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"The effects of Organised Crime in Industrial Districts"

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Firma dello studente

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Introduction

Actors (people, firms, institutions) are always involved in the environment, as socio-economic context, in which they act. As explained by Becattini (2000), workers are not simply puppets, indeed, a worker is intended as a *"variable, plastic entity, that generates its own social environment and is, in turn, generated by the latter* [...]*"*. Hence, actors shape the environment in which they belong, and they are contemporary affected by it.

In this work, two topics are going to be discussed: "Industrial Districts" and "Organised Crime". Both have had a strong impact in the socio-economic Italian context in which they act, with a consequent impact on all the actors therein.

On one hand, Industrial Districts represent one of the core elements of the Italian scenario: studied only after the World War II by the Florentine economist Becattini, they became the engine for Italian economic boom during the end of XX century, when exportation suffered a strong decline. The positive externalities arising from the so called "communitarian factor" were the milestone to the creation of the "Made in Italy" brand and its success through the years.

On the other hand, Organised Crime is, instead, bearer of negative consequences, as it promotes distrust to implement its main activity of protection providers, as a pseudo-State. Economic consequences are well explained by many authors, as Pinotti (2015b) explained in an empirical research of South-Eastern Italian regions. Its expansion in Central-Northern Italy by the 50s has shed a light upon its ability to survive and infiltrate also in wealthier areas, as a plastic entity which adapt itself according to the environment.

The presence of two kind of topic which affects environments and are affected in turns have already been analysed. Though, it would have been interesting to analyse the combined effects of them, in a joint co-existence. Indeed, Organised Crime and Industrial Districts are largely distributed in Central-Northern Italy, thus it would be an interesting outcome to verify how institutions' strength, which is quite high in District areas, might impact mafia effect, whose traditional cradle resides in areas with weaker institutions.

The aim of the following dissertation is to provide empirical evidence of the organised crime's economic consequences in industrial districts. Indeed, a few literature (Albanese and Marinelli, 2013; Malaspina, 2016) has gone through an analysis of the effect of organised crime on firms' performances. But only one (Ganau and Rodríguez-Pose, 2018) has recently shed a light in the combined effect of organised crime, on one side, and industrial district on the other side. Hence,

as briefly explained above, these two topics are opposite in the effect they provide to the socio-economic context. Though, this work is intended to give a further explanation on whether the negative effect of Organised crime on the environment (thus on firms too) is reduced thanks to the presence of an agglomeration of industries which claims to have all the features of an Industrial District. In particular, I started from the assumption that the presence of a cohesive system, i.e. the industrial district, with a strong set of relationship and a trustworthy environment, is able to face better consequences from mafia removal, in terms of ability to recover after the shock.

The research is based on a sample of 106,820 firms located in the Central-Northern Italy belonging to a Local Market Area which has suffered the presence of at least a criminal firm. Criminal presence has been detected by using a sample of criminal firms from a previous empirical research by Fabrizi, Malaspina and Parbonetti (2016; 2017).

The multivariate regression model that has been used is intended to analyse the combined effect of Organised Crime presence and Industrial District location to the sample firms' profitability (ROA, ROE, ROI) and the amount of borrowing costs (COD). Indeed, from literature it is expected that firms which suffered from a criminal presence would have an increase in performances (reduction in cost of debt) after criminal firm removal. This effect it is expected to be higher for firms that belongs to a district area because of the better performances arising from agglomeration externalities, but also thanks to the higher transparency and the trust proper of the district system.

In the following order, the first part (chapters 1 to 3) is aimed at giving an overview of literature. It is broken down into three main chapters: the first one is a digression into "Industrial District" literature, from the origin to the recent evolution. Characteristics and effects in the socio-economic context have been considered to justify assumptions that have been made in the empirical research. The second one describes the "Organised Crime" literature and its approach to the legal economy through criminal firms, focusing on its economic impact. Chapter 3, indeed, is the explanation of the two research hypotheses on which the dissertations is based.

A second part follows, which comprises the way in which the final sample has been obtained and the regression model with the related results. A deeper study with a different unit of analysis has been considered, to have a further insight on how the district effect curb the mafia negative impact.

Last part concludes, giving a brief resume of results, limitations encountered and possible future implementation of this research.

1.Industrial District literature review

1.1 The origin of the Industrial District concept

The concept of "Industrial District" (ID) is not so recent and has evolved since its appearance. It was firstly used by the economist Alfred Marshall in the late XIX century to describe the clusters of small firms located in Sheffield and Birmingham. The peculiarity of these district areas, which will be explained better in "Characteristics of the Industrial District" (paragraph 1.2), was the "*interdependence between the technical-economic issues and sociocultural relationships*" (Becattini, 2002). Marshall's writings were different from the prevailing studies of his coeval (Becattini, 2002), where a consolidated vision affirmed that performances of vertically integrated large firms would have been better than those of a production system made by small firms, geographically concentrated and less integrated.

In his "Principles of economics", Alfred Marshall observed the economic performance of concentrations of small factories specialized on different phases of the same production process (Becattini, 2002). According to him (Lekachman and Marshall, 1962), the advantages of labour division, in terms of both possibility to employ unskilled workers and either to increase the skills through learning by doing, were not exclusively of large establishment. Indeed, he defined the term "external economies[1]" (internal to the district (industry) and external to the single firm) which "*can often be secured by the concentration of many small businesses of a similar character in particular localities*". It was a brand-new concept, where the advantages of large firms vertically integrated were also achieved by these clusters of small firms within the same productive process; and it was proved by the better economic performances observed in these clusters of firms.

Nonetheless, in the first decade of XX century, the triumph of Fordism and the flirt of Marshall with the dominant theory of the "large firm" caused a shift of the external/internal economies from districts to the larger firms (Becattini, 2002), where the presence of Taylor's theories on

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[1]A. Marshall defined the economies arising from the increase in the scale of production into external (generally related to the industry) and internal one (specific of the resources of the firm).

time rationalisation and the needs of mass product at lower cost, obscured the advantages and performances of firms in clusters.

Nearly a century later from Marshall studies, a Florentine economist Giacomo Becattini applied the Marshallian district definition as explanation on what was happening in the Italian economic environment: a boom of small manufacturing businesses, technically well-equipped against a general weakness of large firms (Becattini, 2002).

Contemporary, other economists started to analyse Marshall's studies, to cite some of them Krugman and Porter, who were more interested in the conception of "geographical concentration" than social context (Sforzi, 2008). In details, Porter's definition of cluster as a geographical concentration of firms is quite extended in respect of the Marshallian district, even though for long time the two terms were considered similar. In particular the dimension of the area, for example, was large enough to comprises whole states (California) or countries (Sweden) (De Marchi and Grandinetti, 2014). It can be said that Marshallian District is a subgroup of Porterian Clusters (Sforzi, 2008; De Marchi and Grandinetti, 2014).

Nonetheless, Becattini was the only one to give a different interpretation on Marshall's heritage: whilst other economists tried to give an explanation of the districts' performances basing their ideas on traditional economy, pushed by Porter (Becattini, 2002) and Krugman analysis, he showed the social point of view of the English economist, thanks to his acknowledgment on Marshall's social philosophy (Sforzi, 2008). In particular, Becattini was able to "read between the lines" of Marshall's writings and he shed a light on the importance of the "local community", which he observed in the Italian case and that was also defined by Marshall himself.

According to Becattini (2000), Marshall was particularly concerned about the behaviour of people within districts, considering them not only as workers or entrepreneurs but also as human being[2], who are able to create and affect the environment in which they work[3] (Becattini, 2000). From these considerations, Becattini has given an enlarged definition of ID which depicts a clear view of how strong it is the bond between firms and people: "*industrial district as a socio-territorial entity which is characterised by the active presence of both a community of people*

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[2] In this respect, to quote Marshall "*...no part of the old world in which there might not long ago have flourished many beautiful and highly skilled industries, if their growth had been favoured by the character of the people, and by their social and political institutions.*" (Lekachman and Marshall 1962).

[3] To cite Becattini, the human being is not only a "*puppet that maximises a utility function […] but as a variable, plastic entity, that generates its own social environment and is, in turn, generated by the latter…*" (Becattini, 2000).

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and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge" (Becattini in Pyke, Becattini, and Sengenberger 1990). In this way, Becattini has focused more on local community, not exclusively on physical location in which firms are settled (Sforzi, 2008).

It shall be noteworthy that Marshallian ID is a subgroup of ID as long as the former differs in terms of "Interpenetration between production and social structure". Both are a subgroup of the larger Porterian cluster (Fig.1).

Figure 1: Differences between Clusters, Industrial Districts and Marshallian Industrial Districts.
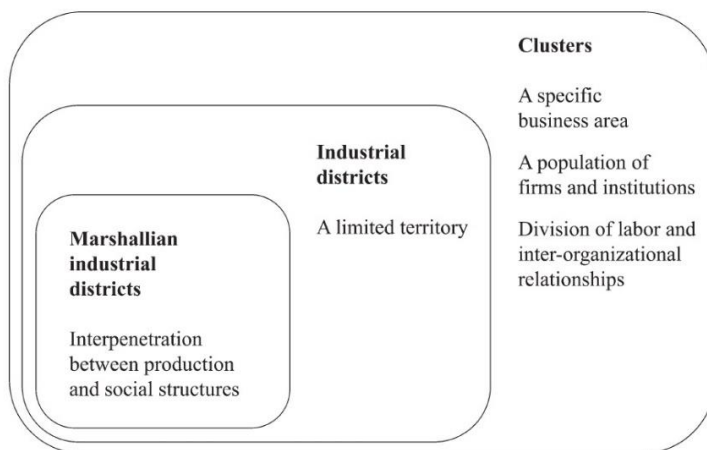
Source: De Marchi and Grandinetti (2014)

For sake of simplicity, with the term Industrial District it will be considered the Marshallian variant. Although, as better described in "The Italian scenario" (paragraph 1.4), the peculiarity of Marshallian ID, despite of its presence in early Italian IDs, is fading away.

1.2 Characteristics of the Industrial District

Before defining what characterises an Industrial District, it should be interesting to give an explanation of what is an Industrial Districts nowadays. First of all, IDs occupy a circumscribed area where a population of manufacturing and service firms operates in the same business field (Becattini in Pyke, Becattini, and Sengenberger 1990).

Each district is specialised in a category of end products[4], and within it there are many firms specialised in a phase of the productive process. Nonetheless, within a district there are also firms not from the same industry but fundamental to the creation of the final product, though, the dominant sector must be the district one.

So, each firm produce a semi-processed output which is reassembled to create the final product. The fundamental concept of interpenetration between social context and productive ones, observed by Marshall but rediscovered by Becattini, is the peculiar trait of Marshallian Industrial Districts.

Notwithstanding differences among Industrial Districts, a common backbone can be defined:
- A specific territory;
- A business area;
- A population of firms;
- A community of people;
- A social capital (paragraph 1.2.1).

A specific territory

Industrial Districts are concentrated in a geographically, historically and culturally circumscribed area. Marshall had observed that there were districts in areas with some characteristics: a presence of fundamental resource, a market demand of products and skilled artisans (Lekachman and Marshall, 1962). Although physical proximity, the peculiarity of ID compared to any agglomeration of firms is related to the common cultural background, which is partly responsible of the district externalities.

A business area

Each district is specialised in a specific industry, mainly in the manufacturing sector, which is the dominant one within it. ID firms might be specialised also in different sectors (i.e. supplier firms). Nonetheless, it is fundamental that the dominance of firms is specialised in the business area of the district.

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[4] Some examples: ceramic tiles in Sassuolo, footwear in Riviera del Brenta and Montebelluna, textile in Prato, to cite some in Italy.

A Population of firms

The peculiarity of ID firms, which is fundamental to explain why they have been a complementary/alternative to the existing one, is the presence of a population of mainly small sized firms. Notwithstanding the presence of firms dimensionally heterogenous, labour division has induced a prevalence of smaller business (De Marchi and Grandinetti, 2014). Hence, each firm is specialised in a phase of the same productive processes. Furthermore, a smaller size guarantees flexibility to market demand in case of variation. The firms' needs to grow is not intended in increasing the firms' dimension, indeed, increasing the set of relationship to obtain resources not available or hardly to produce. These inter-firm relationships are both horizontal and vertical (Schiavone, 2000), furthermore, they are informal at the beginning and later are defined by formal contract, for example through joint ventures.

Recently, there is the tendency of vertical integration due to evolutionary process (paragraph 1.4.1). This trend is quite detrimental for the Marshallian effect, although, no necessarily the cause of ID decline.

Within the ID there are the following actors: phase firms, specialised suppliers, final firms and local institutions.

- *Phase firms* are intended as small-medium firms responsible to execute production phases. They are specialised in one or a few phases of the district industry, thus are a depository of large part of production know-how. Within this category, specialised suppliers (those producing machinery) are comprised as well.

  The specialisation in phases of the productive process is the labour division principle applied at firm level, thus, instead of having a vertically integrated firm with different stages, there are many factories able to generate economies of scale starting with a low level of capital. The transaction among these firms, which will be explained later on (paragraph 1.2.1), is governed by an hybrid form of market: the communitarian market, where prices of semi-finished product are also affected by the standard of living and social status of the families therein (Becattini, 2002).

  Furthermore, firms are normally headed by a finished goods manufacturer, which interacts with the external market (Becattini, 2002).

- *Final firms* are specialised in added-value process, as marketing or design, but also R&Ds and distributions (strategic and barely standardised). Final firms are those which interact with the external market. These firms can also be the inherited of the large factory model: so, they outsourced non-core processes to the phase firms and have

focused on subsidiary activities as described above. They do not have contact only with the external market, but also with universities, researcher centres and other firms.

In addition to these elements, other actors compose the district: public and private institutions, named "*local establishment*" (Dei Ottati, 2002). These intermediate institutions give assistance to the firms within the ID (chambers of commerce, banks…), provide public services, intervene on behalf of ID's categories and promote local development.

A community of people

People, both employed or self-employed, are the crucial point of the district, the driving force of any production system. Workers' daily life in IDs is strongly embedded in the productive activities.

The peculiarity of Industrial district is the high level of social mobility (Pyke, Becattini and Sengenberger, 1990): any person within the district has incentives to look for the most suitable job according to his/her capability. Industrial District is really varied in job positions: from home-based, to part-time, to self-employment and entrepreneurship. In this way, the presence of different position, the possibility to change job as needed (thus generating new job demand), the high job rotation and the mechanism of penalties and incentives are all necessary conditions for the district survival and the elements that create the competitive advantage.

The strong interpenetration between daily life and productive activity is also an incentive to employee any section of population, as it is a double advantage for both workers and ID as well. Hence, districts tend to become "multi sectoral" or even there is a creation of a system of neighbouring districts[5] (Pyke, Becattini and Sengenberger, 1990).

One issue in job rotation can derived from the lost skills when the worker moves from on firm to another. It is a very limited extent, under the district point of view, as the worker's specialisation remain, to quote Marshall, a public good of the entire district (Pyke, Becattini and Sengenberger, 1990). In this case, ID presents a very adaptable workforce, which can be easily exchanged in a flexible market demand, with low cost of formation.

Another characteristic of the Industrial District is the presence of an interpenetration (to cite Becattini) of the productive structure and the socio-cultural ones within a geographical

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[5] The positive effect of neighbouring district (textile nearby coal mines) was highlighted also by Marshall in Barrow district (Lekachman and Marshall, 1962).

circumscribed territory. For sake of simplicity, it can be summarised with the term "*communitarian factor*" (De Marchi and Grandinetti, 2014).

According to Marshall's vision, economic and social cultural phenomena are fused together, "*paving the way for the implementation of cogent public policies*" (Becattini, 2002). Inter-relationship among the economic, social and political spheres are really strong: the functioning of one of them is the result of the others' organization (Pyke, Becattini and Sengenberger, 1990), therefore, industrial district performances are related not merely on economic factors, but they also depends on the social and political issues therein.

The communitarian factor is the borderline between Marshallian ID and ID, indeed, the simple geographical proximity of many suppliers/buyers to producers is not enough. The presence or reproducibility of this set of elements (the relationship between socio-cultural and productive context) is difficult to achieve, because there must be a certain homogeneity in the socio-cultural context (a community) which has been created in many years, plus a homogeneity in a sector, which means that the dominant sector in the area should be the district ones. This factor is the enabler of district externalities (paragraph 1.3); furthermore, relationships among district actors (the so called "Social Capital" – paragraph 1.2.1) are embedded in it and it helps to reduce frictions (transaction costs) and enhance knowledge sharing (Dei Ottati, 1995; De Marchi and Grandinetti, 2014).

1.2.1 Social capital in Industrial Districts and its governance

Social capital, in its broad and general sense, can be defined as "*a set of social relationship owned by an individual (employer or employee) or a collective (private or public) actor in a specific moment*" (Trigilia, 1999).

The importance of relationship within the ID has been enlighten by Marshall since its earlier works even though it was firstly considered marginal, compared to physical and financial capital, by the Fordist era, in which vertically integrated firms' strength was given by the progressive mechanisation of processes, thus in a limited view of the human relational components.

Becattini then exposed the importance of a social capital embedded in the above described communitarian factor. Indeed, the relationships within IDs are mainly fostered by the sense of belonging in a community, where productive life is inter-related to personal life.

There are many types of relationship among actors, from firms, people and also local institutions.

The essential elements of the social capital is a network of non-economic relationships (religious, personal, ethnical, ideological,…) that is responsible of enhancing transfers of information and trust with economic consequences (Trigilia, 1999). For example, the relationship lending between a firm and a bank helps information to flow and thus enable the credit issue (paragraph 1.3.1). Another example, relationships within the Industrial District promotes tacit knowledge sharing therein.

The industrial district is subject to this kind of relationships thanks to the geographical proximity. As a matter of fact, the presence of personal relationships and a common background of implicit rules, language and culture is responsible to create a sense of belonging in a community, which is an advantage in the industrial district (Dei Ottati, 1995).

From the productive point of view, there are problems related to competition (horizontal) and coordination (vertical) due to the multiplicity of small-sized firms along the productive process. Competition arises in each phase because of the high amount of semi-finished outputs created. The decentralisation of processes upon firms causes a high level of transaction costs due to coordination problems (for example monitoring and contracting costs). Whilst a vertically integrated firm is able to reduce these problems through the managerial "visible hands", IDs is able to reduce these costs through an "hybrid form" between "market" and "clan", the so called "community market" (Dei Ottati, 1995). This kind of governance is allowed by the peculiarity of ID, i.e. the fact that these relationships are embedded in a "community" where production is inter-related with the socio-cultural context. Being part of the same territory, hence having the same cultural background promotes reciprocal cooperation and enhance information flow, thus reducing the opportunism[6] to get personal advantages (Dei Ottati, 1995).

Cooperation and competition are both in a mutual advantage: competition among firms is enhanced by the market price, so there is an incremental improvement to better efficiency; cooperation, indeed, reduces the informative asymmetry and opportunism (due to limited rationality) plus it increases the incentive to invest in innovation. Cooperation is able to reduce cost of transaction (arising from cost of monitoring and cost of contracting) thanks to the trust among actors, due to the shared sense of belonging, which guarantee fairness in the trade and also the possibility to conclude more idiosyncratic transaction, not possible otherwise.

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[6] Opportunism can also be reduced in a district thanks to small size and proliferation of firms both in the demand/supply sides. Thus reducing both cost of substitution and the presence of dominant firms (Dei Ottati, 1995).

Coleman defined the social capital as a "*public asset*" because it is accessible by any firm within the district (Trigilia, 1999). This definition included also the free riding problem, as many firms may reduce their participation to the social capital and prefer to use it for personal advantages. In this case, the governance of the district, "*community market*", reduce this risk through a set of social sanction and retaliation (Bàculo, 2002).

Nevertheless, it should be borne in mind that the community market is not a spontaneous outcome inherited from the past. It is the result of year and year of interaction between actors within the district[7], with improvements and sanctions perpetrated from the market (only the most efficient model can survive). Furthermore, perpetrated transactions among actors enhance the trust and make relationship more long lasting, thus maintaining reciprocal cooperation in a virtuous cycle (Dei Ottati, 1995).

However, a major role is played by the local institutions to promote the local development and the district survival, as they are able to spread value throughout the district also along generational turnover. Lack of public government interest can be followed by a rise of personal advantages and detrimental behaviours, plus, it may help firm to collude (Trigilia, 1999). Furthermore, local associations have the responsibility to foster social cohesion through explicit contract, for example, unions set wages at a level which is fair enough to the counterparts and less affected by market fluctuations (Dei Ottati, 1995).

It can be said that social sanction is a good instrument to avoid opportunistic behaviours in small and homogenous districts; however, the more extended the district, the more complex and opened to the outside it is, the more important the presence of strong local institutions.

So far, the community market, which governs ID relationships, is practically based on custom of cooperation, which is an intrinsic value of the district. As described above, it is not spontaneous: first of all, there is the need of social commitment by actors, and also promoted by local institutions. It is a value not explicitly defined, there is not a contract, thus it can be learned only through socialisation; it seems that Industrial Districts are closed system to the "external world", with strong access barriers to avoid new entrances. It is not correct at all, as it is fundamental a continuous circulation of products and individuals to the survival of the district itself and the maintenance of a competitive sustainable advantage. However, circulation inflows must be in line with the districts set of value, otherwise, no relationship can be created at all. Thus, the apparently "closeness" is only caused by a strong bound between actors (family,

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[7] "*This cohesion is typically the result of conscious concerted action among the different categories that contribute to local development*." (Dei Ottati 2002).

employees, employers…) and any institution (public or private); indeed, IDs need to be opened to turnovers as long as anyone is on the same side[8].

To conclude, social capital in Industrial Districts can be considered a kind of investment in reputation, as there is an initial cost in terms of certain income foregone to a less certain future outcome[9].

Industrial District model well exploits investments in reputation. In this way, idiosyncratic frequent transaction can be done thanks to the importance of the personal capital on any member therein: the more the personal capital of an actor, the more the trust, the more frequently the transaction at lower cost, even with innovative transaction (Dei Ottati, 1995).

So far, main characteristics of the Industrial Districts have been explained. In particular, the set of relationship between actors has been explained more in details to stress its importance and to compare it with the one in Organised crime (paragraph 2.6). The next paragraph is intended to shed a light on advantages (externalities) from Industrial District conformation.

1.3 District externalities

It is noteworthy to say that Industrial Districts are not simply a random aggregation of productive units, indeed, it represents a system where there is an interaction in terms of production and socio-cultural context, where the environment affects (through "targeted civilising") actors therein and contemporary is affected by them (Becattini, 2000). The rationale behind its creation is to exploit advantages (or externalities) arising from the concentration in a bounded territory (homogeneous under the productive and social point of view) of a set of small-medium firms specialised in specific phase of a productive process (Serarols I Tarrés, Co and Spohn, 2008). These externalities can be tangible (proximity and local availability of inputs and intermediate goods) and intangible (repeated transaction and trust among actors) (Ganau and Rodríguez-Pose, 2018), and are aimed in reducing transaction costs.

