

Organized Crime, Violence, and Politics*

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Abstract

We show that in Sicily Mafia killings of politicians increase before elections and have negative effects on the vote received by parties not captured by the Mafia. Then, using a very large data set of electoral speeches, we find strong evidence that anti-mafia activities by politicians elected in Sicily are, in fact, negatively correlated with the levels of pre-electoral violence. Using data on homicides in all regions of Italy starting from the end of the nineteenth century, we identify a political cycle of homicides only in regions with organized crime. We also show how this electoral cycle changes as a function of different electoral rules and the relative strength of captured and non-captured parties. All these empirical findings are rationalized by a simple signaling model in which criminal organizations exert pre-electoral violence to inform adverse politicians about their military strength.

KEYWORDS: organized crime, electoral violence, voting, political discourse

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*Politics and mafia are two powers on the same territory;
either they make war or they reach an agreement.*

Paolo Borsellino, Anti-Mafia Prosecutor, assassinated by the Mafia

You make war to live in peace.

Totò Riina, Mafia Boss

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1 Introduction

In many countries, even rich ones, criminal organizations thrive thanks to their connections with the polity. In order to benefit from the profit opportunities afforded by the allocation of public works and procurement contracts, criminal organizations instruct captured politicians to distort the allocation of public funds in their favor.¹ Politicians also use their influence to weaken enforcement against organized crime.² In order to achieve these goals, criminal organizations around the world use various tools, including terror and violence.³

In this paper we study the use of pre-electoral violence by criminal organizations as a means of influencing elections. This violence serves two purposes. First, it damages anti-mafia parties in the electoral competition. Second, by signaling the strength of organized crime, it affects the behavior of appointed politicians. Through these channels, organized crime can profoundly affect the functioning of democracies.

We investigate these phenomena by exploiting several rich data sets on criminal organizations and politics in Italy, a country historically plagued by organized crime. In particular, we take advantage of unique data on victims of the Sicilian Mafia, electoral results, and parliamentary activity of members of the national parliament (MPs) appointed in Sicily since 1945. Using these data, we first uncover abnormal increases in the number of political murders (i.e., murders of party and union members) perpetrated by the Sicilian Mafia during the year preceding an election. The increase is sizable, from 0.034 to 0.098 victims per month. It is specific to political murders – there is no increase in, say, the number of entrepreneurs or judges killed by the Mafia.⁴ In principle, electoral violence may have two opposite effects on the vote share of anti-mafia parties. On the one hand, voters could punish parties that are more connected with the Mafia in response to more murders. On the other hand, they may turn in favor of the parties allied with the Mafia in order to guarantee ‘peace’ and avoid additional violence; also, violence can directly damage the electoral machine of anti-mafia parties (e.g., by killing party activists). Our empirical results suggest that the latter effects prevail in the data.

For historical reasons (discussed in the next Section) the Sicilian Mafia traditionally opposed left-wing groups, such as the Communist and Socialist parties and the labor unions, while favoring parties to the Center-Right of the political spectrum. In fact, we find that an additional political homicide during the electoral period brings, on average,

¹See Schelling (1971) for an early theoretical analysis and Barone and Narciso (2015) for evidence on the allocation of public investment subsidies in Sicily.

²Acemoglu et al. (2013) discuss the generalized amnesty enacted by Colombian President Uribe in favor of members of paramilitary groups.

³Lupo (2013) and Solis and Aravena (2009) provide extensive anecdotal evidence from Italy and Latin America, respectively.

⁴Clearly, electoral violence may include many other activities besides homicides, like non-lethal attacks, disruption of campaign activities, arsons etc. We focus on homicides because (i) more data are available on these (extreme) events, and (ii) they are less subject to the under-reporting issues.

a 3 percentage point decrease in the vote share of the Left across all national elections between 1948 and 2013. This finding is consistent with event-study evidence from an infamous massacre of left-wing activists on Labour Day 1947, which is associated with a dramatic sway of votes away from leftist parties in the following elections.

Turning to the behavior of appointed politicians, we measure their efforts to fight the Mafia by the number of times they mention it in official parliamentary debates, on the (reasonable) premise that they do so to attract attention to the problem of organized crime (and not to praise it). We thus collect the transcripts of all parliamentary debates that featured at least one intervention by an MP appointed in Sicily – about 300,000 pages in total – and we measure the occurrence of the word “Mafia” by MP-legislature. We find that one additional political homicide during the electoral period lowers the probability that a given MP mentions the Mafia at least once over the following legislature by 4 percentage points – on a baseline probability of 10 percent. This effect operates through both an “extensive” and an “intensive” margin. MPs of the Left talk more about the Mafia, and the negative effect of political homicides on the vote share of the Left reduces their probability of appointment in the parliament (the “extensive” margin). Conditional on partisan affiliation, political homicides reduce the propensity of all MPs to talk about the Mafia (the “intensive” margin). Interestingly, the reduction is stronger for MPs of the Left, who are the most likely targets of future Mafia violence; conversely, it is weaker for MPs appointed in other regions, who are probably less threatened by the Mafia. Once again, the effect is specific to political homicides. Indeed, other (non-political) homicides have an opposite effect, increasing the salience of Mafia in parliamentary debates, the more so for MPs of the Left.

Unfortunately, we do not have as detailed information on the victims of the other criminal organizations active in Italy – the Camorra in Campania and the 'Ndrangheta in Calabria – as we have for the Sicilian Mafia.⁵ To overcome this limitation, we compare homicides between Italian regions with and without an historical presence of criminal organizations, through electoral and non-electoral periods. Although local homicide rates are a coarse measure of violence by criminal organizations, they have the advantage of being available for all Italian regions since 1887. Rich institutional variation over this long-run period allows us to quantify electoral violence under different levels of *political contestability* – as determined by the institutional regime, electoral system, and level of political competition. To the extent that violence is a strategic tool used to influence electoral and political outcomes, it should be used more when/where elections are more contestable. Indeed, criminal organizations should abstain from violence when there is little or no scope for affecting political and electoral equilibria.

⁵From now on, “mafia” denotes generically all criminal organizations *ex. Art. 416-bis* of the Italian Penal Code (see, Section 2.1), while *the* “Mafia” denotes the specific criminal organization active in Sicily.

The results across Italian regions confirm this intuition. We detect a significant increase in homicides in mafia regions relative to non-mafia regions before elections in all periods except during the Fascist dictatorship (1922-43). Elections held during this period were one-party votes for the Fascist party – the only one admitted to run in the 1929 and 1934 elections – so criminal organizations had no chances of influencing political equilibria. Democratic elections also varied in the degree of political contestability, depending on the electoral system in place and the relative strength of different parties. In particular, under a *majoritarian system*, in which candidates compete in several single-member, first-past-the-post districts, political violence should be concentrated in those swing districts where the electoral outcome is uncertain. This is because there is little incentive to engage in violence where the preferred party is either very likely or very unlikely to win the election – irrespective of the actions of the criminal group. By contrast, under a *proportional system*, in which all candidates compete in a single, “at large” electoral district, the incentives to perpetrate electoral violence should depend only on the gap between parties at the national level. We find empirical support for these predictions by exploiting the electoral reform of 1993, which changed the Italian electoral system from proportional to majoritarian. We provide a simple theoretical model that rationalizes these empirical findings.

We are not the first to study violence as a political tool. In their pioneering work, Dal Bó and Di Tella (2003) show how interest groups may use violence to manipulate elected politicians.⁶ Dal Bó et al. (2006, 2007) build on the same idea but allow for the use of both monetary incentives and self-enforceable punishments within a unified framework, and derive implications for the quality of public officials.⁷ The main implication of these models is that, in order to influence political decisions, criminal organizations should perpetrate violence against politicians in office.⁸ Our empirical results suggest that violence *before* elections is at least as valuable as violence *after* elections as a strategy for influencing political outcomes.

Using media reports on attacks against Italian local politicians (i.e., mayors and city councilors) over the period 2010-2014, Daniele and Dipoppa (2016) show that violence increases mostly after local elections. A potential reconciliation of the different timing of political violence in national and local elections is that, *ex-ante*, criminal organizations may have less information on candidates and parties running in local elections. Thus they do not quite know whom to target *ex-ante*. In fact, the greatest majority

⁶See also Collier and Vicente (2012). More generally, the idea that special interest groups may try to exert political influence dates back to early work in public choice theory – see, e.g., the articles collected in Buchanan et al. (1980).

⁷This follows the tradition of economic models of lobbying, which focus primarily on the role of positive (monetary) incentives — see, e.g., Bernheim and Whinston (1986), Grossman and Helpman (1994), and Leaver (2009) among others.

⁸See also Ellman and Wantchekon (2000) who study a model in which riots are used strategically by the party that loses the elections to hold up politicians that take office.

of local politicians are affiliated to a myriad of local party lists (“*liste civiche*”). Based on our own calculations on publicly available data from the Italian Ministry of Interior (www.amministratori.interno.it) this was the case for 75% of all local politicians in office in 2014. Such local lists typically operate only in one of the 8,100 Italian municipalities and have little or no connection with national mass parties. In this case, a “wait-and-see” strategy may be more efficient. In national elections, instead, there is much less uncertainty on the attitude of different parties towards criminal organizations. As we have discussed above, Center-Right parties – the Christian Democrats before and the Forza Italia party later on – were closer to Mafia interests than the leftist parties. Under these conditions, it is more effective for criminal organizations to perpetrate violence before elections, in order to influence not only the behavior of appointed politicians, but also the chances of election of well identified anti-mafia candidates.

More generally, our results contribute to a burgeoning empirical literature on the relationship between organized crime and the polity. De Feo and De Luca (2013) and Buonanno et al. (2014) document the symbiotic relationship between the Sicilian Mafia and Center-Right parties in the First and Second Republic, respectively; this is, indeed, an important premise of our empirical analysis.⁹ Pinotti (2013) and Daniele (2015) test the implications of Dal Bó et al. (2006, 2007) on the quality of the political class using data on, respectively, national and local politicians in Italy. Consistent with the predictions of the model, they find that politicians in mafia-ridden areas are negatively selected on outside income opportunities. These papers are silent on the use of violence by criminal organizations to influence electoral results and politicians’ behavior, the effectiveness of such practices, and how such use varies with the type of institutional regime, electoral rule, and level of political competition. These are the primary objectives of our empirical and theoretical analysis.

The rest of the paper is structured as follows. Section 2 provides an historical overview that explains why Italian criminal organizations — especially the Sicilian Mafia — are of particular interest. Hence, in Section 3 we consider mafia killings in Sicily and their effects. In Section 4 we consider all regions of Italy for a longer historical period. Section 5 provides a model that rationalizes our results, focusing on the role of the electoral system. Section 6 concludes. Additional results and proofs are in the Appendix.

⁹Acemoglu et al. (2013) provide evidence of a similar relationship in Colombia between paramilitaries and the so-called “third political parties”.

2 Institutional and historical background

2.1 Criminal organizations in Italy

Article 416-bis, introduced into the Italian Penal Code in 1982, defines a mafia-type criminal organization as a “stable association that exploits the power of intimidation granted by the membership in the organization, and the condition of subjugation and *omertà*¹⁰ that descend from it, to commit crimes and acquire the control of economic activities, concessions, authorizations, and public contracts”. As of the end of 2013 — the last year in which these data are available — 5,470 people have been charged with this crime, 4,148 of whom in Sicily, Campania, and Calabria.¹¹ These southern regions host three of the oldest and most powerful criminal organizations in the World: Mafia, Camorra, and 'Ndrangheta.¹²

The definition in Article 416-bis highlights three fundamental features of these criminal groups. First, they are organizations governed by a complex hierarchical structure. For example, the Sicilian Mafia, which is of primary interest for the present paper, has a distinctively pyramidal structure. At the base there is a multitude of criminal groups (*clans*) that control criminal businesses — extortion, racketeering, drug smuggling, loan sharking, prostitution, etc. — in a town or city neighborhood. Clans are organized into districts (*mandamenti*) of three or four geographically adjacent clans. Each district elects a representative to sit on its Provincial Commission, whose primary role is to resolve conflicts between the clans and to regulate the use of violence. Finally, the apex of the pyramid is the Regional Commission (*Cupola*), which takes decisions regarding alliances or wars with other criminal organizations, the commission of terrorist attacks, or the murder of prominent politicians and public officials.¹³

The second major feature of mafia groups highlighted by Article 416-bis is the power of intimidation. These organizations command thousands of heavily armed men, equipped with machine guns, RPG launchers, high-powered explosives, and armored cars. This allows Mafia, Camorra, and 'Ndrangheta to control all criminal activity in their respective regions of influence.

Finally, and most importantly, Article 416-bis emphasizes the reach of these criminal groups into the official economy. Mafia-type organizations derive part of their profits from

¹⁰The *omertà* is a code of conduct prohibiting the reporting of fellow members to authorities. Although it is sometimes disguised as a “rule of honor”, it rests in practice upon the threat of extreme violence against the relatives of informants.

¹¹Obviously, these figures greatly understate the size of these organizations, as *omertà* limits whistleblowing and other sources of reporting of mafia crimes (Acconcia et al., 2014).

¹²Two other regions in the South-East, Puglia and Basilicata, have also witnessed the presence of criminal organizations since the mid-1970s (Pinotti, 2015). However, such organizations have been traditionally less powerful than Mafia, Camorra, and 'Ndrangheta, especially from a political perspective.

¹³The 'Ndrangheta adopts a similar pyramidal model, whereas the Camorra has a more horizontal structure (Catino, 2014).

“the control of economic activities, concessions, authorizations, and public contracts”. Schelling (1971) argued that public works and procurement contracts are attractive profit opportunities for mafia-type organizations, since they allow extorted firms to offload the predation costs on soft public budgets. According to the Italian judge Giovanni Falcone, who led the so-called *Maxi Trial* against the Sicilian Mafia in 1987 — and was later killed by the organization — “more than one fifth of Mafia profits come from public investment” (Falcone, 1991). More recently, Barone and Narciso (2015) show that the allocation of public investment funds is correlated with Mafia presence across Sicilian municipalities.

