Organized Crime, Violence, and Politics*

Alberto Alesina† Salvatore Piccolo ‡ Paolo Pinotti§

First Draft: December 2015
This Draft: September 2017

Abstract

We study how criminal organizations use violence as a means to influence electoral results and politicians' behavior. We propose a theoretical model in which electoral violence acts as a signaling device of the strenght of the criminal organization, and we characterize incentives to use violence under different levels of electoral competition and different electoral rules. The model predictions are consistent with empirical evidence across Italian regions. The presence of organized crime is associated with abnormal spikes in violence against politicians before elections – particularly when the electoral outcome is more uncertain – which in turn reduces voting for parties opposed by criminal organizations. Using a very large data set of parliamentary debates, we also show that violence by the Sicilian Mafia reduces anti-Mafia efforts by members of parliament appointed in Sicily, particularly from parties that traditionally oppose the Mafia.

Keywords: Organized Crime, Electoral Violence, Political Speeches, Voting
JEL codes: K42, D72

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

*We thank the Editor (Uta Schoenberg) and four anonymous referees for excellent comments and suggestions. For useful suggestions we are also grateful to Ylenia Brilli, Paolo Buonanno, Ernesto Dal Bo, Melissa Dell, Rafael Di Tella, Claudio Ferraz, Nicola Gennaioli, Armando Miano, Luisa Patruno, Aldo Pignataro, Shanker Satyanath, Andrei Shleifer, Francesco Sobbrio, Guido Tabellini, and seminar participants at NBER Barcelona GSE Summer Forum, Bocconi University, Universitat de Barcelona, EEA-ESEM (Toulouse, 2014), Paris School of Economics, the 2016 Transatlantic Workshop on the Economics of Crime, and the 2016 Workshop on Economics of Crime and Conflict (Bergamo). Gabriele Borg, Elisa Facchetti, Armando Miano, Giorgio Pietrabissa, and Benjamin Villanyi provided excellent research assistance. We thank Unicredit and Universities Foundation and EIEF for financial support.

†Harvard University, IGIER, CEPR, and NBER
‡Catholic University of Milan, Department of Economics and Finance, and CSEF (Naples)
§Bocconi University, BAFFI-CAREFIN Center, Fondazione Debenedetti, and CEPR

You make war to live in peace.
Totò Riina, Mafia Boss

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, and in order to reduce enforcement of the law, criminal organizations favor the elections of captured politicians using violence. [1] .

We study the use of pre-electoral violence by criminal organizations in Italy as a means of influencing elections. This violence serves two purposes. First, it damages anti-mafia parties in the electoral competition. Second, it affects the behavior of appointed politicians. First we provide a model of this electoral use of violence. Then we investigate these phenomena by exploiting several rich data sets on criminal organizations and politics in Italy, a country historically plagued by organized crime. We use two data sets. One for the Sicilian Mafia and another one for other criminal organizations in other parts of Italy, but the former data set is much richer and more precise. 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, and it is specific to political murders — i.e., there is no increase in, say, the number of entrepreneurs or judges killed by the Mafia.[2] 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, 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 Labor Day 1947, which is associated with a dramatic sway of votes away from leftist parties in the following elections.

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.[3] To overcome this limitation, we compare

[1] See Schelling (1971) for an early theoretical analysis and Barone and Narciso (2015) for evidence on the allocation of public investment subsides in Sicily.Acemoglu et al. (2013) discuss the generalized amnesty enacted by Colombian President Uribe in favor of members of paramilitary groups.Lupo (2013) and Solis and Aravena (2009) provide extensive anecdotal evidence from Italy and Latin America, respectively.

[2] Clearly, 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 usual under-reporting issues.

[3] From 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

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 as shown in our model. Indeed, criminal organizations should abstain from violence when there is little or no scope for affecting political and electoral equilibria.

In fact 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. Thus we show that criminal organizations use violence strategically as any other (legal) political entrepreneur would, namely with the same strategic incentives.

We measure the effort of elected MPs against 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

Sicily.

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.

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.[4] 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.[5] The main implication of these models is that, in order to influence political decisions, criminal organizations should perpetrate violence against politicians in office.[6] 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 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. Each of these local lists typically operates 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. 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. Criminal organizations rationally adapt their strategy of violence to the type of elections, parties and politicians targeted.

[4]See 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).

[5]This 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.

[6]See 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.

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.[7] 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. Section 3 presents our model. The following two sections explore empirically various implications of our model with data principally on Sicily which are the most complete for our purposes. For the basic implications of our model, namely pre-electoral killings we can also use data on other regions of Italy (for a longer period of time) and we also present some suggestive cross country evidence Section 6 concludes. Additional results and proofs are in the Appendix.

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*[8] that descends 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.[9] These southern regions host three of the oldest and most powerful criminal organizations in the World: Mafia,

[7] Acemoglu et al. (2013) provide evidence of a similar relationship in Colombia between paramilitaries and the so-called "third political parties".

[8] The *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.

[9] Obviously, these figures greatly understate the size of these organizations, as *omertà* limits whistle-blowing and other sources of reporting of mafia crimes (Acconcia et al., 2014).

Camorra, and 'Ndrangheta.[10]

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, has a distinctively pyramidal structure. At the base there is a multitude of criminal groups (*clans*) that control criminal businesses — extortion, racketeering, drug smuggling, usury, 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.[11] The second major feature 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.

Finally, and most importantly, Article 416-bis emphasizes the reach of these criminal groups into the official economy. These criminal organizations derive part of their profits from "the control of economic activities, concessions, authorizations, and public contracts". [12]. 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 investments" (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.

