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## **Organized Crime and Foreign Direct Investment: the Italian Case**

Vittorio Daniele\* and Ugo Marani\*\*

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**Abstract.** The paper estimates the effects of organized crime on FDI inflows in 103 Italian provinces in the period 2004-06. The presence of organized crime at a provincial level is quantified through several indicators, based on data for different kinds of crimes: extortion; association for criminal purposes, including mafia (Art. 416 and 416 bis of the Italian Penal Code); attacks; arson. Several control variables are used, included a proxy for (financial) investment incentives provided by public sectors. Estimation suggests that FDI inflows are influenced by different variables. Our results show that the extent of extortion and the number of persons denounced for "criminal association" are significantly and negatively correlated with FDI inflows. Finally, our analysis suggests the presence of organized crime is a strong disincentive for foreign investors, particularly in the less developed Italian provinces.

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**Keywords:** FDI determinants; Italy; Mezzogiorno; crime; regional attractiveness.

**JEL:** F23; R 30; R 38.

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## 1. Introduction

The south of Italy, known as the *Mezzogiorno*, receives a marginal share of foreign direct investment (FDI) entering Italy. In the two-year period 2005-06 the eight southern Italian regions have attracted less than 1 % of total FDI flows. In Campania, the southern region with the best performance in terms of attracting foreign investment, the flows amounted to only 0.2 % of those entering Italy.

The low degree of the *Mezzogiorno*'s attractiveness for foreign investors is also shown by the "geography" of the multinational firms operating in Italy. In 2005, the firms in southern Italian regions with foreign participation amounted to only 5 % of all Italian firms with foreign participation. For the sake of comparison, suffice it to think that in Lombardy alone there were ten times as many firms with foreign capital as in the whole *Mezzogiorno*.

Despite this performance, in the *Mezzogiorno* there are several factors which, at least potentially, could incentivize the siting of firms from outside the area. First of all, the *Mezzogiorno* represents a major share of the domestic market: this area has a population of almost 21 million, that is, 35 % of the nationwide total. Secondly, there is a considerable workforce available (many of whom are skilled), while the cost of labour is lower than the Italian average. Further, in many southern regions there are extensive non-congested industrial zones which are able to offer business location benefits (IPI, 2005). Finally, firms that invest in the *Mezzogiorno* — especially in regions included the EU's "convergence" objective — may benefit from a series of financial incentives envisaged by EU programmes and by national laws.

However, against such potential benefits, in the *Mezzogiorno* there are several business location disbenefits which limit its attractiveness (Basile, 2001). One of the factors able to negatively affect the choices of potential investors, whether foreign or Italian, is the historically rooted presence of several criminal organisations: *camorra*, *mafia*, *'ndrangheta*, *sacra corona unita*. The impact of organised crime is particularly high in certain regions, notably Calabria, Campania, Sicily and Puglia.

Crime may be considered an additional risk (or cost) for business activity. Especially if of the mafia type, crime may condition business operations in various ways: extorting money; retail market limitations; being forced to take on suppliers of raw materials or pressurised to employ workers; distortions in the functioning of markets and local

institutions (Centorrino and Signorino, 1993; Centorrino *et al.* 1999). In general, crime is a signal of a somewhat unfavourable business climate.

While the links between crime and regional economic development have been extensively examined both in theoretical and empirical terms, little attention has been paid to estimating the effects on foreign investment.

In this paper we analyse the impact of certain crimes — to be assumed as proxies for organised crime — on FDI inflows into the Italian provinces. The underlying hypothesis is that, other conditions being equal, the presence of crime constitutes a competitive disadvantage which limits the degree of an area’s attractiveness for potential foreign investors. By extending the results from previous studies (Pazienza *et al.* 2005; Daniele, 2007), our analysis shows that the presence of crime negatively and significantly affects the FDI inflows, limiting the *Mezzogiorno’s* attractiveness and hence impacting upon the area’s economic development.

## 2. Foreign direct investment in Italy

### 2.1. The national scenario

Italy is well below its potential for attracting foreign investment. According to UNCTAD, in 2005 Italy was 107th in the world’s performance index in attracting FDI, immediately after Sri Lanka<sup>1</sup>. Importantly, Italy’s result is far below its economic size and its weight in the international trade system. According to the potential index of attractiveness, Italy ranked 29th in the world league table (Tab. 1).

**Table 1. Performance and potential indexes for FDI**

Countries	Performance index			Countries	Potential index		
	1990	2000	2005		1990	2000	2004
Norway	48	60	105	Austria	18	23	26
Sri Lanka	72	108	106	UAE	26	26	27
Italy	65	117	107	Italy	17	24	29
Benin	18	95	108	Slovenia	..	29	29
Algeria	108	113	109	Bahrain	23	32	30

The indexes cover 141 countries. The UNCTAD inward FDI performance index is a measure of the extent to which a host country receives inward FDI relative to its economic size. It is calculated as the ratio of country’s share in global FDI inflows to its share in global GDP. The potential index is based on 12 economic and politico-economic variables. Countries are ordered according to their 2005 (performance) and 2004 (potential) index. Source: Our elaboration of UNCTAD data, *World Investment Report 2006*; [www.unctad.org/wir](http://www.unctad.org/wir).

Comparison with major European countries reveals Italy’s low degree of attractiveness. As shown by Tab. 2, in the period 2000-05, Italy

<sup>1</sup> Cfr. UNCTAD, *World Investment Report 2006*; [www.unctad.org/wir](http://www.unctad.org/wir).

received 4.2 % of FDI towards the EU, roughly equivalent to 1.2 % of GDP and 6 % of gross fixed investment. These shares are appreciably lower than those of its main European competitors and the EU average.

**Table 2. Basic data on Italy's ranking**

Countries	Flows in % EU	% of GDP	% of Gross fixed investments
United Kingdom	19.0	4.1	21.7
Germany	14.3	2.9	13.5
France	12.3	2.9	14.3
Netherlands	9.1	8	36.8
Spain	7.9	4.1	18.8
<b>Italy</b>	<b>4.2</b>	<b>1.2</b>	<b>6.1</b>
Sweden	3.4	4.1	23.4
Ireland	3.3	11.8	70.3
Austria	1.5	2.5	10.8
Finland	1.4	3.8	21.7
EU 25	100.0	3.9	22.4

Source: Our elaborations of UNCTAD data.

There are many reasons for Italy's poor ability to attract FDI. Several studies show that this depends, to a great extent, both on the scant efficiency of the bureaucratic and administrative system and on its SME-dominated industrial structure, featuring entrepreneurial set-ups that are often hostile to mergers and acquisitions on the part of foreign firms (Committeri, 2004). Other reasons, some of which are examined below, limit Italy's appeal to potential foreign investors.