The embezzlement of public funds on a large-scale is only possible through the collusion of political parties with criminal organizations. Indeed, the history of Mafia, Camorra, and 'Ndrangheta has been inextricably intertwined with political power since Italy's Unification in 1861. The very origin of the Sicilian Mafia has been traced back to the demand for protection from southern landlords and urban elites, generated by the power vacuum that followed the defeat of the Kingdom of Two Sicilies (Bandiera, 2003). In its role as protector, the Mafia also acted as a military force, fighting against workers' protests and revolts (Gambetta, 1996).¹⁴

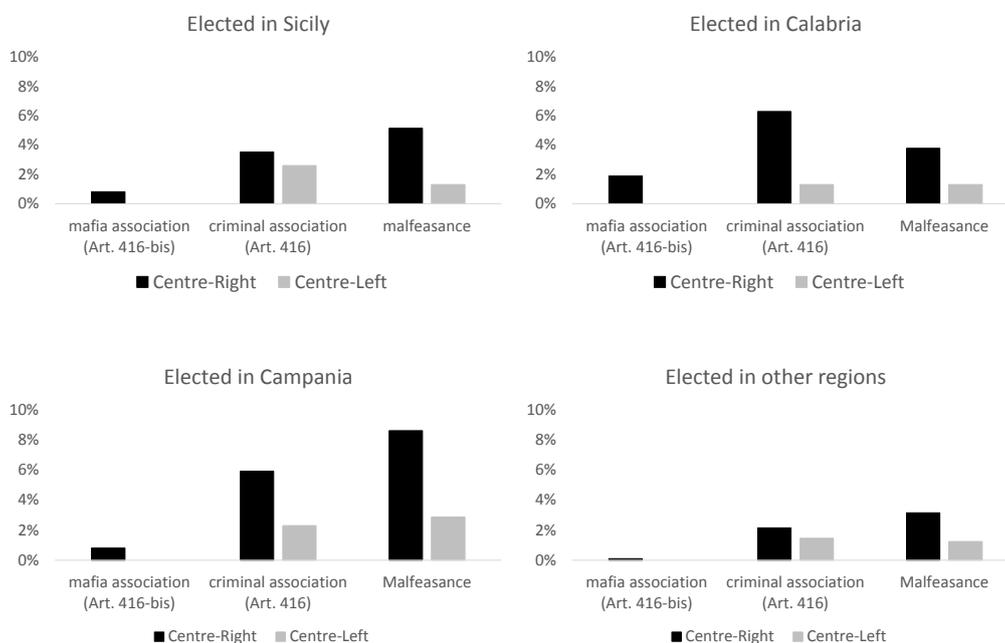
Over the subsequent decades, this tradition of collaboration between the Sicilian Mafia and the conservative bloc remained pervasive. During the so-called First Italian Republic (1945-1993), the two protagonists in the Italian political arena were the Christian Democrats and the Italian Communist Party. Some of the most prominent Sicilian members of the Christian Democrats accepted the Mafia's support to reinforce their positions against leftist opponents. In return, if elected, they would use their influence to subvert the police and judicial system interference with Mafia activities, both at the local and national level (Falcone, 1991; Paoli, 2003; Lodato and Buscetta, 2007).

The collusion between a section of the Christian Democrats and criminal organizations is apparent from judicial investigations into members of the Italian Parliament for mafia-related crimes. We explored this relationship by looking at prosecutors' requests to proceed against a member of Parliament (“*Richieste di autorizzazione a procedere*”) — a key step to lifting Parliamentary immunity, which protected national-level politicians from judicial investigations. We used the data originally collected by Golden (2007) — and used, among others, by Nannicini et al. (2013) — and added the types of crime described in each request. The institution of Parliamentary immunity was abolished in 1993, so our data cover only the period up to that year. Between 1945 and 1993, 11 members of Parliament were investigated for mafia association ex. Article 416-bis; all of them had been elected as representatives of the Christian Democrats or their government allies

¹⁴A formalization of Gambetta's theory of protection is offered by Dixit (2003). In a repeated game in which transactions involve asymmetric prisoners' dilemmas, criminal organizations act as profit-maximizing private intermediaries that supply information and enforcement to parties whose trade is not protected by state enforcement. In this context, he finds conditions under which private law enforcement dominates no enforcement: a theory of the emergence of criminal organizations.

of the Center-Right. In addition, many more politicians were investigated for “simple” criminal association (Article 416 of the Penal Code) or for malfeasance, which typically signal some relationship with criminal organizations – at least in mafia-ridden regions.¹⁵ Figure 1 shows that the Christian Democrats and their allies were more likely to be investigated for mafia-related crimes compared to politicians of the Left, even more so in Sicily, Campania, and Calabria. This finding is confirmed by OLS regressions of the probability of being investigated on a dummy for partisan affiliation, a dummy for being appointed in mafia regions, and the interaction between the two.¹⁶

Figure 1: Members of the Italian Parliament investigated for mafia-type criminal association and related crimes, 1945-1993



Note: The graphs show the fraction of members of the Italian Parliament investigated for mafia-type criminal association (Article 416-bis of the penal code) and related crimes, by political alignment and region in which they were elected.

After the transition to the Second Republic (1993), a similar relationship holds between the Sicilian Mafia and important factions of the Center-Right coalition (Buonanno et al., 2014). Criminal organizations have been especially interested in influencing na-

¹⁵Article 416 (“*associazione a delinquere*”) punishes *all* groups of three or more people involved in some type of criminal activity. As such, it does not recognize the specificity of mafia-types associations in terms of stability, military power, and infiltration of the official economy. The category malfeasance includes instead different types of corruption.

¹⁶The results are presented in Table A1 of Appendix 3.

tional elections because criminal laws concerning the length and harshness of prison sentences, mandatory resettlement of mafia members, seizures of assets, and harshness of enforcement against criminal organizations are decided by the national Parliament.

2.2 The strategy of violence

In the first post-Fascism democratic elections for the Regional Government of Sicily, on April 20, 1947, a coalition of communist and socialist parties clinched an unexpected victory over the Christian Democrats. A few days later, on May 1, 1947, hundreds of Sicilian peasants were celebrating the victory during the traditional ‘Labour Day’ parade at Portella della Ginestra, when machine-gun fire broke out from the surrounding hills. Eleven people were killed immediately and thirty-three wounded, some of whom died in the following days. Although the bandit and separatist leader Salvatore Giuliano was blamed for orchestrating the shooting at Portella, it later emerged that the Sicilian Mafia ordered the massacre in reaction to the recent electoral success of the Left (Lupo, 2013). Over the following months, the Mafia killed dozens of political activists, members of worker unions, and peasants. When Sicilians voted again at the national elections on April 18, 1948, Communists and Socialists obtained only 20.9% of the votes, down from 30.4% the previous year. The Christian Democrats, on the other hand, almost secured an absolute majority, winning 47.9% of the vote, up from 20.5% the year before. Other right-wing factions such as the fascist and the monarchist parties also gained considerable ground.

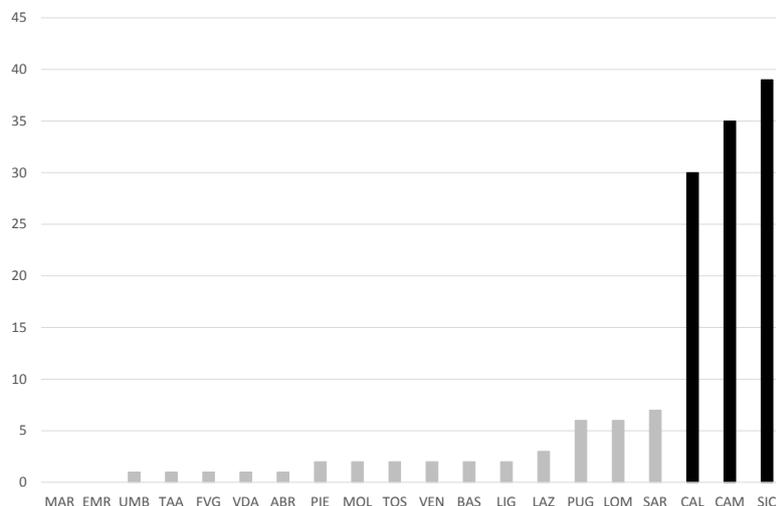
Although particularly infamous, the episode of Portella Della Ginestra was just part of a wider strategy of intimidation against left-wing groups, their candidates and the electorate.¹⁷ During subsequent decades, the Sicilian Mafia killed many political activists and local politicians, including the proponent of Article 416-bis, Pio La Torre, who was the head of the Italian Communist Party in Sicily. Similarly, starting from the mid 70’s, the Sicilian Mafia exerted heavy political pressure to prevent national laws aimed at harshening imprisonment conditions for convicted mafia members. In particular, between 1992 and 1995 the Sicilian Mafia undertook an aggressive intimidation campaign against national politicians to force them to abolish Article 41-bis of the Penal Code, which imposed extremely harsh prison conditions on members of criminal organizations.

Other criminal organizations in Italy have also engaged in violence and intimidation against local politicians and party members, so much so that in 2013 the Italian Parliament instituted an ad-hoc Commission to investigate this phenomenon. The final report produced by the Commission (Lo Moro et al., 2015) contains a list of political homi-

¹⁷Note that this episode is consistent with the signaling model that will be developed in the next section and not with a story in which violence is just a retaliation device. The reason is that, if used as a threat, violence should have been directed toward center/right candidates that were responsible (*vis-à-vis* the mafia) for not winning the elections, rather than toward their opponents.

cides in Italy during the period 1974-2013. In the total of 143 such homicides, 104 were committed in Sicily, Campania, and Calabria; see Figure 2.

Figure 2: Homicides of local administrators across Italian regions, 1974-2013



Note: The graph shows the total number of local administrators killed in Italian regions during the period 1974-2013. Black bars denote regions with a higher presence of criminal organizations – namely Sicily, Calabria, and Campania.

2.3 Not only Italy

The links between criminal organizations and politics, together with the systematic use of violence against political opponents and activists, are features not only of Italian criminal organizations, but are widespread in other countries as well. Drug cartels in Mexico and Colombia have often turned to violence to establish control of political leaders, local administrators, the police forces, and public officials. Between the 80's and 90's, the Medellin cartel of Pablo Escobar waged a systematic campaign of violence and intimidation against national-level politicians to block the extradition of Colombian narcos to the United States. Ministry of Justice Rodrigo Lara and the presidential candidate Luis Carlos Galan — both strong supporters of extraditions — were killed during this period, together with hundreds of lower-level politicians and public officials.¹⁸ Also similar to the Sicilian Mafia, Colombian drug cartels allied with rich landowners to combat advocates of social reforms. As a consequence, thousands of left-wing activists — in particular, the members of the party *Union Patriótica* — were killed by the drug lords of both the Medellin and Cali cartels (Americas Watch Committee, 1989; Méndez, 1990).

¹⁸At the time of his assassination, Galan was conducting his electoral campaign for the 1990 elections and was comfortably ahead in the polls.

Mexico has experienced a similar wave of political terrorism after President Filipe Calderon launched the “war on drugs” in 2006. The murder rate increased from 8.1 per 100,000 inhabitants in 2007 to 23.5 per 100,000 inhabitants in 2011. The number of deaths directly related to drug-cartel violence has been estimated at around 60-70,000, including hundreds of politicians and public officials (Shirk and Wallman, 2015; Molzahn et al., 2015). This surge in political violence attracted the attention of media all over the world. On June 29, 2010, the Wall Street Journal reported the murder of Rodolfo Torre, the candidate governor of the troubled Mexican state of Tamaulipas (“Killing Escalates Mexico Drug War”); on May 15, 2015, the Financial Times ran an article titled “Third Mexican midterm election candidate murdered”; on June 9, 2015, The Economist dedicated a piece (“Death and the mayor”) to the numerous political victims of drug cartels; and so on.

Political violence by criminal groups is widespread also in other Latin American countries. Foglesong and Solis (2009) carried out a series of interviews with more than thirty experts in six countries: Mexico, Guatemala, Costa Rica, Panama, Dominican Republic, and the United States. When asked about the links between criminal organizations and the State, the majority of the interviewed agreed that there is a mutually beneficial and reciprocal relationship between drug trafficking and a section of the political elites in Mexico, Dominican Republic and Central America.¹⁹

In summary, the results of our empirical and theoretical analysis should not be interpreted as specific to Italy. They apply, *mutatis mutandis*, to any democracy plagued by strong connections between organized crime and politics.

3 Mafia and politics in Sicily, 1945-2013

3.1 Data on Mafia victims

The Sicilian Mafia has attracted the greatest attention from the media, as compared to the other criminal organizations in Italy. As a result, much more information is available about the Mafia than about Camorra and 'Ndrangheta. In particular, several NGOs compile lists of victims of the Sicilian Mafia — excluding individuals who were themselves members of the organization. These lists are available online and report the date and location of each murder as well as a few individual characteristics of the victim (the detailed sources are reported in Appendix 2). By cross-checking information available from different associations and NGOs, we derive a list of 463 mafia victims between 1945 and 2013. These data have two main advantages for us. First, they distinguish between

¹⁹Green (2015) provides a thorough historical account of political violence by criminal groups in Latin America. Similar patterns are also found in many African countries, which exhibit a higher risk of civil violence during election cycles relative to normal times – see, e.g., Goldsmith (2015).

Table 1: Victims of the Sicilian Mafia, 1945-2013

Total number of victims	462
Police forces and judges	142
Entrepreneurs	79
Politicians, party and union members	50
Others	192

Note: This table shows the number of mafia victims, for different categories of individuals, during the period 1945-2013.

victims that were somehow linked with politics — specifically, members of political parties and labor unions — and other victims. Note that in Italy labor unions — in particular the largest one, the CGIL — have been closely linked with the Communist Party and its successors. Second, they report the exact date of each murder, which allows us to precisely investigate the time dynamics of violence around elections. Finally, they also report the municipality in which each murder was committed.²⁰

Table 1 shows that police officers, judges, and entrepreneurs paid the highest toll to Mafia violence, followed by politicians and other representatives of political parties and union members. However, taking into account that those politically involved are a very small fraction of the population, they face a particularly high risk compared to individuals not involved in politics.

Unfortunately, this type of information was not collected in a systematic way for the victims of other criminal organizations. For instance, the NGO *Progetto Legalità* lists 352 victims of the Sicilian Mafia, but only 34 victims of the Camorra and 31 victims of the 'Ndrangheta. This large difference is at odds with the number of homicides in each region classified by judicial authorities as mafia-related (*ex. Article 416-bis*): 1695 in Sicily, 2892 in Campania, and 1307 in Calabria.²¹ For this reason, we begin and focus our empirical analysis on Sicily.