2.2 Organized crime and Italian politics

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 Sicily (Bandiera, 2003).[13] During the period of parliamentary monarchy (1861-1921), the Sicilian Mafia acted as a military force of the island's

[10]Two 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.

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

[12]Schelling (1971) argued that public works and procurement contracts are attractive profit opportunities for mafia-type organizations

[13]For a recent test of this hypothesis, see **?**.

ruling class, fighting against workers' protests and revolts (e.g. Gambetta, 1996; Dixit, 2003).

After a parenthesis during the Fascism, when the regime launched a military campaign to re-establish the State's control over the island — with little success, see Lupo (2013) — collaboration between the Sicilian Mafia and the centre right wing bloc resumed after World War II.

A national unity government formed by all anti-fascist parties guided the transition to the First Italian Republic, allowing universal suffrage under a proportional electoral rule with party lists and preference votes for individual candidates. Throughout this period, the political landscape was marked by the competition between the Christian Democrats and the 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 (Falcone, 1991; Paoli, 2003; Lodato and Buscetta, 2007). Criminal organizations have been especially interested in influencing national politics 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.

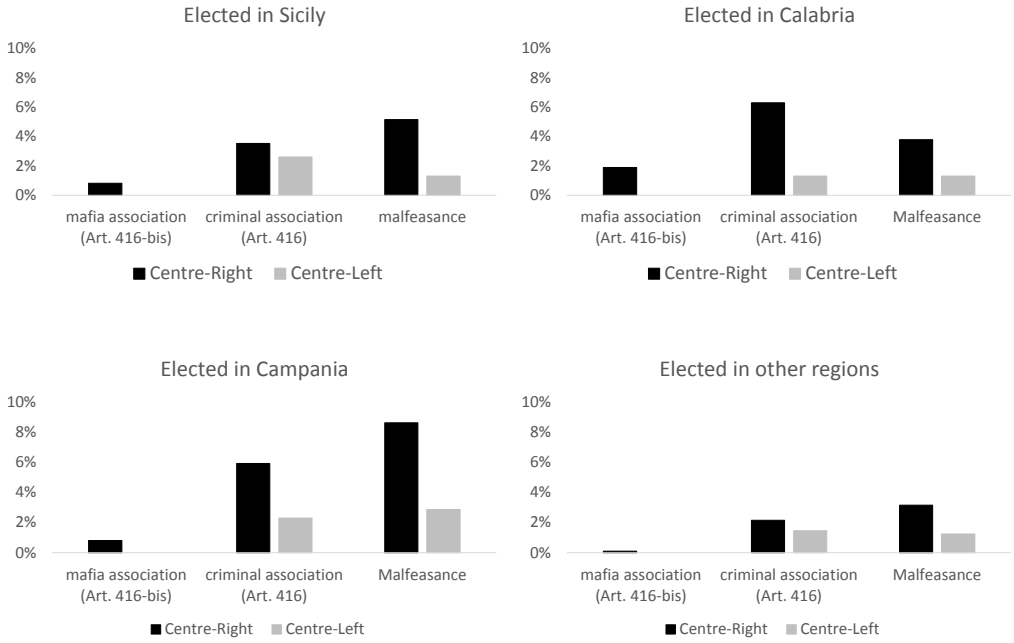
The collusion between a section of the Christian Democrats and criminal organizations is apparent from judicial investigations into members of the Italian Parliament for mafia-related crimes. We explored this relationship by looking at prosecutors' requests to proceed against a member of Parliament (*"Richieste di autorizzazione a procedere"*) — a key step to lifting Parliamentary immunity, which protected national-level politicians from judicial investigations.[14] 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 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. 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.[15]

In 1992-1993, widespread corruption scandals precipitated the crisis of Italian tradi-

[14] 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.

[15] The results are presented in Table A1 of Appendix 3.

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



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

tional parties — notably, the Christian Democrats and their government allies — and the transition to the so called Second Republic. In 1993, the electoral law also changed to a mixed rule with a strong majoritarian component: 75% of seats were attributed by plurality rule in 475 single-member districts and 25% were filled with proportional representation. This electoral rule naturally led to a bipolar political system opposing the heirs of the Italian Communist Party to a new Right coalition. Even under this new political landscape, the Sicilian Mafia continued to maintain strong ties with important factions of conservative parties (Buonanno et al., 2014).

2.3 The strategy of violence

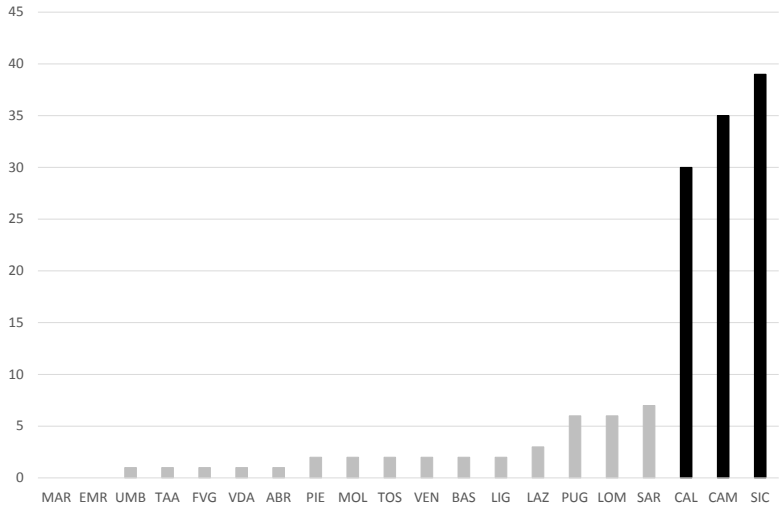
In the first post-Fascism democratic elections for the Regional Government of Sicily, on April 20, 1947, a coalition of communist and socialist parties clinched an unexpected victory over the Christian Democrats.[16] A few days later, on May 1, 1947, hundreds of Sicilian peasants were celebrating the 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. During subsequent decades, the Sicilian Mafia killed many political activists and local politicians, including the proponent of Article 416-bis, Pio La Torre, the leader 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 hardening imprisonment conditions for convicted mafia members. 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. Other criminal organizations in Italy have also engaged in violence and intimidation against local politicians and party mem-