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[8] To cite Becattini: "*a sort of community-like superior interest which becomes an inner principle for the people of the district as a whole*" (Pyke, Becattini and Sengenberger, 1990).

[9] It might be interesting to explain reputational investment through an example: a supplier trades valuable products/services within the district at a fair price, thus obtaining less earning today to get a long lasting relationship (Dei Ottati, 1995).

"*District externalities*" or "district effect", as the positive influence on firms' performances within an Industrial District, can be defined as a peculiar subcategory of the more general "*agglomeration economies*" (Bronzini, 1999).

In particular, advantages on each firm derive from the coexistence of characteristics of ID: the concentration, the specialisation in a specific business field, the small-size and the social capital. As already mentioned above, the interpenetration among these factors (communitarian factor) reduces frictions among actors (cost of transactions) and fosters knowledge spill overs within the ID (Dei Ottati, 1995; Grandinetti and De Marchi, 2012), to constitute a kind of "*Industrial atmosphere*[10]" to cite Marshall.

The strong suit of communitarian factor is the ability to enhance firms' performances within the Industrial District, thanks to externalities which are internal to the industry (thus within ID) and external to each firm.

Concentration in a bounded place of many small-sized firms devoted to a specific phase of the productive process generates economies of scale (at aggregate level) (Lekachman and Marshall, 1962) and economies of learning. In details, geographical and cognitive proximity allows tacit and explicit knowledge sharing among actors; furthermore, specialisation enhance productivity in terms of efficiency (less wasted materials, implementation of innovative methods). The dimension of each firm best fits changes in market demand and product customisation, plus it fosters a leaner production.

The workforce tends to be more skilled thanks to the labour division; furthermore, the presence of a common socio-cultural background enhance trust and knowledge sharing (Dei Ottati, 1995). All these elements are positive in attracting skilled employees and thus increasing ID dynamicity. Indeed, personnel and procurement costs are negatively affected: the former are reduced thanks to less training costs (the community enhance knowledge sharing), the latter due to proximity and specialisation per phase (De Marchi and Voltani, 2014).

Advantages are not only exploited by firms of the production process, but also by suppliers (firms which produce machinery or semi-processed output external to the industry) which are yet part of the industrial district. Indeed, the higher aggregate volume produced thanks to the concentration and specialisation per phase is able to reduce unitary fixed cost of expensive

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[10] "*The mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. Good work is rightly appreciated, inventions and improvements in machinery, in processes and the general organization of the business have their merits promptly discussed: if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas.*" (Lekachman and Marshall 1962).

machinery. In details, specialised suppliers "*are able to keep in constant use machinery of the most highly specialized character, and to make it pay its expenses, though the original cost may have been high, and its rate of depreciation very rapid*" thanks to the proximity to a high number of clients (Lekachman and Marshall, 1962).

Also advantages in terms of actors' relationship (1.2.1) have impacts on firms performances, in particular, the sense of belonging to a community enhances trust and reduce opportunism, thus increasing number of transactions and their specificity at lower costs (Dei Ottati, 1995). Price competition among same-phase firms is positive as long as it enables efficiency and quality improvements. This can be possible only thanks to the contemporary cooperation promoted by the community sentiment. Furthermore, investment opportunities are feasible thanks to both a system of neighbouring support[11] and credit relationship where final firms act as intermediaries (paragraph 1.3.1).

Externalities are able to enhance district performances as long as the cost of increased competition (therein) are lower than gains from agglomeration (Becchetti and Rossi, 2000).

The importance of "district externalities" in enhancing ID firms' performances and to obtain credit access is still an important issue to be studied. In the following paragraph, firstly a review of the literature from 90s till nowadays, then a focus on the credit relationship within the ID and its advantages from district belonging (paragraph 1.3.1).

Literature from 90s to 2000 was particularly common in defining a positive effect of district identity. The already described equilibria (cooperation – competition) typical of the Industrial District was able to enhance performances of member firms, in terms of profitability (Fabiani and Pellegrini, 1998), export propensity (Becchetti and Rossi, 2000) and credit availability (Russo and Rossi, 2001). Conversely, the impact of district effect on Foreign Direct Investment was not significant[12] (Bronzini, 1999).

A research made by Fabiani in 1997 on a sample of Italian firms depicted a higher level of ROI and ROE (respectively +4 and +2 on a point basis) for district firms among non-district ones. Performances are better considering district sectors (mainly manufacture ones) and firms with

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[11] Notwithstanding the small size and capital level, firms within a district are well intended to take part of investment because they are supported by neighbouring firms. Furthermore, there is a less economic impact of sunk cost, as the failed investment could be reused by other firms (Dei Ottati, 1995).

[12] There is no difference between ID and non-ID firms as long as foreign investors are less interested in social dynamics therein. Moreover, as already said, Industrial District are considered a quite close system, thus preventing from entrance of outsiders.

less than 20 employees. Positive outcomes are better seen in district firms from the same production sector, due to learning economies, knowledge spill overs and competition and cooperation arising from the fact that these firms are specialised in the same sector.

Less impactive, but still significant, are externalities (à la Jacobs) from concentration of firms from other sectors, mainly thanks to indirect effects, such as entrepreneurial mindset and flexible job offers (Fabiani and Pellegrini, 1998), as long as they are not in the same production process, thus, they can not exploit Marshallian (or direct) district effect.

In terms of export propensity, Industrial Districts were better performing thanks to competition/cooperation and information transparency therein (Becchetti and Rossi, 2000). Empirical research made by Becchetti and Rossi (2000) on a sample of 4000 Italian firms confirm higher benefits from geographical agglomerations in smaller firms belonging to traditional and specialised sectors.

An empirical research (Russo and Rossi, 2001) has found out a lower cost of credit for ID firms, even though these effects have been reduced after currency devaluation and tight monetary policy in '92 and '93.

Nonetheless, literature analysed before (Fabiani and Pellegrini, 1998; Becchetti and Rossi, 2000; Russo and Rossi, 2001) is based mainly on the period between 1990s and early 2000s.

More recent literatures (Foresti, Guelpa and Trenti, 2009; Busato and Corò, 2011; De Marchi and Voltani, 2014; OND, 2015; Foresti *et al.*, 2017; Cucculelli and Storai, 2018) have shed a light on the district effect thinning mainly because of increased competition and financial crisis. An empirical research made by "Osservatorio Nazionale dei Distretti" (2015) had shown a reduction in the positive effect of being in a district. The same in terms of turnover, export and profitability between ID and non-ID firms (Foresti *et al.*, 2017). Notwithstanding, overall performances of ID firms are better than non-ID (fig.2), in particular in medium-high tech sectors, thanks to the ability to be a dynamic model (OND, 2015).

The latter statement can be confirmed as the jewellery sector (which can be comprised in low-tech sector) has shown a non-significant difference between ID firms versus no-ID firms (De Marchi and Voltani, 2014). District effect is thus fading over time. Nonetheless, it is not ended.

Figure 2: ROE after taxation in Italian firms.
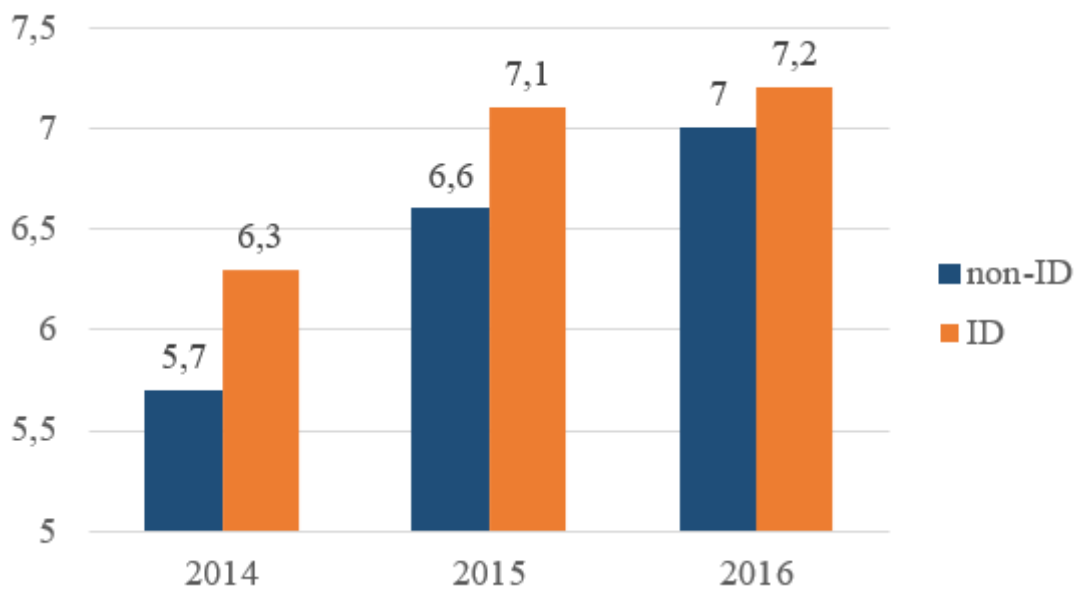
For what concerns cost of debt, actual literature is quite poor, thus it is hard to have a clear idea on whether district effect still exists or not. An empirical model by Alessandrini et al. (2008) suggests a lower probability of credit rationing for ID firms (Alessandrini, Presbitero and Zazzaro, 2008). Foresti et al. (2009) on a period from 1991 to 2005 depicts a situation where a greater leverage ratio of ID than non-ID firms has shown the same cost of debt, *ceteris paribus*. Reasons might be related to the monetary union and the presence of local bank. Furthermore, Ricciardi (2013) suggests that ID provinces have lower interest rate on debt.

The following paragraph shed a light into peculiar credit relationships among district firms and the importance in terms of investment profitability and credit trustworthy.

1.3.1 Credit relationship in Industrial District and externalities

Within the "Social Capital" concept there is a kind of relationship which shall be considered, i.e. the credit relationship among firms and local institutions.
One of the main ways to make investment for a firm is to use debt. This kind of investment may be quite risky as long as firms become unsolved. The risk to default is higher the lower the capital of the firms.
An industrial district is made by small sized firms, which have a financing portfolio at a low level of diversification, as they finance themselves mainly through owned capital and debt, thus

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reducing the possibility to make innovations. Two ways to obtain credit can be defined: through a credit institution and the "*credit and subcontractor credit relationship*" (Dei Ottati, 1995). The former is well known, whilst the latter might be not so clear.

Bank credit

The main way to get funds for a small-medium firm, generally, is through banks. The lack of legal personality (except for leader firms, e.g. Luxottica in the Belluno eyewear district) does not allow them to enter the capital markets, thus reducing the portfolio of alternative borrowing instruments. In this way, the high cost of debt plus the bank dependence increases SMEs default risk (Ricciardi, 2008). Furthermore, SMEs might find switching cost high thus remaining bound to the same bank, with risks related to higher interest rates applied due to the so called "*hold up*" procedure (Alessandrini, Presbitero and Zazzaro, 2008; Cenni *et al.*, 2015).

Firms within industrial districts are suffering the same risk of non-ID SMEs (Alessandrini, Presbitero and Zazzaro, 2008), however, the peculiarity of being within the district has some advantages in term of credit relationship.

Reputation and trust within the industrial area are two of the already cited milestones of the system, and they are also valuable in credit relationship lending. Otherwise, it would be difficult for IDs firms to obtain finance from banks basing terms of contract exclusively on financial condition, given that small and medium firms tend to be informationally opaque (Berger and Udell, 2002)[13].

The presence of many SMEs which lacks legal personality gives problem in terms of mandatory disclosure. In this way, in an imperfect information setting due to adverse selection and moral hazard, banks are less prone to issue credit (Russo and Rossi, 2001; Berger and Udell, 2002). This might increase the cost of credit and reduce the possibility to innovate for firms within ID. The already cited social capital, information flows and social sanction are useful to reduce asymmetries in relationship with banks, thus reducing monitoring costs (Russo and Rossi, 2001).

There are several ways in which banks get in contact with the firms which are intended to obtain credit funds: financial statement lending, asset-based lending, credit scoring and relationship

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[13] The paper "*Small business credit availability and relationship lending: the importance of bank organisational structure*" by Berger and Udell (2002) used a sample of American SMEs. Nonetheless, the topics discussed hold throughout most of industrialised countries.

lending. The first three are also known as transaction-based lending as they involve "hard" information flows; the last one, as previously discussed, base the creditworthiness of the customer on a set of "social" information (Berger and Udell, 2002). The former includes some information to be communicated and verified, respectively, audited financial statements (obtained mainly by large corporations), assets as collateral (it involves receivables and inventory) and the last one, credit scoring, which gives a rate according to several information on history and financial statement. All these methods have some limitations for firms within an industrial district: lack of mandatory disclosure, small sizes and thus less capital as collateral cause an increase in monitoring costs by bank officers and thus higher costs of credit.

Relationship lending is based on "soft" data, which hardly can be quantified, verified and communicated (Berger and Udell, 2002), hence, more prone to opportunism and information asymmetry than transaction-based ones, which, by definition, is based on objectively defined criteria. It is based on information gained through contact over times, with the client but also with other locals (suppliers, customers, people…). Under relationship lending, the credit availability, collateral requirements and loan interest rates are lower the stronger the relationship between bank officers and firms (Berger and Udell, 1995, 2002). In particular, empirical results from late XX century showed a positive correlation between the duration of relationship and information accumulated, with a consequent redefinition of loan term contracts (Berger and Udell, 1995). The duration of relationship is not significantly affected by the kind of firm (district or non-district), although it seems to be more effective for district ones. Firms get advantages in terms of credit rationing when are within an Industrial District (Alessandrini, Presbitero and Zazzaro, 2008), thus confirming positive "district effect".

Furthermore, credit rationing probability is lessen when banks are (functionally) near IDs firms (Alessandrini, Presbitero and Zazzaro, 2008; Cenni *et al.*, 2015), which means that the more power is given to loan officers, the less the agency problems are and then the lower the probability of credit rationing (Berger and Udell, 2002). Moreover, the less structured both the firm and the bank, the less the layers of management within which agency problems may arise, the more efficient the relationship lending (Berger and Udell, 2002; Alessandrini, Presbitero and Zazzaro, 2008).

So far, there are several factors that affect the relationship between bank and firms within the ID. In particular: duration of the relationship and proximity to the ID positively affect credit rationing, by diminishing the probability of credit denial. The size of firms (Cenni *et al.*, 2015) is negatively correlated with the credit rationing: the larger the firm, the lower the probability to be rationed. Although, as seen before, firms within ID can obtain better lending terms.

All these elements are positive to credit issuance and thus interest rates on loans.

So, local banks tend to create strong connection with those firms which mainly use debt to finance their activity, e.g. final firms when they buy or sell and distribute having relationship with external market (Dei Ottati, 1995), thus having a competitive advantage thanks to private information collected (Cenni *et al.*, 2015).

That is the reason why local banks have settled within ID areas[14], to reduce the possibility of agency problems and to be more in contact with customers; not at all, also to exploit positive externalities coming from the "*industrial atmosphere*".

It can be confirmed that there is a reciprocal advantage in bank-firm relationship. From one side, banks are encouraged to lend money to final firms because of trust, less default risk (thanks to the district structure) and economies of scale (the more credit contracts are signed, the lower the fixed negotiating costs); from the other side, final firms are obliged to satisfy the debt to avoid social sanction, loss of reputation and thus the driver of the main activity (Dei Ottati, 1995).

Furthermore, any exogenous (macroeconomic level such as financial crisis, shocks in demand, monetary policies…) or endogenous (disequilibria in competition and cooperation) shocks can affect the credit financing relationship. However, it was shown that negative shocks have had more impact on transactions based relationship than relationship ones (Berger and Udell, 2002).

Credit and subcontractor credit relationship

It is a form of credit relationship typical of the underdeveloped countries, but is also useful to explain what happens within the district (Dei Ottati, 1995). Firstly, there is a relationship between firms or people: whoever wants to make an investment (e.g. a new machinery, or a new specific-phase firm) might ask a loan to another firm, in this way, enhancing a positive effect on new firms' creation.

Most of the time, this credit relationship is between phase[15] and final firms. Despite it, other firms within the district may be involved, for example two final firms, e.g. raw materials buyer and the vendor.

Considering that phase-firms are mostly small-sized, it is difficult to access credit relationship with banks without collaterals. Despite of it, this form of credit relationship creates a quasi-

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[14] Empirical research have found an increase in bank branches higher in district areas than non-district ones between 1991 and 2001 (Alessandrini, Presbitero and Zazzaro, 2008).

[15] Just to remind that, with the word "phase" it is included also firms which provide machineries.

legal entity with limited liability among the two parts of the obligation. In case of contract violation, only what has been invested will be lost.

The functionality of the contract is based on trust among actors, but it is not enough. There must be an economic benefit (not necessarily based on payments) in order not to deviate from the original contract: both debtor-supplier and creditor-final firm prefer to continue the relationship.

In phase-final credit relationship, the debtor is responsible to repay the debt in terms of long-lasting relationship and more competitive prices. The final firm-creditor is intended to bind a supplier through the credit relationship to be more flexible in case of fluctuating demand. In this way, the debtor is able to produce even in tougher condition while the creditor obtains product at competitive prices. The solely credit relationship is not enough, there must be a social (credible) commitment and a reciprocal advantage: in case of fluctuating local market, it might be preferable to retain the relationship for both phase firms and final firms. In case of violation of the contract, from one side the creditor will lose the capital invested and a trustworthy supplier. On the other side, the supplier will lose in reputation.

The credit relationship between final firms and phase firms, respectively creditor and debtor, is really important within the ID for two reasons: (i) there is less opportunism due to the trust among actors; (ii) less asymmetry on creditor, which is actively involved in the investment evaluation. In fact, the better the quality of the investments, the more worthwhile to the final firm (creditor), which buys directly from the supplier. In this way, investments are well evaluated to get a better expected return, which is fundamental for both firms. Moreover, this relationship is still embedded in a climate of confidence and fairness, where opportunism is yet reduced (Dei Ottati, 1995).

So far, there is a common denominator between these two relationship: bank – final firm and final firm – supplier (Dei Ottati, 1995). Hence, there is a double intermediation by final firm, and it might be more expensive due to the cost of transaction. However, suppliers would not obtain financing due to their size and financial performances, by this way, they are able to obtain credit in a more advantageous way. Positive effects can be resumed as follows: banks issue credit to final firms on the basis of trust and social performances, thus reducing the amount of cost of debt. Banks are assured about firms' creditworthiness by the trust they have on final firms; the latter are involved in the evaluation of the investment: as a result, investments are better allocated and better returns are expected.

1.4 The Italian scenario

As depicted above, Industrial District is not an Italian phenomenon. Nonetheless, Italian districts are (or at least *were*) eligible as the "Marshallian Industrial District" and thus needed particular attention (Pyke, Becattini and Sengenberger, 1990; Cucculelli and Storai, 2018).

The Italian scenario after the Second World War was dominated by two factory models: the hierarchical and the entrepreneurial one (OND, 2015). Inherited by Ford approach, the hierarchical model was based on vertically integrated manufactures, while the entrepreneurial one was based on small and medium firms, specialized in products for personal use or for home (Sforzi, 2008), with the peculiarity of being part of a cluster of firms in a specific closed territory, which can be assimilated to the industrial district model as described before.

Since 1970s, the increased environmental complexity had led to changes in the demand of products: customization instead of mass production, mainly due to a change in both local supply and general demand (Trigilia, 1999; Becattini, 2002; OND, 2015). It was the first sign of the Fordism decline: large firms started to externalise non-strategic processes, thus creating a network with inter-firm vertical and horizontal relationships (Schiavone 2000; Guelpa 2013; OND, 2015); contemporarily, an extraordinary expansion of local clusters of SMEs in traditionally sector (i.e. "Made in Italy") took place (Becattini and Dei Ottati, 2006). These changes in the structure were due to failures in satisfying variation in product demand by large enterprises. Indeed, even though large firms can be considered as a "local system" as the Industrial District, thus being able to produce variation and innovative idea, it is too much hierarchised and integrated. Consequently, it lacks of what has driven IDs' strength: conviviality and serendipity (Becattini, 2000).

The process from large firms to SMEs was not immediate. It was a gradual spontaneous process (Bàculo, 2002) in which the market has been responsible to select the most efficient system. Firms located themselves in areas where "social capital" had sedimented in the past, in a mutual process of exploitation and enhancement. Productive chains were created and competitive advantage generated through the well-known dualistic behaviour (competition-cooperation). A high-skilled labour market, specialisation in product production, innovation and flexibility granted the ability of IDs firms to cover niches in the evolved demand (Pietrobelli, 1998).

Furthermore, these firms were mainly run by families, thus generating a sort of buffer in demand varying[16].

In the period 1951-1991, Italy has seen a rise in employment level in provinces with SMEs, whilst assisting in an increasing and then a decreasing of employment rate in Large Enterprise provinces (Becattini and Dei Ottati, 2006).

In details, in 70s, labour division and small dimensions, thus the factor of competitive advantage for ID firms, was the reason of restructuring slowdown of ID firms. Indeed, large firms had a comeback thanks to the same restructuring process made by industrial districts (Pietrobelli, 1998). In particular, large firms started to locate decentralised unit of production in specialised area to exploit collaboration advantages (Trigilia, 1999).

In 90s, a greater institution presence enhanced district performances (formal contract with subcontractor) in order to sustain the rise of transaction costs due to the higher number of networks among firms, even with abroad firms (Trigilia, 1999).

During the 90s, large firms continue to loose workers, while increasing competition and globalisation induced some IDs to open the value chain to the foreign market, and more structured firms emerged (mainly in higher value adding activities) (Becattini and Dei Ottati, 2006).

1.4.1 Evolutionary tendency

At the end of the XX century, competition from Far East and other exogenous macroeconomic shocks caused a fall in the world trade. Despite, exports from traditional sectors of Italian Districts (i.e. personal and household goods, light engineering) were strong enough to sustain a positive balance of payments (Becattini and Dei Ottati, 2006). It was the so called "Made in Italy" sector to sustain Italian economy.

Competition from Far East, mainly in low segment market, and financial crisis were also responsible of a breach in the competition-cooperation equilibrium. In a normal condition, the Industrial District model can evolve due to a virtuous loop cooperation-competition-innovation. In case of external shocks, what drives ID firms might be the reason of its decline or transformation: shocks in market demand may lead to a price competition with a consequent social sanction and reduction of innovation by damaged firms (Dei Ottati, 1995).

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[16] According to Pietrobelli (1998), family-run businesses was initially a reason of ID success. Nowadays, it seems to represent a weakness signal (Pietrobelli, 1998), due to migration phenomena and generational turnover (De Marchi and Grandinetti, 2014).