3.2 Electoral violence

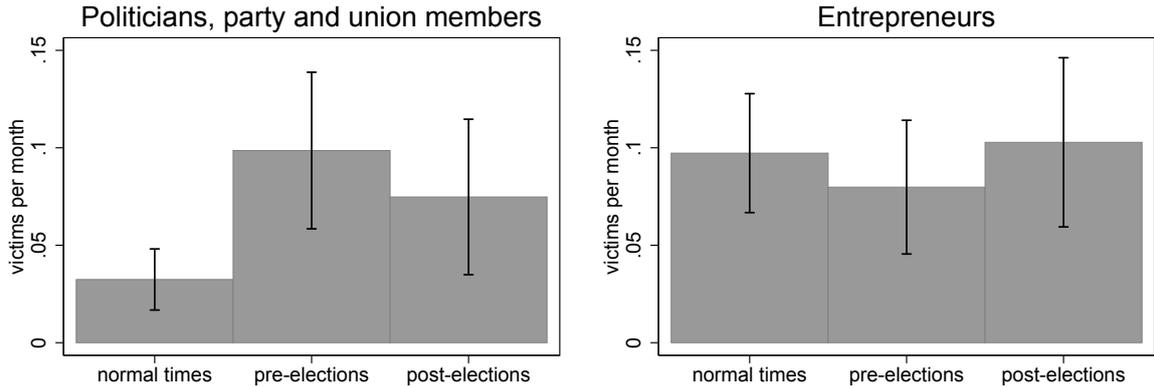
We begin by investigating the relationship between the timing of national elections and political murders — murders of politicians and representatives of political parties and workers' unions. In Figure 3, we simply compare the incidence of political homicides and homicides of entrepreneurs in the 12 months before a national election, in the 12 months after the election, and in the other months. The average number of victims per month is comparable between the two groups (0.060 and 0.094, respectively); however,

²⁰The Italian administrative framework comprises 8,100 municipalities in total, corresponding to level 4 of Eurostat's Nomenclature of Territorial Units for Statistics (NUTS2). In the 2011 census, the median (average) population size was 2,448 (7,386) inhabitants.

²¹The total number of mafia-related homicides is much higher than the number of mafia victims because the former — but not the latter — include all murders of individuals that were themselves members of criminal organizations.

they exhibit very different temporal patterns. Political homicides increase by three times in the 12 months before the elections – from 0.032 to 0.098 victims per month (left graph). They also remain higher in the 12 months after the elections (0.074); however, the difference with the number of victims in normal times is not statistically significant. As for entrepreneurs (right graph), there is no evidence of abnormal increases in homicides around elections.

Figure 3: Timing of homicides committed by the Sicilian Mafia, 1945-2013



Note: This figure compares the number of politicians and party and union members (left graph) and entrepreneurs (right graph) killed by the Mafia around elections. In particular, the graphs show the average number of Mafia victims per month in the 12 months before a national election, in the 12 months after the election, and in the other months, respectively, and the corresponding confidence intervals (at the 95% confidence level).

We then estimate the following equation:

$$y_t = \alpha + \beta * electoral_t + \gamma * postelectoral_t + \delta' X + \varepsilon_t,$$

where y_t is the number of political murders committed by the Mafia in each month t during the period 1945-2013; $electoral_t$ is a dummy equal to 1 in the month of the elections and in the 11 preceding months (and equal to zero otherwise); $postelectoral_t$ is a dummy equal to 1 in the 12 months after an election; X_t is a vector of control variables; finally, ε_t is an error term summarizing the effect of other factors omitted from the equation.²²

Consistent estimates of β and γ require that the timing of national elections is uncorrelated with other (omitted) determinants of political murders in ε_t . They are. In fact, unlike local (administrative) elections, the timing of national elections does not systematically respond to local conditions in Sicily, so reverse causality should not be a serious issue in this context.²³ To address spurious correlation from other sources, we always

²²The month of the elections is included in the pre-electoral period. All results are unaffected when including the month of the elections in the post-electoral period.

²³As a robustness check, we also exclude from the sample earlier elections called before the end of the legislature (5 years). All our results are robust.

include on the right-hand side of the equation a third order polynomial in the number of months since January 1945 (to control for long-run trends) and 12 month-specific fixed effects (to control for seasonality).

The estimated coefficients from this baseline specification, presented in column (1) of Table 2, confirm the preliminary evidence in Figure 3. On average, the Sicilian Mafia commits 1 additional political homicide in the year before a national election (0.078 per month \times 12 months). The average number of political murders over the whole period is 0.7 per year, therefore the number of political murders more than doubles in the year before elections. By contrast, there is a much smaller (and not statistically significant) increase in political homicides after elections. In column (2) we add (the log of) regional GDP per capita and population to the right-hand side of the equation. Although GDP per capita is robustly associated with the occurrence of political murders, the coefficients of interest remain virtually identical. This last finding supports the assumption that the abnormal spike in political homicides observed in the months before elections are *not* driven by other omitted factors – possibly after controlling for month fixed effects and long-run trends.

Table 2: Timing of political murders by the Sicilian Mafia, 1945-2013

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS regression		Prais-Winsten		Poisson	
$electoral_t$	0.078*** (0.028)	0.076*** (0.028)	0.080** (0.032)	0.077** (0.032)	1.030*** (0.318)	0.866*** (0.334)
$postelectoral_t$	0.042 (0.027)	0.032 (0.026)	0.046 (0.031)	0.036 (0.029)	0.702** (0.349)	0.462 (0.333)
\log of GDP per capita		1.011** (0.440)		0.999** (0.506)		4.733 (2.919)
\log of population		1.465 (1.155)		1.460 (1.332)		0.385 (12.606)
Observations	828	804	828	804	828	804
Durbin Watson	1.597	1.672	2.025	2.007	.	.
R ²	0.054	0.115	0.036	0.09	.	.

Note: This table shows the relationship between the timing of national elections and political homicides committed by the Mafia in Sicily between January 1945 and December 2013. The dependent variable is the number of victims in each month, $electoral_t$ is a dummy equal to 1 in the month of the elections and in the 11 preceding months (and equal to zero otherwise), and $postelectoral_t$ is a dummy equal to 1 in the 12 months after an election. All regressions control for a cubic polynomial in the number of months since January 1945 and 12 month-specific fixed effects; the specifications in columns (2), (4), and (6) include in addition the log of regional GDP per capita and population. Each column reports the results using a different method, reported on top of each column. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

A different concern is the presence of autocorrelation in the error term, as evidenced by the value of the Durbin-Watson test statistics on bottom of columns (1) and (2). We address such concerns by employing the Prais-Winsten estimator (columns 3 and 4). The results are unaffected. The same is true when we estimate a Poisson model for count events (columns 5 and 6).

Table 3: Timing of murders by the Sicilian Mafia, 1945-2013, for different categories of victims

	(1)	(2)	(3)	(4)	(5)
	politicians	entrepreneurs	police & judges	others	all victims
<i>electoral</i>	0.935***	-0.512	0.176	0.316	0.216
	(0.323)	(0.323)	(0.406)	(0.455)	(0.235)
IRR	[2.547]	[0.599]	[1.192]	[1.372]	[1.241]
<i>postelectoral</i>	0.487	-0.289	0.453	0.489	0.339
	(0.395)	(0.281)	(0.430)	(0.450)	(0.252)
IRR	[1.627]	[0.749]	[1.573]	[1.631]	[1.404]

Note: This table shows the relationship between the timing of national elections and homicides committed by the Mafia in Sicily between January 1945 and December 2013, by category of victim. The dependent variable is the number of victims in each month, $electoral_t$ is a dummy equal to 1 in the month of the elections and in the 11 preceding months (and equal to zero otherwise), and $postelectoral_t$ is a dummy equal to 1 in the 12 months after an election. The coefficients are estimated using Poisson regressions. Incidence Rate Ratios (equal to the exponentiated coefficients) are reported in square brackets. All regressions include on the right hand side a cubic polynomial in the number of months since January 1945, 12 month-specific fixed effects, the log of regional GDP per capita and population. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

In Table 3 we compare the Incidence Rate Ratios (IRR) of being killed by the Mafia before and after elections – as given by the exponentiated coefficients of the Poisson regression – between politicians and other groups: entrepreneurs, police and judges, and other victims. These results confirm that political homicides more than double before elections, while there is no significant effect for any other category of victims.

Our results are robust to using alternative definitions for *electoral* and *postelectoral*, which attach lower importance to months that are farther away from the elections (within the 1-year time window around the elections). In particular, we regress the number of political murders on $electoral_t^* = [12 + (t - t^*)]/12$, $\forall t \in [t^* - 11, t^*]$, and $postelectoral_t^* = [12 + (t^* + 1 - t)]/12$, $\forall t \in [t^* + 1, t^* + 12]$, where t^* is the month of the elections. They are also robust to excluding from the sample earlier elections called before the end of the legislature, whose timing is potentially endogenous (if anything, the effect is larger on this sub-sample).²⁴

3.3 Electoral results

We now investigate whether pre-electoral political homicides influence electoral results in the direction preferred by the Mafia, namely against leftist parties. In Table 4, we regress the share of votes obtained by the Left in each municipality and election during the post-War period on the number of people killed by the Mafia in the 12 months preceding the elections. The baseline specification in column (1) includes municipality and election fixed effects, observations are weighted by the size of the electorate in each municipality and election (so the results are representative at the regional level), and

²⁴The results of these robustness tests are shown in Tables A2 and A3 of the Appendix.

heteroskedasticity-robust standard errors are clustered by municipality. In column (2), we add the number of victims during the same period who were members of political parties or labor unions.

Both total and political homicides negatively affect the vote share of the Left; however, the effect of political homicides is ten times larger (-2.2 percentage points). These findings are unaffected when we control for the share of votes obtained in the previous election (column 3). They are also robust to coding Mafia violence using a dummy for observing (at least) one homicide (columns 4 to 6).

Table 4: Electoral violence and electoral outcomes in Sicily, 1947-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	all national elections, 1948-2013						period 1947-48	
<i>Total homicides before elections</i>	-0.003*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)					
<i>Political homicides before elections</i>		-0.022*** (0.006)	-0.024*** (0.007)					
<i>Any homicide before elections</i>				-0.017*** (0.004)	-0.011** (0.005)	-0.004 (0.004)		
<i>Any political homicide before elections</i>					-0.021** (0.010)	-0.025*** (0.009)		
<i>Voting for the Left, previous election</i>			0.513*** (0.035)			0.513*** (0.035)		
<i>Distance from Portella della Ginestra</i>							0.001 (0.026)	
<i>Elections 1948</i>							-0.070*** (0.011)	-0.065*** (0.015)
<i>Distance from Portella X Election 1948 (100s km)</i>							0.030** (0.012)	0.029* (0.016)
Constant	0.207*** (0.009)	0.208*** (0.009)	0.112*** (0.009)	0.208*** (0.009)	0.208*** (0.009)	0.112*** (0.009)	0.288*** (0.034)	0.286*** (0.005)
Observations	6,533	6,533	6,171	6,533	6,533	6,171	709	709
Municipality FE	YES	YES	YES	YES	YES	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES	NO	NO
R-squared	0.788	0.789	0.854	0.789	0.789	0.854	0.024	0.927

Note: This table shows the effect of electoral violence by the Mafia on electoral results in Sicily. The dependent variable is the vote-share obtained by the Left – the Italian Communist Party in the First Republic and the Center-Left coalition in the Second Republic – in each municipality and election after World War II. Columns (1) to (6) include in the sample all national elections between 1948 and 2013, columns (7) and (8) include in the sample only the regional elections of 1947 and the national elections of 1948. *Total homicides before elections* is the number of people killed by the Mafia in each municipality in the year before elections, and *political homicides before elections* is the number of victims that had some linkage with political parties and/or trade unions (e.g., party members or local administrators); *any (political) homicide before elections* equals 1 if there was at least one (political) victim before elections and 0 otherwise. *Distance from Portella della Ginestra* is the geodesic distance of each municipality from the location of the massacre and *elections 1948* is a dummy for the 1948 elections. Observations are weighted by the size of the electorate. Robust standard clustered by municipality are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

In the last two columns of Table 4 we focus on the events of Portella della Ginestra, already discussed in Section 2.2. In particular, we regress the vote share of the Left at the regional elections of 1947 and at the national elections of 1948 on the distance of each municipality from the location of the massacre, a dummy for the 1948 election, and the interaction between these two variables.²⁵ The interaction coefficient in column (7) of Table 4 suggests that the loss in votes by the Left between the 1947 and 1948 elections is stronger in municipalities that are closer to the massacre; the same is true when including municipality fixed effects, thus dropping distance from Portella from the

²⁵The location of Portella Della Ginestra is shown in Figure A2 of Appendix 3.

regression (column 8).²⁶

The effect on voting in other municipalities — i.e., those that were not directly targeted by the massacre — is likely due to the intimidating effect of electoral violence, which is likely stronger in municipalities that are closer to the location of the massacre. This finding is consistent with political violence affecting subsequent electoral results over and above the destruction of (local) party and electoral machinery. We further explore the intimidating effect of electoral violence by looking at the behavior of appointed politicians.

3.4 The behavior of appointed politicians

Since it credibly signals the military power of the Mafia, and the willingness to use it, electoral violence may influence the behavior of appointed politicians. Once again, the direction of such influence is not clear *a priori*. On the one hand, the public opinion could push politicians to take action against the increase in violence — e.g., by devoting more resources to the fight against organized crime. On the other hand, electoral violence increases the credibility of future retaliation, thus discouraging anti-mafia efforts by scared politicians.

We consider the relationship between electoral violence and the behavior of appointed politicians, as measured by how often they openly talk about the Mafia once they sit in the national parliament. In principle, one could talk about the Mafia to praise it, or to discount its existence; in practice, however, the Mafia is overwhelmingly mentioned with a negative connotation and to indicate the need to take measures against it (at least in official discourses). Therefore, the willingness to bring up the problem in the national parliament is a good proxy for anti-mafia efforts.

We collected the transcripts of all parliamentary debates featuring at least one intervention by an MP elected in Sicily from the main parties of the Left and Right during the period 1948-2013. We processed this very large amount of information — about 300,000 pages of transcripts — using an ad-hoc automatized routine that identified the intervention of each MP within the same debate. This was possible thanks to the fact that the name of each speaker, and the beginning and end of each intervention, are clearly marked in the transcripts.²⁷ We then measured the occurrence of the word “Mafia” by MP-legislature. Table 5 shows summary statistics distinguishing MPs by partisan affiliation and region of election. In particular, we report the average number of occurrences of the word “Mafia”, its occurrence every 1,000 words, and the fraction of cases in which it

²⁶Notice that, in column (7), the votes obtained by the Left at the 1947 regional elections (before the massacre) do not vary significantly with distance from Portella della Ginestra.

²⁷This was possible thanks to the fact that the name of each speaker, and the beginning and end of each intervention, are clearly marked in the transcripts. In general the work was made difficult and extremely time consuming because of the poor physical state of parts of this documentation.