[16] Sicily with a few other Italian regions has a "special status" which included a regional government directly elected and with more autonomy. The other regions of Italy started have regional elections in 1983.

bers, 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 homicides 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.

2.4 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, together with hundreds of lower-level politicians and public officials.[17] Like the Sicilian Mafia, Colombian drug cartels allied with rich landowners to combat advocates of social reforms. As a

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

consequence, thousands of left-wing activists — in particular, the members of the party *Union Patriotica* — were killed by the drug lords of both the Medellin and Cali cartels (Americas Watch Committee, 1989; Méndez, 1990).

Mexico has experienced a 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 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).

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.[18]

3 A model of electoral violence

We show how criminal organizations use pre-electoral violence to signal their criminal strength and to intimidate the parties competing in elections in order to facilitate the election of captured politicians.

3.1 Proportional electoral system

Two political parties compete to attract a mass 1 of voters. One party is honest (h), the other (c) is captured by a criminal organization. With no loss of generality, we assume that each vote is equivalent to one seat. When in office, party c favors the illegal activities of the organization; party h does not. The criminal organization gets a return b for each seat (vote) obtained by the captured party: thus if the latter wins a share $x \in [0, 1]$, the criminal organization gets a return bx. The electoral effort (e) exerted by the honest party during the electoral campaign determines voters' behavior; thus, the vote-share of the honest party is

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

where x is the share of voters always voting for h regardless of e — i.e., fully honest voters. The c party gets $1 - h(e, x)$.[19] For simplicity, we assume that only honest

[18] Green (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).

[19] Our 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

candidates exert effort to win swing voters (more on this below). The cost of exerting campaigning effort is $\psi(e, x, \theta)$ and is increasing and convex in e. It is decreasing in x since when there is large share of secure votes for the h party the c party faces higher cost of capturing swing voters because of social norms of generalized "honesty" in the population (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). In any case, This assumption is not crucial for the equilibrium analysis of the game — i.e., we could simply have $\psi(e, \theta)$. However, the empirical implications of having the campaign effort as a function of x are coherent with the evidence that we will discuss later. 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 $\Delta \equiv s - w \geq 0$.[20]

The relationship between effort cost and military strength of the organization captures several aspects. First, the voters may be intimidated by violence, and may thus prefer to elect the corrupt party in order to avoid additional violence. Second, strong organizations may kill candidates of the honest party. In that case, another candidate may have to run; the latter may be less efficient at attracting votes (because he is scared or, even more simply, because he is a second choice). Third, even if the honest candidate is not killed, organizations with strong military power may disrupt his campaign by damaging his headquarters and scaring his campaign 'workers'. These disruptions increase the cost of effort.

In order to obtain closed form solutions we assume a specific functional form for the effort cost:

$$\psi(e, x, \theta) = \frac{\theta e^2}{2(1+x)}. \tag{1}$$

The honest party has the prior belief that the organization is strong with probability $\beta \in [0, 1]$. The criminal organization would like to signal its military power in order to increase the effort costs of the h party, with its pre-electoral violence, $\nu \geq 0$. Thus, from now on, signaling military power means signaling the willingness to use a certain level of violence.

The cost of electoral violence is $k(\nu, \theta) = \frac{\nu}{\theta}$, which is inversely related to the organization's military power. 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.

be convinced by campaign effort. See also Prat (2002) and Roemer (2006) for similar models.

[20] The qualitative insights of the model remain true in a more general environment with multiple types.

4. The elections occur.

We solve the game using the concept of a *perfect Bayesian equilibrium* (see, e.g., Fudenberg and Tirole, 1991). A strategy for the organization is a function that maps its 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 below. We focus upon separating equilibria, which are of greatest interest; 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.** $w > \frac{1+x}{1-x}$.

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 $\beta(\nu_w^*) \equiv 0$. Upon observing ν_θ^*, at stage 3 the honest party chooses the effort level that solves the following problem

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

where, under the quadratic specification (1), it follows that

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

In separating equilibria, with $\mathbb{E}[\theta|\nu_\theta^*] = \theta$, the first-order condition, implies

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

with $e_s^* < e_w^* < 1-x$ by Assumption A1. Hence, in equilibrium, effort is decreasing in the military power of the criminal organization and is increasing in the share x of h's ideological voters. The incremental vote-share that the corrupted party obtains when it is supported by a strong organization amounts to

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

which is (*ceteris paribus*) increasing in x and in Δ.[21]

[21] 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). See Appendix 1 for details.

In a separating equilibrium, the violence exerted by the weak organization must be zero ($\nu_w^* = 0$) because violence is costly. Hence, to find an equilibrium we simply need to determine ν_s^*, which will be pinned down by the incentive compatibility constraints (formally discussed in the Appendix). We thus establish the following result under A1.

