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The social consequences of organized crime in Italy

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Abstract: Organized crime affects security, development, and democracy worldwide, but not much is known about its social consequences. We study how exposure to the presence of organized crime groups shapes the social capital of Italian citizens, including political participation, civic engagement, and institutional and interpersonal trust. To address this question, we first leverage a survey of almost 800,000 respondents on social capital and exposure to organized crime conducted in Italy between 2000 and 2018. Second, we compile data on social capital and related variables between 1861 and 2020 in the Italian region of Apulia to exploit the unexpected and exogenous arrival, in the 1970s, of organized crime in the region, where no groups had been present before. We compare levels of social capital in Apulia with a synthetic control of regions which were not notably exposed to the presence of organized crime groups. Results from both exercises show that exposure to organized crime reduces political participation, institutional and interpersonal trust and has mixed effects on civic engagement. Using a mediation analysis leveraging both quantitative and qualitative evidence, we show that the negative effects of organized group presence on political participation and trust are largely explained by disinvestment in social capital by those exposed to the presence of criminal groups due to psychological factors (fear and resignation) and frustration with lack of state capacity to deal with the groups.

Key words: organized crime, gangs, Mafia, social capital, Italy

JEL classification: E26, H00, K42

Note: The online appendix is available as supplementary material here (https://www.wider.unu.edu/publication/social-consequences-organized-crime-italy).

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1 Introduction

Organized crime is arguably one of the largest threats to security, development, and democracy worldwide and the cause of the world's deadliest type of violence (Magaloni et al. 2020). Organized crime groups are prevalent in urban areas of many developing countries and are a growing challenge in Western Europe and North America (Patrick 1973; Varese 2001; Chu 1999; Hill 2003; Wang 2017; Blattman et al. 2021). A survey of law enforcement agencies in the USA found that almost all agencies serving cities with more than 100,000 residents experienced problems with organized crime (Bruhn 2021). In Europe, almost one in five individuals has identified organized crime as the main global challenge to the future of the continent (Eurobarometer 2021: 81), whilst in Latin America, almost 26 million people live under the influence of organized crime groups (Lessing et al. 2019).

Organized crime has serious adverse effects on economic outcomes, by reducing GDP (Pinotti 2015), literacy levels (De Feo et al. 2019), and income and labour mobility (Melnikov et al. 2020). Organized crime also hinders democratic processes given the influence of organized crime groups on electoral processes (Alesina et al. 2019) and the quality of political candidates (G. Daniele and Dipoppa 2017). But, while there is little disagreement about the origins, *modus operandi*, and the economic and political consequences of organized crime, knowledge about the impact of organized crime on social outcomes has remained elusive. Yet, understanding how organized crime affects the social fabric of local communities is fundamental to the design of effective policies to eradicate criminal groups, as well as to grasping the social context under which organized crime groups operate.

This paper seeks to address this question by investigating empirically the effect of exposure to the presence of organized crime groups on four social outcomes: political participation, civic engagement, institutional trust, and interpersonal trust. These outcomes fall under Uphoff's (1999) definition of social capital, whereby social capital is expressed in a set of behaviours (political participation and civic engagement) and perceptions (trust).[1] The paper focuses on the case of Italy, a country with a long history of organized crime.

Understanding the effect of organized crime on social capital is an important question because social capital has been shown to play a key role in a variety of outcomes central to the organisation of markets, societies, and polities. Social capital affects economic growth (Knack and Keefer 1997; Algan and Cahuc 2010, 2014) through its effects on the formation of firms (Fukuyama 1995), innovation and productivity (Zak and Knack 2001; Bloom et al. 2012; Massa et al. 2022), financial development (Guiso et al. 2004), and trade expansion (Guiso et al. 2009). Social capital also shapes key governance outcomes, including the delivery of public goods (Knack 2002), fiscal capacity (Besley 2020), and political accountability (Nannicini et al. 2013).[2]

Individual levels of social capital are shaped both by individual intrinsic characteristics and by the cultural and social environment that surrounds the individual. Intrinsic individual social capital characteristics derive from inter-generational values and norms transmitted via families (Bisin and Verdier 2001; Dohmen et al. 2012; Moscona et al. 2017) and from genetic similarities (Glaeser et al. 2002; Guiso et al. 2009; Uslaner 2013). Well-documented environmental factors include historical events such as the slave trade and colonialism (Michalopoulos and Papaioannou 2020; Nunn 2020), technologies of production

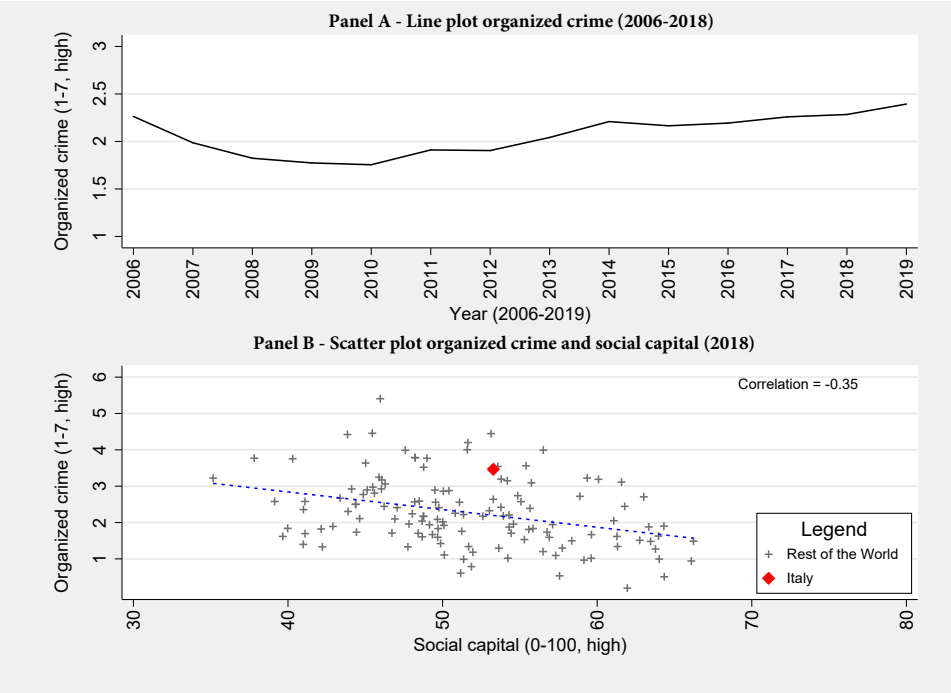
[1] We acknowledge the complexity of defining social capital in operational terms, as discussed in large bodies of literature in sociology, political science, and economics, following the seminal work of Banfield (1967), Coleman (1988), Putnam (1994), and Putnam (2000). Throughout the paper, we use the terms 'social outcomes' and 'social capital' interchangeably. When we refer to social capital, we use the concept as a shorthand for the four separate outcomes we consider in the paper.

[2] For reviews on the impacts of social capital, see Durlauf and Fafchamps (2005), Algan and Cahuc (2014) and Alesina and Giuliano (2015).

(Alesina et al. 2013), governance models (Putnam 1994; Alesina and Fuchs-Schündeln 2007; Acemoglu et al. 2014), factor endowments (Voigtländer and Voth 2012; Buggle and Durante 2021; Giuliano and Nunn 2021), culture and norms (Hoff et al. 2011; Bloom et al. 2012; DellaVigna et al. 2012; Lowes et al. 2017; Dell et al. 2018), and the heterogeneous composition of communities (Alesina and La Ferrara 2000; Vigdor 2004).

Social capital includes both persistent and more malleable components. For some time, individual social capital characteristics were thought to be persistent given the stickiness of cultural and normative values in families and communities across history (Putnam 1994). Although many individual choices with respect to political participation, civic engagement, and trust may persist across time, and often across generations, it is now well-documented that such choices may change in response to a myriad of factors, including natural shocks (Buonanno et al. 2021), wars (Guriev and Melnikov 2016), changes in regulatory rules (Aghion et al. 2010), corruption (Banerjee 2016), income shocks (Ananyev and Guriev 2019), teaching practices (Algan et al. 2013), technology (Olken 2009; Geraci et al. 2022), and social norms (Alesina et al. 2018; Depetris-Chauvin et al. 2020; Mousa 2020; Alan et al. 2021; Alrababa'h et al. 2021; Weiss 2021). Notably, since Putnam (2000), several studies have documented a persistent erosion of social capital in developed economies (see Inglehart and Welzel (2005)), with an acceleration of such erosion after the 2007–08 financial crisis, as illustrated by the rise of political polarisation, individualism, and social mistrust (Algan et al. 2017; Guriev and Papaioannou 2020). The rise in the presence of organized crime since around 2010 across the world (see Panel A of Figure 1) and in Italy (see Figure A1 in Online Appendix) suggests that this erosion in social capital may be further exacerbated as these groups gain a foothold in societies and become intertwined with the social fabric of such societies. Panel B of Figure 1 shows a negative correlation between the two phenomena worldwide.

Figure 1: Organized crime and social capital worldwide



Note: this figure presents the line plot of the global presence of organized crime groups between 2006 and 2019 (Panel A) and the scatter plot between organized crime groups and social capital in 2018 (Panel B). Organized crime presence is measured asking to business leaders in each country worldwide: "In your country, to what extent does organized crime (Mafia oriented racketeering, extortion) impose costs on businesses?". The answer goes from 1 (it imposes no costs to businesses) to 7 (it imposes huge costs to businesses). Social capital is an index constructed by World Economic Forum (2019) which goes from 0-100 and comprises questions on political participation, institutional trust, and interpersonal trust.

Source: authors' elaboration based on data from World Economic Forum (2019).

The effect of organized crime on social capital is, however, theoretically ambiguous. Although almost no studies exist on the social consequences of organized crime, literature on other determinants of social capital suggests that organized crime may erode the social fabric of local communities by crowding-out the effectiveness of state institutions and the rule of law (Alesina et al. 2019) and by reducing social co-operation and social coordination required for effective collective action (Aghajanian et al. 2020; Justino 2022). Similarly to the effects of other forms of violence, organized crime may also increase mistrust and social distance between community members who may not know who is involved with organized crime groups or whether the group is relying on informants to control the community (Kalyvas 2006). Like other violent and non-violent shocks, organized crime may also affect idiosyncratic characteristics such as how individuals respond to fear and insecurity that unavoidably follows the arrival of organized crime groups in the community (Justino 2012; Moya 2018; Moya and Carter 2019; Verwimp et al. 2019), and the propensity of individuals and families to invest in social capital, especially towards those outside their immediate group (Aghajanian et al. 2020). It is possible, however, that the presence of organized crime may improve other dimensions of social capital. An emerging literature on armed groups operating in modern civil wars has shown how exposure to such groups and the violence they perpetrate may generate forms of positive traumatic growth via psychological mechanisms, bringing people together to fight a common enemy and, thus, investing more on bridging forms of social capital (Blattman 2009; Bateson 2012; Bauer et al. 2016). Similarly, organized crime groups could plausibly lead to increases in state capacity, at least with respect to the deployment of law and order forces to combat it, or improve collective action as communities strengthen their capacity to either fight or accommodate the group (Arjona 2016; Gáfaro et al. 2022). Whether and how organized crime groups affect individual levels of social capital is therefore an empirical question.

We analyse the causal effect of exposure to the presence of organized crime groups on social capital in Italy using two identification strategies. The first strategy is a pooled OLS regression with province-level and year fixed effects using data on social outcomes across almost 800,000 individual respondents for the whole Italian territory between 2000 and 2018 from a dataset from the Italian National Institute of Statistics (ISTAT 2019). To measure organized crime group presence, we use a question included in the dataset on the presence of organized crime groups in the area where the respondent lives. This 'on-the-ground' measure has several advantages over the use of administrative police data, commonly used in the literature on organized crime. First, a challenge faced by this literature is the fact that administrative police data typically identifies organized crime presence based on arrests or indictments. Thus, this approach essentially reflects periods when organized crime groups are at their weakest because they get caught or where the state is strongest and thus able to identify and prosecute those groups. Moreover, due to its clandestine nature and the 'rule of silence' prevalent in areas controlled by organized crime groups, organized crime is rarely denounced, sometimes because the actions of the groups are normalised and not viewed as crimes. Therefore, these data tend to under-represent the presence of groups in places where they are able to operate without being identified or apprehended by state authorities. Second, our measure is collected at the individual level, allowing for more fine-grained analysis than administrative police data, often only available at the municipality or province levels, which make it difficult to account for the fact that the presence of organized crime is often limited to specific neighbourhoods and sometimes to specific streets within neighbourhoods (Weisburd et al. 2012). Third, the measure we use captures how individual respondents perceive their exposure to organized crime. This is arguably a better basis for individual decision-making than information obtained from administrative police data that may not reflect the specific environment in which each individual lives.[3] In addition to this variable, the ISTAT (2019) dataset includes information on a uniquely rich set of controls that may simultaneously explain organized crime group presence and individual levels of social capital. All mod-

[3] Even though we believe our self-reported measure captures best our independent variable of interest—individual exposure to organized crime—we compare our results in Section 3.2 with administrative police data and find estimates are broadly consistent, especially when using administrative police data on territorial presence of organized crime groups.

els use province-level fixed effects to account for the historical importance of provinces in Italy since the formation of the country in 1861, each with its own specific culture, social norms, and dialects. We also provide detailed historical and empirical evidence to rule out potential reverse causality concerns, and report beta-adjusted effects for omitted variable bias in all regressions.[4]

As a second identification strategy, we exploit a unique historical event in the form of the arrival of organized crime groups in the southern Italian region of Apulia in the 1970s, where no groups had previously emerged. Organized crime groups arrived in Apulia in the 1970s as a result of two exogenous events. First, the Italian government implemented in 1956 a resettlement policy intended to cut *Mafiosi* linkages with the Sicilian Mafia by resettling these in the rest of Italy. Among the southern regions of Italy, Apulia received the largest share of *Mafiosi*, who facilitated the expansion of organized crime to areas where it did not previously exist. Second, in 1960, the closure of the tax-free port of Tangier moved all illicit trade in tobacco to Apulia due to the disruption of the old trade route between Marseille and Morocco. As a result, a new route appeared from Albania and the former Yugoslavia to Turkey and Cyprus via Apulia due to its particular geographic location. To exploit these historical events that led to the arrival of organized crime to a region previously free from it, we rely on a new dataset we compiled for this paper covering almost 160 years of data on social capital at the regional level. We employ a synthetic control approach, which compares changes in social capital as a result of organized crime arrival in Apulia in the 1970s, with a synthetic comparison unit composed by regions outside historical organized crime strongholds, before and after the arrival of organized crime groups. The social capital data is obtained from our own digitisation of census surveys, which builds on Nuzzo (2006), administered in Italy every decade since 1861.

Our main set of results shows that, nationally, the presence of an organized crime group results in a reduction in the aggregate measure of social capital (-0.067SD) among those exposed, when compared to those in areas with no organized crime groups. This includes a reduction in political participation (-0.013SD) and trust among exposed individuals (-0.207SD for institutional trust and -0.109SD for interpersonal trust). We observe a small increase in civic engagement among the same individuals (0.024SD). This translates in levels of social capital which are 8.1 per cent lower among exposed individuals, in relation to those not exposed to organized crime. Results from the synthetic control approach mirror these results. In the decade between 1971 and 1981, the level of social capital in Apulia fell by approximately 30 per cent, with the gap between the actual and counterfactual social capital remaining constant until today. This drop in social capital happened in the same decade in which organized crime groups settled in Apulia. Results from the synthetic control confirm the pooled OLS results, but are of larger magnitude given the focus on a region with heavy presence of organized crime since the 1970s. As with the pooled OLS results, the synthetic control estimates show that most of the effect emerges from a reduction in interpersonal trust. There is also a small negative effect on political participation, and a null effect on civic engagement.[5] We interpret these results as indicative of a 'social trap' emerging in areas where organized crime presence causes a reduction in cooperation and trust when these are most needed to combat it (Rothstein 2005)

We extend the results above in two additional ways. First, we conduct a quantile regression, which shows that the negative effect of the presence of organized crime on social capital is twice as strong for

[4] See Oster (2019). We test also for selection on observables by progressively adding a battery of relevant control variables. To control for concerns with testing multiple outcomes, we report the Romano and Wolf p-values to control for family-wise error rate (J. P. Romano and Wolf 2005) and create aggregate indices (Kling et al. 2007). Results are robust to further tests for measurement error bias, social desirability bias, and model choice.

[5] We cannot test the effect on institutional trust in the synthetic control approach due to lack of an appropriate indicator but are able to compare later in the paper Apulia and areas that make up the synthetic control using Eurobarometer data, which confirms a reduction in institutional trust in Apulia in relation to the other regions during the arrival of organized crime in the 1970s.

those individuals whose social capital is either at the bottom or at the top of the distribution. Second, an heterogeneous analysis highlights that the effect is stronger when an individual is exposed to organized crime groups in regions that are not historical Mafia strongholds. When comparing municipalities within historical Mafia strongholds, the effect is stronger for individuals who live in municipalities where organized crime groups do not face competition with other groups and have sole control over the territory.

In relative terms, these effects are economically meaningful and offer new insights to the literature on social capital in Italy and on the determinants of social capital more widely. A number of studies have shown how social capital is among the most persistent characteristics of an individual. Putnam (1994) in his seminal work, and later empirical analysis by Guiso et al. (2016), provide convincing historical evidence that differences in social capital between the north and the south of Italy are inherited from different governance models adopted as far back as the Middle Ages. These differences have persisted for centuries. The fact that exposure to organized crime groups leads to a reduction in social capital between 8 (pooled OLS) and 30 per cent (synthetic control) is a rather significant effect demonstrating the malleability of individual levels of social capital in the face of a perceived threat (the arrival of an organized crime group). From a methodological perspective, these results also offer a plausible causal identification of a new determinant of social capital—organized crime presence.

These results add also to a growing literature on the emergence and consequences of armed groups and gangs in developing countries (Dell 2015; Kalyvas 2015; Arjona 2016; Arias 2017; Lessing and Willis 2019; Magaloni et al. 2020; Blattman et al. 2021; Gáfaro et al. 2022; Sviatschi 2022), organized crime in developed countries (Patrick 1973; Varese 2001; Chu 1999; Hill 2003; Wang 2017; Bruhn 2021), and on the Mafia in Italy (V. Daniele and Marani 2011; Pinotti 2015; Buonanno et al. 2016; Alesina et al. 2019; De Feo et al. 2019; Dipoppa 2021; G. Daniele and Dipoppa 2022; Le Moglie and Sorrenti 2022). This literature has yet to consider the effects of criminal groups on social capital. Yet, the large effects of organized crime groups on social capital we report suggest a possible important explanation not yet considered in the literature for the erosion in social capital observed in Italy and elsewhere in recent decades. Our measurement of both social capital and exposure to organized crime at individual level is also an important contribution to this literature because higher levels of aggregation used in many of the studies above (especially on those focused on Italy) may hide important decision-making mechanisms (such as reasons for disinvestment in social capital) that operate at the individual level.

Finally, our study validates a small qualitative sociological literature on how organized crime groups manipulate the social capital of those that surround them to expand and govern areas and to build safe houses where to store drugs or appoint individuals to act as lookouts (Densley 2014; Harding 2014; McLean et al. 2019), interact with institutional, political, economic, and civil society actors (Sciarrone 2015), and enter in relations of collusion and complicity to advance their economic advantage (Dagnes et al. 2018). We are not able to distinguish whether criminal groups in Italy manipulate the social capital of local communities strategically or whether social capital changes as an organic response to the arrival of the group. However, our results suggest that the presence of organized crime groups leads to considerable and often rapid changes in social capital among individuals exposed to these groups, especially to those exposed for the first time, who have the most to lose, and who live in areas where the groups assume territorial control.

One possible concern with our study design and main results is the possibility of reverse causality. Early historical accounts link the emergence of the Mafia in Italy to low levels of social capital and development in southern Italy. This interpretation has been debunked in more recent studies. However, if (low) social capital has a causal effect on the emergence of organized crime groups, our results may not be valid due to reverse causality biases. We address this concern in two ways. First, we revisit in the next section the history of organized crime in Italy which shows that (i) organized crime groups did not emerge in many regions of Italy with very low levels of social capital, and (ii) organized crime has also

emerged in areas with very high levels of social capital. Second, we conduct a series of empirical checks using several historical datasets which show that (i) social capital in 1885 does not explain the presence of *Cosa Nostra* in Sicily in the 1900s, and (ii) the presence of organized crime groups across Italy in the 1980s is not explained by levels of social capital in the late 1960s and early 1970s. Taken together, these pieces of evidence suggest that reverse causality is unlikely to substantially affect our results.

In the last part of the paper, we study what mechanisms may mediate the effects of the presence of organized crime on social capital. Organized crime groups typically operate underground under the law of silence. As a result, determining their social consequences is challenging because it is unlikely individuals affected by organized crime groups will be willing to discuss openly their attitudes and beliefs. In the absence of an off-the-shelf theoretical framework, we use an inductive approach to structure our mechanism analysis based on the existing literature on social capital and organized crime and a series of qualitative interviews we conducted for this paper. To analyse which mechanisms may shape the relationship between exposure to organized crime and social capital, we conducted a series of interviews with professionals with extensive experience on organized crime in Italy (policemen, army officers, and prosecutors), a number of research specialists on organized crime (criminologists, political scientists, and economists), and community leaders in the city of Genoa exposed to organized crime.[6] These latter interviews were centred on the effect of the exposure to organized crime groups on their social capital and the social capital of their community. This detailed qualitative work was conducted alongside an empirical mediation analysis that quantified, using the nationally representative dataset, the relative importance of each mechanism.

Results suggest that the large negative effect of organized crime on social capital is largely explained by a psychological mechanism: individuals exposed to the presence of organized crime groups tend to disinvest in social capital (by almost 45 per cent) for reasons related to fear and resignation. The inefficiency of the state in solving practical problems caused by the presence of organized crime groups explains a smaller but still substantial share of the main results (just under 10 per cent), especially those related to institutional trust and political participation. The positive effect of organized crime on civic engagement, although to be taken with care given data limitations, is partly explained also by psychological mechanisms (indignation and desire of revenge). While we cannot claim full causality, we believe this mediation analysis is an important contribution, because rarely do studies on the consequences of organized crime identify clear mechanisms for those effects, especially at the fine-grained levels of analysis conducted in his paper. In addition, the combination of qualitative and quantitative methods used in the mediation analysis, whilst unusual in economics, offers in our view an important methodological contribution to the study of difficult-to-uncover or sensitive phenomena (such as individual private responses to organized crime), which may matter for economic outcomes. This methodology allows us in particular to understand in-depth emotional and normative mechanisms that are challenging to capture quantitatively. In this way, we offer a small contribution to a growing interest in the importance of moral values and emotions in economics (Enke 2020; Loewenstein 2000).

The paper proceeds as follows. Section 2 outlines the historical and empirical evidence of how organized crime groups originated and expanded in Italy since the 1800s. Section 3 describes the data sources. Section 4 outlines the main empirical strategies and discusses the effect of exposure to organized crime group on social capital outcomes. Section 5 presents the mechanisms. Section 6 concludes.

[6] Genoa was chosen because it represents the 'median' experience of Italians with organized crime. Using administrative data on the presence of organized crime groups, which takes into account a number of crimes committed by organized crime groups (violent, economic, and political), Genoa shows an indicator of 62 out of 100. As points of comparison, Palermo, where the presence of *Cosa Nostra* is strong, has an indicator of 69, whilst Reggio Calabria, where *'Ndrangheta* is mostly established, has an indicator of 87. Naples, where *Camorra* is well-established, has an indicator of 89. Appendix Table A1 shows in addition that Genoa scores average values in all main socioeconomic indicators in relation to other Italian regions.

2 A brief history of organized crime in Italy

Organized crime groups first emerged in Italy in the 1800s in Sicily (*Cosa Nostra*), Calabria (*'Ndrangheta*), and Campania (*Camorra*), all regions part of the Kingdom of the two Sicilies (Reign of Naples and Reign of Sicily), which were ruled by the Spanish Habsburg dynasty since 1516, and by the Bourbon dynasty since 1735. Both ruling dynasties left these areas underdeveloped in terms of human capital and infrastructure in comparison to the rest of Italy.[7] In addition to being responsible for the underdevelopment of southern Italy, as thoroughly discussed in Gambetta (1993), the Habsburgs and the Bourbons also contributed to endemic distrust in southern Italy towards the state and outsiders (Pagden 1988),[8] which has led scholars, for a long time, to view the emergence of Mafia groups in southern Italy as a response to endemic distrust. This 'cultural explanation' for the emergence of the Mafia has been subject to recent scrutiny.

2.1 Origins of organized crime in Italy in the 1800s

One of the first opponents to the 'cultural explanation' was the most prominent Italian intellectual of the early 20th century, Benedetto Croce, who criticised this prevalent theory of the origins of the Mafia by arguing that the United Provinces (today the Netherlands) were equally affected by Spanish oppression, without substantial effects on social capital or the emergence of Mafia groups. Furthermore, Mafia groups have not emerged in other countries ruled by the Spanish, such as Argentina, Mexico, Chile, and Peru, or in Greece or Spain itself. Many other areas ruled by the Spanish dynasties in Italy also did not experience the emergence of the Mafia, including Milan and Lombardy (Sales 2015: 66), nor did areas with similar levels of underdevelopment and low social capital, such as Basilicata, Cilento, Abruzzo, or Molise (Sales 2015: 15–16, 105). Within traditional Mafia historic strongholds, Mafia groups did not expand to all areas. For instance, some areas of eastern Sicily, some municipalities in western Sicily, some areas in the interior of Campania and parts of Calabria (Cosentino and Crotonese) have not experienced the emergence of Mafia groups (Gambetta 1993: 78).

These historical accounts of the expansion of the Mafia beg the question as to why areas with the same initial social and cultural conditions did not experience the arrival of Mafia groups. Historians today seem to have converged upon a more economic-driven explanation: the emergence of organized crime groups across the Italian territory has been driven by business opportunities and demand for protection in specific areas and times (Gambetta 1993). This was particularly true in Sicily, where the demand for protection increased after the end of feudalism and in response to state failures in controlling the monopoly of violence across the island (S. Romano 1966; Smith 1968; Brancato 1976; Bandiera 2003). Demand for protection by landowners was highest in the most profitable areas: close to urban centres, on the western side of the island, where citrus fruits were produced, and close to the sulphur mines. Demand for protection was particularly strongly correlated with the large export boom in sulphur and citrus fruits in the mid-1800s (Buonanno et al. 2015; Dimico et al. 2017). The expansion of *Cosa Nostra* to eastern Sicily at the end of the 1800s was also driven by demand for protection among landowners against rioting peasants (Socialist Peasant *Fasci* groups), following an unprecedented drought in Sicily in 1893 and a drastic reduction in agricultural output by up to 50 per cent in some areas. Reductions in labour opportunities and salaries led to rioting and violent protests. After failed requests for protection from the Italian army, landowners were forced to turn to the Mafia for protection (De Feo et al. 2019).

[7] De Feo et al. (2019) show that Sicily in the late 1800s had fewer roads, primary school teachers, university students, and weaker state presence than the remainder of the country. For instance, there were only 350 policemen on the entire island (Smith 1968).

[8] The Habsburgs' policy of *dividi et impera* (divide and conquer) further undermined trust in the ruling institutions among oppressed citizens (Ferrara 1837: 144).

Mafia groups emerged also in other areas where opportunities for protection and extortion were high. In the 1800s, two groups formed in two distinct southern regions of Italy: *'Ndrangheta* in Calabria and *Camorra* in Campania. In Calabria, *'Ndrangheta* emerged in two specific areas: the Aspromonte region, where there was a rich wood market, and in the Piana di Gioia Tauro, where olive production was a particularly profitable market (Ciconte 2017: 17). In Campania, *Camorra* initially originated in Naples, where *camorristi* were seen extorting money in the gambling dens of the city and in the prisons, where every asset owned by prisoners was taxed at 10 per cent (Sales 2015: 78–80). *Camorra* also emerged in areas close to the city with large land and export markets, where it was involved in the provision of protection and mediating prices of goods.