The Great Recession of 2008-09 exacerbated the pre-existing situation of structural crisis in the district: the small-size and the specialisation in traditional sectors hindered district survival[17]. Financial crisis hit, in particular, export-oriented firms, which is the main component of Italian industrial districts (Busato and Corò, 2011).

However, the strength of industrial district comes from its ability to change and evolve during time, as it is not a static entity, against shocks at macroeconomic and socio-cultural levels (Bianchi, 2017).

Such changes, however, have not affected all the districts in the same way. The peculiar competences of single firms (distinctive competences) within the district, and how firms are able to exploit them, is responsible of heterogeneity between district results.

Firms, as independent agent free to act (Camisón, 2004), are more or less embedded in a district. The latter has a set of competences (shared competences or external economies) freely available to firms therein. Though, external economies are valuable once internalised by firms in a sustainable competitive advantage (Chiarvesio, Di Maria and Micelli, 2010). This ability is strictly related to the firms distinctive competence and its embeddedness within the ID (Camisón, 2004). According to it, it can be possible to explain differences in performances between firms within the same district (Camisón, 2004) and also among districts from the same sector (De Marchi and Voltani, 2014) or geographic area (De Marchi, Di Maria and Gereffi, 2018)[18].

So far, a set of empirical studies has enlighten several recurring phenomena which has led to the dissolution of the Marshallian ID or to its evolution (Grandinetti and De Marchi, 2012):

- Concentration of value upon a few actors within IDs;
- A depletion in relationship among actors;
- An extension of value chain outside the original borders;
- Immigration and the impact on communitarian factor;
- Generational turnover;

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[17] According to Dei Ottati (2002), elements to district survival are the following: ability to maintain an enduring competitive advantage; good internal social cohesion and the consensus among actors therein on common objectives (Dei Ottati, 2002). These elements were affected by globalisation, competition and recession.

[18] The research, from "Evolutionary trajectories of industrial districts in global value chains" by De Marchi, Gereffi and Grandinetti (2018), consider four district performances within Veneto region (Vicenza gold jewellery, Belluno eyewear, Riviera del Brenta footwear and Montebelluna Sportsystem).

- Product diversification.

Competition from globalisation and the financial crisis have had a negative impact on the ID structure. Two possible outcomes have been observed: on one hand a depletion of ID firms (due to a contemporary low birth rate and a high mortality one); on the other hand, more forward-thinking firms have succeeded through acquisitions. Notably, the acquisition of local firms in a vertical integration process has led to the creation of oligopoly (authority relation) of medium-large firms (Tod's in footwear and Luxottica in optical industry) with a large concentration of employment and revenues (De Marchi and Grandinetti, 2014). Despite the admissibility of non-small sized firms within the district, such as larger trees in a forest (to quote Marshall), these changes have compromised ID characteristics.

Furthermore, the globalisation has reduced relationships within ID due to delocalisation of productive process abroad to exploit lower production costs, thus enlarging district's borders in a Global Value Chain. In particular, manufacturing activities are outsourced (also internationally) in a supply chain rethinking, to focus more on value-adding activities.

Communitarian factor has been affected by both immigration and generational turnovers. The former has met the need of district of low-skilled employees at a low-paying job. Consequences concern a multi-ethnic and heterogenous portion of foreigner workers who facilitate the arrival of other workers from the same ethnic group[19] (De Marchi and Grandinetti, 2014).

The problem of generational turnover, indeed, represent an outcome of actual cultural scenario. The less entrepreneurial character plus an increased competition have reduced the firms' spin-offs through entrepreneurial initiatives.

Lastly, Italian IDs have seen a tendency to diversify activities (non- district specific) therein. It is detrimental to the Marshallian characteristics as it causes a reduction in the number of firms specialised in the districts' sector. Although, there is the creation of a diversified local system where new activities have been set, such as those related to tourism (Grandinetti and De Marchi, 2012). Furthermore, as a reaction to shocks, IDs are facing a progressive tertiarization through

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[19] Interesting the Chinese immigration which led to the constitution of Chinese businesses in textile district of Prato, whose characteristics can be assumed to be those of Marshallian District (De Marchi and Grandinetti, 2014).

the presence of firms specialised in providing services, i.e. Knowledge Intensive Business Services (KIBS)[20].

All these elements have enlightened different situations which have been shown by variation in some empirical analysis.

Literature (Grandinetti and De Marchi, 2012; De Marchi, Di Maria and Gereffi, 2018) define three distinctive process of district reorganisation: decline, hierarchisation and resilience. These three phenomena are a district response to globalisation, competition from lower-end market segment and financial crisis, thus different pathways of traditional ID model within the Global Value Chains literature (De Marchi, Di Maria and Gereffi, 2018).

- *Decline* is a condition of districts that face a strong reduction of active firms (rate of natality is lower of the mortality one), mainly due to lack of social cohesion[21]. The inability to exploit district externalities (conversely, there might be well-performing firms unable to pull other district firms to success) is the reason of firms to exit the district and being stand alone. Often, a reduction in manufacturer employees is a consequence of decline of the district. Although, it should be not considered as an indicator. It might happened that the reduction is caused by a shift from manufacturing sector to tertiary sector, which is a positive outcome (Busato and Corò, 2011).

- *Hierarchisation*, instead, represents a condition where the reduction of firms' birth is considerable, although, it is not associated to a reduction of value added (as in the decline trajectory) due to a concentration to a few big players vertically integrated (Belluno Eyewear with Luxottica is an example). In this case, the leading firm is responsible of enhancing local economy. Conversely, it has been observed that in case of predatory behaviour from leading firm, small-sized firms are going to innovate to regain leadership in value chain (Cucculelli and Storai, 2018).

- Lastly, *resilience*, which can be considered as a modern model of Industrial District, represent a situation of moderate reduction of active firms and moderate concentration of value added upon a few firms. Here, there are many active actors that maintain many

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[20]As example, ratio of manufacturer employees (1,9%), from consolidated balance sheet of Geox (2010). See De Marchi and Grandinetti (2012) in "L'industria del Nord Est e il suo intorno: crisi e discontinuità evolutiva" (De Marchi and Grandinetti, 2012).

[21] See also De Marchi and Grandinetti (2014) to have an understanding upon generational turnover and migration problems (De Marchi and Grandinetti, 2014).

(more selective) relationships, which tend to be less concentrated at local level, indeed, global networks increase (Grandinetti and De Marchi, 2012). Empirical examples are given by Sportsystem district in Montebelluna and Riviera del Brenta footwear. The latter has seen successful investments which have led to specialisation in niche markets (thus avoiding competition in mass market) of high-end shoes (De Marchi, Di Maria and Gereffi, 2018).

Table 1: Evolutionary trajectories of IDs

	Decline	Hierarchization	Resilience
Reduction of ID firm population	High	High	Moderate
Increase of resource concentration	Moderate	High	Moderate
Reduction of ID value production	High	Negligible	Negligible

Source: De Marchi et al. (2018)

So far, it can be noteworthy that Industrial District model is under an evolutionary trend, which support them to increasingly diverge from the traditional Marshallian model and support the surge of heterogeneities across districts, so that the "communitarian factor" and the external economies that it support might have a different degree in different districts.

2.Economic impacts of organised crime

The following part of this dissertation is aimed at giving a wide view over the organised crime phenomenon. In particular, starting with a historical review, it follows a description of organised crime's peculiarities. Lastly, organised crime's social impact is pointed out, in terms of macro and micro economic consequences.

2.1 Definition of organised crime

There is a large literature in defining organised crime and its peculiarity, in particular through the distinction with other forms, such as the criminal group or the terrorist ones. Starting from Schelling (1971), the term "Organised crime" is not considered simply a juxtaposition of two English words, thus it is not an organised group of criminals. Indeed, there are many criminal groups that are well-organised, still they are not considered an organised crime group. What characterise this term and enable to distinguish from a criminal group is that "*Burglars may be in the underworld, but they do not seek to govern it, they are not captains of underworld industry* […] *they are not associated with ideas of power, control and underworld society"*(Schelling, 1971). Indeed, the key characteristic is the exclusivity, or seek to monopoly, what really distinguish organised crime from a group of criminals.

Within the context of "Organised Crime", it is not so easy to give a clear bounded definition, it might seem a "conceptual pudding" (von Lampe in Finckenauer, 2005).

According to Armao (2014), in a broader category of violent non-state actors, "Organised Crime" is intended as a "*structured and permanent group of individuals who use violence to gain profit through criminal activities.*" (Armao, 2014). Here, terms such as "structured" can be quite problematic as long as there might be criminal groups with an internal organisation, as earlier mentioned. Although there are other elements to be added: "permanent" and "use of violence to obtain profit". Permanency is important in defining organised crime as long as it exclude those ephemeral organisations of criminals, such as foreign crime groups and gangs in Italy, which can be considered as "profit aimed crews" with looser ties (Paoli, 2014). Another element of distinction, at least in the paper, between "Organised Crime" and any other terrorist group is related to the fact that the latter uses violence to gain power. Among the macro group of organised crime it shall be noted that there are some type of associations which are mafia-type ones (Sciarrone, 1998; Albanese and Marinelli, 2013). The peculiarity of these associations concerns the use of violence to obtain power (power syndicate). Conversely, there are also

terrorist groups which finance their activities through illicit profit, which is an organised crime matter. Hence, definition of organised crime is not so clear. It might seem that Mafia-type organisations (on which this thesis is based) differ from organised crime due to their peculiarities: the aim to obtain political power by weakening local institutions, to provide protection and to get controls over activities in a particular territory. Furthermore, there is another element that characterise Mafia from other organised crime: the presence of a code of honour based on *omertà* which is peculiar of the association (Finckenauer, 2005).

Another line of research brought forward by social scientist before 1980s, in Italy, considered Mafia as a form of behaviour and power, not a formalised organisation (Catino, 1997; Paoli, 2014).

Nevertheless, judicial inquiries in 1980s have proved that mafia-type associations existed as formalised group and introduced the Article 416-*bis*.

Italian legislation is, indeed, quite recent in defining what is a mafia-type association. Before 1982, application of Article 416 (Associazione a delinquere) was used to comprise all associations of at least three people aimed in committing criminal activities. The Article thus failed to distinguish between a simple criminal group and a wider extended network of criminal with political power (Pinotti, 2015b). Furthermore, some activities of mafia-type associations, such as participating to public tenders, were not considered under the previously cited article, due to their apparent "legal" scope. Hence, in 1982, Law Rognoni – La Torre (646/82) introduced the Article 416-*bis* (Associazione a delinquere di stampo mafioso), which was aimed to mafia organisation, described as those organisations which "*exploit the power of intimidation granted by the membership in the organisation, and the condition of subjugation and omertà that descends from it, to commit crimes and acquire the control of economic activities, concessions, authorisations, and public contracts*" (Pinotti, 2015b).

In this way, there is a specific law which punish any mafia-type associations whose intimidating power might have caused involuntary actions to others.

The organisational form of mafia has been confirmed also by studies (Lupo in Catino, 1997) which found a set of shared rules governing members, coordinating the activities. Organisations have also differences and peculiarities, better described in "Mafia-Type Associations Structure" (paragraph 2.3).

Hence, it might be an error not to consider Mafia as an organised crime, as long as both of them are related to criminality. Indeed, it is noteworthy to say that Mafia is a *particular type* of Organised Crime, which shares with the latter the objective to obtain profits through criminal

activities[22], the seek of exclusivity and its structure, even though it comprises pseudo-State functions (Sciarrone, 1998).

For sake of simplicity, from now on, "Organised Crime" and "Mafia" are going to be used as synonymous[23], even though it must be borne in mind that Mafia-type associations are a peculiar kind of organised crime group.

2.2 The origin of organised crime in Italy and the XX century development

The organised crime (in particular mafia-type organisation) in Italy has its roots since the XIX century, more precisely, the first time the term appears was in 1838 (Gambetta, 1988). Under the Bourbons Kingdom, the policy of *divide et impera* had promoted and exploited distrust to facilitate government and manipulation of people, thus creating a violent environment, where crimes were not sanctioned due to a general weak of institutions[24]. Untrustworthy institutions plus a general absence of credible system of justice and legal uncertainty were detrimental to agreements among people, which triggered a stagnation in commerce and industry (Gambetta, 1988). It was not only a political issue, as also an economic backwardness was responsible of a reduction in private initiatives, thus people had less incentive to cooperate and private interest were above public one (Gambetta, 1988). Such conditions are not enough; though, the presence of social mobility was a breeding ground for criminal organisation to arise, as members decided to take advantages and enrich themselves. It was not unusual that Mafia arose in urban areas (e.g. Palermo and Naples) where social mobility was feasible or in productive areas, such as sulphur mines, where a boom in resource demand would have been a way to obtain rents through extortion (Buonanno *et al.*, 2015).

Weak institutions, legal uncertainty and poverty were the reason of a fragmented social environment, where only the strongest would have been able to survive. Conditions did not change after Italy reunification in 1861.

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[22] According to Armao (2014), both Organised Crime and mafia-type associations have the "*desire to intervene directly in the economic sphere in a criminal manner, through threat or use of violence.*" (Armao, 2014).

[23] Many papers have considered "Organised Crime" and "Mafia" as synonymous: Fabrizi, Malaspina and Parbonetti (2016), La Rosa, Paternostro and Picciotto (2018), Paoli (2014) to cite some of them.

[24] A general weakness in institutions was pre-existing during Feudalism, whose collapse in 1812 caused a decentralisation of *latifondi* control over the Bourbons court (Buonanno *et al.*, 2015). The lack of a central control causes crimes and violence to be perpetrated without sanction, thus increasing distrust.

In Sicily, a severe drought in 1893 was responsible of the rise of a socialist movement "The peasant fasci" (Acemoglu, De Feo and De Luca, 2017). In this situation, landowners started to ask for private protection due to the lack of a public army. People who received protection from these groups of men started to trust them, enhancing their reputation. These groups were composed by people related among them, to reduce risk of distrust. This event was responsible in mafia spreading from urban centres and sulphur mines to the rural part of Sicily, causing the phenomenon expansion.

The survival of Mafia associations is still a debated issue, as its long lasting presence has not been granted by a monopoly position nor by a cooperation with other clusters (Gambetta, 1988). Indeed, to cite Gambetta (1988), persistence is given by a "*turbulent equilibrium*" caused by both unintentional and intentional reasons (Gambetta, 1988). The former comes from the migration of mafia-averse people, who decides to migrate in order to avoid retorsions and, unintentionally, causes a lowering in opposition. The latter, indeed partially unintentional, is based on the peculiarity of democratic state. Hence, the democratic state ability to reduce crime diffusion is quite reduced by the ability of Mafia to mobilize voters thus being connive with politics members. Conversely, a dictatorship would be "better" in contrasting criminal organisation due to its nature (Gambetta, 1988; Acemoglu, De Feo and De Luca, 2017). Indeed, during Fascism, Mafia declined considerably; though, it was still active even after Liberation Day.

During post-war period, mafia-type associations expanded in South-Eastern regions such as Apulia and Basilicata. In particular, the first spike in 1970s to 1980s was during the so called "second mafia war", when Mafiosi (from Sicily and Campania) started to emigrate in Apulia and Basilicata to escape from assassinations[25] or to expand in other illicit markets[26] (Pinotti, 2015b).

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[25] According to Varese (Moro and Catino, 2016), there are two reasons which cause the mafia transplantation: "push" and "pull". The former is related to an exogenous cause, such as a war (as for Apulia and Basilicata) or law enforcement (as in Northern Italy). The "pull" is cause by needs in term of human or financial capital, new businesses. These two reasons can be correlated and contemporary cause the expansion of mafia-type associations.

[26] Particularly important were the boom in tobacco smuggling and the earthquake in Basilicata to attract Mafiosi in these two areas (Pinotti, 2015b).

Mafia expansion was also enhanced (though not exclusive[27]) by "enforced stay" of members of *cosche* in other regions to break linkages with the motherland. One example was the expansion in Central and Northern Italy of *Cosa Nostra* and '*Ndrangheta*, with an increased presence of the latter after *Cosa Nostra* reduction due to law enforcement (Moro and Catino, 2016).

Organised Crime groups were strongly weakened after Maxi trials (1986-1987), in particular after the murder of two judges Borsellino and Falcone. Though, Mafia is still present nowadays: in 2001-2014, 43 Sicilian municipalities were put under external administration due to involvement in mafia activities (Acemoglu, De Feo and De Luca, 2017). In 2015, there was an attempt to dissolute Verona for mafia infiltration, even though it was not conclusive (Belloni and Vesco, 2018). Furthermore, in an article from the newspaper "Il Sole 24 Ore", 4 of 10 entrepreneurs from North-East Italy have perceived criminal organisation presence in their territory (Marchetto, 2012).

Even organised crime has faced competition and internationalisation: since 1990s, Italy became territory of migration flows, also thanks to European process of integration and abolition of controls on borders. Moreover, empty spaces left in Central and Northern of Italy, after law enforcement, enable other organisations (less lasting than Southern ones) to rise. It is noteworthy that these groups differ from Italian Mafia: less structured and more ephemeral, these "crews" are involved mainly in illicit traffic or reinvesting dirty money from their countries, but are not able to obtain political power (Paoli, 2014).

2.3 Mafia-type associations structure

The main sources of information on organised crime in Italy are the official reports of the Parliamentary Antimafia Commission (PAC), established in 1962 (Pinotti, 2015b).

The term "*Mafia*" is usually associated with the Sicilian Mafia. Although, its meaning comprises all criminal organisation which have a defined hierarchical structure. There are several kinds of organisations with different peculiarities: *Cosa Nostra* in Sicily and '*Ndrangheta* in Calabria. These are *organisation* as they have a peculiar hierarchical structure. They are "*independent government bodies that regulate the internal life of each associated family*" (Paoli, 2014). Since 1950, collegial bodies composed by families' elected chiefs have been set up with govern functioning (e.g. *La Cupola* in Sicily).

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[27] According to Belloni and Vesco (2018), *confino* in North Italy of mafia members is not the only cause of mafia transplantation.

Cosa Nostra is particularly important as it can be represented as a vertically integrated corporation with a central governance which coordinates managers below in a common and unitary objective (fig.3).

Figure 3: Representation of Cosa Nostra structure.
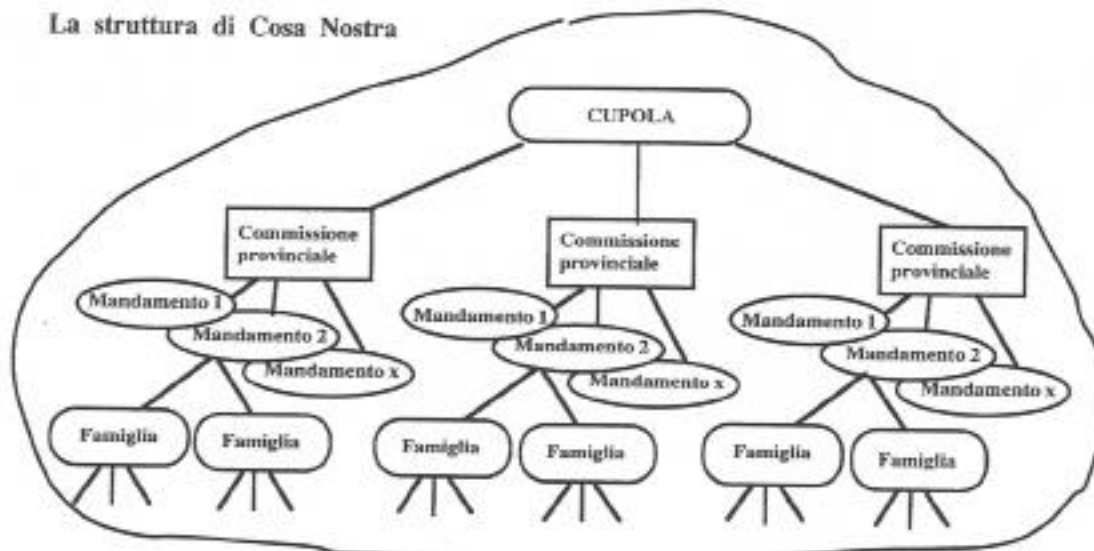
Furthermore, there are other groups of criminals which are usually referred to as organised crime: *Camorra* in Campania and a multiplicity of criminals in Apulia (Paoli, 2014).

C*amorra* is made by many independent groups of families in competition among them to obtain the control over the territory (Catino, 1997). It lacks a coordinating level thus it is not vertically integrated as Sicilian and Calabrian counterparts. It is noteworthy to say that characteristics of *Cosa Nostra*, such as the more hierarchical structure and the higher specificity of its members[28] (so difficulties in substituting them), represent the reason why it is less able to face risks to be detected than *Camorra*, whose more horizontal framework makes it more elusive (La Spina and Lo Forte, 2006).

Furthermore, *Camorra* does not come directly from its ancestor late back in time, indeed, it was "born again" in 1960s thanks to expansion in drugs and tobacco smuggling (Paoli, 2014).

The Apulian organised criminality was initially created by groups from *Camorra*, then new criminal groups arises in different part of Apulia. The most recognised collective actor was

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[28] In particular, *Cosa Nostra* has a rigid rule is term of membership: only people born in Sicily.

Sacra Corona Unita, a consortium of several criminal groups (it tended to emulate *'Ndrangheta*), with a power of control among them.

Other minor groups, that are also referred as "organised crime" even though they are less structured than *Cosa Nostra* and *'Ndrangheta* are *Stidda* in Sicily, *Banda della Magliana* in Lazio and *Mala del Brenta* in Veneto, to cite some of them.

2.4 Characteristics of organised crime

There are some common traits (Finckenauer, 2005; Astarita, Capuano and Purificato, 2018) helpful to give (at least) a coherent definition of organised crime, which comprise also mafia-type associations:

- They tend to act in a *geographical area* with weak institutions, to fill the void and provide protection acting as guarantor in uncertain environments;
- They develop various *structures* to coordinate affiliates[29]. There are examples of highly-structured hierarchies (i.e. *Cosa Nostra*) with leaders, associates and newly-entrants, but also less vertically-integrated structures, with many families in a hard-to-achieve equilibrium (e.g. *Camorra*). It might seem a large corporation made by many resources exploited to maintain the enterprise, to conduct illicit activities and expand their business on a larger scale (Pinotti, 2015a);
- *Continuity*, in the sense that the organisation is a self-perpetuating entity, with the aim to replace members in case of death or arrest (Finckenauer, 2005);
- *Violence and the use of threats*, as core business. Violence or its threat is used to obtain controls over territory areas (mainly where there are economic activities) to extort rents, to mobilise vote, to obtain financing from public sectors and to get monopoly over the illicit traffic (Pinotti, 2015b). Furthermore, violence is used either inside and outside the organisation: respectively to challenge, leaders, to punish members or to discourage internal competition. External use of violence against recalcitrant or to face competition (Gambetta, 1988). The aim is to obtain a *respectful position* to gain trust from the local community (Belloni and Vesco, 2018), to enhance corruptive and extortive capacity and to foster durability of reputation (Reuter in Finckenauer, 2005);

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[29] Organisation through an internal structure is not a key point of being an organised crime. Indeed, as already mentioned, organisation is also a trait of groups of criminals.