Proposition 1. *There always exists the least-costly separating equilibrium in which the weak type exerts no effort $\nu_w^* \equiv 0$ while the strong one exerts $\nu_s^* \equiv b(1+x)\frac{\Delta}{s} > 0$.*

The 'least-costly' separating equilibrium we have identified corresponds to the '*Riley outcome*' (Fudenberg and Tirole, 1991). In the Appendix 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.

3.2 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 $i \in \{1, .., N\}$. In each district a candidate wins the election with a simple majority. The (total) benefit for the criminal organization is $\frac{by}{N}$ where y 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 $h(e_i, x_i) = x_i + e_i$ of the honest party in that district. As before, x_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 in Remark 1 below.

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 the Appendix. 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.**

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

Formally, Assumption A2 implies that the organization's maximization problem is separable across districts.[22] Therefore, in order to characterize the equilibrium of the

[22] Committing crimes and violence in district i may, of course, affect the cost of doing the same in district j in a variety of ways. Party h may, for example, adopt more precautions in district j having observed violence in district i, in turn lowering the cost of violence in support of party c in that district.

game we can focus on a generic district (say i). The timing of the moves is as before. When the captured party obtains a majority of votes in a district it wins the seat.[23] That is, for given effort e_i it needs to obtain a share of votes

$$1 - h(e_i, x_i) > \frac{1}{2},$$

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

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

Obviously, engaging in pre-electoral violence in district i is useless if $x_i \geq 1/2$ since the honest party wins the election even if no effort is exerted ($e_i = 0$).[24] Hence, hereafter, we focus on the most interesting case $x_i < 1/2$. 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, as long as

$$1 \geq \psi(\tfrac{1}{2} - x_i, x_i, \theta).$$

Let us first focus on districts in which honest candidates win the election *only* when they face a weak organization, namely districts in which the following condition holds

$$\psi(\tfrac{1}{2} - x_i, x_i, w) \leq 1 < \psi(\tfrac{1}{2} - x_i, x_i, s). \tag{2}$$

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 x_i satisfies (2). Hence, a separating equilibrium (if it exists) 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 x_i, we assume that:

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

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 x_i is

On the other hand, Law enforcers (possibly under pressure from public opinion) may increase security as violence escalates in several districts, whereby increasing the cost of violence in all other districts as well. 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.

[23] In the case of a tie the honest party wins the subsequent round of elections.

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

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*

$$\nu^*_{i,w} \equiv 0 < \nu^*_{i,s} \equiv \frac{wb}{N},$$

and exists only if s is not too small, and if x_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.

In a majoritarian system, an equilibrium in which only the strong organization engages in electoral violence arises in 'marginal' 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 (see Appendix 1).

We conclude this section with two remarks on extensions of our model.

Remark 1. Thus far we have assumed that captured politicians always know the organization type and that they always favour it once they are elected. 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.

Remark 2: We also 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 Appendix 1).

3.3 Anti-mafia activities after elections

Consider now a two period model. In the first period the electoral game analyzed before takes place, while in the second period honest politicians in office can promote an initiative a ('anti-organization' effort) that damages the criminal organization (e.g., enforcement activities).[25] Higher values of a hurt more the criminal organization. Each honest politician obtains a benefit ηa from proposing initiative a, with $\eta \geq 0$ being a proxy of the benefits (moral or for future elections,) of honesty. However, contrasting the mafia involves some risk: criminal organizations typically retaliate. In order to capture the effects of retaliation in the simplest possible way, we assume that promoting initiative a costs $c(a, \theta)$ to a honest politician: the retaliation loss.[26] Intuitively, this loss is increasing with the organization's type θ since it is likely that stronger organizations have lower costs of exerting violence and, therefore, establish reputation more easily. We also assume that the cost $c(\cdot)$ is increasing in a since criminal organizations enact stronger punishments for politicians damaging the organization more. For simplicity, we assume that $c(\theta, a) = \frac{\theta a^2}{2}$.[27]Both the moral benefits and the cost of contrasting organized crime do not depend on the electoral system in place.

In a separating equilibrium (ν_s^*, ν_w^*) [28] the optimal 'anti-organization' effort solves the following:

$$\max_{a \geq 0} \{\eta a - \mathbb{E}[c(\theta, a) | \nu_\theta^*]\} \quad \Longrightarrow \quad a^*(\theta) = \frac{\eta}{\theta}.$$

In separating equilibria, there is an informational link between the pre-electoral period and the post-electoral one: by signaling its type before the elections, the criminal organization not only influences political competition, but it also manages to reduce the

[25]The anti-organization effort of captured candidates is norfmalized at zero.

[26]Incentives to build reputation are typically analyzed in dynamic games where long run players (criminal organizations) interact with short run players (politicians). In these games long run players usually benefit from punishing deviations by short run players in order to persuade future players not to deviate. Modeling such dynamic aspects of the game is outside the scope of our paper.

[27]Convexity of the cost function is simply needed to obtain interior solutions. An equivalent formulation would require a quasi-concave benefit and a linear retaliation loss.

[28]As before, we analyze pooling equilibria in the Appendix, where we show that they do not satisfy the intuitive criterion.

anti-organization effort of the honest candidates that are elected.

Hence, the second-period utility of a honest politician in office is equal to

$$\eta a^*(\theta) - c(\theta, a^*(\theta)) = \frac{\eta^2}{2\theta},$$

which is increasing in the politician's honesty η and decreasing in the organization's type θ.