2.2 Expansion of organized crime in areas of high social capital in the 1900s

Not only was the expansion of the Mafia not uniform across underdeveloped areas with high levels of mistrust, but several groups also emerged in areas of high social capital. Between 1900 and 1945, Italy fought in two world wars and was under fascist rule between 1922 and 1943. In this period, organized crime groups were largely repressed, as their business of private protection was adversely affected by war and fascist antagonism. Mafia groups re-emerged in the second half of the 1900s and expanded in areas in the centre and north of Italy, which Putnam (1994) defined paradoxically as the 'cradle' of social capital.[9]

There are three main reasons to explain this expansion. The first is the resettlement law implemented in Italy between 1956 and 1988, which forced individuals convicted or suspected of belonging to *Cosa Nostra* to move to a different municipality in Italy (PAC 1994). This forced resettlement of *Mafiosi* aimed to isolate potentially dangerous individuals for whom there was not sufficient evidence for an indictment. Although its aim was to cut the ties between members of *Cosa Nostra*, it actually facilitated the arrival of Mafia groups in areas from which they had been (almost) absent (PAC 1991, 1994).[10] This resettlement law is a textbook example of legislative action with good intentions but unexpected adverse outcomes. Based on the widespread view that organized crime presence was a by-product of low social capital in southern regions, it was assumed that re-settled *Mafiosi* outside those areas would change their criminal behaviour. Instead, these re-settled *Mafiosi* facilitated the expansion of organized crime groups to new areas (Varese 2006; Buonanno and Pazzona 2014; Scognamiglio 2018).

Second, the closure of the tax-free port of Tangier in 1960 facilitated the development of the illicit tobacco trade in the south of Italy (PAC 1993b) that was mostly conducted by *Cosa Nostra* and the Marseille organized crime group. After a conflict with *Cosa Nostra* and the arrest of most of the prominent members of the Marseille organized crime group in 1972, *Camorra* replaced them and took a prominent role in the illicit tobacco trade. This trade particularly affected the southern region of Apulia when the closure of the port of Tangier disrupted the old route between Morocco and Marseille. A new route was established from Eastern Europe (Albania and Yugoslavia), where the new deposits of tobacco where relocated, to Turkey and Cyprus, passing through Apulia. This route change attracted Mafia groups to Apulia in the 1970s, and tobacco smuggling became the most important criminal business in the Italian peninsula (Pinotti 2015).

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[9] In the first half of the 1900s, the three historical Mafia groups were strongly repressed. In Sicily, *Cosa Nostra* suffered severe losses under the administration of the Prefect Cesare Mori, even though families with strong political connections were not fully defeated (Ciconte 2017). After the fall of fascism, *Cosa Nostra* re-emerged due to renewed demand for the provision of private protection during the 1944 riots following a state decree allocating all non-cultivated land to peasants (Sales 2015). The other two organized crime groups had a different fate. In Calabria, in the first half of the 1900s, *'Ndrangheta* was mostly untouched thanks to its close links with the public administration (Ciconte 2017). In Campania, *Camorra* was decimated in 1915 following a systematic repression by the state and the reconstruction of the poorest suburbs (Sales 2015). *Camorra* re-emerged only in the 1950s and 1960s as business opportunities improved in Campania.

[10] The sparsity of the Mafia outside their strongholds in the south was extensively documented in the late 1960s (Lupo 2004; Varese 2006, 2011; Dalla Chiesa 2017; Dipoppa 2021).

Third, in the late 1970s, the *Cosa Nostra*, *'Ndrangheta*, and *Camorra* moved from illicit trade in tobacco to the highly profitable drug trade (Sales 2015). Large profits from heroin trade needed to be laundered through investments in the legal economy, in particular in the construction sector. In Sicily and Calabria, the need to reinvest in the legal economy further reinforced the presence of Mafia groups in those regions. For *Camorra*, an important opportunity for money laundering was opened after the Irpinia earthquake in 1980. The Irpinia earthquake was a major earthquake in the border between Basilicata and Campania. It affected a massive area of 10,000 square miles across 687 municipalities.[11] The aftermath of the earthquake led to large inflows of relief money to the region (roughly 25 billion euros), which ended up largely favouring *Camorra* groups through profitable public procurement contracts (PAC 1993a; Pinotti 2015). The construction sector was also critical to attracting Mafia groups to the centre and north of Italy (Buonanno and Pazzona 2014; Dipoppa 2021).[12]

These three sets of events led to the expansion of organized crime to the centre and north of Italy during the 1990s and early 2000s, including Valle d'Aosta, Piedmont, Lombardy, Veneto, Emilia Romagna, and Liguria (Buonanno and Pazzona 2014; Scognamiglio 2018; Dipoppa 2021; Sciarrone 2014, 2021). This expansion of internal Mafia groups throughout the 1990s was also accompanied by the arrival of foreign organized crime groups. These included Albanian and Chinese organized crime groups and, more recently, Nigerian groups, involved in human trafficking, prostitution, illegal migration, and drug and arms trade. In the remainder of the paper, we analyse the impact of the presence of these groups on social capital outcomes across Italy.

3 Measuring social capital and exposure to organized crime in Italy

We discuss below the main data sources used in the paper. Details of all data and variables constructed are provided in Online Appendix C1.

3.1 Social outcomes

To analyse the effects of organized crime on social outcomes (political participation, civic engagement, institutional trust, and interpersonal trust), we compiled data from the Italian annual household survey collected by ISTAT (2019) between 2000 and 2018.[13] Individual-level data are collected annually among 24,000 households drawn from a pooled random sample of 900 municipalities (selected from 7,926 Italian municipalities). The data is representative at the regional level, and public access to this dataset is available only at the regional level. Access to the municipality codes is restricted, approved only after clearance from an ethical committee and accessible only from a secured location in ISTAT offices. We obtained such clearance and all data used in this paper was compiled under strict measures of security and confidentiality in the ISTAT office in Genoa.[14] Municipalities are randomly selected with probabilities proportional to their demographic size and without replacement to provide a nationally and regionally representative dataset of all variables. Households are randomly selected with equal

[11] The earthquake caused 2,735 deaths. 8,848 people were injured and 280,000 people were evacuated from their homes (Scalfaro 1991).

[12] Dipoppa (2021) discusses how increased market competition (owing to a construction boom) and the Mafia's ability to provide cheap illegal labour by exploiting migrants from Mafia-controlled areas in the south allowed criminal groups to spread into northern Italy.

[13] ISTAT (2019) has implemented this survey every year with the exception of 2004, when the period of data collection moved from the last trimester (of 2003) to the first trimester (of 2005).

[14] Please note that some questions are available in the online questionnaire but not present in the dataset. According to the ISTAT employee responsible for this survey, these questions are not available because they had never been validated (for instance through comparison with other sources and by validation by experts).

probabilities, without replacement, from the municipality registry office.[15] The final pooled sample we use in the paper comprises a total of 765,718 individuals.[16]

Political participation. We measure individual political participation using two variables. The first is a dummy variable equal to 1 if the respondent answered yes (and 0 otherwise) as to whether in the 12 months preceding the interview they: (i) were informed about politics by attending political meetings; (ii) volunteered in a political party; (iii) sent money to a political party; (iv) voted online (in the past three months); (v) participated in political rallies; and (vi) participated in demonstrations. A second set of variables captures individual participation in trade unions. These variables measure, also using a 0–1 scale, whether the respondents volunteered in a trade union in the past three months and were informed about politics by attending union meetings. To avoid possible multiple hypothesis testing bias (or family-wise error rate, FWER henceforth), we first standardised each question by subtracting the mean and dividing it by the standard deviation of the relevant survey wave. Then, for each set of variables, we created a mean index by taking the average of the standardised scores and then re-standardised it (Kling et al. 2007). This results in two mean indices measuring, respectively, participation in politics and participation in unions. We also constructed a standardised single outcome for each question. We follow this same procedure for all dependent variables below.

Civic engagement. This variable captures the participation of individuals in community affairs and activities, as well as participation in civil society organisations (CSOs). The first set of variables we use captures individual participation in community affairs and was only collected in 2016 as part of a special questionnaire on civic engagement by ISTAT (2019). These variables measure (using a dummy equal to 1 if the answer is yes and 0 otherwise) whether, in the 12 months preceding the interview, the respondents: (i) discussed local issues on social media (for example Facebook or Twitter); (ii) contacted the radio, the television, or a local newspaper to engage in local issues; (iii) contacted the public office or relevant entities to solve local issues; (iv) participated in meetings to solve local issues; (v) participated in protests or collected signatures with respect to local issues; (vi) volunteered in local groups; (vii) participated in activities to maintain and look after green areas in the community; and (viii) organized local festivals, cultural gatherings, or sport events in the community. A second set of variables measures whether, in the 12 months preceding the interview, the respondents: (i) volunteered in a CSO; (ii) volunteered in a for-profit CSO that works in the same areas as the not-for-profit CSO; or (iii) sent money to a CSO.

Institutional trust. We capture this variable in three ways. The first set of variables captures individual levels of trust towards political institutions. These variables measure (using a scale from 1=low to 10=high) to what extent the respondents trust: (i) political institutions in Europe; (ii) political institutions in Italy; (iii) political institutions of the region; (iv) political institutions of the province; (v) political institutions of the municipality; (vi) political parties; and (vii) the political system. The second set of variables captures individual levels of trust (using the same 1–10 scale) in judicial institutions and the police. The third set of variables captures individual attitudes towards the rule of law. These latter questions were only asked in 2016 as part of the questionnaire by ISTAT (2019) mentioned above. These variables include: (i) whether the respondents think that not paying taxes is bad (using a scale from 0=completely disagree to 10=completely agree); (ii) a dummy variable equal to 1 if the respondents believe it is never justified to evade taxes, and 0 otherwise (for instance, it is always acceptable or it is fine to evade taxes when the services are not efficient, or when not everyone pays them); (iii) a dummy equal to 1 if the respondents insist on receiving a fiscal receipt when the shop owner does not give it to them, and 0 otherwise (for instance, they prefer not to ask for it to avoid any discussion or they do

[15] The sampling process is presented in detail online here (in Italian).

[16] This is the final cleaned sample, which excludes individuals below 14 years old and those for whom questions on social outcomes are missing.

not even notice); (iv) a dummy equal to 1 if the respondent does not pay under the table when asked by a self-employed professional (for instance, doctor, lawyer, mechanic, plumber) and 0 otherwise (for instance, they prefer not to say anything to avoid discussion or they do not even notice); (v) to what extent the respondents think it is bad to offer in-kind gifts or money to a public administrator to gain a personal favour (using a scale from 0=completely disagree that is bad to 10=completely agree that is bad); (vi) to what extent the respondents think that it is bad to offer in-kind gifts or money in exchange for a vote in elections (using a scale from 0=completely disagree that is bad to 10=completely agree that is bad); (vii) a dummy equal to 1 if the respondent does not think that corruption is natural and inevitable, and 0 otherwise; (viii) a dummy equal to 1 if the respondent thinks that denouncing corruption is not useless, and 0 otherwise; (ix) whether the respondents think that it is important to respect the law (using a scale from 0=a lot to 3=not at all, reversed); and (x) whether the respondents think that it is important to behave honestly (using a scale from 0=a lot to 3=not at all, reversed).

Interpersonal trust. Interpersonal trust is defined as whether others (known or unknown) have their own or other people's interests at heart (Gambetta 1988). This variable is usually disaggregated into trust in immediate (known) relations, and generalised trust (in unknown others). We first measure levels of individual trust in the proximate using information on the extent to which respondents have: (i) relatives (excluding parents, children, siblings, grandparents, nephews and nieces) on whom they can count (yes or no); (ii) friends on whom they can count (yes or no); and (iii) neighbours on whom they can count (dummy equal to 1 if the respondent has at least one, and 0 otherwise). To measure generalised trust, we use a dummy equal to 1 if the respondent thinks most people in society can be trusted (and 0 if they feel they need to be careful), in line with the existing literature (Alesina and La Ferrara 2002). We include an additional measure of trust extracted from a vignette in the survey in which respondents were asked to assess a real case scenario. In this scenario, they were asked whether, if they lost their wallet, they believed that it would be returned to them by: (a) their neighbours; (b) the police; or (c) an unknown person. Each respondent was asked to assign values (using a scale from 1=very likely to 4=not at all likely, reversed) to each of the three entities. Finally, we use also a set of measures that capture individual altruistic behaviour as a measure of pro-social behaviour more generally. These variables measure (using a scale from 0=not at all, to 4=a lot) whether the respondents think that: (i) it is not important to think primarily about their own interests; (ii) it is not important to put only their family first; (iii) it is not important to have success and emerge above all the others through any possible means; and (iv) it is important to help those who are worse off.

Aggregate index of social outcomes (social capital). We constructed an average aggregate index of social capital by taking the mean indices and then standardising it. Between 2000 and 2018, the region with the highest social capital index was Trentino Alto Adige. The region with the lowest social capital index was Sicily. Appendix Table A2 presents the summary statistics of the social outcomes in Italy between 2000 and 2018.[17]

3.2 Exposure to organized crime groups

Much of the existing research on the consequences of organized crime in Italy uses municipality-level indicators to approximate exposure to the presence of organized crime groups, based on administrative police and judicial data on violent events related to organized crime (such as Mafia-related murders and other violent crimes committed by both Mafia groups and foreign organized crime groups), on the economic presence of organized crime (such as assets and firms seized from Mafia groups, extortion, drug trafficking, pimping and pandering, usury), and on the political presence of Mafia groups (such

[17] A general background on the regional levels of social capital is given in Putnam (1994) and shown in Sabatini (2009).

as municipalities dismissed because of Mafia infiltration).[18] While these data are valuable, conducting empirical analyses using municipality-level administrative data on organized crime is problematic because, as discussed in the introduction, these data risk capturing the strength of state action against organized crime groups rather than the actual presence of the group. For these reasons, we use, in our main empirical analysis, an indicator of the presence of organized crime groups in each municipality based on a question in the household surveys that asked the respondents about the presence of organized crime groups in the area where they live (ISTAT 2019).[19] This approach is in line with research in Latin America on criminal gang presence (see for example Lessing et al. 2019) and on armed group presence (Gáfaro et al. 2022) using survey-based data.[20]

As with any self-reported data, the indicator we use may entail some measurement error. First, the self-reported indicator may be more likely to capture some types and forms of organized crime groups than others. For example, foreign organized crime groups tend to be more visible than Mafia-type groups (for instance a Nigerian man selling drugs in a neighbourhood is easier to see than an Italian *mafioso* whose core business is laundering money in a waste management firm). This might overestimate the presence of some types of organized crime groups in some areas, while underestimating them in other places.[21] Second, the respondent may not consider the local organized crime group as criminal because they are either used to living alongside the group or because they simply do not consider the activities conducted by the group to be criminal. Third, the individual may not report accurately the presence of criminal groups in the area because they are scared about the possible consequences of their answers. While we cannot exclude some of these issues, we believe our measure is the best available for the analysis at hand. From a conceptual point of view, the views of the respondents are what really matter to us, as these are the stakeholders who act on those views: ultimately, individuals will (dis)invest in social capital depending on the way in which they *perceive* the presence of organized crime groups. From a statistical point of view, using an individual-level indicator allows us to capture richer variation in the outcome variables than would be possible with more aggregated municipality-level indicators. This reduces the error variance and allows us to compare individuals who live in the same province who are similar to each other, except for their exposure to organized crime groups. This is particularly important given the nature of organized crime groups that might occupy some specific neighbourhoods and not others, or some streets and not others (Weisburd et al. 2012). This feature makes this paper one of the first to study the impact of organized crime at the individual level.

The scale of the indicator of organized crime group presence we use ranges between 0 and 3. While index measures are widely used in the literature, they are built upon scales that may not reflect constant effects. For this reason, as slightly more than 25 per cent of the respondents were exposed to 'quite a lot' or 'a lot' of organized crime presence between 2000 and 2018, we created a dummy equal to 1

[18] There are two ways in which administrative data have been used so far in the literature. On one hand, economists have limited their analyses to only one of the available indicators (violence, perpetration of economic crimes, or links to politicians) (see Pinotti 2015; Buonanno et al. 2016; Alesina et al. 2019, among others), which may miss out other dimensions of the presence of organized crime. On the other hand, to address this limitation, efforts have been made to construct holistic municipality-level indicators that aggregate some of these measures (Calderoni 2011; Transcrime 2013; Dugato et al. 2019). However, few studies make the disaggregated data available and/or data are only available for a large fee, an important shortcoming because there is a large variation in the presence of organized crime groups across Italian provinces depending on the type of crimes used as indicators (Bernardo et al. 2021). A detailed description of how these variables are constructed is available in Online Appendix C2.

[19] The interviewee was asked "From 1 to 4 (with 1 = not at all, 2 = a little, 3 = quite a lot and 4 = a lot), what is the risk of criminality in the area where you live?". We interpret this as referring to organized crime because the word used in Italian *criminalità* is typically associated with the actions of these groups.

[20] These studies have found survey data to be a valuable tool for capturing the realities of organized crime 'on the ground', which may be then different from administrative data compiled from judicial and police (or military) sources.

[21] To attenuate this measurement error bias, we control for immigration rate in the regression analysis as discussed in more detail in the next section.

if the respondents replied 'quite a lot' or 'a lot', and 0 if the respondent replied 'none' or 'a little' or 'when the individual cannot say' (Justino and Stojetz 2019).[22] Appendix Figure A1 plots the exposure to organized crime groups in the past 20 years, showing an increase since 2010 and a small reduction in the past two years. Appendix Table A4 presents the exposure to organized crime groups across regions in Italy between 2000 and 2018. The region with the highest level is Campania, where 47 per cent of the population is exposed to a high presence of organized crime.

Notwithstanding the caveats discussed above, we compare this individual-level, survey-based indicator with municipality-based indicators using administrative data on organized crime presence. For this purpose, we digitised 36 police reports (one for each semester between 2000 and 2018) to construct a dummy variable that takes the value of 1 if the police reports detail the presence of organized crime groups in the municipality in that semester. These are precise reports written by the police based on judicial material available to them, and corroborated by confidential information and expert oversight by specialised analytical units. Appendix Table A3 shows a correlation matrix of all indicators. The construction of these indicators is explained in Online Appendix C2. We notice our survey-based indicator is almost three times more correlated with the indicator constructed from police reports on the territorial presence of the organized crime groups than with the other indicators more commonly used in the literature.[23]

3.3 Control variables

The estimation strategy we use is conditional on a wide variety of control variables that might influence both the social outcomes we measure and organized crime presence. From the main ISTAT (2019) dataset, we use variables that control for age, gender, marital status of the respondent.[24] We then add a set of less conservative controls which are important predictors of social capital, as documented in a number of studies (Wilson and Musick 1997; Alesina and La Ferrara 2002; Glaeser et al. 2002; Buonanno et al. 2016; Mastrorocco and Minale 2018; Velásquez et al. 2020). These are a categorical variable for the education of the individual, a dummy equal to 1 if the individual has a job, whether the respondent interviewed lives and works in another city, and an asset index.[25]

We further control for a group of geographic characteristics of the municipality, which were shown to be related to organized crime presence and can arguably shape the social capital of the individuals: altitude, elevation, whether the municipality is mountainous, whether the municipality is coastal, an indicator for arable land, an indicator of the presence of fruit trees, an indicator of the presence of meadows, and an indicator of the presence of woods (Guiso et al. 2016).

We also control for a group of socioeconomic characteristics of the municipality. First, we include a dummy equal to 1 if the municipality is a provincial capital, as this could confer a different status to the

[22] In the main analysis we coded this latter answer as 0. Results obtained by dropping these few observations (3 per cent of the replies) are consistent and presented in Appendix B4.

[23] The digitising process of the police maps we employed to construct this indicator is available upon request. In Appendix B4 we also present results using different constructions of the self-reported index and interact it with the municipality-level indicators. We also test for the possibility of social desirability bias in the self-reported variable. All results, discussed later in the paper, remain consistent and unlikely to be biased due to social desirability considerations.

[24] Wilson and Musick (1997) find that volunteering is associated to gender, age, and health. We also control for age squared as we seek to capture the inverse U-shape relationship, whereby social capital rises with age but then decreases, as found in Glaeser et al. (2002).

[25] The asset index includes the number of rooms in the house, presence of a terrace, presence of a garden, presence of a heating system, presence of a washing machine, presence of a dish-washing machine, a dummy equal to one if the house is small and 0 otherwise, a dummy equal to 1 if the house is in poor condition and 0 otherwise, and whether the individual has a landline, a video recorder, a video-camera, a hi-fi sound system, a computer, a modem, internet access, a landline phone, a fax, a television, a mobile phone, a car, a bike, a scooter, a motorbike, a debit card, and a credit card.

city, possibly affecting the level of social capital (for example, attract a greater presence of CSOs), as discussed in Guiso et al. (2016). Second, we control for the size of the municipality, which can influence both the level of social capital and organized crime presence, by adding the log of the surface of the area and the population size, which also proxy for rural–urban differences (Buonanno et al. 2016). These data come from Guiso et al. (2016) and ISTAT (2019). Third, we account for immigration rates using data from ISTAT (2018), as this could affect the perception of organized crime presence (especially of foreign groups) and interpersonal trust in others, as discussed in Buonanno et al. (2016). Fourth, we add information on income per capita of the municipality using data from the Ministero dell'Economia e delle Finanze (2019), following the finding in Glaeser et al. (2002) that income is associated with social capital. Fifth, in response to Alesina and La Ferrara's (2002) and Battisti et al.'s (2019) result that inequality is a predictor of social capital and organized crime groups, we add to the regression the Gini index, calculated from the average income in bands and number of individuals living in a municipality, using data provided by the Ministero dell'Economia e delle Finanze (2019). Finally, because social outcomes and organized crime presence can be directly affected by the institutional quality of the municipality, we control for average years in education of the politicians in the municipality council, the average age of the politicians in the municipality council, and include a measure of inclusiveness using data on gender equality in the distribution of the municipality seats from the Interior Ministry (Ministero dell'Interno 2019).

4 The social effects of organized crime

Individual levels of social capital comprise both individual and community characteristics and are shaped by persistent cultural and normative factors (which form the persistent dimension of social capital across time for each individual) and by transient shocks that may change the different components of social capital, both in the short and in the long term. As discussed above, we postulate that organized crime operates as a transient shock to all four social outcomes we consider in the paper. Our main estimating equation is the following:

$$y_{it} = \alpha + \beta_1 OCindex_{it} + \beta_2 X_i + \beta_3 X_{geo} + \beta_4 X_{mun} + \beta_5 ProvinceFE + \beta_6 YearFE + e_{it} \qquad (1)$$

where y_{it} denotes each of the four social outcomes (political participation, civic engagement, institutional trust, and interpersonal trust). *OC index*$_{it}$ is our main independent variable of interest and denotes a dummy equal to 1 if the individual is exposed to 'quite a lot' or 'a lot' of organized crime group presence, in each year, and 0 otherwise. Because social outcomes are affected both by idiosyncratic and community-level characteristics, in addition to the presence of the organized crime group, we add to the model (i) individual observables X_i, (ii) geographical variables X_{geo}, and (iii) variables measuring the socioeconomic and institutional quality of the municipality X_{mun}, as outlined in the previous section. β_1 is the effect of organized crime on each dimension of social capital, conditional on other individual and environmental characteristics that also shape social capital. Equation 1 includes province and year fixed effects to control for province-level and time unobservable characteristics that may affect both the

persistent and malleable dimensions of social capital.[26] e_{it} is the error clustered at the municipality level. All variables used are described in Section 3 and in Online Appendix C1.

4.1 Reverse causality

One concern with the empirical strategy above is the possibility of reverse causality bias. Even though the discussion in Section 2 attenuates this concern substantially, it is still possible that, empirically, levels of social capital affect the arrival of different organized crime groups in specific areas. Assessing potential reverse causality bias using the dataset above is challenging due to its starting date. We have compiled two alternative pieces of evidence to show that reverse causality is unlikely to be a serious threat to our empirical strategy.

The first piece of evidence shows that social capital did not determine the presence of Mafia groups in Sicily in 1900, when these groups consolidated their emergence in Italy. To conduct this analysis, we use data on Mafia presence in Sicily in the 19th century, constructed by De Feo et al. (2019) and Buonanno et al. (2015).[27] Figure 2 illustrates the relationship between the presence of *Cosa Nostra* in Sicily in 1900 and the possible determinants of its presence in the 1800s. The dependent variable is *Cosa Nostra* presence in 1900 as mapped out by police officer Cutrera.[28] The variable has values ranging from 0 (no *Cosa Nostra*) to 3 (major *Cosa Nostra* presence). To measure possible determinants of *Cosa Nostra* presence, we use two variables digitised by Dimico et al. (2017) from a parliamentary inquiry addressed to the Sicilian lower court judges in 1885.[29] The first is the degree of trust citizens have in the law, captured by a dummy variable equal to 1 if citizens trust the law, and 0 if they mistrust or do not care about the law. The second variable is expressed as a dummy equal to 1 if access to credit is easy, and 0 if credit is either expensive or difficult to access. Difficulties related to accessing credit, especially the fact that it is expensive, have been associated in the past with low interpersonal trust, which makes every money transaction more uncertain and thus more expensive (Gambetta 1993: 285–86). The variable measuring social capital in 1885 is an equally weighted indicator of these two variables. We also use other determinants of the presence of *Cosa Nostra* compiled from Buonanno et al. (2015). The first is the number of sulphur mines in each Sicilian municipality in 1886, which captures the emergence of *Cosa Nostra* next to booming sulphur mines. The second is citrus land suitability, to proxy the presence of *Cosa Nostra* next to the highly profitable citrus fields, as discussed in Section 2. The third variable is land fragmentation, which increased the request for private protection (Bandiera 2003), measured using a dummy variable equal to 1 if in a municipality small and medium landholdings were present, and zero otherwise. Fourth, as argued by Buonanno et al. (2015), *Cosa Nostra* had a crucial role in controlling the presence of underground water supply basins. We capture this feature with a dummy variable equal to 1

[26] While the dataset is created to have a regionally representative sample, we prefer using province fixed effects to gain precision in the estimates—as individuals living within the same province are much more comparable than within the same region. This is possible because for each province the number of observations in the survey is above the minimum (10 observations) needed to construct an average value according to ISTAT methodological guidelines (Camussi et al. 2018). Provinces correspond to NUTS-3 territorial units while regions correspond to the larger NUTS-2 territorial units. As of 2018, in Italy there are 107 provinces included within 20 regions, with an average population size of 565,270 inhabitants for the provinces, as opposed to 3,024,199 inhabitants for the regions. There are also important historical reasons to use province-level fixed effects. Since the formation of Italy in 1861, Italian provinces are well-defined cultural spaces with their own norms, food, and dialects. In addition, as we cannot fully exclude that some groups (for example city dwellers or the better educated) might be over-sampled in some provinces, we present results using region fixed effects in Appendix Table B1. These are statistically and economically the same as the results using province fixed effects.

[27] The authors digitised historical information from a number of sources which are described in detail in Online Appendix C1.

[28] Cutrera was a Sicilian police officer who compiled this material based on his own observations and study. Importantly, he not only considered the number of crimes, as he wrote: "*We have already seen that the Mafia does not always commit crimes, and that the crimes perpetrated by them are not exclusive to the Mafia [...] For this reason we drew this map using our personal appraisal of the different densities of the Mafia from town to town*" (Cutrera 1900: 114–15).

[29] Damiani ran a parliamentary inquiry in 1881–86 on Sicilian towns where *pretori* (lower court judges) provided answers.

if the municipality had underground water basins in early 1924, assuming that the number of aqueducts (typically with origins in the Roman Empire) did not change between the late 1800s and 1924. Fifth, we consider also the arrival of *Cosa Nostra* as a response to the 1893 drought. De Feo et al. (2019) provide historical information on rainfall, extracted from 39 stations in Sicily in the early 1890s, matched to rainfall data from 1941.[30]

Figure 2 shows the results of this analysis. Each row is a separate pooled OLS regression, where both the dependent and the independent variables are standardised for ease of interpretation.[31] Results show that social capital and citrus land suitability are not statistically significant, while a one standard deviation (SD) increase in sulphur mines in a municipality is associated with a 0.13SD increase in *Cosa Nostra* presence in 1900 and a one SD increase in rainfall is associated with a 0.21SD decrease in the presence of *Cosa Nostra*.[32] This exercise excludes social capital in 1885 as a main determinant of *Cosa Nostra* presence in 1900, a date in which the group was already well-established in Sicily,[33] after the citrus and sulphur boom in the 1880s and the drought and rise of the Peasant *Fasci* in 1893.