Table 5: Summary statistics on parliamentary debates featuring the intervention of an MP appointed in Sicily, 1948-2013

	MPs elected in Sicily			elected in other regions		
	all	Left	others	all	Left	others
number of obs. (MP-legislature)	653	187	466	7,064	2,822	4,242
Sample statistics (avg. by MP-legislature):						
total number of words spoken ($\times 1,000$)	8.28	10.91	7.23	6.78	7.97	5.99
occurrences of the word “Mafia”	3.17	6.76	1.72	0.53	0.71	0.40
occurrence of “Mafia” $\times 1,000$ words	0.38	0.62	0.24	0.08	0.09	0.07
mentioning “Mafia” at least once	0.22	0.37	0.16	0.09	0.12	0.07
maximum number of occurrences	263	263	62	99	98	99

was mentioned at least once. As might be expected, Mafia is more salient in the parliamentary discourses of MPs appointed in Sicily: on average, 22 percent of them mention it at least once in the course of a legislature, compared to 9 percent of MPs appointed in other regions. Differences by partisan affiliation are even more important: 37 percent of MPs appointed in Sicily with Left parties talk about the Mafia, as opposed to just 16 percent of those appointed with other parties. Partisanship also plays a role for MPs appointed in other regions – though the gap is smaller.

In Table 6 we relate the probability of talking (at least once) about the Mafia in the course of a given legislature to the number of political homicides committed by the Mafia in the 12 months before the elections (analogously to what we did in Table 4 for electoral results). We always control for the total number of words spoken by each MP in a given legislature.²⁸

The sample in the first three columns of Table 6 includes only MPs elected in Sicily. In column (1), a higher number of homicides during the electoral period increases the salience of Mafia-related issues in the political debate during the legislature that follows, but the coefficient is small and not statistically significant. In column (2), however, political murders *decrease* the propensity to talk about the Mafia – keeping constant the total number of homicides. This effect is large and statistically significant: an additional political homicide reduces the probability of talking about the Mafia by 4 percentage points – on a baseline probability of 22 percent. These results confirm the hypothesis that (only) political homicides have an intimidating effect on MPs appointed in the elections.

In column (3) we add to the equation a dummy for politicians appointed from the Left and its interaction with total and political homicides committed during the electoral

²⁸We focus on the probability of mentioning the Mafia at least once rather than on the total number of occurrences in order to ease the interpretation of the coefficients of interest and minimize the influence of outliers – the great majority of MPs never mention the Mafia and a few of them mention it hundreds of times, see the last row of Table 5. However, the results are qualitatively unaffected when we use this alternative definition of the dependent variable; see Table A4 in the Appendix.

Table 6: Electoral violence and parliamentary debates about the mafia, 1948-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	all MPs elected in Sicily			MPs elected in other regions			all MPs	
<i>Total number of words</i> ($\times 1,000$)	0.007*** (0.002)	0.007*** (0.002)	0.006** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.009*** (0.001)	0.009*** (0.001)
<i>Total homicides before elections</i>	0.004 (0.004)	0.011** (0.005)	0.008* (0.004)	0.002 (0.002)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.005*** (0.001)
<i>Political homicides before elections</i>		-0.039** (0.015)	-0.029** (0.013)		-0.020*** (0.003)	-0.018*** (0.002)	-0.020*** (0.003)	-0.018*** (0.002)
<i>Left</i>			0.134*** (0.039)			0.020** (0.007)		0.021*** (0.007)
<i>Left X total homicides</i>			0.014*** (0.004)			0.002 (0.001)		0.002 (0.001)
<i>Left X political homicides</i>			-0.042*** (0.010)			-0.005 (0.004)		-0.005 (0.004)
<i>Sicily</i>							0.101*** (0.031)	0.071* (0.034)
<i>Elected in Sicily X total homicides</i>							0.005 (0.004)	0.003 (0.004)
<i>Elected in Sicily X political homicides</i>							-0.019 (0.013)	-0.012 (0.012)
<i>Left X Sicily</i>								0.105** (0.040)
<i>Left X Elected in Sicily X total homicides</i>								0.011*** (0.003)
<i>Left X Elected in Sicily X political homicides</i>								-0.034*** (0.007)
Constant	0.133** (0.051)	0.120** (0.047)	0.084 (0.049)	0.005 (0.016)	-0.002 (0.012)	-0.010 (0.011)	0.001 (0.014)	-0.006 (0.013)
Observations	653	653	653	7,064	7,064	7,064	7,717	7,717
R-squared	0.405	0.418	0.430	0.097	0.101	0.102	0.170	0.184

Note: This table shows the effect of electoral violence by the Mafia on parliamentary debates since 1948, as reported in the official transcripts of the Italian Parliament. The sample in columns (1) to (3) includes all parliamentary speeches by MPs elected in Sicily; the sample in columns (4) to (6) includes all MPs elected in other regions who intervened in a parliamentary debate in which at least one MP elected in Sicily also intervened; and the sample in columns (7) and (8) includes all MPs in the previous columns. The unit of observation is the MP-legislature and the dependent variable is a dummy equal to 1 if the MP mentioned the word “Mafia” at least once in a given legislature. *Total homicides before elections* is the number of people killed by the Mafia in each municipality in the year before elections, and *political homicides before elections* is the number of victims that had some linkage with political parties and/or trade unions (e.g., party members or local administrators). *Left* and *Sicily* are dummy variables for MPs of the Left (the Italian Communist Party in the First Republic and the Center-Left coalition in the Second Republic) and MPs appointed in Sicily, respectively. Finally, *total number of words* ($\times 1,000$) is the total number of words pronounced by each MP in a given legislature. Robust standard errors are reported in parentheses and are clustered by MP and by legislature using the two-way clustering method described in Cameron et al. (2012). *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

period. Several interesting findings emerge. First, in line with the preliminary evidence in Table 5, MPs of the Left are more willing to bring up the Mafia in parliamentary debates, especially after periods of greater electoral violence. Each homicide increases the probability of talking about the Mafia on average by 2.2 percentage points for MPs of the Left, but only by 0.8 percentage points for other MPs (see the coefficients of *Total homicides* and *Left X total homicides*). Second, the coefficient of political homicides becomes smaller and is no longer statistically significant. This is due to the fact that political homicides decrease voting for the Left (see Table 4) and, thus, the chances of appointing MPs that, on average, talk more about the Mafia. Third, although MPs of the Left are on average more willing to talk about the Mafia, they are also more intimidated by political murders. Each political homicide decreases the probability of talking about the Mafia on average by 7.1 percentage points for MPs of the Left, but only by 2.9 percentage points for other MPs (see the coefficients of *Political homicides* and *Left X political homicides*). Therefore, electoral violence effectively signals the strength of the Mafia to its political opponents, who are more at risk of future retaliation.

In columns (4) to (6) we replicate the analysis for MPs appointed in other regions who intervened in the same debates in which (at least) one MP appointed in Sicily also intervened. The coefficients of total homicides, political homicides, and their interactions with *Left* have the same sign as those estimated for MPs appointed in Sicily, but they are lower in magnitude and often not statistically significant. Clearly the Mafia may have less intimidatory power against MPs, party organizations, and voters in other regions than Sicily. In the last two columns of Table 6 we pool together MPs appointed in all regions, we include a dummy for MPs appointed in Sicily and interact it with all other variables of interest. On the one hand, MPs appointed in Sicily talk more about the Mafia; on the other they also seem more vulnerable to intimidation (column 7). In line with the results in the previous columns, these effects are stronger for MPs appointed with the Left (column 8).

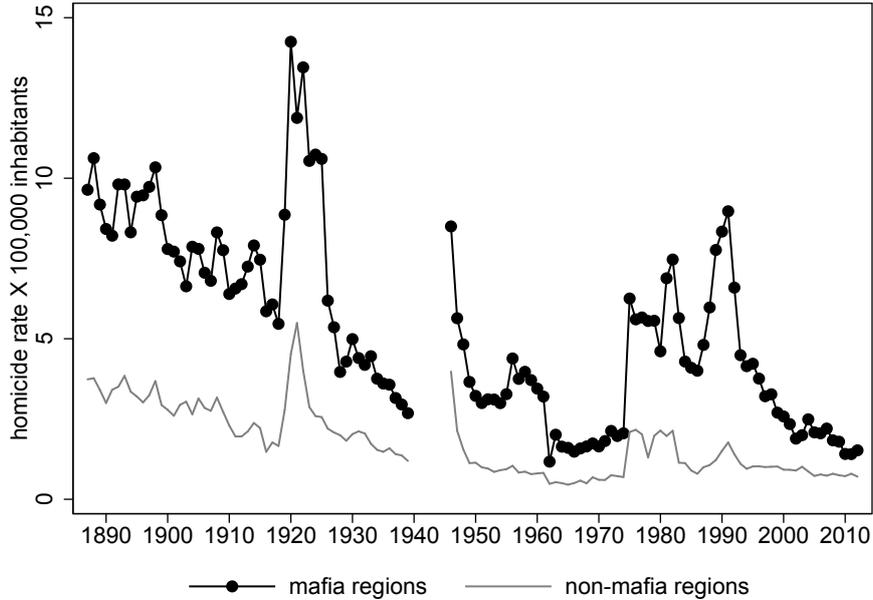
4 Criminal organizations and electoral violence in Italy: 1887-2012

Italy comprises 20 administrative regions, corresponding to level 2 of Eurostat's NUTS classification of territorial units. Using official paper publications by the Italian National Statistical Institute (ISTAT), we have reconstructed yearly series of homicide rates at the regional-level starting from 1887. For the first decades of this period, the small region of Valle D'Aosta was aggregated with Piedmont, and the regions of Veneto, Friuli Venezia Giulia and Trentino were aggregated. We maintain the same classification (16 regions in total) also for the following years. Provincial-level data are available for the last part of

the sample period (1983-2012).

Figure 4 plots the homicide rate distinguishing between regions with an historical presence of mafia-type criminal organizations — i.e., Sicily, Campania, and Calabria — and other Italian regions. The homicide rate in mafia regions is always much higher than in non-mafia regions.²⁹

Figure 4: Homicide rates in mafia and non-mafia regions, 1887-2012



Note: The graph shows the time series of homicides per 100,000 inhabitants in regions with an historical presence of mafia-type criminal organizations (Sicily, Campania, and Calabria) and in other regions. The series does not include the years during World War II (1940-45).

In order to quantify the extent of electoral cycles in violence, we first estimate a series of simple univariate regressions for each Italian region:

$$homicides_{rt} = \alpha_r + \beta_r * electoral_t + \varepsilon_{rt}, \quad (1)$$

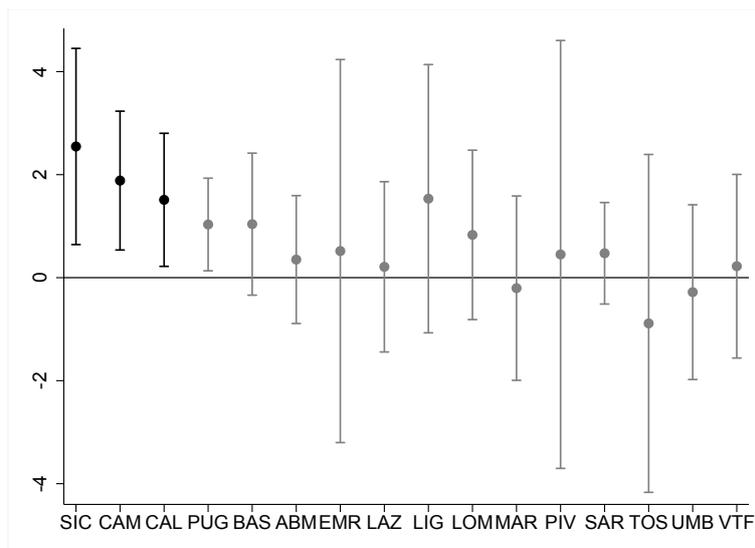
where $homicides_{rt}$ is the homicide rate per 100,000 inhabitants in region r and year t , $electoral_t$ identifies the period before the elections (defined below), and ε_{rt} is an error term. The coefficient β_r captures any systematic change in the homicide rate of region r during the electoral period. In line with the analysis in the previous section, we assume that the electoral period starts one year before the election date. However, since data

²⁹We exclude homicides for the World War II years because, during this period, the victims of the civil war between Fascists and partisans were recorded as homicides. Since the civil war was fought mainly in the northern part of Italy, the homicide rate in non-mafia regions is abnormally high – greater than in mafia regions – towards the end of the conflict (1944-45). However, this is clearly a distinct phenomenon from criminal homicides perpetrated outside the war period. For completeness, in Figure A1 of Appendix 3 we also show the graph including the war period.

on homicide rates are available only at yearly frequencies, we impute to each year t the fraction of the electoral period falling within that year. Therefore, if elections are held in month m of year t ($m = 1, 2, \dots, 12$), $electoral_t = m/12$ and $electoral_{t-1} = (12 - m)/12$. For instance, if national elections are held in April (as is normally the case in Italy) $electoral_t = 1/3$ and $electoral_{t-1} = 2/3$.

Figure 5 shows the region-specific estimated coefficients and confidence intervals. Sicily, Calabria, and Campania exhibit abnormal spikes in the homicide rate during the electoral period — i.e., between 1.5 and 2.5 additional homicides on average per 100,000 inhabitants. This is a large effect, as the average homicide rate during the same period was 5.5 in mafia regions and 2.5 in non-mafia regions. The coefficient is positive and significantly different from zero also for Puglia, and it is close to statistically significant for Basilicata. These two regions also experienced the presence of criminal organizations, although only since the 1970s and on a smaller scale than in Sicily, Calabria, and Campania (Pinotti, 2015). The coefficient is not significantly different from zero for any other Italian region.

Figure 5: Electoral violence in Italian regions, 1887-2012



Note: This figure shows the differential effect of electoral cycles on homicides in Italian regions, based on separate regressions by region of the homicide rate per 100,000 inhabitants on a measure of the electoral cycle. Black symbols denote regions with an historical presence of mafia-type organizations. The regressions are estimated on yearly observations for the homicide rate over the period 1887-2012, the measure of the electoral cycle is the fraction of months in each calendar year within 12 months from the following national election. The plots show the point estimate and confidence intervals of the coefficient of this variable. Robust standard errors are used for constructing the confidence interval.