When moving back to the first stage consider first the proportional system. As before, in order to rule out uninteresting corner solutions — i.e., to avoid that the honest party always wins the elections — we restrict attention to the following set of parameters:

- **Assumption A4.** The honest party does not win all the swing voters. That is:

$$\eta \leq \min\left\{\frac{1}{2}, \sqrt{2(1-x)\left(w - \frac{1+x}{1-x}\right)}\right\}, \tag{3}$$

  which is well defined since $w > \frac{1+x}{1-x}$ by Assumption A1.

Hence, in a separating equilibrium, the optimal campaigning effort e_θ^* maximizes the sum of the utility of the honest party before and after the election — i.e.,

$$\max_{e\in[0,1-x]} \left\{h(e) - \psi(e,\theta) + h(e)\left[\eta a^*(\theta) - c(\theta, a^*(\theta))\right]\right\}.$$

Maximizing with respect to e, under (3), we obtain

$$e_\theta^* = \frac{1+x}{\theta} + \frac{\eta^2}{2\theta} < 1 - x.$$

Effort is increasing in η and it is equal to the effort obtained in the baseline model for $\eta = 0$. Hence, the share of the h party is higher the higher is the benefit they obtain from implementing anti-organization activity. The expected utility of the criminal organization is

$$\underbrace{b\left(1 - h(e_\theta^*, x)\right) - \frac{\nu_\theta^*}{\theta}}_{\text{First-stage utility}} - \underbrace{h(e_\theta^*, x)\, a^*(\theta)}_{\text{Second-stage loss}},$$

where the second stage loss $h(e_\theta^*, x)\, a^*(\theta)$ amounts to the total anti-organization effort exerted by the honest politicians who were elected. Hence, imposing the standard incentive compatibility constraint (see the Appendix) which guarantees that the weak type cannot profit from mimicking the strong one, we can show the following.

Proposition 3. *Suppose that Assumption A1 and A4 hold. There always exists the least-costly separating equilibrium in which the weak type exerts no effort $\nu_w^* \equiv 0$ while*

the strong one exerts

$$\nu_s^* \equiv \underbrace{b\left(1+x\right)\frac{\Delta}{s}}_{\text{Baseline outcome}} + \underbrace{\eta\frac{\left(2\left(1+x\right)+\eta^2\right)\left(s+w\right)+sw\left(2x+b\eta\right)}{2ws^2}\Delta}_{\text{Anti-organization effort effect}}.$$

In this equilibrium $a^*(s) < a^*\left(w\right)$.

The equilibrium level of violence ν_s^* is increasing in the politicians' benefit from proposing anti-organization initiatives η. A weak organization has now two reasons to mimic a strong type: by so doing, it reduces not only the campaigning effort of the honest party, but also the ex post anti-organization effort of the honest candidates that get elected. Therefore, a strong organization has to exert a level of violence that is higher than that obtained in the baseline model in order to prevent deviations (mimicking) by the weak type.

In the majoritarian system the optimal level of anti-organization effort is the same as under the proportional system — i.e., $a^*\left(\theta\right) = \frac{\eta}{\theta}$. Hence, conditional of facing an organization of type θ, winning the election in district i is optimal for the honest candidates if, and only if,

$$1 + \frac{\eta^2}{2\theta} \geq \psi(\tfrac{1}{2} - x_i, x_i, \theta).$$

The incentive to win the election is increasing in η. In order to make the problem interesting for our purposes, we focus on the space of parameters where

$$\psi(\tfrac{1}{2} - x_i, x_i, w) - \frac{\eta^2}{2w} \leq 1 \leq \psi(\tfrac{1}{2} - x_i, x_i, s) - \frac{\eta^2}{2s}, \tag{4}$$

which is equivalent to (2) and guarantees that honest politicians only win elections when they face a weak organization. Hence, we can show the following.

Proposition 4. *Suppose that Assumptions A1, A3 and A4 hold. For every district i such that (4) holds, under a majoritarian system the least-costly separating equilibrium exists and has the following features*

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

In this equilibrium $a^*(s) < a^*(w)$.

Otherwise, in district i, there is only a pooling outcome in which both types exert the same level of pre-electoral violence and politicians' anti-organization activity does not react to pre-electoral violence.

Again, as seen in the baseline model, the organization has an incentive to exert violence only in 'marginal districts'. The analysis of the pooling equilibria is in Appendix 1.

3.4 Summing up: from theory to empirics

We have five empirical implications of the model which we can take to the data. We can test all of them with our better data from Sicily, some of them with additional data from the rest of Italy.

P1. Criminal organizations commit more violence against politicians during electoral periods.

P2. In proportional systems violence is inversely related to the gap between the honest and the corrupt party, whereas in majoritarian first-past-the-post systems violence is concentrated in swing districts.

P3. Violence against politicians leads to a lower (higher) share of votes for the honest (corrupt) party.

P4. Anti-organized crime activities of elected honest politicians are decreasing with pre-electoral violence, which signals the organization type.

P5. Anti-organized crime activities lead to retaliation and the higher the willingness of the organization to retaliate, the lower are anti-mafia activities.

4 Organized crime and pre-electoral violence

In the section, we empirically investigate model Prediction P1, namely that political violence should be higher in pre-electoral periods.