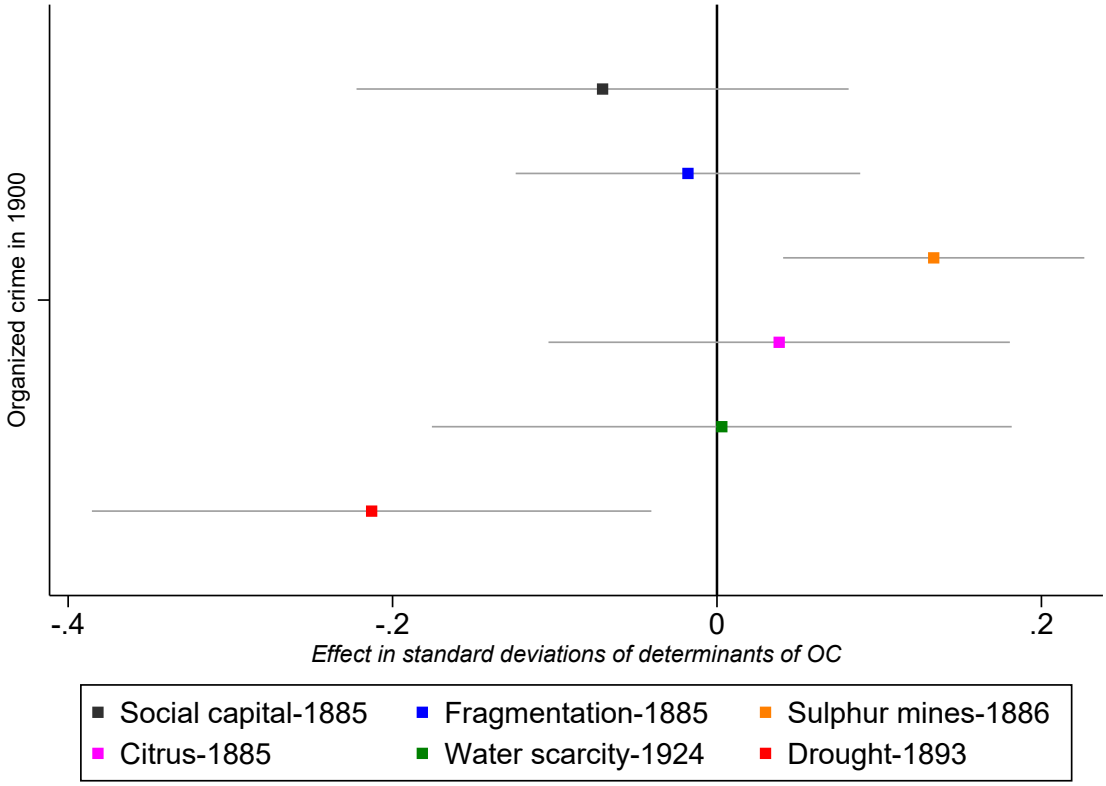
[30] We will refer to rainfall as the variable for the inverse of drought. De Feo et al. (2019) show how the drought is associated to the rise of Peasant *Fasci* using a list of all the *Fasci* organisations present in Sicily between 1891 and 1894.

[31] We use the same set of geographic control variables as in De Feo et al. (2019). These are log population in 1861, log area of the municipality, maximum and average altitude and the elevation of the town centre, distance to Palermo in 1856, distance to the closest port in 1856, number of roads in 1799, the average temperature, the variance of rainfall, and average value of rainfall. Due to data availability, each regression has a different number of observations. Results (available upon request) are consistent when using the base model with no control variables added.

[32] One may argue that the rise of Peasant *Fasci* and widespread riots at the time may be associated with the social capital of the Sicilian municipalities. We test this in Appendix Table A5 and the results exclude a statistically significant association between social capital in 1885 and the rise of the presence of the Peasant *Fasci* in 1893, which is also in line with what we know from the historical process of these groups and its riots. As discussed in De Feo et al. (2019), there had been riots before, but none had been particularly successful before the spread of the Socialist party, which led to the escalation of the riots through a top-down approach (riots led from the party to the community), rather than starting from grassroots movements (with possible linkages with the social capital of the municipality).

[33] The first evidence of an organisational structure similar to the *Cosa Nostra* was found in Sicily today was uncovered in 1895 by the judges of Agrigento (Ciconte 2017)

Figure 2: Reverse causality test of the origins of organized crime groups (1885–1900)



Note: this figure presents the OLS estimates of the effects of the determinants of organized crime on the presence of organized crime groups in 1900 in Sicily. Each row is a regression. Both the dependent and the independent variables are standardised with mean 0 and standard deviation 1. The dependent variable is *Cosa Nostra* presence in 1900 as mapped out by the police officer Cutrera. The raw variable has values ranging from 0 (no Cosa Nostra) to 3 (major *Cosa Nostra* presence). Row 1 shows the effect of social capital in 1885. Row 2 shows the effect of land fragmentation in 1885. Row 3 shows the effect of the number of sulphur mines in 1885. Row 4 shows the effect of citrus land suitability in 1885. Row 5 shows the effect of water scarcity in 1924. Row 6 shows the effect of the drought (proxied by rainfall and associated to the rise of Peasant *Fasci* in 1893). The control variables are the same set of geographic control variables as in De Feo et al. (2019). We add province fixed effects. Standard errors are clustered at the municipality level. Confidence intervals are calculated at the 95% level.

Source: authors' elaboration based on data described and variables constructed in Section 4.1 and Online Appendix C1.

As a second piece of evidence, we show that social capital also did not determine the emergence of organized crime groups in Italy in the second half of the 1900s. Table 1 presents the results of this exercise. The dependent variable is a province-level indicator of organized crime groups presence in 1983 based on a series of variables related to violence perpetrated by Mafia groups (number of Mafia murders, number of Mafia association crimes, number of extortion payments, and number of crime associations) and their economic presence (assets and firms seized from the Mafia, drug trade, and pimping & pandering).[34] To measure social capital, we use province-level data from the Italian National Election Studies in 1968 and 1972 (ITANES 1972), using variables that are available in both years and mirror the social outcome variables we use in our main analysis.[35] Column (1) of Table 1 shows the

[34] See Online Appendix C2 for details on how we constructed each of these variables and their data sources.

[35] The variables are (i) an ordinal variable ranking (from 1 to 4) whether the individual is interested in politics; (ii) a dummy variable equal to 1 if the individual participated in strikes; (iii) a dummy variable equal to 1 if the individual is member of any civic organisation; (iv) a variable rating honesty of the politicians in the government (ranging between 1 and 3); (v) a dummy variables equal to 1 if the individual thinks the politicians care about what people think; (vi) a variable ranking from 1-3 about wastefulness in the government, and (vii) a dummy variable equal 1 if the individual thinks that politics is not too complicated. All variables are reverse coded so that an higher value represents a positive indicator. Social capital in 1968-1972 is an equally weighted index of the standardised measures above.

baseline effect of social capital in 1968–72 on organized crime in 1983. Column (2) adds a number of control variables available in the 1951 census, as provided by ISTAT.[36] Column (3) adds region fixed effects. In all three regressions, social capital in the late 1960s and early 1970s is not a statistically significant determinant of the presence of organized crime groups, a decade later, in 1983.

Table 1: Reverse causality test of the expansion of organized crime in the second half of the 20th century (1968–83)

	Organized crime 1983 (1)	Organized crime 1983 (2)	Organized crime 1983 (3)
Social capital 1968–72	0.154	0.164	0.112
	(0.118)	(0.122)	(0.125)
Base model	Yes	Yes	Yes
Control variables	No	Yes	Yes
Region FE	No	No	Yes
Observations	70	70	70
R^2	0.011	0.587	0.701

Note: this table presents the OLS estimates of the effect of social capital between 1968 and 1972 on the presence of organized crime in 1983. Data excludes the Mafia historic strongholds (Sicily, Calabria, and Campania). Both the dependent and the independent variables are standardised with mean 0 and SD 1. The dependent variable is the organized crime presence as proxied by its violent presence (number of Mafia murders, number of Mafia association crimes, number of extortions, and number of crime association) and economic presence (assets and firms seized to the Mafia, money-laundering crimes, and a list of typical economic crimes: drug trade, pimping and pandering, and counterfeit). The variable of interest is the social capital aggregate index between 1968 and 1972. In Column (1) we present the base-model. In Column (2) we add the full list of control variables from the census in 1951 (ISTAT). In Column (3) we add region fixed effects. Description of all the variables used is in Section 4.1 and in Online Appendix C1. Standard errors in parentheses clustered at the province level with the borders of provinces in 1968. *p <10%, **p <5%, ***p <1%.

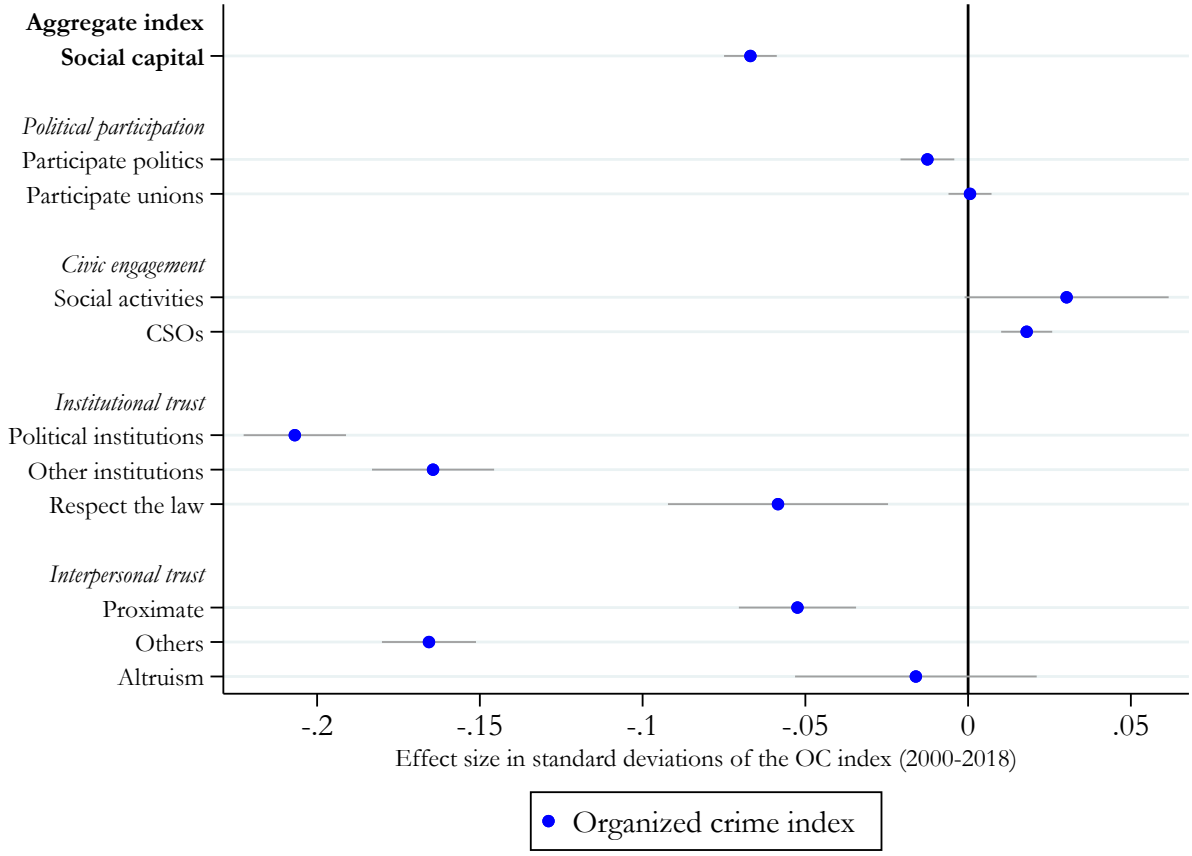
Source: authors' calculations based on data described in Section 4.1 and in Online Appendix C1.

4.2 Main results

Figure 3 and its corresponding Appendix Table A6 show a negative effect of the presence of organized crime groups on individual political participation, institutional trust, and interpersonal trust between 2000 and 2018. The effect on civic engagement is positive. The aggregate effect is overall negative: an individual exposed to the presence of organized crime groups has a reduced social capital aggregate index (-0.067SD), in comparison to those individuals who are not exposed to the presence of organized crime groups. In percentage terms, this represents a reduction in aggregate social outcomes of 8.1 per cent, on average.

[36] These include altitude of the municipality, log of surface area, ratio of male population to female population, ratio of population less than 6 years old to total population, ratio of 65-year-old population to total population aged between 15 and 64, average household size, ratio of houses owned to the total number of available houses, an index of available services (drinking water, bathroom, and hot water), inhabitants per square meter, ratio of males with a diploma to females with a diploma, ratio of illiterate population to total population above 6 years old, share of individuals with a university degree in relation to those with middle school, employment rate, population size, and share of industrial sector. To reduce multicollinearity, we exclude indicators that are the inverse of an already added variable. We also exclude those indicators that are not strictly the inverse of others but are redundant (for example the number of elderly who live alone is already captured by other variables).

Figure 3: Effect of organized crime index on social capital (2000–18)



Note: this figure presents the pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed between 2000–03 and 2005–18. All estimates show results from the pooled OLS regressions based on Equation 1. Each row is a regression. The dependent variables are standardised with mean 0 and standard deviation 1. The dependent variables are the social capital aggregate index and the mean indices of political participation, civic engagement, institutional trust, and interpersonal trust. The variable of interest is the organized crime index, which measures the individual's exposure to organized crime groups' presence and takes the value of 1 if the individual's exposure to organized crime groups is (i) quite a lot or (ii) a lot, for each year, and 0 if the individual's exposure is (iii) none, (iv) a little, or (v) when the individual cannot say. The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. Standard errors clustered at the municipality level. Confidence intervals are calculated at the 95% level.

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.

In what follows, we discuss in more detail the main results summarised in Figure 3 and presented in more detailed form in Appendix Tables A7 , A8 , A9, and A10. The tables display the average effect of organized crime presence on each social outcome with both the full set of parsimonious and enriched controls. All tables report beta-adjusted effects for the mean index (see Appendix B1) and the Romano and Wolf p-values to control for the family-wise error rate (see Appendix B2).

Political participation: Exposure to organized crime groups has a small negative effect on political participation. Panel A of Appendix Table A7 shows that exposure to organized crime groups is statistically significant and negatively correlated with participation in politics (-0.013SD), with the effect being largely driven by attendance of political meetings, volunteering in and sending money to a political party, and participation in political rallies. Among these indicators, only sending money to a political party is statistically significant when using the Romano and Wolf p-values, while attendance of political meetings, volunteering in a political party, and participating in political rallies have p-values of 0.112, 0.104, and 0.112, respectively. Panel B of Appendix Table A7 shows null and not statistically significant effects of exposure to organized crime groups on participation in unions.

Civic engagement: Exposure to organized crime groups has a positive effect on civic engagement. Panel A of Appendix Table A8 shows that individual exposure to the presence of organized crime groups increases the social engagement by 0.030SD. The effect is largely driven by discussions on social media and contacts with local offices. The other indicators are not statistically significant. Panel B of Appendix Table A8 indicates that exposure to organized crime groups increases individual participation in CSOs by 0.018SD, with the effect being driven by volunteering in a CSO, volunteering in a for-profit CSO, and sending money to a CSO

Institutional trust: Exposure to the presence of organized crime groups has a large negative effect on institutional trust. Panel A of Appendix Table A9 shows that exposure to crime groups reduces trust towards political institutions by 0.207SD, with similar effects across all political institutions ranging from European-level institutions to municipal governments. Panel B of Appendix Table A9 illustrates a similar pattern: exposure to organized crime groups reduces trust in other institutions by 0.164SD, including trust towards the judicial system (-0.175SD) and the police (-0.111SD). Panel C of Appendix Table A9 shows that exposure to the presence of organized crime groups reduces respect towards the law by 0.058SD. An individual exposed to the presence of organized crime groups is also more likely to evade taxes and thinks that evading taxes is justifiable.

Interpersonal trust: Exposure to the presence of organized crime groups has a negative effect on trust towards the people close to the individual and those that live in their community. Panel A of Appendix Table A10 shows that an individual exposed to the presence of organized crime groups trusts less the proximate (-0.052SD), including their own relatives (-0.041SD), friends (-0.033SD), and neighbours (-0.048SD). Panel B of Appendix Table A10 shows that this individual exhibits also reduced trust towards the people outside of their circle by 0.166SD. These include the majority of people (-0.148SD). When asked if their lost wallet would be returned, exposed individuals do not believe their neighbour will return the wallet (-0.120SD), nor the police (-0.093SD) or any other stranger (-0.094SD). Exposure to organized crime groups has null and non-statistically significant effects on altruism (Panel C).

4.3 Heterogeneity analysis

Heterogeneity analysis across organized crime groups

Italy is home to three broad types of organized crime groups. The first are Mafia groups with well-defined territorial and business functions, and strong connections to the Italian political and administration systems. These are most commonly found in the historical Mafia strongholds in the south of Italy, although some operate in other Italian regions, such as in Genoa. These groups profit from illicit businesses (such as illicit drug trade, pimping, pandering, and counterfeit) as well as from businesses under their territorial control (largely through the provision of protection, extortion, and usury). Profits are generally reinvested in legal businesses (such as, for example, waste management, construction, and tourism). The second type are Mafia groups with more covert business operations. These are most commonly found in areas outside historical Mafia strongholds, such as the centre and north of Italy. These groups operate discreetly to ensure the protection of their illicit business (mostly drug trafficking) and reinvest and launder their profits through the legal economy. They also invest largely in social relationships with corruptible public administrators, judges, policemen, and politicians. The third are foreign organized crime groups involved in drug trafficking, pimping, pandering, weapons dealing, smuggling, counterfeiting, and robbery. In contrast with the other groups, their links to politicians and the Italian administration are usually weak.

In Figure 4 and its corresponding Appendix Table A11, we analyse the effect of exposure to organized crime on social capital across these three groups.[37] Panel B of Figure 4 shows that an individual exposed to the presence of organized crime groups in non-stronghold Mafia regions experiences a larger reduction in social capital than an individual exposed to organized crime groups in a stronghold Mafia region (Sicily, Calabria, Campania, and Apulia). A possible explanation for this result may be that the newly arrival of a group has a large immediate effect on social capital, which then adjusts itself until it reaches a stable low-level equilibrium as the group establishes itself locally. Panel C of Figure 4 estimates whether the results vary across areas with high violent presence, political presence, and economic presence across different group types. Results suggest that there is no statistically significant heterogeneous effect across these categories.

Heterogeneity analysis: group competition

Bruhn (2021) shows that most of the violence between gangs in Chicago takes place at the border of territories disputed by different gangs, suggesting that a higher number of groups in one area may correlate with higher levels violence. This finding mirrors research on armed groups in civil wars, which shows that violence increases when more than one group competes for the same territory (Kalyvas 2006). It is therefore plausible to think that levels of violence may be higher in areas where organized crime groups compete, potentially affecting how exposed individuals (dis)invest in social capital. In Panel D of Figure 4, we analyse the effects of organized crime on social capital across areas with one or more groups.[38] We compare the pooled OLS regression in 2013 and 2018 for individuals who live in a municipality with more than one group and individuals who live in a municipality where there is only one group. Individuals that live in a municipality with only one organized crime group have lower social capital than those that live in a municipality with more than one group. These results need to be taken with care because the statistical two-sided t-test between the to groups has a p-value of 0.11, and it is likely that the number of groups present in one municipality is endogenous and related to specific characteristics of that municipality. However, the results suggest that organized crime reduces social capital more in areas controlled by one dominant group. This may be because the presence of a single group in the municipality allows the group to have strong links with political institutions and actors, reducing the residents' institutional trust and political participation. Alternatively, local control may allow the group to have a stronger influence over the community by preventing any form of collective mobilisation to take place.

Heterogeneity analysis: local institutional capacity

The effects of organized crime on social capital may vary not only across levels of group control, but also across levels of institutional strength of the municipality. Organized crime groups may be less able to affect the social capital characteristics of individuals living in municipalities with a long history of strong institutions, in line with similar arguments made by Gáfaro et al. (2022) for the effects of armed groups in Colombia. We measure the historical strength of institutions at the municipality level in two ways. First, we compiled information on the historical presence of institutions since the Middle Ages across Italy using information about whether each municipality was characterised as a Free State-*Comune* or a Bishop City-*Comune*) using data from Guiso et al. (2006). The *Comune* was in the Middle Ages a Free City state which produced a unique autonomous and prosperous form of governance. Bishop Cities in the High Middle Ages (476AD–1000AD) in Italy managed to remain quite autonomous and were more

[37] Definition and construction of all variables used in this analysis are presented in Online Appendix C2. This analysis makes use of the administrative police data as desegregating groups is not possible using the self-reported data. In Panel A of Figure 4, we present the estimates from the main analysis for comparison purposes.

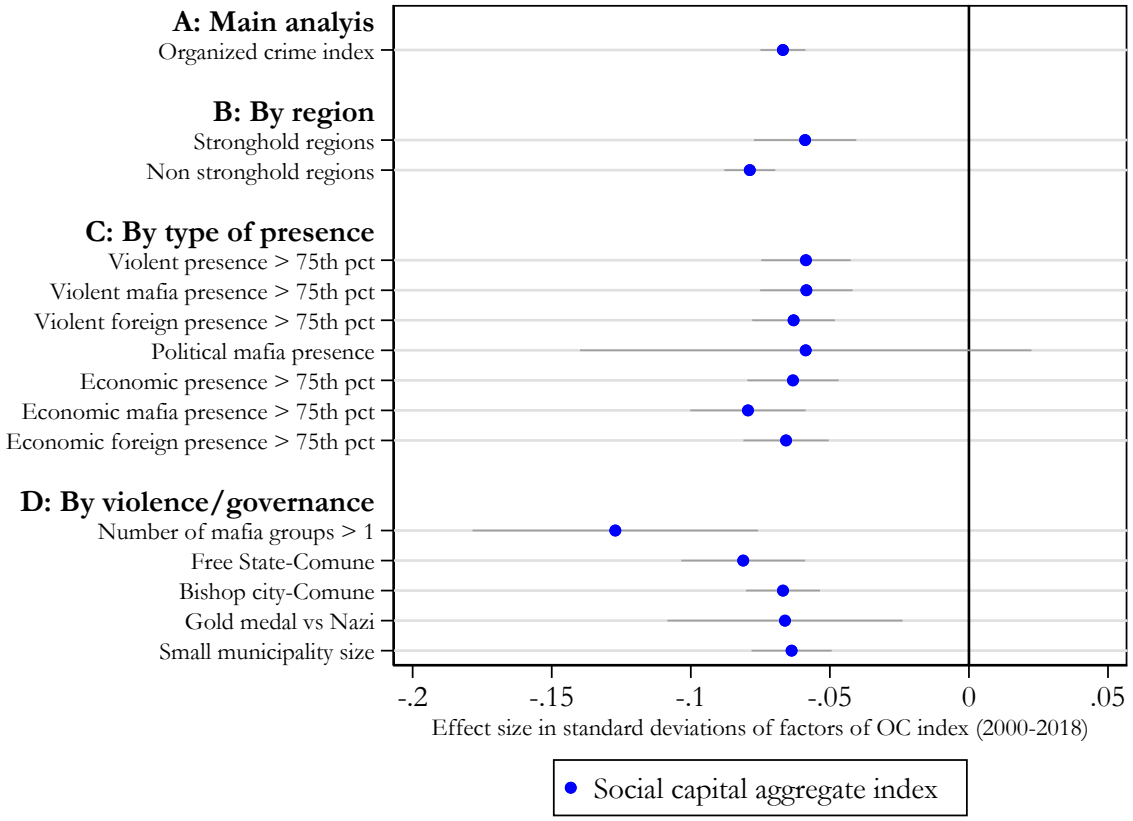
[38] We use the first and the last years available for this variable (2013 and 2018), as the number of groups in a municipality are quite stable over time. Sicily is excluded from the analysis because, according to police reports, apart from a few big cities, all municipalities have only one Mafia group present.

likely to become *Comuni* later on in the Low Middle Ages (1000AD–1492AD). We restrict the sample to individuals that live in municipalities in the north of Italy where the *Comuni* (Free State or Bishop City) emerged and we create a dummy equal to 1 if the individual lives in a municipality which was a *Comune* in the Middle Ages, and 0 otherwise. As a second measure of institutional strength, we use a dummy variable from Guiso et al. (2006) which equals to 1 if an individual lives in a municipality awarded a gold medal for its fight against Nazi/fascist rule. Results do not differ across any of the variables measuring historical institutional strength of the municipality. Results show that the size of a municipality also does not affect the impact of organized crime on social capital in Italy.

Heterogeneity analysis across social outcome distributions

Another plausible source of heterogeneity is the distribution of social capital itself, as it is possible that organized crime may affect more those that possess either very low or very high social capital before their exposure to the organized crime group. Justino (2009) shows that armed groups are more likely to adversely affect households both at the bottom and at the top of the income distribution because those at the bottom are not able to escape, whereas those at the top are valuable targets for armed groups. Similarly, organized crime groups may affect more the social capital of those with initially low levels of social capital because these individuals are less likely to be politically active or trust institutions or others. Organized crime may also affect disproportionately those at the top of the social capital distribution because those may be perceived to be threats to be managed. To assess these heterogeneous effects, we estimate a quantile regression. Appendix Figure A2 shows as predicted larger coefficients at the low and at the top end of the distribution of the social capital aggregate index. These quantile effects differences are large, with individuals with initial low or high levels of social capital having a negative social capital effect that is twice as much as that of individuals at the centre of the social capital distribution. We return to this result in Section 5.

Figure 4: Heterogeneous effect of organized crime index on social capital (2000–18)



Note: this figure presents the heterogeneous pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed between 2000-03 and 2005-18. All estimates show results from the pooled OLS regressions based on Equation 1. Each row is a regression. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. The variable of interest is the organized crime index. In Panel A, we present the baseline effect of exposure to organized crime on the social capital aggregate index. In Panel B, we present the results split in two samples: in the first row, we present the analysis keeping individuals that only live in the regions which are Mafia historic strongholds (Sicily, Calabria, Campania, and Apulia), while in the second row we present the analysis dropping all the individuals that live in the Mafia historic strongholds. In Panel C, we present the analysis by comparing individuals that live (or not) in a municipality where the violent crimes (general, Mafia, or foreign) or political crimes, or economic crimes (general, Mafia, or foreign) are above the 75_{th} percentile of the distribution in year *t*. In Panel D, we present the analysis by comparing individuals that live (or not) a in municipality with varying levels of violence and governance of the organized crime groups. The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. Standard errors clustered at the municipality level. Confidence intervals are calculated at the 95% level.

Source: authors' elaboration based on data described and variables constructed in Section 4.3 and Online Appendix C1.

4.4 Robustness checks

The results above remain consistent across a number of robustness checks. In Appendix B3, we report a test of the selection on observables by progressively adding parsimonious and enriched control variables to the regression. In Appendix B4, we present the results using alternative constructions of the organized crime index. In Appendix B5, we show the results using a weighted mean index of social capital, which gives more weight to those indicators that bring new information to the index and are least correlated with the others. Appendix B6 shows the results directly accounting for social desirability bias of the respondent: (i) by comparing the answers of the respondents when alone in the room or when in presence of an enumerator and/or family member; and (ii) by analysing how the answers about exposure to organized crime groups change across areas with different levels of criminal group control. Finally, in Appendix B7, to further validate the pooled OLS regression results, we present results using two matching estimators: a propensity score matching at the individual level and an inverse probability

weighting regression. We also mix both regression and matching procedures by estimating a doubly robust augmented inverse probability weighting. The latter adds an argumentation term in the regression model that adjusts the results based on the degree of misspecification in the matching model. All results across these robustness tests are largely consistent, further reassuring us of the validity of the main results.