## ***2.2. Regional distribution of FDI***

In all countries FDI tends to be concentrated in certain areas. In Spain, for example, Madrid and Cataluña are the main destinations of FDI. Also in France, the UK and Greece we encounter clear differences between the various regions<sup>2</sup>.

In Italy the degree of FDI concentration is fairly high. As shown by Table 3, Lombardy has absorbed most (69 %) investment flows towards Italy in the two-year period 2005-06. It is followed by Piedmont (13 %) and Lazio (7 %). The shares of the other regions are low. Overall, the Centre-North has received almost all the FDI in-flow to Italy. The share of the *Mezzogiorno* is residual, amounting to less than 1 % of the national total. Equally high regional differences are encountered if we

<sup>2</sup> For the French case, cfr. Mayer (2004); for Spain, Hermosilla and Ortega (2001); for Britain, Devereux *et al.* (2006); for Greece, Kokkinou and Psycharis (2004).

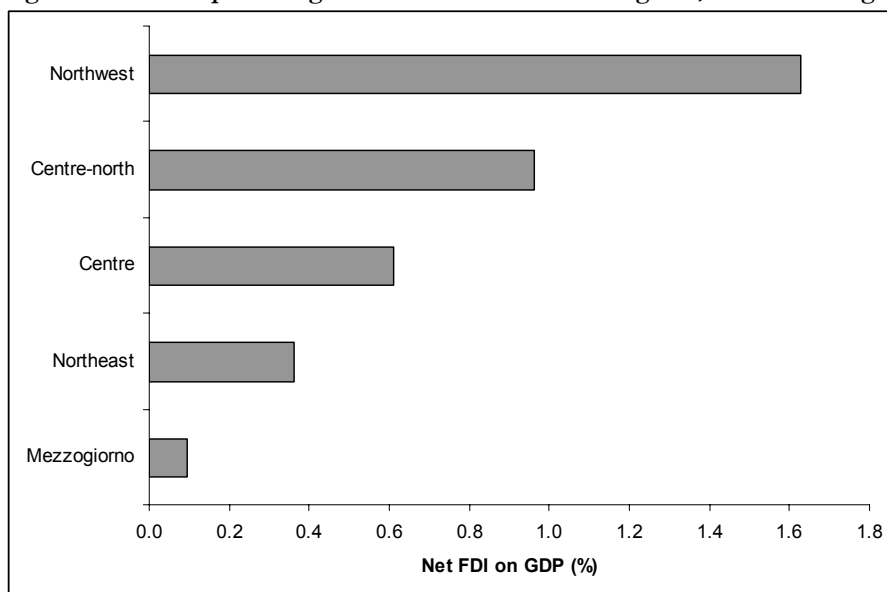
consider the ratio of FDI to GDP (Fig. 1). In the five-year period 2000-05, net FDI inflows on average represented 1.6% of GDP in the Northwest, 0.6 in the central regions and just 0.1 % in the *Mezzogiorno*.

**Table 3. FDI in Italian regions and as a percentage of Italy**

	FDI 2005	FDI 2006	In % Italy
Abruzzo	71,284	98,161	0.1
Basilicata	188,778	246,100	0.2
Calabria	8,969	29,963	0.0
Campania	305,358	245,991	0.2
Emilia Romagna	3,004,748	5,735,505	3.2
Friuli	119,177	182,567	0.1
Lazio	7,513,904	12,010,842	7.1
Liguria	619,756	1,074,358	0.6
Lombardy	84,986,699	104,464,729	68.9
Marche	62,310	55,632	0.0
Molise	180,097	21,313	0.1
Piedmont	18,856,070	17,392,351	13.2
Puglia	120,067	247,269	0.1
Sardinia	29,320	97,674	0.0
Sicily	54,542	30,135	0.0
Tuscany	4,370,503	2,916,814	2.6
Trentino A. A.	200,837	744,712	0.3
Umbria	1,182,322	1,189,123	0.9
Valle d'Aosta	3,835	1,292	0.0
Veneto	5,293,644	6,356,404	4.2
Italy	121,878,576	153,140,935	100.0
Centre-North	120,920,161	152,124,329	99.3
Mezzogiorno	958,415	1,016,606	0.7

The data refer to FDI gross flows IDE and do not include trade credits and transactions in the banking sector. Source: UIC.

**Figure 1. FDI as a percentage of GDP in Italian macroregions, 2000-05 average**



Source: Net FDI inflows. Our elaborations of UIC and ISTAT data.

Data by province show an even greater degree of concentration. Table 4 reports the first and last ten provinces drawn up on the basis of FDI incoming flows in the two-year period 2004-05. Importantly, the province of Milan alone absorbs over 66 % of FDI and the top three are provinces with large urban areas. Moreover, the data show that nine of the last ten places are occupied by provinces in the *Mezzogiorno*.

**Table 4. First and last 10 provinces by FDI in-flow in the years 2004-06 as a % nationwide percentage**

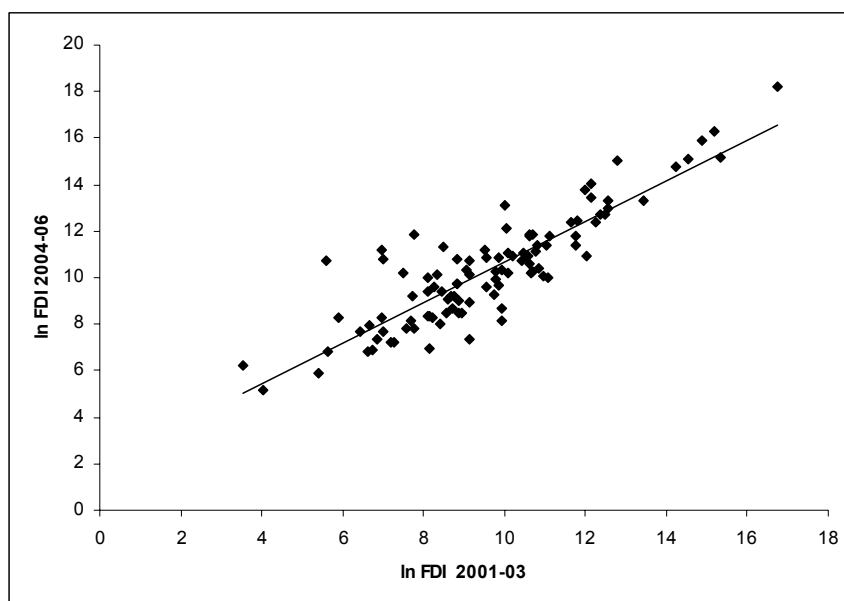
Ranking	Province	FDI	Ranking	Province	FDI
1	Milan	66.46	94	Foggia	0.00
2	Turin	9.25	95	Ragusa	0.00
3	Rome	6.33	96	Reggio Cal.	0.00
4	Florence	3.06	97	Gorizia	0.00
5	Verona	2.86	98	Agrigento	0.00
6	Bologna	2.63	99	Catanzaro	0.00
7	Cuneo	2.03	100	Caltanissetta	0.00
8	Terni	0.99	101	Enna	0.00
9	Alessandria	0.75	102	Vibo Valentia	0.00
10	Vicenza	0.56	103	Oristano	0.00

Source: Elaboration from Italian Exchange Office data

On the provincial level, FDI has a high degree of area concentration and spatial autocorrelation, a sign of the importance played by agglomeration phenomena: in geographically close provinces investments tend to assume very similar patterns, especially in southern Italian provinces (Bronzini, 2004). Moreover, the degree of attractiveness

of individual provinces tends to remain stable in time: indeed, as shown by Fig. 2, the coefficient of autocorrelation in the FDI inflows is very high ( $R^2$  0.8).