- *Membership restriction*, thus a restricted access to the *cosche* in order to retain a sense of trust. Restriction is mainly based on kinship and nationality;
- *Profit purpose* through illicit (drug traffic, loan sharking and extortion) and legal business, i.e. by investing in legal firms to use them as method to launder "illicit" money (from extortion or drugs traffic);
- *Corruption* of public officials and political to better infiltrate in legal economy, to obtain immunity, to get political power and to get public funds.

Another element which characterise organised crime, a sort of key point (Schelling, 1971), is the *pursuit of exclusivity*, by obtaining monopoly in the sector/area of control. The following paragraph is aimed at describing what are the main activities of organised crime.

2.5 Activities of Italian organised crime

"Organised crime exists and thrives because it provides services to the public demands… it depends not on victims, but on customers" (Pinotti, 2015b).

The main activity ascribable to organised crime is "*to provide goods and services that are either illegal, regulated or in a short supply*" (Finckenauer, 2005). Albanese and Marinelli (2013) also added the needs of the organised crime to obtain the monopoly (through an extensive use of violence) over the production and distribution of commodities in a specific area, and also to levy taxes and regulation over both illicit and legitimate business activities. According to Gambetta (1988), the Sicilian Mafia has had the monopoly over protection provision (as a short supply good) since its constitution.

It is important to define specific characteristics of mafia-type activities, which represent the distinctive character of Italian organised crime groups: the power syndicate and the enterprise syndicate (Block in Sciarrone, 1998). The former comprises criminal activities which claim territorial control over a given place (Albanese and Marinelli, 2013). Furthermore, they are exercised in traditional areas, where Mafia was born and where it has achieved a certain reputation. The latter, indeed, is aimed at maximizing profits (Scandizzo and Ventura, 2015). It comprises more entrepreneurial activities, such as organising and managing illegal market and illicit trafficking (Albanese and Marinelli, 2013), and also investments opportunities useful to expand mafia domain, mainly in non-traditional areas (Armao, 2014). These two (power and enterprise syndicates) are correlated in traditional areas where organised crime was born, thus using power to control illicit activities. Conversely, in non-traditional areas where mafia-type

associations tend to be less known, these set of activities tend to be inverse: first, mafia association try to enter illegal markets (through corruption or through legal firms) and then they try to establish a territorial control (Sciarrone in Albanese et al., 2013).

The expansion in other areas is also in line with a development process defined by Armao (2014): entrenchment and expansion. The former is given by the territorial conquest through violence, and it happens mainly in the Southern Italy, the cradle of the Mafia. The latter, the expansion or projection of power, represents the need to expand in other areas through commercial colonisation and thus taking roots to replicate the original model[30].

Activities in traditional areas

First of all, traditional areas are regions (Sicily, Campania, Calabria and since 70s Apulia) where mafia-type associations were born.

In these places, mafia activities are mainly related to the monopoly of protection of both illicit and legitimate business in order to obtain control over the community (power syndicate). Indeed, mafia-type association prefers to obtain political power instead of accumulating fortune (Sciarrone, 1998) The way to obtain control and grant protection is through violence and extortion. For example, drug trafficking, gambling and other illicit activities need protection to avoid State intervention (Schelling, 1971). Also some legitimate businesses need the protection from Mafia in weaker environment, in particular, construction business, harbour activities or waste disposal, which are facing more fluctuating demand and other sources of business volatility (Scandizzo and Ventura, 2015). Most of the time, extortion creates a mutual relationship (social capital) between organised crime and victims/customers of reciprocal "advantages", in terms of revenues/control and protection in transactions (Sciarrone, 1998).

Since its birth, Mafia has been recognised for its protection provider function, nonetheless, it is difficult to define whether protection comes from a true or a deliberately generated threat (Gambetta, 1988). Indeed, mafia has had the ability to turn distrust into institutions in a profitable business, by protecting their customers from unfair agreements (the so-called lemon market) in both demand and supply side. The payment of a tip (*pizzo* under *Cosa Nostra* jargon), which can be considered as an extortion, let vendors to be selected among other competitors[31],

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[30] An example in Lombardy, where a quasi-monopoly in drug traffic was followed by infiltration in the legal market (Moro and Catino, 2016).

[31] On this sense, during a meeting in Treviso by the association Proetica, Tiberio Bentivoglio, an entrepreneur who has not paid tips to Mafia, has seen his business failure due to absence of suppliers and also due to retaliation.

whilst, from buyers' point of view, let them to enter a market where they are less informed (Gambetta, 1988). It might seem a positive action, as Mafiosi act as guarantor in an untrusty world. Indeed, both vendor and buyer have a payoff which is greater than the payoff they would have obtained in case of no transaction at all. In this way, trust represent a positional good, which can be consumed by a part only if it can not be consumed by anyone else (Gambetta, 1988). Nonetheless, it is a case of market failure (Scandizzo and Ventura, 2015). "*Pizzo*" represents a kind of tax which must be paid to operate in that specific area, and it is difficult to oppose due to fear of retaliation, but is also due to the fact that there is a common social acceptance of the phenomenon (La Rosa, Paternostro and Picciotto, 2018). Indeed, by paying the "*pizzo*", there is an advantage for the victim/customer who gains from reduced competition and from unfair transaction. It is an extra-legal protection required, which foster a reciprocal agreement between victims-mafia and create a social consensus on mafia activities.

It is particularly interesting the study made by Scandizzo et al. (2014) in the rationality behind Organised Crime activity. Whilst extorting money from smaller businesses (both illegal and legitimate) might be quite cheap (in terms of expected costs), for greater deals there should be a threefold consideration in terms of deal's characteristics: selectively, irreversible investment and uncertainty (Scandizzo and Ventura, 2015). In particular, organised crime has to consider the expected profit from the activities through an analysis of expected revenues ("*pizzo*" or the advantages arising from the investment in legitimate businesses) and the expected cost (in terms of fear of being denounced). Indeed, organised crime's investment costs come from the public protection by institutions, but also it can be increased by firms themselves if they engage in several measures of self-protection, among which investing in community relationship (Scandizzo and Ventura, 2015). Moreover, the level of *omertà* positively affect expected revenues as long as it reduces the need to use violence, thus risk of being arrested (Gambetta, 1988; Rose-Ackerman et al. in Basu and Cordella, 2018).

Along the profitable activity of illicit-goods traffic[32], which is quite limited also due to recruitment criteria[33], South Italian organised crime (in particular *Cosa Nostra* and *'Ndrangheta*) are recognised to pursue the political dominion as main objective (Paoli, 2014). The latter is obtained through the control over areas in which members are located, by acting

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[32] Nearly 32% to 51% of total revenues from illegal activities (respectively €8.3 billion and €13 billion) are owned by Mafia organisations (Transcrime, 2013), thus confirming literature in saying that mafia does not have monopoly over illicit activities (except for extortion) (Gambetta, 1988; Transcrime, 2013).

[33] Both *Cosa Nostra* and *'Ndrangheta* recruitments criteria are restricted to men from criminal families or born in Sicily and Calabria (Paoli, 2014). The former one plus competition from other criminal groups has hampered opportunities to the geographical expansion in profitable markets.

on public tenders (as an enforcer of collusive agreements), mobilise votes and corrupt politicians and exerting extorsions on all the economic enterprises of the area, even using both reputation and violence (Paoli, 2014). Extortion is also applied on the most profitable economic activities, where there can be a monopolistic position, for example sulphur mines (Buonanno *et al.*, 2015).

Activities in non-traditional areas

As already said above, the peculiar structure of organised crime as an enterprise is helpful to the survival of the organisation. Indeed, mafia-type associations have decided to expand their activities in areas different form original ones, such as in Northern and Central Italy, to avoid competition and to be more profitable. Some scholars consider the expansion in Northern Italy as a consequence of "enforced stay" during 70s, even though, mafia has been present in Veneto since 50s (Belloni and Vesco, 2018). Although, the effects of Mafia presence hit only from 70s, thanks to other favourable conditions (such as the economic boom and the drug traffic). Furthermore, it shall be noted that local organised crime groups have been cooperating with imported mafia in an alarming partnership (Draghi, 2011).

The presence of Mafia-type association is less socially impactive, indeed, according to Draghi (2011) there are less reports of murders, kidnapping or extorsion. Nonetheless, criminal infiltration within non-traditional areas is as detrimental as the one in the traditional areas, even worse, as long as it is less visible. Many crimes are related to corporate crime, such as the money laundering or usury, in particular in tougher economic context.

In this area, organised crime tends to operate in the "Overworld", by having partnership with legitimate businesses[34] (mainly construction, transportation and restaurant), to take roots in the social context. It can be summed up with the process already described of enterprise and power syndicate. Firstly, entering in collusion with legitimate firms in illicit activities (money laundering, public tenders' alteration), then, the objective to replicate motherland activities, thus gaining monopoly in supplying protection and using extortion. Although, it is difficult, especially in non-traditional areas, to obtain power of control, mainly due to law enforcement and lack of reputation. Thus, mafia-type associations become actors of the market, instead of governing it.

There are several reasons that explain mafia expansion in other areas (Anderson in Moro and Catino, 2016). Among them, investments opportunities, legal activities to cover illicit activities

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[34]Industries' characteristics that are eligible in mafia penetration are better explained in the "Criminal firms" paragraph (2.7).

(such as money laundering), legal activities to provide services to mafia members (such as protection or limitation of competition for those firms which are connected to mafia association), legal activities external to the core business of mafia associations.

Money laundering is one of the main activities that are made by mafia-type groups. By using clean firms through control (connected to mafia firms or "criminal firms"), they use it to make legal "dirty money", causing price distortion and unfair competition in a vicious cycle toward firms' failure.

Money laundering procedure (Rose-Ackerman et al. in Basu and Cordella, 2018) is composed in three steps: placement, layering and integration. The first procedure entails the introduction of money from illicit activities in the legal system, through deposits or financial investments, directly or through third parties (e.g. knowledge providers), in small quantity to avoid detection. Layering process is intended to emulate payments for services, thus money is shifted among accounts using shell companies., also known as "Società Cartiere" (paragraph 2.7). Then, in the integration phase, the newly obtained "legal" fund is introduced in the economy and it is sent to beneficiaries (which might be a firm connected to mafia). The aim of this process is to recover illicit profit and to introduce it in the legal system.

Criminal organisations are economic rational actors aimed at maximizing their profit (Savona, 2001), though one of the problem of organised crime is the structure within them. Secrecy and the restrictive condition to access in the association (paragraph 2.6) are the reason of a lack in terms of human capital and knowledge[35]. Therefore, organised crime needs a set of relationship with people outside their "*affiliati*" (Catino, 2018). These outsiders are mainly highly educated people (so called "white collars") who are a value-adding resource thanks to their competences and knowledge. The function of these actors (which will be explained better in "The importance of white collars in organised crime" – paragraph 2.6.1) is mainly related to be a gatekeeper between Mafia and the external environment, thus reducing the information asymmetry on organised crime (knowledge broker); moreover, white collars act as intermediator to find potential clients to the criminal association. They are useful in non-traditional environments, where mafia does not know to whom be connected to run the business (Catino, 2018).

Thus, organised crime tends to create a set of relationship in "grey areas" with these external actors (entrepreneurs, politics, public officers, experts), thanks to pre-existing conditions and a reciprocal advantages, in order to enlarge their social capital to extend their influence (Sciarrone, 2012; Catino, 2018). Furthermore, this meeting point is useful to organised crime

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[35] In details, Mafia lacks of *embrained knowledge* (due to restriction in recruiting) and encoded knowledge (due to the secrecy duty) (Catino, 2018).

because it creates a link between illegality and legality, with the aim to provide services both legal and illegal to firms and also to member of the organised crime (Savona, 2001).

So far, all the mafia activities generate a flow of income between the legal and illicit side of the economy. To sum up, it can be represented as it follows (fig.4).

Figure 4: Relationship between Organised Crime and legal sector.
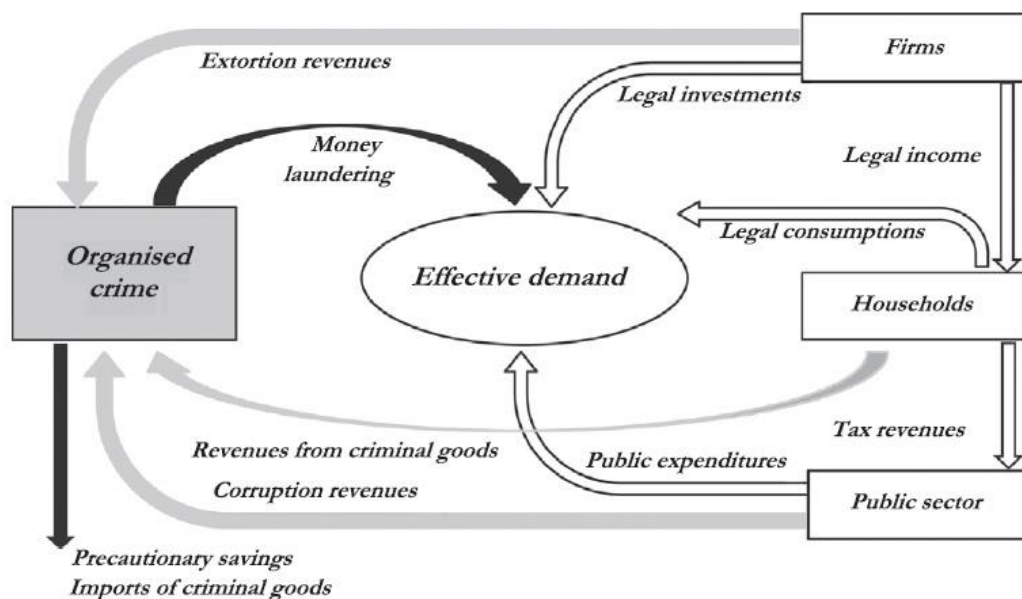
Source: Astarita, Capuano and Purificato (2018)

The illegal income, which outflows from legal sector, obtained through the three offences: extortion, illegal trade and corruption is then reinvested in the legal economy (through consumption and investment) thanks to laundering activity (Astarita, Capuano and Purificato, 2018). As it will be explained later (paragraph 2.8), the impact of organised crime in the economy depends on this equilibrium between legal and illegal sector.

2.6 Social capital in organised crime

One of the characteristics of organised crime is its ability to create and exploit a network of relationships, with different level of social consensus, in order to achieve objectives of control and to survive through time (Sciarrone, 2012).

The set of relationship in the organised crime can be divided into external and internal ones. The former concerns the relationship that the organisation has with external actors, who can be another criminal organisation, a firm or a single person; the latter comes from the relationship within the organised crime, thus kin or friendship among associated. Internal relationships tend

to be more dense also because are among related people with commonalities (network closure), and are aimed at create a unit. External ones (network brokerage), indeed, have weaker ties because their function is to link different clusters (network closure) among them to a common objective (Sciarrone, 1998, 2012; Catino, 2018).

Figure 5: Network Closure and Network Brokerage.
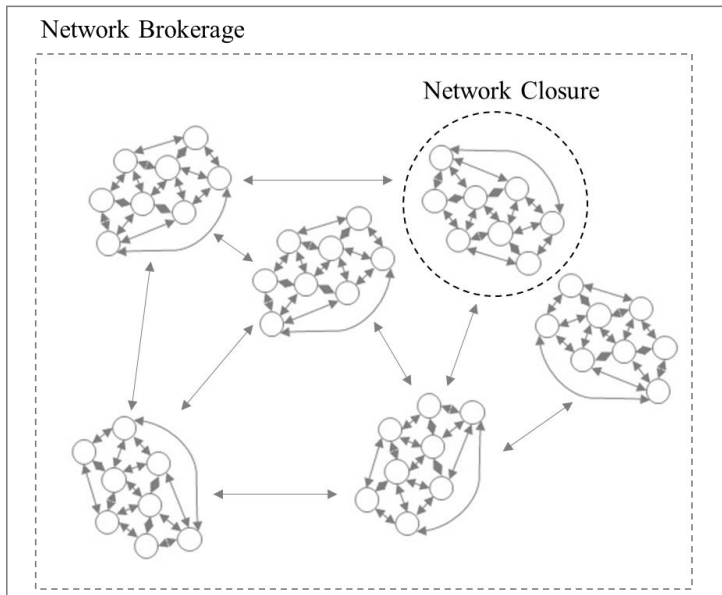
Source: personal elaboration

It is noteworthy that weaker ties are better than the dense network among members because they are less visible (likely to be suppressed) and thus better able to infiltrate the legal economy with lower risks (Sciarrone, 2012).

In both the above mentioned type of relationship, Mafia use simultaneously the four elements to enhance cooperation: coercion (fear of retaliation and violence); mutual interests (economic mainly); common values (such as ideological, cultural or religious) and personal bonds (Gambetta, 1988). The use of violence is not itself an exclusive way to retain the relationship. Even though the risk of a threat might act as deterrent to "break the rule" and escape from the criminal organisation, too much violence might impose to confess and break the silence duty (e.g. the so called "*pentiti*" who have helped in criminal groups' chiefs arrest). It is thus necessary to foster the relationships with the already cited interests, values (e.g. secrecy) and personal bonds.

Mafia-type associations are well-known to rise in areas with lack of trust on institutions. By this way, the need of certainty inside the group is granted by "*the sharing of common cultural codes and a single organisational formula*" (Paoli, 2014). Taking in consideration *Cosa Nostra* and *'Ndrangheta*, the way by which novices enter the group (*cosca*) is based on rituals whose

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objective is to tie members, to sacrifice themselves to serve the association (Paoli, 2014). Once the ritual has been concluded, the person assumes a new identity, a "man of honour", with a set of rules (status contract) to be respected, one of them is related to the duty of secrecy, as a defence strategy (Paoli, 2014).

Fraternisation promote trust and solidarity (also by sacrificing themselves to save their "brothers") among all members. Furthermore, it enhances a general reciprocity without a short-term reward, in order to achieve a common objective beneficial to each member.

Rigid recruitment rules (only men from nearby or from criminal families) are negative for the survival and expansion of organised crime, which can be considered as a "close system" (Paoli, 2014).

Although, Mafia has been fostering external relationships with third parties to obtain more opportunities also in non-traditional areas.

2.6.1 The importance of "white collars" in organised crime

The increasing needs to be present in non-traditional areas have led to human capital enlargement through external relationship (Catino, 2018). It might seem to be contradictory with the "duty of secrecy" rule of organised crime. Nonetheless, there is a reciprocal aid between these external actors and Mafia. From both sides there is an economic interest to be satisfied, even though no common values are requested (Savona, 2001; Catino, 2018). Indeed, these experts are not customers neither colluding with mafia[36], they simply act as partner of the business to achieve an equilibrium where both the contractor and the expert are better off economically.

These people, better known as "white collars", are important subjects due to their competences, knowledge and also their networks. Thanks to those competences, criminal organisation can expand in non-traditional areas and creates networks with firms to exercise profitable illegal activities. Furthermore, these agents reduce cost of transaction (i.e. cost of negotiating and contracting) of criminal organisation by reducing information asymmetries. It must be said that the presence of these actors is fundamental to the expansion of criminal organisations: they act as enabler, as they let do things not feasible otherwise. Indeed, many of Mafiosi activities (i.e.

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[36] It is very difficult to incriminate these people for mafia association under Italian Law, because they are not involved in the organisation, though they are fundamental to the organisation's survival. In 2000-2015, 16 of 1,251 suspects were incriminated for "*concorso esterno in associazione mafiosa*" (Catino, 2018).

money laundering, corruption, investments) would not be executed due to low educational level of most of the members of organised crime groups[37].

According to Catino (2018) white collars can be divided into two categories, which are not mutually exclusive: knowledge providers and knowledge brokers.

While the formers are fundamental to organised crime for their competences and knowledge; the latter are able to generate networks between Mafia and other actors.

More in details, the knowledge provider (which can be a consultant, a lawyer, an entrepreneur or a public officer) is someone able to convert mafia core capabilities in an action in the legal market (money laundering, investments, corporate crimes…). Knowledge providers have the following tasks:

- Obtaining financial resources and enhancing the business: thanks to their knowledge (in particular in economics and finance, law, capital markets, etc), knowledge providers sustain mafia in activities otherwise not feasible. For example, in helping Mafia groups to acquire assets from auctions, developing new business objectives;
- Helping in financial resources usage and management, for example, in money laundering activities, with the introduction of illegal profit in the economy;
- Developing and enhancing a social image, in order to get visibility in new business relationships, though hiding the real nature of the deal.

Knowledge brokers, instead, can be find between networks. They act as intermediary (gatekeepers) to connect two parts who can not have access to the network due to lack of trust, as in a non-traditional environment for organised crime group. In this way, they foster mafia's continuous learning and its adaption to the environment. Furthermore, these players enhance social capital of organised crime by defining to whom to be connected (Catino, 2018).

Knowledge brokers are mainly in charge of:

- Reducing information asymmetries in the new environment, by providing a network of possible customers and partners (otherwise impossible due to the lack of reputation and partnerships) and through information acquisition on law enforcement to protect the mafia members;
- Providing public tenders, thus helping organised crime groups to beat the market;
- Find new customers, partners, people to appoint as figurehead of shell companies;
- Ensuring communication among members, even if held in prison.

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[37] The 82% of people associated to mafia has studied from 5 to 8 years, according to a study made by Savona et al. (2018) (Catino, 2018).

It is noteworthy the presence of these actors in defining the mafia approach to new enterprises, where organised crime meets economic crimes. The latter are less risky in term of criminal prosecution, though, they are responsible of organised crime's capital enlargement (Catino, 2018).

The following part is related to the way in which mafia-type association shows its entrepreneurial face, by acting in the legal market as an active actor.

2.7 Criminal firms

"*The organised crime is first and foremost an enterprise, even before being an association of people*" (Bini in Savona, 2001).

Criminal organisation takes on new businesses to invest and launder financial resources from illegal activities (Ravenda, Argilés-Bosch and Valencia-Silva, 2015). Through the creation of a legal firm which is connected to mafia-type association, henceforth "Criminal firm", mafia is able to expand its control also in non-traditional areas and to exercise its activities through the power of intimidation. There are several reasons why organised crime invest in firms: to cover illicit activities (money laundering); due to economic reasons (obtain profits through a legal activity); to obtain social consensus; to obtain control over the territory and for personal reasons (Transcrime, 2013). But first of all, it is important to bear in mind the way in which they become criminal firms.

A firm becomes criminal if: (i) it is created by organised crime to foster illicit activities and provide services, in which a mafioso is a shareholder and/or a director; (ii) if shares of a pre-existing firm are owned by another criminal firm (Fabrizi, Malaspina and Parbonetti, 2017). Mafia prefers to invest in Srl (46.6%) due to the limited responsibility and the low level of capital required to constitute it. Corporations (SpA) counted only a 2% of the total of investments, because they require higher level of disclosure and a higher level of equity to be constituted (Transcrime, 2013).

