Università degli Studi di Bari
Dipartimento di Scienze Economiche e Metodi Matematici

Southern Europe Research in Economic Studies
S.E.R.I.E.S.

Organized Crime, Migration and Human Capital Formation: Evidence from the South of Italy

Nicola Daniele Coniglio, Giuseppe Celi and Cosimo Scagliusi

Organized Crime, Migration and Human Capital Formation: Evidence from the South of Italy

Nicola D. Coniglio♦(1), Giuseppe Celi(2) and Cosimo Scagliusi(1)

(1) *University of Bari* **(2)** *University of Foggia*

Abstract

The presence of organized crime is a pervasive feature of many developed and developing countries. Even if '*mafia*' organizations have greatly enlarged the geographical scope of their activities, as in the past they are still deeply rooted in specific territories where their presence generates a host of influences on socio-economic performances (*perverse social capital*). In this paper we analyse the consequences of the presence of organized crime on the long-term accumulation of human capital, a key determinant of economic growth. To do this we build a unique dataset where – among other information – we identify municipalities where the presence of organized crime is particularly pervasive in an Italian region, Calabria, where is based one of the most powerful international criminal organization, '*Ndrangheta*. Our results suggest that the presence of organized crime inhibits the accumulation of human capital both directly (reducing the incentive to invest in formal education) and indirectly by increasing migration outflows.

♦ *Corresponding author*: Nicola Coniglio, Dept. of Economics, University of Bari, Via Rosalba n.53, 70124 Bari (Italy), email address: nicola.coniglio@snf.no. We wish to thank participants at the following seminars and conferences for useful comments and suggestions: Nihon University (Tokyo, Japan), Hokkaido University (Sapporo, Japan), European Regional Science Association Conference (Liverpool, UK), Staffordshire University (Stoke-on-Trent, UK), London School of Economics, Ch. Michelsen Institute (Bergen, Norway). The usual disclaimer applies.

1. Introduction

The economics literature has had a longstanding interest in analysing the phenomenon of crime and especially its determinants and costs for society (Becker 1968 and Becker and Stigler 1974). However little attention has been devoted to the study of the long term consequences of crime. In particular most of the literature has focussed on criminal activities in general, while organised crime has received less attention comparatively. Although organized crime is a ubiquitous and increasingly relevant phenomenon affecting both developed and developing countries, in fact we know very little on the long term effects in the geographical areas where these criminal organizations operate. Surely several authors have pointed out that the presence of (violent) organized crime coexists usually with under or limited development (Centorrino et al 1999; Goglio 2004; Zamagni 1993), but the channels through which this happens and the direction of causality between crime and limited development are not understood very well yet.

This paper represents a first attempt in filling this gap in the rapidly growing literature of the economics of criminal activity in general and of organized crime in particular. We want to shed some light on how the presence of deeply rooted criminal organization affects the growth and the accumulation of one of the most fundamental factors of economic development: Human Capital. We investigate whether the presence of the "Mafia" and other similar criminal organization has any effect on individuals' economic incentives to invest in their own education in order to increase their future income. Methodologically we adopt a similar approach to Peri (2004). To analyse the long term impact of the organized crime we take a long term perspective and assess the change in the stock of human capital between 1971 and 2001, using census data. However, instead of data at provincial level like most of the authors studying the interaction between crime and economy (Peri 2004 and Buonanno et al 2006), we use data at municipal level.

To conduct our analysis, we focus our attention on an extremely well developed and aggressive kind of organized crime in Italy, 'Ndrangheta, deeply rooted in Calabria, one of the Italian southern regions. Calabria is the poorest region in Europe and 'Ndrangheta is, together with the Sicilian Mafia (i.e. "Cosa nostra") the most ancient criminal organization in Italy. It has strong links with the territory especially in the forms of family ties and, maybe rather surprisingly, is the most powerful Italian criminal organization today, with an estimated annual turnover between 36 and 55 billions of Euros, approximately 3% of the Italian GDP in 2007 (Eurispes 2008, Masciandaro 2008). Therefore represents in our opinion a very well suited case study for our research question.

The novelty in our empirical strategy consists in building a database of municipalities where we can be confident up to a reasonable degree that the 'Ndrangheta has been *historically* present and well developed for quite a long time and does not represent a new phenomenon. Therefore we are able to investigate the long term effects of this presence.

We find evidence of a negative "Godfather effect" on human capital accumulation which seems to operate through two main channels: (i) the presence of a negative incentive to acquire formal education; (ii) a significant migration from territories where the presence of organized crime is strong. An interesting aspect which characterizes Calabria, together with other Mezzogiorno regions, is the presence of "*arbereshe*" communities who fled Albania and settled in the South of Italy between the XV and XVIII century, mainly after the death of the Albanian national hero Giorgio Castriota Scanderberg, in order to escape the Ottoman invasion of Albania. Notwithstanding the centuries that passed since their initial settlement these communities still preserve their ethnic and linguistic cultural traits. A by-product of our research, one we deem worthy of further investigation, is that the presence of local "good" social capital in the form of cohesion within this ethnic and linguistic minorities seems to have a positive effect in the process of

human capital formation, and seems to have worked as a shelter to the infiltration within the local society of organized crime.

The paper is organized as follows. *Section 2* discusses the extensive control of mafias on their local territories and the potential effects of this perverse form of social capital on human capital formation. In *Section 3* we present a brief overview of the literature on the determinants of organized crime and its negative economic effects. The case analysed in this paper is presented in *Section 4*. Firstly we describe the criminal organization known as *'Ndrangheta;* then we discuss the empirical approach, data employed and main results. Conclusive remarks and potential avenue for further research are reported in *Section 5*.

2.   The local dimension of organized crime and its effects on human capital accumulation

Crime in general is understood as a human activity posing a threat to the orderly and peaceful conduct of human business and, more generally, human life. Organized crime according to several authors (see Paoli 2002 and literature therein referenced) possesses two additional features: (i) the provision of illegal goods and services; (ii) a stable organization - with its own human, financial and capital resources - engaged in illegal activities with a well-defined collective identity, internal rules and subdivision of work among its members. Such organizations have several features in common with productive (legal) firms; in fact the common scope of their activities is that of generating profits. As private firms, criminal organizations undertake investments in physical and human capital, decide whether to expand or not the range of products/services, extend their "market" both nationally and abroad (and become "multinational organizations"). Contrarily to legal firms, the rules which regulates the internal functioning of the organizations and its interactions with the external world are based on the use of violence (or the mere threat of violence).

Organized crime is characterized by the existence of a hierarchical and structured institution, able to expand its ties in the business world and in the political realm, capable of dealing with the conflicts emerging between its members and the different sub-groups the organized crime institution is made of. Furthermore the organized crime institution not only conducts its business by enforcing its rules in a violent way, not only it does squeeze and extort money and income from several citizens, but it supplies them with "law", "order" and "security" in the territories where its presence is stronger. These organizations in order to maintain a strong grip over the "home area" often invest real resources in search of legitimization and consensus among the population (creation of a *mafia culture*). In this case crime is not (only) a cause or an effect or a manifestation of a difficult social situation, like the usual violent crime: it becomes instead a completely different way of organizing a vast part of the social, human and economic interactions between individuals and (legal and illegal) institutions.