**Figure 2. Correlation between FDI inflows into the Italian provinces in the years 2001-03 and 2004-06**



Average FDI inflows in natural logarithms. Source: UIC data.

### ***2.3. Multinationals in the Italian regions***

The presence of foreign firms in the Italian regions may be examined in depth by means of data on the number of firms with foreign participation headquartered in Italy. Of over 6,800 firms with foreign participation operating in Italy in 2005, only 371 (i.e. 5 % of the total) were headquartered in southern Italy (Tab. 5). By comparison, in Lombardy alone the number of foreign-participated firms was ten times higher than in the whole *Mezzogiorno*.

**Table 5. Number, employees and sales of participated Italian firms**

Years	Firms		Employees		Sales	
	Centre-North	<i>Mezzogiorno</i>	Centre-North	<i>Mezzogiorno</i>	Centre-North	<i>Mezzogiorno</i>
2001	6,359	329	850,698	62,136	315,290	18,611
2004	6,739	347	867,294	60,071	346,353	18,031
2005	6,810	371	858,912	61,663	363,297	18,970

For the region where the firm is headquartered; data refer to January 1st in each of the years considered.  
*Source:* Elaborations of the REPRINT data base, ICE - Milan Polytechnic.



**Table 6. Firms with foreign participation by region as a percentage nationwide**

Regions	Firms	Employees	Sales	Regions	Firms	Employees	Sales
Valle d'Aosta	0.2	0.3	0.3	Lazio	7.5	10	16.7
Piedmont	9.5	15.6	12.5	Abruzzo	0.9	2.2	1.7
Lombardy	51.8	46.4	46.3	Molise	0.2	0.1	0
Liguria	2.5	2	2.3	Campania	1.6	1.5	1.1
Veneto	6	4.7	4.7	Puglia	0.7	0.8	0.6
Trentino-Alto Adige	1.9	1.5	1.2	Basilicata	0.3	0.7	0.6
Friuli-Venezia Giulia	1.8	2.5	1.8	Calabria	0.2	0.1	0
Emilia-Romagna	7.9	5.8	5.3	Sicily	0.8	0.6	0.3
Tuscany	4.3	3.1	2.8	Sardinia	0.5	0.7	0.6
Umbria	0.7	0.7	0.8	<b>Centre-North</b>	<b>94.8</b>	<b>93.3</b>	<b>95</b>
Marche	0.7	0.5	0.4	<b>Mezzogiorno</b>	<b>5.2</b>	<b>6.7</b>	<b>5</b>

(a) the region in which the firm is headquartered is considered; the data refer to January 1 2005. *Source:* Elaborations of the REPRINT data base, ICE - Milan Polytechnic.

Table 6 presents the data on the regional presence of firms with foreign capital. The case of Lombardy is striking: the region contains half of the all Italian firms that have foreign capital and generates over 45 % of employment and sales of such firms. As observed for FDI inflows, Lombardy is followed by Piedmont, Lazio and Emilia. Overall, foreign participated firms in the Centre-North in 2005 generated 95 of sales and employment of all firms with foreign capital in Italy.

This confirms that the geography of foreign investments in Italy has clear regional differences and that the *Mezzogiorno* is, overall, completely marginal to the dynamics of passive internationalisation in the country.

#### **2. 4. Determinants of foreign direct investments**

In this section we will briefly examine some of the main determinants of FDI<sup>3</sup>. To offer a taxonomy of these determinants it is worth distinguishing between horizontal (*market seeking*) and vertical FDI. In the case of horizontal FDI (which are prevalent in advanced economies), the fundamental determinant is market size. This type of FDI tends to flow to high-income countries with a large population, i.e. to places that have relatively low transport costs and allow access to large markets. By contrast, vertical FDI is greatly influenced by international

<sup>3</sup> The empirical literature on the topic is very extensive. For a review of models and studies on the determinants and effects of FDI, see, for example, the work of Barba Navaretti and Venables (2006).

trade costs (insofar as products have to cross several borders in the various phases of the production process) and by the costs of production factors. The degree of a country's attractiveness depends on other variables. Of particular importance are those related to the quality of institutional systems (political stability, degree of corruption, absence of conflict) and the so-called business climate (Busse and Hefeker, 2007).

FDI may be an important factor for development: they contribute to capital accumulation, employment creation and technology transfer (Uppenberg and Riess, 2004; Konings, 2004). This is why many countries implement active policies to attract FDI. Such policies may include incentives for investments, subsidies, tax relief, real services and technical assistance to investors. However, the effect of such incentives on FDI is controversial.

Studies show that incentives may affect the business location of multinationals provided, however, that the latter have already taken the decision to make the investment in a given regional context. With reference to the European Union, Devereux and Griffith (2002) find that the national differentials in tax rates affect business location of American multinationals, but only after they have made the choice to invest in Europe.

In general, from empirical studies it emerges that subsidies (in their various forms) are not a decisive determinant for the degree of attractiveness of a country or region. A study on the Irish case shows that regional policies, despite promoting foreign business location in disadvantaged areas of the country, have acted almost "selectively" on firms with a low technological content (Barrios *et al.* 2003). However, in Italy, as in France, Spain or the UK, research shows that financial incentives for investments (e.g. grants or easy-term loans), tax relief or EU structural policies do not have a significant effect in attracting foreign investment in underdeveloped regions (Mayer, 2004; Pelegrin Solè, 2002; Devereux *et al.* 2006; Daniele, 2007). In reality, the decision to invest in a country or in a region is affected by a set of variables — potential market size, availability and quality of human capital, infrastructures. Hence, in the presence of structural constraints, subsidies are rarely sufficient to attract investment.

Distribution of FDI within a country may be incentivised (or disincentivised) by several factors *specific* to the regional or local context (Basile, 2002; Basile *et al.* 2004; Artige and Nicolini, 2005). Although the attraction factors may differ according to the regions considered, the chief determinants include:

- the size of local markets, which may be approximated by aggregate per capita GDP, which significantly affects horizontal FDI;
- the presence of agglomeration economies, especially those deriving from previous business location of foreign firms, which signal the availability of infrastructures, high-quality human capital, high productivity and a high degree of sector specialisation;
- the presence of a favourable socio-institutional environment for business location, such as an efficient institutional and bureaucratic system.

