italian company, depending on its main activity; it takes into account industries and services which are then broken into Agricultural manufacturing activities, Extractive industry, Construction, Manufacturing industry, Enterprises services, Consumer services, Social services, Traditional services (Istat 2011c).

Industrial districts are areas characterized by manufacturing activities, consequently it becomes critical to consider the classification of the manufacturing industry, which is decomposed into: Textiles and apparel; Leather goods and footwear; Household goods; Jewelry, musical instruments etc.; Food industry; Mechanic industry; Metallurgical industry; Chemical, petrochemical industries and rubber products; Transport equipment; Paper and polygraph industry; Other manufacturing industries.

Figure 10 displays the list of Ateco 2007 codes associated by Istat to each industrial typology; these are used to identify the productive specialization of firms.

Matching the territorial area and the productive specialization and considering the size of enterprises present in the area analyzed, Istat identifies the industrial districts present in Italy.

Figure 10. Industrial typologies for manufacturing activities

Industrial typology	Ateco 2007 codes
Textiles and apparel	13, 14
Leather goods and footwear	15
Household goods	16, 23, 31, 3291, 32994, 9524, 9529
Jewelry, musical instruments, etc.	264, 3211, 3212, 322-324
Food industry	10, 11, 12
Mechanic 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, 2441-1445, 2451, 2452
Chemical, petrochemical industries and rubber products	19, 201-204, 2052-2060, 21, 22, 2446, 268, 2733, 32991
Transport equipment	291, 292, 29320, 301-303, 30911, 30912, 30921-30923, 30990, 3315-3317, 38312
Paper and polygraph industry	17, 181, 581, 59201, 59202
Other manufacturing industries	20510, 30924, 3213, 32992, 32993, 32999, 3319, 38311, 3832

Source: personal elaboration on Istat

The identification of industrial districts is made through a 4-step approach (Istat 2011c):

1. Identification of mostly manufacturing LLSs. For each LLS a territorial concentration coefficient is calculated for every economic activity of industries and services, using the following relation:

$$(LLS_{emp,ateco} / ITA_{emp,ateco}) / (LLS_{emp,tot} / ITA_{emp,tot})$$

where:

$LLS_{emp,ateco}$ indicates the employees ('addetti'⁷) of a single economic activity in a LLS

$ITA_{emp,ateco}$ indicates the employees of a single economic activity in Italy

$LLS_{emp,tot}$ indicates the total employees of industry and services in a LLS

$ITA_{emp,tot}$ indicates the total employees of industry and services in Italy.

When the value of this index is higher than the national mean in manufacturing, enterprises services or consumer services, the prevalent sector is then calculated through the following relation:

⁷ 'Addetti' is the plural of the Italian word 'addetto' and it indicates people occupied in a sector, in a company, in a productive unit.

$$[(LLS_{emp,ateco} / ITA_{emp,ateco}) - (LLS_{emp,tot} / ITA_{emp,tot})] * ITA_{emp,ateco}$$

When the higher value corresponds to manufacturing industry, then the LLS is considered mostly manufacturing.

2. Identification of mostly manufacturing LLSs of SMEs, through the following relation:

$$(LLS_{emp(dimclass),manuf} / ITA_{emp(dimclass),manuf}) / (LLS_{emp,manuf} / ITA_{emp,manuf})$$

where:

$LLS_{emp(dimclass),manuf}$ indicates the employees of each size class of productive units of the manufacturing industry in a LLS

$ITA_{emp(dimclass),manuf}$ indicates the employees of each size class of productive units of the manufacturing industry in Italy

$LLS_{emp,manuf}$ indicates the total number of employees of the manufacturing industry in a LLS

$ITA_{emp,manuf}$ indicates the total number of employees of the manufacturing industry in Italy

In this way, we obtain the LLSs for which the territorial concentration coefficient is higher than the national one in the size class of reference. The higher value in one of the size classes (micro, small and medium) defines a mostly manufacturing LLS of SMEs.

3. Identification of main industry of mostly manufacturing SLL of SMEs. To understand which the industry of specialization of each LLS is, a coefficient of territorial concentration for each of the subgroups of the manufacturing industry is calculated in the following way:

$$(LLS_{emp,ind} / ITA_{emp,ind}) / (LLS_{emp,man} / ITA_{emp,man})$$

$LLS_{emp,ind}$ indicates the employees of a single industry in a mostly manufacturing LLS

$ITA_{emp,ind}$ indicates the employees of a single industry in Italy

$LLS_{emp,man}$ indicates the manufacturing employees in a mostly manufacturing LLS

$ITA_{emp,man}$ indicates the employees of the manufacturing industry in Italy

Then, to assess the prevalence of an industry for those LLSs for which a territorial concentration coefficient is found to be higher than the national mean, it is calculated:

$$[(LLS_{emp,ind} / ITA_{emp,ind}) - (LLS_{emp,man} / ITA_{emp,man})] * ITA_{emp,ind}$$

The higher value in one of the industries indicates the main industry of the LLS.

4. Identification of industrial districts. The last step for the identification of IDs, is composed by two requirements:

- a) The employment of micro, small and medium enterprises belonging to the main industry of the LLS needs to be higher than the half of the total employment of the main industry, which means:

$$(LLS_{emp(sme),ind_m} / LLS_{emp(tot),ind_m}) > 50.0\%$$

where:

$LLS_{emp(sme),ind_m}$ indicates the employees of the main industry occupied in small and medium enterprises in a mostly manufacturing LLS of SMEs

$LLS_{emp(tot),ind_m}$ indicates the total employees of the main industry in a mostly manufacturing LLS of SMEs

- b) The employment of productive units of micro, small and medium dimension belonging to the main industry of the LLS must be higher than the half of productive units of medium dimension, when only one productive unit of medium dimension is present

$$(LLS_{emp(m_ent),ind_m} / (LLS_{emp(me_ent),ind_m})) > 50.0\%$$

$$(LLS_{emp(s_ent),ind_m} / (LLS_{emp(me_ent),ind_m})) > 50.0\%$$

where:

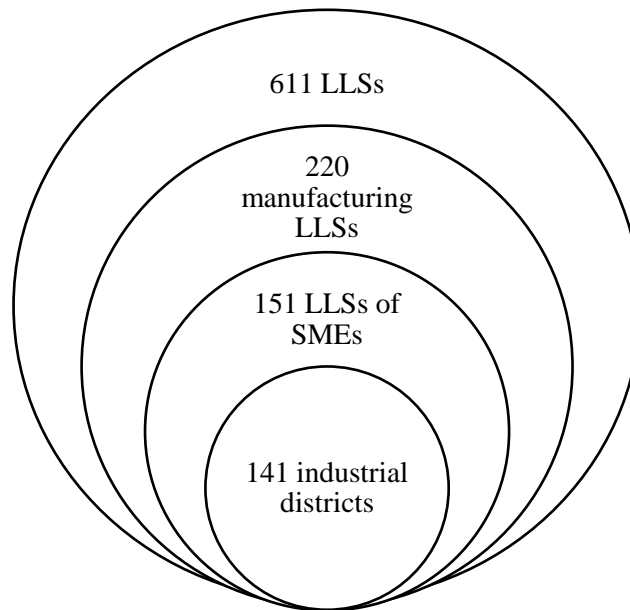
$LLS_{emp(m_ent),ind_m}$ indicates the employees of the main industry occupied in the productive units of micro dimension in a mostly manufacturing LLS of SMEs

$LLS_{emp(s_ent),ind_m}$ indicates the employees of the main industry occupied in the productive units of small dimension in a mostly manufacturing LLS of SMEs

$LLS_{emp(me_ent),ind_m}$ indicates the employees of the main industry occupied in the productive units of medium dimension, when there is only one productive unit, in a mostly manufacturing LLS of SMEs.

Figure 11 shows the 4-step process used to identify industrial districts in Italy; starting from the 611 Local Labor Systems, the procedure leads to the identification of 141 industrial districts. This classification is used in the thesis in order to understand which the companies operating in industrial districts are.