The trans-national dimension of mafia activities is considered as one of the main future challenges for governments and international institutions. According to the United Nations "organized crime is one of the major threats to human security, impeding the social, economic, political and cultural development of societies worldwide". But although the scale of their operation is more and more taking place across borders, the criminal organization needs a well defined local dimension, a territory where to base itself in order to conduct its own different illegal activities. Several authors have noticed that controlling the territory and especially the municipalities endows the organized crime with the best possible option to do so: the nature of organized crime in general and particularly of Italian organized crime is deeply rooted in the control of local territory, especially at the municipal level. This "glocal" dimension of the organised crime is even more true nowadays in an extremely integrated world (Forgione 2009; Gratteri and Nicaso 2009). Since even in the same province very close municipalities may have a very different situation regarding the presence of the organized criminality, we think that it is the municipality, rather than the province,

the unit of investigation better suited to our investigation: it will be at this level that the persistence of Mafia-like organizations will explicate their most powerful and negative effect.

According to Coleman (1988) social capital has two main components: (i) a social structure; (ii) facilitation of certain beneficial actions within the structure which are not necessarily beneficial to others. Strong and deeply rooted criminal organizations - such as the one object of our analysis, the Calabrian *'Ndrangheta* – might be considered as a perverse form of social capital. The link between social capital and human capital has received some attention within the economic literature (see La Porta et al 1997, Papagapitos and Riley 2009) but it has been confined only to "beneficial" forms of social capital.

The presence of organized crime might have strong effects on the accumulation of human capital through two main channels. Firstly, organized crime by severely distorting the functioning of the local economy and society might induce individuals to emigrate from areas where the phenomenon is particularly intense and pervasive ('*Human flights' effects*). The literature on migration has long established that individuals with a higher endowment of human capital – highly skilled, talented and educated individuals – are more sensitive to geographical differences in economic opportunities and/or quality of life (Chiswick 1999; Borjas et al 1992; Florida 2005). The presence of organized crime would hence boost the incentive to migrate particularly for these individuals within the population. Secondly, a *dis-incentive effect* might be at work when this perverse form of social capital is particularly abundant. Human capital - skills and knowledge acquired by human beings - is mainly the result of individual investments in education and training activities. In turn, the individual incentive to invest in human capital depends on subjective costs and benefits associated to this choice: the presence of organized crime might severely affects (and hence distort) these individual decisions by altering both the costs and benefits, in particular by making investments in education less valuable within the local economy.

3. On the determinants of (organized) crime and its economic and social costs

In the last five decades, the relationship between crime and economics has been investigated employing different approaches and perspectives. Whereas in the 1950s' and 1960s' the dominant paradigm among social scientists was the explanation of crime in terms of mental illness and social oppression, Gary Becker (1968) was in the forefront of those considering criminal behaviour as dictated by rational choices. By applying the analytical apparatus of economic optimization to crime, Becker showed that illegal conduct is the outcome of a cost-benefit evaluation balancing pecuniary (and non pecuniary) rewards from crime compared to legal activities, the probability of arrest and conviction, and the strictness of penalty. Following studies (Stigler, 1970; Becker and Stigler, 1974; Landes and Posner, 1975) extended the economic approach to crime in order to define the optimal enforcement of laws in a social context aiming to deter criminal behaviour but, at the same time, to minimize social costs of dissuasion. Building on Becker's approach, Ehrlich (1973) developed a more comprehensive model in which the choice to engage in legal or illegal activities was assimilated to occupational responses to incentives and economic opportunities under uncertainty; the empirical implementation of the model showed - other than the statistical relevance of law enforcement as deterrent to criminal behaviour - a significant association between the rate of (specific) crimes and income inequality.

In effect, later studies have emphasized that *income inequality, unemployment and the level of education* are crucial factors conditioning criminal decisions. Freeman (1994, 1996, 2000) provided evidence of the costs of inequality in the United States during the 1980s in terms of high level of crime by less educated (young and black) workers, despite the rising trend in incarceration in the same period. Gould, Weinberg and Mustard (2002) carried out a more systematic empirical analysis to test if the trend in labour market conditions for young, unskilled American workers –

characterized by a deterioration in the 1980s and an improvement in the 1990s – could be explained by the reverse pattern followed by crime rates in the two decades. They found that especially wages, compared to unemployment, were significantly associated with crime[1]. Machin and Meghir (2004) focussed on the United Kingdom case (in particular on England and Wales in the period 1975-96) and found a similar relationship: a decline in the remunerations of low-wages workers induced an increase in crime rates.

Although less investigated compared to the effect of labour market conditions (also because it is indirectly captured by them), the level of education plays a fundamental role in criminal decisions. From a theoretical point of view, many channels suggest that an increase in educational attainment should induce a decline in the probability of being involved in illegal activities[2]. First, schooling leads to higher wage rates and therefore to higher opportunity cost of crime. Moreover, in the case of punishment, the time out of the labour market due to incarceration is more costly for high (more educated) earners. In addition, social discredit associated with conviction extends the negative impact on earnings beyond the time spent in prison and this reputational repercussion is stronger among white collars (Kling, 1999). Second, education may affect time preferences (Becker and Mulligan, 1997) and tastes for crime (Arrow, 1997). In other words, more schooling increases the patience of individuals and their risk aversion and this should lead to a more careful consideration of the probable penalty associated with crime, other than the psychic costs of violating the law. Third, if criminal behaviour is affected by path dependence - the probability of offending today depends on the offences accumulated in the past - school attendance and time spent in education should divert from crime (Jacob and Lefgren, 2003).

On the side of empirical analysis, Lochner and Moretti (2004) provided empirical evidence of the negative link between education and crime in the case of United States. Using Census and FBI data, they found that schooling diminishes the probability of apprehension and incarceration and this outcome is due to changes in criminal behaviour.

In general, the contributions on economic approach to crime shortly reviewed so far - although they differ widely in methods and specific research questions - share in common the same causal direction, that one moving from socio-economic factors (incentives and opportunities, wage inequality, unemployment, education, etc.) to criminal behaviour.

It is evident that the reverse causal link is equally relevant in the real word. In many countries economic activities managed by organized crime are pervasive and have a significant effect on socio-economic structure (see, for example, some areas of Italian Mezzogiorno). However, when we want to assess the channels through which (organized) crime has an impact on the economy – for example, in terms of misallocation of resources or long run effects on growth – literature support is less abundant.

Baumol (1990) provided historical evidence to suggest that differences in allocation - and not in total supply - of entrepreneurship between productive activities (such innovation) and unproductive activities (such as organized crime, military activity or rent seeking) are crucial in order to determine the relative degree of innovativeness of a society compared to another one. The presence of organized crime by changing the structure of relative rewards in the society affects the allocation of talents in productive/unproductive activities. According to Baumol, policy makers can play a key role in the transformation of society by changing the rules of the games influencing relative payoffs.