Unlike what happens in other EU countries, in Italy the capacity of individual regions to attract FDI is significantly limited by several characteristics of the “country-system”. The attraction potential of the Italian regions is negatively affected by some inefficiencies of Italy’s institutional system, such as those of bureaucracy and the legal system, and the relatively high levels of taxation on labour and companies. These national traits, rather than those specific to individual local conditions, limit the degree of attractiveness of the Italian regions. According to a survey by Basile *et al.* (2005), performed on a broad sample of firms from five European countries (Italy, Spain, France, Germany and Britain), with the exception of Lombardy, the Italian regions attract on average about 40 % less FDI than other European regions with similar characteristics.

Of course, this does not rule out the fact that there may be significant differences also at a local level in the presence of business location factors. Especially in the *Mezzogiorno* specific disincentives may be encountered that can significantly reduce the degree of attractiveness for potential investors. One such factor is the presence of organised crime, whose impact is greater than in the rest of the country and on which we focus our attention below.

### **3. Crime as an economic disincentive**

#### ***3.1 Effects on the economy***

The fact that organised crime constitutes a constraint to local economic development is clear from many studies that economists, sociologists and historians have devoted to examining crime (Catanzaro 1991; Centorrino *et al.* 1999; Peri, 2004). There are many ways by which crime conditions the legal economy; one of the most evident is the extortion of money from firms and retailers. Besides guaranteeing a fixed

income, generally used to finance other illegal activities, extortion allows a criminal organisation to control their territory and the local economy. Moreover, legal firms are very often forced to purchase goods or raw materials from certain suppliers, to employ staff with links to the same organisations. Constraints or limits may also be imposed on market outlets.

Extortion and control of part of the legal economy are well documented by judicial inquiries and extensive research (Catanzaro, 1991). It is also widely attested that organised crime manages to condition the activity of large firms engaged in public works programmes for regions in southern Italy (Confesercenti, 2007).

In general, organised crime increases the risk and costs of investment and thus has a depressive effect on the economy. A further depressive effect arises from the operations of the same «entrepreneurs of crime». By using violence or corruption to impose monopolies, the criminal undertaking conditions the functioning of markets and institutions, distorting resource allocation and capturing part of public spending. The result is that the market and institutions' ability to function is compromised, and development of the local economy is jeopardised (Centorrino and Signorino, 1993).

According to Becchi and Rey (1994), a system which is imposed on the market has several inefficiencies: besides burdening legally operating firms with costs through extortion and other obligations imposed by firms with ties to criminal associations, criminal protection guarantees the activity of inefficient firms, often used as a cover for illicit activity.

Although the effects of organised crime on development have been extensively examined, also in theoretical terms (Fiorentini and Peltzman, 1995), those on outside investments have received less attention. Such effects are, however, intuitive<sup>4</sup>.

As regards the *Mezzogiorno*, the idea that organised crime works as a deterrent to foreign investment has been postulated by Sylos Labini

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<sup>4</sup> That such effects are negative is evident. The issue of security and its importance for internal and external investments in the *Mezzogiorno* has long been part of the political and economic debate in Italy. Recently, a series of events has made this issue one of the most urgent for development in southern Italy. The Federation of Anti-racket and Anti-usury Associations (FAI) has proposed the establishment of a “security tutor” for foreign firms interested in investing in the *Mezzogiorno* (FAI, *Antiracket tutoring, Experimental three-year project*, Naples, 12 December 2007). One of the reasons behind the above project was the declaration made by the President of the Council of Ministers at the Antimafia summit, according to which organised crime represents a significant deterrent for foreign firms interested in investing in southern Italian regions.

(1985), who points out that criminal organisations that impose “levies” drive production elsewhere while discouraging entrepreneurs from investing in the south. This problem was also underlined very clearly by the American economist Mancur Olson (1984) who noted that the southern Italian regions, due to organised crime, had accrued a huge range of extra-governmental institutions. According to Olson, anyone wanting to start up a new firm in that environment knew they would have to run risks - which could be avoided in a more stable environment.

The “crime risk” appears to seriously compromise the “image” of the *Mezzogiorno* and hence the overall perception on the part of potential foreign investors. The negative impact of crime on investment decisions in the south emerges both from surveys and from empirical studies. A survey carried out by Marini and Turato (2002) on a panel of entrepreneurs in the north-east of Italy interested in internationalisation processes shows that almost all the interviewees (92.6 %) think that criminal presence is the main constraint to investment in the *Mezzogiorno*. A survey carried out for the Ministry of Economics in 11 countries confirms that in the perception of entrepreneurs the *Mezzogiorno* appears like an area with shortcomings in security (Gpf-Ispo, 2005). In addition, organised crime is only one aspect — certainly the most evident — of a social and institutional context with other forms of illegality. Such forms of illegality include corruption and, more commonly, violation of non-penal but important laws for the good functioning of the economy. A major result is that what emerges is a socio-institutional environment and business climate which are somewhat unfavourable for business activity.

Recently, it has been shown (Basile 2001, Pazienza *et al.* 2005 and Daniele 2005; 2007) that organised crime negatively affect FDI inflows into Italian regions. Pursuing this strand of research, in the section below we offer an estimate of the effect of crime on FDI inflows into Italian provinces. Our analysis differs from the above studies both because it concentrates expressly on the impact of organised crime, and because it uses different variables and estimation procedures.

### ***3.2. Geography of organised crime***

In this paper we will measure the occurrence of organised crime in Italian provinces by using data for some types of crime: extortion; mafia association, including attacks; arson<sup>5</sup>. The first two types of crime are typical, albeit not exclusive, of mafia organisations. As stated above, extortion is one of the ways in which mafia organisations are financed

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<sup>5</sup> These are crimes reported to the judicial authorities. As emerged from judicial inquiries, for some types of crimes such as extortion, the victims often fail to report the crime immediately.

and control their territory. As regards mafia association crimes (Penal Code Art. 416 and 416b), the link between the number of crimes and the presence of mafia clan members is evident. Such crimes may therefore be assumed as proxies for the presence of organised crime. Arson and attacks may be considered as *modus operandi* which criminal organisations use to intimidate other operators (economic or political) or to establish control over their territory. Such methods are often adopted by mafia organisations.

In Tab. 7 we report the incidence of the above crimes committed in the Italian regions. It may be noted that in the regions of southern Italy, the average number of crimes per 10,000 inhabitants is much higher than in the rest of the country. Of course, there are significant differences in the incidence of organised crime even within the *Mezzogiorno*. With regard to the crimes which we considered, the index of organised crime is rather high in Calabria, Campania, Sicily and Puglia. What is particularly striking is the case of Calabria where the incidence of the crimes in question is far higher than the national average. In this region, mafia crimes had an incidence of 196 % compared to the national average, extortion 185 % and attacks as high as 717 %.