4.1 Sicily

4.1.1 Data and estimating equation

Several NGOs in Italy compile lists of organized crime's victims — excluding individuals who were themselves members of criminal organizations — along with their individual characteristics; Appendix 2 lists the detailed sources used for constructing the dataset. These lists allow us to distinguish between victims that were directly linked with the polity — specifically, members of political parties and labor unions — and other victims.[29] They also report the exact date of each murder and the municipality in which it was committed.[30]

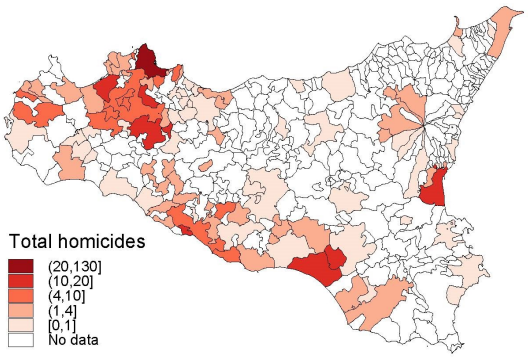
[29]The main Italian labor unions — in particular the largest one, (CGIL) — have traditionally been colsely linked with the Communist Party and its successors.

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

These data are accurate only for the victims of the Sicilian Mafia, which received much greater attention in the public debate compared to the other Italian criminal organizations. For instance, *Libera* (one of the most important NGOs in Italy) provides detailed information on 426 victims of the Sicilian Mafia, 187 victims of the Camorra, and 104 victims of the 'Ndrangheta (LIBERA, 2015). Another NGO, *Fondazione Progetto Legalitá* lists 353 victims of the Mafia, but only 34 and 31 victims of Camorra and 'Ndrangheta, respectively.[31] These numbers stand in contrast with other measures of the relative strength and political influence of the three organizations. For instance, the number of homicides attributed to organized crime by judicial authorities between 1983 – when Article 416-bis was introduced into the Penal Code – and 2015 is comparable in Sicily and Calabria (1695 and 1307, respectively) while it is much higher in Campania (2970).[32] Similarly, the number of municipal governments dissolved for organized crime infiltrations reached 104 in Campania, 93 in Calabria, and 70 in Sicily. These comparisons suggest that lists compiled by NGOs may heavily under-report victims of Camorra and 'Ndrangheta, so we focus mainly on victims of the Sicilian Mafia.

By cross-checking information available from different associations and NGOs, we derive a list of 452 victims of the Mafia between 1945 and 2013. Figure 3 shows their distribution across Sicilian municipalities as well as the number of victims for different categories of individuals. Police officers, judges, and entrepreneurs paid the highest toll, followed by politicians and other representatives of political parties and union members. However, taking into account that relatively few people are directly involved in politics, they face a particularly high risk compared to the rest of the population.

Figure 3: Victims of the Sicilian Mafia, 1945-2013



Total number of victims	452
Police forces and judges	138
Entrepreneurs	78
Politicians, party and union members	50
Others	186

Note: The map on the left shows the geographic distribution of Mafia victims across Sicilian municipalities during the period 1945-2013, whereas the table on the right reports their number, by category.

To test model Prediction P1 on electoral violence by criminal organizations, we regress

[31] The complete list is available at the link http://progettolegalita.it/it/prodotti_sociali/elenco_vittime_della_mafia.php.

[32] The total number of homicides committed by criminal organizations is generally higher than the number of organized crime victims in our dataset because the former – but not the latter – includes homicides of individuals that were themselves members of criminal organizations.

the number of victims (by category) in each month t between January 1945 and December 2013 on an indicator variable $elect_t$ equal to 1 in the 12 months up to a national election,

$$victims_t = \alpha + \beta * elect_t + \delta' X + \varepsilon_t, \tag{5}$$

where X_t is a vector of control variables and ε_t is an error term summarizing the effect of other factors omitted from the equation.

Consistent estimates of β require that the timing of national elections is uncorrelated with other (omitted) determinants of political murders in ε_t. Unlike local (administrative) elections, the timing of national elections is indeed exogenous to local conditions in Sicily. In particular, Italian national elections are regularly held every 5 years, though early elections are called if the government loses parliament support (our results are robust to excluding the latter elections from the sample). We check the robustness of results to including in X_t the logarithms of yearly GDP per capita and population; a flexible polynomial in time, to control for long-run trends; and month-specific fixed effects, to control for seasonality. We will show the results of both OLS and Poisson regressions for equation (5), and we will consider different assumptions about the time-series properties of the error term.

Importantly, we will estimate equation (5) separately for different categories of victims. We expect a spike in the number of political victims (i.e., politicians as well as party and union members) before elections.

4.1.2 Results

Table 1 reports the coefficient β in equation (5), estimated using different methods, for the number of political victims (columns 1-3) and for other categories of victims (columns 4-7). According to the baseline OLS specification in Panel A, column (1), which includes on the right-hand side only $elect_t$, the Sicilian Mafia kills on average 1 additional politician in the year before a national election (0.075 per month $\times$ 12 months). The average number of political murders over the whole period is 0.7 per year, so the number of political murders more than doubles in the year before elections. This estimate is only slightly affected when including time trends and month fixed effects (column 2) and the logarithms of regional GDP per capita and population (column 3). By contrast, there is no significant change in murders of entrepreneurs, police officers and magistrates, and other categories of victims (columns 4-7).