Acemoglu (1995) extended Baumol's hypothesis and provided a less optimistic view on the role of policy as factor of social change. In Acemoglu's model the reward structure influences allocation of talents but, at the same time, it depends on how talents are distributed between

---

[1] Levitt (2004) focussed on the factors explaining the decline in crime in the 1990s in the United States. Four causes are relevant for Levitt: increases in the number of police, rising prison population, receding crack consumption, the legalization of abortion.

[2] In general, it is more reasonable to expect a negative relationship between education and crime. However, there are specific criminal activities which could require high levels of education.

productive and unproductive activities. In particular, more abundant rent seeking activities decrease the reward to productive entrepreneurship and distorts the allocation of talent. The dynamic version of the model, based on a overlapping generation framework, reinforces the idea that if a society inherits an adverse allocation of talents (and/or reward structure) it could incur in a underdevelopment trap: a "rent-seeking" equilibrium.

A recent study on socio-economic factors affecting the economic performance of Italian provinces by Peri (2004) shows that the presence of organized crime is "the single most important social variable negatively associated with economic development". The author employs provincial murder rates to identify the presence of established and strong criminal organizations (mafias) and finds that provinces characterized by a very high murder rate (more than 7 murders per 100 thousands inhabitants per year) have a per capita growth rate 0.41% lower than other Italian provinces.

What are the channels through which the presence of organized crime might negatively affects the local economic system? Broadly speaking we can categorize negative externalities generated by organized crime into three groups. In the first group there are the negative effects that organized crime have on the *mobilization of local resources* within an economic system. The presence of organize crime might distort the "allocation" of talent and human capital toward unproductive or destructive activities. In the longer run this distortion is likely to reduce the incentive to accumulate skills and develop productive talent (as pointed out by Baumol 1990 and Acemoglu 1995). Organized crime, through extortive activity, represents a "tax" on all productive activities; their strong presence might induce the owners of factors of production (capital but also labour) to relocate in other economies thus reducing the stock of local resources. Together with "flights" of productive physical and human capital, such negative externality might reduce incentive to accumulate resources since there is a risk of capture or destruction by members of mafia (Konrad and Skaperdas 1998). It is also important to notice that not only expected returns from investments might be lower in environment characterized by the presence of organized crime but also the cost of investment might be substantially higher. Empirical support on this hypothesis is provided by a recent work by Bonaccorsi di Patti (2009). The author uses a rich and detailed dataset on bank-firms relationship in Italy and shows that the cost of loans is significantly higher, banks require more collaterals and firms have a reduced access to credit in areas where crime rates (and in particular organized crime) are high. A corollary of these findings is that firms (and families) often are forced to borrow capital from a criminal organization with an extremely high probability of being trapped in usury and hence the likely consequences of handing to the same organization most of their assetts.

The presence of organized crime might also affects the *mobilization of external resources*. Daniele and Marani (2007) find that FDI inflows are discouraged in those Italian provinces where crimes typically associated to the presence of mafia have a high incidence. There are reasons to believe that organized crime could discourage also the inflow of human capital through immigration although to our knowledge no studies documents this hypothesis.

Other important costs imposed by mafia-style organizations to the local economy are linked to the *production of public goods*. The infiltrations of organized crime in public procurement have been extensively documented (for the case of 'Ndrangheta see for instance Gratteri and Nicaso 2007, Forgione 2009a). The "involvement" of these organizations substantially increases the costs for the of local public goods and decreases their quality. An emblematic case of such effects is the construction of the Salerno – Reggio Calabria highway, the main transport infrastructure connecting Calabria to the rest of Italy; the cost per km of realization of this infrastructure has been estimated around 23,3 million Euros against the initially planned costs per km of 5.8 million Euros (Ciconte 2008b; Forgione 2009a and 2009b). The mafia-control upon the political process might be considered one of the main determinants of the inefficient and costly provision of several key public services such as health, public transports, garbage collection in some municipalities of the Italian Mezzogiorno.

4. Organized crime and human capital: the case of *'Ndrangheta* in Calabria

4.1 Growing in the shadow: the rise and expansion of 'Ndrangheta

The *'Ndrangheta*, based in Calabria, like the other three main Italian Mafias ("Cosa Nostra" in Siciliy, "Camorra" or "Sistema" in Campania and "Sacra Corona Unita" - Holy United Crown - in Apulia) is a powerful illegal institution which owes its success and prosperity to the shared (economic) interests of its members and to the cruel but efficient mechanisms of detection and punishment of affiliates deviating from the rules of solidarity and hierarchical obedience of the organization.

However, economic interests and fear of punishment are not the only strings holding together this organization and making them the most secretive, rich and powerful Mafia in Italy: in fact the "secret of success" of the 'Ndrangheta can be found in a peculiar mixture of modernity and antiquity. The 'Ndrangheta is an extremely modern criminal organization whose investment strategy is flexible and very aggressive, always ready to take all the new opportunities and exploit new "lines of business" when the old ones are not anymore profitable[3]. Interestingly, all this coexists with an archaic approach regarding family ties and kinship relations. According to some authors, what makes the 'Ndrangheta such a mighty organisation is the fact that the criminal bonds, the solidarity and the obedience in this organisation are due mainly to "blood ties", rather than (or together with) common interests and fear of punishment. For this reason the fight against this organization has been less successful than against the Sicilian Mafia or the Camorra in Campania. In fact the "*pentitismo*" – the cooperation with the authorities of ex-affiliates of the organization in exchange of some privileges in the judicial process – has been very limited for the 'Ndrangheta: betraying the organization is often equivalent to a betrayal of the "family" and hence much more costly. According to many experts on the structure and history of the organization (Ciconte 2008; Forgione 2009a and 2009; Gratteri and Nicaso 2007), these strong ties have allowed the 'Ndrangheta to become a reliable partner of other criminal organizations all over the world and enabled the positioning of the organization as leader in cocaine trafficking and other illicit international transactions (weapons, human smugglings etc).

The meaning and origin of the word 'Ndrangheta is mysterious and an investigation of it cannot disentangle reality and myth, history and religion. According to one source the word 'Ndrangheta comes from the ancient Greek word *andragathos* meaning *valorous men*.[4] Furthermore the heritage of the ancient Greek civilization mixes together with anthropological elements coming from the Catholic religion: in fact the admission rituals of new members to the 'Ndrangheta sees the presence of blood, ceremonial cuts, reading of the Gospel, all under the safeguard of Saint Michael, the Saint protector of the organisation.