As regards extortion, in Italy there are estimated to be at least 160,000 shop owners involved in this phenomenon. Many of the firms affected are located in the southern regions. Payment of protection money is believed to affect 70 % of Sicilian shop owners, 50 % of Calabrian shop owners, 40 % of those from Campania and 30 % from Puglia, amounting to a total of 120,000 shop owners involved in these four regions (Confersecenti, 2007). According to a recent study, the magnitude of protection money paid by firms is quite variable. In Sicily, amounts range from a minimum of 32 euros monthly to a maximum of about 27,000 euros, depending on firm size. On average, the amount paid is 881 euros (Asmundo and Lisciandra, 2008). Failure to pay protection money is accompanied by intimidation, damage and attacks.

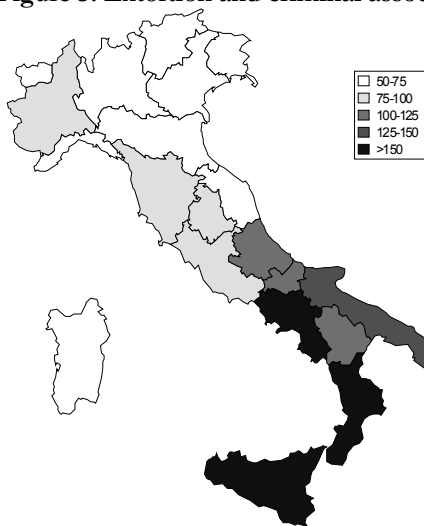
**Table 7. Extortion, criminal association, attacks and fires for every 10,000 inhabitants, 2002-05 (Italy=100)**

Regioni	Extortion	Criminal association	Attacks	Arson
Abruzzo	108	119	47	67
Basilicata	87	222	29	94
Calabria	185	196	717	346
Campania	162	155	99	107
Emilia-Romagna	77	56	24	66
Friuli-Venezia Giulia	64	96	29	52
Lazio	86	109	35	78
Liguria	70	83	39	121
Lombardy	70	71	35	65

Marche	77	68	26	53
Molise	124	104	34	110
Piedmont	102	51	58	83
Puglia	150	119	200	146
Sardinia	74	36	429	149
Sicily	143	177	186	166
Tuscany	88	81	41	92
Trentino-Alto Adige	49	90	28	59
Umbria	75	89	35	66
Valle d'Aosta	44	86	26	38
Veneto	52	62	18	50
Centre-North	76	74	34	71
Mezzogiorno	144	147	220	153

\*Calculated as the sum of crimes for the period 2002-2005 per 10,000 inhabitants. Index Italy = 100. Source: ISTAT data “Area information system on justice”.

**Figure 3. Extortion and criminal association in Italian regions, 2002-05**



Index calculated as the sum of crimes for the period 2002-2005 per 10,000 inhabitants. Index Italy = 100. Source: ISTAT data, “Area information system on justice”.

Fig. 3 illustrates the “geography of organised crime” by means of an index produced by the sum of extortions and mafia crimes per 10,000 inhabitants. Clear regional differences may be observed, with a high concentration in the regions of the south, except for Sardinia in which the incidence of the two crimes is below the national average. Data by province also show that the area distribution of the crimes in question is not equal and clearly has north-south differences. If we measure the degree of provincial concentration with the Gini index, clear differences are observed between crimes (Tab. 8). The level of provincial

concentration of extortion and mafia association is appreciably lower than that of attacks, in which the data from the Calabrian provinces (28% of all attacks recorded in Italy) have a considerable weight. (See also Fig .1 in the appendix, which reports the Lorenz curves for each crime).

**Table 8. Provincial concentration of crimes. Gini indexes**

Gini index	Extortion	Mafia association	Attacks	Arson
Sample	0.25	0.35	0.77	0.35
Estimate of population value	0.26	0.35	0.78	0.35

Source: ISTAT data, “Area information system on justice”

Although the “geography” of organised crime has changed over time, with progressive expansion from their areas of origin to the regions of central and northern Italy, appreciable regional (and provincial) differences may still be found. Many areas of the *Mezzogiorno* are more burdened than the rest of Italy by a criminal presence which, as we stated above, represents a “competitive disadvantage” which can strongly affect development.

## 4. Empirical analysis

### 4.1. Data and methodology

To estimate the impact of organised crime on FDI we used a dataset of observations for 103 provinces. Empirical analysis is based on the following specification:

$$FDI_i = \alpha + \beta_1 X_i + \beta_2 Crime_i + \varepsilon_i \quad [1].$$

In all the regressions, the dependent variable (FDI) is made up by the natural logarithm of average gross FDI inflows in each province in the years 2004-06. Flow data are gathered by the Italian Exchange Office (UIC) with a view to compiling the balance of payments<sup>6</sup>. By the standard definitions, FDI establishes a long-term interest between a foreign-based firm and one resident in Italy. They therefore include

<sup>6</sup> Use of the three-year mean allows a reduction in volatility which occurs in FDI flows to several provinces. Data on flows do not include banking sector transactions and trade credits.



mergers and partial acquisitions (above a certain threshold) of Italian firms on the part of foreign firms and greenfield investments. The UIC data do not allow us to distinguish between the two types of direct investment. In [1], the vector  $X$  represents a *set* of control variables, proxies for the economic provincial structure and size. Control variables used are: the resident population (POP); per capita GDP (GDPpc); the ratio of provincial GDP to that of Italy (SIZE1); the ratio of provincial GDP to that of the region in question (SIZE2); the rate of industrialisation (INDUSTR); the index of infrastructure endowment (INFR). Also consider a *proxy* of financial incentives granted to investments through Law 488/92 (GRANTS). The incidence of organised crime is measured by different variables. We consider data regarding crimes of extortion, mafia association, arson and attacks. For each crime cumulative data for the years 2002-04 are measured against the population (per 10,000 inhabitants). We also use an organised crime index (CRIME) given by the sum of extortion and mafia association crimes per 10,000 inhabitants. Table 9 contains a description of variables and sources.