In Table 7 we pool all regions together and estimate a series of difference-in-differences models interacting the measure of electoral cycles, $electoral_t$, with indicator variables for regions with an historical presence of criminal organizations. The estimated equation in

Table 7: Electoral violence in mafia and non-mafia regions, 1887-2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	complete sample: 1887-2012				1887-1921	1922-45	1946-2012
<i>electoral period</i>	0.407 (0.863)						
<i>mafia X electoral period</i>	1.574** (0.731)	1.504* (0.816)	0.149* (0.085)				
<i>Sicily X electoral</i>				1.992*** (0.548)	1.971*** (0.372)	1.280 (1.674)	1.132** (0.483)
<i>Calabria X electoral</i>				1.338** (0.547)	1.524*** (0.237)	-1.228 (0.768)	0.761 (0.563)
<i>Campania X electoral</i>				1.182** (0.484)	0.909*** (0.044)	-2.168 (1.426)	0.972*** (0.363)
Observations	2,016	1,936	1,936	1,936	496	400	1,040
Controls and year FE	NO	YES	YES	YES	YES	YES	YES
R-squared	0.004	0.487	0.650	0.487	0.554	0.472	0.481

Note: This table shows the differential effect of electoral cycles on homicides in mafia and non-mafia regions. In all columns with the exception of (3), the dependent variable is the homicide rate per 100,000 inhabitants in each region and year; in column (3), the dependent variable is the logarithm of 1 plus the total number of murders in each region and year. The explanatory variable *electoral period* is the fraction of months in each calendar year within 12 months of the following national election, and *mafia* is an indicator variable equal to 1 for regions with an historical presence of mafia-type criminal organizations – Sicily, Calabria, and Campania. Columns (5), (6), and (7) include in the sample only the years between Unification and Fascism, Fascism and the World-War II period, and the Republican period, respectively (the exact period is indicated at top of each column). The average homicide rate in each period is also reported (in brackets). Region fixed effects are included in all regressions; in columns (2) to (7) we also include year fixed effects and the logarithms of GDP per capita and population in each region and year. Robust standard errors are reported in parentheses and they are clustered by region and by year using the two-way clustering method described in Cameron et al. (2012). *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

column (1) is

$$homicides_{rt} = \alpha * electoral_t + \beta * mafia_r * electoral_t + \gamma' x_{rt} + \delta_r + \varepsilon_{rt}, \quad (2)$$

where $mafia_r$ is a dummy equal to 1 for Sicily, Calabria, and Campania, and it is equal to 0 for other regions; x_{rt} is a vector of additional observed determinants of the homicide rate that vary across regions and years; δ_r is a region-specific fixed effect; and ε_{rt} is a residual term summarizing the effect of other omitted factors. The estimated coefficient α captures the average increase in homicide rate for regions without an historical presence of mafia organizations ($mafia_r = 0$) and β estimates the additional increase in Sicily, Calabria, and Campania. We always report heteroskedasticity-robust standard errors clustered by region and year – for a total of 116 clusters – using the two-way clustering method of Cameron et al. (2012).

During electoral periods, the homicide rate in mafia regions increases by 1.6 additional homicides per 100,000 inhabitants (statistically significant at the 5% confidence level) relative to non-mafia regions. This result is unaffected when including a full set of year fixed effects in the regression — thus dropping $electoral_t$ — the log of regional GDP per capita, and the log of population (column 2).³⁰ In column (3) we re-estimate

³⁰Data on regional GDP per capita and population are available from Malanima and Daniele (2007)

the same specification for the log of murders (as opposed to the murder rate).³¹ Since we are controlling on the right-hand side of the equation for the log of population, the coefficient of the interaction term equals approximately the (additional) percentage increase in homicides over population. This coefficient is positive and significant, meaning that the homicide rate increases also in relative terms – not only in levels – in mafia regions during the electoral period. In column (4) we estimate three separate interaction terms for each of the mafia-affected regions. All three coefficients are statistically significant and of the same order of magnitude (between 1 and 2 additional homicides per 100,000 inhabitants).

4.1 Electoral violence under democracy and dictatorship

To the extent that electoral violence is strategically used to influence electoral and political outcomes, it should vary with the degree of political contestability, which in turn depends on the institutional regime. The recent Italian history provides rich variation in this respect. In particular, it is possible to distinguish three periods since the Unification: the Constitutional monarchy until 1861, in which the Parliament was elected through free democratic elections (though with restricted suffrage); the Fascist dictatorship between 1922 and 1945; and the Republican period after 1945. Of course, political contestability was minimal (or nil) under the dictatorship, in which elections were actually plebiscites for the Fascist party – the only one admitted to run in the 1929 and 1934 elections.

In columns (5) to (7) of Table 7, we compare the extent of electoral violence under the Fascist regime and under the other two periods. Homicides increase around electoral periods in mafia regions (relative to other regions) in all periods except during Fascism. This finding is consistent with the fact that criminal organizations had little or no chances of influencing elections during this period.³²

4.2 Electoral violence under different voting rules

Even within the Republican period, there is considerable variation in political contestability, depending on the type of electoral institutions in place and the relative strength of different parties.

and ISTAT, respectively. These are the only control variables available at the regional level over the period 1887-2012.

³¹In 6 observations out of 2,016 the number of homicides is equal to zero, so the logarithm would not be defined. For this reason, we increase by 1 the number of homicides in all observations.

³²The results for the Fascist period can actually be considered as a placebo test. As an additional placebo test, we run our analysis for other types of (predatory) crimes. These results are reported in Table A5 of Appendix 3.

4.2.1 Proportional elections

At the end of World War II, a national unity government formed by all anti-fascist parties (Communists, Socialists, Christian Democrats, and Liberals) guided the transition to the First Italian Republic. The committee in charge of the electoral reform adopted a proportional system with party lists and preference votes for individual candidates. The system remained in place, with only minor changes, until 1993. Throughout this period, the political landscape was marked by competition between the Christian Democrats and the Communist Party. Although the Christian Democrats always obtained a relative majority — i.e., forming a series of coalition governments with the help of small center parties — their vote share was progressively eroded by the advance of the Italian Communist Party. Since the Sicilian Mafia and other criminal organizations traditionally opposed the Left, we should expect that electoral violence intensifies when the gap with government parties gets narrower (as we will argue more formally in Section 5).

To test this prediction, we interact our main variable of interest, $mafia_r * electoral_t$, with the gap between the percentage vote-shares of the Christian Democrats and the Italian Communist Party. Since the relative performance of the two parties in mafia regions would partly depend on electoral violence carried out by criminal organizations — this is indeed the main premise of our analysis — we consider the gap within the sub-sample of non-mafia regions.³³

The results are presented in column (1) of Table 8. Indeed, more contested elections are characterized by greater electoral violence. If the two parties had equal chances of winning the elections (i.e., $gap_t = 0$), the homicide rate in the year before elections would increase by 4.3 additional homicides in mafia regions relative to non-mafia regions. An electoral advantage of 5 percentage points for the Christian Democrats over the Communists reduces the differential in homicides to about 2.5 per 100,000 inhabitants.³⁴

4.2.2 Majoritarian elections

In the wake of massive corruption scandals, the First Republic came to an abrupt end in 1992-1993. The Christian Democrats and their allies in government were severely damaged by the judicial investigations and disappeared from the political arena. The subsequent transition to the so-called Second Republic involved a change from a pure proportional electoral system to a mixed system with a strong majoritarian component. Under the new system, 75% of seats were attributed by plurality rule in 475 single-

³³Official data on electoral results are available from the dedicated website of the Italian Ministry of Interior (www.elezionistorico.interno.it).

³⁴To minimize the risk of omitted variable bias in the estimated coefficient of $mafia_r * electoral_t * gap_t$, one must also include, on the right-hand side of the equation, all interactions between any two variables in the triple interaction term. However, gap_t is defined only for the electoral period (analogously to $electoral_t$) so $mafia_r * gap_t$ is ultimately identical to $mafia_r * electoral_t * gap_t$, while $electoral_t * gap_t$ is absorbed by the year fixed effects.

Table 8: Electoral violence under different types of electoral system

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	regional data, 1946-2012			provincial data, 1993-2004		type of homicide		
	1948-1992	1887-1909	1993-2004	majoritarian elections		mafia	non-mafia	
<i>mafia X electoral period</i>	4.303*** (1.098)	1.463*** (0.332)	1.610** (0.585)	1.512** (0.578)	1.254** (0.416)			
<i>mafia X electoral period X gap</i>	-0.372*** (0.075)	-0.028 (0.029)	-0.007 (0.041)					
<i>mafia X electoral X contested district</i>					5.686** (1.911)	5.459** (2.408)	4.350*** (1.049)	1.109 (1.457)
<i>electoral X contested district</i>					0.465** (0.171)	0.418** (0.181)	0.019 (0.016)	0.398* (0.193)
Observations	752	496	192	1,140	1,140	1,140	1,140	1,140
mafia region X year FE	NO	NO	NO	NO	NO	YES	YES	YES
R-squared	0.143	0.127	0.277	0.082	0.108	0.030	0.071	0.009

Note: This table shows the differential effect of electoral cycles on homicides in mafia and non-mafia regions under different electoral regimes. The units of observation are region-years in columns (1) to (3), and province-years in columns (4) to (8), as reported at the bottom of each column – the sample period is also indicated. The dependent variable in columns (1) to (6) is the homicide rate per 100,000 inhabitants. Separate figures for mafia-related and other crimes are available in columns (7) and (8) for the sub-period 1993-2004. The principle explanatory variables of interest are interactions between *electoral period*, *mafia*, and *gap*. *electoral period* is the fraction of months in each calendar year within 12 months from the following national election. *mafia* is an indicator variable equal to 1 for regions with an historical presence of mafia-type criminal organizations – Sicily, Calabria, and Campania. Finally, *gap* is the difference in the voting share of the two main parties (or coalition of parties) of the Left and Right in non-mafia regions. Region and year fixed effects are included in all regressions and region X year fixed effects are included in columns (6) to (8). Robust standard errors are reported in parentheses and they are clustered by region and year using the two-way method described in Cameron et al. (2012). *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

member districts (the remaining 25% were filled with proportional representation). The system remained in place until 2004, when a further electoral reform abolished single-member districts and re-introduced closed party lists. A majoritarian rule had already been adopted in Italy in the period before Fascism (1861-1909) although, at that time, suffrage was restricted to a minor share of the population (males above a certain income level).

Under a majoritarian system, electoral competition is concentrated in contested districts. Therefore, electoral violence should be localized in such districts, whereas it should not depend on the gap between the two main parties at the national level. This is consistent with the evidence we obtain when we replicate the analysis in column (1) of Table 8 for the periods in which a majoritarian system was in place: 1887-1909 (column 2), and 1994-2004 (column 3). During the former period, the Left coalition comprised the Socialists and other radical parties, whereas the Right comprised liberal and conservative parties — including the so called “Historical left”, a moderate liberal party very similar to the “Historical right”. During the latter period, the Left comprised the Democratic Party — i.e., the heir of the Italian Communist Party — and its allies, whereas the Right comprised *Forza Italia* — i.e., the party of Silvio Berlusconi — and its allies.³⁵ The results in columns (2) and (3) of Table 8 confirm that, under majoritarian elections, the extent of electoral violence is unrelated to the intensity of electoral competition at the national-level.

³⁵The electoral data for the periods 1887-1909 and 1994-2004 are available, respectively, from Corbetta and Piretti (2009) and from the website of the Italian Ministry of Interior.

Violence should be concentrated, instead, in those “swing” districts where the outcome is more uncertain. Unfortunately, homicide rates are not available at the district level. The finest level of geographical detail is provincial — available since 1983. Each province includes multiple districts but no electoral district crosses provincial borders.³⁶ We thus compute the fraction of voters in each province residing in contested districts, defined as those in which the gap between the winning and losing coalition at the first elections held with the majoritarian system (1994) was below 5 percent.³⁷ Then, we interact this variable with $mafia_r * electoral_t$ in equation (2). We also interact the fraction of voters in contested districts with $electoral_t$, while the interaction with $mafia_r$ is absorbed by the province fixed effects (always included in the regression). The regression also controls for the log of province population, the only variable available at the provincial level during the sample period.

The results are presented in columns (4) to (6) of Table 8. A standard deviation increase in the fraction of voters residing in contested districts (0.32) increases the differential in homicides between mafia and non-mafia regions during electoral periods from 1.2 to 3 (column 5). Exploiting variation across provinces, it is possible to extract any differential trend in homicide rates between mafia and non-mafia regions by interacting $mafia_r$ with the set of year fixed effects; when doing so, the triple interaction coefficient remains identical (column 6).

The province-level criminal statistics available since 1983 also allow us to distinguish between mafia-related homicides and other homicides. Such a distinction was introduced with Article 416-bis of the Penal Code, which classifies as mafia-related the homicides committed by mafia members for the purposes of the organization. The last two columns of Table 8 show that the effect of interest is entirely due to mafia-related homicides.

5 A model of pre-electoral intimidation

Building on the evidence collected up to this point, we now develop a simple model in which criminal organizations use pre-electoral violence to signal their military strength to the parties competing in the political arena. Specifically, we study the mechanisms that allow criminal organizations to have their captured politicians elected under alternative electoral rules and different degrees of political competition.³⁸ The results rationalize the findings highlighted above regarding different voting systems.

³⁶In 1993 there were 95 provinces and 475 districts, with a median size of 2,247 and 527 square kilometers, respectively.

³⁷The results are robust to other sensible choices regarding this threshold.

³⁸The mechanism through which politicians are captured by criminal organizations is not studied here. In some cases, the members of Italian criminal organizations become themselves politicians.

5.1 Proportional electoral system

Two political parties compete to attract a mass 1 of voters in a large election. One party is honest (h), the other (c) is captured by a criminal organization. For simplicity, and with no loss of generality, we posit that each vote is equivalent to one seat.³⁹ When in office, the c party favors the criminal organization and its illegal activities; the h party does not. The criminal organization obtains a return, b , for each seat (vote) obtained by the captured party. Therefore, if the captured party wins a share $x \in [0, 1]$, the criminal organization gets a return bx . The voters' choice is influenced by the electoral effort (e) exerted by the honest party during the electoral campaign. The vote-share of the honest party, when it exerts effort e , is

$$h(e, \alpha) \equiv \alpha + e,$$

where α is the share of voters who always vote for h regardless of e — i.e., fully honest voters. Hence, the c party obtains a share equal to $1 - h(e, \alpha)$.⁴⁰ For simplicity, we assume that only honest candidates exert effort to win swing voters (we relax this assumption in Section 5.3).

The cost of exerting campaigning effort is $\psi(e, \alpha, \theta)$ and is increasing and convex in e . It is decreasing in α since parties with a larger share of fully honest voters have — other things being equal — a relatively lower cost of capturing swing voters because of positive externalities and/or herding behavior within social networks (see, e.g., Knoke, 1994, among others). In other words, if a large fraction of voters is honest it is easier to enforce honesty on potentially dishonest individuals: an hypothesis consistent with Tabellini (2008). Finally, the cost of effort is also increasing in the parameter $\theta \in \{s, w\}$, which measures the organization's military power and its willingness to use it: s stands for strong, w stands for weak, with $\Delta \equiv s - w \geq 0$.⁴¹

This relationship between effort cost and military strength of the organization is a convenient shortcut to capture, within a unified framework, several interpretations of the model. First, violence may imply that a candidate of the honest party is killed. In that case, another candidate may have to run; the latter may be less efficient at attracting votes (possibly because he is scared or, even more simply, because he is a second choice) which is equivalent to a higher cost of effort per vote obtained. Second, even if the honest candidate is not killed, violence may disrupt his campaign by damaging

³⁹Further, we also assume there is only one honest party, but there could be more as was the case in Sicily. Assuming that there is only one criminal organization in each district is consistent with the pyramidal structure of the Sicilian Mafia, as we discussed above.