Figure 11. From LLSs to Industrial Districts



Source: personal elaboration

To integrate the original sample of criminal firms, data are downloaded from the database AIDA and from TELEMACO, an online service where official documents of the commercial registers can be consulted, when data on AIDA was not available.

In particular, information about the Istat code of municipality and the full Ateco 2007 code (6 digits), for each company, are downloaded.

Then, the LLS of the company is found considering the Istat code of the legal seat and using the classification provided by Istat, which lists for each Istat code of municipality the correspondent LLS.

In order to classify the LLS of each company as district or non-district, I rely on the classification of IDs made by Istat: it provides a list of the Local Labor Systems where industrial districts are present together with the LLSs' codes, the LLSs' denomination and the sectors for each district LLS.

This list is integrated associating for each sector (industrial typology) the correspondent Ateco 2007 codes (as shown in Figure 10), divided in 2-digit, 3-digits, 4-digits, 5-digits, 6-digits codes. Consequently, I divided in subgroups (2-digit, 3-digits, 4-digits, 5-digits, 6-digits) the 6 digits Ateco 2007 code for each company.

2.1.1.2. ARE CRIMINAL FIRMS LOCATED IN AN INDUSTRIAL DISTRICT?

Starting with the sample described in the previous section, it is assessed whether some criminal companies were operating inside an ID.

In order to do so, each criminal firm of the sample is matched with the 141 industrial districts identified by Istat in 2011, following these steps:

1. STEP ONE

For each company, it is associated its LLS and it is determined whether it is a district one (when it includes, at least, one industrial district) or not. Then, the sample is filtered considering only companies operating in district LLSs.

Among 649, 111 criminal companies used to operate in 38 district LLSs, while the remaining 548 were present in a non-district LLSs (Figure 12).

Figure 12. Distribution of the sample of criminal firms in district and non-district LLSs

	Criminal firms	Criminal LLSs
District LLSs	111	38
Non-district LLSs	538	64
Total	649	102

Source: personal elaboration

2. STEP TWO

For each of the remaining criminal companies, the correspondent LLS and the Ateco 2007 code (divided in subgroups of 2-digit, 3-digits, 4-digits, 5-digits, 6-digits) are matched with the classification provided by Istat. The whole process leads to the identification of only 2 criminal companies operating inside an ID.

Due to the limited number of criminal firms operating in IDs, it becomes more meaningful to conduct the analysis on LLS basis. In this sense, companies are grouped by LLSs, classified into district (when at least an industrial district is present in the area covered by the considered LLS) and non-district LLSs.

This is justified by the fact that, in general, positive externalities of industrial districts can represent benefits also for companies in the surrounding area; these positive spillovers are represented by local institutions, social capital and relations. Moreover, the interrelation between the production domain and the social domain of Marshallian industrial districts indicates not only a geographical proximity but also a cultural and social proximity (De Marchi and Grandinetti 2014).

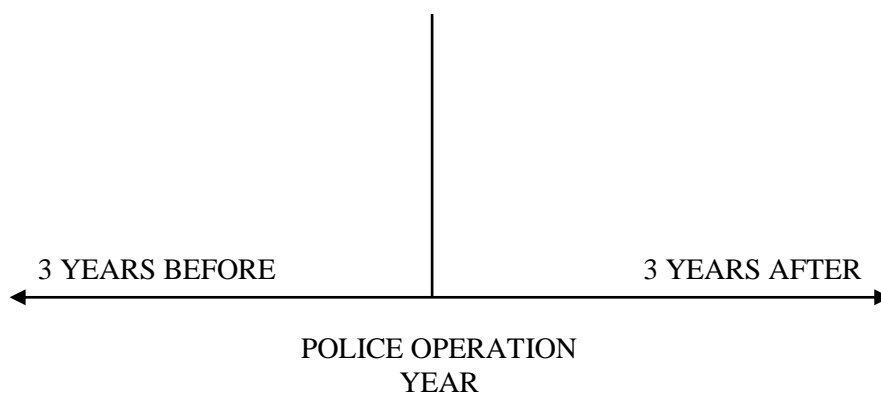
Consequently, in the case of a district Local Labor System, which includes companies operating in industrial districts as well as companies not operating in industrial district, it is assumed that some communitarian factor is at work in the whole LLS territory, as the Local Labor System represents a limited territory.

Moreover, recent studies (De Marchi and Grandinetti 2014) show that industrial districts in Italy present a non-concentric diversification trend in activities that are not linked with the district specialization; this has a positive effect on the territory. In this sense, the proxy of district LLS used to measure the ‘district effect’ seems to be adequate as it enlarges the area of analysis including companies whose performance may be positively affected by the traditional characteristics of industrial districts and by the most recent trends.

The scope of the thesis is evaluating the ‘district effect’ through a comparison among the performances of firms operating in district and non-district areas characterized by a presence of (at least) a criminal firm; to conduct the analysis the year of the police operation is used as a proxy for the moment of removal of mafia.

In this sense, the year of police operation acts as a watershed between a period where mafia is present and a period where mafia is assumed to be eliminated; the observations for the year where the police operation took place are not considered, as they could bias the results. The period considered before and after the removal of mafia is three years; the following figure represents the time framework of the analysis (Figure 13).

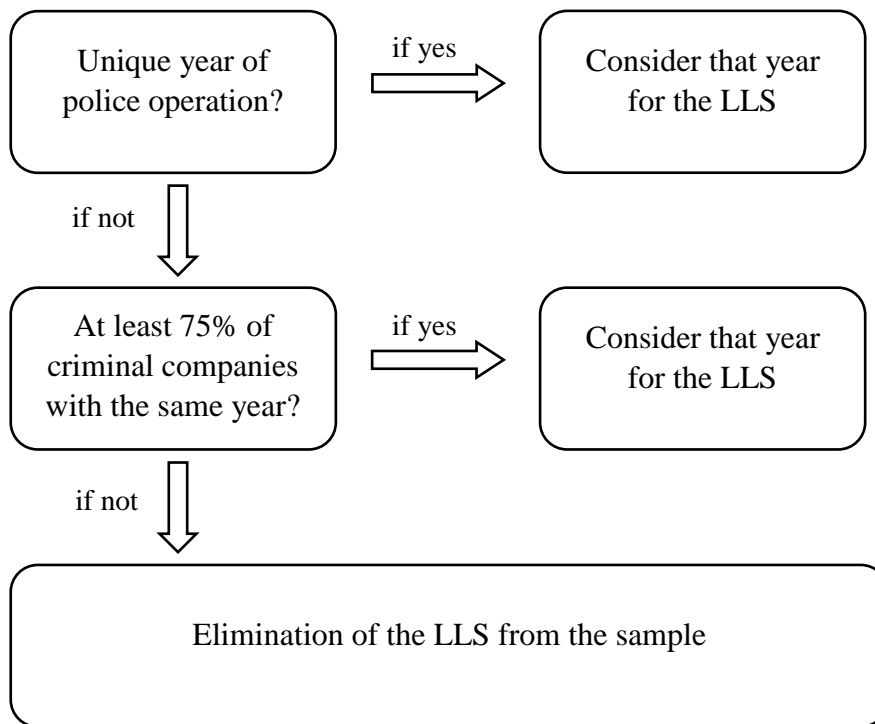
Figure 13. Time framework of the regression model



Source: personal elaboration

Moreover, considering that the unit of observation for the analysis is the LLS, there is the need to associate one year of police operation to each LLS, while in some cases there are multiple police operations for the same LLS. In these cases, the year of police operation considered is the one presented by at least 75% of the criminal companies in the LLS. When the just mentioned threshold of 75% is not met, the LLS is excluded from the analysis (Figure 14).

Figure 14. Process to associate only one year to a criminal LLS



Source: personal elaboration

The presented sample of criminal companies is the point of start of the analysis: it defines the territorial dimension of the research, which is based only on those areas characterized by a proved presence of a criminal organization in the past.