**Table 9. Description of variables and sources**

Variables	Description	Sources
FDI	Logarithm of average FDI inflow into provinces in the years 2004-2006. Data refer investment flows and do not include trade credits and transactions in the banking sector.	Italian Exchange Office (UIC)
POP	Natural logarithm of the resident population in Italian provinces in 2004. Proxy of local market size.	Elaborated from ISTAT data Census data.
GDPpc	Natural logarithm of value added per capita in 2004. Proxy of the development level	Elaborated from ISTAT data
SIZE1	Provincial value added in 2004 as a percentage of value added in Italy. Proxy of local market size.	Elaborated from ISTAT data
SIZE2	Provincial value added in 2004 as a percentage of value added region-wide. Proxy of local market size.	Elaborated from ISTAT data
INDUSTR	Industry employees <i>sensu stricto</i> every 1000 inhabitants for 2003. <i>Proxy</i> of provincial production structure.	Elaborated from ISTAT data.
INFR	Synthetic index of infrastructure endowment (excluding ports) in percentage terms compared nationwide. 2004.	Tagliacarne Institute.
GRANTS	Proxy variable of financial loans granted to firms, given by the logarithm of the number of the investment applications for incentives under Law 488/92. The data refer to applications for incentives to build new production plants within industrial sector announcements (excluding “special industry” announcements)	Ministry of Economic Development –Ipi-Print data base
EXTORTION	Number of reported crimes of extortion. Period 2002-2004, cumulative values per 10,000 inhabitants.	Elaborated from ISTAT data, “Area information system on justice” ( <i>online data base</i> ).
MAFIA ASSOCIATION	Number of mafia association crimes reported. Period 2002-2004, cumulative values per 10,000 inhabitants.	Elaborated from ISTAT data, “Area information system on justice” ( <i>online data base</i> ).
ATTACKS	Number of attacks. Period 2002-2004, cumulative values per 10,000 inhabitants.	Elaborated from ISTAT data, “Area information system on justice” ( <i>online data base</i> ).
ARSON	Number of arson offences. Period 2002-2004, cumulative	Elaborated from ISTAT

	values per 10,000 inhabitants.	data, "Area information system on justice" ( <i>online data base</i> ).
CRIME	Sum of extortion and mafia association crimes. Period 2002-2004, cumulative values per 10,000 inhabitants.	Elaborated from ISTAT data, "Area information system on justice" ( <i>online data base</i> ).

Table 10 reports the values of correlation coefficients among the variables. Note that the indicators of organised crime are negatively and significantly correlated with FDI inflows in Italian provinces. Also, the same indicators of organised crime are negatively correlated with GDP per capita, i.e. with the level of relative development, and with other variables representative of the local economic context.

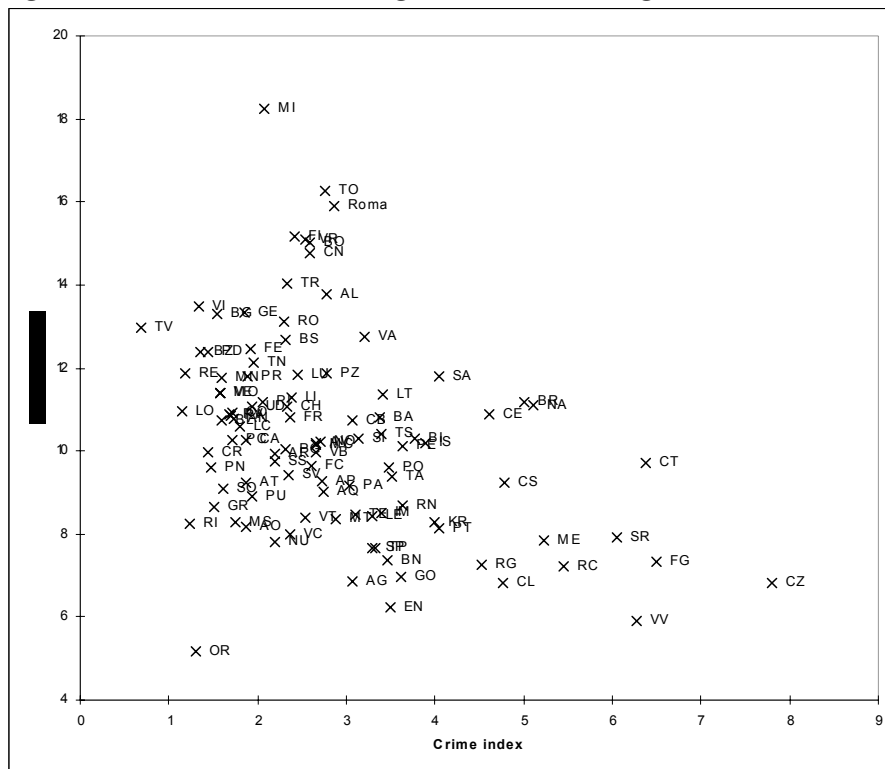
**Table 10. Correlation matrix**

FDI	POP	GDPpc	SIZE1	SIZE2	
1.00	0.60	0.60	0.65	0.30	FDI
	1.00	0.09	0.77	0.37	POP
		1.00	0.31	0.09	GDPpc
			1.00	0.42	SIZE1
				1.00	SIZE2
INDUS	INFR	GRANTS	EXTORTION	ASSOCIAT	
0.49	0.46	-0.14	-0.33	-0.34	FDI
0.08	0.25	0.33	0.06	0.02	POP
0.70	0.51	-0.68	-0.52	-0.50	GDPpc
0.13	0.39	0.11	-0.08	-0.03	SIZE1
-0.16	-0.04	0.18	-0.05	0.08	SIZE2
1.00	0.31	-0.45	-0.41	-0.49	INDUSTR
	1.00	-0.26	-0.15	-0.09	INFR
		1.00	0.46	0.39	GRANTS
			1.00	0.39	EXTORTION
				1.00	ASSOCIATION
		ARSON	ATTACKS	CRIME	
		-0.49	-0.38	-0.39	FDI
		-0.11	-0.12	0.06	POP
		-0.65	-0.44	-0.60	GDPpc
		-0.18	-0.13	-0.07	SIZE1
		-0.13	-0.09	-0.02	SIZE2
		-0.58	-0.36	-0.51	INDUSTR
		-0.32	-0.20	-0.15	INFR
		0.45	0.30	0.51	INCENTIVES
		0.47	0.30	0.94	EXTORTION
		0.58	0.44	0.67	ASSOCIATION
		1.00	0.74	0.59	ARSON
			1.00	0.40	ATTACKS
				1.00	CRIME

Critical value at 5% (for two tails) = 0.1937 for n = 103

Fig. 4 illustrates the correlation between the variable *Crime* and FDI inflows into the 103 provinces. The graph shows that many southern Italian provinces are clustered in the bottom right-hand sector. This corresponds to high *Crime* index values and low FDI. Of course, the partial correlation between the two variables is negative.

**Figure 4. Correlation between foreign investment and organised crime index**



Source: Elaborated from UIC and ISTAT data.

The normality tests performed on the dependent variable were those of Shapiro-Wilk and Anderson-Darling, both at a significance level of 0.05. The results do not allow us to refute the null hypothesis according to which the sample follows a normal distribution (Tab. 11).