The first historical traces of the organization dates back to the XVI century, the period of the Spanish domination of the South of Italy, but it is only with the unification of the entire peninsula in a single state at the end of XIX century that the 'Ndrangheta starts to concern the public authorities. Notwithstanding its ancient past of glory, prosperity and civilization, Calabria is today one of the most backward, underdeveloped and poor regions in Italy and in the entire Europe. Its GDP pro-

---

[3] For instance, between the 80s and the 90s the 'Ndrangheta abandoned the kidnapping activity and heavily invested, together with the Colombian narcos, in the import of hard drugs in Italy and in the entire Europe.
[4] In fact the region of Calabria was part of the Magna Grecia (Greater Greece) since the 8th century BC. In few small villages in Calabria the local spoken dialects are very close to the ancient Greek language. Traces of this word and similar words derived from it are in the province of Reggio Calabria where the word *'ndraghitiari*, from the ancient Greek verb *andragatizomai* means assuming proud, valorous but also jaunty behaviours.

capite (PPP) is equal to 67% of the EU-27 average in 2006 (Eurostat 2009). Nevertheless, the research centre Eurispes has estimated that the annual turnover of 'Ndrangheta is equal to 3,4% of the Italian GDP, that is 35.700 million of euro in 2004, of which 22.300 millions of Euros come from the drugs traffic, making the 'Ndrangheta the richest, the most liquid and the most powerful criminal organization in Italy and maybe in the world. The threat of seizure by the Italian authorities of this financial treasures and the need to recycle this massive amounts of resources has induced the heads of the organization – a few individuals out of the estimated 6 thousands affiliates – to invests abroad (or in other Italian regions).
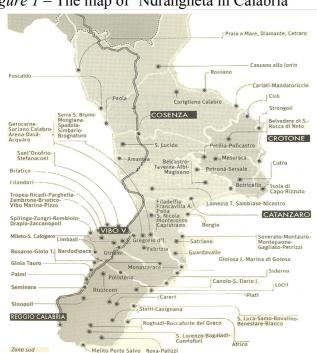
Figure 1 – The map of 'Ndrangheta in Calabria

Source: Ciconte (2008) based on Italian Parliament XV Antimafia Commission

Other than extremely rich, very secretive and violent, the 'Ndrangheta is also a "mass organisation", in terms of number of affiliates: while the Sicilian Cosa Nostra has the smallest number of members, both in absolute terms and in percentage on the total of population, the 'Ndrangheta has the largest number of affiliates while the Campanian Camorra is in the intermediate position. According to the annual report of Confesercenti (2007) on Italian mafias, one every 345 inhabitants in Calabria is affiliated to the 'Ndrangheta, the same figure for the Sicilian mafia is 1 in 903 inhabitants and for the Camorra in Campania 1 in 840 (Nicaso 2007). Although one might question these estimates, the evidence of a wider diffusion of the phenomenon in Calabria seems rather robust. The backbone of the organization is the "family" (of group of families; the so-called "locali") which is rooted and (mainly) operates in a given local territory (often the area of a municipality). We can consider the *'Ndrangheta* as a federal organization where the so-called "*locali*" (family groups) are rather autonomous and have a high hierarchical internal organization. The upper levels of the organization (for instance the 'provincial council') have just a role of coordination, partnership, design of common strategies, facilitation of risks and resources pooling (for instance to carry out important international drug transactions) and (when necessary) regulation of internal struggles and sanctioning of the breaking of federal rules. *Figure 1* shows the map of municipalities in Calabria where - according to the Italian Parliament XV Antimafia Commission – organized crime is based.

The focus on Calabria in the present study is in our opinion interesting since although the spatial diffusion of *'Ndrangheta* is wide in all Calabrian provinces the grip of the organization is far from being uniform. Such heterogeneous presence of the organization in an area otherwise rather homogeneous in terms of economic and social characteristics calls for an analysis at the municipal level rather than provincial level.

Summing up, the presence of the organization in Calabria is in many municipalities (but far from all of them) consolidated and pervasive since many decades and hence able to exert a strong distortive role through the channels described earlier. The consequence of this presence on human capital accumulation is the subject of the remaining sections of the present work.

4.2 Organized crime and human capital: empirical strategy and data description

In this section our aim is to investigate the role played by the (historical and pervasive) presence of a powerful criminal organization on human capital accumulation. We use Italian Census data from 1971 till 2001 to investigate the nexus between the "strong" presence of organized crime and human capital in 408 municipalities in Calabria. As a proxy for human capital, our dependent variable, we use the:

(i) Percentage share of individuals within the municipal population with an high-school diploma and above in 2001;

(ii) Change in the share of highly educated individuals between 1971 and 2001.

Thus our empirical strategy is to estimate the following equations:

$$H_{i,2001} = b_0 + b_1 H_{i,1971} + b_2 OrgCrime_{before1971} + b_3 \Delta Pop_{i,2001-1971} + b_4 X_{i,1971} + b_5 \Delta X_{i,2001-1971} + \varepsilon_i \qquad (1)$$

$$\Delta H_{i,2001-1971} = b_0 + b_1 H_{1971} + b_2 OrgCrime_{before1971} + b_3 \Delta Pop_{i,2001-1971} + b_4 \Delta X_{i,2001-1971} + b_5 X_{i,1971} + \varepsilon_i \qquad (2)$$

where *H* represents our measure of human capital accumulation at the municipal level (*i*), *OrgCrime* is our variable which identifies the historical and strong presence of 'Ndrangheta before the period considered, *Pop* is the municipal population and *X* a set of control variables that are expected to influence human capital formation in the municipality. Since, as suggested above, the change in the municipal population in the three decades here considered - $\Delta Pop_{i,2001-1971}$ - might be strongly influenced by the presence of the criminal organization we estimate the model using instrumental variables as well as ordinary least squares. Furthermore, the effects of organized crime on population dynamics (in particular migration) is an interesting question per se, and therefore we also estimates the following equation:

$$\Delta Pop_{i,2001-1971} = b_0 + b_1 Pop_{1971} + b_2 OrgCrime_{before1971} + b_3 \Delta X_{i,2001-1971} + b_4 X_{i,1971} + \varepsilon_i \qquad (3)$$

In fact the economic and social costs imposed by the presence of organized crime might induce part of the population, and in particular those individuals who have invested in their human capital, to vote with their feet and leave the municipality.

The description of the variables employed is reported in *Table 1*. The identification of the presence of organized crime in a given municipality is a challenging task. Precise measures of the phenomenon are not available, in particular since we are not interested in the actual geography of the organization and the strength exercised over the municipal territory today – as depicted in *Figure 1* - but our ideal measure should be able to capture the pervasive presence and strength of

the organization during a sufficiently long period of time (hence for decades before the period considered in our study, 1971-2001).