2.1.2. SAMPLE OF NON-CRIMINAL FIRMS

To assess the performance of companies operating in the same area where a criminal company used to operate data are downloaded from the database AIDA. The thesis takes into consideration only corporations that have to deposit the financial statements, which are limited share and limited liability Italian companies (Spa and Srl), as AIDA collects data from the Italian Register of Companies and from Italian Chamber of Commerce. AIDA stores data of the last ten years (2008-2017); as the period chosen for the analysis is three years before and three years after the removal of mafia, areas for which the year of police operation is before 2011 are excluded from the analysis.

As the study is focused on Central and Northern Italy, data are downloaded on a regional basis, excluding those regions belonging to the South and the Islands. Namely, the sample include the following regions: Lombardy, Piedmont, Veneto, Aosta Valley, Trentino-South Tyrol, Friuli Venezia Giulia, Marche, Tuscany, Emilia-Romagna, Umbria, Liguria, Lazio.

The search strategy used for each region is a Boolean one which looks for companies operating in each region considered (with every region identified by a number in AIDA) and for which financial statements are available consecutively from 2008 to 2016 or from 2008 to 2017.

For each company, data downloaded in AIDA (which include both financial variables but also the Ateco 2007 classification and information about the location of the firm) are integrated with the information about the LLS which the company belongs to and the correspondent year of police operation, when available, to form the final dataset. In particular, the size of the LLS is given by the number of local units in the LLS as provided by Istat; a dummy variable is created to indicate whether the LLS is criminal (when at least one of the criminal firms of the sample was operating in that LLS) or not; and another dummy variable specifies whether it is a district LLS or a non-district one.

This dataset has been created in Excel and it is used as the point of start for the implementation of the regression model in Stata 14.

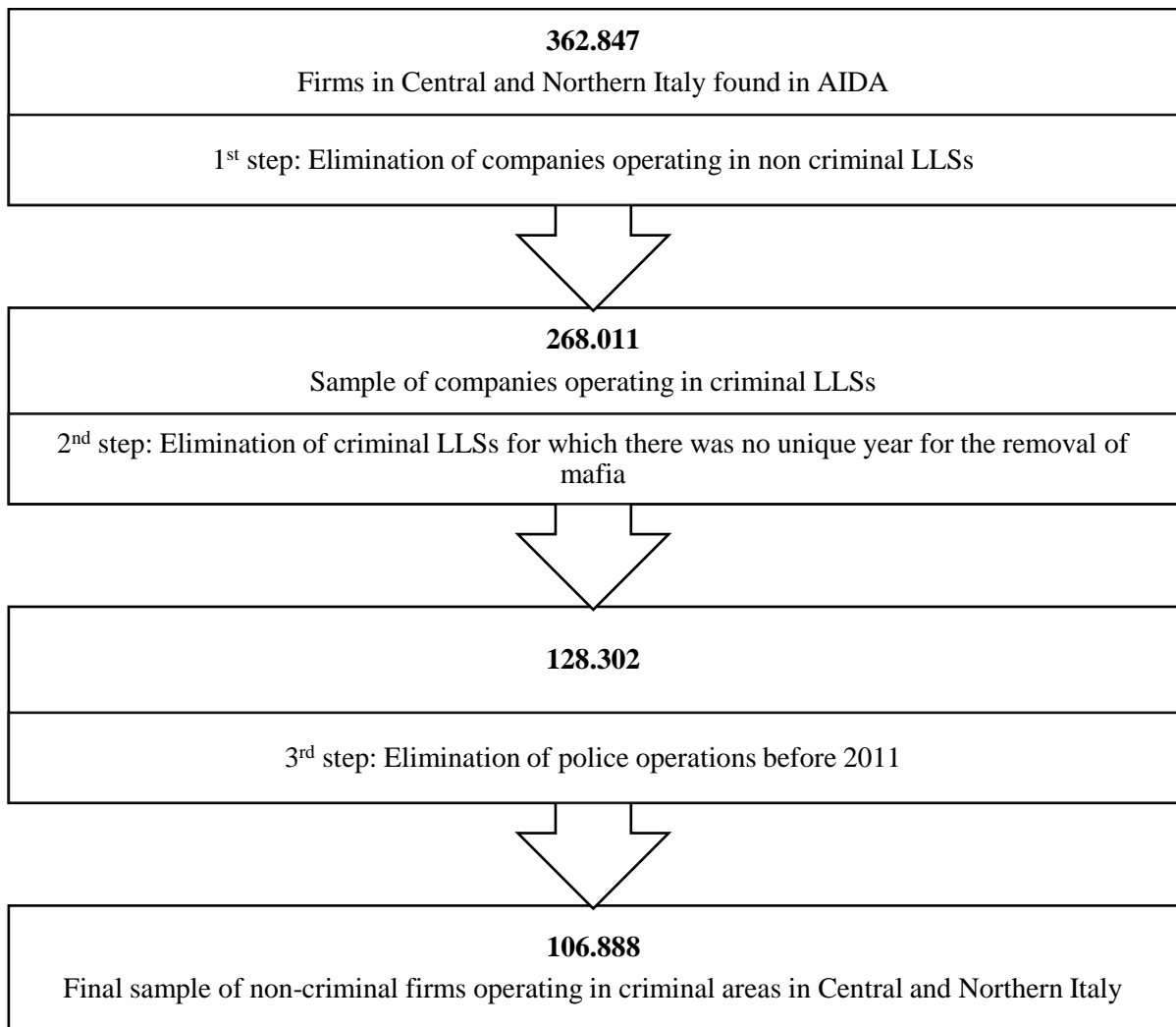
Once imported in Stata, additional variables are created to assess whether the company belongs to an industrial district or not; in this sense, the dummy variable *ID* is generated, and it takes value 1 when the company is part of an industrial district (specific industry typology in a specific LLS).

The sample still includes all the non-criminal companies; as mentioned earlier, the thesis focuses on areas where at least one criminal company used to operate.

To get the final sample, the process executed through commands in Stata is shown in Figure 15A; it is made of companies operating in areas where a criminal firm was present (1st step), for which it is possible to consider a unique year for the removal of mafia (2nd step), considering years of removal since 2011 (3rd step) as for previous years it is not possible to conduct the analysis on a three year basis (this is due to the fact that AIDA database stores data of the last ten years).

Lastly, data of the final sample are grouped by LLSs and data are reshaped to have variables as columns and their observations (which, for some variables, vary along years) as rows. The number of LLSs taken into consideration is 55 and for each LLS there are 6 observations (observations of the three years before the removal of mafia and of the three years after the removal of mafia): the total number of observations is 330 (Figure 15B).

Figure 15A. Sample selection



Source: personal elaboration

Figure 15B. Total observations of the model



Source: personal elaboration

2.2. A MULTIPLE REGRESSION MODEL

2.2.1. THE VARIABLES

The aim of this thesis is to analyze the performance of non-criminal companies; the regression model is applied on three different dependent variables, which are ROA, ROI, ROE.

I investigate whether belonging to a district area affects the recovery of non-criminal companies after a period of crime presence in their area of business. The independent variables of the model are: *DistrictLLS*, a dummy variable indicating if the LLS is a district or a non-district one, *PostOperation*, a dummy variable which counts 1 if the year considered is after the police operation and 0 in the opposite case and Interaction, and the *DistrictLLS-PostOperation* interaction. The following table sums up the variables which will be found in the model in the next section, including controls.

Table 1. Variables of the regression model

Variable	Dependent/independent/control variable	Variable type
Mean ROA/ROE/ROI	Dependent variable	Continuous
DistrictLLS	Independent variable	Dummy
PostOperation	Independent variable	Dummy
Interaction (DistrictLLS*PostOperation)	Independent variable	Dummy
Year	Control variable	Dummy, for each year
Region	Control variable	Dummy, for each region
Size	Control variable	Discrete
Lnrevenues	Control variable	Continuous
Debt-to-equity	Control variable	Continuous

Source: personal elaboration

2.2.2. ASSUMPTIONS OF THE MODEL

As mentioned before, the thesis tries to understand whether the district fabric of an area (LLS) can support the recovery of companies present in that area after the removal of a criminal company.