4.5 Synthetic control approach

While we are confident the results discussed above are plausibly causal, we cannot fully exclude all possible threats to causality. To address this concern, we exploit in this section an exogenous event that led to the arrival of organized crime groups to Apulia in the late 1960s and 1970s. Historically, there is no evidence for the presence of these groups in Apulia before the 1960s, possibly due to a lack of requests of protection by landowners (Sales 2015: 381), since landowners in some of these areas had their own private armies (Gambetta 1993: 80–83). Appendix Figure A3 shows the homicide rate per 100,000 inhabitants since 1887, using data from Alesina et al. (2019). Until the 1970s, Apulia's level of violence was in line with the Italian base value (100). The year 1970 represents a clear turning point when Apulia becomes one of the most violent regions in Italy.

As discussed in Section 2, organized crime groups expanded to Apulia due to two largely exogenous events. First, the resettlement law had a particularly strong effect on Apulia, which became the southern region with the highest number of resettled *Mafiosi* (Pinotti 2015). According to the resettlement law, judges who headed the provincial tribunal where Mafia suspects lived had the power to decide where to relocate them. In the period of time under which the resettlement policy operated, there is no evidence that levels of social capital shaped the preferences of judges for the destinations of forced resettlement of *Mafiosi*. First, information on such province characteristics was not collected by the Italian administration during that period (Scognamiglio 2018). Second, there is no historical evidence which suggests that *Mafiosi*, through either power or influence, managed to move to areas of their preference. To support further these claims of exogeneity, we analyse the effect of social capital between 1968 and 1972 at the province level using the same data as in Section 4.1 on the number of resettled *Mafiosi* per 100,000 inhabitants in 1972. Results discussed in detail in Appendix Table A12 show that the social capital of the province does not influence the receipt of resettled *Mafiosi*.

The second exogenous event that led to the arrival of organized crime groups to Apulia was the closure of the tax-free port of Tangier and the development of the illicit tobacco trade in the 1960s (PAC 1993b), which led Apulia to become the main tobacco trading port in Italy. It is difficult to conceive of a reason for a direct relationship between the closure of a port in Morocco and levels of social capital in Apulia. The emergence of the illicit tobacco trade happened in Apulia mostly for geographic reason as Apulia was both the region in Italy closest to the Mafia historical strongholds and thus easily reachable, as well as being located in a strategic position in the middle of the new trading route between Eastern Europe (where the new tobacco depots were built) and Turkey and Cyprus (where the tobacco was sent to).

We exploit Apulia's unique experience with the exogenous arrival of Mafia groups as proof of concept that our main results can be interpreted as a causal effect of organized crime on social outcomes.[39] To do this, we compare Apulia's social outcomes before and after the arrival of organized crime groups with

[39] We have also used an instrumental variable approach for Sicily using as instruments both/either the presence of sulphur mines in a municipality (Buonanno et al. 2015), citrus land suitability (Dimico et al. 2017), and drought intensity interacted with the presence of rioting peasants (De Feo et al. 2019). We decided to exclude these results from the paper for two reasons. First, while, as discussed in Section 2, these instruments are well-suited to explain the emergence of organized crime in Sicily in the 19_{th} century, these economic variables are likely to be related to social capital through other channels than organized crime. Second, the F-test of the relevance test for the instrument(s) substantially vary with small changes in the model specification making the results unstable. Results are nonetheless available upon request.

a (synthetic) control group of regions which were not notably exposed to the establishment of criminal organisations. Following the approach originally devised by Abadie and Gardeazabal (2003) to estimate the economic costs of terrorism in the Basque country and later used by Pinotti (2015) to estimate the economic costs of organized crime in Italy, we weighed units in the control group to construct a synthetic control that mimics the initial conditions in Apulia several years before the presence of organized crime (before 1960).

The outcome of interest is a measure of social capital calculated from every census year (every decade) between 1861 and 2020.[40] Social capital includes three available indicators largely comparable to those used in the previous section: political participation, civic engagement, and interpersonal trust. Political participation is measured as (i) the number of political associations per capita and (ii) the number of male voters over the total electorate during the Senate elections.[41] Civic engagement is measured as the number of CSOs per capita. Interpersonal trust is measured as the number of civic court disputes per capita (reverse coded). This latter measure has been used in the literature to proxy the litigiousness of individuals, which strongly correlates with low levels of interpersonal trust (Nuzzo 2006).[42] These three indicators are normalised to the Italian base value of 100 and averaged to create a social capital aggregate index.

The vector of weights we use minimises the difference between treated and control regions over the period in which none of them had been exposed to the treatment (before the 1960s, see Pinotti 2015). Therefore, we had to exclude from the control regions the Mafia historical strongholds (Sicily, Calabria, and Campania).[43] The vector of variables that minimises the difference between treated and control regions before 1961 includes the outcome of interest pre-treatment and a number of control variables.[44] Appendix Table A13 confirms that the synthetic control matches the treated region well in terms of social capital and the main socioeconomic variables, with the exception of variables related to population size, as documented also in Pinotti (2015). The region with the largest weight is Basilicata which takes up to two thirds of the total weight. Even though no geographical variable is explicitly included in the control variables, the synthetic weighting procedure assigns most of the weight to the region in the control group that is closest to Apulia. In contrast to Pinotti (2015), we do not include Basilicata as a treated region as more recent historical work has shown how Basilicata, along with Abruzzo and some internal areas of Campania, has been exempted by the presence of organized crime groups, making it a perfect candidate as a control region (Sales 2015: 288). Evidence of this can be found by plotting the density of organized crime presence at the municipality level between 2000 and 2018 (see Online Appendix C2 for how we constructed the indicator). Appendix Figure A4 shows that Basilicata (the region between Campania, Calabria, and Apulia in blue) has very low levels of organized crime presence. In addition, in Appendix Figure A5 we show how the murder rate per 100,000 inhabitants in Basilicata starts decreasing after the

[40] The construction of this variable builds on Nuzzo (2006), who compiled this variable at the regional level between 1901 and 2001. We expanded this time series from 1861 until 1891 and between 2001 and 2020. The series is interrupted during the fascist rule between 1931 and 1941 because the information is either not available or is heavily biased by the political (fascist) context (Nuzzo 2006).

[41] The choice of male voters guarantees consistency in time as women were not allowed to vote before 1945.

[42] This indicator is available only since 1871.

[43] We also had to exclude Valle d'Aosta, Trentino Alto Adige, Veneto, Friuli Venzia Giulia, Lazio, and Molise as there is no data available on social capital for some of the census years.

[44] These are the percentage of female in the population, household size, population size, GDP per capita, productivity (calculated as GDP per worker), employment rate, human development indicator (index of life expectancy, education, and income), value added per capita, value added in the industrial sector per capita, share of workers in industry, agriculture and other sectors, number of migrants per capita that leave the region, train connectivity, road connectivity, percentage of people living in mountainous areas, and percentage of people living in small municipalities. Description of these variables is provided in Online Appendix C1.

1970s, in contrast to Apulia.[45] Additionally, in Panel A of Appendix Figure A7 we drop Basilicata as a control region and our main result holds. We also re-estimate our results including Basilicata. Results (available upon request) are of smaller magnitude (as Basilicata is our main control region capturing two thirds of the weights) but remain consistent. Regions that are additionally weighted against Apulia are Sardinia, Liguria, and Tuscany. One concern with this approach is that estimates may be sensitive to the particular performance of a small number of regions. To address this concern, we show in Appendix Figure A7 that results are similar in magnitude when excluding one-by-one each of the control regions (Basilicata in Panel A, Sardinia in Panel B, Liguria in Panel C, and Tuscany in Panel D).

Figure 5 shows that in the decade between 1971 and 1981, the level of social capital in Apulia fell by roughly 30 per cent.[46] The gap between the actual and counterfactual social capital remains constant until today. The drop in social capital happens in the same decade in which organized crime groups settle in Apulia.

Results from the synthetic control confirm the pooled OLS results, but are of larger magnitude. This has three plausible explanations. First, the pooled OLS effects are an average effect for all Italy and not specifically for Apulia, one of the regions in Italy with the highest presence of organized crime. Second, the indicators used to proxy social capital, while similar, are not the same. Finally, it is possible that the pooled OLS results underestimate the true effect of exposure to organized crime groups and social capital, which is instead more causally approximated by the synthetic control approach.

Similarly to the pooled OLS results, the synthetic control results also show that most of the social effect of organized crime is driven by a reduction in interpersonal trust (Appendix Figure A8). Until 1971, Apulia's reported civic court disputes per capita were in line with the Italian average value. One decade later, a sharp rise in civic court disputes reduces the interpersonal trust score to -2. This value never catches up against the synthetic control. The results show a small negative effect of the arrival of organized crime groups between 1971 and 1981 on political participation (Appendix Figure A9). This generates a gap in the political participation variable between Apulia and the synthetic control of approximately 10 per cent, which has persisted until today.[47]

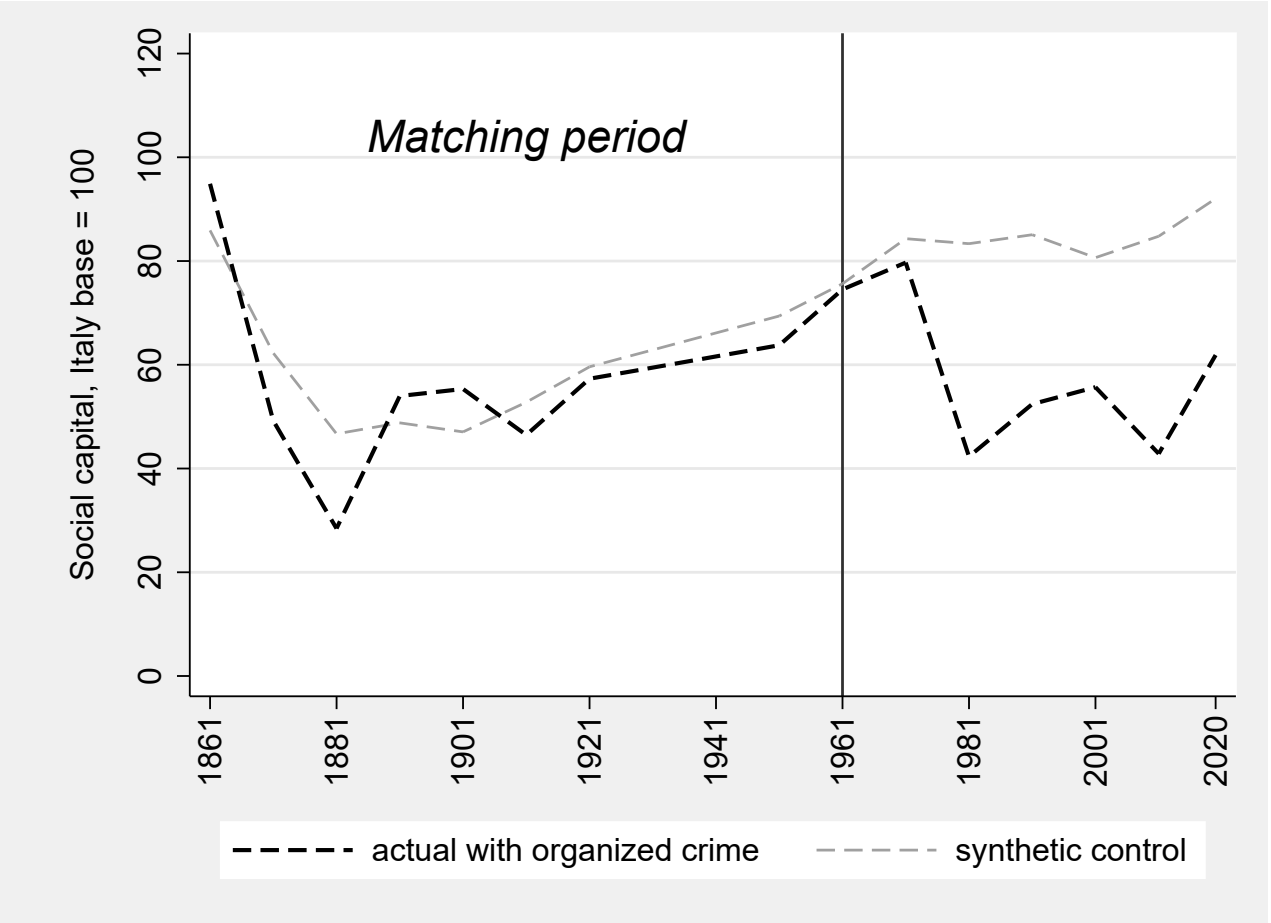
Appendix Table A14 shows that between 1971 and 1981, at the same time organized crime groups arrive in Apulia, there is a clear turning point. The gap in social capital in Apulia in relation to the synthetic control group moves from -5 to -49 per cent and remains stable around -30 per cent during the next 40 years. This is in line with the results discussed in Section 4.3, whereby the arrival of organized crime groups induces at first a strong adverse impact on social capital and adjusts afterwards at a (negative) equilibrium of a slightly smaller magnitude, generating a 'social trap'.

[45] We also replicate the results from Pinotti (2015) in Appendix Figure A6. The figure shows that the negative impact of organized crime on GDP found in Pinotti (2015) is confirmed, but only comes from Apulia (Panel A and Panel B), while the effect on Basilicata is more mixed and less clear, with an almost similar level of GDP between Basilicata and the synthetic control in the late 1990s (Panel C).

[46] The first initial drop in social capital levels between 1861 and 1871 is due to the fact that social capital was first measured with only two indicators (political participation and civic engagement) due to data availability. We start using the average of three indicators (adding interpersonal trust) after 1871.

[47] We cannot interpret the effect of organized crime on civic engagement, as the divergence between Apulia and the synthetic control happens before the arrival of the organized crime groups, with the gap remaining constant until today (Appendix Figure A10).

Figure 5: Synthetic control: social capital in the treated region and in the synthetic control (1861–2020)



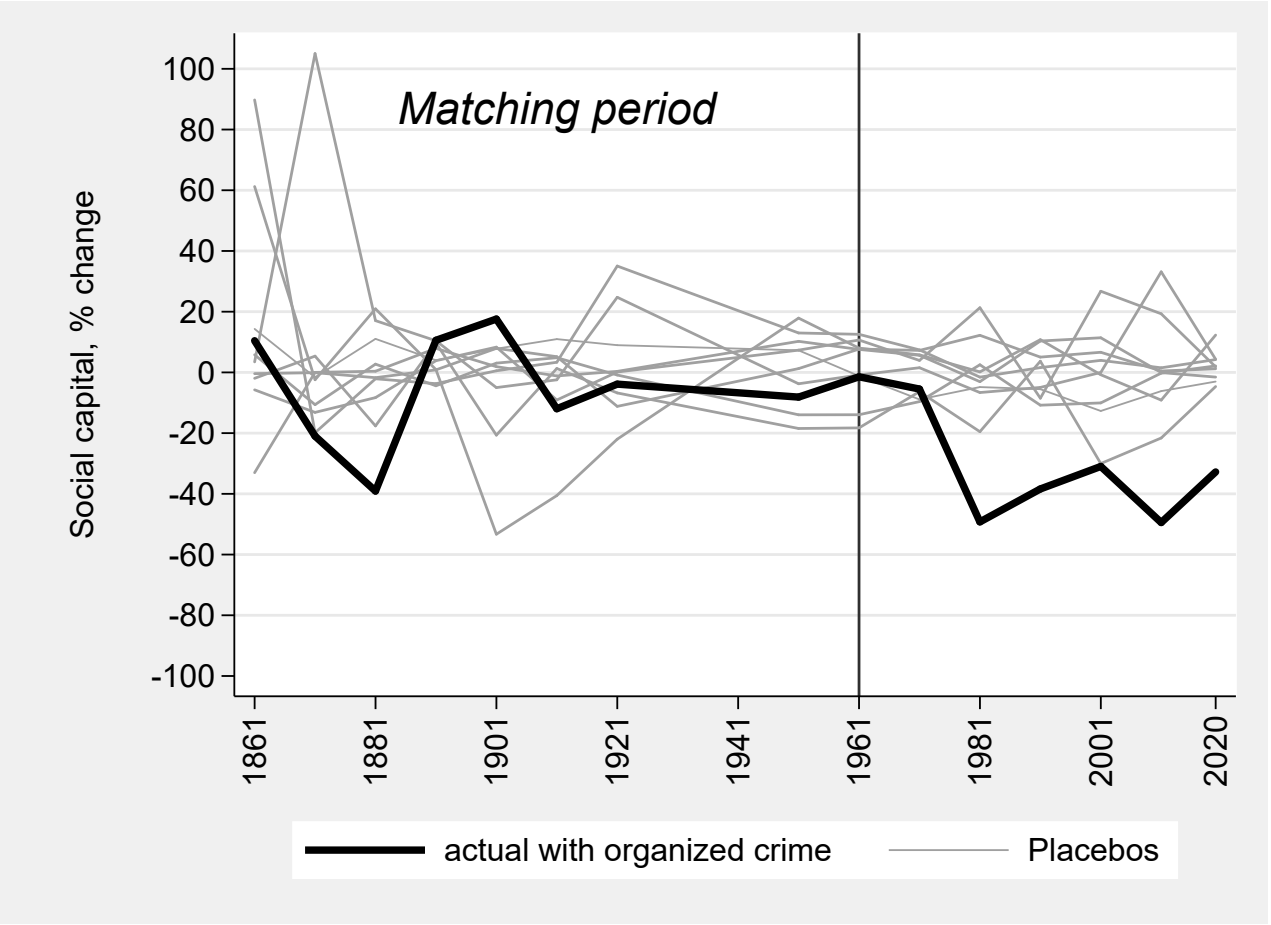
Note: this figure presents the synthetic control estimates of the effect of the arrival of organized crime groups in Apulia in the 1970s on the social capital of the region compared to a group of synthetic control regions. The black dotted line is the level of social capital of Apulia between 1861 and 2020, every decade. The grey dotted line is the level of social capital of the synthetic control regions (Basilicata, Sardinia, Liguria, and Tuscany). The dependent variable is the social capital aggregate index normalised to the average Italy base-value of 100. The matching period in which the synthetic control approach minimises the differences between Apulia and the control regions is before 1961 (the time period on the left of the vertical black line in 1961). The calculation of the weights uses the social capital of the regions and a set of socioeconomic indicators before 1961.

Source: authors' elaboration based on the data described and variables constructed in Section 4.5 and Online Appendix C1.

An outstanding question is the statistical significance of the estimated effects of the synthetic control approach. Large sample inferential approaches are not ideal for comparative case studies with a small number of treatment and control units. As a result, Abadie et al. (2010) suggest the implementation of a placebo test based on the distribution of (placebo) effects for each region in the control group. If the effect estimated for the ('real') treated unit is abnormal relative to the distribution of the placebo estimates, the null hypothesis that organized crime has no effect on social capital can be rejected. Figure 6 explores the robustness of our main finding using this placebo test. The figure shows the distribution of estimates for the placebo and the treated unit.[48] Since no placebo unit shows a similar drop in social capital, we are able to reject the null hypothesis that the effect of the arrival of organized crime groups in Apulia on social capital is zero.

[48] Following Pinotti (2015), we drop Sardinia in this placebo test because the region experienced an abnormally large surge in civic proceedings after the Second World War due to land grabbing and arson, without any known links to the presence of organized crime groups.

Figure 6: Synthetic control: placebo test (1861–2020)



Note: this figure presents a placebo test to study the statistical significance of the synthetic control results. The black line shows the estimates obtained for Apulia, and the grey lines show the estimates obtained when we treat each of the control units as if it were treated.

Source: authors' elaboration based on the data described and variables constructed in Section 4.5 and Online Appendix C1.

A second outstanding question is related to our inability to test directly for the effect of the arrival of organized crime groups in Apulia on institutional trust due to the lack of an appropriate indicator before the 1970s. We are able, nonetheless, to present compelling descriptive evidence about the differential levels of institutional trust between Apulia and the synthetic control regions (Basilicata, Sardinia, Liguria, and Tuscany) using data from the Eurobarometer. The Eurobarometer survey has been conducted in Italy since 1973 almost yearly and includes two questions that proxy for institutional trust: (i) the level of satisfaction with how democracy works in the country (1=not at all satisfied and 4=very satisfied) and (ii) a dummy variable equal to 1 if the interviewee does not want to change society or would like to do that only through institutional means, and 0 if the interviewee would want to enact change through a revolution. In both cases, we expect the two indicators to be positively correlated with an higher level of institutional trust, as it is plausible that those satisfied with democratic institutions and their settings may also trust those same institutions. In Appendix Table A15, we compare in percentage terms the difference in the level of institutional trust between Apulia and the synthetic regions. With the exception of the first year (1973), there is a clear lower level of institutional trust in Apulia (by 8 per cent). This is in line with the pooled OLS results.

5 Mechanism analysis

The results presented so far suggest that exposure to the presence of organized crime has in general a strong, negative effect on social outcomes, with the exception of a positive effect on civic engagement in the national-level data. We discuss in this section what mechanisms may link individual exposure to organized crime groups and social capital. To identify relevant mechanisms, we followed three approaches. First, we worked with 24 specialists heavily engaged in fighting organized crime groups (policemen, army officers, prosecutors, and judges) or in studying them in detail (criminologists, political scientists, and economists) to theorise inductively a number of relevant mechanisms that might link exposure to organized crime groups with social capital. The interviews were conducted using open-ended questions and took place after we obtained the results discussed in Section 4, which we shared with all interviewees. Second, we road-tested these mechanisms by administering semi-structured in-depth interviews to 29 community leaders exposed to the presence of organized crime groups in Genoa. Genoa is a particularly interesting location to conduct this analysis as it represents the 'median' experience of Italian citizens with organized crime, as discussed in the introduction. Individuals living in the historic city centre are also exposed to the presence of all the three different types of organized crime groups, in ways similar to other urban areas in Italy, in contrast with studies more commonly focused on rural Sicily, where only one form of the Mafia exists (*Cosa Nostra*). The community leaders we interviewed in Genoa included members of residents' associations, CSO volunteers, business owners, and local politicians. The interviews covered three themes: (i) the social capital of the individual and of the community, (ii) the type of exposure to organized crime groups, and (iii) how the exposure to organized crime groups may have had an effect on their social capital and the social capital of their community. Their answers were transcribed and we applied deductive coding, using the set of theorised mechanisms identified with the specialists, to further refine the initial list. A summary statistics of the interviewees is presented in Appendix Table A16.[49] Finally, we made use of a small body of literature on the consequences of armed group and gang presence in developing countries (Blattman et al. 2021; Gáfaro et al. 2022), and the larger body of literature on the determinants of social capital reviewed in the introduction to further validate the choice of mechanisms.

5.1 Theorising mechanisms

Based on our qualitative research, we identified six key mechanisms that appear to explain the adverse effects of organized crime groups on social capital. Three mechanisms operate at the individual level—psychological factors, propensity to invest in social capital, and social polarisation—and three mechanisms operate at the community level—local capacity for collective action, local state capacity, and social proximity between community members. We discuss each mechanism in turn below.

Psychological factors. Exposure to organized crime groups can induce a number of psychological and emotional reactions which negatively affect social capital (Bauer et al. 2016; Depetris-Chauvin et al. 2020). The most important factors we identified in the interviews were fear and resignation. Fear seems to affect mainly the elderly. The head of a resident association we interviewed expressed this widely shared view as follows: "*Total closure. There are people in the neighbourhood that do not go out because they are scared of being robbed. There are people that ask their children to go shopping for them, because they are fearful*" (Community leader 7.5, December 2021). Fear has also large implications for those individuals who have received direct intimidation from *Mafiosi*. Some have decided to leave, as illustrated by a couple we interviewed who were repeatedly threatened after starting a business in the area. They left because "*we could not resist anymore*" (Community leader 8.18, January

[49] All details of the qualitative sampling, ethical considerations, the questionnaire used, and the qualitative coding protocols are available upon request.

2022). A long-time resident and business owner further unpacked the fear component, telling us how the *Mafiosi* hope that fear is a common feeling among the residents: "*I received a number of intimidations. These could be of different kinds. You can even yourself intimidate me when you tell me: "Oh wow, it is very brave of you to have a shop here", because indirectly you are telling me that you would not have a shop here and that I should be scared. This word of mouth is something organized crime counts on and results with people not denouncing*" (Community leader 6.1, November 2021). Some of the specialists we interviewed mentioned how individuals responding to a trauma can also fall into resignation, with a general lack of desire to engage with people and maintain close relationships. A CSO volunteer who has lived and worked in Genoa since 1985 explained the feeling of resignation as follows: "*Unfortunately, you find yourself in an area [ed.:plagued by organized crime groups] where you are always in a constant movement between the Good and the Bad, a step forward and a step backward. You have a community party, the area looks cleaned up but ten minutes later, it is worse than before*"(Community leader 6.5, November 2021).

Propensity to invest in social capital. Exposure to organized crime groups can induce individuals to recalibrate the different opportunity costs of investing in social capital. Many find it easier, safer, and economically advantageous to reduce investments in social capital. Adverse events have been shown to affect individual propensity to (dis)invest in social capital through increases in individual opportunistic behaviour (Winkler 2021). In addition, investing in social capital may be costly to those who work in sectors of interest to organized crime, in which the use of intimidation and violence by the organized crime group is more likely. For example, Battisti et al. (2018) found that firms that are less likely to join anti-racket organisations in Palermo exhibit low levels of human capital. This view was expressed by one of the experts we interviewed as follows: "*If the human capital [ed.: in an area with organized crime] is low, while the physical capital is high (...), if you have a construction firm that needs local workers and local costumers, your options are not many. If you fight...you risk to lose it all*" (Specialist interview 1.42, June 2021). This type of reasoning seems to have become a popular belief as suggested to us by two experts: "*there is a cultural aspect typically Italian but more evident in Mafia strongholds which is the following - since you are a child, the family teaches you: 'Mind your business and you will live for 100 years'*" (Specialist interview 1.6, June 2021; similarly expressed by Specialist interview 1.40, June 2021).

Social polarisation. The arrival of organized crime groups usually forces individuals to take a position for or against them, which tends to polarise the community. Some individuals become extra-civic-minded because they want to clearly show they are firmly against the groups and do not accept any compromise with them. Other individuals either accept the presence of the group or remain indifferent and prefer not to express strong views either way. Bazzi et al. (2019) provide evidence that polarisation of this type may reduce social capital and lead to a decline in public goods provision. A similar mechanism was found among conflict-affected individuals by Grossman et al. (2015) and after civil wars (Wood 2008). A political scientist we interviewed describes this widely observed phenomenon as follows: "*Where I live there have been important homicides, of the mayor and of union leaders, for example. The initial reaction had been of public indignation, but in time one minor part of the community accused the other part of wanting to criminalise the image of the community (...) this is divisive. It is divisive from an historical point of view as it creates historical fractures and communities cannot recover a sense of unity back again. And it is divisive in terms of social composition because in front of an homicide you need to position yourself, there is a narration and this narration you have to accept it or not (...) this brings a personification of the memory and these historical facts become a battleground between factions*" (Specialist interview 1.23, March 2021). A CSO volunteer we interviewed added: "*Organized crime groups 'split the shore'...there are people that are conscious of the situation and commit to make it better, while there are others that do not like this sort of commitment because it spots light on things that, for them, are fine like they are*" (Community leader 6.8, November 2021). We also noticed when speaking with community leaders how extra-civic-minded residents are also those more likely to distance themselves from local politics, as they believe local political systems to either be inef-

fective or in collusion with organized crime and, because of that, those working with local governments are often seen as 'collaborating with politics' or being open to 'blackmail by politics'.[50]

Local capacity for collective action. Organized crime groups affect the social and economic fabric of local communities and force people to move away from their communities or distrust other community members. This, in turn, reduces the social capital of the area as old businesses close and people stop interacting or move. This mechanism was firstly theorised by Boyd and Richerson (1988) in their seminal work detailing how individuals make a decision according to the environmental constraints they face. The qualitative interviews often mentioned how organized crime groups reduce the ability of local communities to act collectively, either by driving businesses away or discouraging local social interactions. A business owner in Genoa who spent four years implementing a business development plan in the area told us how: "*in the neighbourhood we realised that the area was so compromised by the monocultures of illicit drugs and prostitution that there was no hope...in 2008 in the main street of the neighbourhood one shop per month was shutting down, it looked like a 'Vietnam'*" (Community leader 6.3, November 2021). Two historic residents remembered when they could go from a shop to the next freely, and how organized crime groups have now "*switched off the light*" (Community leader 6.18, December 2021) and how they "*made the area empty...ugly...and the ugly attracts ugly*" (Community leader 7.1, December 2021). This has consequences for local collective action: "*The presence of organized crime groups sterilises any form of participation. This does not mean that it does so directly, but there is a socioeconomic and political context which is sterile and this reduces any hope you might have for the future. You participate and mobilise not individually, but with other people with whom you share values with, and when the benefits of participating are more than its costs*" (Specialist interview 1.22, March 2021). As a result, local residents either do not interact or leave. For instance, two shop owners had to leave an area in Genoa after multiple acts of intimidation because "*we were fighting alone*" (Community leader 8.18, January 2022).