It should be borne in mind that organised crime has been able to infiltrate in many areas thanks to professional people, the already-mentioned white collars.

Mafia tends to penetrate mainly markets with the followings socio-economic characteristics: a low level of entry barriers, low-specialised labour force (mainly immigrated ones are better

exploited), low-tech level and many SMEs independent[38] (Moro and Catino, 2016). To the previous ones it should be added a higher observability of outputs and profits, so firms are not able to hide from mafia extorsion (Lavezzi, 2008). Hence, a firm which is small, in a traditional/low-tech sector strongly related to the territory and with a large public sector (Lavezzi, 2008; Fabrizi, Malaspina and Parbonetti, 2017) is perceived as the main prey of organised crime.

The coexistence of these factors is particularly observable in some sectors: construction (for example the earth-moving activities), transportation, restaurants and catering services (Moro and Catino, 2016). There are many examples (Moro and Catino, 2016)[39] of family-based firms in the construction sector owned by mafia members, which are able to beat the competition in public tenders thanks to a strong price competition granted by tax evasion, lower salaries and large quantity of zero-cost capital from illicit profit. In this way they alter the market and cause other legal firms' failure (see 2.8).

According to a research[40] made by Fabrizi, Malspina and Parbonetti (2017), in Northern and Central Italy there are three kinds of criminal firms: "Società di Supporto", "Società Cartiere" and "Società Star", which differs in terms of profitability, operative costs and total assets.

- "Società di supporto" (Supportive firms) are small firms with revenues nearly equal to 0, and a low (also negative) level of profitability which is mitigated by higher "Non-operating revenues". Other elements: high level of "Cost for services" and a high level of liquidity. To sum up, these firms have been created mainly to provide services to the criminal organisation, for example buying machinery needed by other criminal firms. The high level of liquidity and the positive other revenues can be caused by the activity of usury.

- "Società Cartiere" means companies created ad hoc to launder money. They are characterised by a high correlation between revenues and costs, with highly-volatile revenues. The volatility and the high correlation can be explained by the fact that invoices are most of the time fictitious (or come from other criminal firms) and needed to justify the large amount of financial resources.

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[38] I would like to enlighten that firms within IDs represent a good barrier to mafia entrance, due to the strong social cohesion and the highly skilled labour force.

[39] According to Varese (Moro and Catino, 2016), large construction firms have convenience in procures out-of-territory works to local specialised firms (most of the time criminal firms) instead of paying for transportation of the machineries.

[40] The sample of criminal firms of the mentioned research is the starting point of this dissertation.

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- "Società Star" are characterised by better performances and a high amount of equity participation. These firms are those used to infiltrate the legal system, to create ventures with other legal firms and thus let organised crime to obtain control.

The presence of a criminal firm in a legal market is characterised by several consequences for firms therein.

Firstly, a criminal firm has advantages from its nature: the large amount of financial laundered resources is employed to make investments at zero-cost. This competitive advantage, in term of lower prices, is granted also thanks to wage compression (due to evasion of social security, insurance, contribution, overtime, trade union rights) and also tax avoidance (also lack of environmental sustainability) (Ravenda, Argilés-Bosch and Valencia-Silva, 2015). The higher profit, income and the employment of local people is the advantage of these firms which are socially accepted[41]. The risk is that people tend to accept these firms as a good presence in the community, and that is the reason why it is so difficult to detect mafia presence. Though, in case of law enforcement and failure of the criminal firm, there is an anti-state reaction by local community.

Criminal firms are considered a good partner for legal firms in the nearby; indeed, there might be relationship (voluntary or coercive) with local entrepreneurs. The reason why a business owner should contact a mafioso might be a consequence of the recent crisis, in terms of credit facility or need to face competition. Furthermore, a relationship might be created also because the entrepreneur wants to obtain higher profits (thus it is a collusion case). There are also situations in which entrepreneurs enter in the vicious cycle because of intimidation from criminal firm.

There are three services provided by criminal firms to the legal market (Moro and Catino, 2016): business development, restriction of competition and enforcement.

Business development is related to the provision of exploitation and exploration of new opportunities, in terms of new markets or new resources precluded. For example, the possibility to obtain public tenders thanks to mafia contribution[42].

Restriction of competition is another service provided to legal firms: by using power of intimidation, mafia-type firms create cartels to affect market prices. There are also examples in which criminal firms use the power of intimidation to oblige legal firms to buy from a firm (the

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[41] Social consensus is the main suit point to foster mafia activities also because it enhances the power and control of the organisation.

[42] Some real examples are provided in Moro and Catino (2016).

protected one) instead of another. In this case, non-criminal competitors are not able to face competition and might decide to connect with organised crime, in a vicious cycle which leads to a criminal monopoly in a specific area (Savona, 2001).

Lastly, enforcement, is a typical protection service where criminal firms act in order to settle claims or as a debt collector (Moro and Catino, 2016). In "Aspide operation" it was detected a holding company (Aspide S.r.l.) which provided several services to north-eastern entrepreneurs, such as usury, tax evasion and tax avoidance and also as violent debt collectors (Belloni and Vesco, 2018).

So far, criminal organisation is responsible in affecting the legal market because of its intimidating function, the introduction of illicit profit in illegal markets and the consequent market competition alteration. The next step is to find out which are the effects in the economy.

2.8 The organised crime externalities

Organised crime presence is bearer of deep economic and social consequences, which can be both direct (e.g. racketeering) and indirect (weakening of institution and promotion of distrust; Gambetta, 1988). In both cases, it represents an additional cost to economic activities thus reducing the profitability of firms.

Literature is flourishing in assessing these effects, in particular by distinguishing between macro and micro effects, both in the sense of presence of a criminal organisation and its presence through criminal firms (paragraph 2.7). Most of the literature concern macro effects on GDP growth rate (Gambetta, 1988; Pinotti, 2015b; Astarita, Capuano and Purificato, 2018), literacy and education (Acemoglu, De Feo and De Luca, 2017) and Foreign Direct Investments (Daniele and Marani, 2011), to cite some of them.

At a micro level, which is less analysed, there are effects on production function (Albanese and Marinelli, 2013; Ganau and Rodríguez-Pose, 2018), profitability (Malaspina, 2016) and cost of credit (Bonaccorsi di Patti, 2009).

Macroeconomic effects

The presence of mafia in areas with weaker institutions is mainly aimed at exercise control activities: by creating the need of protection through violence or credible threats, they obtain control over economic activities and a fixed income through tips (Gambetta, 1988). Consequences are both direct and indirect: indeed, firms have a contraction in profit margins and in investment opportunities. Furthermore, the juxtaposition of lack of trust in institutions

causes a migration of potential entrepreneurs, or the reduction in investments and private initiatives to avoid mafia contacts[43]. These elements combine to reduce economic development in a reverse causality where Mafia is at the same time cause and consequence of weak institutions and economic backwardness (Pinotti, 2015b).

In this sense, Pinotti (2015b) has demonstrated mafia impacts through an empirical example in Apulia and Basilicata in the end of XX century, whereas exogenous shocks ("the second mafia war", the 1980 earthquake and the "*confino*"; Pinotti, 2015b) caused mafia organisations to spread in these areas. It is particularly interesting noting that the comparison between the actual and counterfactual[44] scenarios has shown a reduction of 16% of GDP *per capita*, which is consistent in explaining the detrimental effect of mafia presence in the economy.

Astarita, Capuano and Purificato (2018) have empirically find out that the impact of organised crime presence (on economic activities and growth) might be both positive or negative depending on the level of effective demand from legal sector. Indeed, the Italian case represent a situation in which the impact is generally negative, as long as the reduction in the demand of legal goods and public expenditure, due to criminal offences, is higher than the rise in the effective demand caused by the injection of laundered money, thus affecting the economic activity. Growth rate is also negatively affected because the reduction in investments due to lower economic activity is higher than the increase due to laundered criminal income (Astarita, Capuano and Purificato, 2018). These results can be compared and confirmed by Pinotti (2015b).

Organised crime has had also effects in the medium-long terms (Acemoglu, De Feo and De Luca, 2017): it has affected human capital in the beginning of XX century, with a negative significant effect on literacy, taken as proxy. Furthermore, there are also notable negative effects on State capacity, by considering infant mortality, water provision and expenditures level. According to Acemoglu, De Feo and De Luca (2017), organised crime ability to mobilise votes and to use violence or credible threats to corrupt public officers cause a reduction in state capacity in providing public goods and protect its citizens.

So far, the presence of Mafia creates, in the short term, a reduction in human capital, infrastructure and investments which trigger economic backwardness, weaker institutions, thus a reduction in growth rate in the long-term. Furthermore, the higher uncertainty in law

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[43] It can be summed up with two features: sterilisation of entrepreneurial potentialities and migration of talents (Champeyrache, 2018).

[44] It is a scenario which shows the evolution of the treated region in absence of mafia activity (Pinotti, 2015b).

enforcement and protection from institutions are going to pave the way for mafia control and persistence.

Mafia is also responsible in affecting Foreign Direct Investment inflows. In particular, it is known that investment flows are facilitated via strong institutions, where there is trust in law and in its enforcement, lack of corruption, etc. Indeed, crime generates an unfavourable business climate, a kind of additional cost (due to extortion, intimidation, destruction of property, arson), which discourage both foreign and national investments. In this sense, a quantitative analysis made by Daniele and Marani (2011) has found a significant and negative correlation between organised crime index and FDI. Especially low is the level of FDI inflows in Southern Italy, were mafia was born (Daniele and Marani, 2011).

Microeconomic effects

As already mentioned before, the recent Great Recession in 2008 has had a negative impact to the economic environment. Thus, lower level of profitability and a severe credit constraint caused many firms to distress. To avoid it, many business owners decide to collude with mafia[45], in order to obtain credit facilities thus enhancing the mafia political power.

Although, mafia is not only consequence, but it is also a cause of firms' failure: the presence of organised crime in an area cause a reduction in development (macro level), with an overall effect also to the micro level, such as for firms, by acting on human, financial and physical capital.

By analysing the micro level, organised crime (as itself or through criminal firms) has negative consequences in terms of profitability, productivity and cost of credit.

Particularly important the contribution of Malaspina (2016), in cooperation with Professors Fabrizi and Parbonetti, in assessing the effect of criminal presence, through criminal firms, in the legal economy, especially in non-criminal competitors' performance. Significant results show a positive effect from mafia removal, in terms of better performances. It can be said that the elimination of criminal presence has had positive spill-overs for firms in the same industry (and also in the same geographic area) in terms of more efficient and less distorted business environment, less corruption. Furthermore, the renovation of market competition, which was harmed by the presence of criminal firms with a huge amount of financial resources from illicit

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[45] In "Come pesci nell'acqua" by Belloni and Vesco (2018), an economist sustained what drives collusion with mafia might be the sense of responsibility of the entrepreneur in the economic development in North-East Italy at the end of XX century.

activities. All these effects are positively related to business performances, as EBITDA/assets or ROA (Malaspina, 2016), and subsequently to economic growth and local development.

Organised crime also negatively affects firm-level productivity growth (Albanese and Marinelli, 2013; Ganau and Rodríguez-Pose, 2018), as it reduces profit margin due to both direct and indirect effects (as already stated above). According to Albanese and Marinelli (2013), negative impact of organised crime is mainly caused by the power syndicate offences (racketeering), thus the power of control over a territory. This negative effect is more detrimental for small firms due to their weaker market power and the lower amount of resources, according to Ganau and Rodriguez-Pose (2018). Differently, Albanese and Marinelli (2013) have not found significant differences in results by breaking the model down by firms' size. Despite, the overall effect is negative in terms of productivity.

Lastly, an empirical research (Bonaccorsi di Patti, 2009) has found a correlation between organised crime and access to credit for firms. It is particularly interesting the negative effect on cost of credit, where results have shown a difference of 30 basis point among interest rate for similar firms in a different level of distribution crime. Crime also affects the amount of collaterals requested by bankers to prevent loss given defaults, which tend to be higher in high-level criminality provinces. Collaterals and cost of credit increase is driven by banks' operating costs, the risk of default and loss and the presence of asymmetries. The latter is not significant in explaining the effect of crimes on loans contracts, though, it tends to be higher in high-crime areas and thus causing restrictions in credit supply.

Furthermore, it is useful to note that negative externalities in credit rationing arising from criminal presence are lower the larger the firm size (Bonaccorsi di Patti, 2009), thus, where greater is the disclosure and lower the information asymmetry.

Credit rationing and high cost of credit negatively impact firms' opportunity to invest, thus reducing human, physical and financial capital and so the growth rate.

3. Research hypotheses

3.1 Design of research hypotheses

The previous literature was aimed to give a wide knowledge on Industrial Districts and Organised Crime. It should be noted that one common element, the social capital, can vary according to the context in which it develops itself. Indeed, social capital can have different outcomes in terms of social development (Trigilia, 1999): positive externalities when the information flow enhance local development, through coordination and cooperation; negative outcomes, when there is an appropriation of information to achieve personal interests, such as in collusive cartels. Indeed, political interventions can affect these outcomes, by fostering development through infrastructures, legal certainty and individual protection. Lack of institutional presence, as already explained before (Gambetta, 1988), or the misappropriation of public sources by politics is the reason why mafia has been flourishing since the origin.

Considering the institutions' distribution in Italy, it is noteworthy to consider that it has its roots since the first millennium. Indeed, free cities in Central-Northern Italy have created the basis for stronger institutions and a greater presence of social capital devoted to local development (Guiso, Sapienza and Zingales in Buonanno, Montolio and Vanin, 2009), which might be the reason why Industrial Districts are mainly distributed in the mentioned area; on the other hand, Bourbon' presence and distrust generated have been responsible for weaker institutions and the rise of Mafia in Southern Italy at the end of IXX century (Gambetta, 1988).

So far, the infiltration of mafia in Northern areas during 1950s has generated issues in terms of negative effects in the socio-economic context, with interesting outcomes. Indeed, negative effects from mafia presence might have a different impact according to the institutions' strength.

Hence, the aim of this dissertation is to verify whether the removal of a criminal firm, whose impact is positive according to literature analysed so far (Malaspina, 2016), might be enhanced by the presence of stronger institutions and social capital, in particular in presence of District areas. Hence, by analysing a sample of 106,820 firms distributed in 55 Criminal Labour Market Areas (LMA), I would like to assess whether benefits from criminal firms' removal are better exploited by firms within a District LMA, as a proxy of Industrial District, or outside it.

It is expected that the presence of strong relationships among actors, the communitarian factor and the trustworthy environment are going to work as catalyst in enhancing performances after the criminal firm removal.

The research hypotheses can be therefore summarized as in the following:

1. Do firms within a District LMA have better performances after criminal firms' removal?
2. Do firms within a District LMA suffer a lower cost of debt after criminal firms' removal?

From the literature, it is expected to confirm both hypotheses. Indeed, positive effects from mafia removal (Malaspina, 2016) are larger for Industrial Districts firms thanks to a better ability to recover from the shock. This ability is related to positive externalities from the industrial clustering and the strength of social capital: trust among actors and the competition-cooperation behaviour to efficiency are good way to curb the negative impact from mafia presence and to be able to enhance performances. Furthermore, the reduction of monitoring costs due to mafia removal plus the district's transparency is useful to reduce the cost of debt. Hence, the negative impact on profitability and credit cost is expected to be off-set by positive externalities arising from Industrial District presence.

4. Data and methodology

4.1 Data set

The second part represents the core of this dissertation. It is structured as follows: the first paragraph is aimed at describing how the sample of treated firms has been selected, starting from a sample of criminal firms from a previous research (Malaspina, 2016; Fabrizi, Malaspina and Parbonetti, 2017). It follows a second paragraph in which the empirical research is explained, with results of the two previously cited research hypotheses.

4.1.1 Identifying criminal firms

The core of this dissertation started form a sample of criminal firms which were detected by police operations during decade 2004-2014. This sample is obtained from a previous research made by Fabrizi, Malaspina and Parbonetti (2016, 2017). The importance of the mentioned research is based on its attempt to reduce biases[46]. Indeed, the sample is referred to the Central and Northern Italy, where the mafia expansion is more recent and less pervasive, reducing the risk of considering as non-criminal firms those that are actually criminal or not yet detected (type II error); furthermore, it is based on official ruling from Italian Courts, thus it reduces the risk to define firms as criminal by considering proxies or rumours, with less probability to commit type I errors (Malaspina, 2016). Another important consideration is related to the method by which this sample has been created. Indeed, it does not only collect firms that had been confiscated by Italian authorities, as the number would have been much lower and less realistic. Hence, firms are defined as criminal even if a person convicted under 416-*bis* is in the

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[46] Some research has based studies on Mafia phenomenon on indexes which measured extortion, homicide, theft and robberies ratio. Though, these indexes might be subject to underreports, for fear of retaliation; other, as the homicide, might not be directly related to mafia crimes. Furthermore, these indexes are not useful in non-traditional areas, where mafia activities are less violent but more involved in the economic sphere (Draghi, 2011). To avoid these cases, Albanese and Marinelli (2013) have taken Calderoni Mafia Index, which comprises also confiscated assets. Such criterion has been used also by Fabrizi, Malaspina and Parbonetti (2016).

board of the firm or he/she has held a share of at least 10% (Fabrizi, Malaspina and Parbonetti, 2017). By enlarging criteria to detect criminal firms, it is possible to comprise also situation in which the firm is not totally owned, but at least there is a presence in the board of directors. Notwithstanding, this sample of criminal firms is not complete, indeed, it is not so easy to apply art. 416-*bis*, especially in Northern area, where the mafia phenomenon has been underrated for many years (Belloni and Vesco, 2018).

Results

So far, the sample consists of 649 criminal firms in the Central and Northern Italy, with full indication of the firm business name, municipality and its Istat code, ATECO code, year and name of anti-mafia operation, full name, social security number and position within the firm of the convicted person.

Starting from the business fiscal code, I looked for financial data and other commercial information from database AIDA, through Bureau van Dijk, and also from Telemaco[47] for those firms not retrieved from the previous one. Some limitations occurred while finding firms, as some of them had been removed due to failure declaration but has been re-established in other municipalities. Thus, there have been differences between the registered office from AIDA, the registered office from the initial sample (Fabrizi, Malaspina and Parbonetti, 2017) and the operational headquarters from AIDA. Problems arises as AIDA database is constantly updated and returns last available data.

Table 2 is aimed at clarifying assumptions that have been considered:
- AIDA registered office: A;
- Criminal Firms sample registered office: B;
- Operational headquarter: C.

While the first case's choice was quite trivial, in the second and third ones I assumed to consider the registered office from the initial sample (B) (Fabrizi, Malaspina and Parbonetti, 2017), as it represents the actual site where the mafia operation had been perpetrated. Thus, it would be more consistent for the analysis because it allows to observe the effects in the actual affected site.

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[47] Telemaco database collects financial and governance information from the Italian Chamber of Commerce on all Italian firms.

Table 2: Criminal Firms headquarters' location

N. of criminal firms	Firm site
188 of 649 firms	A = B = C
401 of 649 firms	A = B, C not available.
60 of 649 firms:	
- 13 of 60	A = B ≠ C
- 1 of 60	A ≠ B ≠ C
- 18 of 60	A ≠ B, A = C
- 28 of 60	A ≠ B, C not available

Figure 6 is useful to understand how firms from the sample are distributed in the Central-Northern Italy. As it can be seen, most of infiltrations is in provinces such as Turin (71), Milan (155), Venice (68) and Rome (110)[48]. Though, infiltration is extended nearly in all Central-Northern provinces. A broad presence is visible in North-East Italy, as documented by Belloni and Vesco (2018).

Figure 6: Distribution of Criminal firm at province level.
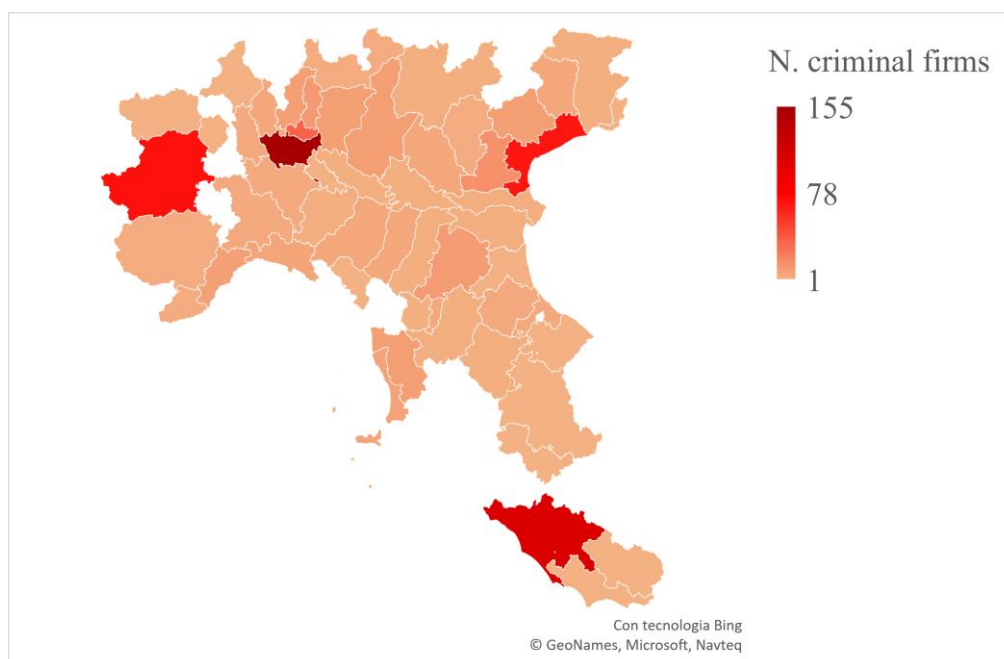
Source: personal elaboration from the Criminal firms sample.

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[48] These numbers are indicative to explain mafia presence in Central-Northern Italy. Indeed, if it had been possible to represent the number of criminal firms per LMA, which is a starting point of the thesis, there would have been different numbers, as LMAs do not correspond to the administrative units.

The following step is related to Local Market Areas detection, which is useful to the structure of the final sample of treated firms.

4.1.2 *Identifying Industrial Districts: from LMA to Industrial District*

Italy is divided into 611 Local Market Areas (LMAs), 72 less than those detected in 2001 (Istat, 2011a).

These sub-regional geographical areas represent an analysis of commuting patterns, a proxy of social and economic relationship of workers, which are useful to verify research hypotheses.

There is a procedure to detect LMAs which comprise an Industrial District, henceforth District LMA, according to Istat (2011b).