In Panel B we address autocorrelation in the OLS residuals, as evidenced by the values of the Durbin-Watson statistics in Panel A, using the Prais-Winsten estimator; all results are unaffected. The same holds for the Poisson in Panel C, which also reports the relative risk of being killed by the Mafia before elections and in other periods – as given by the exponentiated coefficient of the Poisson regression. In line with the OLS estimates, such

Table 1: Timing of murders by the Sicilian Mafia, 1945-2013, for different categories of victims

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	politicians			entrep.	police	others	all victims
Panel A: OLS regression							
elect	0.075**	0.064**	0.065**	-0.021	0.022	0.040	0.106
	(0.029)	(0.025)	(0.026)	(0.027)	(0.072)	(0.079)	(0.113)
R-squared	0.013	0.112	0.132	0.132	0.051	0.090	0.155
Durbin-Watson	1.526	1.664	1.703	1.955	1.860	1.933	1.817
Panel B: Prais-Winsten							
elect	0.073**	0.064**	0.064**	-0.020	0.018	0.041	0.106
	(0.035)	(0.029)	(0.029)	(0.027)	(0.078)	(0.084)	(0.128)
R-squared	0.008	0.088	0.105	0.127	0.048	0.086	0.137
Durbin-Watson	2.043	2.009	2.002	2.005	2.010	1.997	2.007
Panel B: Poisson regression							
elect	1.041***	0.756**	0.652**	-0.394	-0.019	0.115	0.077
	(0.330)	(0.295)	(0.298)	(0.290)	(0.354)	(0.282)	(0.162)
Relative risk ratio	[2.833]	[2.130]	[1.920]	[0.674]	[0.981]	[1.122]	[1.080]
Pseudo R-squared	0.0328	0.229	0.236	0.321	0.215	0.195	0.229
Observations	828	828	804	804	804	804	804
time trends and month FE	NO	YES	YES	YES	YES	YES	YES
other controls	NO	NO	YES	YES	YES	YES	YES

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, distinguishing between different groups indicated on top of each column. The main explanatory variable $elect_t$ is a dummy equal to 1 in the 12 months up to a national election and equal to zero otherwise. Specifications in columns (2)-(7) control for a cubic polynomial in the number of months since January 1945 and 12 month-specific fixed effects, and specifications in columns (3)-(7) also add the log of regional GDP per capita and population. Panel A, B, and C report estimates obtained using different estimation methods: OLS, Prais Winsten, and Poisson regression, respectively. Durbin-Watson statistics are reported in Panels A and B, relative risk ratios in Panel C equal the exponentiated Poisson coefficients. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

risk more than doubles for politicians before elections, while there is no significant effect for any other category of victims.

Table A2 in Appendix 3 presents a series of robustness checks. In Panels A and B we re-estimate equation (5) including additional indicator variables equal to 1 in the 12 months before regional elections (*regelect*) and in the 12 months after national elections (*postelect*), respectively. In both cases, the estimated effect before elections is unaffected, whereas violence changes neither in the post-electoral period nor around regional elections.

4.2 Italian regions and provinces

4.2.1 Data and estimating equations

For other regions of Italy, as we discussed above, we do not have as good data as for Sicily. Thus we use the homicide rate to investigate electoral-violence cycles in other regions with a significant presence of organized crime – namely, Campania and Calabria, in addition to Sicily. Italy comprises 20 regions and 110 provinces, corresponding to levels 2 and 3, respectively, of Eurostat's NUTS classification of territorial units.[33] Using official paper publications by the Italian National Statistical Institute (ISTAT), we have reconstructed yearly series of homicide rates at the regional level since 1887, and at the provincial level since 1983. Clearly, the overall homicide rate allows neither to distinguish between homicides committed by criminal organizations and other homicides, nor to distinguish homicides of politicians from other homicides. On the other hand, it is available on a comparable basis across all Italian regions for over a century.

We can thus compare the increase in homicides during electoral periods in the two groups of regions by estimating the following difference-in-differences specification:

$$homicides_{r,t} = \beta * elect_t * orgcrime_r + \gamma' X_{r,t} + f_r + f_t + \varepsilon_{r,t}. \tag{6}$$

The dependent variable $homicides_{r,t}$ is the homicide rate per 100,000 inhabitants in region r and year t. The province-level data available since 1983 also allow us to distinguish homicides attributed by judicial authorities to criminal organizations, defined *ex.* Article 416-bis as those directly committed for the purposes of some criminal organization. Like in equation (5), $elect_t$ identifies the 12 months up to the elections. Since equation (6) is estimated on yearly data, we set $elect_t$ equal to the fraction of the year falling within the

[33] During our sample period, the number of regions increased from 16 to 20, and the number of provinces increased from 95 to 110. All new provinces and regions were created by secession from the existing ones. In order to have consistent time series over the entire sample period, we aggregate all data at the level of the original administrative units. In the 2011 census, the median and average population across regions was 1.8 and 3 million, respectively; the median and average population across provinces was 372 and 540 thousand, respectively. Administrative borders of regions and provinces are shown in Figure A3 in the Appendix.

electoral period: if elections are held in month m of year t ($m = 1, 2, ..., 12$), $elect_t = m/12$ and $elect_{t-1} = (12 - m)/12$. For instance, if national elections are held in April (as is normally the case in Italy) $elect_t = 1/3$ and $elect_{t-1} = 2/3$. Turning to the other variables in equation (6), $orgcrime_r$ is a dummy equal to 1 for Sicily, Calabria, and Campania, and equal to 0 for other regions; X_{rt} is a vector of additional determinants of the homicide rate that vary across regions and years; f_r and f_t are region and year fixed effects, respectively; and $\varepsilon_{r,t}$ is a residual term summarizing the effect of other omitted factors. We allow errors to be arbitrarily correlated over time within each region. Since we have a small number of clusters (16 regions) we will also present wild bootstrapped p-values based on the procedure devised by Cameron et al. (2008).