Our aim is to identify those municipalities where organized crime has played (and still plays) a relevant role in shaping the local economic and social environment and in turn in affecting the individual incentive to invest in human capital. We employ three different dummy variables in the analysis. The variable *Organized Crime1* is equal to 1 if the criminal organization has been 'active' and has strongly influenced the economic and social life of the municipality over a long period of time. This variable has been compiled by the authors on the basis of an historical reconstruction of the spatial diffusion of 'Ndrangheta. Contributions by widely acknowledged experts on the historical origin and development of the criminal organization (Ciconte 2008a and 2008b; Forgione 2009a and 2009b; Gratteri and Nicaso 2007) have been used along with direct sources such has historical officials documents and reports of the Italian Parliament, Ministry of Interior Affairs, Ministry of Justice etc. This historical reconstruction of the organization allowed us to identify 55 municipalities (mainly located in the province of Reggio Calabria) where the presence of *'Ndrangheta* has been pervasive in the last half century (and in some cases since the end of the eighteenth century). With the approval of the Law n. 221/1991 the Italian Parliament introduced the possibility for the central government to remove the municipal council in case of mafia infiltration. This law represented an important step in the fight against organized crime since allowed "external control" over local territories where the border between criminality and politics is highly porous. More than 30 municipalities in Calabria have been subject to the application of Law n. 221/1991 and we use this information for creating the dummy variable "*Dissolved municipal council*" (equal to 1 if the municipal council has been removed from power by the central government). In our opinion this allows us to identify those areas where organized crime is powerful and embedded in local society so as to be able not only to deeply influence the political process but of being be part of it. Our preferred measure for identifying a deep and pervasive presence of organized crime is the variable *Organized Crime2* which is a merge of the two above-described dummies variables *Organized Crime1* and *Dissolved municipal council*.[5]

Among the other covariates employed in the analysis we include a dummy variable - *arbereshe* - which is equal to 1 for those municipalities where there is a strong presence of an Albanian-origin ethnic community. As a consequence of the Ottoman invasion of Albania, culminated with the death of Skanderberg, the Albanian national hero in 1468, a large number of individuals fled from the Ottoman invasion of Albania. Between XV and XVII centuries more than 50 arbereshe communities (Albanian ethnic minorities) were formed and scattered around in the South of Italy. Many of these communities were formed in Calabria and even if several centuries have passed their language[6] and cultural traditions are still preserved by locals. This strong sense of belonging to the ethnic communities of (ancient) Albanian origins represents a peculiar form of social capital. We investigate in our analysis whether this form of 'local social capital' matters in the process of human capital formation. The hypothesis is that the level of "trust" within the ethnic minority might provide a stronger incentive to invest in education in a process similar to that described by La Porta et al (1997).

---

[5] We do not use official statistics on declared crimes for three main reasons. Firstly, there is a lack of consistent historical data on judiciary/crime statistics. Secondly, available official statistics are reported only for highly aggregated geographical level (region or provinces) which we believe are not fully adequate for the high heterogeneity in the presence of such organizations. Peri (2004) for instance uses as a proxy for the presence of organized crime the murder rate for 100.000 inhabitants in 1951 (regional level) or in 1971 and later (provincial level). No such data exists to our knowledge at municipal level. Thirdly, most of declared crimes suffers from a serious problems of under-reporting; this is even more true in areas where organized crime is often more powerful (and quicker in enforcing its rules) than the State.

[6] Arberesh language derives from *tosk*, a dialect once spoken in Southern Albania, and is substantially different from current albanian.

10

Table 1 – Description of the variables employed in the empirical analysis

Variable name	Description	Mean (standard deviation)	Source
Dependent variables.			
Higher Education in 2001	Percentage of municipal (or Local Labour System, LLS) population with secondary or tertiary education in 2001	26.75 (7.45)	Census Data (Istat)
Higher Education change 1971-2001	Percentage change in the municipal share of highly educated individuals between 1971 and 2001	23.17 (3.65)	Census Data (Istat)
Population change between 1971 and 2001	Percentage change in the municipal population between 1971 and 2001	-7.13 (32.37)	Census Data (Istat)
Covariates employed in the regression analysis			
Organized crime 1	Dummy variable equals 1 if the presence of organized crime has been strong and pervasive before 1971. Municipalities are included only if reliable documentation exists on multiple and significant episodes of organized crime influences in the economic and social life.	.135 (.342)	Authors' elaboration (1)
Municipality controlled by Ndrangheta	Dummy variable equals 1 if the municipal council has been subject to an order of dismissal based on the application of Law n. 221/1991 ("Normativa sullo scioglimento dei consigli comunali per presunte infiltrazioni mafiose").	.086 (.280)	Authors' elaboration based on Gazzetta Ufficiale della Repubblica Italiana (several years)
Organized crime 2	Merge between the two variables "*Organized crime 1*" and "*Municipality controlled by Ndrangheta*"	.167 (.373)	Authors' elaboration (see above)
Arbereshe (Albanian origin)	Dummy variable equals 1 if the municipality population still preserves arbereshe language and traditions.	.074 (.261)	Authors' elaboration
Secondary Education in 1971	Share of municipal population with high-school diploma in 1971 (%)	4.540 (1.993)	Census Data (Istat)
Tertiary Education in 1971	Share of municipal population with university diploma and above in 1971 (%)	.775 (.529)	Census Data (Istat)
Higher Education in 1971	Percentage of municipal population with secondary and/or tertiary education	26.749 (7.452)	Census Data (Istat)
Higher Education attainment in the Local Labour System in 1971	Percentage of LLS's population with secondary and/or tertiary education	49.295 (5.882)	Census Data (Istat)
Illiteracy rate in the Local Labour System (1971)	Rate of illiteracy within the Local Labour System (LLS) where the municipality is located.	16.138 (3.751)	Census Data (Istat)
Unemployment rate in 1971	Percentage of the municipal population which is actively searching for a job in 1971	2.982 (1.092)	Census Data (Istat)
Employment rate in 1971 (%)	Percentage of the municipal population which is employed in 1971	43.346 (7.496)	Census Data (Istat)
Employment rate change 1971 – 2001	Percentage change in the municipal employment rate between 1971 and 2001.	-12.295 (7.71)	Census Data (Istat)
Public sector	Share of public employment over total employment at the municipal level (% in 1981)	32.761 (10.817)	Census Data (Istat)
Migrants in 1971 (population absent for work, % share)	Share of the municipal population working outside the municipal area in 1997 (%)	6.706 (4.179)	Census Data (Istat)
Population in 1971	(log of) Number of individuals residing in the municipality in 1971	4872.67 (11438.19)	Census Data (Istat)
Population in 1971 - squared	Square of "Population in 1971"		Census Data (Istat)
Population in the Local Labour System in 1971	(log of) Number of individuals residing within the Local labour System in 1971	60830.97 (63644.02)	Census Data (Istat)
Altitude	Average altitude of the municipal area (in meters)	419.1 (227.3)	Istat
Highway SA_RC	Dummy variable equals to 1 if the municipality is crossed by the main regional highway (Salerno-Reggio Calabria)	.453 (.498)	Authors' elaboration

(1) Historical reconstructions made by the authors on the basis of multiple sources (in particular the following sources - and references cited therewith – have been mainly used: Forgione 2009a e 2009b, Nicaso 2007, Ciconte 2008a e 2008b, Gratteri and Nicaso 2007)

There is overwhelming evidence on the importance of parents' background (income and education)

as a key determinant of children' investments in education - estimates of the elasticity for intergenerational mobility in education lie between 0.25 to 0.40 in the UK (Dearden *et al* 1997). The low intergenerational mobility in education in Italy is well documented in Checchi et al 1999. In order to take this effect into account we include as a covariate the *share of highly educated individuals in the municipal population before the period of analysis* here considered. In some specification we also control for the level of education in the Local Labour System[7] where the municipality is located, in order to capture spatial effects in the process of human capital accumulation from neighbouring municipalities. We expect a positive relationship between past levels of education - reflecting the human capital accumulation of past generations - and actual levels (and changes).