Local state capacity. The presence of organized crime groups creates very practical problems that need to be solved including urban decay, dealing with people openly conducting illicit activities and with criminals controlling the territory. Citizens expect the state to solve these problems. Failing to do so may lead to lower institutional trust and lower political participation. Buonanno et al. (2021) discuss how the Irpinia earthquake affected social capital due to the ineffectiveness of the state to provide public goods. In Medellin, Blattman et al. (2022) show that increasing state presence in areas overrun by organized crime groups has limited influence on state legitimacy because the state struggles to meet citizens' expectations. Similarly, Armingeon and Guthmann (2014) and Armingeon and Ceka (2014) find that citizens have lower institutional trust after economic recessions because people realise state institutions are not able to protect them. Almost all community leaders we interviewed in Genoa described how the inability of the state to address problems caused by organized crime groups has destroyed institutional trust. A common example was the widespread view that groups of policemen moving throughout the neighbourhood were mostly there "*for appearances' sake*" as mostly their presence is ignored by criminal groups. Several community leaders put forward a strong view that local political institutions deliberately attempt to create ghettos where all problems are contained,[51] or are in collusion with organized crime groups:[52] "*The Mafia is linked to the institutions so you participate less in political life.*" (Specialist interview 1.46, June 2021).

Social proximity between community members. The activities conducted by organized crime groups are illicit, secret, and (at times) violent, which produces a culture of mistrust. A literature on 'social

[50] Community leader 6.12, December 2021; Community leader 6.18, December 2021; Community leader 6.1, November 2021.

[51] Community leader 6.8, November 2021; Community leader 6.16, December 2021; Community leader 7.1, December 2021; Community leader 8.14, January 2022; Community leader 8.4, January 2022

[52] Community leader 6.1, November 2021; Community leader 6.16, December 2021; Community leader 8.20, January 2022

proximity' has described the conditions under which interactions between groups can be conducive to integration and empathy (Allport 1954): sharing the same status and goals, living in a cooperative rather than competitive environment, and operating under a well defined set of norms, laws, and regulation. The culture of mistrust brought by organized crime groups may reduce social proximity between community members who may become suspicious of others, especially when "*organized crime is infiltrated in a subtle way and it is very difficult to distinguish what is legit and what is not*" (Community leader 6.8, November 2021). Organized crime groups also normalise illegality which has adverse effects on forms of civic sense, and often normalise violence too: "*One thing I experienced interviewing people living in areas with organized crime group presence is a cultural trait of accepting violence...you could say 'The Banality of Violence'...the fact that you know, historically, this is a phenomenon that exists and that you have to live with it. This has historical roots which identifies the territory where you come from.*" (Specialist interview 1.23, June 2021). The normalisation of illegality and violence contributes further towards driving people apart, particularly those who view relations with organized crime in different ways. Additionally, organized crime groups attract undocumented immigrants as cheap illegal labour, who contribute further to increasing social distances given the challenges they face in integrating in local communities (Ajzenman et al. 2020).

Our empirical analysis showed also a positive effect on civic engagement induced by the exposure to organized crime group. We dealt with this result separately when theorising and analysing the mechanisms that may explain it and asked separately in our interviews for possible reasons that may explain this result. The strongest reason that emerged was a sense of indignation and desire for revenge, despite the possible costs of such actions. A business owner told us that she "*keeps going*" because she sees all this as a "*personal challenge*" (Community leader 6.24, December 2021). Another business owner described that the neighbourhood had moments in which it appeared with a "*desire for redemption*" (Community leader 6.3, November 2021). Exposure to organized crime groups acted for some as an "*aggregating force*" which resulted in the creation of two resident associations (Community leader 6.11, November 2021). A CSO volunteer who provides psychological support to the residents summarises this mechanism very eloquently telling us how indignation brought people out on the streets: "*Once a young woman was assaulted and the day after there was a highly-attended demonstration of all the residents (...) and one of the things that came out very strongly was also this very peculiar statement: 'I am a resident here and I refuse to associate my neighbourhood with criminality*' (Community leader 6.18, December 2021). Even though we are not able to test this mechanism quantitatively (see below), this sense of indignation and this desire for revenge mirror a large literature on civil wars which has emphasised the importance of emotions (such as fear, revenge, grief, anger, pride, defiance, hope, dignity, and pleasure of agency) in explaining the participation of ordinary citizens in violence and in armed groups (Goodwin 2001; Petersen 2001; Wood 2003).

5.2 Measuring mechanisms empirically

The qualitative fieldwork we conducted in Genoa and the various qualitative interviews allowed us to zoom on the six broad mechanisms discussed above that may explain the impact of organized crime groups on social capital. This analysis was necessarily based on a small sample and, as discussed, much of the discussion applies to Genoa. Even though Genoa is a good match for the 'average' Italian experience with organized crime, it is still important to add external validity to the discussion above. Thus, once we identified the main mechanisms suggested by the qualitative interviews, we matched each with appropriate quantitative measures using the national-level dataset conducted by ISTAT (2019).[53]

[53] Note that we are not able to test quantitatively the mechanisms underlying the positive effect of organized crime on civic engagement due to the lack of appropriate proxies for indignation and revenge. We therefore interpret those results cautiously.

Psychological factors. The qualitative analysis identified two key psychological mechanisms: fear and resignation. To measure the levels of fear experienced by individuals exposed to organized crime groups, we use a dummy equal to 1 if the respondent reports feeling scared, quite scared, very scared, or scared to the point of not leaving the house when walking alone in the area where they live. The variables takes the value 0 if the respondent feels quite safe or very safe. To capture the resignation mechanism, we constructed a dummy equal to 1 if the responded reported in the survey having low expectations about the future (believes it will be worse), and 0 if the individual thinks their lives in the future will be the same or get better.

Propensity to invest in social capital. We discuss above how exposure to organized crime may lead to reduced investment in social capital by community members. To proxy for these effects quantitatively, we use a dummy equal to 1 if the individual works in a sector which usually is of interest to organized crime groups in Italy (and 0 otherwise). These include waste management, construction sector, wholesale, and tourism (bar and restaurants). The available data do not allow us to calculate the different costs and benefits of investing in social capital. This variable is rather used as a proxy for the fact that individuals working in sectors likely to experience the infiltration of organized crime groups—or at the very least likely to be in direct competition with the activities of organized crime groups—may be more likely to calibrate more carefully the opportunity cost of investing in forms of social capital, in relation to others working in less exposed sectors.

Social polarisation. We used two variables to capture the sense of polarisation described in the qualitative analysis. The first uses a question in which the respondent is asked whether they feel they belong to the local municipality (using a scale from 0=a lot to 3=not at all, reversed). We created a variable at the municipality level for each year averaging the answers by the respondents, and coded a dummy variable as 1 if the respondent lives in a municipality in the top 25_{th} percentile of municipalities where there is a strong feeling of belonging. Second, to capture how exposure to organized crime groups may also polarise individuals politically, we used a dummy variable equal to 1 if the respondent believes their vote in the municipality and regional election matters. As above, we created a variable at the municipality level for each year averaging the answers by all respondents, and then created a dummy equal to 1 if the respondent lives in a municipality in the top 25_{th} percentile of municipalities where there is a sense that voting does not matter.[54]

Local capacity for collective action. The qualitative analysis uncovered how exposure to organized crime may reduce social capital because community members are prevented or refrain from coming together collectively. This exact mechanism is difficult to capture empirically because we do not have information about the reasons why individuals may not participate in the political process, may not engage in forms of civic engagement, or may not trust others or institutions. However, the qualitative analysis uncovered the fact that disinvestment in social capital is often manifested in the fact that many people leave their communities when criminal groups arrive and establish themselves. To measure this process quantitatively, we use a dummy equal to 1 if a family member moved out of the house in the previous 12 months, while recognising that this move may have happened for other reasons.

Local state capacity. Frustration with the capacity of the state to deal with the problems associated with the presence of organized crime appeared as a strong determinant of why local community members distrust political institutions, view other community members and community organisations suspiciously, and disengage from political processes. To measure local state capacity, we use a question asked in the surveys about the level of satisfaction of the individual with the municipality's services. The index of satisfaction with municipality services is a sum of the following services (all recoded as dummy

[54] The two questions were asked only in 2016. Thus, we used the value obtained in 2016 and assigned to the municipalities in 2012, 2013, and 2014 that match those sampled in 2016. As the municipalities sampled in 2016 are not always the same as those sampled in 2012, 2013, and 2014, the sample for this analysis is reduced from 117,086 observations to 95,479 observations.

variables and reverse coded): road cleaning, parking, link to the transport services, congestion, air pollution, sound pollution, malodorous air, street lights, street maintenance, closeness to parks). We create a dummy variable equal to 1 if levels of satisfaction are low (between 1 and 3), and 0 otherwise.

Social proximity between community members. Social proximity is a well-documented determinant of social capital and likely to be affected by the culture of illegality and violence promoted by organized crime groups. The qualitative analysis highlighted two factors that may shape social proximity in areas exposed to organised crime: changes in civic sense and the arrival of outsiders to the community. To capture a lack of civic sense in the area, we use a variable that measures the probability of children in primary schools (8_{th} grade) being caught cheating in 2008 during a national maths exam taken by all schools in Italy, with data obtained from INVALSI (2008).[55] We also include a question on whether respondents believe immigrants who are residents in the community should not be given the right to vote (coded as a dummy variable). While this is not a perfect proxy for social proximity, it could be interpreted as acceptance towards outsiders' presence and culture.[56]

5.3 Results and discussion

The results of the mechanism analysis are presented in Table 2. In this table, we synthesise for each mechanism the three types of evidence at our disposal—the specialists' interview, oral testimonies of community leaders in Genoa, and the quantitative analysis. In the left-hand column of Table 2, we list the six theorised mechanisms. In Column (1) we present the simple percentage of community leaders who mention at least once the specific mechanism. For transparency purposes, Column (2) directs the reader via a hyperlink to the online document with the transcripts in which the community leaders mention the mechanism.[57] The results of the quantitative mediation analysis are presented in Columns (3) to (7). To calculate the mediating effect for each mechanisms we used three calculations. In Column (3), we show the β effect of organized crime index on each of the mechanism. Logically, if a mechanism is relevant, it should be affected by the exposure to organized crime groups. In Column (4), we present the β effect of the organized crime index on social capital, which illustrates the overall effect of exposure to organized crime groups on social capital. In Column (5), we present the β effect in the full specification of the effect of organized crime index and of the mechanisms on social capital. These estimates tell us how much the coefficient of the exposure to organized crime index changes when adding the mechanism. This calculation allows us to quantify the effect of the mechanism on social capital when taking into account exposure to organized crime groups. In Column (6), we add the two mechanisms for which we have data only for a reduced sample. Finally, in Column (7), we calculate the mediating percentage effect of the mechanism, which is the product between Column (3) and Column (6), divided by Column (4) (Attanasio et al. 2020). In other words, this column shows how much the increase in the mechanism driven by exposure to organized crime groups—the product between Column (3) and Column (6)—has a mediating effect in the overall relationship between exposure to organized crime groups and social capital (Column (4)). This number is normalised to 100 and presented in percentage terms.

The first notable result in Table 2 is that Column (1) shows a good match between the mechanisms theorised by the specialists and the oral testimonies of the community leaders: almost all mechanisms were mentioned at least once by more than 50 per cent of the community leaders. By combining special-

[55] This estimate is based on the concentration of similar wrong answers in a class in the presence of very low variation across answers and very high average scores compared to classes with a similar socioeconomic background. The method used for pattern recognition is a fuzzy c-means clustering.

[56] These two questions were asked only in specific years. The first question was asked in 2008 and the second on migration was asked only in 2016.

[57] Transcripts are accessible only after registration and agreeing with the United Nations Data Policy End User licence agreement. This data protection is in line with the consent form signed by the interviewees and the University of Sussex ethical review process MW/GB/21917581.

ists' interviews, the oral testimonies of community leaders, and the quantitative mediation analysis, we observe that the mechanisms that are mostly relevant in explaining the negative effect on social capital are psychological factors, in the form of fear and resignation. Column (1) shows that 74 per cent of the community leaders mention this mechanism, and Column (3) shows that the effect of the organized crime index on this mechanism is positive and significant. This is further reinforced by the estimates presented in Columns (5) and (6) which show how the psychological mechanisms are both economically and statistically significant determinants of social capital, while controlling for the organized crime index. The mediation analysis in Column (7) shows that the psychological mechanism accounts for almost 45 per cent of the overall effect. The second most relevant mechanism is local state capacity. This mechanism explains a fairly large share of the reduced effect of organized crime on social capital by lowering institutional trust and political participation (mentioned by 87 per cent of the community leaders and accounting for 8.6 per cent of the overall effect in the mediation analysis). The other mechanisms seem to account for a very small share of the mediating effect.

Despite these strong results, it is important to note that there is still an unknown 45.73 per cent mediating effect that is captured by the organized crime index, which ultimately reflects all the possible mechanisms that are not added in the model and that are captured by this variable. Moreover, the quantitative mediation analysis cannot be interpreted as fully causal because the inclusion of the mechanism can introduce bias if the potential mechanism is endogenous (Attanasio et al. 2020). A final limit of this mediation analysis is that some of the theorised mechanisms are not trivial to proxy quantitatively. Nonetheless, it is our expectation that this exercise opens further opportunities for new research on mechanisms in the literature on the determinants of social capital and on the consequences of organized crime.

Table 2: Mediation analysis

	Community leaders		Mechanism relevance	Adding the mechanism			Mediation
	% that mention it (1)	Link to transcripts (2)	The effect of OC index on M (3)	The effect of OC index on Y (4)	The effect of OC index + M on Y (5)	The effect of OC index + M on Y (6)	(3) X (6) / (4) in % (7)
OC index (direct effect)				-0.143***	-0.072***	-0.065***	45.73%
				(0.010)	(0.011)	(0.011)	
Mechanisms theorized with the specialists							
Psychological: Fear	74%	Online Document 1	0.215***		-0.257***	-0.256***	38.61%
			(0.005)		(0.010)	(0.012)	
Psychological: Resignation		Online Document 1	0.045***		-0.199***	-0.197***	6.24%
			(0.004)		(0.010)	(0.011)	
Propensity to invest	39%	Online Document 2	0.001		-0.177***	-0.174***	0.06%
			(0.002)		(0.010)	(0.011)	
Capacity for collective action	65%	Online Document 3	0.007**		-0.033	-0.041	0.21%
			(0.003)		(0.023)	(0.026)	
State capacity	87%	Online Document 4	0.111***		-0.110***	-0.111***	8.62%
			(0.006)		(0.021)	(0.023)	
Polarization of views: Belonging	52%	Online Document 5	-0.006			0.010	0.04%
			(0.007)			(0.023)	
Polarization of views: Politics		Online Document 5	0.009			-0.046*	0.31%
			(0.008)			(0.024)	
Social proximity: Cheating	87%	Online Document 6	-0.001			-0.007	0.01%
			(0.007)			(0.019)	
Social proximity: Immigrants		Online Document 6	0.013*			-0.020	0.18%
			(0.007)			(0.024)	

Note: this table presents the mediation analysis for social capital of the individuals interviewed between 2012 and 2014. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. Column (1) reports the share of community leaders that mention at least once the mechanisms theorised with the specialists. Column (2) directs the reader to the transcripts in which the community leaders mention the mechanism, for better context. Column (3) presents the effect of the OC index on the mechanism. Column (4) presents the estimate from the baseline pooled OLS regression based on equation 1. Column (5) presents the effect of the OC index and the mechanisms on social capital. Column (6) adds two mechanisms (polarisation of views and social proximity) which reduce the sample. Column (7) calculates the mediating effect as the product between Column (3) and Column (6), all divided by Column (4). To calculate the OC index (direct effect) mediating effect, the calculation is simply Column (6) divided by Column (4). The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. Standard errors in parentheses clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on variables presented in Section 5 and Online Appendix C1.

6 Conclusions

This paper analyses the effect of organized crime on social capital at the individual level. We present evidence using new data on individual and regional exposure to organized crime groups in Italy and on four dimensions of social capital: political participation, civic engagement, and interpersonal and institutional trust. The analysis draws on two identification strategies. The first strategy makes use of pooled OLS results of individual-level data on social capital and exposure to organized crime between 2000 and 2018 across the whole of Italy. The second strategy is based on a synthetic control approach using 160 years of data for the region of Apulia, which experienced a large increase in organized crime in the 1970s as a result of two exogenous events: a resettlement law that directed judges to move suspected members of criminal groups to regions where organized crime was not present, and the closure of the Tangier port in the 1970s, which directed illegal trade in tobacco to Apulia due to its geographical location. Our main results show that exposure to organized crime groups reduces the social capital aggregate index between 8 (pooled OLS) and 30 per cent (synthetic control) in comparison to individuals and regions (for pooled OLS and the synthetic control, respectively) that are not exposed to the presence of organized crime groups. The effect is strongest for those who live outside Mafia historic strongholds, for those that live in a municipality with only one organized crime group present, and for those whose social capital is at the bottom or at the top of the social capital distribution. Results suggest that areas where organized crime groups emerge have fallen in a 'social trap' (Rothstein 2005), whereby organized crime causes a reduction in cooperation and trust in areas where these factors are most needed to combat organized crime. A detailed mechanism analysis based on a mix of qualitative and quantitative data reveals that individuals exposed to the presence of organized crime groups reduce their social capital largely due to fear and resignation, and to a smaller extent due to frustration with lack of state capacity to solve problems related to the actions of organized crime. These factors combined explain around 54 per cent of the overall mediating effect. The more mixed effect we find on civic engagement (positive in the national data) seems to be explained by feelings of indignation.

These results have important policy implications. Interventions aimed at reducing the presence of organized crime tend to focus on increasing levels of policing and strengthening state institutions in areas where organized crime is present. However, these interventions can only succeed if they have enough buy-in from local communities—where trust and support for those same institutions is likely to be at its lowest due to the presence of organized crime. Addressing these 'social traps' should thus be of first-order importance, before more policing and state interventions are considered. Our results show that organized crime seems at time to increase the levels of civic engagement of affected citizens, suggesting that the presence of organized crime groups may be undermined by leveraging collective action. This result is only suggestive given our data limitations when measuring this variable and its underlying mechanisms. However, it points towards the need for more research on the relationship between organized crime and civic engagement, including its suitability as an area for policy experimentation. The presence of organized crime groups is a problem that is expected to increase and proliferate over the next few decades. Many organized criminal groups around the world are expanding their capabilities and influence in international business, finance, and politics, and they could soon reach the economic and political strength of Italian Mafia groups. We hope this paper contributes to the debates on how to counteract these trends by acting to strengthen the social capital of communities and individuals exposed to organized crime.

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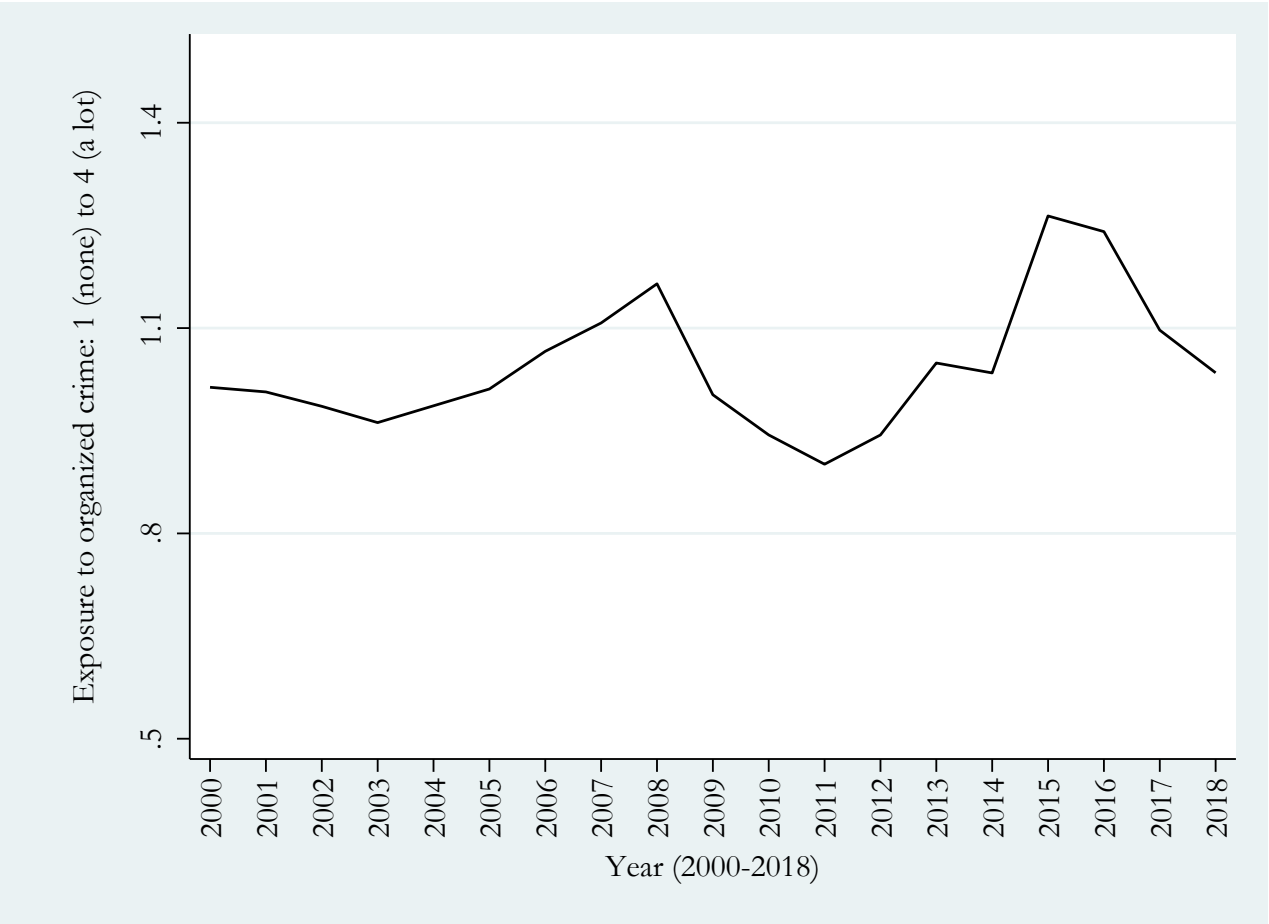
A Appendix figures and tables

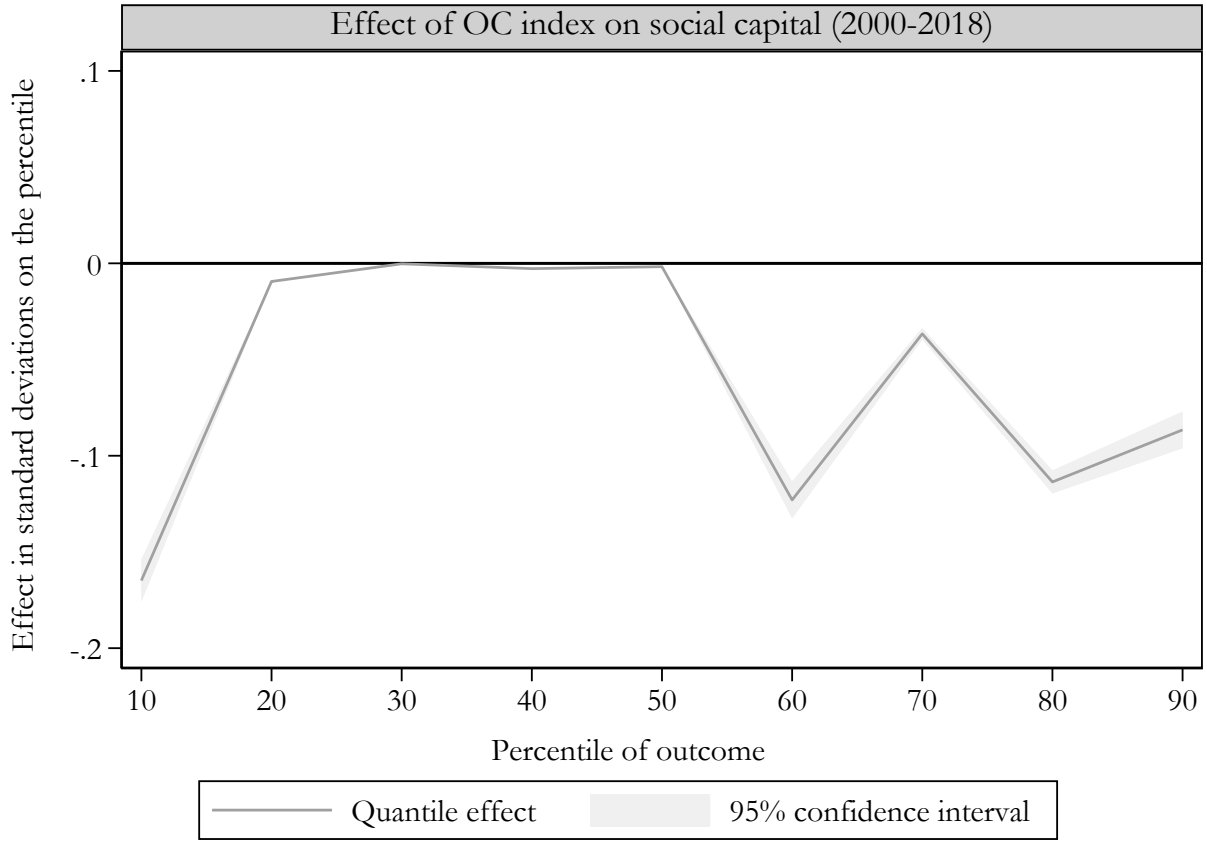
Figure A1: Line plot: exposure to organized crime in Italy (2000–18)



Note: this figure presents the line plot of the exposure to organized crime in Italy between 2000 and 2018. The raw variable takes the value of 1 if exposure is equal to 'none', 2 if exposure is 'a little', 3 if exposure is 'quite a lot', and 4 if exposure is 'a lot'.

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.