The fact that only two criminal firms are found to be operative in an industrial district is not enough to state that industrial districts are immune to criminal organizations; consequently, what this thesis tries to highlight is the different recovery – if any – after the removal of mafia between firms operating district and non-district areas.

As already mentioned, the research focuses on companies for which the economic and financial information is available on the database AIDA; these companies are limited liability companies and limited share companies, so that a part of companies is excluded from the sample.

We can assume that the sample of non-criminal companies considered is representative of the population as it represents a large share of the universe of Italian manufacturing industry and a larger share of Italian manufacturing firms that are required to deposit their financial statements (Cucculelli and Storai 2018).

2.2.3. THE MODEL

To test the different recovery between companies operating in district and non-district areas, after the removal of mafia, the following regression model is adopted:

$$Y_{lls,t} = \beta_0 + \beta_1 \text{DistrictLLS}_{lls} + \beta_2 \text{PostOperation}_{lls,t} + \beta_3 \text{Interaction}_{lls,t} + \beta_4 \text{Controls} + \varepsilon_{lls,t}$$

Where Y is the mean of ROA/ROE/ROI by LLS and *Controls* include year, region, size of LLS (in number of Local Units as provided by Istat), natural logarithm of total revenues at time t and debt-to-equity ratio (winsorized at level 1%).

The control variable *Year* (a dummy variable for each year observed) plays a critical role in the model: the analysis takes into consideration the performance of companies in the last ten years, thus, the period considered is affected by the financial crisis of 2008 and it becomes crucial to isolate the effects of this shock from the analysis.

The control variable *Region* takes into consideration the differences among regions in terms of institutions, cultures, laws and incentives; starting from a nominal variable which associates to each region the correspondent number in the classification provided by Istat, it is then introduced a dummy variable for each region.

The most interesting parameter is *Interaction*, as it assesses whether companies operating in a district area show a better performance compared with companies operating in a non-district area, after the removal of criminal organizations.

In the following table (Table 2A), descriptive statistics of the variables of the model (including control variables) is displayed, where the second one is for dummy variables only.

Table 2A. Variables of the model - descriptive statistics

Variable	N	Mean	Standard deviation	p25	p50	p75
ROA	330	2.1586	1.6268	1.2379	2.3730	3.2937
ROE	330	3.0593	2.4263	1.4967	3.0812	4.4573
ROI	330	4.8575	0.9737	4.2576	4.8050	5.4042
<i>CONTROL VARIABLES</i>						
<i>Size</i>	330	17984.27	42589.97	4992	7308	15916
<i>LnRevenues</i>	330	6.2890	0.2822	6.1112	6.2748	6.4613
<i>Debt-to-equity</i>	330	3.4668	1.901	2.2552	3.2044	4.2478

Note: ROA, ROE, ROI, natural logarithm of revenues (LnRevenues) and debt-to-equity values refer to winsorized values at level 1%.

In Table 2B the correlation matrix is reported. As expected, ROA, ROE, ROI, present significant positive correlation with each other, as they all are performance measures.

The size of the LLS seems to be negative correlated with the revenues; this may be explained by the fact that when the number of players increases the revenues by company decreases as it is less concentrated and better distributed. This reminds also a characteristic of the Marshallian ID which is the one to be populated by many firms of small and medium size.

Table 2B. Variables of the model - correlation matrix

	ROA	ROE	ROI	Size	Ln Revenues	Debt-to-equity
ROA	1.000					
ROE	0.4519	1.000				
ROI	0.3182	0.7118	1.000			
Size	-0.0601	0.0335	-0.0557	1.000		
LnRevenues	0.3313	0.4600	0.4404	-0.2801	1.000	
Debt-to-equity	0.2237	-0.0725	-0.2011	-0.0192	-0.0660	1.000

Note: The correlation matrix includes quantitative variables only. ROA, ROE, ROI, natural logarithm of revenues (LnRevenues), debt-to-equity values refer to winsorized values at level 1%.

2.3. EMPIRICAL RESULTS

2.3.1. MAIN ANALYSIS

The main analysis is conducted on performance at LLSs' level, comparing non-district and district LLSs; the regression model evaluates the change in performance of companies before and after the removal of the criminal firms, moving from a non-district area to a district area. In Table 3 the output of the analysis conducted on ROA is presented. The ROA as independent variable is the mean ROA by LLS, winsorized at level 1%. As the dependent variable is a percentage value, the estimated coefficients may therefore be interpreted as percentage values too.

Table 3. District effect – ROA

VARIABLES	(1) ROA %	(2) ROA %
DistrictLLS	-0.252 (0.220)	-0.613*** (0.207)
PostOperation	-1.956*** (0.184)	-0.419 (0.255)
Interaction	0.643** (0.321)	0.660*** (0.250)
Size		-1.66e-06 (1.48e-06)
LnRevenues		0.643* (0.367)
Debt-to-equity		-0.0481 (0.0464)
Constant	3.114*** (0.100)	0.868 (2.505)
Time fixed effects		yes
Geographic fixed effects		yes
Observations	330	330
R-squared	0.298	0.592

Note: In column (1) the output of the regression without control variables is displayed. In column (2) the output of the model with controls for region, year, size, revenues and debt-to-equity is presented. Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% level, respectively.

The output of the model shows a positive and always statistically significant ($b = 0.643^{***}$, column 1) estimated coefficient for variable *Interaction*, which can be interpreted as a faster recovery for companies operating in district areas than companies operating outside it, after a period where mafia was present in the territory.

A possible interpretation of this output is the fact that the social capital typical of industrial districts remains at work even when mafia is present and, then, after removal of criminal firms

it allows companies operating in district areas to recover faster.

Another explanation of a positive and statistically significant coefficient for *Interaction* can be represented by the fact that the negative effect of organized crime is more pervasive in district contexts so that once removed the criminal company, the benefits of this removal are greater, and the recovery process is stronger.

In the regression model with controls included, the analysis improves with a slightly higher estimated coefficient for the variable *Interaction* ($b = 0.660^{***}$, column 2).

This estimated coefficient for *Interaction*, which indicates that in periods after the removal (*PostOperation* = 1) of criminal firms the performance of firms inside district LLSs (*DistrictLLS* = 1) is better than the firms operating in non-district areas, supports the theory behind the positive spillovers of ID model lying in the fact that the informal network of relations and interactions among firms (suppliers and clients) in IDs is based on cooperation and trust, in a competitive environment. It can be hypothesized that, after the removal of criminal organizations, which used to drive economic transactions lowering the level of trust among companies and imposing the different parties of the transactions, the ID fabric represents for companies an environment to recover more easily.

In the first analysis (column 1) the estimated coefficient of variable *PostOperation* is negative and statistically significant. This means that the additional effect of variable *PostOperation* is negative; in other words, the performance of firms keeping constant the effect of the area where they operate (variable *DistrictLLS*) is estimated to decrease after the removal of mafia. This may be due to difficulties met by companies to recover after the removal a mafia criminal firm: as mentioned before, mafia criminal companies operate as intermediaries linking different actors of the society, and they also provide ways to cut costs for companies. Consequently, when a criminal company is removed from a territory we can presume that the companies operating in that area find themselves to some extent impoverished as the network of relations is actually created and kept alive from the criminal organization.

When moving to the regression model with controls (column 2), the estimated coefficient of *PostOperation* becomes less negative and not statistically significant: this result is mostly affected by the control variable *Year*. As mentioned before, the period considered by the analysis is crossed by the economic crisis of 2008; consequently, the performance is affected not only by the removal of the criminal organization but also by other shocks too; the control variable *Year* allows to isolate the time fixed effects for each year. Thus, the estimated coefficient for *PostOperation* becomes smaller and it loses its significance, as the decline in performance is also due to other shocks of the single year considered (from $b = -1.956^{***}$ to $b = -0.419$).