We use past and/or contemporaneous *population dynamics (in or out- migration)* as a general proxy for economic and social opportunities at the municipal level since individuals move out from locations which offers poor opportunities. Poor or scarce opportunities, ceteris paribus, will also imply a reduced incentive to invest in human capital; we hence expect a negative (positive) relationship between outmigration (immigration) and the share of highly educated individuals within the population. The negative association between outmigration and human capital is also reinforced by a "composition" effect due to the fact that migration flows are generally positively self-selected since the most talented and skilled individuals have a higher propensity to migrate. Calabria has historically been a land of emigration; the outflows were particularly intense in two historical periods (i) the decades after the Italian reunification (toward the New World, US, Canada, Australia and South American countries and other European countries); (ii) during the post-WWII reconstruction toward the industrial poles located in the North of Italy. In the following analysis we use a measure of past migration flows from the municipality by employing an information available in the 1971 Census; more precisely the number of residents absent from the municipality in 1971 for work reasons (*migrants in 1971*). The expected sign of this variable is ambiguous since it might represents a lack of opportunities in the local labour market but might also generate positive diaspora externalities since migration might promote development in the areas of origin through remittances, return migration, innovation flows or trade.

We also control for the *unemployment and/or employment rate* at the municipal level in the considered period and the *share of public sector jobs* over total employed. The latter variable is expected to be negatively associated with our measures of human capital since the higher the value of this variable the lower is the number of jobs opportunities created by the private sector within the municipality considered. Other controls includes the accessibility of the municipality through the main transport corridor in the region (the *highway Salerno-Reggio Calabria*) and the average *altitude* of municipal area. We also included several control variables as a proxy of the (municipal and/or Local Labour System) supply of education such as the presence of high schools or the number of teachers within the population but these variables always proved to be non relevant in the analysis.[8]

4.3 Empirical results

Table 2 and *Table 3* report the results of the econometric analysis on the determinants of municipal high education respectively in *levels* in 2001 and the *change* between 1971 and 2001. The first columns use the alternative organized crime indicators presented above. In what follows we

---

[7] A Local Labour System (Sistema Locale del Lavoro) is defined by Istat (Italian National Office of Statistics) by an area, usually encompassing several municipalities, where labor supply and demand are largely self-contained; hence an area within which commuting takes place (see www.istat.it for details).
[8] This result is probably due to the high homogeneity of these variable within the regional area. Estimations are available from the authors upon request.

concentrate our discussion on the last column of each table where we use our preferred measure and use a two-stage least square estimation in order to correct for the endogeneity of population growth.

Table 2 – The determinants of the level of municipal human capital accumulation in 2001
(*dependent variable*: % of municipal population with at least a high-school diploma in 2001)

	Model 1 (OLS)	Model 2 (OLS)	Model 3 (OLS)	Model 4 (IV)
Organized crime 1	-1.765* (0.775)			
Municipality controlled by Ndrangheta		-1.962* (0.890)		
Organized crime 2 (merge)			-1.769* (0.717)	-1.846* (0.732)
Arbereshe (Albanian origin)	1.831* (0.95)	1.893* (0.95)	1.832* (0.948)	1.653+ (0.97)
Secondary Education (1971)	1.889** (0.219)	1.862** (0.219)	1.873** (0.218)	1.963** (0.226)
Tertiary Education (1971)	1.544* (0.774)	1.335+ (0.764)	1.639* (0.778)	1.754* (0.795)
Illiteracy rate in Local Labour System (1971)	-0.129+ (0.073)	-0.136+ (0.072)	-0.122+ (0.073)	-0.176* (0.078)
Population change 1971-2001 (%)	0.057** (0.009)	0.059** (0.009)	0.057** (0.009)	0.023 (0.017)
Unemployment rate in 1971 (%)	-0.395 0.243)	-0.361 (0.243)	-0.388 (0.243)	-0.446+ (0.249)
Employment rate change 1971-2001 (%)	0.072+ (0.038)	0.067+ (0.038)	0.074* (0.038)	0.092* (0.039)
Public sector (% share in 1981)	-0.074** (0.024)	-0.072** (0.024)	-0.073**	-0.102** (0.027)
Constant	24.053** (1.826)	24.169** (1.821)	23.975** (1.826)	25.468** (1.962)
Observations	408	408	408	408
Adj R-squared	0.57	0.57	0.57	0.56
Wu-Hausman test				F(1,397)=6.11

Note: + significant at 10%;* significant at 5%; ** significant at 1%; Standard errors in parentheses
Variable instrumented: Population change 1971-2001 (%) / *instruments*: municipal population with at least high-school diploma in 1971, population in the Local Labour System (LLS) with at least high-school diploma in 1971, Migrants in 1971 (population absent for work in 1971, % share), organized crime 2, altitude of municipality, employment rate in 1971, population in 1971 and its square, population in LLS in 1971.

The coefficients of our proxies for the presence of organized crime are always negative and statistically significant suggesting that municipalities where such perverse form of social capital is pervasive accumulate less human capital. Our result suggests that organized crime is costly for hosting society not only in terms of short-term distortion or destruction of resource but also since it undermines the prospects of future growth by depleting human capital. It is interesting to notice that the variable arbereshe is significant and positive; this findings seems to suggest a tale of two stories related to social capital in the considered case study. On one side there is a positive story where trust, social cohesion within a community of individuals who shares a common cultural origin, positively affects the accumulation of human capital. On the other side there is a perverse social externality, organized crime, which corrupts the accumulation of fundamental resources for growth.

The level of education within the municipal population or in the surrounding areas (LLSs) at the beginning of the period, in 1971, is always positive and significant confirming the hypothesis of low intergenerational mobility in educational levels. In addition, those municipalities characterized by a growing population within the period considered have a relatively higher rate of accumulation of human capital. This might be due both to a higher incentive to invest in education or to the fact that immigrants are very often positive self-selected (i.e. higher educated). A similar finding is associated to the variable employment rate between 1971 and 2001; while in *Table 2* the unemployment rate in 1971, another proxy for economic opportunities, is negative but not always significant. Municipalities characterized by a high share of public sector employment are characterized by a lower level of formal education within the population. Often low profile public jobs represents in small municipalities in the South of Italy one of the few (if not the only) employment opportunities[9].