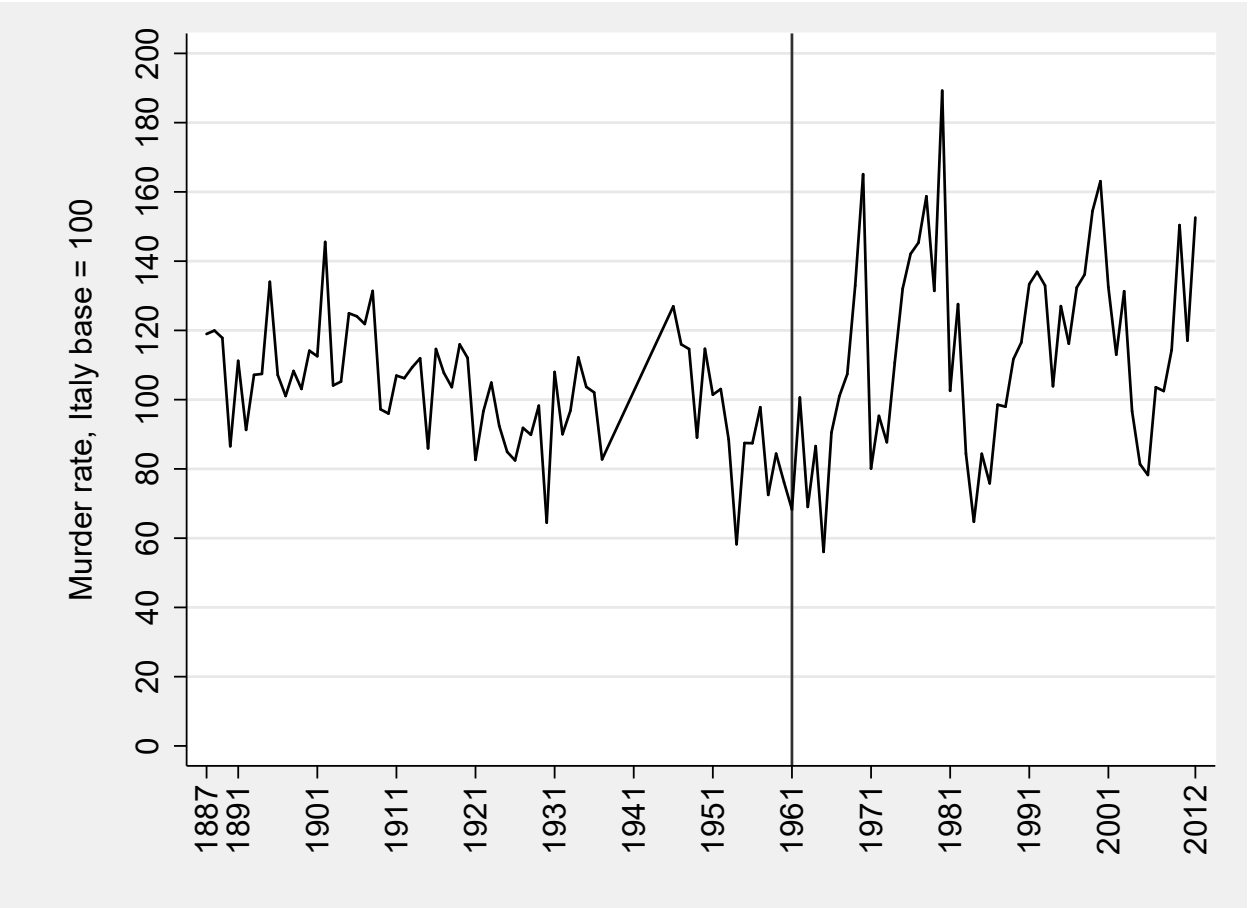
Figure A2: Quantile regression: the effect of organized crime index on social capital (2000–18)



Note: this figure presents the quantile effects of exposure to organized crime on the social capital of individuals interviewed between 2000–03 and 2005–18 for nine deciles with their corresponding 95% confidence intervals (shaded area). The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. The variable of interest is the organized crime index which measures the individual's exposure to organized crime groups' presence and takes the value of 1 if the individual's exposure to organized crime groups is (i) quite a lot or (ii) a lot, for each year, and 0 if the individual's exposure is (iii) none, (iv) a little, or (v) when the individual cannot say. To reach convergence in the calculations and for the excessive computational waiting time, the figure presents a baseline estimate of the outcome on the variable of interest, without controlling for additional variables. Description of all the variables used is presented in section 3. Confidence intervals are constructed based on bootstrapped standard errors (2000 iterations).

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.

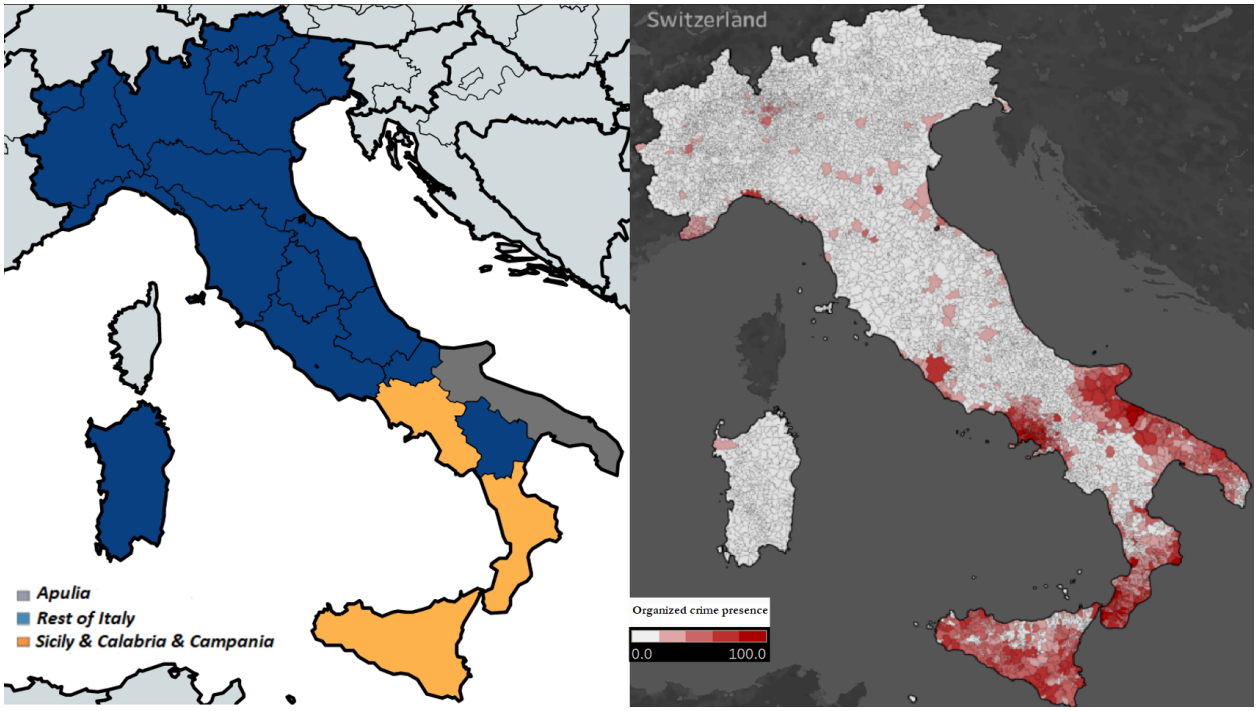
Figure A3: Line plot: murder per 100,000 inhabitants in Apulia, Italy base = 100 (1887–2012)



Note: this figure presents the number of murders per 100,000 inhabitants in Apulia between 1887 and 2012 normalised to the average Italy base-value of 100. Data has been set to missing during World War II between 1939 and 1945.

Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

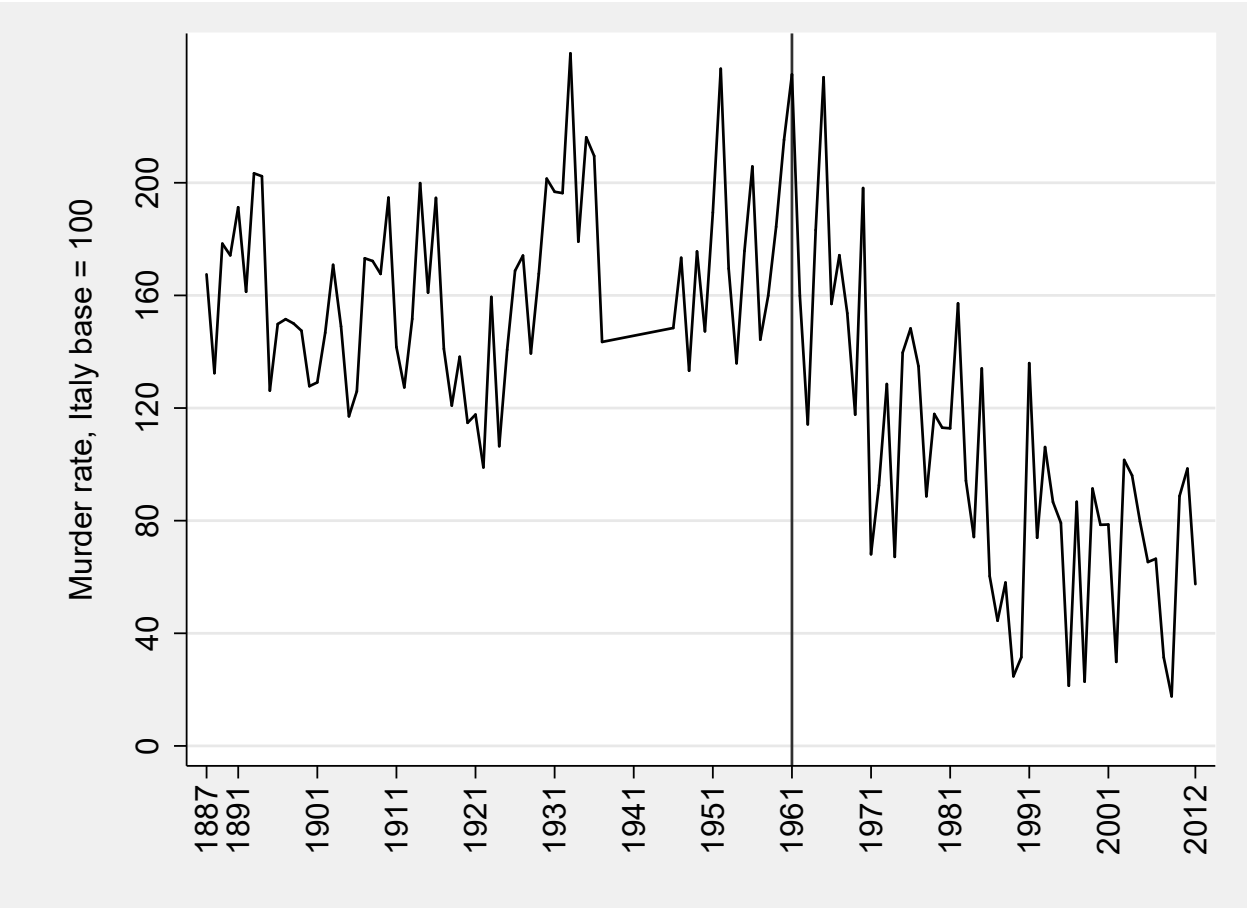
Figure A4: Map: Italy and density of organized crime presence (2000–18)



Note: this figure presents, on the left-hand side, Italy as divided between Mafia historic strongholds in orange (Sicily, Calabria, and Campania), Apulia in grey, and the rest of Italy (in blue). Basilicata is the region between Calabria, Campania, and Apulia in blue. On the right-hand side, the figure presents the density of organized crime presence using a municipality-level indicator we constructed using administrative data between 2000 and 2018. Description of the construction of the municipality-level indicator is in Online Appendix C2.

Source: authors' elaboration based on data described and variables constructed in Online Appendix C2.

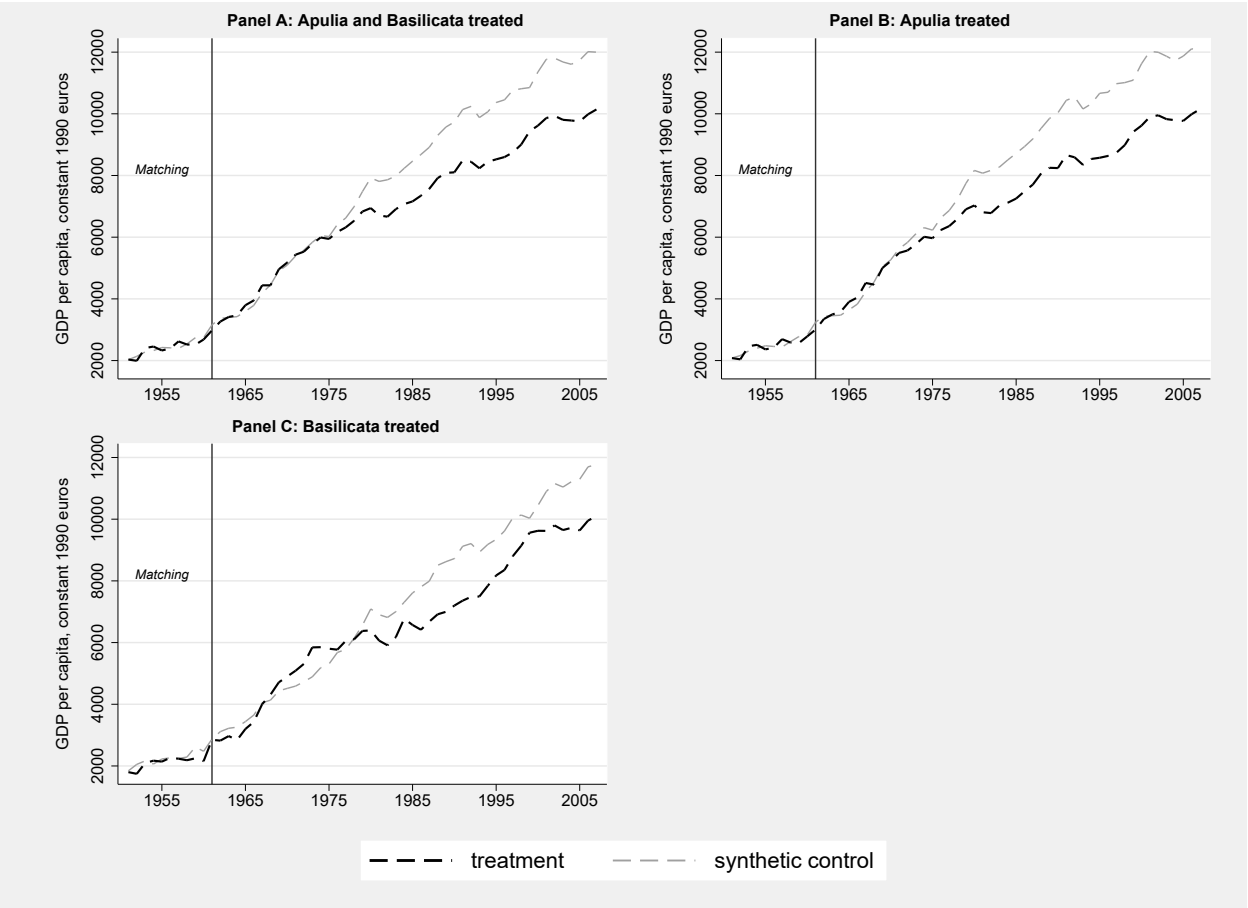
Figure A5: Line plot: murder per 100,000 inhabitants in Basilicata, Italy base = 100 (1887–2012)



Note: this figure presents the number of murders per 100,000 inhabitants in Basilicata between 1887 and 2012 normalised to the average Italy base-value of 100. Data has been set to missing during World War II between 1939 and 1945.

Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

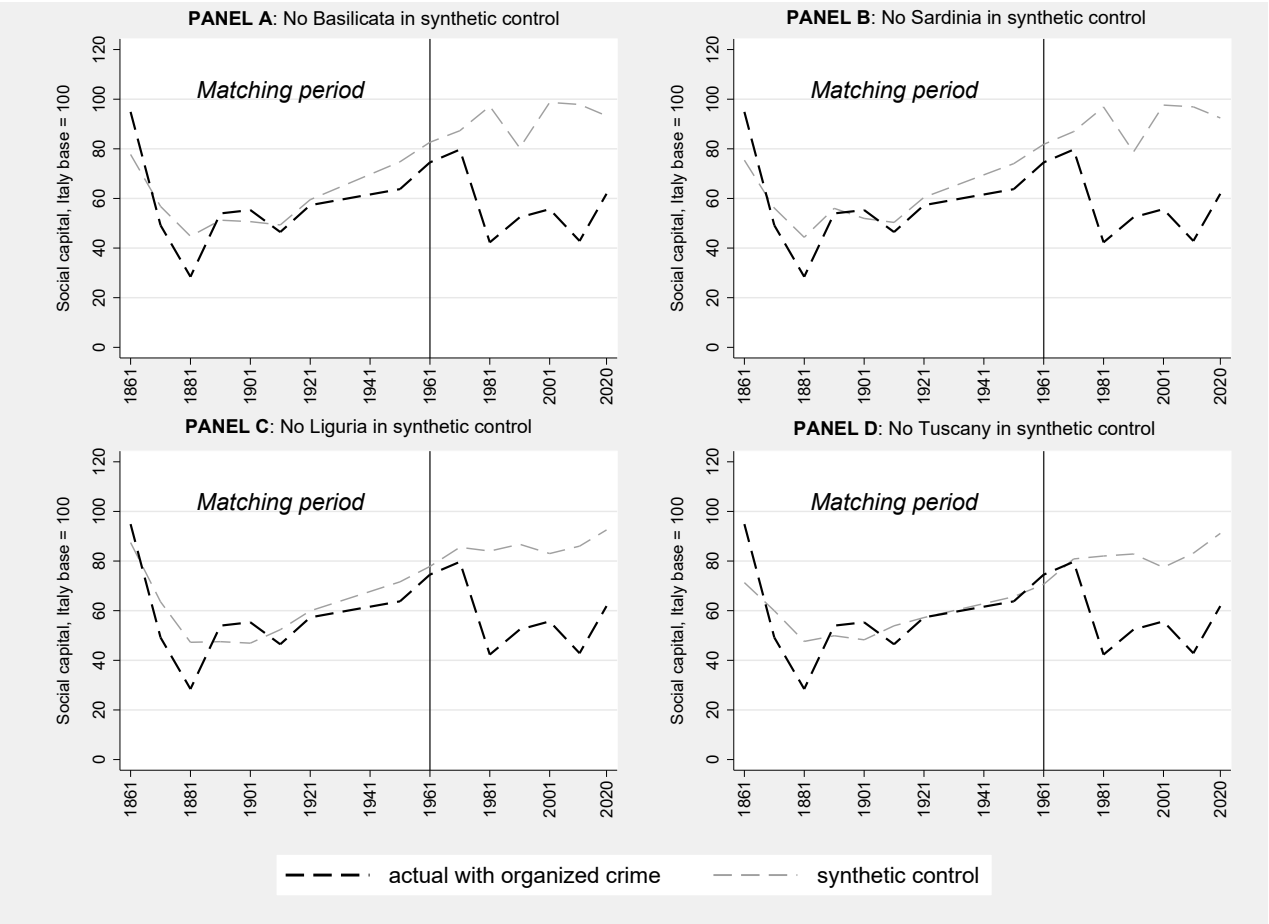
Figure A6: Synthetic: replication of Pinotti (2015) with Basilicata as treatment (1951–2005)



Note: this figure presents three panels which replicate the analysis by Pinotti (2015). In Panel A, we present the synthetic estimates from (Pinotti 2015), who considers as treatment both Apulia and Basilicata. In Panel B, we consider as treatment only Apulia. In Panel C, we consider as treatment only Basilicata.

Source: authors' elaboration based on data kindly publicly provided by Pinotti (2015) and described there.

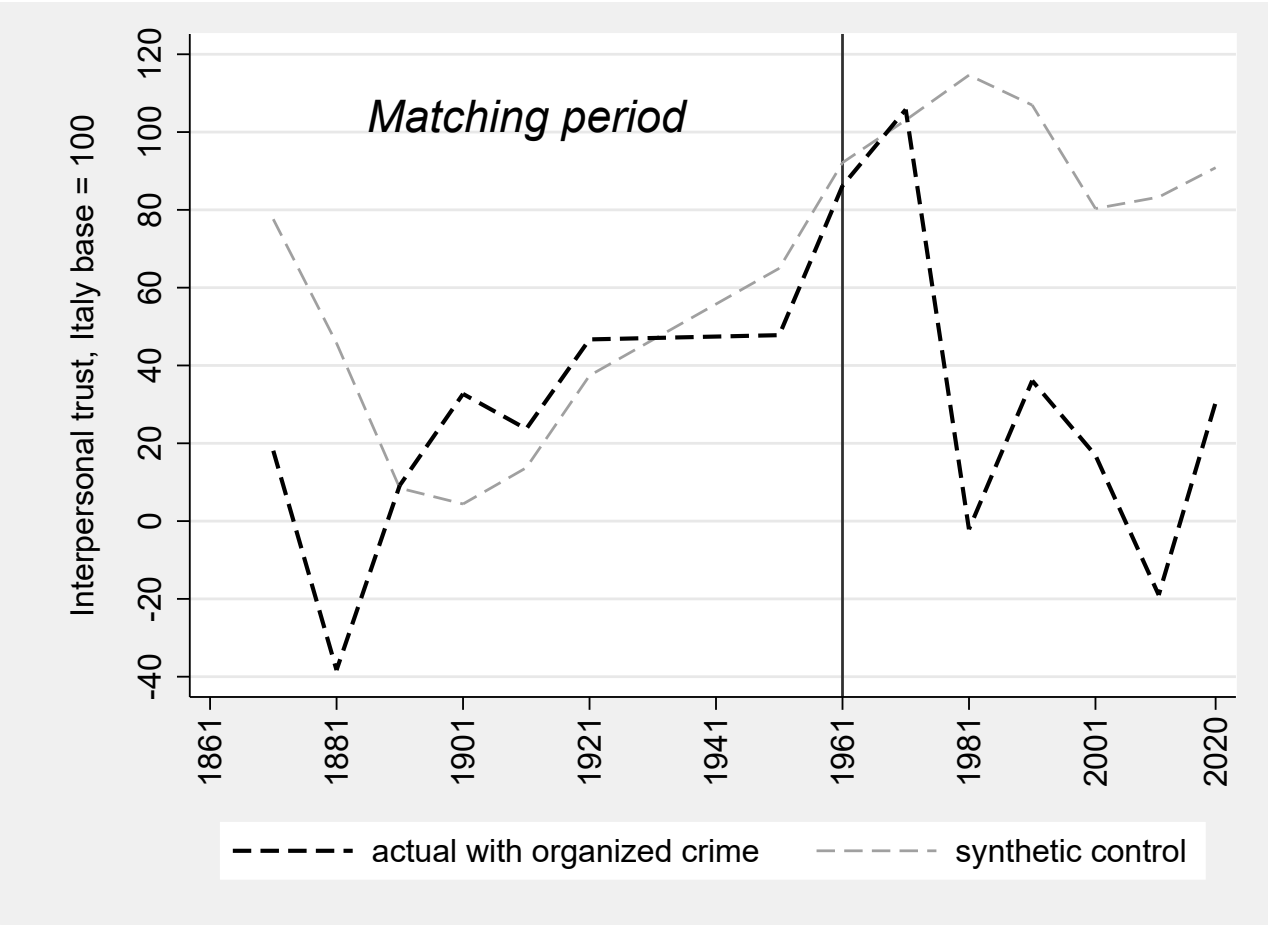
Figure A7: Synthetic control: robustness check (1861–2020)



Note: this figure presents the synthetic control estimates of the effect of the arrival of organized crime groups in Apulia in the 1970s on the social capital of the region compared to a group of synthetic control regions. In Panel A, we drop Basilicata from the pool of synthetic control regions. In Panel B, we drop Sardinia. In Panel C, we drop Liguria. In Panel D, we drop Tuscany. For details on the synthetic control method, see Figure 5.

Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

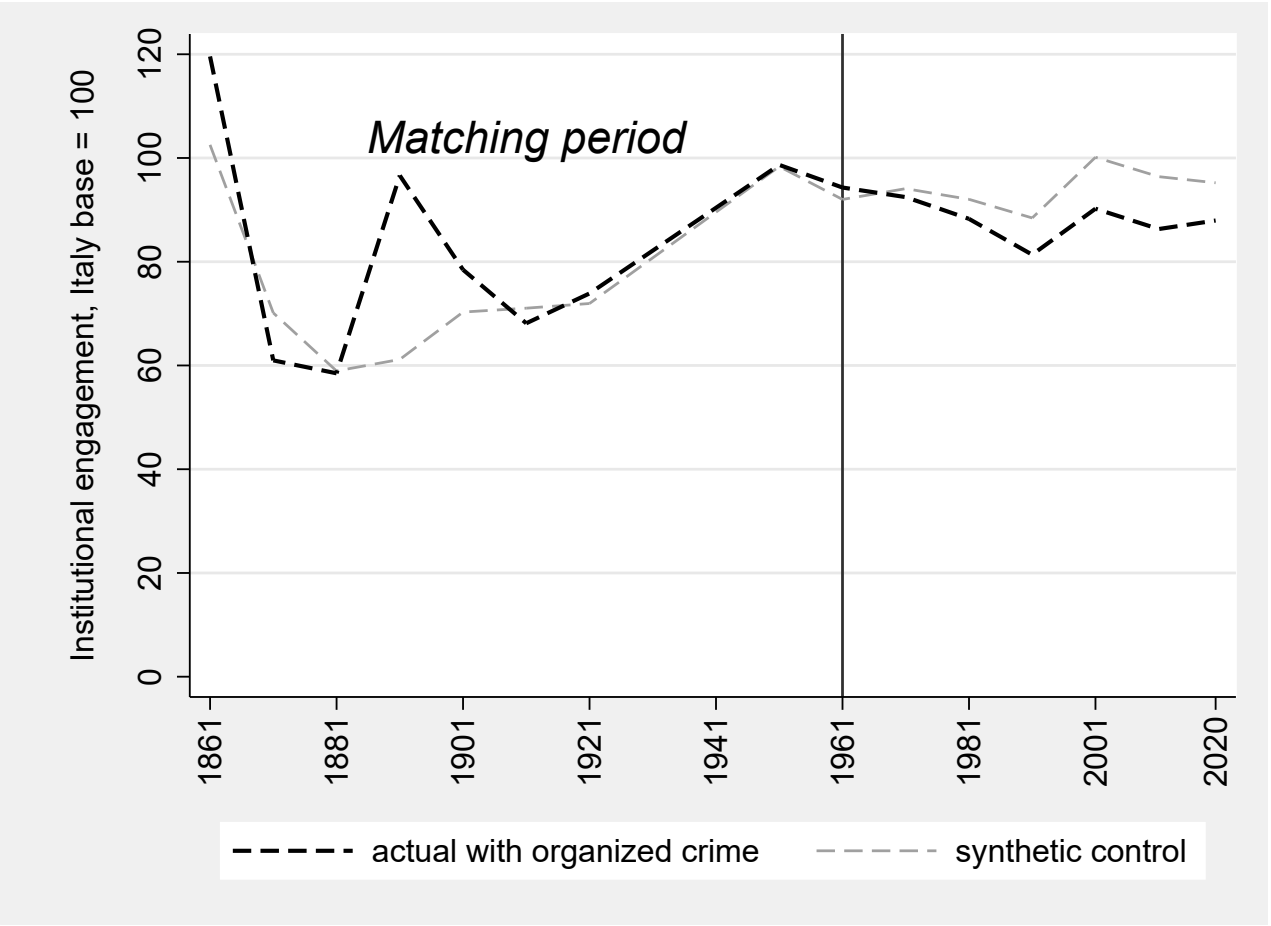
Figure A8: Synthetic control: interpersonal trust in the treated region and in the synthetic control (1861–2020)



Note: this figure presents the synthetic control estimates of the effect of the arrival of organized crime groups in Apulia in the 1970s on the interpersonal trust of the region compared to a group of synthetic control regions. For details on the synthetic control method, see Figure 5.