⁴⁰Our approach borrows from Coate (2004). In his model there are three groups of voters: those who vote for sure for a certain candidate (leftists, and rightists in Coate's model) and swing voters who can be convinced by campaign effort. See also Prat (2002) and Roemer (2006) for similar models.

⁴¹We make the assumption of two possible types of criminal organization for simplicity. The qualitative insights of the model remain true in a more general environment with multiple types.

his headquarters and scaring his campaign ‘workers’. These disruptions increase the cost of effort. Third, voters may be intimidated by violence, and may thus prefer to elect the corrupt party in order to avoid additional violence, which implies that the necessary effort to persuade them to vote for the honest party increases. Our specification allows for all three interpretations or a combination of them.

In order to obtain closed form solutions we assume a specific functional form for the effort cost — i.e.,

$$\psi(e, \alpha, \theta) = \frac{\theta e^2}{2(1 + \alpha)}. \quad (3)$$

The honest party does not know the organization’s type when it chooses effort. Their prior belief is that the organization is strong with probability $\beta \in [0, 1]$. Hence, if feasible, the criminal organization would like to signal its military power in order to increase the effort costs of the h party. The signaling device is pre-electoral violence, $\nu \geq 0$, which may take the form of assassinations, violent riots, vandalism, etc., causing both psychological and physical impediments (including death) to the candidates of the honest party. Thus, from now on, signaling military power is meant in the sense of signaling the willingness to use a certain level of violence. Although criminal organizations always retain this option, the willingness to actually exert violence may vary considerably over time, depending (among other things) on the leaders in power in a given historical period. For instance, Totò Riina and Bernardo Provenzano — the two most important leaders of the Sicilian Mafia in recent decades — had a very different propensity to use violence; very high propensity for the former, less so for the latter. Strong leaders may want to reveal their willingness to use violence; however, this is complicated by the fact that they operate in the underworld. Therefore, politicians and voters may have imperfect information about the attitude of the criminal leaders in power and they may, as a consequence, be unable to distinguish truly strong leaders from imitators. For this reason, strong leaders may need to undertake costly action for the threat of violence to be credible.⁴² Thus violence disrupts the campaign of the honest party and, in addition, intimidates its candidates and voters.

The cost of electoral violence is $k(\nu, \theta) = \frac{\nu}{\theta}$, which is inversely related to the organization’s military power and, as discussed above, reflects the willingness to use it. The timing of the game is as follows:

1. Nature draws θ .
2. The criminal organization chooses the intensity of electoral violence ν .
3. Honest candidates observe ν , update beliefs, and decide how much effort e to invest in the campaign.

⁴²Smith and Varese (2001) discuss a similar issue in the case of extortion.

4. The elections occur.

The game is solved using a *perfect Bayesian equilibrium* (see, e.g., Fudenberg and Tirole, 1991). Therefore, a strategy for the criminal organization is a function that maps its military power (type) onto a level of violence, while the strategy for honest politicians specifies an effort choice contingent on the information revealed at stage 2. Off-path beliefs will be specified as we go along. We mostly focus upon separating equilibria, which are of greatest interest; however, in Appendix 1 we also examine pooling ones.

Let ν_θ^* denote the equilibrium intensity of violence when the type of the criminal organization is θ . We rule out uninteresting equilibria in which, regardless of the organization type, honest politicians exert no effort as well as those in which honest politicians always win the election regardless of effort. This is guaranteed by the following:

- **Assumption A1.** $w > \frac{1+\alpha}{1-\alpha}$.

Let $\beta(\nu) \equiv \Pr[\theta = s | \nu]$ be the posterior of the honest party upon observing $\nu \geq 0$. In a separating equilibrium, $\beta(\nu_s^*) \equiv 1$ and $\beta(\nu_w^*) \equiv 0$. The objective function of the honest party is equal to its share of votes net of the effort cost. Hence, upon observing ν_θ^* , at stage 3 the honest party chooses the effort level that solves the following problem

$$\max_{e \in [0, 1-\alpha]} \{h(e, \alpha) - \mathbb{E}[\psi(e, \alpha, \theta) | \nu_\theta^*]\},$$

where, under the quadratic specification (3), it follows that

$$\mathbb{E}[\psi(e, \alpha, \theta) | \nu_\theta^*] = \underbrace{[\beta(\nu_\theta^*)s + (1 - \beta(\nu_\theta^*))w]}_{\equiv \mathbb{E}[\theta | \nu_\theta^*]} \frac{e^2}{2(1+\alpha)}.$$

The first-order condition, necessary and sufficient for an optimum implies

$$e_\theta^* = \frac{1+\alpha}{\theta},$$

with $e_s^* < e_w^* < 1 - \alpha$ by Assumption A1.

Hence, in equilibrium, effort is decreasing in the military power of the criminal organization and is increasing in the share α of h 's ideological voters. The incremental vote-share that the corrupted party obtains when it is supported by a strong organization amounts to

$$h(e_w^*) - h(e_s^*) = (1+\alpha) \frac{\Delta}{ws},$$

which is (*ceteris paribus*) increasing in α and in Δ . The outcome described above emerges in equilibrium when (ν_s^*, ν_w^*) satisfy the no-mimicking conditions of the organization, which ensures that types do not mimic each other — i.e., a strong (resp. weak) type

must not profit from exerting a level of violence that is attributed to the weak type (resp. strong).

Note that, in a separating equilibrium, the level of violence exerted by the weak organization cannot be positive — i.e., it must be $\nu_w^* = 0$. Intuitively, this is because a weak organization would always have an incentive not to exert violence in a separating equilibrium. Hence, to find an equilibrium we simply need to determine ν_s^* , which will be pinned down by the incentive compatibility constraints. We thus establish the following result.

Proposition 1. *Suppose that Assumption A1 holds. There always exists the least-costly separating equilibrium in which $\nu_w^* = 0$ and $\nu_s^* = b(1 + \alpha) \frac{\Delta}{s}$.*

The ‘least-costly’ separating equilibrium we have identified corresponds to the ‘Riley outcome’ (Fudenberg and Tirole, 1991). It implies that the level of pre-electoral violence can act as a signal to intimidate candidates of the honest party. This seems consistent with the evidence presented in Section 3.2. Moreover, consistent with the evidence reported in Section 4.2.1, the level of violence exerted by the strong type in such an equilibrium is increasing in α , the popularity of the honest party.

In Appendix 1 we discuss multiplicity of equilibria including pooling outcomes and we also show that the equilibrium just described is the only one that survives the Cho and Kreps (1987) intuitive criterion.

5.2 Majoritarian system

Consider now a majoritarian system. Specifically, suppose that the voting population is split in N identical districts, each populated by a mass $\frac{1}{N}$ of voters and denoted by $i \in \{1, \dots, N\}$. In each district a candidate wins the election with a simple majority. Everybody votes. The (total) revenue of the criminal organization is $\frac{bx}{N}$ where x is the total number of districts won by candidates of party c . The honest politician running in district i exerts effort e_i , which determines the share $h(e_i) = \alpha_i + e_i$ of the honest party in that district. As before, α_i measures the mass of a district i ’s electors that always vote for h . The criminal organization can still be either strong or weak, and this characteristic is common to all districts. For the moment we posit that there are no informational externalities between districts. That is, the information about θ revealed through the use of violence within district i does not affect the behavior of politicians in the other districts. We discuss this in more detail below and in Appendix 1.

We restrict attention to separating equilibria in which only the strong organization engages in pre-electoral violence; the analysis of pooling equilibria is discussed in Appendix 1. We also assume that the cost of exerting violence for the organization is additively separable across districts. That is, letting $\nu = \sum_{i=1}^N \nu_i$, we assume:

- **Assumption A2.** The total cost of violence $k(\nu, \theta)$ is additive — i.e.,

$$k(\nu, \theta) = \sum_{i=1}^N k(\nu_i, \theta).$$

Clearly, this is a restrictive assumption. Committing crimes and violence in district i may affect the cost of doing the same in district j in a variety of ways. Party h may adopt more precautions in district j having observed violence in district i , in turn raising the cost of violence in support of party c . Law enforcers — possibly under pressure from public opinion — may increase security as violence escalates in several districts. On the other hand, public opinion (and law enforcers) may be accustomed to a certain level of intimidation and violence (or be scared by it), numbing the effect of further violence and releasing pressure for greater enforcement efforts. Both these effects seem plausible and, in principle, they may be at play simultaneously. Hence, by imposing separability we isolate the model results from the relative strength of these two forces.

Formally, Assumption A2 implies that the organization's maximization problem is separable across districts. Therefore, in order to characterize the equilibrium of the game we can focus on a generic district (say i). The timing of the game is as before. When the captured party obtains a majority of votes in a district it wins the seat.⁴³ That is, for given effort e_i it needs to obtain a share of votes

$$1 - h_i(e_i, \alpha_i) > \frac{1}{2},$$

which requires the honest candidates to exert a sufficiently low campaigning effort — i.e.,

$$e_i < \frac{1}{2} - \alpha_i.$$

Obviously, engaging in pre-electoral violence in district i is useless if $\alpha_i \geq 1/2$ since the honest party wins the election even if $e_i = 0$.⁴⁴ Hence, hereafter, we focus on the most interesting case $\alpha_i < 1/2$.

In a separating equilibrium, the honest party wins the elections if, and only if, the utility of being appointed exceeds the corresponding effort cost. That is,

$$1 \geq \psi\left(\frac{1}{2} - \alpha_i, \alpha_i, \theta\right).$$

Let us first focus on districts in which honest candidates win the election *only* when they

⁴³For simplicity, we assume that in the case of a tie the honest party wins the subsequent round of elections.

⁴⁴We are excluding here a situation in which the candidate of party h is killed and the party cannot supply another candidate for which $\alpha \geq 1/2$.

face a weak organization, namely districts in which the following condition holds:

$$\psi(\frac{1}{2} - \alpha_i, \alpha_i, w) \leq 1 < \psi(\frac{1}{2} - \alpha_i, \alpha_i, s). \quad (4)$$

Note that, under a majoritarian system, a weak criminal organization has an even stronger incentive not to exert violence in a separating equilibrium. This is because it makes no profit when α_i satisfies (4). Hence, a separating equilibrium must again be such that $\nu_{i,w}^* = 0 < \nu_{i,s}^*$, with the latter inequality satisfying the organization's incentive compatibility constraints.

To rule out the uninteresting case in which the weak organization always loses the elections regardless of α_i , we assume that

- **Assumption A3.** w is large enough to imply $\psi(\frac{1}{2} - \alpha_i, \alpha_i, w) > 1$ for some $\alpha_i \in (0, \frac{1}{2})$.

Essentially, when this assumption is violated the problem becomes trivial since the weak organization is never willing to exert violence to win the election even when α_i is equal to zero.

We can thus establish the following result.

Proposition 2. *Suppose that A2 and A3 hold. Under a majoritarian system, the least-costly separating equilibrium features*

$$\nu_{i,w}^* = 0 < \nu_{i,s}^* = \frac{wb}{N},$$

and exists only if s is not too small, and if α_i is neither too large nor too low. Otherwise, in district i , there is only a pooling outcome in which the organization does not exert violence.

As seen in the data (i.e., Section 4.2.2), under a majoritarian system, an equilibrium in which only the strong organization engages in electoral violence only arises in districts where there is *head-to-head* competition between parties. By contrast, it is never optimal for the criminal organization to rely on costly violence in order to signal its military strength if one of the two parties wins the election no matter what e_i is. In this region of parameters, only a pooling equilibrium exists, which can be easily constructed by choosing appropriate off-equilibrium beliefs.⁴⁵

⁴⁵Of course, among the class of pooling equilibria, the one that maximizes the organization's expected profit features no violence.

5.3 Remarks

5.3.1 Uninformed corrupt candidate

We have so far assumed that captured politicians always know the organization type and that they always favour it once they are elected. Although both these assumptions seem quite realistic, at least in the case of the Sicilian Mafia, the insights of the model do not change — qualitatively — when such assumptions are weakened. Suppose, for example, that corrupt politicians do not know the type of the organization they are facing and that they may decide, once in office, not to support the organization. In this case, the organization members have an extra reason for signaling their military strength. In fact, by exerting violence against the candidates of the honest party, they will signal their type not only to these candidates but also to corrupt politicians. Anticipating this, corrupt politicians will continue to favor the criminal organization once they are in office. Obviously, this argument is strengthened if we assume that corrupt politicians also exert a campaigning effort that counterbalances the effort exerted by the honest candidates on the swing voters.

5.3.2 Information externalities across districts

In our analysis of the majoritarian system we have assumed that candidates in one district do not learn from the criminal organization’s behavior in other districts. Suppose instead that exerting violence in one district signals the criminal organization’s type in other districts as well. Our results do not change qualitatively in this case. Here is the intuition for why. Consider the simplest possible case where there are only two districts ($N = 2$) that differ not only by the share of people that always vote for the honest candidates but also with respect to the attention they receive from the media. District 1 is ‘central’ while district 2 is ‘peripheral’. Formally, this means that if the organization signals its type to the honest candidates in district 1, with probability $\lambda_1 \in [0, 1]$ this information reaches district 2, while the information disclosed in district 2 reaches district 1 with probability $\lambda_2 < \lambda_1$. Intuitively, if it is profitable for a strong type to only exert violence in district 1 in order to win elections in both districts, then a weak type will want to do the same. Actually, the more attractive this option is to the strong type — e.g., the larger is λ_1 — the more attractive it is for the weak type too. Hence, the potential cost savings from only exerting violence in central districts is offset by the possibility of mimicking. This makes it hard for strong types to exploit information externalities between central districts and peripheral ones (see also Appendix 1).

6 Conclusions

We show that in Sicily mafia killings of politicians increase before elections and have negative effects on the vote received by parties not captured by the mafia. Then, using a very large data set of electoral speeches, we find strong evidence that anti-mafia activities by politicians elected in Sicily are, in fact, negatively correlated with the levels of pre-electoral violence. Using data on homicides in all regions of Italy going back to the end of the nineteenth century, we document a political cycle of homicides only in regions with organized crime. We also show how this cycle changes as a function of the institutional regime, the electoral rules, and the relative strength of captured and non captured parties. All these findings are rationalized by a novel signaling model.