**Table 11. Normality tests on the dependent variable**

Shapiro-Wilk	Results	Anderson-Darling	Results
W (observed value)	0.978	And.-Darling's A <sup>2</sup>	0.566
unilateral p-value	0.080	unilateral p-value	0.139
Alpha	0.05	Alpha	0.05

Alpha significance level of 0.05.

Finally, we verified collinearity among the variables by calculating the variance inflation factors (VIF). In the absence of collinearity, the VIF is known to assume values between 1 and 10. As the results obtained (Tab. 12) are clearly below the critical value, it is possible to rule out problems of multicollinearity being able to distort estimates.

**Table 12. Variance inflation factors**

Variables	VIF
Pop	3.082
GDPpc	5.335
SIZE1	3.332
SIZE2	1.535
INDUSTR	2.468
INFR	1.651
GRANTS	2.784
CRIME	1.719

#### **4.2. Estimation results**

Equation [1] was initially estimated with an OLS estimator, with standard errors robust to heteroskedasticity. As reported in Table 13, the results show that, overall, the model is sufficiently robust and has good explanatory power (adjusted  $R^2$  0.70).

As was expected, the population, economic weight of the province in terms of GDP, the rate of industrialisation and the per capita GDP are positively and significantly correlated with foreign investment. This agrees with the findings on the subject in the literature. By contrast, the infrastructure endowment and incentives to firms (measured by financial incentives granted under Law 488/92) do not seem to affect FDI inflows. The fact that incentives and grants for investment have no significant impact on FDI is worth noting. As observed in the previous section, there are many empirical studies showing that financial incentives (especially if not expressly aimed at foreign firms) seem fairly ineffective in attracting FDI. This seems to hold also for Italy in which, unlike other countries, there is no policy as yet specifically to attract foreign investment.

The OLS estimates show that the incidence of organised crime is negatively correlated with IDE. In particular, the quantity of extortion and association for criminal purposes is highly significant. Hence the variable *Crime* (*stat t* 2.5) is also significant. However, the number of arson attacks does not appear to significantly affect investment flows, although the coefficient of this variable is negative.

As we noted above, variability in provincial (and regional) distribution of FDI is very high: some provinces (especially that of

Milan) receive a very high proportion of total flows. In the distribution of the variable there are therefore some outliers which could distort the estimates. The presence of *outliers* in the dependent variable suggests the use of a robust estimator like the LAD (least absolute deviation) which is more efficient than the classic OLS when the error term does not have a normal distribution (Koenker and Bassett, 1978).

LAD estimation results are shown in Tab. 14. They are similar to those obtained using the OLS estimator, except that, in this procedure, crimes of arson and attacks are not significantly correlated with FDI. This may be explained by the fact that, if we exclude Calabria which represents an outlier with very high values, the differences in the incidence of arson among the Italian provinces are not so high. Attacks also show a high concentration in some provinces, as shown by the value of the Gini index (0.78), and this may justify the results obtained. Further, as noted above, correlations between the incidence of attacks, extortion and mafia association, albeit significant, are not particularly high.

However, in all the specifications that we used, organised crime, as measured by extortion, mafia association and with an index consisting of the two crimes, appears to maintain its explanatory power for the dependent variable: *ceteris paribus*, a greater incidence of such crimes reduces FDI inflows.

**Table 13. OLS estimates: Dependent variable: ln FDI**

	Model 1	Model 2	Model 3	Model 4	Model 5
const	-46.26** (-3.423)	-43.46** (-3.086)	-44.74** (-3.211)	-45.77** (-3.306)	-42.78** (-3.129)
Pop	1.245** (3.134)	1.180** (3.116)	1.167** (2.991)	1.143** (2.944)	1.231** (3.140)
GDPpc	3.955** (3.313)	3.744** (3.038)	3.909** (3.217)	3.999** (3.274)	3.641** (3.045)
Size1	0.2446* (1.781)	0.2748** (1.997)	0.2864** (2.094)	0.2866** (2.135)	0.2531* (1.823)
Size2	0.009073 (0.8125)	0.01159 (1.050)	0.007618 (0.7117)	0.009394 (0.8615)	0.009479 (0.8626)
Industr	0.007666** (2.199)	0.007117** (2.057)	0.006756* (1.862)	0.008005** (2.297)	0.006987** (2.009)
Infr	0.004531 (1.134)	0.005400 (1.332)	0.003522 (0.8900)	0.003929 (0.9510)	0.005322 (1.385)
Incentives	0.1492 (1.460)	0.1268 (1.263)	0.1377 (1.319)	0.1316 (1.241)	0.1564 (1.554)
Extortion	-0.2535* (-1.821)				
Association		-0.6254** (-2.007)			
Arson			-0.05883 (-1.324)		
Attacks				-0.1163** (-2.591)	
Crime					-0.2858** (-2.495)
n	103	103	103	103	103
R <sup>2</sup>	0.6981	0.6998	0.6962	0.6960	0.7040
lnL	-173.634	-173.349	-173.952	-173.997	-172.621

Standard errors are robust with respect to heteroskedasticity. t statistic in brackets - \* denotes significance at the 10 % level - \*\* denotes significance at the 5 % level

**Table 14. LAD estimates. Dependent variable: ln FDI**

	Model 6	Model 7	Model 8	Model 9	Model 10
const	-44.53** (-3.585)	-55.06** (-4.231)	-53.12** (-4.234)	-59.14** (-4.848)	-55.40** (-4.325)
Pop	1.295** (4.339)	1.415** (4.601)	1.303** (4.223)	1.359** (4.308)	1.533** (5.374)
GDPpc	3.747** (3.187)	4.689** (3.837)	4.624** (4.003)	5.155** (4.593)	4.600** (3.855)
Size1	0.2755 (1.356)	0.2644 (1.408)	0.2949 (1.442)	0.2999 (1.456)	0.2327 (1.258)
Size2	0.008221 (0.9718)	0.004152 (0.5098)	0.003201 (0.3920)	0.0003850 (0.04797)	-0.0005929 (-0.07479)
Industr	0.009889** (2.624)	0.005505 (1.469)	0.007372* (1.956)	0.006802* (1.833)	0.005327 (1.412)
Infr	0.002529 (0.6918)	0.001743 (0.4613)	-4.862e-05 (-0.01250)	-0.002010 (-0.5289)	0.002889 (0.8132)
Incentives	0.02767 (0.2451)	0.06178 (0.5846)	0.05319 (0.5084)	0.08380 (0.7835)	0.04378 (0.4178)
Extortion	-0.2945** (-2.194)				
Association		-0.6712** (-2.121)			
Arson			-0.04940 (-1.339)		
Attacks				-0.06590 (-0.7818)	
Crime					-0.2873** (-2.515)
n	103	103	103	103	103
lnL	-173.634	-173.349	-173.952	-173.997	-172.621

t statistic in brackets - \* denotes significance at the 10 % level \*\* denotes significance at the 5 % level.