Moving to the estimated coefficient of variable *DistrictLLS*, it is negative but not statistically significant in the first model (column 1). It is important to notice that the estimated coefficient of *DistrictLLS* becomes more negative and statistically significant when including controls in the analysis, the estimated coefficient for *DistrictLLS* increases and it becomes statistically significant (from $b = -0.252$ to $b = -0.613^{***}$). This output referred to the estimated coefficient for *DistrictLLS* is in line with recent researches conducted on IDs in Italy which didn't find a 'district effect' on the whole population of firms belonging to a district area (Cucculelli and Storai 2018).

I applied the same regression model also for other two measurements of performance, which are ROE and ROI.

Table 4 displays the output of the regression in case the dependent variable is ROE, intended as the mean ROE by LLS winsorized at level 1%. Also in the case of ROE, in the first analysis the coefficient of *DistrictLLS* is negative but not statistically significant ($b = -0.590$, column 1) while it becomes negative and statistically significant ($b = -1.185^{***}$, column 2); the coefficient of *PostOperation* is in the first analysis negative and statistically significant, while it is negative but not statistically significant in the model with control variables.

Table 4. District effect – ROE, regression with controls

VARIABLES	(1) ROE %	(2) ROE %
DistrictLLS	-0.590 (0.362)	-1.185*** (0.313)
PostOperation	-1.712*** (0.318)	-0.430 (0.371)
Interaction	1.118** (0.534)	1.251*** (0.371)
Size		4.82e-06*** (1.83e-06)
LnRevenues		3.510*** (0.524)
Debt-to-equity		-0.104 (0.0712)
Constant	3.926*** (0.205)	-16.01*** (3.677)
Time fixed effects		yes
Geographic fixed effects		yes
Observations	330	330
R-squared	0.089	0.579

Note: In column (1) the output of the regression without control variables is displayed. In column (2) the output of the model with controls for region, year, size, revenues and debt-to-equity is presented. Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% level, respectively.

In Table 5 the output of the analysis on ROI is displayed, where ROI is the mean ROI by LLS winsorized at level 1%; the estimated coefficient of variable *DistrictLLS* is negative but never statistically significant, while the coefficient of variable *PostOperation* is negative and statistically significant in both analyses. In this regression model too, the estimated coefficient for *Interaction* is positive and statistically significant (at level 5% in the model without controls and at level 1% in the model with controls).

Table 5. District effect – ROI

VARIABLES	(1) ROI %	(2) ROI %
DistrictLLS	-0.128 (0.155)	-0.199 (0.127)
PostOperation	-0.466*** (0.125)	-0.484*** (0.158)
Interaction	0.487** (0.231)	0.557*** (0.160)
Size		-1.69e-06** (7.92e-07)
LnRevenues		1.137*** (0.225)
Debt-to-equity		-0.0251 (0.0250)
Constant	5.053*** (0.0823)	-1.134 (1.565)
Time fixed effects		yes
Geographical fixed effects		yes
Observations	330	330
R-squared	0.042	0.543

Note: In column (1) the output of the regression without control variables is displayed. In column (2) the output of the model with controls for year, region, size, revenues and debt-to-equity is presented. Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% level, respectively.

In the just presented analyses, for three different measures of performance (ROA, ROE, ROI – percentage values) the estimated coefficient of *Interaction* is always statistically significant. The decision to apply the regression model to three different performance measures is done in order to check the reliability of the result found in the first analysis made on ROA.

2.3.1. ROBUSTNESS

After a first analysis which tests the difference in performance between a district area and a non-district area, I investigated the ‘district effect’ as catalyst of a faster recovery after the removal of mafia with an additional analysis, made on company level. The observations are now referred to a single company over the years. I took into consideration 4 different cases (Figure 16):

- 1st case, where the performance of ID firms is compared with the rest of the population of firms. This includes companies which operate both in the area outside the ID but in a district LLS and in non-district LLSs. In this first analysis, the sample of companies is the same as the one used for the main analysis (the one conducted on LLS basis). The fact that the number of observations varies, and it varies also between the analysis without controls and the analysis with controls is explained considering that each missing value represents one less observation, while in the analysis made on LLSs each observation was a mean value, consequently the number of observations remained unchanged.
- 2nd case, where companies operating in an industrial district are compared only with companies located in a non-district LLSs. In this case, the sample changes, as companies which operate in the area belonging to the district LLS but outside the ID (companies with different productive specialization) are excluded from the dataset.
- 3rd case, where companies in an ID are compared with companies operating in the area outside the ID but located in a district LLS. In this case, I drop from the sample the companies belonging to a non-district LLS, in order to measure the difference between the ‘district effect’ (typical of the industrial district itself) and the ‘institutional effect’ (which the companies operating in a district LLS benefit from).
- 4th case, where companies belonging to IDs are excluded from the analysis, this case evaluates the performances of companies outside the ID but belonging to a district LLS and companies operating in a non-district LLS.

For the first three cases the following regression model has been used:

$$Y_{ils,t} = \beta_0 + \beta_1 ID_{ils} + \beta_2 PostOperation_{ilst} + \beta_3 Interaction_{ilst} + \beta_4 Controls + \varepsilon_{ils,t}$$

where the variable ID_{ils} is a dummy which values 1 when the company belongs to an ID (combination of LLS and type of specialization) and zero otherwise.

Controls include year, LLS, size of LLS (in number of Local Units as provided by Istat), natural logarithm of total revenues (winsorized at level 1%) at time t and debt-to-equity ratio (winsorized at level 1%).

The model differs from the previous one, as the variable *DistrictLLS* (which was a dummy used to determine the belonging to a district or non-district LLS) is replaced by the variable ID.

Moreover, the control variable used to assess the geographical fixed effects is LLS rather than region; as these analyses are made on company level, this choice is adopted in order to take into consideration the most part of the geographical features that impact the output (as LLS is a smaller unit of analysis than region, it should include both regional and local characteristics).

Figure 16. Robustness analysis – four cases. Colored squares: areas compared in the case (each color corresponding to an area); empty squares: areas not considered in the case.

1st case: ID vs the remaining population of firms

DISTRICT LLS	NON-DISTRICT LLS
ID	
Non-ID AREA	

2nd case: ID vs non-district LLS

DISTRICT LLS	NON-DISTRICT LLS
ID	
Non-ID AREA	

3rd case: ID vs non-ID area in district LLS

DISTRICT LLS	NON-DISTRICT LLS
ID	
Non-ID AREA	

4th case: excluding the ID

DISTRICT LLS	NON-DISTRICT LLS
ID	
Non-ID AREA	

Source: personal elaboration.

For the first case the sample is the same one of the main analysis, while for the second and third case I respectively drop companies which are in a district LLS but outside the ID (for which the condition $D = 1$ & $ID = 0$ is satisfied) and companies which are in a non-district LLS ($D = 0$).

For the last case, which drops from the sample the companies belonging to an ID, the same regression of the main analysis has been used:

$$Y_{lls,t} = \beta_0 + \beta_1 DistrictLLS_{lls} + \beta_2 PostOperation_{llst} + \beta_3 Interaction_{llst} + \beta_4 Controls + \varepsilon_{lls,t}$$

where *Controls* include year, LLS, size of LLS (in number of Local Units as provided by Istat), natural logarithm of total revenues (winsorized at level 1%) at time t and debt-to-equity ratio (winsorized at level 1%).

As I dropped from the sample the companies operating in IDs, the sample is composed by the companies in district LLSs but outside the ID and companies in non-district LLSs; consequently, I used the variable *DistrictLLS* to assess the change involved by moving from a non-district LLS to a district one.

The empirical results of the robust analyses are displayed in the following table (Table 6); for each case, two regression models are implemented (the first without control variables and the second with controls); ROA is the dependent variable considered to measure performance.