Firstly, from 611 LMAs, those mainly manufacturing[49] (220) are selected through a concentration index of workers in manufacturing activity that has to be higher than the national average. From this sample, LMAs with a prevalence of SMEs are selected by analysing the number of employees within the three categories: micro (max 9 workers), small (10 to 49) and medium (50 to 249). From this operation, 151 LMAs are selected. The next step is aimed at verifying the main industry within the manufacturing sector. From this step, two criteria must be fulfilled to define the LMA as an Industrial District (141):

- the number of workers within SMEs specialised in a manufacturing activity must be greater than the 50% of workers from the same industry;
- in presence of a medium-size firm, the number of workers in small and micro firms must overtake the 50% of workers within the medium-sized firms.

The last criterion is useful because it avoids comprising as IDs those LMAs where workers, even specialised in manufacturing activities, are employed in the medium-sized firm, thus representing a hierarchised system.

In an attempt to sum this procedure, Istat provides 611 LMAs that are broken down as reported in Table 3:

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[49] According to Istat (2011b), economic activities can be divided into: farming, extractive industry, manufacturing industry, construction, services to business and to consumers, social services and traditional services. In this case, I focus on manufacturing activities, which are subdivided into 11 sub-categories, which represents IDs specialisations.

Table 3: Industrial District identification from Local Market Areas

Total Labour Market Areas	611
1- LMAs mainly manufacturing	220
2- LMAs mainly manufacturing with SMEs	151
3- Identification of the main industry among the 11 cited in note	
4- Identification of Industrial Districts	141

Source: personal elaboration from Istat (2011b)

As it can be seen from fig.7, the distribution of Industrial Districts is mainly in Central-Northern Italy, thus increasing the number of observations in this research and its utility.

Figure 7: Distribution of Industrial Districts in Italy (2011)
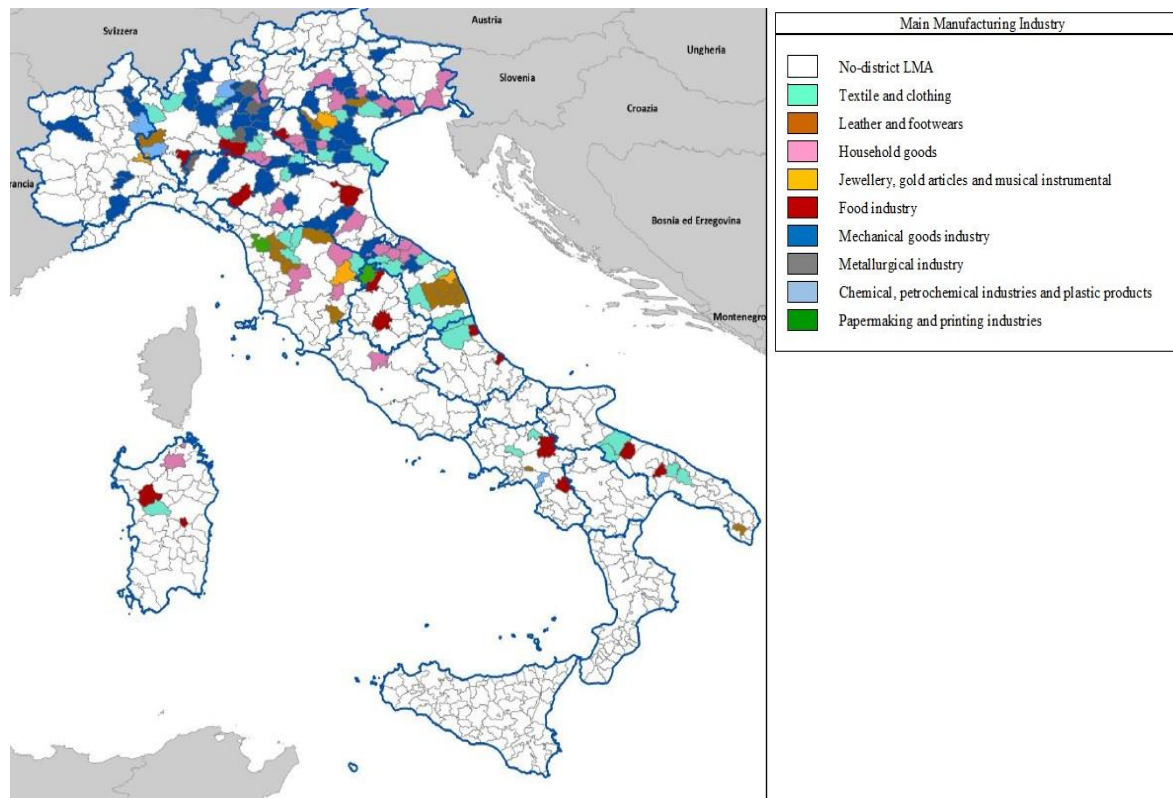
Source: Istat (2011b)

Assumptions

The unit of analysis of this work is based on Local Market Areas (LMAs) as defined by Istat (2011a).

There have been several reasons why I had decided to use this kind of unit of analysis.

Firstly, the initial objective of using Industrial Districts as unit, thus comparing IDs with a criminal presence with non-criminal ID, was not possible due to lack of observations. Indeed,

a firm is considered a district one if there is a fulfilment of these two criteria: the firm must be located in the district area (territorial dimension), which can be find out through Istat code; the second criterion claims the firm to be in the prevalent industry (industry dimension), through ATECO code. With this definition, I have found that only 2 of 649 criminal firms were actually within an ID, as both criteria of ATECO code and Istat code location were fulfilled.

Secondly, it was necessary to reduce difficulties arising from Industrial District geographical boundaries definition: due to their evolutionary tendency, boundaries are not so easy to be defined (Busato and Corò, 2011).

Thus, I decided to consider a macro area (LMA) which is useful to solve partially the first problem, as it comprises firms that might be considered part of IDs, e.g. phase-firms, even though they are not included among them as they belong to another industry, giving more observations to be analysed. It might be a strong assumption, though, I assume it would have been better as these firms within District LMA are able to exploit district externalities too, as if they were within the Industrial District. Furthermore, this decision solves definition problems as it gives a greater area clearly defined and accepted. In fig. 8 an explanation of the unit of analysis. Indeed, the coloured part represent the unit of analysis of LMA-level regression model.

Figure 8: Unit of analysis (in orange the unit of analysis, i.e. LMA).

Source: personal elaboration

So, within a District LMA, there is the actual Industrial District through a double match between ATECO code (industry dimension) and Istat municipality code (territory dimension), while the leftover part comprises firms excluded by this criterion, though they exploit district externalities. In this sector it can be found those phase-firms essential to ID functioning[50].

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[50] Please note that LMA-level regression model distinguishes between Criminal District and Criminal no-District LMA. The further subdivision of Criminal District LMA into ID and no-ID is useful for the additional analysis at firm-level.

Moreover, these analysis units are more internally cohesive (Istat, 2011a), with less dispersion than those with province-level unit of analysis (Becattini and Dei Ottati, 2006), as it represents a bounded territory with a homogeneity in terms of socio-economic context.

Industrial Districts detected through LMAs analysis is a good proxy to consider the presence of homogeneity in business area and in social context, i.e. the well-known communitarian factor.

Limitations

The use of LMAs to detect the effect of organised crime in firms which can be district or no-district is quite biased by the fact that the boundaries are larger than the real Industrial District. Although, as already defined above, it might be accepted thanks to the fact that it represents a good proxy of Industrial District characteristics (homogeneity in social and economic context). Another element to be stressed regards LMAs composition: indeed, they do not coincide with administrative units and they might comprises more provinces (30.3%) or even cross-border ones (9.2%) (Istat, 2011a). Also sizes and number of firms therein differs across Italy, depending on the socio-economic level of the Region or the presence of great urban centres in nearby. To avoid such problems, controls for the region effect and for the number of firms in the multivariate regression model have been introduced. Furthermore, the Istat census of Industrial District has been made in 2011, the same for the definition of Local Market Areas. Some municipalities have been modified, through mergers, thus changing the Istat code. The latter has caused some problems in the matching process between firms and their appropriate LMA. I got through these problems by observing the location of the new municipality, trying to reallocate in the 2011 municipality.

4.1.3 Treated Final Sample

My empirical research does not compare directly the performances of criminal and non-criminal firms due to endogenous problems, thus it does not allow to draw significant results (Malaspina, 2016). Indeed, mafia infiltration in firms is an endogenous matter which depends on several factors, one of these can be the performance. Basing mine thoughts on Fabrizi, Malaspina and Parbonetti (2016) research, I use as natural experiment the exogenous shock provided by police operations which detected and remove criminal firms. Herein, I decide to compare performances of firms in criminal areas between district and no-district Local Market Areas using the year of operation as a dividing line. The next paragraph is aimed at describing how treated firms' sample has been obtained.

The construction of the final data set

Starting from the Criminal Firms sample, I collocate each firm in a LMA by using registered office code from mafia operation. From this operation it resulted a group of LMAs which accounted a criminal firm presence. Furthermore, I make a distinction between district and no-district LMAs, according to tables provided by Istat. Hence, LMAs can be divided into four categories: criminal or not, and district or not. Non-Criminal LMAs are not used in the research, because I decided to focus on assessing the effects that the district oppose to a criminal firm presence.

So far, 101 Criminal LMAs were obtained, of which 38 District. In these 38 LMAs, there are 111 of 649 Criminal firms (Table 4).

Table 4: Internal partition of Criminal LMAs.

	Criminal LMAs
District LMA	38
no-District LMA	63
Total	101

Source: personal elaboration

The next step was to create the treated group. From AIDA database I collected financial and commercial data available of all firms[51] using the geographic location in Central-Northern Italy as a research criterion. All legal entities with a registered office or the operational headquarter in the Central-Northern Italy was considered in the sample. To reduce biases due to lack of observations, I introduced a criterion to include only those firms with available financial statements from 2008 to 2016, plus those where 2017's financial statement was available too. From this initial sample, I reported the ATECO code, the amount of revenues from 2008 to 2017, the cost of debt (COD), the financial structure (Debt to Equity ratio), performance indexes such as Return on Assets (ROA), Return on Equity (ROE) and Return on Investments (ROI). Furthermore, the number of employees for each firm. Number of firms and banks per LMA are from Istat databases.

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[51] All firms from AIDA are those who have mandatory disclosure. By this way, the sample of firms is reduced, even though high enough to permit the regression.

The set of data is the following:

- Business Name
- Fiscal Code
- Istat Municipality
- Region
- Local Market Area in which the firm belongs
- Criminal LMA = 1 if the LMA had at least a criminal firm; 0 otherwise
- District LMA = 1 if the LMA is a district one (Istat, 2011b); 0 otherwise
- Year of operation, if Criminal LMA = 1
- Operation = 1 if the "Year of operation" is the same in the LMA or at least for the 75% of the times[52]
- Number of firms per LMA (avg 2008 – 2017)
- Number of banks per LMA (avg 2015 – 2017)
- Number of employees
- ATECO code
- Revenues (2008 – 2017)
- Cost of Debt (%) (2008 – 2017)[53]
- Debt to Equity (%) (2008 – 2017)[54]
- Return on Assets (%) (2008 – 2017)[55]
- Return on Equity (%) (2008 – 2017)[56]
- Return on Investments (%) (2008 – 2017)[57]

By matching the Istat municipality code with Istat tables of LMAs, I have been able to create a panel data with yearly observations, where each firm was connected to a LMAs, which would have been Criminal or no-Criminal (1 if criminal 0 otherwise), District or no-District (1 if

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[52] To cite some LMAs excluded: Turin, Milan and Verona, where there have been several police operations in different years.

[53] $Cost\ of\ debt = \frac{Borrowing\ costs}{Total\ Financial\ Debt}$

[54] $ROA = \frac{EBIT}{Total\ Assets}$

[55] $Debt\ to\ equity = \frac{Financial\ Debt}{Equity}$

[56] $ROE = \frac{Net\ Income}{Equity}$

[57] $ROI = \frac{EBIT}{Equity + Financial\ Debt}$

district, 0 otherwise). For each Criminal LMAs, I reported the year of the mafia removal operation.

The sample was then skimmed, as explained in Table 5, to obtain the final Treated firms' sample:

Table 5: Process to obtain "Treated Final Sample" from "Initial Sample".

Starting point	Variation	Results
Initial sample		362,772
Removal of firms with a HQ in South Italy	-641	362,131
Removal of non-Criminal LMAs firms	-94,215	267,916
Removal of LMAs with different operation years	-139,683	128,233
Removal of LMAs where year of operation < 2011	-21,413	106,820
Treated Firms		106,820

Source: personal elaboration

In specific, the removal of firms with HQ in South Italy was necessary because the research criterion which has been used provided all firms with registered office and/or operational headquarters in Central and Northern Italy, thus comprising also firms with HQ in Southern Italy. From this operation it is obtained the Total firms' sample, which comprises all Central-Northern firms.

The second criterion, so the removal of firms belonging to non-Criminal LMAs, was aimed at analysing the effect of only firms that suffered from criminal presence.

The third criterion was addressed to obtain homogeneity in the sample treatment. Indeed, as in some larger LMA (e.g. urban centres such as Milan or Turin) where many police operations in different year occurred. In this case it would have been difficult to compute the effect three year before and after the exogenous shock (mafia removal) due to the presence of many police operations. Hence, for LMAs where there were more than a police operation, I assumed to use a unique year if the number of criminal firms removed in that year was higher or equal than 75% of the other criminal firms in the LMAs.

Lastly, the fourth criterion we used is useful because only financial statements from 2008 are available. Hence, criminal firms detected before 2011 are not taken into account due to lack of financial statements.

The sample of treated firms is composed by 106,820 firms whose operational headquarters are located in Central-Northern Italy.

It shall be noteworthy the comparison between Criminal Firms and Total Firms of the sample in terms of distribution per sector, thus, fig. 9 is aimed at describing how the two samples are allocated. Please note that Total firms sample considers all the Central-Northern Italy firms (362,131) that represent the initial database, once firms with HQs in Southern Italy have been removed. I have considered all firms regardless their location within Criminal or no-Criminal LMAs to obtain a better understanding of firms' distribution among chosen sectors.

As visible in fig.9, I consider three main sector categories: "Manufacturing", "Services" and "Other", plus a residual category, namely "Not available", which comprises those firms whose ATECO was not available or difficult to estimate.

Sectors can be broken down as explained in the following scheme (2-digits ATECO code in brackets):

- **Manufacturing**
  - Manufacturing (10 to 33);
- **Services**
  - Wholesale and Retail (45 to 47);
  - Transportation and Warehousing (49 to 53);
  - Hospitality (55 to 56);
  - Information and communication (58 to 63);
  - Financial firms (64 to 66);
  - Real Estate (68);
  - Professional activities (69 to 75);
  - Leasing, Travelling and Service firms (77 to 82);
  - Education (85);
  - Healthcare (86 to 88);
  - Sport and Entertainment (90 to 93);
  - Other services (94 to 96);
- **Other**
  - Agriculture (01 to 03);
  - Electricity and gas (10 to 33);
  - Water and Waste Management (35);
  - Constructions (41 to 43).

Figure 9: Comparison in Industry composition between Criminal firms and the sample of Total firms.
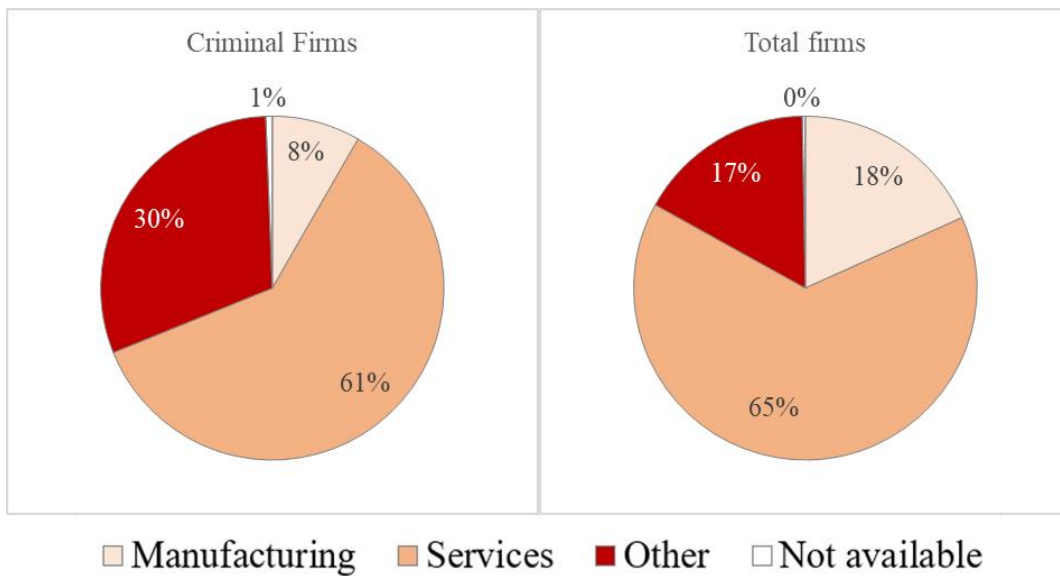
There are some interesting insights from these pie charts: firstly, there are large differences in sectors, except for "services" which is quite similar for both samples. Instead, mafia presence in manufacturing sector is very low (8% instead of 18%), thus confirming literature in defining that mafia prefers activities which are involved in public sector. Herein, it can be assumed that Industrial Districts, which are the expression of manufacturing, are less infected by mafia because it has less interests in being involved in such activities. Criminal firms are largely distributed in the "other" sector, which comprises more appetible activities, such as Construction and Waste management.

A more detailed sight can be observed from Table 6, which is aimed at giving an overview of the composition of the two samples in terms of industry. Firms have been grouped into 17 categories of different industries, by using the 2-digit Italian Industry classification. These categories represent subcategory of the sector-level agglomeration.

Before going more in detail, it is useful to note how criminal firms are nearly within any industry, thus showing how difficult it would be to detect them and also how unpredictable the phenomenon is.

Table 6: Comparison of Industry specialisation between Criminal firms and the sample of Total firms.

INDUSTRY	ATECO	Criminal Firms		Total firms	
		N. obs	%	N. obs	%
Constructions	from 41 to 43	152	23,4%	50,413	13.90%
Real Estate	68	115	17,7%	69,607	19.20%
Wholesale and Retail	from 45 to 47	74	11,4%	62,261	17.20%
Manufacturing	from 10 to 33	54	8,3%	66,214	18.30%
Professional activities	from 69 to 75	42	6,5%	26,680	7.40%
Water and Waste Management	from 36 to 39	39	6,0%	2,224	0.60%
Transportation and Warehousing	from 49 to 53	35	5,4%	10,124	2.80%
Leasing, Travelling and Service firms	from 77 to 82	35	5,4%	13,407	3.70%
Hospitality	from 55 to 56	25	3,9%	13,459	3.70%
Sport and Entrainment	from 90 to 93	23	3,5%	4,995	1.40%
Financial firms	from 64 to 66	15	2,3%	5,696	1.60%
Information and communication	from 58 to 63	13	2,0%	16,689	4.60%
Healthcare	from 86 to 88	8	1,2%	6,263	1.70%
Electricity and Gas	35	7	1,1%	1,992	0.60%
Other services	from 94 to 96	6	0,9%	3,009	0.80%
Education	85	2	0,3%	2,343	0.60%
Agriculture	from 01 to 03	0	0,0%	5,690	1.60%
Not available		4	0,6%	1,065	0.30%
		649		362131	

Source: personal elaboration of data. The idea comes from Malaspina (2017).

I ordered Criminal Firms observation on a decreasing basis to highlight industries in which mafia is prominent. Coloured areas are used to emphasise the allocation among industries.

In particular, criminal firms are mainly involved in the Construction industry, which is confirmed also in literature (Moro and Catino, 2016). Moreover, another peak is visible in Water and Waste management (6% against 0.6%). These activities, which are comprised in "other" sector, are characterised by high level of contact with public officers and also with a high level of low-specialised workers with a low level of technology, thus embodying useful characteristics to infiltrate legal economy.

The "services" sector is quite similar for both the samples (as visible in fig.9). Indeed, within this category, a higher presence of criminal firms is visible in Transportation and Warehousing (which are easily used to warehouse counterfeit goods) and also in Sports and Entertainment, mainly used to launder money. Real estate is quite similar for both samples, though, it shows how Criminal firms are good at emulating lawful firms.

The other sample, namely Total Firms (not criminal firms), is mainly operating in Manufacturing sector, which is quite important as it demonstrates that many firms might operates within an Industrial District. Criminal firms operating in agriculture are 0 in the Criminal Firms sample. It is quite interesting, because in traditional areas mafia is mainly related in farming activities, while in the non-traditional areas, activities are mainly based in the public sector, where there are more possibilities to infiltrate in the legal economy.

4.2 *Empirical model*

4.2.1 Description of the multivariate regression model adopted

The following OLS regression model (firm and year subscripts omitted) is used to investigate the effect of criminal firms' removal on firms, focusing on the differences arising from the location in a District LMA. Firstly, to be noted is the fact that the unit of analysis is the LMA, which comprises average of data from firms.

$$y = \beta_0 + \beta_1\ dummyLMA + \beta_2\ PostOP + \beta_3\ dummyLMA*PostOP + \sum Controls + \sum Year\ Fixed\ Effects + \sum Geographical\ Fixed\ Effects + \mathcal{E}$$

The dependent variable is the *Return On Assets* (*ROA%*) for the first research hypothesis, the *Cost of Debt* (*COD%*) for the second one. I decided to use *ROA* as dependent variable, instead of ROE, to reduce the influence of firms' accounting policies and also to take into account firms' amount of debt. Indeed. ROA is a good measure of returns from the core business, without biases from financing choices (Sostero *et al.*, 2014).

Both variables have been winsorized at the 1st and 99th percentiles to undue influence of outliers. *DummyLMA* is equal to 1 (0) if the Local Market Area is (not) a district one. The dummy variable *PostOP* is equal to 1 (0) for three years after (before) the police operation. The coefficient of interaction term *dummyLMA*PostOP* (β_3) tests the hypotheses and examines the effects of Criminal firms' removal from an area, distinguishing between District and no-District areas.

Control variables

The regression model includes a vector of control variables, some concerning the firm's characteristics and one related to the banking market.

Indeed, firm's characteristics control variables comprise: *lnRevenuesW* which is the log transformation of the firm's annual revenues[58], which has been winsorized to eliminate outliers, and it controls for firms' sizes, which might affect firms' performances. *DEW* which represent the winsorized capital structure of firms, to control that differences in performance are not related to difference in Debt to Equity ratio. *ROAW,* for the second research hypothesis, is used to avoid influences from firms' profitability level. Finally, the *Number of firms* per LMA, which represents the size of LMAs and it enables to control for LMAs where the greater number of firms might affect performances.

Furthermore, there is a control related to the banking system: *Number of banks* within LMAs. This kind of control has been used in regressing the Cost of Debt, because it has been found that a higher presence of banks positively affects the probability of being credit denied (Cenni *et al.*, 2015), thus having impacts on Cost of credit.