Table 3 – The determinants of the change of municipal human capital between 1971 and 2001
(*dependent variable*: change in the municipal population with at least a high-school diploma 2001-1971)

	Model 1 (OLS)	Model 2 (OLS)	Model 3 (OLS)	Model 4 (OLS)	Model 5 (TSLS)
Organized crime 1	-1.252** (0.431)				
Municipality controlled by Ndrangheta		-1.019* (0.502)			
Organized crime 2 (merge)			-1.201** (0.394)	-1.28** (0.390)	-1.199** (0.400)
Arbereshe (Albanian origin)	1.57** (0.542)	1.643** (0.544)	1.576** (0.541)	1.69** (0.54)	1.6** (0.543)
Municipal Human Capital (% of highschool diploma and above in 1971)	0.132* (0.067)	0.091 (0.065)	0.135* (0.067)	0.142* (0.066)	0.126+ (0.07)
Education level in 1971 in Local Labour System (% of total population)	0.354** (0.026)	0.358** (0.026)	0.353** (0.026)	0.362** (0.026)	0.349** (0.027)
Population change 1971-2001 (%)	0.014** (0.005)	0.015** (0.005)	0.014** (0.005)	0.015** (0.005)	0.02* (0.009)
Migrants in 1971 (population absent for work in 1971, % share)	0.07+ (0.037)	0.081+ (0.037)	0.072+ (0.037)	0.057 (0.037)	0.085* (0.038)
Employment rate (% change 1971-2001)	0.037+ (0.02)	0.037+ (0.02)	0.039+ (0.02)	0.031 (0.02)	0.037+ (0.021)
Public sector (% share in 1981)	-0.017 (0.014)	-0.017 (0.014)	-0.016 (0.014)	-0.012 (0.014)	-0.011 (0.016)
Highway SA_RC				-0.88** (0.28)	
Constant	5.732** (1.532)	5.54** (1.538)	5.772** (1.531)	5.59** (1.51)	5.417** (1.494)
Observations	408	408	408	408	408
Adj R-squared	0.43	0.42	0.43	0.44	0.42

Note: + significant at 10%;* significant at 5%; ** significant at 1%; Standard errors in parentheses
Variable instrumented: Population change 1971-2001 (%)

---

[9] The allocation of employment opportunities in the public sector is often in these areas more related to "relationship" capital (family and friends connections) rather than individual skills and abilities.

What is the main channel linking organized crime and human capital accumulation? One potential answer comes from the results reported in *Table 4*. In fact a strong local presence of organized crime is associated with a reduction in the municipal population between 1971 and 2001. Given the marginal role played by municipal differences in natural demographic change (fertility and mortality rates); most of the population adjustment is due to migration flows. The selective nature of outflows of migrants can be considered one of the main channels through which human capital at the municipal level is (indirectly or directly) depleted by the influence of organized crime.

Table 4 – Organized crime and population growth between 1971 and 2001
(*dependent variable*: change in the municipal population 2001-1971)

	Model 1 (OLS)
Organized crime 2 (merge)	-10.358** (3.903)
Arbereshe (Albanian origin)	-7,031 (4.999)
Population in 1971 (log)	0.001* (0.000)
Population in 1971 – square	0.0001** (0.000)
Migrants in 1971 (population absent for work in 1971, % share)	-1.206** (0.323)
Employment rate in 1971 (%)	3.049** (0.312)
Employment rate (% change 1971-2001)	3.263** (0.308)
Altitude of municipalità	-0.028** (0.006)
Population in 1971 (Local labour system)	0.0001** (0.000)
Constant	-87.065** (11.561)
Observations	408
Adj R-squared	0.37

Note: + significant at 10%;* significant at 5%;
** significant at 1%; Standard errors in parentheses

Other covariates relevant in explaining population changes are the level of *employment rate* at the beginning of the period and its subsequent change. The initial size of the municipal's *population* (and its square) and that of the Local Labour System' population are positively associated with subsequent changes suggesting a process of concentration in larger centres which is common to the path observed in other Italian regions. We observe also a pattern of depopulation in municipalities located at higher *altitude*, often small and isolated villages in hilly or mountain areas of the region.

5. Conclusive remarks

Organized crime has profound effects on the economy and society not only because it leads to a misallocation of resources and to a reduction of the quality of life in the short period but also because it compromises economic growth and human improvement in a long run perspective. The great bulk of the literature has investigated the economic approach to crime by analysing economic determinants of criminal behaviour in terms of incentives and opportunities. A less abundant amount of studies has focussed on costs of criminal activities in terms of adverse mobilization of local and external resources and downgrading in the provision of public goods. Few contributions have explored the influence of organized crime on economic development. Although the long run

consequences of criminal infiltration in the economy are less easily observable and have a less sensationalistic impact on public opinion, we believe that the study of such consequences is fundamental in order to better understand the structural damages caused to the economy by organized crime and design adequate policies of crime deterrence.

In this paper we provide evidence of a significant relationship between organized crime and human capital accumulation, the engine of economic growth. We investigate the case of *'Ndrangheta*, the powerful criminal organization whose illegal activities are spread worldwide but, at the same time, are deeply rooted in the local territory of Calabria, a southern Italian region. Whereas existing studies on the economic role of organized crime in Italy use data at the regional or provincial level, we assume municipalities of Calabria as units of analysis since territorial differentiation of *'Ndrangheta's* presence in Calabria can be captured at this level of disaggregation only.

We employ three different dummy variables for indicating the long standing presence of criminal organization in the economic and social life of municipality. When we regress levels (or change) in high education on crime variables we always find negative and statistically significant coefficients. A similar outcome is obtained when change in population is used as dependent variables in the place of high education. In other words, empirical results suggest that organized crime determines a deterioration in human capital formation through two modalities: on the one hand, a strong presence of organized crime poisoning local economy might force more educated individuals to migrate (*human flights effect*); on the other hand, individual incentives to invest in human capital might be sharply distorted if criminal institution influences pervasively economic activities in the territory (*dis-incentive effect*).

In general, our results are strongly supportive of the link between social capital and human capital formation, even if organized crime is a *perverse* form of social capital.

It is interesting to notice that the link "social capital/human capital" is curiously confirmed in our results when we look at the reversal of the coin: municipalities preserving Arbereshe (Albanian) language and traditions are almost immune from infiltration of *'Ndrangheta* and are positively correlated with human capital formation; in this case, *virtuous* social capital - characterized by reciprocal trust and social cohesion inside a community of individuals sharing common cultural origins - has a positive impact on education.

In agenda of future research, the innovative content of the present work - consisting in the investigation of the link between organized crime and human capital accumulation – should be developed in line with three directions: i) the design of a formal theoretical model aiming to better understand all implications of the nexus between organized crime, human capital formation and migration; ii) the improvement of the identification of organized crime variable according to a quantitative measure of the phenomenon, other than the qualitative indicator here adopted (for example, historical murder rates, historical extension of *latifondo*[10] as form of landownership, etc.); iii) expansion of the analysis to the entire Italian Mezzogiorno in order to increase the robustness of results.

References:

Acemoglu, Daron (1995), "Reward structures and the allocation of talent", *European Economic Review*, vol. 39, pp. 17-33.

Arrow, Kenneth (1997), "The Benefits of Education and the Formation of Preferences," in Jere Behrman and Nevzer Stacey, eds., *The social benefits of education*, Ann Arbor, MI: University of Michigan Press, pp. 11-16.