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Appendix 1: Proofs

Proof of Proposition 1. The (equilibrium) profit of a type- θ criminal organization is:

$$\pi_{\theta}^* \equiv b[1 - h(e_{\theta}^*, \alpha)] - k(\nu_{\theta}^*, \theta) = \begin{cases} b[1 - \alpha - \frac{1+\alpha}{s}] - \frac{\nu_s^*}{s} & \Leftrightarrow \theta = s, \\ b[1 - \alpha - \frac{1+\alpha}{w}] - \frac{\nu_w^*}{w} & \Leftrightarrow \theta = w. \end{cases}$$

In order to construct equilibria we must now specify off-path beliefs. Note that, for any ν_w^* , a weak type has no incentive to mimic the strong type as long as $\nu_s^* \geq \hat{\nu}$, with $\hat{\nu}$ being the solution of

$$b[1 - h(e_s^*, \alpha)] - k(\hat{\nu}, w) = b[1 - h(e_w^*, \alpha)] - k(\nu_w^*, w) \quad \Leftrightarrow$$

$$\hat{\nu}(\nu_w^*) = \nu_w^* + b(1 + \alpha) \frac{\Delta}{s}.$$

The most natural separating equilibria are those in which the observed violence level is high and the organization is strong. That is, a candidate for a PBE has to set beliefs such that

$$\beta(\nu) = 1 \quad \Leftrightarrow \quad \nu \geq \hat{\nu},$$

$$\beta(\nu) = 0 \quad \Leftrightarrow \quad \nu < \hat{\nu}.$$

If the criminal organization optimizes its behavior given these beliefs, then it is easy to show that it chooses no violence when it is weak — i.e., $\nu_w^* = 0$. Indeed, if $\nu_w^* > 0$ the weak organization would strictly gain by choosing $\nu = 0$ regardless of the off-equilibrium belief associated with this choice. By contrast, when it is strong, it chooses

$$\hat{\nu}(0) \equiv b(1 + \alpha) \frac{\Delta}{s}.$$

Note that this level of violence also satisfies the incentive compatibility constraint of the strong type — i.e.,

$$b[1 - h(e_s^*, \alpha)] - \frac{\nu_s^*}{s} \geq b[1 - h(e_w^*, \alpha)] \quad \Leftrightarrow \quad \nu_s^* \leq b \frac{\Delta}{w} (1 + \alpha),$$

with $b \frac{\Delta}{w} (1 + \alpha) > \hat{\nu}(0)$. Hence, the separating equilibrium that is least costly requires a level of violence equal to $b \frac{\Delta}{s} (1 + \alpha)$. ■

Equilibrium selection (proportional system). The intuitively plausible PBE identified in Proposition 1 is not unique: many other separating equilibria exist. In fact, note that, for any equilibrium candidate such that $\nu_s^* > 0 = \nu_w^*$, incentive compatibility

requires

$$b[1 - h(e_s^*, \alpha)] - \frac{\nu_s^*}{s} \geq b[1 - h(e_w^*, \alpha)] \Leftrightarrow \nu_s^* \leq b(1 + \alpha) \frac{\Delta}{w},$$

for the strong type. And, equivalently,

$$b[1 - h(e_w^*, \alpha)] \geq b[1 - h(e_s^*, \alpha)] - \frac{\nu_s^*}{w} \Leftrightarrow \nu_s^* \geq b(1 + \alpha) \frac{\Delta}{s},$$

for the weak type. One can find off-equilibrium beliefs that support any ν_s^* such that

$$\nu_s^* \in \mathcal{S} \equiv \left[b(1 + \alpha) \frac{\Delta}{s}, b(1 + \alpha) \frac{\Delta}{w} \right].$$

Essentially, this requires $\beta(\nu) = 1$ for every $\nu \geq \nu_s^*$ and $\beta(\nu) = 0$ otherwise. The least-costly separating equilibrium has two appealing properties. First, it maximizes the criminal organization's expected profit (this property is straightforward to verify). Second, it is the only one that meets the Cho and Kreps (1987) intuitive criterion. To see why, recall that a PBE is 'unreasonable' in the Cho-Kreps sense if it is sustained by off-path beliefs that 'attribute' some deviations to types that prefer to play their equilibrium strategy rather than the observed deviation, even if these beliefs would treat such types in the best possible way following the deviation (see Fudenberg and Tirole, 1998). In other words, beliefs conditional on out-of-equilibrium actions should reflect the fact that these actions are more likely to be chosen by one organizational type rather than another. More formally, using our notation, $\beta(\nu) = 1$ for some $\nu \neq \nu_s^*$ is compelling in the Cho-Kreps sense whenever

$$\pi_w^* > b[1 - h(e_s^*, \alpha)] - k(\nu, w),$$

$$\pi_s^* \leq b[1 - h(e_s^*, \alpha)] - k(\nu, s).$$

Similarly, $\beta(\nu) = 0$ for some $\nu \neq \nu_s^*$ is compelling in the Cho-Kreps sense whenever

$$\pi_w^* \leq b[1 - h(e_s^*, \alpha)] - k(\nu, w),$$

$$\pi_s^* > b[1 - h(e_s^*, \alpha)] - k(\nu, s).$$

Meaning that when a deviation is *dominated* for one type of organization but not for the other, this deviation should never be attributed to the player for which it is dominated. When an equilibrium does not satisfy this criterion, it fails the Cho-Kreps test. Applying this logic to the set \mathcal{S} of separating equilibria, it can be shown that every $\nu_s^* > \hat{\nu}(0)$ fails to satisfy its requirements except for the least-costly one $\hat{\nu}(0)$. In fact,

consider any $\nu \in [\hat{\nu}(0), \nu_s^*]$. By construction

$$\pi_s^* = b[1 - h(e_s^*, \alpha)] - k(\hat{\nu}(0), s) > b[1 - h(e_s^*, \alpha)] - k(\nu, s),$$

but

$$\pi_w^* \leq b[1 - h(e_s^*, \alpha)] - k(\nu, w).$$

Meaning that a reasonable system of off-equilibrium beliefs should be such that $\beta(\nu) = 1$ for every $\nu \in [\hat{\nu}(0), \nu_s^*]$, which is in contradiction with the fact that ν_s^* is sustained by off-equilibrium beliefs such that $\beta(\nu) = 1$ for every $\nu \geq \nu_s^*$ and $\beta(\nu) = 0$ otherwise. Hence, all separating equilibria strictly contained in \mathcal{S} are discarded by the intuitive criterion.

By construction, the least-separating equilibrium cannot be discarded by the Cho-Kreps intuitive criterion — i.e., it survives the test. Indeed:

$$\pi_w^* < b[1 - h(e_s^*, \alpha)] - k(\nu, w),$$

and

$$\pi_s^* < b[1 - h(e_s^*, \alpha)] - k(\nu, s),$$

at any $\nu < \hat{\nu}(0)$. So that $\beta(\nu) = 0$ for $\nu < \hat{\nu}(0)$ is plausible in the Cho-Kreps sense.

By the same token, it can be shown that

$$\pi_w^* > b[1 - h(e_s^*, \alpha)] - k(\nu, w),$$

and

$$\pi_s^* > b[1 - h(e_s^*, \alpha)] - k(\nu, s),$$

for any $\nu > \hat{\nu}(0)$. So that $\beta(\nu) = 1$ for $\nu > \hat{\nu}(0)$ is plausible in the Cho-Kreps sense. ■

Pooling Equilibria (proportional system). In a pooling equilibrium, the criminal organization always chooses ν^* regardless of its type. In this case, honest politicians base their effort choice on the prior, i.e., $\beta(\nu^*) = \beta$. Hence, the electoral effort chosen by the honest candidates in any of these (candidate) equilibria solves the following maximization problem

$$\max_{e \in [0, 1-\alpha]} \left\{ h(e, \alpha) - \mathbb{E}[\theta | \nu^*] \frac{e^2}{2(1+\alpha)} \right\},$$

where

$$\mathbb{E}[\theta | \nu^*] = \beta s + (1 - \beta) w.$$

The solution for is:

$$e^* = \frac{1 + \alpha}{\beta s + (1 - \beta) w}.$$

In equilibrium we must have:

$$\nu^* \in \mathcal{P} \equiv \left[0, \frac{b(1+\alpha)\beta\Delta}{\beta s + (1-\beta)w} \right]$$

For any ν^* in this interval, one can construct off-equilibrium beliefs that support this outcome as a PBE. Intuitively, the set of pooling equilibria is determined by the fact that the weak organization could induce an effort of $\frac{1+\alpha}{w}$ without the need to exert violence. That is

$$b[1 - h(e^*, \alpha)] - k(\nu^*, w) \geq b[1 - h(e_w^*, \alpha)] \Leftrightarrow \nu^* \leq \frac{b(1+\alpha)\beta\Delta}{\beta s + (1-\beta)w}. \quad (5)$$

This is because there cannot exist a pooling equilibrium such that $\beta(0) = 1$. Hence, $\beta(0)$ must be equal to 0 in any pooling equilibrium. Condition (5) is in fact a necessary condition for a pooling equilibrium to exist, otherwise a weak organization would always profit from revealing its type. As before, it is possible to find appropriate out-of-equilibrium beliefs that support each of these levels of violence as a pooling equilibrium. For example, $\beta(\nu) = \beta$ whenever $\nu \geq \nu^*$ and $\beta(\nu) = 0$ otherwise. Under these beliefs, a strong organization never profits from revealing its type if the weak organization doesn't, nor can it gain by pretending to be a weak type. Indeed, any level of violence higher than the equilibrium level is always attributed (off-equilibrium) by candidates to the weak type, which leads them to increase effort at the expense of the deviating organization.

How robust are these equilibria? Following the logic used in the case of separating equilibria it is straightforward to show that the Cho-Kreps intuitive criterion discards all of them.⁴⁶ Let π_θ^p be type θ 's equilibrium expected profit in a pooling equilibrium. The idea is that since the pooling outcome is sustained by beliefs such that $\beta(\nu) = 0$ for every $\nu \geq \nu^*$, and the strong type has lower costs of violence, there always exists a $\nu' > \nu^*$ such that

$$\pi_s^p > b[1 - h(e_w^*, \alpha)] - k(\nu', s),$$

$$\pi_w^p \leq b[1 - h(e_w^*, \alpha)] - k(\nu', w),$$

but yet $1 - \beta(\nu') > 0$, which is implausible in the Cho-Kreps sense.

We can thus conclude that the least-costly separating outcome characterized in Proposition 1 is the most appealing equilibrium of the game. ■

⁴⁶Of course, there may also exist semi-separating equilibria, in which at least one type mixes between two signals, one of which is also chosen with positive probability by the other type. These equilibria, however, do not satisfy the intuitive criterion – for a simple exposition, see, e.g., Bolton and Dewatripont, (2005, Ch. 3.1.).

Proof of Proposition 2. First, note that condition (4) can be rewritten as

$$\frac{1}{s} < \psi\left(\frac{1}{2} - \alpha_i, \alpha_i, 1\right) < \frac{1}{w},$$

where

$$\psi\left(\frac{1}{2} - \alpha_i, \alpha_i, 1\right) \equiv \frac{\left[\frac{1}{2} - \alpha_i\right]^2}{2(1 + \alpha_i)},$$

which is strictly decreasing in α_i for $\alpha_i \in [0, \frac{1}{2}]$. Hence, it is satisfied only if s is not too small — i.e., $\frac{1}{s} < \lim_{\alpha_i \rightarrow 0} \frac{[\frac{1}{2} - \alpha_i]^2}{2(1 + \alpha_i)} = \frac{1}{8}$ — and if $\alpha_i \in [\underline{\alpha}, \bar{\alpha}]$, with

$$\underline{\alpha} \equiv \frac{1}{2} + \frac{1}{w} - \sqrt{\frac{3}{w} + \frac{1}{w^2}} < \bar{\alpha} \equiv \frac{1}{2} + \frac{1}{s} - \sqrt{\frac{3}{s} + \frac{1}{s^2}} < \frac{1}{2},$$

and $\underline{\alpha} > 0$ by assumption A3.

Recall that, under assumption A2, the objective function of the criminal organization is separable across districts. Hence, focus (without loss of generality) on a generic district i , and assume that $\alpha_i \in [\underline{\alpha}, \bar{\alpha}]$. In this region of parameters a weak type can never induce the honest candidate(s) to lose the election. As a result, in equilibrium it must be $\nu_{i,w}^* = 0$, so that it makes no profit — i.e., $\pi_{i,w}^* = 0$. By contrast, in a separating equilibrium, the strong type can allow the corrupt party to win the election. Hence, its (equilibrium) profit is

$$\pi_{i,s}^* \equiv \frac{b}{N} - k(\nu_{i,s}^*, s).$$

That is, the benefit of ruling the district $\frac{b}{N}$ net of signaling cost $k(\nu_{i,s}^*, s)$.

Hence, a separating equilibrium in which $\nu_{i,s}^* > 0$ can exist if, and only if, the following incentive compatibility constraints hold

$$\frac{b}{N} - k(\nu_{i,s}^*, s) \geq 0 \geq \frac{b}{N} - k(\nu_{i,s}^*, w).$$

This defines the set of separating equilibria

$$\nu_{i,s}^* \in \mathcal{S}' \equiv \left[\frac{wb}{N}, \frac{sb}{N} \right].$$

As before, the off-equilibrium beliefs that support each of these equilibria are such that $\beta(\nu) = 1$ for every $\nu \geq \nu_{i,s}^*$, and $\beta(\nu) = 0$ otherwise. We have thus established the existence of the least-costly separating equilibrium, in which $\nu_{i,s}^* = \frac{wb}{N}$. ■

Equilibrium selection (majoritarian system). The least-costly separating equilibrium characterized in Proposition 2 not only maximizes the organization's expected profit, but it is also the only one that survives the intuitive criterion. To see why, consider any $\nu_{i,s}^* \in \mathcal{S}'$ strictly larger than $\underline{\nu}_{i,s}^*$, sustained by off-equilibrium beliefs such that $\beta(\nu) = 1$

for every $\nu \geq \nu_{i,s}^*$, and $\beta(\nu) = 0$ otherwise. Consider a deviation $\nu \in [\frac{wb}{N}, \nu_{i,s}^*)$. The following is true

$$\pi_{i,s}^* = \frac{b}{N} - k(\nu_{i,s}^*, s) < \frac{b}{N} - k(\nu, s),$$

whereas by incentive compatibility

$$0 = \frac{b}{N} - k(\frac{wb}{N}, w) > \frac{b}{N} - k(\nu, w).$$

Hence, the off-equilibrium beliefs such that $\beta(\nu) = 0$ for every $\nu < \nu_{i,s}^*$ cannot satisfy the intuitive criterion.

By contrast, the least costly separating equilibrium is consistent with Cho-Kreps because

$$0 < \frac{b}{N} - k(\nu, w),$$

and

$$\frac{b}{N} - k(\frac{wb}{N}, s) < \frac{b}{N} - k(\nu, s)$$

for every $\nu < \frac{wb}{N}$. So that $\beta(\nu) = 0$ for $\nu < \frac{wb}{N}$ is plausible in the Cho-Kreps sense.