The regression model also includes controls for Year and Geographical fixed effects to control for macroeconomic events that might be responsible of driving the dependent variable (for example the Financial Crisis in 2008 or the Italian Sovereign Debt Crisis in 2010). Geographical Fixed Effects, at regional level, is useful to control for fixed and unobservable characteristics that might depend on firms' locations.

4.2.2 First research hypothesis: effects on ROA

The first line of research is aimed at assessing whether firms within a district LMA are better able to recover in terms of profitability (*ROA*) after the elimination of a criminal firm.

Firstly, starting from the sample of treated firms (106,820) I grouped average values per LMA, which represent the unit of analysis.

Table 7 shows the descriptive statistics for the sample of treated firms.

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[58] I opted to use the log transformation to reduce the variance. Indeed, mean (median) of Revenues of the sample was 5,598.234 (298) in thousands of Euro. The mean (median) of lnRevenues is 6.07 (6.08).

Descriptive statistics

Table 7: Descriptive statistics of Treated Final Sample.

Variables	N	mean	sd	p25	p50	p75
ROAW (%)	495	2.17	1.80	1.16	2.46	3.45
ROEW (%)	495	3.70	2.57	1.92	3.68	5.40
ROIW (%)	495	5.16	1.10	4.42	5.07	5.82
lnRevenuesW	495	6.31	0.30	6.11	6.30	6.49
DEW (%)	495	3.33	1.87	2.12	3.14	4.21
N. of firms	495	17,984	42,577	4,992	7,308	15,916

The sample is composed by 55 LMAs, which are observed from 2008 to 2017. There is a high variability in terms of LMA size, indeed, the average of firms therein is much higher than the 75th percentile.

Profitability indexes' average are positive and quite similar to the median value as they have been winsorized to reduce outliers' influence. Figures 10 and 11 depict the average of ROA (2008-2017) respectively for Total Firms sample (362,131) and the Treated Final sample (106,820). It considers not winsorized ROA to have an insight into the actual situation. Indeed, better performances area achieved in Northern Italy, mainly in the Eastern part, where it can be found the highest level of ROA. for this reason, variable control for firms' performance has been added. By considering the distribution of Industrial Districts (fig. 12) and the ROA level (fig. 11), it can be said that district areas show a greater performance level, even though it is a strong assumption because no inference can be made. From Criminal Firms distribution (fig. 12) it can be seen that provinces which present high-level of organised crime presence are associated with areas with highest performances (see for example Venice, Turin and Milan). Thus, mafia tends to infiltrate in most profitable areas to gain greater advantages.
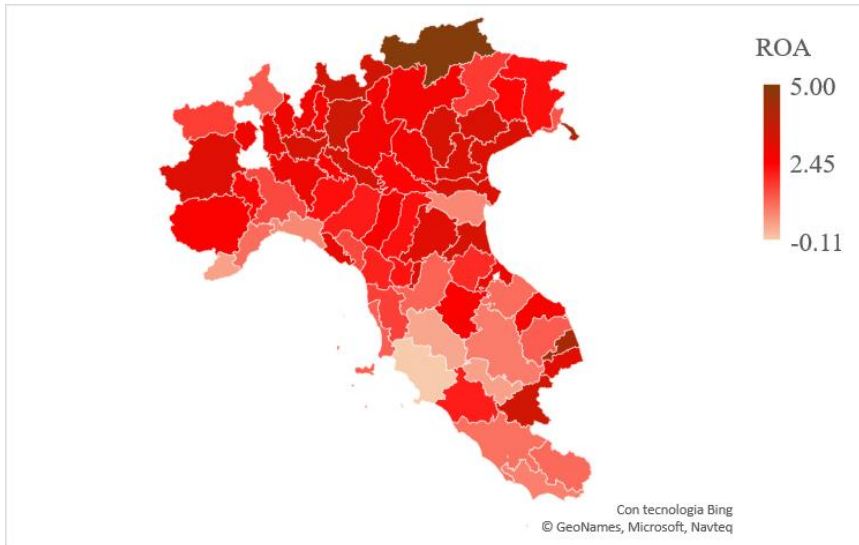
Figure 10: Avg. ROA of Total Firms sample.

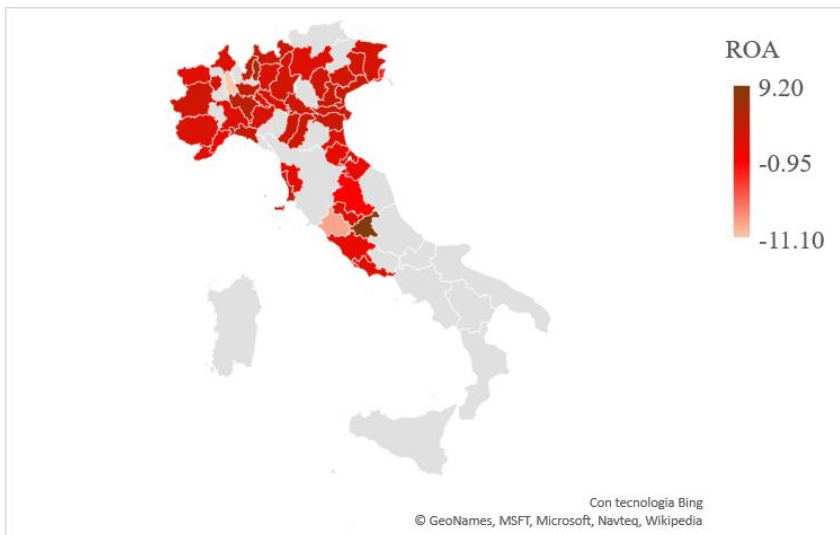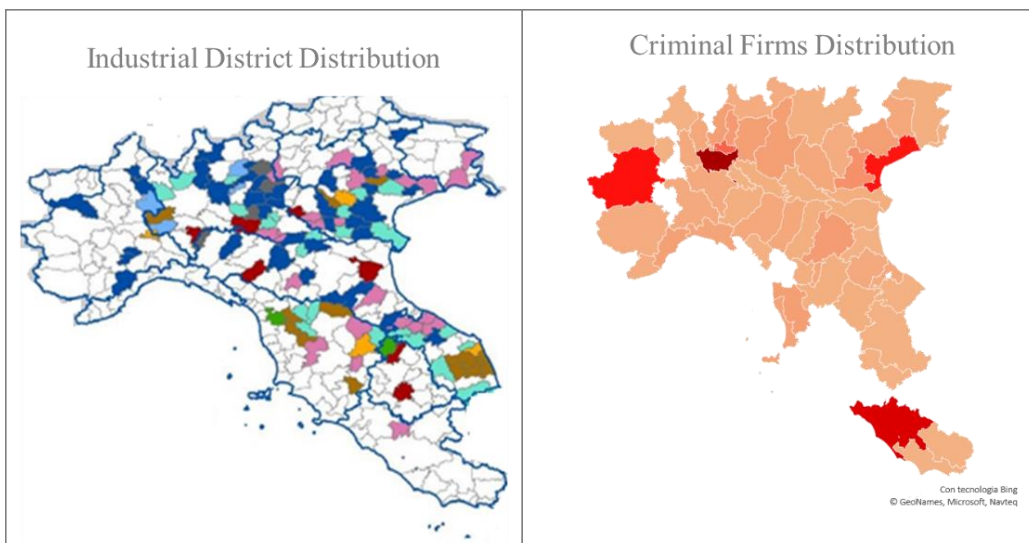*Figure 11: Avg ROA of Treated Final sample.*

Figure 12: Comparison between Industrial District and Criminal firms distribution.

Regarding the capital structure, it can be seen a strong third capital recurrence, with a primacy of debt over owned capital. Finally, the average number of firms is higher than the 75th percentile, showing differences among LMAs.

Correlation matrix

Table 8: Correlation matrix of Treated Final Sample (ROAW).

		1	2	3
1	ROAW (%)	1		
2	lnRevenuesW	0.3375*	1	
3	DEW (%)	0.2079*	-0.0577	1
4	N. of Firms	-0.0695	-0.2837*	-0.0241

*, **, *** indicate statistical significance at 10%, 5% and 1% respectively.

The correlation matrix is aimed at describing how the dependant variable is related to explanatory ones. Furthermore, it reduces multicollinearity problems, which may arise when the coefficient is significant and higher than 50%. Please note that "*dummyLMA*", "*PostOP*" and "*dummyLMA*PostOP*" are not considered as they are dummy variables.

From the correlation matrix it can be noted that *ROAW* is positively and significantly (at 10%) correlated to *lnRevenuesW* and *DEW*, which means that firms' better performances are associated to firms with higher overall revenues and firms with a high level of indebtedness. The latter case might rely on the fact that firms with better performances would be less credit rationed and would obtain better credit terms.

It might be interesting to note that *lnRevenuesW* and *Number of firms* are negatively and significantly (at 10%) correlated, thus implying that an increase of revenues per LMA is associated to a decrease in the number of firms. It might be said that the higher the number of firms in a LMA, the higher the competition, thus the lower the overall revenues. Furthermore, the larger the size of firms, the lower the number of players within a LMA.

Results

Table 9 presents results from the regression model described before. In particular, it is structured as follows: in column 1 the baseline regression, without any control. I progressively added controls for fixed effects and variables control.

Table 9: Regression analysis with ROA as dependent variable

VARIABLES	(1) ROAW (%)	(2) ROAW (%)	(3) ROAW (%)	(4) ROAW (%)	(5) ROAW (%)	(6) ROAW (%)
dummyLMA	-0.277	-0.269	-0.542***	-0.654***	-0.659***	-0.653***
	(0.212)	(0.188)	(0.185)	(0.191)	(0.194)	(0.195)
PostOP	-1.951***	0.0896	-0.328	-0.413*	-0.407	-0.424*
	(0.182)	(0.296)	(0.259)	(0.248)	(0.249)	(0.253)
dummyLMA*PostOP	**0.663****	**0.697****	**0.702*****	**0.702*****	**0.694*****	**0.694*****
	(0.314)	(0.285)	(0.244)	(0.242)	(0.242)	(0.243)
lnRevenuesW				0.726**	0.697**	0.623*
				(0.351)	(0.348)	(0.361)
DEW					-0.0412	-0.0391
					(0.0459)	(0.0461)
Number of firms						-1.84e-06
						(1.41e-06)
Constant	3.115***	4.662***	4.829***	-0.0470	0.326	0.822
	(0.100)	(0.308)	(0.280)	(2.391)	(2.388)	(2.469)
Observations	330	330	330	330	330	330
R-squared	0.301	0.457	0.583	0.591	0.592	0.594
Year Fixed Effect		YES	YES	YES	YES	YES
Region Fixed Effect			YES	YES	YES	YES

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

The model is based on a sample of 330 observations, hence, 55 Criminal LMAs observed three years after and before the year of police operation.

Conversely from literature analysed so far, β_1 is negative and significant at 1% from Column 4 to 6, thus after controlling for size, capital structure and number of firms. Indeed, being a firm within a District LMA, during infiltration period, is associated with a lower profitability, compared to a firm in a no-district LMA. It is quite interesting and surprisingly, because last empirical literature analysed in chapter 1 has shown better performances for District firms (Foresti *et al.*, 2017). Results might be explained as follows: firstly, it must be said that the previously cited research is based on years after the Great Recessions (2014-2017), thus it shows the district firms recover. Secondly, all these firms are in Criminal LMAs, which means they have suffered worse economic conditions (β_2), in terms of lack of liquidity and harsh unfair competition. Indeed, by reducing trust and imposing suppliers, mafia activities within District LMA tend to compromise the equilibria of coordination/competition, which is the fuel of ID externalities.

Furthermore, another additional element might be explained by considering that the financial crisis has hit mainly export-oriented manufacturing firms (Busato and Corò, 2011). Lastly, observations of this dissertation started from 2008, thus the financial crisis and the sovereign debt crisis cover most of the years observed.

Another important thing (already cited) to be stressed is the coefficient of *PostOP* variable (β_2), as it shows that firms, generally, have a negative impact on *ROA* in the three years after mafia removal. The coefficient still continues to be negative and significant (at 10%) by controlling for firms' sizes and the *Number of firms* per LMA. The magnitude is reduced by controlling for year and region fixed effect, as I reduced biases from different region performances and the impact of Financial and debt sovereign crisis. Though, results are quite controversial as I would have expected better performances for firms after elimination of criminal presence. It might be explained by the fact that these kinds of shocks, plus the crisis, have increased time to recover, with visible effects in the long-run, so more than three years. Furthermore, it should be noted that the coefficient loses significance (to 10%) after adding all controls (column 6), thus, the inference is less robust.

Nonetheless, my interest is mainly based on the interaction term coefficient (β_3) which is positive and significant (at 1%) in all the cases. As it can be seen, the magnitude is quite similar also by introducing controls. This result confirms the first research hypothesis, according which, a District LMA has seen an increase of *ROA* to nearly 0.7% in the three years after the removal of a criminal firm.

It is an interesting outcome which explains the ability of firms within a District LMA to recover quicker than firms within a no-District LMA, after the criminal firm's removal. Notwithstanding worse performances during mafia infiltration, as explained by β_1, firms within District LMA are better able to exploit positive effects from mafia removal than no-District LMA firms, thanks to the presence of externalities from clusters, arising from the set of relationship, trust among actors, the knowledge spill overs and the cooperation-competition behaviour aimed at efficiency. All these elements contribute to generate a competitive advantage in facing mafia removal, which is beneficial to all firms therein. Proximity and trust might be responsible in enhancing the ability to invest and innovate in riskier but more profitable projects; moreover, social sanctions reduce the possibility of personal advantages which might undermine a sustainable common development.

It might be worthy to explain also the control variable effect on *ROA*: the logarithmic value of revenues positively affects ROA (with a decreasing magnitude as long as controls are added).

Robustness check

Results analysed so far might be driven by the choice of *ROA* instead of other profitability indexes. Hence, I decide to run the regression model with other dependent variable which are strongly correlated to ROA: ROE and ROI. While ROE takes into account the returns for investors, and is strongly affected by firms' decisions, thus more biased; ROI considers the return on capital invested, which depends on the ability of the firms to make profitable investments. It might be said that ROI and ROA are both indexes which explain the ability of firms to make profitable investments. Though, ROI gives a further insight by showing the profitability of the core business (Sostero *et al.*, 2014).

Tables 10 and 11 describe respectively the correlation matrixes for *ROEW* and *ROIW* (dummy variables are not included). In both cases, the dependant variable and *lnRevenuesW* are positively correlated.

Table 10: Correlation matrix of Treated Final Sample (ROEW).

		1	2	3
1	ROEW (%)	1		
2	lnRevenuesW	0.4730*	1	
3	DEW (%)	-0.0808	-0.0577	1
4	N. of Firms	0.0277	-0.2837*	-0.0241

*, **, *** indicate statistical significance at 10%, 5% and 1% respectively.

Table 11: Correlation matrix of Treated Final Sample (ROIW).

		1	2	3
1	ROIW (%)	1		
2	lnRevenuesW	0.4434*	1	
3	DEW (%)	-0.1914*	-0.0577	1
4	N. of Firms	0.0598	-0.2837*	-0.0241

*, **, *** indicate statistical significance at 10%, 5% and 1% respectively.

Finally, table 12 represents the additional analysis of *ROE* and *ROI*, to verify whether beforementioned empirical results are robust or not.

Table 12: Regression analysis with different dependent variables.

VARIABLES	(1) ROAW (%)	(2) ROAW (%)	(3) ROEW (%)	(4) ROEW (%)	(5) ROIW (%)	(6) ROIW (%)
dummyLMA	-0.277	-0.653***	-0.590	-1.170***	-0.114	-0.178
	(0.212)	(0.195)	(0.362)	(0.311)	(0.151)	(0.123)
PostOP	-1.951***	-0.424*	-1.681***	-0.394	-0.455***	-0.447***
	(0.182)	(0.253)	(0.313)	(0.367)	(0.123)	(0.155)
dummyLMA*PostOP	**0.663****	**0.694****	**1.109****	**1.244****	**0.446****	**0.513****
	(0.314)	(0.243)	(0.526)	(0.367)	(0.221)	(0.153)
lnRevenuesW		-1.84e-06		4.71e-06**		1.10e-05***
		(1.41e-06)		(1.82e-06)		(3.41e-06)
DEW		0.623*		3.450***		1.071***
		(0.361)		(0.517)		(0.215)
Number of firms		-0.0391		-0.0957		-0.0236
		(0.0461)		(0.0754)		(0.0258)
Constant	3.115***	0.822	3.925***	-15.66***	5.054***	-0.733
	(0.100)	(2.469)	(0.205)	(3.638)	(0.0822)	(1.506)
Observations	330	330	330	330	330	330
R-squared	0.301	0.594	0.088	0.576	0.042	0.548
Year Fixed Effect		YES		YES		YES
Region Fixed Effect		YES		YES		YES

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

By using other indexes as dependant variable, the interaction coefficient (β_3) is still significant. Magnitude changes since *ROE* is more biased by firms' accounting policies, but the sign is the same and depicts a positive influence on profitability for firms within a District LMA, where a police operation had removed a criminal firm.

4.2.3 Second research hypothesis: effects on Cost of Debt

The second research hypothesis bases the empirical model on the same sample as before (106,820 firms), but it is aimed in analysing the effect of mafia removal in terms of credit cost between firms within a District LMA and in a no-District LMA.

Descriptive statistics

Table 13: Descriptive statistics of Treated Final Sample.

Variables	N	mean	sd	p25	p50	p75
CODW (%)	495	5.79	1.02	5.12	5.71	6.34
ROAW (%)	495	2.17	1.84	1.16	2.46	3.45
lnRevenuesW	495	6.31	0.30	6.11	6.30	6.49
DEW (%)	495	3.33	1.87	2.12	3.14	4.21
N. of firms	495	17,984	42,577	4,992	7,308	15,916
N. of banks	495	49	160	6	15	46

As it can be seen, the *Cost of credit* (*CODW*) is quite similar to the median value, as it was winsorized to avoid outliers' influence. In figure 13, it is shown the cost of debt at province-level obtained from the Total Firms sample (362,131). It is immediately visible how larger is the amount of borrowing costs given financial debt in Central and North-Western provinces. It might be explained by the presence of riskier area due to mafia infiltration (Turin and Rome accounted respectively 71 and 110 criminal firms). In the North-Eastern area, indeed, it results lower costs of credit. It can be explained, by taking it as a strong assumption[59], that the higher concentration of district firms (as visible in fig. 15) might reduce the amount of credit cost.

Figure 14, instead, represents the situation of cost of debt for firms of the Treated final sample, on which the regression is based. Here, there are less data available, thus it is more difficult to have a clear idea on how cost of debt is distributed in the territory.

In fig.15 Criminal Firms and Industrial District distributions are compared, to have a look into the situation. It can be interesting to note that district areas have a lower cost of debt and a lower mafia infiltration, even if it is a strong assumption based on given data. Please note that highest value of credit cost has been found in provinces of Rieti (10.66%) and Novara (11.56%).

Another important element is given by the number of banks per LMA, which average value (49) is higher than the median value (15), thus describing a peculiar and various banking system.

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[59] Indeed, Marche has an important presence of Industrial Districts and has not accounted mafia infiltration, though it has a high level of cost of debt (figures 13 and 15).

Figure 13:Cost of debt of the Total firms sample.
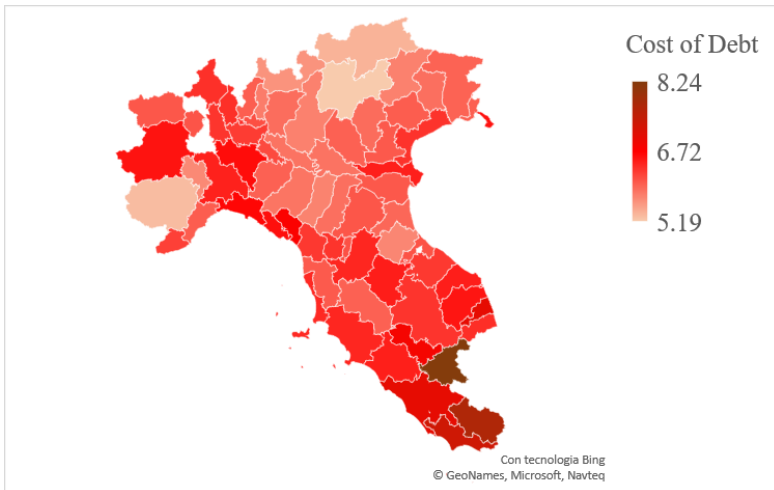
Areas with the highest cost of debt are Rieti and Frosinone.

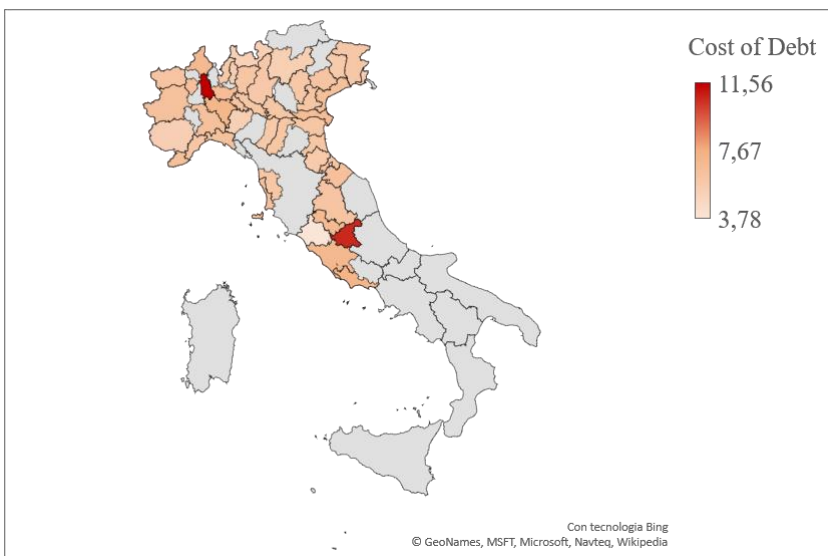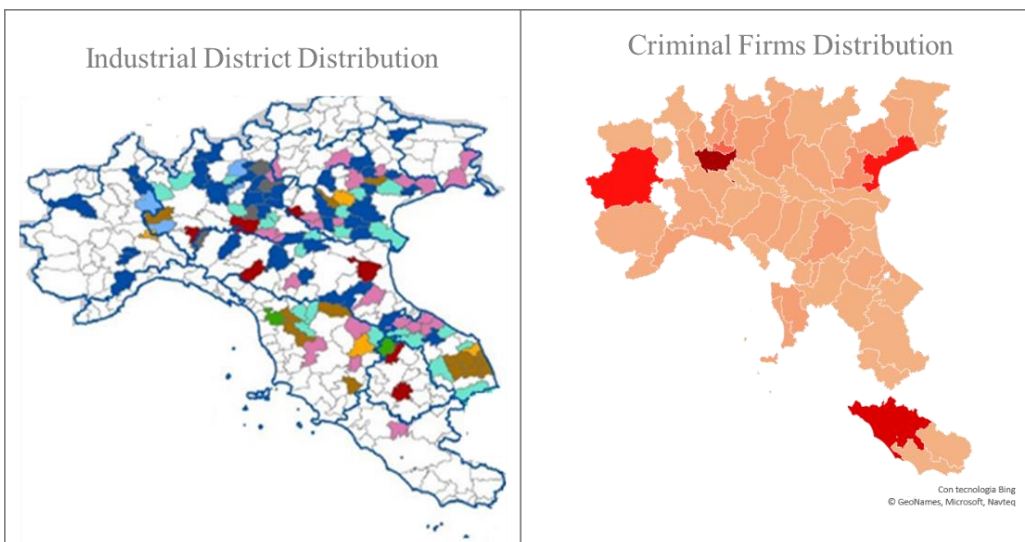*Figure 14: Cost of debt (avg. 2008-2017) of the Treated Final sample.*

Figure 15: Comparison between Industrial District and Criminal firms distribution.