---

[10] Very large estate owned by aristocrats or clergy (often rented to peasants).

Baumol, William J. (1990), "Entrepreneurship: Productive, unproductive and destructive", *Journal of Political Economy*, vol. 98, pp. 893-921.

Becker, Gary and George J. Stigler (1974), "Law enforcement, malfeasance, and compensation of enforcers", *The Journal of Legal Studies*, vol. 3(1), pp. 1-18.

Becker, Gary S. (1968), "Crime and Punishment: An Economic Approach," *Journal of Political Economy* vol. 76, pp. 169-217.

Becker, Gary S. and Casey B. Mulligan, (1997), "The Endogenous Determination of Time Preference." *Quarterly Journal of Economics*, vol. 112(3), pp. 729-58.

Bonaccorsi di Patti, Emilia (2009), "Weak Institutions and credit availability: the impact of crime on banks loan", *Questioni di Economia e Finanza (Occasional papers) n. 52*, June 2009, Banca d'Italia.

Borjas, George J., Bronars Stephen G. and Stephen J. Trejo (1992), "Self-Selection and internal migration in the United States", *Journal of Urban Economics,* vol. 32, pp 159-185.

Centorrino, Mario, La Spina Antonio and Guido Signorino (1999), "*Il nodo gordiano. Criminalità mafiosa e sviluppo nel Mezzogiorno*", Laterza Editori, Roma-Bari, Italy.

Checchi D., Ichino A. e Rustichini A. (1999) More equal but less mobile? Intergenerational mobility and inequality in Italy and in the US. *Journal of Public Economics,* vol. 74, pp. 351- 393

Chiswick, Barry R. (1999), "Are Immigrants Favorably Self-Selected?", *American Economic Review* vol. 89 n.2, pp. 181-185.

Ciconte, Enzo (2008a), "*Storia Criminale. La resistibile ascesa di mafia, 'ndrangheta e camorra dall'Ottocento ai giorni nostri*", Rubettino Editore, Soveria Mannelli, Italy.

Ciconte, Enzo (2008b), "'*Ndrangheta*", Rubettino Editore, Soveria Mannelli, Italy.

Daniele, Vittorio and Ugo Marani (2007), "Organized Crime and Foreign Direct Investments: the Italian case", MPRA Paper No. 6632, Munich Personal RePEc Archive.

Dearden L., S. Machin and H. Reed (1997), "Intergenerational Mobility in Britain", *Economic Journal*, vol. 107, 47-66.

Ehrilch, Isaac, (1973), "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation", *The Journal of Political Economy*, Vol. 81, No. 3, pp. 521-565.

Eurostat (2009), Regional Yearbook 2009.

Florida, Richard (2005), "*The flight of the creative class*", Harper and Collins, New York, USA.

Forgione, Francesco (2009a), "'*Ndrangheta. Boss, luoghi e affair della mafia più potente al mondo. La relazione della Commissione Parlamentare Antimafia*", Baldini-Castoldi-Dalai editore, Milano, Italy.

Forgione, Francesco (2009b), "Mafia export. Come 'ndragheta, Cosa Nostra e camorra hanno colonizzato il mondo", Baldini-Castoldi-Dalai editore, Milano, Italy.

Freeman, Richard B. (1994), "Crime and the Job Market", *NBER Working Papers n. 4910*, National Bureau of Economic Research.

Freeman, Richard B. (1996), "Why Do So Many Young American Men Commit Crimes and What Might We Do about It?," *Journal of Economic Perspectives*, vol. 10(1), pages 25-42.

Freeman, Richard B. (2000), "Disadvantaged Young Men and Crime", in David G. Blanchflower and Richard B. Freeman, ed. by, *Youth Employment and Joblessness in Advanced Countries*, University of Chicago Press.

Gambetta, Dario (1993) "*Sicilian Mafia: The Business of Private Protection*", Harvard University Press, Cambridge MA.

Goglio, Silvio (2004), "Crime, Collective Action and Development, *European Planning Studies*, Vol.12, n. 6, pp. 853-869.

Gould, Eric D., Bruce A. Weinberg and David B. Mustard (2002), "Crime Rates and Local Labor Market Opportunities in the United States: 1979-1997", *The Review of Economics and Statistics,* Vol. 84, No. 1, pp. 45-61.

Gratteri, Nicola and Antonio Nicaso (2007), "*Fratelli di sangue*. La 'Ndrangheta tra arretratezza e modernità: da mafia agro-pastorale a holding del crimine", Luigi Pellegrini editore, Cosenza, Italy.

Jacob, Brian A. and Lars Lefgren (2003) "Are Idle Hands the Devil's Workshop? Incapacitation, Concentration, and Juvenile Crime", *American Economic Review*, vol. 93(5), pp. 1560-1577.

Kling, Jeffrey R. (1999), "The Effect of Prison Sentence Length on the Subsequent Employment and Earnings of Criminal Defendants", Discussion Papers in Economics No. 208, Woodrow Wilson School, Princeton University.

Konrad, Kau and Stergios Skaperdas (1998), "Extorsion", *Economic*a, vol. 65, pp. 461-477.

La Porta, R., Lopez-de-Silanes F., Shleifer A. and R. Vishny (1997), "Trust in large organizations", *American Economic Review*, vol. 87, pp. 333-338.

Landes, William M. and Richard A. Posner, (1975), "The Private Enforcement of Law", *The Journal of Legal Studies*, 4(1), pp. 1-46.

Levitt, Steven D. (2004), "Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six that Do Not", *Journal of Economic Perspectives*, Vol. 18, No. 1, pp. 163–190.

Lochner, Lance and Enrico Moretti (2004), "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports", *The American Economic Review*, Vol. 94, No. 1, pp. 155-189.

Machin, Stephen and Costas Meghir (2004), "Crime and Economic Incentives", *The Journal of Human Resources*, Vol. 39, No. 4, pp. 958-979.

Mehlum, Halvor, Moene Karl and Ragnar Torvik (2005), "Crime Induced Poverty Traps", *Journal of Development Economics*, vol. 77 (2), pp. 325-340.

Nicaso, Antonio (2007), "*'Ndrangheta. Le radici dell'odio*", Aliberti Editore, Roma, Italy.

Paoli, Letizia (2002), "The Paradoxes of Organized Crime", *Crime, Law and Social Change* Vol. 37 pp. 51 - 97.

Papagapitos, A. and R. Riley (2009), "Social Trust and Human Capital Formation", *Economics Letters*, vol. 102, pp. 158-160.

Peri, Giovanni (2004), "Socio-Cultural Variables and Economic Success: Evidence from Italian Provinces 1951-1991", *Berkeley Electronic Journal Topics in Macroeconomics*: Vol. 4: No. 1, Article 12, September

Stigler, George J. (1970), "The Optimum Enforcement of Laws", *The Journal of Political Economy*, Vo. 78, No. 3, pp. 526-536.

Zamagni, S. (1993), (ed) "*Mercati Illegali e Mafie. L'economia del crimine organizzato*", Il Mulino, Bologna, Italy.