Table 6. Analysis on company basis: output of the four cases - ROA

VARIABLES	FIRST CASE		SECOND CASE		THIRD CASE		FOURTH CASE	
	(1) ROA%	(2) ROA%	(3) ROA%	(4) ROA%	(5) ROA%	(6) ROA%	(7) ROA%	(8) ROA%
Treated	0.374** (0.176)	-1.266*** (0.181)	0.498*** (0.178)	1.697 (1.761)	-0.0005 (0.175)	-1.011*** (0.180)	0.506*** (0.0509)	-1.894*** (0.409)
PostOperation	-1.082*** (0.0342)	-0.178* (0.103)	-1.164*** (0.0410)	-0.221* (0.125)	-0.911*** (0.0605)	0.282 (0.325)	-1.149*** (0.0406)	-0.258** (0.106)
Interaction	1.071*** (0.258)	1.295*** (0.257)	1.141*** (0.261)	1.361*** (0.257)	0.939*** (0.253)	0.996*** (0.256)	0.204*** (0.0749)	0.463*** (0.0873)
LnRevenues		0.806*** (0.0096)		0.848*** (0.0118)		0.704*** (0.0160)		0.806*** (0.0097)
Debt-to-equity		-0.0506*** (0.0012)		-0.0465*** (0.0014)		-0.0652*** (0.0022)		-0.0500*** (0.0012)
Size		-1.21e-06 (8.41e-07)		-1.14e-06 (8.47e-07)		4.05e-06 (4.09e-06)		-1.21e-06 (8.42e-07)
Constant	3.003*** (0.0228)	1.199*** (0.331)	2.865*** (0.0269)	0.907*** (0.343)	3.430*** (0.0419)	2.041*** (0.624)	2.880*** (0.0267)	1.163*** (0.332)
Time fixed effects		yes		yes		yes		yes
Geographical fixed effects (LLS)		yes		yes		yes		yes
Observations	608,913	431,085	456,394	318,329	161,171	119,755	600,261	424,086
R-squared	0.002	0.020	0.002	0.021	0.001	0.021	0.002	0.020

Note: Controls include: year, LLS, size, revenues and debt-to-equity. Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% level, respectively. Variable *Treated* is represented by the dummy variable ID for columns 1-6, while it is represented by dummy *DistrictLLS* for columns 7-8.

In the first case (column 1 and column 2), which is the case of comparison between the ID and the remaining firms, the output of the regression models shows that the estimated coefficient of *Interaction* is improved if compared with the main analysis conducted on a LLS basis.

In the second case analyzed (columns 3 and 4) the estimated coefficients of the variable *Interaction* are higher than not only the main analysis conducted on LLS basis, but they are higher also if compared to the first case just analyzed. This provides evidence that being part of an ID rather than only operating in a territory where an ID is present entails more positive spillovers.

In the 3rd case (columns 5 and 6) only the district LLSs are considered; in this way I tried to differentiate the positive externalities generated by belonging to an ID and the positive externalities of operating in an area where district institutions are active. The estimated coefficients of the variable *Interaction* decrease in all the three variables and it is the lowest one found so far. This is due to the fact that, excluding the non-district LLSs, I deal only with areas which have some positive district effects; consequently, moving to the case of companies belonging to IDs would provide slightly less benefits as some of some are available for all companies.

The last case (columns 7-8) is conducted excluding from the analysis companies operating in an ID. Through this choice it is possible to assess the positive effect generated by institutions located in district areas. Looking at the estimated coefficient of *Interaction*, this presents the lowest value up to now; it makes perfectly sense considering that the companies which benefit most from the district positive externalities are excluded from this analysis. The coefficient is smaller, but it remains positive; consequently, the model gives evidence of the fact that a positive effect of district institutions even outside the ID is present and that institutions boost performance of firms.

To sum up, the highest estimated coefficient of variable *Interaction* is found in the case where companies operating in an ID, which are supposed to benefit more from the positive effects of the ID framework, are compared with companies conducting their business in non-district LLSs. Then, the case of the ID compared with the rest of the firms is the one presenting the higher coefficient among the remaining cases. Then, the case in which only district LLS is considered and lastly, the case in which companies belonging to IDs are excluded from the analysis. Figure 17 presents hierarchically the four cases, from the case with the highest coefficient for *Interaction* to the case with the lowest coefficient.

Figure 17. Coefficient of the variable Interaction – from the highest to the lowest

2nd case	•ID VS NON-DISTRICT LLSs
1st case	•ID VS THE REST OF COMPANIES
3rd case	•ONLY DISTRICT LLS
4th case	•EXCLUDING ID

Source: personal elaboration

2.3.2. ADDITIONAL ANALYSIS ON INVESTMENTS

2.3.2.1. INVESTMENTS IN ITALY IN THE DECADE 2008-2017

In Italy, total real investment decreased of around 30% from 2007 to 2014; only in the last years a slight increase in investments has been recorded, thanks to several incentives provided both by national and European institutes (C. Giordano, Marinucci, and Silvestrini 2016).

As a matter of fact, the Italian government has proposed the ‘Industria 4.0’ National Plan to support manufacturing companies in moving to a more automatized and interconnected industrial production (third industrial revolution), thus providing tools such as superamortization and iperamortization, tax credit and tax deductions (KPMG 2017). Another national incentive related to investments is represented by the Development Contracts which provide financial benefits for projects in industry, tourism and environmental protection, and in R&D and innovation. Moreover, every Italian region has approved laws which provide business incentives and local assistance (KPMG 2017).

At European level, the recent investment plan for Europe aims to activate at least 315 billion euros in private and public investment over the three years 2015-2018; its objectives are represented by boosting investments, increasing competitiveness and support long-term economic growth in EU. There are three main tools used to increase investments: firstly, the European Fund for Strategic Investments, which aims to mobilize private investment in a broad range of sectors; then, the European investment project portal and the European investment advisory hub (EIAH), which support investors in finding information about projects, thus making the real investment grow; and lastly, the direction towards a ‘Capital Markets Union’ is crucial to improve the business environment and the access to finance, particularly for SMEs, thus increasing the harmonization in the financial markets and improving the level of investments (KPMG 2017).

When analyzing industrial districts and investments, a trend that needs to be taken into account is the reshoring practice, through which Italian firms that previously transferred their production

abroad decide to bring it back to Italy. In practice, Italian companies create new plants or rely on external local companies to produce them. In addition to that, Italian firms invest abroad to seize opportunities which are not available in the national market rather than to raise low labor cost (Intesa San Paolo 2017).

In general, demand conditions, financial and uncertainty conditions all contributed to investments decisions; in the period after the crisis the private non-financial service sector is the most affected sector in terms of investments' expenditure (Busetti, Giordano, and Zevi 2016).

Coming back to the particular scenario of Italy in the decade 2008-2017, demand conditions in this situation (so the nature and size of the domestic demand for an industry's products and services) represent the main catalyst of capital accumulation; the user cost of capital has a negative impact in the period of the sovereign debt crisis but then it has a positive impact due to the several measures taken to stimulate investments; the credit supply conditions are tight especially in 2009 and 2012, when they have the higher impact on investments; and uncertainty plays a critical role, as it represents an obstacle to the recovery of Italian firms (Busetti, Giordano, and Zevi 2016).

Indeed, Italian firms provide evidence that firm-specific uncertainty has a negative effect on investment decisions, and this negative impact is larger when capital expenses are less reversible and when the firm's market power is greater (Busetti, Giordano, and Zevi 2016).

This additional analysis has the scope to examine whether or not the investments dynamics for non-criminal companies before and after the removal of mafia do change depending on the fact that companies are located in district areas or not.

2.3.2.2. THE ANALYSIS

In this thesis, the proxy used to measure investments is total assets; for this budget item data are available on a smaller scale if compared to data on ROA, ROE, ROI.

For the additional analysis on total assets, the same regression model previously used to analyze performance is applied:

$$Y_{i,t} = \beta_0 + \beta_1 \text{DistrictLLS}_{i,t} + \beta_2 \text{PostOperation}_{i,t} + \beta_3 \text{Interaction}_{i,t} + \beta_4 \text{Controls} + \varepsilon_{i,t}$$

In this case, the dependent variable Y is the mean of total assets by LLS. *Controls* included in the model are the same as before, namely: region, year, size, revenues and debt-to-equity. Continuous variables are winsorized at level 1%.