By the same token, it can be shown that

$$0 > \frac{b}{N} - k(\nu, w),$$

and

$$\frac{b}{N} - k(\frac{wb}{N}, s) > \frac{b}{N} - k(\nu, s),$$

for every $\nu > \frac{wb}{N}$. So that $\beta(\nu) = 1$ for $\nu > \frac{wb}{N}$ is plausible in the Cho-Kreps sense.

The analysis of pooling equilibria under a majoritarian system follows the same logic as in the proportional system and is omitted for brevity. ■

Information externalities. Consider the most interesting case in which in both districts the c party can win if the criminal organization signals its type — i.e., α_i that satisfies (4) for $i = 1, 2$. Clearly, when $\lambda_1 = \lambda_2 = 0$ the organization exerts the same level of violence in both districts — i.e., $\nu_{i,s}^* = \frac{wb}{2}$ and $\nu_{i,w}^* = 0$. The same option is feasible when $\lambda_1 > \lambda_2 \geq 0$, and yields the (strong) organization a total payoff

$$\sum_{i=1,2} \frac{b}{2} \left[1 - \frac{w}{s}\right] = b \left[1 - \frac{w}{s}\right].$$

However, an alternative strategy that the organization could enact would be to exert violence, say ν^* , only in district 1, in order to exploit the informational externality between districts while saving on the cost of signaling in district 2. In this case, the equilibrium

expected payoff of the strong organization is

$$\frac{b}{2}(1 + \lambda_1) - \frac{\nu^*}{s},$$

which does not induce mimicking by the weak type when

$$0 \geq \frac{b}{2}(1 + \lambda_1) - \frac{\nu^*}{w} \Leftrightarrow \nu^* \geq \frac{bw}{2}(1 + \lambda_1).$$

Restricting attention (as before) to the least-costly separating equilibrium — i.e., $\nu^* = \frac{bw}{2}(1 + \lambda_1)$ — we have

$$b \left[1 - \frac{w}{s}\right] \frac{1 + \lambda_1}{2} \leq b \left[1 - \frac{w}{s}\right].$$

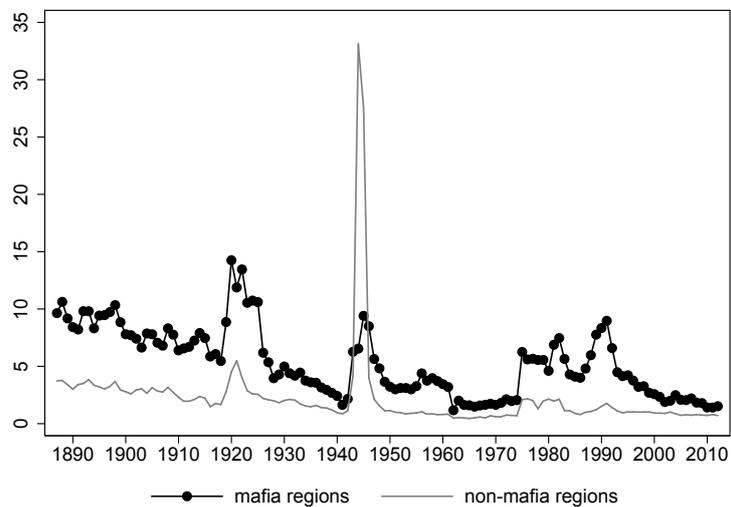
Hence, it is never convenient to exert violence only in district 1. Of course, since, $\lambda_2 < \lambda_1$ it is also not profitable for the organization to engage in violence only in district 2 to save on the signaling cost in district 1. ■

Appendix 2: Lists of victims of the Sicilian Mafia

Organization	Web Address
Fondazione Progetto Legalità	http://www.progettolegalita.it/it/prodotti_sociali/elenco_vittime_della_mafia.php
Libera	http://www.libera.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/87
VittimeMafia	http://www.vittimemafia.it/
Wikipedia	https://it.wikipedia.org/wiki/Vittime_di_Cosa_nostra_in_Italia

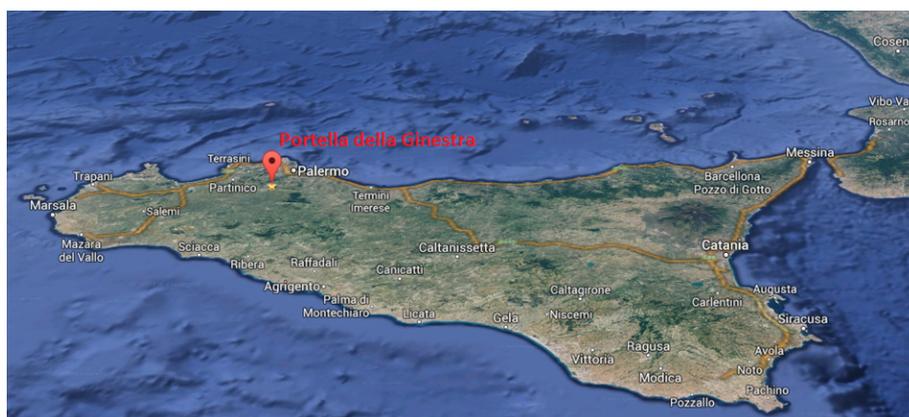
Appendix 3: Additional figures and tables

Figure A1: Homicide rates in mafia and non-mafia regions, 1887-2012



Note: The graph shows the time series of homicides per 100,000 inhabitants in regions with an historical presence of mafia-type criminal organizations (Sicily, Campania, and Calabria) and in other regions.

Figure A2: The Massacre of Portella della Ginestra



Note: The map indicates the location of the Massacre of Portella della Ginestra, on Labour Day 1947.

Table A1: Judicial investigations for mafia-related crimes and political alignment of members of the Italian Parliament, 1945-1993

	(1)	(2)	(3)	(4)	(5)	(6)
	mafia association (Article 416-bis)		criminal association (Article 416)		malfeasance (corruption, abuse)	
<i>mafia region</i>	0.009*** (0.003)		0.029*** (0.008)		0.032*** (0.009)	
<i>Left</i>	-0.001* (0.001)	-0.001 (0.001)	-0.007* (0.004)	-0.002 (0.004)	-0.019*** (0.004)	-0.015*** (0.004)
<i>Left X mafia region</i>	-0.009*** (0.003)	-0.009*** (0.003)	-0.021* (0.011)	-0.024** (0.011)	-0.024** (0.011)	-0.027** (0.011)
Constant	0.001* (0.001)		0.021*** (0.003)		0.032*** (0.003)	
Observations	6,043	6,033	6,043	6,033	6,043	6,033
Region FE	NO	YES	NO	YES	NO	YES
Legislature FE	NO	YES	NO	YES	NO	YES
R ²	0.006	0.014	0.006	0.045	0.009	0.056

Note: This table shows the relationship between the MPs' probability of being investigated for mafia-related crimes, the region in which they were appointed, and their party affiliation. The dependent variable is a binary indicator equal to one for MPs investigated for various types of crime (indicated on top of each column) and equal to zero otherwise. The explanatory variables *mafia region* and *Left* are indicator variables equal to one for MPs elected in Sicily, Calabria, and Campania, and for politicians elected with a party of the Left, respectively. The data cover the period 1945-1993. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

Table A2: Timing of political murders by the Sicilian Mafia, 1945-2013 (robustness: excluding early elections)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS regression		Prais-Winsten		Poisson	
<i>electoral</i>	0.130*** (0.043)	0.138*** (0.048)	0.135*** (0.051)	0.145*** (0.055)	1.310*** (0.335)	1.269*** (0.373)
<i>postelectoral</i>	0.064 (0.041)	0.053 (0.039)	0.070 (0.048)	0.061 (0.045)	0.877** (0.365)	0.736** (0.359)
log of GDP per capita		0.977 (0.642)		0.924 (0.774)		2.268 (2.935)
log of population		3.249* (1.666)		3.326* (2.011)		13.793 (21.995)
Observations	528	504	528	504	528	504
Durbin Watson	1.584	1.616	1.983	1.981	.	.
R ²	0.156	0.170	0.120	0.133	0.298	0.293

Note: This table shows the relationship between the timing of national elections and political homicides committed by the Mafia in Sicily between January 1945 and December 2013. The dependent variable is the number of victims in each month, *electoral* is a dummy equal to 1 in the month of the elections and in the 11 preceding months (and equal to zero otherwise), and *postelectoral* is a dummy equal to 1 in the 12 months after an election. All regressions control for a cubic polynomial in the number of months since January 1945 and 12 month-specific fixed effects; the specifications in columns (2), (4), and (6) include in addition the log of regional GDP per capita and population. Each column reports the results using a different method, reported on top of each column. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

Table A3: Timing of political murders by the Sicilian Mafia, 1945-2013 (robustness: weighting by distance from elections)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS regression		Prais-Winsten		Poisson	
<i>electoral*</i>	0.101** (0.042)	0.092** (0.043)	0.102** (0.048)	0.093* (0.048)	0.989** (0.386)	0.710* (0.426)
<i>postelectoral*</i>	0.026 (0.032)	0.008 (0.033)	0.025 (0.039)	0.008 (0.039)	0.479 (0.584)	0.091 (0.598)
log of GDP per capita		0.991** (0.447)		0.982* (0.516)		6.167* (3.492)
log of population		1.224 (1.130)		1.211 (1.308)		-0.118 (13.151)
Observations	828	804	828	804	828	804
Durbin Watson	1.661	1.698	2.008	2.002	.	.
R ²	0.112	0.130	0.087	0.103	.	.

Note: This table shows the relationship between the timing of national elections and political homicides committed by the Mafia in Sicily between January 1945 and December 2013. The dependent variable is the number of victims in each month, the main explanatory variables *electoral** and *postelectoral** are two measures of the distance from elections constructed as triangular weighting schemes within a symmetric 1-year window around elections. In particular, $electoral_t^* = [12 + (t - t^*)]/12$, $\forall t \in [t^* - 11, t^*]$ and $postelectoral_t^* = [12 + (t^* + 1 - t)]/12$, $\forall t \in [t^* + 1, t^* + 12]$, where t^* is the month of the elections. All regressions control for a cubic polynomial in the number of months since January 1945 and 12 month-specific fixed effects; the specifications in columns (2), (4), and (6) include in addition the log of regional GDP per capita and population. Each column reports the results using a different method, reported on top of each column. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

Table A4: Electoral violence and parliamentary debates about the mafia, 1948-2013 (robustness: occurrence of the word “Mafia”)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	all MPs elected in Sicily			MPs elected in other regions			all MPs	
<i>total number of words</i> ($\times 1,000$)	0.606*** (0.168)	0.607*** (0.165)	0.596*** (0.161)	0.106*** (0.032)	0.107*** (0.032)	0.106*** (0.032)	0.193** (0.079)	0.191** (0.078)
<i>total homicides before elections</i>	0.108 (0.113)	0.291* (0.148)	0.209 (0.129)	0.021 (0.016)	0.046*** (0.011)	0.034*** (0.009)	0.050*** (0.014)	0.043*** (0.013)
<i>political homicides before elections</i>		-0.978** (0.447)	-0.660 (0.400)		-0.131*** (0.035)	-0.107*** (0.025)	-0.140*** (0.043)	-0.121*** (0.033)
<i>Left</i>			1.868* (1.026)			-0.044 (0.076)		-0.131 (0.128)
<i>Left X total homicides</i>			0.350** (0.157)			0.032** (0.013)		0.020 (0.018)
<i>Left X political homicides</i>			-1.336*** (0.386)			-0.062 (0.045)		-0.050 (0.048)
<i>Sicily</i>							1.595* (0.774)	0.552 (0.373)
<i>Sicily X total homicides</i>							0.219 (0.149)	0.130 (0.107)
<i>Sicily X political homicides</i>							-0.812* (0.455)	-0.420 (0.318)
<i>Left X Sicily</i>								3.317* (1.743)
<i>Left X Sicily X total homicides</i>								0.410 (0.239)
<i>Left X Sicily X political homicides</i>								-1.689*
Observations	653	653	653	7,064	7,064	7,064	7,717	7,717
R ²	0.405	0.418	0.430	0.097	0.101	0.102	0.170	0.184

Note: This table shows the effect of electoral violence by the Mafia on parliamentary debates since 1948, as reported in the official transcripts of the Italian Parliament. The sample in columns (1) to (3) includes all parliamentary speeches by MPs elected in Sicily; the sample in columns (4) to (6) includes all MPs elected in other regions that intervened in a parliamentary debate in which at least one MP elected in Sicily also intervened; and the sample in columns (7) and (8) includes all MPs in the previous columns. The unit of observation is the MP-legislature and the dependent variable is the number of times the word “Mafia” is mentioned by each MP in a given legislature. *total homicides before elections* is the number of people killed by the Mafia in each municipality in the year before elections, and *political homicides before elections* is the number of victims that had some linkage with political parties and/or trade unions (e.g., party members or local administrators). *Left* and *Sicily* are dummy variables for MPs of the Left (the Italian Communist Party in the First Republic and the Center-Left coalition in the Second Republic) and MPs appointed in Sicily, respectively. Finally, *total number of words* ($\times 1,000$) is the total number of words pronounced by each MP in a given legislature. Robust standard errors are reported in parentheses and are clustered by MP and by legislature using the two-way clustering method described in Cameron et al. (2012). *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

Table A5: Other crimes in mafia and non-mafia regions during the electoral period, 1956-2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	theft	robberies	extortions	kidnap	all predatory	smug	drug
<i>mafia X electoral period</i>	39.80 (69.49)	-0.757 (12.07)	0.205 (0.841)	0.218 (0.279)	9.123 (12.51)	12.42 (9.175)	-0.300 (6.148)
Average crime rate	1413.5	40.545	5.954	1.463	33.826	22.694	44.214
Observations	912	608	608	608	912	480	608
R ²	0.805	0.435	0.722	0.803	0.566	0.156	0.814
Number of regions	16	16	16	16	16	16	16
Initial year	1956	1975	1975	1975	1956	1983	1975

Note: This table shows the differential effect of electoral cycles on various types of crime (other than homicides), indicated on top of each column, in mafia and non-mafia regions. The category ‘all predatory’ is the sum of robberies, extortions, and kidnappings. The dependent variable is the crime rate per 100,000 inhabitants in each region and year, the explanatory variable of interest is the interaction between the fraction of months in each calendar year within 12 months from the following national election (*electoral Period*) and an indicator variable equal to 1 for regions with an historical presence of mafia-type criminal organizations (*mafia*). All series extend through year 2012 but the initial sample year varies for each type of offense, and it is reported at the bottom of each column; the average crime rate for each type of offense is also reported in the table. Region and year fixed effects are included in all regressions. Robust standard errors are reported in parentheses and they are clustered by region and by year using the two-way clustering method described in Cameron et al. (2012). *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.