## 5. Concluding remarks

The regions in southern Italy attract a wholly marginal share of FDI flows to Italy. Empirical studies show that, at a regional level, investment flows are affected by many determinants, the main ones being the size of the potential market, agglomeration economies, the presence of other foreign firms and productive specialisation. The low attractive capacity of the *Mezzogiorno* is affected by these factors.

In this paper we focused on a disincentive often overlooked by the literature on the subject: impact of organised crime on FDI. Empirical analysis shows that (other conditions being equal) the impact of certain crimes (notably extortion and association for criminal purposes) that may be assumed as proxies for the presence of organised crime have a significant and negative effect on FDI inflows towards Italian provinces.

In our approach, the presence of organised crime is a structural constraint which limits the possibility of creating certain basic conditions which determine an area's degree of attractiveness for outside investors. For example, by creating disincentives for business location, *de facto* organised crime reduces the possibility of creating positive conditions (economies of agglomeration) which trigger virtuous cumulative processes. In other words, the presence of organised crime is a disincentive of the local socio-economic context: a basic «competitive disadvantage».

Importantly, the presence of organised crime reflects negatively on the overall image of the *Mezzogiorno* and hence on the perceptions of potential investors. The overall impact could thus be greater than that resulting from empirical analyses based the variables observed.

In many areas of the *Mezzogiorno* (and not only there), illegality originating in mafia organisations is a manifestation — undoubtedly the most glaring and tragic— of a social environment characterised by other forms of illegality. There is illegality arising from forms of corruption and misgovernment and what is often termed “weak legality” which arises from violation of laws which, though non-penal are nonetheless important for the good functioning of the economy (La Spina, 2008). These forms of illegality lead to an economic and institutional context that creates disincentives for business activity.

The relationship between crime and FDI is therefore complex. Do foreign firms not invest in the south because they are afraid of being directly hit by crime — for example by extortion or other types of conditioning — or is organised crime perceived as a signal of a poor socio-institutional context and of an unfavourable business climate for



investment? Although our analysis does not provide an answer to such questions, it is nonetheless an important point which leaves space for further research.

A clear policy implication can be drawn from our analysis. An improvement in security conditions (and, if possible, in the socio-institutional system in the *Mezzogiorno*) is a prerequisite for improving the degree of attractiveness of weaker areas in Italy.

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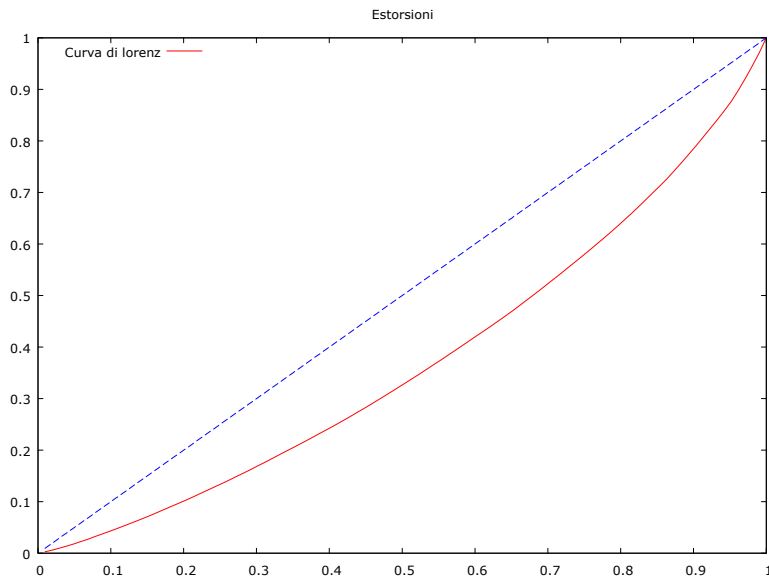
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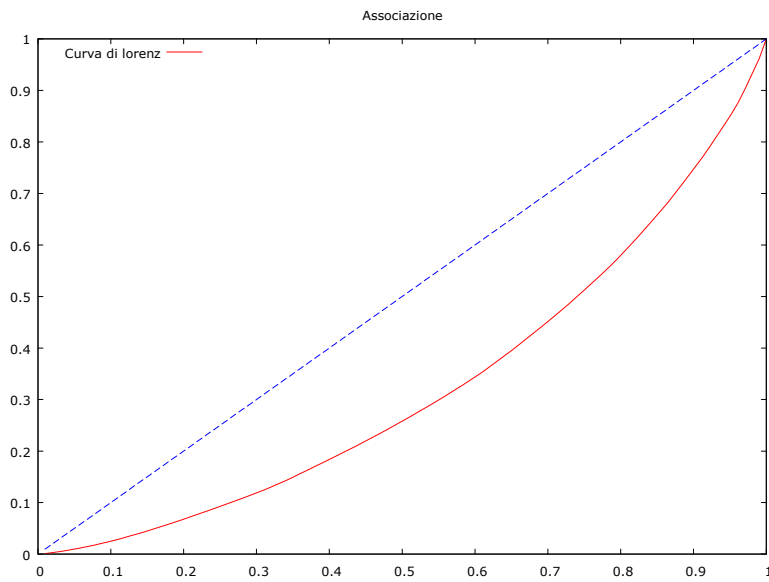
## Appendix

Figure 1. Provincial concentration of crimes: Lorenz curves

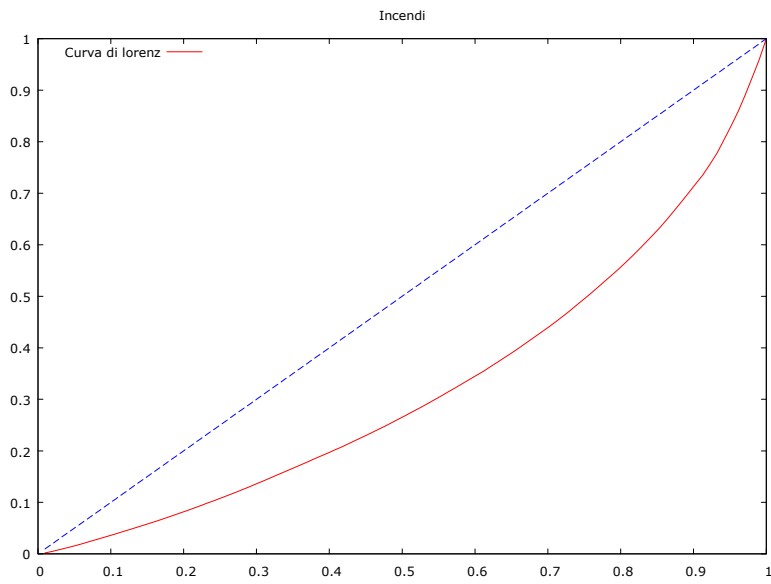
### Extortion



### Criminal associations



## Arson



## Attacks