In Table 7 the output of the analysis made on LLS basis shows a non-significant coefficient for *Interaction*; this may be due to the fact that we consider means and not individual observations

and that investments are not available for each company. In the analysis without controls both the estimated coefficient for *DistrictLLS* and *PostOperation* are positive and statistically significant: these findings may be interpreted as an improvement of total assets after the removal of mafia and a better performance in terms of investments of district areas when compared to non-district areas.

Table 7. District effect, analysis by LLS - Total assets (expressed in thousands of Euro)

VARIABLES	(1) TOT ASSETS	(2) TOT ASSETS
DistrictLLS	0.233*** (0.0438)	0.0235 (0.0296)
PostOperation	0.114** (0.0463)	0.0259 (0.0434)
Interaction	-0.0154 (0.0654)	-0.0057 (0.0384)
Size		9.35e-07*** (2.09e-07)
LnRevenues		0.823*** (0.0458)
DE		0.0133** (0.0055)
Constant	5.038*** (0.0302)	-0.372 (0.314)
Time fixed effects		yes
Geographical fixed effects		yes
Observations	330	330
R-squared	0.126	0.806

Note: In column (1) the output of the regression without control variables is displayed. In column (2) the output of the model with controls for region, year, size, revenues and debt-to-equity is presented. Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% level, respectively.

It is important to highlight that in the regression model with controls none of the estimated coefficients of *DistrictLLS*, *PostOperation*, and *Interaction* is statistically significant: this is relevant as the analysis becomes significant when adding the controls. Above all, it is crucial to mention that neither in the analysis without controls nor in the one with controls the estimated coefficient for *Interaction* is not statistically significant.

When moving to the analyses made on company level, the four cases previously investigated for performance measures are considered (Table 8).

Table 8. Analysis on company basis: four cases – Total assets (expressed in thousands of Euro)

VARIABLES	FIRST CASE		SECOND CASE		THIRD CASE		FOURTH CASE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TOT ASSETS	TOT ASSETS						
Treated	0.786*** (0.0323)	0.0990*** (0.0283)	0.855*** (0.0324)	0.814*** (0.268)	0.575*** (0.0332)	0.0732** (0.0286)	0.280*** (0.0103)	0.472*** (0.0931)
PostOperation	0.0855*** (0.0065)	0.0126 (0.0189)	0.0801*** (0.0076)	0.0214 (0.0224)	0.0830*** (0.0128)	-0.0094 (0.0619)	0.0800*** (0.0076)	0.0190 (0.0195)
Interaction	-0.0785* (0.0466)	-0.0850** (0.0402)	-0.0730 (0.0468)	-0.111*** (0.0396)	-0.0760 (0.0479)	-0.0607 (0.0415)	0.003 (0.0149)	-0.0355** (0.0164)
LnRevenues		0.469*** (0.0019)		0.472*** (0.0022)		0.482*** (0.0034)		0.464*** (0.0019)
DE		0.0126*** (0.0005)		0.0158*** (0.0005)		0.0033*** (0.0009)		0.0126*** (0.0005)
Size		-9.22e-07*** (1.50e-07)		-9.15e-07*** (1.50e-07)		-2.69e-06*** (8.67e-07)		-9.36e-07*** (1.50e-07)
Constant	4.903*** (0.0045)	2.046*** (0.0586)	4.835*** (0.0051)	2.026*** (0.0603)	5.115*** (0.0089)	2.082*** (0.110)	4.835*** (0.0051)	2.084*** (0.0588)
Time fixed effects		yes		yes		yes		yes
Geographical fixed effects		yes		yes		yes		yes
Observations	559,726	409,253	420,116	301,885	148,093	114,313	551,243	402,308
R-squared	0.002	0.160	0.003	0.163	0.003	0.166	0.003	0.156

Note: Controls include: year, LLS, size, revenues and debt-to-equity. Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% level, respectively. Variable *Treated* is represented by the dummy variable ID for columns 1-6, while it is represented by dummy *DistrictLLS* for columns 7-8.

In the first case (columns 1 and 2), in which companies operating in an industrial district are compared to the rest of the companies of the sample, the estimated coefficient for *Interaction* is negative and statistically significant.

To have an interpretation of this coefficient it is necessary to take into consideration also the other estimated coefficients for *PostOperation* and *ID*. In the analysis without controls, these coefficients are positive and statistically significant; this output means that moving from a period in which criminal organization is present to a period in which it is removed has a positive influence on the level of total assets of the company as well as that companies in industrial district present higher total assets.

In the regression model without controls the overall effect is positive: estimated coefficient for *Interaction* may be consequently interpreted as a lower level of total assets of companies operating in an industrial district, after removing criminal companies, compared to companies operating in an area outside the industrial district.

This may be explained by the fact that the negative impact of mafia on companies' investments is mitigated in industrial districts. We can assume that, after removing mafia, the companies operating outside the district area benefit from faster recovery in their investment level.

This finding may find its rationale in the fact that the negative influence of organized crime in reducing the level of investments is higher in non-district frameworks. As already highlighted, in district frameworks companies are more likely to invest, as, thanks to trust and cooperation, the failure of a project doesn't entail a loss in reputation of a company, so it has a lower 'cost' than in non-district framework. At the same time, in the analysis with controls the coefficient of the variable *PostOperation* loses its significance and the positive effect of variable *ID* is not able to offset the negative coefficient of variable *Interaction*; this finding is due to the control variables of time fixed effects (variable *Year*) and of geographical fixed effects (variable *LLS*). The choice to use LLSs to control for geography is very strict as LLSs represent limited areas, much smaller than regions (which was the control variable used in the regression model on LLS basis). The previously presented considerations about total assets referring to the regression model without controls are not valid.

In the second case (columns 3 and 4) it is considered the change in total assets between companies in industrial districts and companies in non-district LLSs, thus excluding from the sample the companies which are in district LLSs but outside the industrial district.

In this case, the coefficient of *Interaction* in the analysis without controls is negative and non-significant, while the coefficient of *ID* and *PostOperation* are positive and statistically significant; therefore, the overall effect remains unknown. In the same way, the output of the regression model with controls reports coefficients statistically significant for *ID* and *Interaction*, with an overall negative impact on the dependent variable.

Next, in the third case (columns 5 and 6) only companies operating in district LLSs are considered; this regression model assesses the change in performance while moving from a district area (LLS) to an industrial district. The output of the model shows a non-significant coefficient for *Interaction* in both analyses (with and without control) while the estimated coefficient for variable *ID* is always positive and statistically significant and the estimated coefficient for variable *PostOperation* is positive and statistically significant in the analysis without controls while it becomes non-significant in the analysis with controls, as in the other two cases so far analyzed.

The last case (columns 7 and 8) is the case where the comparison between companies operating in a district LLS but outside the industrial district and companies in non-district LLSs is conducted. In the analysis without control positive and significant coefficients are found for *DistrictLLS* and *PostOperation*, while the estimated coefficient for *Interaction* is not statistically significant; in the analysis with control the estimated coefficient for *DistrictLLS* is positive and significant and it offsets the negative and statistically significant coefficient for variable *Interaction*.

To sum up, the analyses conducted on total assets stress something new if compared to the analyses made on performance: in the case of total assets, the analysis made on LLS basis is not significant in the coefficient of variable *Interaction*, while it presents positive and significant coefficients in the analysis without controls for variables *DistrictLLSs* and *PostOperation*.

Moving to the analyses conducted at company level, in two out of four cases examined, the analysis with control variables highlights a negative overall effect while moving from non-district to district areas before and after the removal of mafia on total assets. When analyzing only the district LLSs, the coefficient of variable *Interaction* is never significant (in both the analysis without controls and in the one with controls); this may be explained by the fact that, referring to the change of the amount of total assets before and after the removal of mafia, moving from a district area outside the industrial district to the industrial district itself doesn't entail a significant change; this may be due to the fact that positive externalities of industrial districts are uniformly distributed also to companies which have a different industry specialization. This interpretation seems reasonable if we take into consideration the fact that many institutions, associations, entities are active on a local basis rather than on a specialization of production basis. Moreover, this is also in line with the results found for the last case, in which total assets are investigated considering companies in a district LLS but not located in the industrial district and companies operating in a non-district LLS; in this situation, in the analysis with controls the estimated coefficient for *Interaction* is negative and statistically significant, while the coefficients for variables *DistrictLLS* and *PostOperation* are positive and significant and the combined effect on total assets is positive.