Correlation matrix

Table 14: Correlation matrix of Treated Final Sample.

		1	2	3	4	5
1	N. of firms	1				
2	CODW	0.1151	1			
3	ROAW	-0.0613	0.2502*	1		
4	lnRevenuesW	-0.2826*	-0.2908*	0.3278*	1	
5	DEW	-0.0181	0.1574*	0.2309*	-0.0649	1
6	N. of banks	0.9807*	0.1090	-0.0857	-0.2909*	-0.0032

*, **, *** indicate statistical significance at 10%, 5% and 1% respectively.

According to the correlation matrix, control variables such as *Number of firms* and *Number of banks* will be regressed separately as they are strongly and significantly correlated, which might generate multicollinearity problems. Indeed, it is expected that the higher the number of firms in an area, the higher the number of banks. It is interesting to note that *ROAW* and *CODW* are positively and significantly correlated which means that firms with a higher profitability level pays more interest on debt. Size of LMAs, expressed as *lnRevenuesW*, has an interesting outcome: the larger the size, in terms of overall revenues, the lower the interest on debt paid. A lower cost of debt might derive from a lower risk enlighten by the high level of revenues.

The capital structure is positively correlated to the *Cost of debt* and it can be confirmed by literature, as the higher the level of indebtedness, the higher the risk of insolvency, the higher the borrowing cost.

The *Number of banks,* indeed, is negatively correlated with the size of LMAs (*lnRevenuesW).* In this sense, the larger the size of firms, the lower the number of banks. It can be assumed that the presence of large firms reduces the need of capital from third parties, thus reducing the number of new banks in the nearby.

Results

The regression model provides the following results (Table 15): β_1 is negative and significant in the columns 1 and 2. In the latter (2) I added Year Fixed Effect.

Columns 1 and 2 describe a situation in which being a firm within a District LMA is responsible of a reduction in the cost of credit, which has been seen in the literature before. Although, after adding controls, results change of sign, showing worse credit conditions to firms within a District LMA. In particular, the coefficient turns positive and significant at 10% by introducing the performance control *ROAW* (column 6). Thus, by capturing the performance effect, it is

possible to obtain clearer (less biased) results and it turns out that a higher amount of borrowing costs is paid by District LMA firms.

Other explanations might be related to the fact that I took into account a larger area than the Industrial District, thus having results less precise. Though, it was a necessary step in order to have a larger number of observations. Another reason might be related to the literature. Indeed, as already said in "District externalities", research on the relationship between Industrial Districts and Interest rates are mainly of the period before the crisis. The latter paper used (Ricciardi, 2013) refers to the period 2005-2009. So far, it means that, notwithstanding the higher transparency and competitive/cooperating environment within the ID, which has had positive effects in terms of trustworthiness and credit issuance in the first decade of XXI, the recent crisis has had several impacts in terms of credit issuing to small firms, the main actors of Industrial Districts, with an increase in credit rationing and cost of credit.

The removal of a criminal firm has beneficial effects in term of credit cost, indeed, $\beta2$ is negative, which means that firms generally have a reduction in credit costs due to a lower risk of insolvency, lower monitoring costs from the banks and higher trust.

The interaction term is significant and positive with no controls added, which might explain the fact that being a firm within a District LMA in the three years after mafia removal is not bearer of positive consequences. Though it is not robust as it loses significance once controls have been added, thus no inference can be drawn. The impossibility to draw a conclusion is detrimental for the research hypothesis. Reasons that might have affected thus result is that there were many missing data in terms of interest rate, furthermore, the unit of analysis might have been larger and thus with more biases.

Table 15: Regression analysis with COD as dependent variable.

VARIABLES	(1) CODW (%)	(2) CODW (%)	(3) CODW (%)	(4) CODW (%)	(5) CODW (%)	(6) CODW (%)	(7) CODW (%)	(8) CODW (%)
dummyLMA	-0.510***	-0.350***	-0.0557	0.0687	0.0641	0.121*	0.125*	0.123*
	(0.126)	(0.0888)	(0.0737)	(0.0707)	(0.0681)	(0.0697)	(0.0704)	(0.0698)
PostOP	-0.207*	-0.496***	-0.365**	-0.271*	-0.265*	-0.230	-0.255*	-0.255*
	(0.113)	(0.181)	(0.169)	(0.156)	(0.156)	(0.153)	(0.144)	(0.143)
dummyLMA*PostOP	**0.277***	**0.0890**	**0.0877**	**0.0876**	**0.0793**	**0.0191**	**0.0221**	**0.0234**
	(0.165)	(0.129)	(0.101)	(0.0947)	(0.0940)	(0.0918)	(0.0922)	(0.0918)
lnRevenuesW				-0.806***	-0.836***	-0.896***	-0.989***	-0.992***
				(0.165)	(0.161)	(0.152)	(0.159)	(0.159)
DEW					-0.0427***	-0.0391**	-0.0365**	-0.0360**
					(0.0152)	(0.0153)	(0.0155)	(0.0154)
ROAW						0.0867***	0.0812***	0.0794***
						(0.0303)	(0.0296)	(0.0298)
Number of firms							-2.43e-06***	
							(6.04e-07)	
Number of Banks								-0.000677***
								(0.000153)
Constant	6.061***	7.687***	7.744***	13.15***	13.54***	13.51***	14.17***	14.18***
	(0.0853)	(0.170)	(0.167)	(1.107)	(1.093)	(1.024)	(1.081)	(1.082)
Observations	330	330	330	330	330	330	330	330
R-squared	0.060	0.420	0.661	0.699	0.705	0.718	0.730	0.731
Year Fixed Effect		YES	YES	YES	YES	YES	YES	YES
Region Fixed Effect			YES	YES	YES	YES	YES	YES

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

4.2.4 Additional analysis: firm-level approach

This part of the thesis is aimed at giving a further analysis of the two research hypotheses with another unit of analysis: the firm. This choice has been driven by the need to observe whether results would have changed with a different unit, and also to confirm and to worth the impact of district institutions outside the boundaries of district. In the following cases, firms from Criminal LMAs are grouped together according to the following distinction: firms belonging to a no-District LMA, firms belonging to a District LMA and, among them, those belonging to an Industrial District (i.e. they are located within a District LMA and in the same industry, from ATECO code).

The sample is composed by 106,820 firms, as in the LMA-level analysis, but it can be broken down into the following structure:

Figure 16: Unit of analysis (in orange the unit of analysis, i.e. Industrial District firms).

no-District LMA	District LMA
No-ID 79,735	No-ID 25,626
	ID 1,459

Source: personal elaboration

Multivariate regression

The model used for this analysis is similar to the one used before, though, unit of analysis changes as it is based on firm-level data, not on aggregate level ones. Please note that firms and year subscripts are omitted.

$$y = \beta_0 + \beta_1 \; Firm + \beta_2 \; PostOP + \beta_3 \; Firm{*}PostOP + \sum Controls + \sum Year \; Fixed \; Effects + \sum Geographical \; Fixed \; Effects + \sum Industry \; Fixed \; Effects + \mathcal{E}.$$

The dependent variable *y* represents the profitability of firms (*ROA%*) and the *Cost of Debt* (*COD%*). As in the previous case, both have been winsorized at 1st and 99th percentile.

The first independent variable (*Firm*) is a dummy variable which assumes value 0 or 1 to represent different cases, as explained in table 16.

The interaction term *Firm*PostOP* is intended to verify the effect of criminal firm removal between treated firms and the residual ones.

$\sum$ *Controls* comprises *lnRevenuesW*, *DEW* for both research hypotheses and *ROAW* for the second research hypothesis. All these variables have been winsorized at 1st and 99th percentiles to reduce biases.

Furthermore, controls for *Number of firms* and *Number of banks* per LMA have been removed due to their macro-level feature.

The geographical fixed effect is at LMA level as the unit of analysis is the single firm. In this way, by reducing the size of the control, results would be less biased, as the variability in the sample is the variability within LMA, which is a narrower area.

I also added an Industry Fixed Effect to avoid biases from sector profitability, in terms of characteristics that are not proper of the firm but arise from the belonging to a certain sector. I used the classification from "Treated Final Sample" (paragraph 4.1.3) in "Manufacturing", "Services" and "Others".

Table 16: The different sample considered

		Firm = 0	Firm = 1
Case 1	This case focuses on District LMA. In particular, I compared ROA and Cost of Debt of firms inside and outside an Industrial District, but within a District LMA. I expect to obtain better performances for those firms which are in the same industry (ID firms), because they exploit the direct district effect.	Firms within District LMA but outside ID.	ID firms.
Case 2	I focus on comparing ROA and Cost of debt of firms belonging to District and no-District LMAs but excluding firms within the Industrial District. In this case, I expect to obtain a better performance for firms within a District LMA, though, lower than what would be obtained by pure ID firms (in the same industry) as it is an indirect district effect.	Firms in a no-District LMA.	Firms within District LMA but outside the ID.
Case 3	Comparison between firms in an ID and firms outside a District LMA, thus without any indirect effect from district agglomeration. In this case, I expect to obtain a very strong interaction due to the comparison of performances of two cases, where one side can be enhanced by the district effect.	Firms in a no-District LMA.	ID firms.
Case 4	Comparison between performances of firms inside and outside the Industrial District. It can be said that the interaction should measure the real district effect, thus the set of externalities from agglomeration and social capital.	No-ID firms.	ID firms.
Case 5	This comparison focuses on firms within an Industrial District, with a distinction based on the number of employees, in medium and small-sized firms, which are the main actors within ID. I expect a greater performance of small-sized firms, which is the typical size within Industrial Districts.	$n \leq 49$	$50 \leq n \leq 249$

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Results

First research hypothesis: effects on ROA

Table 17: Regression analysis with ROA as dependent variable.

VARIABLES	Case 1 ROAW (%)	Case 2 ROAW (%)	Case 3 ROAW (%)	Case 4 ROAW (%)	Case 5 ROAW (%)
Firm	-0.615***	-0.363***	-1.067***	-0.812***	-4.122***
	(0.192)	(0.0693)	(0.190)	(0.182)	(0.745)
PostOP	0.557*	-0.341***	-0.427***	-0.240***	1.655*
	(0.306)	(0.0929)	(0.104)	(0.0897)	(0.894)
Firm*PostOP	**0.983***	**0.463***	**1.414***	**1.300***	**-1.355**
	(0.265)	(0.0871)	(0.260)	(0.258)	(1.451)
lnRevenuesW	0.763***	0.837***	0.864***	0.836***	0.893***
	(0.0180)	(0.0101)	(0.0120)	(0.0100)	(0.0901)
DEW	-0.0585***	-0.0504***	-0.0475***	-0.0505***	-0.104***
	(0.00214)	(0.00119)	(0.00141)	(0.00119)	(0.0166)
Constant	1.212*	-0.141	-0.400*	-0.118	0.288
	(0.654)	(0.197)	(0.208)	(0.194)	(1.201)
Observations	119,522	423,086	317,562	430,085	6,999
R-squared	0.020	0.020	0.020	0.020	0.041
Year FE	YES	YES	YES	YES	YES
Geografical FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES

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

Please note that Number of Observations vary along the models, as it involves different sub-sample of the initial sample of treated firms. A more detailed view in Table 18.

Table 18: Number of osservations per case.

Case	No-District LMA	District LMA		Tot firms
		No-ID	ID	
1	X	25,626	1,459	27,085
2	79,735	25,626	X	105,361
3	79,735	X	1,459	81,194
4	79,735	25,626	1,459	106,820
5	X	X	1,459	1,459

Table 17 reports results from the multivariate regression model.

Starting with β_1, all cases show a negative and significant effect on *ROA*. The higher magnitude is visible in case 1, 3, 4 and 5, while in case 2, the negative impact is lower as firms are outside the ID. Indeed, former cases directly compare firms within the Industrial District with firms outside the ID. Hence, being a firm within an Industrial District during mafia infiltration is bearer of lower profitability than being a firm outside it. This negative effect is greater mainly for medium firms within Industrial Districts, as visible in Case 5. Thus, being a small firm within an ID is better in terms of profitability than medium-sized firms, which is confirmed by literature in Industrial District. The small size enables firms to be more specialised and flexible. The lower profitability of firms with more than 49 employees might be also driven by the recent crisis, with a lower flexibility level and higher personnel costs which have lowered the profit margin.

An interesting result is given by the coefficient of *PostOP* (β_2), indeed, while it keeps a negative sign in Cases 2, 3 and 4, which is consistent with the previous LMA-level regression, it turns out that in Cases 1 and 2 the coefficient is positive. Please note that the significance is only at 10%, although, it might offer an interesting insight within the District LMA. As it can be seen, firms within a District LMA present higher level of ROA in the three years after the mafia removal, and this level is higher for medium-sized firms. Though, low level of ROA after mafia removal in the other cases might be caused by the presence, in the sample considered, of firms belonging to a no-District LMA, thus confirming the importance of the institutions' strength.

The interaction coefficient (β_3) is always positive and significant (except for case 5), with a higher magnitude in Case 3 and 4. These results are very interesting in confirming the research hypothesis, as it enables to isolate the pure district effect without biases from Labour Market Area agglomerations. Indeed, being a firm within an Industrial District after the removal of a criminal firm results in a greater ability to recover, with an increase up to 1.4% of ROA. Furthermore, these cases compare firms which belongs to ID with firms outside the LMA (case 3) and outside the ID (case 4). In case 3, indeed, the effect is higher than case 4 because in the

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latter it is mitigated by the presence of firms within District LMA but outside ID, which exploit on a lesser extent the district externalities. It means that district externalities are more concentrated within ID, with better environment and institutions with a positive outcome in term of ability to recover from shocks. These externalities are diffused also outside the district but within the District LMA, as it is visible from coefficient in case 2. In this case, the lower magnitude is related to the lesser strength of social capital and district effect.

Second research hypothesis: effects on Cost of Debt

Results from the second research hypothesis (Table 19) are rather inconclusive. Indeed, the base regression model without any controls returns significant results. These results are not robust once more controls have been added.

Indeed, all interaction coefficients are not significant. Hence, no conclusion can be drawn. The previous analysis on Cost of Debt at LMA level was not significant too, thus the model is not robust and it does not confirm the research hypothesis.

The coefficient of treated firms (β_1) is significant and of opposite sign in the first case. It means that, in case 1, within a district LMA, firms belonging to a district suffer higher cost of credit. This result might be explained by both the recent crisis and the detrimental effect for the general economy, but also for the presence of small-medium firms, which might suffer from higher credit rationing probabilities due to lower trust. Nonetheless, I would have expected lower interest rates for district firms because of the higher transparency and the cooperation-competition networks, which is valuable by banks in the nearby. Though, as already mentioned before, the recent crisis has had an important impact on the credit issuing, with a general negative effect.

Table 19: Regression analysis with COD as dependent variable.

VARIABLES	Case 1		Case 2		Case 3		Case 4		Case 5	
	CODW (%)	CODW (%)	CODW (%)	CODW (%)	CODW (%)	CODW (%)	CODW (%)	CODW (%)	CODW (%)	CODW (%)
Firm	0.294***	0.0895	-0.762***	-0.143***	-0.468***	-0.156**	-0.254***	0.0345	-1.361***	-0.213
	(0.0750)	(0.0779)	(0.0228)	(0.0281)	(0.0738)	(0.0775)	(0.0735)	(0.0743)	(0.312)	(0.347)
PostOP	0.152***	-0.460***	-0.317***	-0.0101	-0.317***	0.00751	-0.193***	0.0101	-0.126	-0.106
	(0.0283)	(0.136)	(0.0202)	(0.0425)	(0.0202)	(0.0469)	(0.0165)	(0.0411)	(0.109)	(0.378)
Firm*PostOP	**-0.274****	**-0.109**	**0.469****	**0.0113**	**0.196***	**-0.129**	**0.0719**	**-0.134**	**0.261**	**0.302**
	(0.112)	(0.110)	(0.0347)	(0.0374)	(0.110)	(0.110)	(0.109)	(0.108)	(0.509)	(0.524)
lnRevenuesW		-0.110***		-0.0103**		0.00916*		-0.0193***		-0.498***
		(0.00788)		(0.00461)		(0.00554)		(0.00458)		(0.0372)
DEW		-0.0278***		-0.0347***		-0.0366***		-0.0344***		-0.00530
		(0.00114)		(0.000628)		(0.000738)		(0.000624)		(0.00862)
ROAW		0.00665***		0.00809***		0.00922***		0.00834***		0.0234***
		(0.00177)		(0.00101)		(0.00119)		(0.000999)		(0.00733)
Constant	5.541***	9.548***	6.303***	8.143***	6.303***	7.961***	6.089***	8.230***	5.862***	12.54***
	(0.0186)	(0.314)	(0.0132)	(0.0815)	(0.0132)	(0.0867)	(0.0109)	(0.0807)	(0.0737)	(0.626)
Observations	83,434	76,187	265,689	239,753	192,761	173,822	270,942	244,881	5,253	5,128
R-squared	0.000	0.019	0.005	0.036	0.002	0.039	0.001	0.036	0.002	0.106
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Geo FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

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

Conclusions

Organised Crime and Industrial District have been analysed in a wide literature, in particular in terms of their effects on people, firms, relationships and institutions. Hence, even though these two topics are quite divergent, they have some commonalities in bearing consequences to the socio-economic context. As already seen in the first chapter, clustering of firms is responsible of promoting agglomeration externalities and enhancing cooperative behaviours which are aimed to a common objective: the efficiency and the production of products. Organised crime presence, instead, is responsible of altering market competition and causing negative effects at macro and micro levels. On one side, trust is fostered as driving force, on the other side it is curbed to exploit personal advantages.

Hence, the main aim of this dissertation is to assess whether negative externalities arising from mafia infiltration have the same effect on firms according to their geographical location, or if they incur in a reduction. In particular, I analysed the impact of criminal firms in profitability (*ROA*) and cost of debt (*COD*) for firms inside and outside Industrial Districts.

To do so, I use an already defined sample of Criminal firms that has been detected in Central-Northern Italy in the decade 2004-2014. From this starting point, I have obtained a sample of firms, nominated "Treated Final Sample", located in areas (LMAs) which have experienced at least one criminal firm infiltration. By using a panel data where observations come from financial data three years before and three years after the removal of the criminal firm, which is the instrumental variable used to reduce endogeneity problems, I research for two hypotheses. The first one is intended to verify whether the impact of criminal firms on final sample's profitability is reduced due to the location in a District LMA. According to the results obtained, firms within District LMAs have experienced a better recovery in terms of profitability after the mafia removal. From a macro area level, I checked the robustness by using other two profitability indexes (ROE and ROI); furthermore, I used a different unit of analysis, a firm-level one, which confirmed the research hypothesis. Indeed, it also added some interesting insights, as it shows that better performances are achieved by firms within the Industrial District (when both location and industry criteria are met), when compared with firms outside District LMA. It is very interesting, though, as it shows that district institutions, in terms of set of common values, generally accepted implicit rules, cooperation/competition behaviours, are fundamental to exogenous shock reduction. It must be said that performances for firms in a District territory are worse than those of firms outside, as explained by the always negative and significant β_1, which is controversial from what analysed by literature so far. As already explained before in the first hypothesis, this reduction in performance for district firms might

be related to several factors: the fact that the sample is based on LMAs that have suffered at least a criminal presence, thus comprising firms with a harsh situation to face. Another cause of the negative result can be explained by crisis which have mainly affected export-oriented firms, in primis district ones. Nonetheless, the ability to recover from criminal firms' impact (β_3) is more favourable to district firms, thanks to the already mentioned set of relationships, the cohesive social system which provide a protective function and the cooperative behaviours, with social sanction.

The second research hypothesis, which was aimed at verifying the effect of criminal firms' removal on cost of credit has not be confirmed by empirical evidence. Indeed, conversely from what I expected from literature, it results that no conclusions can be drawn due to lack of significance. The analysis at firm-level has been done also in this case, though, it does not give any significant result. It can be said that the lack of data in terms of cost of debt plus the financial crisis which covered part of the analysis, might be responsible of the outcomes of the research.

This research is affected by lack of observations in terms of years, thus, it might be helpful to analyse more year to see effects in medium-long term, in particular for the second research hypothesis, for its inconclusive results.

Furthermore, another limitation is given by the lack of data of many small-sized firms which are not obliged to mandatory disclosure (partnerships) or are not registered in official database (such as AIDA). Indeed, as Industrial Districts comprise also many small-sized firms which are not present in AIDA, it is difficult to have a good measure of the effect.

It would be an interesting further analysis to verify whether social capital might be a good way to halt mafia infiltration. Indeed, as explained by Buonanno, Montolio and Vanin (2009), civic norms and associational networks cause a reduction of property crime committed, as they increase returns of non-criminal activities. This line of research might be applied in Industrial District literature, thus verifying whether Industrial District's peculiar structure might be helpful to reduce criminal firms' infiltration. Indeed, a research from Scandizzo and Ventura (2015) shed a light on the fact that investments in self-protection by firms, through the creation of networks and relationships, is responsible of increasing the expected cost of organised crime, thus representing a discouragement to mafia infiltration.

To conclude, results from this dissertation explains a clear statement: firms within a District LMA are better able to face shocks. So far, at policies level, it shall be noteworthy saying that sustaining the set of relationships within firms through investments, strong presence of

institutions, might be a good way to reduce negative effects from mafia infiltration, with positive effects on the environment itself and actors therein. Indeed, as claimed by literature in Organised Crime, its presence affects mainly the socio-economic context, creating an inhospitable environment, which promote distrust and lack of private initiatives. Distrust generated is responsible in creating networks among organised crime groups and firms. The latter find pseudo-State functions, such as protection providers, in the former. Hence, the stronger the institutions and the more helpful to enhance firms' growth, the lower the detrimental effect of criminality and the greater the ability to work as a cushion to shocks.

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