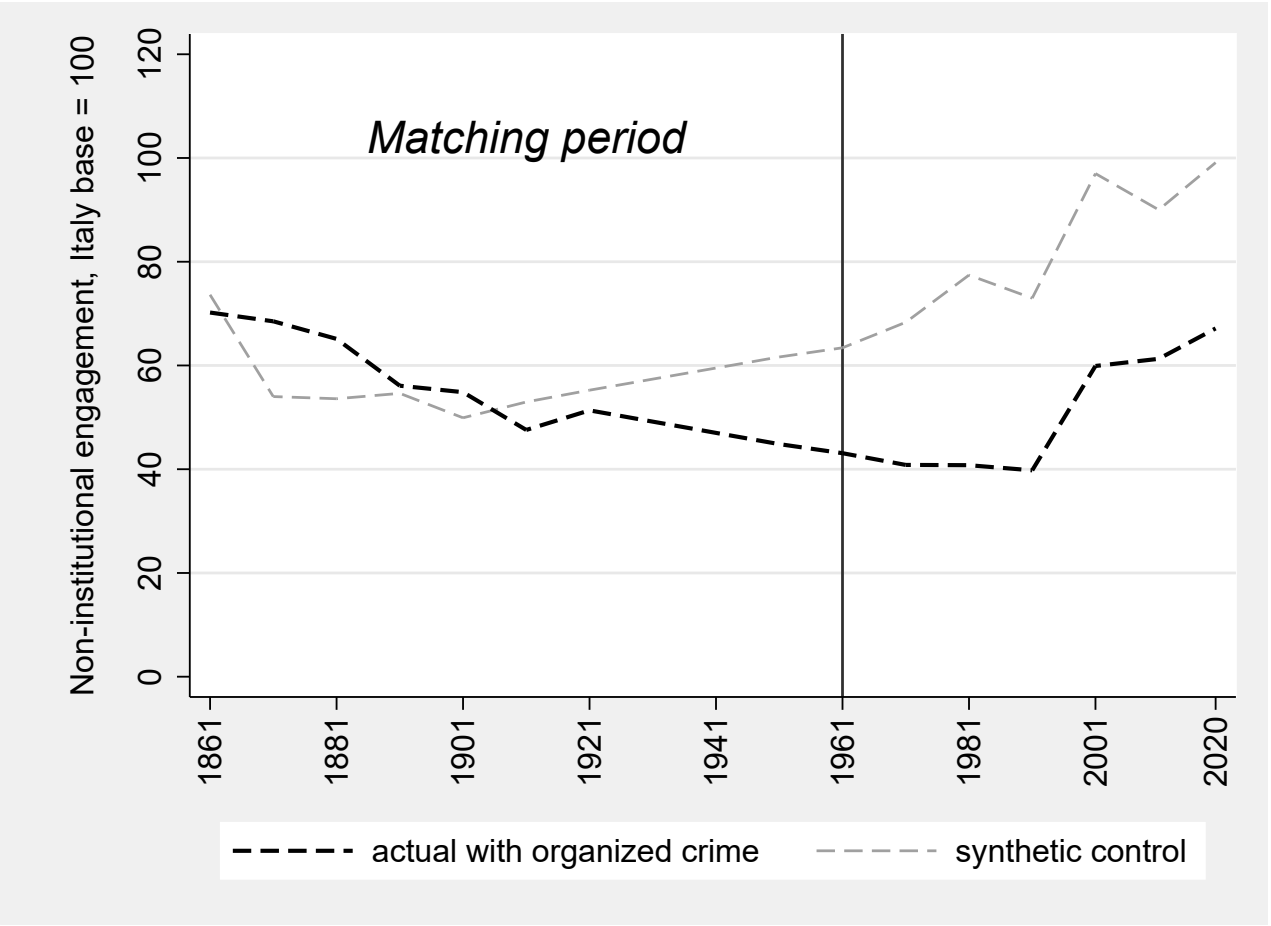
Source: Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

Figure A9: Synthetic control: political participation in the treated region and in the synthetic control (1861–2020)



Note: this figure presents the synthetic control estimates of the effect of the arrival of organized crime groups in Apulia in the 1970s on the political participation of the region compared to a group of synthetic control regions. For details on the synthetic control method, see Figure 5.
Source: Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

Figure A10: Synthetic control: civic engagement in the treated region and in the synthetic control (1861–2020)



Note: this figure presents the synthetic control estimates of the effect of the arrival of organized crime groups in Apulia in the 1970s on the civic engagement of the region compared to a group of synthetic control regions. For details on the synthetic control method, see Figure 5.
Source: Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

Table A1: Summary statistics: socioeconomic indicators of Genoa (2020)

	Genoa (1)	**Italy** (2)
Unemployment rate (15 to 74 years old)	10.0%	10.0%
Income pro-capite	23,684	18,525
Score for literacy skills	204.9	203.6
Life expectancy	82.7	83.0
Political participation at the European elections	56.6%	58.5%
Share of women in the local municipality council	32.3%	32.3%

Note: this table presents a summary statistics of the socioeconomic indicators of Genoa in comparison to Italy.
Source: ISTAT (2020), reused with permission.

Table A2: Summary statistics: social outcomes in Italy (2000–18)

	Obs (1)	Mean (2)	SD (3)	Min (4)	Max (5)
List of variables					
Political participation: attend political meetings	765718	0.01	0.11	0	1
Political participation: volunteered for a party	745008	0.01	0.11	0	1
Political participation: sent money to a political party	745001	0.03	0.16	0	1
Political participation: political rallies	746370	0.06	0.24	0	1
Political participation: attendance demonstration	745144	0.05	0.22	0	1
Political participation: online vote consultations or civic issues	150561	0.10	0.30	0	1
Political participation: volunteered for an union	744640	0.01	0.11	0	1
Political participation: attend union meetings	765718	0.01	0.10	0	1
Civic engagement: activity (social network)	38078	0.04	0.20	0	1
Civic engagement: activity (contact radio or tv)	38078	0.01	0.10	0	1
Civic engagement: activity (local office)	38078	0.07	0.26	0	1
Civic engagement: activity (meeting)	38078	0.06	0.23	0	1
Civic engagement: activity (protest)	38078	0.04	0.19	0	1
Civic engagement: activity (volunteer)	38078	0.05	0.21	0	1
Civic engagement: activity (green project)	38078	0.03	0.16	0	1
Civic engagement: activity (local feast)	38078	0.03	0.17	0	1
Civic engagement: sent money to an association	744530	0.17	0.37	0	1
Civic engagement: volunteered in a CSO	745262	0.10	0.30	0	1
Civic engagement: volunteered in a for-profit CSO	744526	0.04	0.19	0	1
Institutional trust: Italian Parliament	273346	3.50	2.58	0	10
Institutional trust: European Parliament	272948	3.85	2.60	0	10
Institutional trust: regional government	273064	3.62	2.58	0	10
Institutional trust: provincial government	270712	3.53	2.58	0	10
Institutional trust: municipal government	273078	4.48	2.75	0	10
Institutional trust: political parties	272938	2.41	2.39	0	10

Table A2: Summary statistics: social outcomes in Italy (2000–18)

	Obs (1)	Mean (2)	SD (3)	Min (4)	Max (5)
Institutional trust: judicial authorities	272846	4.27	2.68	0	10
Institutional trust: police and military	273367	6.44	2.38	0	10
Institutional trust: don't evade taxes	37233	8.66	2.02	0	10
Institutional trust: unjustifiable to evade taxes	37363	0.69	0.46	0	1
Institutional trust: ask for fiscal receipt	37156	0.63	0.48	0	1
Institutional trust: don't pay under the table	37132	0.58	0.49	0	1
Institutional trust: don't offer money or in-kind in exchange of favours	37286	9.37	1.43	0	10
Institutional trust: don't receive money or in-kind in exchange of votes	37264	9.46	1.36	0	10
Institutional trust: don't agree corruption is natural and inevitable	37046	3.20	0.99	1	4
Institutional trust: don't agree it is useless to denounce corruption	37087	2.90	1.07	1	4
Institutional trust: important to respect the law	37244	2.56	0.57	0	3
Institutional trust: important to live honestly	37289	2.70	0.49	0	3
Interpersonal trust - trust the proximate: can count on relatives	238387	0.51	0.50	0	1
Interpersonal trust - trust the proximate: can count on friends	223629	0.74	0.44	0	1
Interpersonal trust - trust the proximate: can count on neighbours	237670	0.63	0.48	0	1
Interpersonal trust - trust in others: trust majority of people	356804	0.22	0.41	0	1
Interpersonal trust - trust in others: wallet returned by neighbour	355632	1.97	0.95	0	3
Interpersonal trust - trust in others: wallet returned by police	355742	2.23	0.83	0	3
Interpersonal trust - trust in others: wallet returned by stranger	354955	0.67	0.74	0	3
Interpersonal trust: not important to think of her own interest	37055	2.54	0.79	1	4
Interpersonal trust: not important to put the family first	37154	1.89	0.80	1	4
Interpersonal trust: not important to have individual success	37064	2.91	0.85	1	4
Interpersonal trust: important to help the most disadvantaged	37135	2.23	0.58	0	3

Note: this table shows the summary statistics of the social outcomes in Italy between 2000 and 2003 and between 2005 and 2018.
Source: author's elaboration based on data from ISTAT (2019).

Table A3: Correlation matrix of organized crime indicators (2000–18)

	Correlation between OC index and administrative indicators
OC index	1
Police reports	0.1657
Economic presence	0.0799
Economic presence (Mafia)	0.0625
Economic presence (foreign)	0.0742
Political presence	0.0200
Violent presence	0.0875
Violent presence (Mafia)	0.1058
Violent presence (foreign)	-0.0076

Note: this table presents the correlation matrix between the dummy for the exposure to organized crime (OC index) and the municipality-level administrative indicators for the period between 2000–03 and 2005–18.

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.

Table A4: Summary statistics: exposure to organized crime groups in Italy (2000–18)

	Obs (1)	Mean (2)	SD (3)	Min (4)	Max (5)
Exposure to organized crime divided by region					
abruzzo	32272	0.21	0.40	0.00	1.00
basilicata	24600	0.11	0.31	0.00	1.00
calabria	38352	0.19	0.40	0.00	1.00
campania	58356	0.47	0.50	0.00	1.00
emilia romagna	43308	0.30	0.46	0.00	1.00
friuli venezia giulia	26627	0.19	0.40	0.00	1.00
lazio	42255	0.39	0.49	0.00	1.00
liguria	29041	0.27	0.44	0.00	1.00
lombardia	64444	0.35	0.48	0.00	1.00
marche	31412	0.21	0.41	0.00	1.00
molise	23405	0.12	0.32	0.00	1.00
piemonte	51077	0.31	0.46	0.00	1.00
puglia	46675	0.31	0.46	0.00	1.00
sardegna	32616	0.15	0.36	0.00	1.00
sicilia	49786	0.24	0.43	0.00	1.00
toscana	43178	0.27	0.44	0.00	1.00
trentino alto adige/südtirol	42627	0.13	0.33	0.00	1.00
umbria	23663	0.31	0.46	0.00	1.00
valle d aosta/vallee d aoste	16243	0.14	0.35	0.00	1.00
veneto	45781	0.33	0.47	0.00	1.00
Total	765718	0.27	0.45	0.00	1.00

Note: this table shows the summary statistics of the social outcomes in Italy between 2000 and 2003 and between 2005 and 2018.

Source: authors' elaboration based on data from ISTAT (2019).

Table A5: Cross-sectional OLS: the effect of social capital on presence of Peasant *Fasci* organisation (1885–93)

	Presence of Peasant *Fasci* in 1893 (1)	Presence of Peasant *Fasci* in 1893 (2)	Presence of Peasant *Fasci* in 1893 (3)
Social capital 1885	-0.002	0.019	0.014
	(0.040)	(0.040)	(0.040)
Base model	Yes	Yes	Yes
Control variables	No	Yes	Yes
Province FE	No	No	Yes
Observations	154	138	138
R^2	0.000	0.305	0.355

Note: this table presents the OLS estimates of the effect of social capital in 1885 on a dummy equal to 1 if in the municipality there is the presence of a Peasant *Fasci* organisation in 1893. The independent variables is standardised with mean 0 and SD 1. The dependent variable's data come from De Feo et al. (2019). Column (1) presents the base-model. Column (2) adds the same set of geographic control variables as in De Feo et al. (2019). Column (3) adds province fixed effects. Standard errors in parentheses clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data and variables described in Section 4.1 and in Online Appendix C1.

Table A6: Pooled OLS: the effect of organized crime index on social capital (2000–18)

	OC index β/SE (1)	Oster β (2)	RW p-value (3)	R^2 (4)	Obs (5)
Outcomes of interest					
Social capital aggregate index	-0.067***	-0.057		0.074	765718
	(0.004)				
Political participation: participate politics	-0.013***	-0.003	0.018	0.034	765718
	(0.004)				
Political participation: participate unions	0.001	0.000	0.863	0.016	765718
	(0.003)				
Civic engagement: social activities	0.030*	0.034	0.182	0.046	38078
	(0.016)				
Civic engagement: CSOs	0.018***	0.037	0.001	0.099	746651
	(0.004)				
Institutional trust: political institutions	-0.207***	-0.220	0.001	0.038	273698
	(0.008)				
Institutional trust: other institutions	-0.164***	-0.179	0.001	0.028	273732
	(0.010)				
Institutional trust: respect the law	-0.058***	-0.073	0.003	0.080	37593
	(0.017)				
Interpersonal trust: proximate	-0.052***	-0.040	0.001	0.070	238609
	(0.009)				
Interpersonal trust: others	-0.166***	-0.156	0.001	0.094	357871
	(0.007)				
Interpersonal trust: altruism	-0.016	-0.017	0.650	0.059	37329
	(0.019)				

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed between 2000–03 and 2005–18. All estimates show results from the pooled OLS regressions based on Equation 1. The dependent variables are standardised with mean 0 and standard deviation 1. The dependent variables are the social aggregate index and the mean indices that compose it. The variable of interest is the organized crime index. Each row is a regression in which the outcome Y is in the row and the independent variable X is in the column. Column (1) presents the β effect. Column (2) presents the Oster bias-adjusted β. Column (3) presents the Romano and Wolf p-values. Column (4) presents the R^2. Column (5) presents the number of observations. The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data described and variables constructed in Section 3 and Online Appendix C1.

Table A7: Pooled OLS: the effect of organized crime index on political participation (2000–18)

	OC index β/SE (1)	Oster β (2)	RW p-value (3)	R^2 (4)	Obs (5)
Panel A: participate politics					
Mean index	-0.013***	-0.003		0.034	765718
	(0.004)				
Attend political meetings	-0.007**		0.112	0.013	765718
	(0.003)				
Volunteer in a political party	-0.007**		0.104	0.011	745008
	(0.003)				
Send money to a political party	-0.014***		0.003	0.024	745001
	(0.004)				
Voted online	0.005		0.644	0.024	150561
	(0.008)				
Participate in political rallies	-0.010**		0.112	0.045	746370
	(0.005)				
Participate in demonstrations	-0.005		0.644	0.026	745144
	(0.006)				
Panel B: participate unions					
Mean index	0.001	0.000		0.016	765718
	(0.003)				
Attend union meetings	0.003		0.516	0.011	765718
	(0.003)				
Volunteer in an union	-0.003		0.516	0.012	744640
	(0.003)				

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the political participation of individuals interviewed between 2000–03 and 2005–18. All estimates show results from the pooled OLS regressions based on Equation 1. Each row is a regression in which the outcome Y is in the row and the independent variable X is in the column. Column (1) presents the β effect. Column (2) presents the Oster bias-adjusted β. Column (3) presents the Romano and Wolf p-values. Column (4) presents the R^2. Column (5) presents the number of observations. The dependent variables are standardised with mean 0 and standard deviation 1. The dependent variables are the mean indices of political participation: participate in politics and participate in unions, along with their single components. The variable of interest is the organized crime index, which measures the individual's exposure to organized crime groups' presence and takes the value of 1 if the individual's exposure to organized crime groups is (i) quite a lot or (ii) a lot, for each year, and 0 if the individual's exposure is (iii) none, (iv) a little, or (v) when the individual cannot say. The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data described and variables constructed in Section 3 and Online Appendix C1.

Table A8: Pooled OLS: the effect of organized crime index on civic engagement (2000–18 with gaps)

	OC index β/SE (1)	Oster β (2)	RW p-value (3)	R^2 (4)	Obs (5)
Panel A: social activities					
Mean index	0.030*	0.034		0.046	38078
	(0.016)				
Discuss on social network local issues	0.036***		0.028	0.026	38078
	(0.012)				
Contact radio/TV for local issues	-0.001		0.959	0.008	38078
	(0.014)				
Contact local office for local issues	0.051***		0.004	0.030	38078
	(0.015)				
Participate to meetings	0.012		0.784	0.030	38078
	(0.015)				
Participate to protest	0.019		0.536	0.018	38078
	(0.013)				
Volunteer	0.022		0.531	0.028	38078
	(0.014)				
Participate to green activity	-0.005		0.920	0.013	38078
	(0.015)				
Organize local event	-0.012		0.784	0.021	38078
	(0.012)				
Panel B: CSOs					
Mean index	0.018***	0.037		0.099	746651
	(0.004)				
Volunteer in a CSO	0.020***		0.001	0.050	745262
	(0.004)				
Volunteer in a for-profit CSO	0.006*		0.067	0.037	744526
	(0.003)				
Send money to a CSO	0.013***		0.011	0.097	744530
	(0.004)				

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the civic engagement of individuals interviewed between 2000–03 and 2005–18. The dependent variables are standardised with mean 0 and standard deviation 1. The dependent variables are the mean indices of civic engagement: social activities, political interests, and CSOs, along with their single components. For all Table details, see Appendix Table A7.

Source: authors' elaboration based on data described and variables constructed in Section 3 and Online Appendix C1.

Table A9: Pooled OLS: the effect of organized crime index on institutional trust (2010–18 with gaps)

	OC index β/SE (1)	Oster β (2)	RW p-value (3)	R^2 (4)	Obs (5)
Panel A: political institutions					
Mean index	-0.207***	-0.220		0.038	273698
	(0.008)				
Europe	-0.170***		0.001	0.029	272948
	(0.008)				
Italy	-0.177***		0.001	0.032	273346
	(0.008)				
Region	-0.177***		0.001	0.050	273064
	(0.008)				
Province	-0.180***		0.001	0.063	270712
	(0.008)				
Municipality	-0.189***		0.001	0.081	273078
	(0.008)				
Political party	-0.171***		0.001	0.028	272938
	(0.008)				
Panel B: other institutions					
Mean index	-0.164***	-0.179		0.028	273732
	(0.010)				
Judicial	-0.175***		0.001	0.030	272846
	(0.009)				
Police	-0.111***		0.001	0.032	273367
	(0.009)				
Panel C: respect the law					
Mean index	-0.058***	-0.073		0.080	37593
	(0.017)				
Don't evade taxes	-0.071***		0.001	0.047	37233
	(0.017)				
Unjustifiable to evade taxes	-0.096***		0.001	0.036	37363
	(0.017)				
Ask for fiscal receipt	-0.022		0.607	0.045	37156
	(0.018)				
Don't pay under the table	-0.030*		0.377	0.026	37132
	(0.017)				
Don't offer money or in-kind for favours	0.003		0.991	0.041	37286
	(0.019)				
Don't receive money or in-kind for votes	0.001		0.991	0.041	37264
	(0.020)				
Don't agree corruption is natural	-0.033*		0.377	0.031	37046
	(0.019)				
Don't agree is useless to denounce corruption	-0.107***		0.001	0.032	37087
	(0.020)				
Important to respect the law	-0.002		0.991	0.058	37244
	(0.017)				
Important to live honestly	0.033*		0.353	0.060	37289
	(0.018)				

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the institutional trust of individuals interviewed between 2000–03 and 2005–18. The dependent variables are standardised with mean 0 and standard deviation 1. The dependent variables are the mean indices of institutional trust: trust towards political institutions, trust towards other institutions, and respect the law, along with their single components. For all Table details, see Appendix Table A7.

Source: authors' elaboration based on data described and variables constructed in Section 3 and Online Appendix C1.

Table A10: Pooled OLS: the effect of organized crime index on interpersonal trust (2010–18 with gaps)

	OC index β/SE (1)	Oster β (2)	RW p-value (3)	R^2 (4)	Obs (5)
Panel A: trust the proximate					
Mean index	-0.052***	-0.040		0.070	238609
	(0.009)				
Relatives	-0.041***		0.001	0.049	238387
	(0.009)				
Friends	-0.033***		0.001	0.109	223629
	(0.008)				
Neighbours	-0.048***		0.001	0.024	237670
	(0.009)				
Panel B: trust in others					
Mean index	-0.166***	-0.156		0.094	357871
	(0.007)				
Majority	-0.148***		0.001	0.041	356804
	(0.007)				
Wallet returned by neighbour	-0.120***		0.001	0.078	355632
	(0.010)				
Wallet returned by police	-0.093***		0.001	0.046	355742
	(0.008)				
Wallet returned by strangers	-0.094***		0.001	0.048	354955
	(0.008)				
Panel C: altruism					
Mean index	-0.016	-0.017		0.059	37329
	(0.019)				
Not important to think of own interests	-0.014		0.443	0.046	37055
	(0.017)				
Not important to put family first	-0.024		0.334	0.049	37154
	(0.019)				
Not important individual success	0.032*		0.199	0.074	37064
	(0.018)				
Important to help most disadvantaged	-0.035**		0.110	0.025	37135
	(0.016)				

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the interpersonal trust of individuals interviewed between 2000–03 and 2005–18. The dependent variables are standardised with mean 0 and standard deviation 1. The dependent variables are the mean indices of interpersonal trust: trust the proximate, trust in others, and altruism, along with their single components. For all Table details, see Appendix Table A7.

Source: authors' elaboration based on data described and variables constructed in Section 3 and Online Appendix C1.

Table A11: Pooled OLS: the heterogeneous effect of organized crime index on social capital (2000–18)

	Social capital aggregate index		
	β/SE	R^2	Obs
	(1)	(2)	(3)
Organized crime index	-0.067***	0.074	765718
	(0.004)		
Stronghold regions	-0.059***	0.069	193169
	(0.009)		
Non stronghold regions	-0.079***	0.065	572549
	(0.005)		
Violent presence $>$ 75th pct	-0.059***	0.072	185229
	(0.008)		
Violent Mafia presence $>$ 75th pct	-0.058***	0.072	186927
	(0.008)		
Violent foreign presence $>$ 75th pct	-0.063***	0.074	183177
	(0.008)		
Political Mafia presence	-0.059	0.196	2684
	(0.041)		
Economic presence $>$ 75th pct	-0.063***	0.064	186370
	(0.008)		
Economic Mafia presence $>$ 75th pct	-0.079***	0.079	136644
	(0.011)		
Economic foreign presence $>$ 75th pct	-0.066***	0.062	182485
	(0.008)		
Number of Mafia groups $>$ 1	-0.127***	0.106	22321
	(0.026)		
Free State-Comune	-0.081***	0.068	114977
	(0.011)		
Bishop city-Comune	-0.067***	0.073	279637
	(0.007)		
Gold medal vs Nazi	-0.066***	0.065	49103
	(0.022)		
Small municipality size	-0.064***	0.085	276950
	(0.007)		

Note: this table presents the heterogeneous pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed between 2000–03 and 2005–18. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. For all the Table details, see Figure 4.

Source: authors' elaboration based on data described and variables constructed in Section 4.3 and Online Appendix C1.

Table A12: Cross-sectional OLS: the effect of social capital on number of resettled Mafiosi per 100,000 inhabitants (1968–72)

	Number resettled Mafiosi in 1972	Number resettled Mafiosi in 1972	Number resettled Mafiosi in 1972
	(1)	(2)	(3)
Social capital 1968–72	-0.432	0.106	0.346
	(0.438)	(0.433)	(0.345)
Base model	Yes	Yes	Yes
Control variables	No	Yes	Yes
Region FE	No	No	Yes
Observations	70	70	70
R^2	0.015	0.394	0.788

Note: this table presents the OLS estimates of the effect of social capital between 1968 and 1972 on the number of resettled Mafiosi per 100,000 inhabitants in a province in 1972. Both the dependent and the independent variables are standardised with mean 0 and SD 1. The dependent variable is the number of resettled Mafiosi prior to 1972 in each province in Italy with data from Scognamiglio (2018). Data excludes the Mafia historic strongholds (Sicily, Calabria, and Campania). The variable of interest is the social capital aggregate index between 1968 and 1972. Column (1) presents the base model. Column (2) adds the full list of control variables from the census in 1951 (ISTAT). Column (3) adds region fixed effects. Description of all the variables used is in Section 4.5 and in Online Appendix C1. Standard errors in parentheses clustered at the province level with the borders of provinces in 1968. *p <10%, **p <5%, ***p <1%.

Source: see note just above.

Table A13: Synthetic control: pre-treatment characteristics in Apulia and in the synthetic control (average 1861–1961)

Pre-treatment characteristics	Apulia (1)	Synthetic control (2)
Social capital aggregate index (Italy base - 100)	58.21	61.53
Precentage of female population	.49	.50
Average household size	4.1	4.06
Population size	2137111	899997
GDP per capita (Italy base - 100)	87.12	82.99
Productivity per capita (Italy base - 100)	95.37	83.91
Occupation rate (Italy base - 100)	91.50	100.43
HDI per capita (Italy base - 1)	.42	.42
Value added per capita (Italy base - 1)	.84	.82
Value added in industry per capita active population (in mln)	218.88	213.14
Share of occupation in the industry	22.63	20.15
Share of occupation in the agriculture	61.86	65.19
Share of occupation in other sectors	15.50	14.65
Outflow migration per capita	.006	.0129
Number of railways per 100,000 inhabitants	53.70	62.88
Number of roads per 100,000 inhabitants	275.33	383.53
Percentage of individuals that live in mountains (coastal or internal)	.015	.419
Percentage of individuals that live in small municipalities	.183	.465

Note: this table presents a comparison of the characteristics of Apulia and its synthetic control between 1861 and 1961. Column (1) presents the average value in Apulia. Column (2) presents the average value in the synthetic control. For details on the synthetic control method, see Figure 5.

Source: authors' calculations based on the data described and variables constructed in Section 4.5 and Online Appendix C1.

Table A14: Synthetic control: differences in social capital between the treated unit and the synthetic control (1861–2020)

Time period	**Apulia**	**Synthetic control**	**Gap in %**
1861–71	94.89	85.91	10.45
1871–81	49.19	62.25	-20.98
1881–91	28.44	46.68	-39.07
1891–1901	53.97	48.80	10.58
1901–11	55.33	47.06	17.57
1911–21	46.47	52.78	-11.95
1921–51	57.31	59.61	-3.85
1951–61	63.76	69.40	-8.12
1961–71	74.53	75.62	-1.44
1971–81	79.69	84.31	-5.47
1981–91	42.31	83.34	-49.22
1991–2001	52.41	85.07	-38.38
2001–11	55.67	80.65	-30.96
2011–20	52.36	88.40	-41.10

Note: this table presents a comparison of the levels of social capital between Apulia (treated) and its synthetic control between 1861 and 2020, every decade. For details on the synthetic control method, see Figure 5.

Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

Table A15: Synthetic control: differences in institutional trust between the treated unit and the synthetic control (1973–2001)

Year	Apulia	Control regions	Gap in %
1973	95.67	95.25	0.44
1976	92.63	103.83	-10.78
1977	88.41	105.75	-16.39
1978	96.21	101.22	-4.94
1979	97.05	99.37	-2.33
1980	94.44	102.56	-7.91
1981	96.71	100.75	-4.00
1982	98.02	101.25	-3.18
1983	95.14	101.98	-6.70
1984	92.70	102.16	-9.26
1985	95.28	102.33	-6.89
1986	100.36	100.00	.36
1987	93.32	105.22	-11.30
1988	100.76	99.58	1.18
1989	91.34	105.78	-13.65
1990	97.56	99.03	-1.49
1991	100.06	102.17	-2.06
1992	99.58	103.24	-3.54
1993	96.13	98.83	-2.73
1994	88.21	113.83	-22.50
1995	92.41	104.89	-11.89
1997	89.71	101.85	-11.91
1998	95.12	105.83	-10.11
1999	87.72	106.28	-17.46
2000	92.17	108.01	-14.66
2001	95.93	99.52	-3.61

Note: this table presents a comparison of the levels of institutional trust between Apulia (treated) and the control regions used in the synthetic control between 1973 and 2001, with gaps.

Source: authors' elaboration based on data described and variables constructed in Section 4.5 and Online Appendix C1.

Table A16: Summary statistics: specialists and community leaders (2021–22)

	Total number (1)	**Average age (in years)** (2)	**Share of female** (3)
Panel A: Specialists			
Academics	17	40.4	29.41%
Police, army, and prosecutors	7	55.5	14.28%
Panel B: Community leaders			
Members of residents' associations	7	56.14	71.42%
CSO volunteers	13	51.69	46.15%
Business owners	8	49.37	62.50%
Local politicians	2	45	50.0%

Note: this table presents a summary statistics of the interviewees. In Panel A we present the summary statistics for the specialists. In Panel B we present the summary statistics for the community leaders. Column (1) presents the total number of interviewees. Column (2) presents the average age in years. Column (3) presents the share of female interviewees for each group.

Source: author's elaboration on collected qualitative data described in Section 5 (available upon request).