CONCLUSION

The thesis has explored the interaction between mafia criminal organizations and industrial districts; more specifically, it has provided an analysis on the areas of Northern and Central Italy where at least a criminal company used to operate, and it has assessed the role of the industrial district environment in the recovery of non-criminal firms.

An open debate characterizes the role of industrial districts today; having represented for long time the essence of the Italian manufacturing industry and the backbone of ‘Made in Italy’ (KPMG 2017), the question is whether they still embody an efficient system more able to face challenges and threats or not. This work has aimed to contribute to this debate understanding if the district environment provides more favorable conditions to recover from a negative shock, which is the one of the presence of mafia criminal firms.

Indeed, the presented thesis has investigated how the performance of non-criminal firms can be affected by the presence of mafia. Recently, many studies have focused on the economic consequences of mafia criminal organizations; from a macroeconomic point of view, analyzing the influence of the aggregate demand and the costs of the presence of organized crime (Astarita, Capuano, and Purificato 2018); empirically, proving the costs of mafia presence (Pinotti 2011); and again, examining the characteristics of criminal firms (Fabrizi, Malaspina, and Parbonetti 2017).

In this work, in order to identify the areas of analysis (‘criminal areas’) it has been used a sample of criminal firms located in Central and Northern Italy, which have been targeted by a police operation between 2004-2015; their legal seat has been used as a proxy for the location of mafia presence, while the year of the police operation has been used as a proxy for the moment of removal of mafia. Certainly, the assumption that the removal of a criminal firm eliminates mafia from an area is a strong assumption; we can presume that removing one company doesn’t mean to eliminate completely mafia from an area.

Data about non-criminal firms have been downloaded from AIDA database for companies operating in all the regions of Northern and Central Italy over the period 2008-2017, then the analysis has been conducted only on those companies located in criminal areas, comparing the performance three years before and three years after the removal of mafia (year of the police operation). It is important to say that the sample is made of companies whose financial statement is available (limited liability companies and limited share companies); a more complete research could be done including data about companies which don’t furnish data on a compulsory basis.

Moreover, the period considered in the thesis is the decade just after the financial crisis of 2008, whose negative effects may have influenced the results found. Therefore, it could be interesting to conduct a similar analysis on a future period less affected by the financial crisis; this, for sure, would entail an updated sample of criminal firms targeted by more recent police operations.

The recovery of non-criminal companies, after the removal of criminal firms, has been measured in terms of performance, using ROA, ROE, ROI and in terms of investments, using total assets as a proxy.

Data of individual firms have been aggregated by Local Labor System (Italian acronym for Labor Market Area).

The choice to carry the analysis on LLS basis was necessary as only two criminal companies have been found to have operated inside industrial districts; consequently, it was not possible to conduct an analysis comparing non-criminal firms operating in the industrial districts and firms operating in the area outside them as the sample would not have been representative.

Therefore, LLSs have been classified as district (where at least one industrial district is present) and non-district; it has been assumed that companies located in district LLS benefit from positive externalities specific of the industrial district system despite not having the same specialization of the industrial district.

It is worth mentioning that the identification of industrial district considered is the one provided by Istat, which associates to an industrial district one LLS and its industry of specialization (identified by the correspondent Ateco 2007 codes); consequently, this thesis has not taken into consideration businesses related to the industry of specialization of the district for identification of companies located in industrial districts.

Moreover, none of the presented models has considered the industry of specialization in comparing district and non-district areas; the analyses have been carried out evaluating the recovery inside and outside the district context. An interesting future work could be focused on the analysis of the different industry typologies, as different industries have a different role in the actual economy (in general, industrial districts have moved to capital goods' production, rather than final goods' production).

The empirical results show a positive effect of operating in district areas while recovering after the removal of mafia, considering ROA, ROE and ROI as measures of performance. This strong and faster recovery of non-criminal firms in district areas can be explained by the social capital of district areas which can play a relevant role in rebuilding relations and recovering once mafia has been removed, or, in the opposite case, it can be explained by a more pervasive presence of

mafia firms in district contexts such that the benefits of the removal of mafia are larger thus leading to a faster recovery in district areas.

Then, additional analyses on ROA have been conducted on company level in order to better investigate the 'district effect', as in the previous analyses this had been explored at LLS level, where a district LLS includes both the industrial district itself and the surrounding area (i.e. companies operating in the same LLS but with a different specialization than the one of the industrial district). Four different cases have been examined: the first case has compared the industrial district and the rest of the population of the sample, the second one has compared the industrial district with the non-district LLS (not considering companies in a district LLS but outside the industrial district), the third case has compared only companies in the district LLS thus assessing whether the district effect is stronger in industrial district, and the last one, excluding the industrial district from the analysis, has measured the effect to be in a district area but not inside an industrial district rather than operating in a non-district LLS.

All the cases confirm a positive effect of operating in district areas: they furthermore provide evidence of a stronger positive effect in the recovery for companies operating in industrial districts, rather than for companies operating in district areas, but not inside an industrial district. This is in line with the definition of industrial district of Becattini (1990), which sees the industrial district as a socio-economic system where the local community plays a critical role in activating and supporting a specific industrial specialization.

In general, with reference to the performance of companies after the removal of criminal organization, the analyses carried out in this thesis provide empirical evidence that industrial districts do play a role contributing in a positive way in the recovery of companies' performance.

An additional analysis has been conducted on total assets, using the same regression models. First, on LLS basis, thus comparing district and non-district LLSs, the analysis with control variables shows non-significant coefficients for all the variables of the model; consequently, it is not possible to say anything about a potential influence of the district context in the recovery referred to the level of investments, after a period where a criminal organization was present. This may be due to the fact that, in general, data about total assets are available for an inferior number of companies.

For total assets too, other analyses have been conducted on company level and the aforementioned four cases for ROA are considered.

The output of these analyses have to be taken into consideration cautiously as they are not uniform; in two cases (the case of comparison between companies located in the industrial district and the rest of the population of firms, and the case in which companies in industrial

districts are compared to companies in non-district LLSs) the analysis with control variables highlights a negative overall effect while moving from non-district to district areas before and after the removal of mafia on total assets. When examining the district LLSs only, thus verifying whether some difference is present while moving from industrial districts to district areas outside them, the coefficient of variable *Interaction* is not significant. This may be interpreted as a uniformly distributed effect to be in a district area, not depending on the effective belonging to industrial districts, when it comes to total assets, maybe because many institutions and associations are active on a local basis. Lastly, the case where total assets are investigated considering companies in a district LLS but not located in the industrial district and companies operating in a non-district LLS, shows, in the analysis with controls, an estimated coefficient for *Interaction* is negative and statistically significant, while the coefficients for variables *DistrictLLS* and *PostOperation* are positive and significant and the combined effect on total assets is positive. As previously mentioned, the period considered in the analysis is a particular one, especially for investments, which level is highly affected by the uncertainty caused by the financial crisis of 2008; it could be then interested to conduct a similar analysis for a future period. Moreover, relying on other database able provide more specific information about investments' decision on a broader basis could lead to a more accurate investigation.

To sum up, the investigation conducted in this thesis about the recovery of firms after the shock of mafia highlights a positive effect of the district context in supporting and making faster the recovery of firms when it is related to performance measured as ROA, ROE, ROI. This may be due to the fact that the district context represents a more favorable fabric to recover, due to the informal network based on cooperation and trust of the actors, or it can also be explained by the fact that mafia criminal firms succeeded to penetrate more efficiently in the districts, such that the benefit of removal are larger and the recovery is faster for companies operating in industrial districts.

At the same time companies operating in district area, after the removal of mafia present a lower level in their total assets; this may be explained by the fact that the effect of the mafia presence is less perceived in terms of reduction of total assets in district environment, while companies operating in non-district areas are more exposed to negative influence of mafia and then they present larger benefits of the removal of mafia.

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