Table A17: Pooled OLS: mediation analysis on civic engagement (2000–18)

	Mechanism relevance	Adding the mechanism		Mediation
	The effect of OC index on M (1)	The effect of OC index on Y (2)	The effect of OC index + M on Y (3)	(1) X (3) / (2) in % (4)
OC index (direct effect)		0.019***	0.019***	93.35
		(0.004)	(0.004)	
Propensity to investment: small children	-0.005***		-0.068***	1.73
	(0.001)		(0.005)	
Propensity to investment: house ownership	-0.007***		0.031***	0.99
	(0.002)		(0.005)	
State capacity: CSOs presence	-0.020***		0.040***	3.94
	(0.003)		(0.009)	

Note: this table presents the mediation analysis for civic engagement of the individuals interviewed between 2000–03 and 2005–18. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the civic engagement aggregate index. Column (1) presents the effect of the OC index on the mechanism. Column (2) presents the estimate from the baseline pooled OLS regression based on Equation 1. Column (3) presents the effect of the OC index and the mechanisms on social capital. Column (4) calculates the mediating effect as the product between Column (1) and Column (3), all divided by Column (2). To calculate the mediating effect of the OC index (direct effect on the table), the calculation is simply Column (3) divided by Column (2). The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. Standard errors in parentheses clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data described and variables constructed in Section 5 and Online Appendix C1.

B Validity and robustness checks

B1 Coefficient stability test

We follow Oster (2019) to test if the organized crime index coefficient changes based on the inclusion of observed controls. We can obtain bias-adjusted β under the assumption that the relationship between the organized crime index and unobservables can be recovered from the relationship between the organized index and the observables. This can be done empirically by assuming a value for the relative degree of selection on observed and unobserved variables (δ), unknown a priori, and a value for the R-squared of the regression, which includes the variable of interest, the observables, and the unobservables ($R_{\max}$), which are also unknown.

The bias-adjusted β is calculated as the following:

$$\beta^* = \tilde{\beta} - \delta\left(\beta - \tilde{\beta}\right) * \frac{\left(R_{\max} - \tilde{R}\right)}{\left(\tilde{R} - R\right)}$$

where $\tilde{\beta}$ and $\tilde{R}$ are the organized crime index coefficient and the R-squared obtained from the regression after the inclusion of all observable covariates, while β and R are the organized crime index coefficient and the R-squared resulting from the regression without covariates.

$R_{\max}$ is the R-squared of a hypothetical regression in which we can control for both observed and unobserved variables, where $R_{\max} = \pi\tilde{R}$. Essentially, it represents the effect of adding unobservables on the explanatory power of our outcome of interest. Oster (2019) recommends $R_{\max}$ to be equal to 1.3 $\tilde{R}$. In other words, the proportional importance of the unobservables in explaining the outcome is somewhat less than the observables (with the observables this time—as opposed to the calculation of the δ—including the organized index). The logic is appealing as the observables added were chosen as the most relevant ones to explain the variation in the outcome. This intuition has been validated by simulations applied to randomised controlled trial studies (Oster 2019).

δ is the proportional importance of the unobservables in explaining the organized crime index in comparison to the observables. Simulations shown by Oster (2019) suggest that δ=1 to be an appropriate bound (ratio 1:1). Unobservables and observables are then symmetric in their impact on the organized crime index.

B2 Romano Wolf step-down procedure

The tables in the main text present results of the single dimensions of social capital aggregated in the mean index. We also show estimates for each dimension accounting for FWER using the Romano Wolf adjustment (J. P. Romano and Wolf 2005). This method was applied as follows.

First, the method places each outcome of interest in a group of related outcomes. In our case, for instance in the vase of the variable measuring political participation, one group of outcomes is composed by participation in politics outcomes and the other as participation in unions outcomes, as in the main specifications. Second, this method calculates a t-statistic of the relationship between the exposure to organized crime and the outcome of interest, for each outcome. Third, within each group, the estimated t-statistics are ordered from largest to smallest. Fourth, using bootstrapping we replicate the t-test of the effect of exposure to organized crime on one outcome 5,000 times. We then compare the distribution of the bootstrapped t-statistic with the original t-statistic. The Romano Wolf p-value reported in the tables is the probability of the original t-statistic being larger than the bootstrap distribution of t-statistics.

If, by chance, this probability is below p=0.1, we reject this joint null hypothesis, remove the most significant hypothesis, and test the other single outcomes that remain in the group (the ones with a lower original t-statistic). This procedure of dropping the most significant hypothesis continues until either the hypothesis fails to be rejected or only one hypothesis remains.

B3 Selection on observables

Appendix Table B1 shows how the effect of exposure to organized crime groups changes when adding different sets of control variables. Column (1) presents the base results. Column (2) includes individual-level conservative controls, which comprise age and gender and whether the individual is married. Column (3) includes individual-level non-conservative controls, such as the level of education of the individual, whether the individual has a job, and the asset index of the household. Column (4) adds the municipality-level conservative controls (geographic): altitude, elevation, whether the municipality is on a mountain, whether the municipality is on the coast, an indicator of arable land, an indicator of presence of fruit trees, an indicator of the presence of meadows, an indicator of presence of woods, whether the municipality is a provincial capital, and the log of surface area of the municipality. Column (5) adds the non-conservative municipality-level controls such as population size, immigration rate, income per capita, GINI income, ratio of women in the municipality council, years of education, and age of the politicians in municipality. Column (6) adds the year fixed effects. Column (7) adds the region fixed effects. Column (8) adds the province fixed effects. Column (9) adds the strata, which is the interaction between region and municipality size. The latter is not needed in the main analysis as the variables are already weighted, but as per confidentiality agreements we did not have access to the specific weights themselves, we also try to directly show the survey design characteristics. Column (10) replaces the cluster at the municipality level with cluster at the regional level, the highest level. The magnitude of the exposure to the presence of organized crime groups on social capital is stable across specifications, suggesting that omitted variables biases are unlikely to substantially affect our estimates.

Table B1: Pooled OLS: selection on observables (2000–18)

	Outcome: social capital aggregate index									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Organized crime index	-0.096***	-0.097***	-0.102***	-0.073***	-0.070***	-0.070***	-0.068***	-0.067***	-0.067***	-0.067***
	(0.011)	(0.011)	(0.006)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.006)
Base	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual controls conservative	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual controls non-conservative	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality controls conservative	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality controls non-conservative	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Region FE	No	No	No	No	No	No	Yes	No	No	No
Province FE	No	No	No	No	No	No	No	Yes	Yes	Yes
Strata: region X municipality size	No	No	No	No	No	No	No	No	Yes	No
Cluster region	No	No	No	No	No	No	No	No	No	Yes
Observations	765718	765718	765718	765718	765718	765718	765718	765718	765718	765718
R^2	0.002	0.015	0.063	0.067	0.068	0.069	0.072	0.074	0.074	0.074

Note: description of all the variables used is in Section 3. Standard errors in parentheses clustered at the municipality level (apart from Column (9) and Column (10)). *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.

B4 Alternative organized crime index

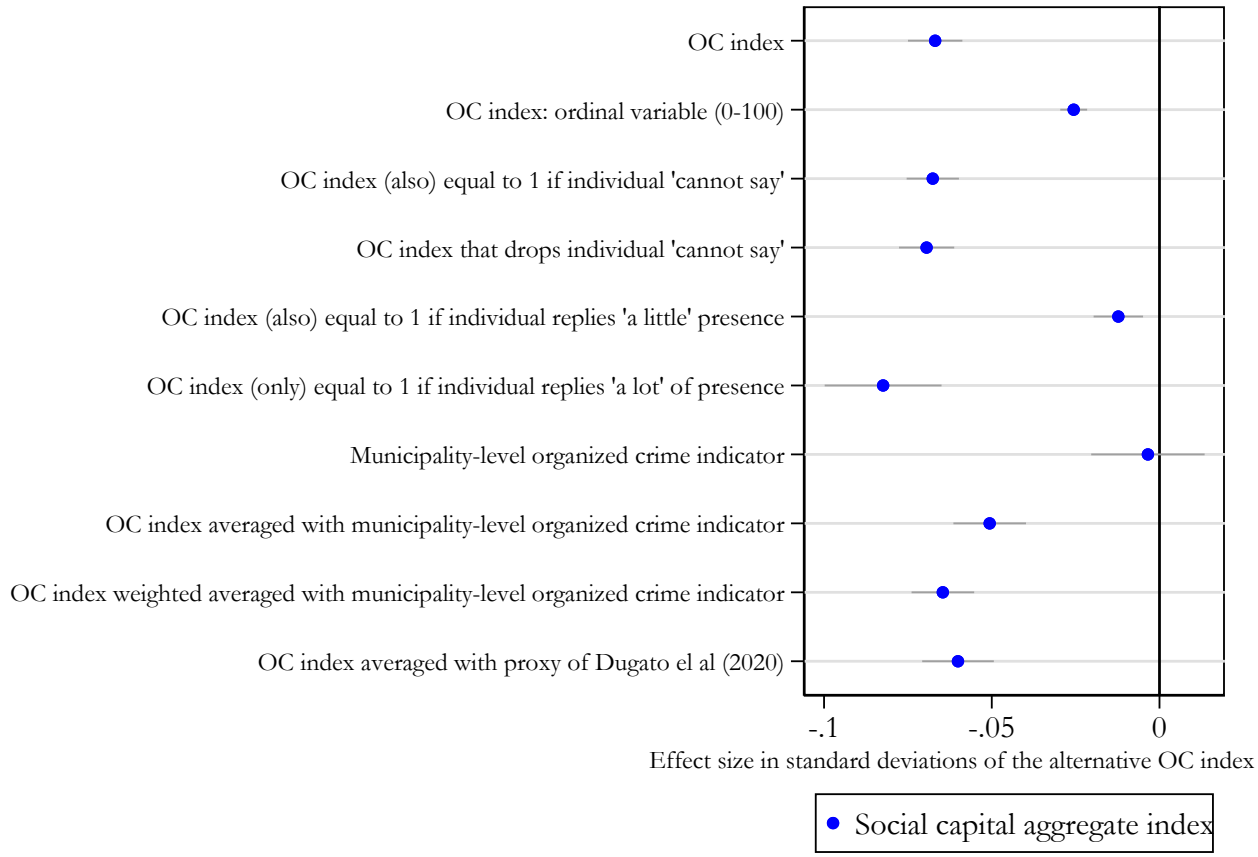
Measurement error can affect our estimates if the organized crime index does not accurately measure organized crime groups presence. In this section, we use different combinations of the organized crime index to test the robustness of the main results across these different definitions of organized crime presence. In Row 1 of Figure B11, we present the main result as shown in Section 4. The main variable is the organized crime index in the form of a dummy variable and, thus, uses a coarsened treatment. As the estimate could be susceptible to coarsening bias (Marshall 2016), in Row 2 we present the continuous organized crime index. Results are still negative and statistically significant but, as expected, are of smaller magnitude. In Row 3, we present the results using the organized crime index, which also includes a dummy variable coded as 1 if the answer to the question is 'cannot say' (which was answered by 3.28 per cent of the sample). In Row 4, we present the results using the organized crime index but dropping the observations that answer 'when the individual cannot say'. In both cases the results are consistent.

The main analysis uses the organized crime index as a dummy variable equal to 1 if the respondents replied 'quite a lot' or 'a lot', and 0 if the respondent replied 'none' or 'a little', or 'when the individual cannot say'. In Row 5, we present the results using a dummy variable equal to 1, which now also includes the answer 'a little'. Results are still negative and statistically significant but, as expected, are of smaller magnitude. In Row 6, we use the organized crime index as a dummy variable equal to 1 if the respondents replied 'a lot', and 0 if the respondent replied 'none' or 'a little' or 'quite a lot', or 'when the individual cannot say'. Results are still negative and statistically significant but, as expected, are of larger magnitude.

In Row 7, we present the results using the municipality-level organized crime indicator, whose construction is explained in Online Appendix C2. This index is the equally weighted average of four organized crime presence municipality-level indicators (territorial presence, violent presence, economic presence, and political presence). The result using the municipality-level indicator is not statistically significant. In Row 8, we present the results using an equally weighted average between the organized crime index and the municipality-level organized crime indicator presented in Row 7. In Row 9, we present the inverse co-variance weighted index developed by Anderson (2008) between the organized crime index and the municipality-level organized crime indicator. This weighted average, explained in more detail the next Section B5, gives more weight to those indicators that are less correlated with the others (those that bring new information in the index). In Row 10, we present the results using an equally weighted average between the organized crime index and the Mafia index developed by Dugato et al. (2019), which includes reported and attempted Mafia-type murders, reported Mafia type associations, city councils dissolved due to Mafia infiltration, assets confiscated from organized crime, and counts of the presence of Mafia groups, as reported by the National Anti Mafia Directorate (DNA) and Investigative Anti Mafia Department (DIA).[58] All results remain broadly consistent. It is to note that the effect is not statistically significant when only using the municipality-level indicator alone, possibly due to the limitations of this indicator that we discuss in Section 3.

[58] As the disaggregated index is not publicly available, we have used all its indicators, with the exception of the DNA reports, which we did not digitise. We do not apply the smoothing procedure the authors adopt.

Figure B11: Pooled OLS: testing alternative organized crime index (2000–18)



Note: this figure presents the pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed between 2000–03 and 2005–18 using a range of different indicators for our variable of interest. All estimates show results from the pooled OLS regressions based on Equation 1. Each row is a regression. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. The variable of interest is the OC index. In the first row, we present the baseline effect of exposure to organized crime on the social capital aggregate index. In the following rows, we present different combinations of the OC index. The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. Standard errors clustered at the municipality level. Confidence intervals are calculated at the 95% level.

Source: authors' elaboration based on data described and variables constructed in Appendix Section B4.

Table B2: Pooled OLS: testing alternative OC index (2000–18)

	Outcome: Social capital aggregate index									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Organized crime index	-0.067***									
	(0.004)									
OC index: normalised variable (0-100)		-0.026***								
		(0.002)								
OC index (also) equal to 1 if individual 'cannot say'			-0.068***							
			(0.004)							
OC index that drops individual 'cannot say'				-0.069***						
				(0.004)						
OC index (also) equal to 1 if individual replies 'a little' presence					-0.012***					
					(0.004)					
OC index (only) equal to 1 if individual replies 'a lot of' presence						-0.082***				
						(0.009)				
Municipality-level organized crime indicator							-0.003			
							(0.009)			
OC index averaged with municipality-level organized crime indicator								-0.051***		
								(0.006)		
OC index weighted averaged with municipality-level organized crime indicator									-0.065***	
									(0.005)	
OC index averaged with proxy of Dugato et al. (2019)										-0.060***
										(0.005)
Observations	765718	758901	765718	740606	765718	765718	765718	765718	765718	765718
R^2	0.074	0.074	0.074	0.074	0.073	0.074	0.073	0.074	0.074	0.074

Note: this figure presents the pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed between 2000–03 and 2005–18 using a range of different indicators for the variable of interest. All estimates show results from the pooled OLS regressions based on Equation 1. Each row is a regression. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. The variable of interest is the OC index. The first row presents the baseline effect of exposure to organized crime on the social capital aggregate index. In the following rows, different combinations of the OC index are presented. The control variables are the individual-level control variables, municipality-level socioeconomic variables, and geographic variables. Year fixed effects and province fixed effects are added. Standard errors clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data described and variables constructed in Section B4.

B5 Weighted mean index

Figure 3 shows our main estimates using the social capital aggregate index, which is constructed as an unweighted mean whereby each social outcome in the index is given the same weight. In this section, we apply an inverse co-variance weighted index (weighted mean index) to estimate the models, following Anderson (2008). This process allocates less weight to highly correlated outcomes within a group of outcomes, while rewarding new information by giving a larger weight to outcomes that have a weaker correlation within the group's outcomes. The procedure attributes a weight to each outcome calculated as the sum of the inverted co-variance matrix comprising all the outcomes in the group under consideration. Results in Table B3 show in Column (1) the main pooled OLS results. Column (2) shows the results with the social capital aggregate index constructed as a weighted mean index in 2016 (the year for which all outcomes are available). For comparison purposes, we show the pooled OLS main results and the results using the weighted mean index only for 2016. Results are largely similar in economic and statistical significance.

Table B3: Pooled OLS: weighted mean index (2016)

	Outcome: social capital aggregate index	
	Main	Weighted mean index
	(1)	(2)
Organized crime index	-0.153***	-0.128***
	(0.017)	(0.017)
t-test between (1) and (2)		
p-value	0.016	*ibid*
Observations	36621	36621
R^2	0.112	0.083

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed in 2016 by using both the social capital aggregate index (Column (1)) and the social capital weighted mean index (Column (2)). Observations and R^2 at the bottom of the table. Standard errors clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data described and variables constructed in Section B5.

B6 Social desirability bias

We use self-reported variables to measure individual-level social capital and exposure to organized crime groups. These variables are, thus, potentially subject to social desirability bias, which could lead to measurement error and place bias upon the estimates if the respondent, for instance, provides answers that are affected by peer pressure or perceived social stigma. In particular, social desirability bias could be a threat to our estimations if social norms about appearing more invested in social capital are stronger in areas affected by the presence of organized crime groups, as coefficients would overestimate the effect of organized crime on social capital. This is a particularly relevant problem for questions that are more prone to social desirability, such as those about respect towards the law and civic behaviour. One way in which we can test for potential social desirability bias is by examining differences in responses when individuals were alone in the room with the interviewer, or when others are present (such as other family members). The national-level data collected this valuable information for all social capital variables we use. Our hypothesis is that individuals are more likely to offer socially desirable answers if others are present in the room. We investigate whether the effects of organized crime on the aggregate index of social capital vary depending on whether the various responses were reported by the respondent when alone in the room with the enumerator or self-reported with family members in the same room. In Panel A of Table B4, we compare the main results (Column (1)) with the social capital measures self-reported by the respondent alone in the room (Column (2)) and with the social capital measures self-reported

when someone else was in the room (Column (3)). We find that the effect of organized crime group on social capital is not statistically different across both types of answers.

Social desirability bias may also be illustrated by patterns of non-response as it is plausible that respondents who may not want to talk about their exposure to organized crime groups may say 'Cannot say' or ask to pass on answering that question. Only 3.28 per cent of the sample answered 'Cannot say' to the questions about exposure to organized crime. If these were primarily driven by worries about organized crime, as discussed in Blattman et al. (2021) for the case of gang exposure in Medellin, we might expect a correlation between exposure to organized crime and the proportion of questions unanswered. Panel B of Table B4 shows each respondent's percentage of unanswered questions across municipality-level measures of organized crime strength. There are no substantively or statistically significant correlations.

We recognise that these two tests may only partially address potential social desirability biases in self-reported replies. However, the results of this analysis suggest that the extent of any potential bias is likely to be limited, with arguably negligible implications for the validity of our main results.

Table B4: Pooled OLS: testing for social desirability bias (2000–13; 2000–18)

Panel A: questionnaire administration	Outcome: social capital aggregate index				
	Main (1)	Alone (2)	W. enumerator in room (3)		
Organized crime index	-0.032***	-0.033***	-0.030***		
	(0.005)	(0.007)	(0.006)		
t-test between (2) and (3)					
p-value		0.717	*ibid*		
Observations	548461	163075	267911		
R^2	0.074	0.084	0.076		
Panel B: correlation 'Cannot say' and OC strength	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say
Mafia group $>$ 1, 0 otherwise (2013-2018)	-0.011				
	(0.008)				
Municipality was a *Comune*		-0.002			
		(0.005)			
Municipality was a Bishop city			-0.002		
			(0.004)		
Municipality was assigned gold medal for anti nazi/fascism				-0.004	
				(0.005)	
Individual lives in small town					-0.008***
					(0.002)
Observations	45378	465828	765718	465828	765718
R^2	0.026	0.007	0.010	0.007	0.011

Note: this table presents the pooled OLS estimates of the effect of exposure to organized crime on the social capital of individuals interviewed by testing for social desirability bias. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. Panel A presents the results by dividing the sample between the main sample (Column (1)), the sample of individuals that answer alone in the room (Column (2)), and the sample of individuals that answer with either an enumerator or a family member in the room (Column (3)). Data is available between 2000 and 2013. Panel B presents the correlations between the variables that proxy the varying degrees of governance of the organized crime and patterns of non-response. Each row is a separate regression. Data is available for the years between 2000 and 2018. Observations and R^2 at the bottom of the table. Standard errors clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based on data described and variables constructed in Section B6.

B7 Matching

Equation 1 attempts to isolate a plausible causal relationship between exposure to organized crime and individual levels of social capital using a battery of control variables in a pooled OLS model with fixed effects. Another way of studying this relationship is by constructing comparison groups that are similar

according to a set of matching control variables. In Table B5, we show that individuals exposed to the presence of organized crime groups differ in almost all control variables (both conservative and non-conservative) when compared to those not exposed to the presence of organized crime groups. In what follows, we employ matching techniques to take this imbalance into account.

Panel A of Table B6 presents matching estimates using propensity score matching. We first specify the probability model for the propensity scores by estimating a logit model to predict the probability of an individual being exposed to the presence of organized crime groups. We add to the model all sets of observable characteristics that are imbalanced in Table B5. We then check for the common support rule and keep only the predictions which overlap between the control and the treatment groups. This applies to 99.9 per cent of the cases. Only 79 individuals are excluded from the common support area, leaving us with a sample of 765,639 individuals. The overlap of the propensity score distributions suggests that the population assumption of common support is reasonably fulfilled in the sample. Finally, we apply a kernel matching method, which uses all the observations within the common support as a match, with the closest matches given a higher weighting than more distant matches. Results in Panel A using propensity score matching show that exposure to the presence of organized crime groups reduces the social capital aggregate index by 0.076SD, in line with the pooled OLS estimates.

We calculate also matching estimates using an inverse probability weighting (Cattaneo 2010). To do so, we estimate a model that attributes less or more weight to observations among individuals exposed to the presence of organized crime groups that show imbalances in the control variables when compared with individuals who are not exposed to the presence of organized crime groups. In other words, we correct for selection by weighting observations. If the property of balance on propensity scores holds, this correction provides a consistent estimation of the average treatment effect. We estimate the probability of being exposed to the presence of organized crime groups (using a logit model) on the imbalanced variables of Table B5 and use the resulting predictions to weight the observations.[59] Results using inverse probability weighting show that exposure to organized crime groups reduces the social capital aggregate index by 0.065SD, in line with the pooled OLS estimates.

In Panel B, we combine the original regression and matching estimators with a doubly robust estimation which ensures that the estimate is corrected if either the outcome model or the treatment model is misspecified. We estimate an augmented inverse probability weighted estimator (AIPW) in which we estimate both a treatment model with the exposure to organized crime groups as a dependent variable on the set of imbalanced variables as in the inverse probability weighting regression above. In addition, we also estimate an outcome model with social capital aggregate index as a dependent variable and exposure to organized crime groups, along with a set of conservative control variables that are not influenced by the exposure to organized crime groups. Thus, we add the control variables from our main model which are either time invariant or not affected by the exposure to organized crime presence: age of the individual, age squared, gender of the individual, whether the individual is married, and the geographic controls of the municipality where the individual lives (altitude, elevation, whether the municipality is on a mountain, whether the municipality is on the coast, an indicator of arable land, an indicator of presence of fruit trees, an indicator of presence of meadows, an indicator of presence of woods, whether the municipality is a provincial capital, and the log of surface of the municipality). The AIPW adds an argumentation term in the outcome model that adjusts the results based on the degree of misspecification in the matching model. Results using AIPW show that exposure to organized crime groups reduces the social capital aggregate index by 0.067SD. These results are consistent with our main estimates.

[59] We exclude from the treatment model predictors that show near collinearity, which do not allow the logit estimator to achieve convergence (this includes population size which is highly collinear with the log of surface of the municipality).

Table B5: Balance table: differences in observables between those exposed and not exposed to organized crime (2000–18)

Variable	(1) Exposed to OC Mean/SE	(2) No or little exposure to OC Mean/SE	(3) Total Mean/SE	T-test Difference (2)-(1)
Age	48.513	48.512	48.513	-0.001
	(0.042)	(0.026)	(0.022)	
Age squared	2726.531	2735.855	2733.319	9.324
	(4.288)	(2.675)	(2.270)	
Gender	0.528	0.518	0.521	-0.010***
	(0.001)	(0.001)	(0.001)	
Individual is married	0.537	0.541	0.540	0.005*
	(0.001)	(0.001)	(0.001)	
HH size	3.024	3.017	3.019	-0.008
	(0.003)	(0.002)	(0.001)	
Education level	1.022	1.009	1.012	-0.013***
	(0.001)	(0.001)	(0.001)	
Individual is employed	0.418	0.426	0.424	0.008***
	(0.001)	(0.001)	(0.001)	
Principal component analysis: asset index	0.033	-0.020	-0.005	-0.053***
	(0.005)	(0.003)	(0.002)	
Individual regularly lives away from municipality for work	0.029	0.033	0.032	0.004***
	(0.000)	(0.000)	(0.000)	
Altitude	153.835	268.585	237.369	114.750***
	(0.400)	(0.371)	(0.297)	
Elevation	484.076	674.248	622.515	190.171***
	(1.119)	(0.863)	(0.705)	
Municipality is in the mountain	0.031	0.030	0.030	-0.001***
	(0.000)	(0.000)	(0.000)	
Municipality is on the coast	0.191	0.179	0.182	-0.012**
	(0.001)	(0.001)	(0.000)	
Arable land	0.439	0.386	0.400	-0.052***
	(0.001)	(0.000)	(0.000)	
Fruit trees	0.209	0.183	0.190	-0.026***
	(0.001)	(0.000)	(0.000)	
Meadows	0.104	0.138	0.129	0.034***
	(0.000)	(0.000)	(0.000)	
Forest	0.161	0.204	0.192	0.043***
	(0.000)	(0.000)	(0.000)	
Municipality is the provincial capital	0.398	0.232	0.277	-0.166***
	(0.001)	(0.001)	(0.001)	
Log of surface	8.803	8.610	8.663	-0.192***
	(0.003)	(0.002)	(0.001)	
Population size	2.88e+05	1.07e+05	1.56e+05	-1.81e+05***
	(1342.966)	(498.437)	(523.022)	
Immigration rate	0.060	0.050	0.053	-0.010***
	(0.000)	(0.000)	(0.000)	
Income pro capite	11988.839	11164.836	11388.990	-824.003***
	(8.586)	(5.078)	(4.393)	
Gini income index	0.418	0.404	0.408	-0.014***
	(0.000)	(0.000)	(0.000)	
Municipality council: gender balance	0.196	0.197	0.197	0.001***
	(0.000)	(0.000)	(0.000)	
Municipality council: average years of education	14.694	14.137	14.288	-0.557***
	(0.003)	(0.002)	(0.002)	
Municipality council: average age	47.269	46.722	46.871	-0.547***
	(0.007)	(0.005)	(0.004)	
N	208299	557419	765718	

Note: this table presents a balance between individuals exposed and not exposed to the presence of organized crime groups. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.

Table B6: PSM, IPW, and AIPW: alternative estimators (2000–18)

Outcome: social capital aggregate index	OC index (1)	Observations (2)
Panel A: matching		
Propensity score matching	-0.076***	765639
	(0.002)	
Inverse probability weighting	-0.065***	765718
	(0.002)	
Panel B: regression and matching		
Augmented inverse probability weighting	-0.067***	765718
	(0.002)	

Note: this table presents estimates of the effect of the exposure to organized crime groups on social capital of individuals interviewed between 2000–03 and 2005–18, using a number of different estimators. Each row is a regression in which the Y is in the rows and the variable of interest is in the column. Column (1) presents the β effect. Column (2) presents the number of observations. The dependent variable is standardised with mean 0 and standard deviation 1. The dependent variable is the social capital aggregate index. The variable of interest is the OC index. Panel A presents the matching results: propensity score matching with kernel weights and the inverse probability weighting. Panel B presents the mix regression and matching results: the augmented inverse probability weighting procedure. Standard errors in parentheses clustered at the municipality level. *p <10%, **p <5%, ***p <1%.

Source: authors' elaboration based data described and variables constructed in Section 3 and Online Appendix C1.