The estimated coefficient β in equation (6) captures the differential change in homicides during the electoral period in regions with an historical presence of criminal organizations relative to other regions; in light of Prediction P1 of our model, we thus expect a positive β. The availability of long time series also allows us to compare the size of such effect under different institutional regimes: parliamentary monarchy before 1922, 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. We will thus estimate equation (6) separately for each sub-period. Intuitively, we expect a lower coefficient β during the Fascist period, as in such period elections were actually plebiscites for the Fascist party – the only one allowed to compete in elections. Therefore, criminal organizations had little or no chances of influencing electoral outcomes.

In democratic elections, instead, our model relates the size of the effect of interest to the level of electoral competition and the type of electoral system. Electoral results for all national elections since 1948 are publicly available, at the municipality-level, from Italian Ministry of Interior.[34] From Corbetta and Piretti (2009), we also obtained the results of earlier elections (1890-1934), though the latter are available only at the regional level.

Electoral data allow us to measure to difference in votes – as an inverse measure of electoral competition – between the main parties (or coalitions) of the Left and Right, respectively. According to Prediction P2 of the model, under the proportional system in place between 1948 and 1992 electoral violence by criminal organizations decreases with the difference in votes between the "honest" and "corrupt" party. To test this prediction, we augment equation (6) as follows:

$$homicides_{r,t} = \alpha * elect_t + \beta * elect_t * orgcrime_r + \mu * elect_t * orgcrime_r * gap_t + \gamma' X_{r,t} + \delta_r + \varepsilon_{r,t}, \tag{7}$$

where gap_t is the difference between the (percentage) vote shares of the Christian Democrats and the Italian Communist Party at the national level. Therefore, we should expect a

[34] These data can be downloaded from www.elezionistorico.interno.it.

negative coefficient μ across elections held under proportional rule (1948-1992). Since the gap between the two main parties observed (ex-post) in regions with $orgcrime_r = 1$ would respond to electoral violence carried out by criminal organizations – this is indeed the main premise of our analysis – we measure gap_t within the sub-sample of regions with $orgcrime_r = 0$. The specification also controls for the interactions of gap_t with, respectively, $orgcrime_r$ and $elect_t$ (the latter interaction term is absorbed by year fixed effects).

In a majoritarian system, instead, electoral violence by criminal organizations should be concentrated in those "swing" districts where the outcome is more uncertain. Ideally, we would test this prediction on district-level data, however homicide data are not available at such level of geographical disaggregation. For this reason, we exploit the province-level data available since 1983. Each province includes multiple districts and no electoral district crosses provincial borders. We thus compute the variable $swing_p$ as the fraction of the electorate in province p residing in contested districts, defined as those in which the gap between the Left and Right coalition in the first elections held with the majoritarian system (1994) was below 5 percent.

The resulting estimating equation is

$$homicides_{p,t} = \beta * elect_t * orgcrime_p + \mu * elect_t * orgcrime_p * swing_p + \gamma' X_{p,t} + f_p + f_t + \varepsilon_{p,t}, \tag{8}$$

where the sub-index p denotes provinces, and $orgcrime_p = 1$ for provinces in Sicily, Campania, and Calabria. The specification also controls for the interactions of $swing_p$ with, respectively, $elect_t$ and $orgcrime_p$ (the latter interaction term is absorbed by province fixed effects). According to Prediction P2 of the model, the triple interaction coefficient μ should be positive during the period in which a majoritarian system was in place (1994-2004): returns to electoral violence are higher in provinces with more swing voters.[35]

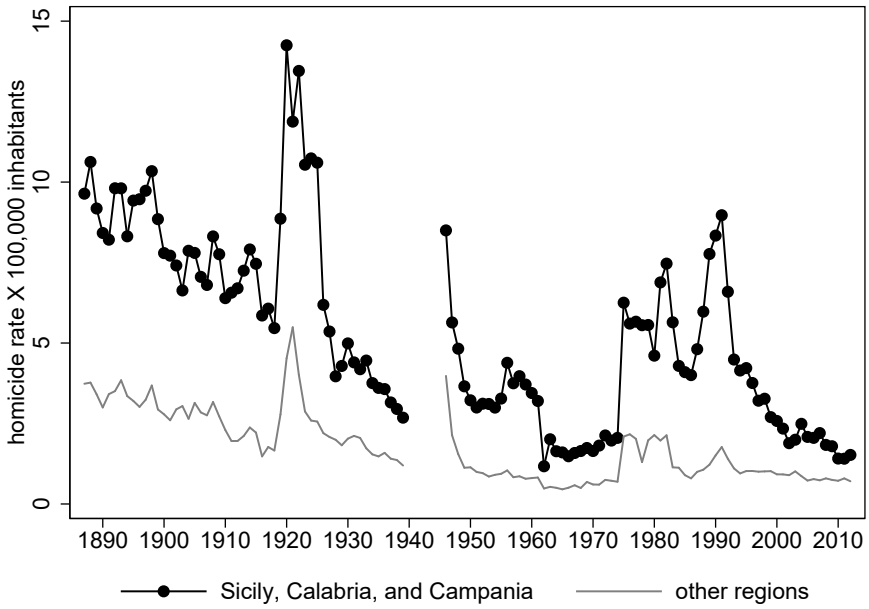
4.2.2 Results

Figure 4 plots the homicide rate in regions with an historical presence of criminal organizations — Sicily, Campania, and Calabria — and in other Italian regions, respectively. Not surprisingly, the homicide rate is much higher in the former group of regions.[36]

[35] Although a majoritarian system had been in place also before the Fascism, data on electoral results and homicides for such period are available only at the regional level, so we cannot exploit heterogeneity in the fraction of voters living in swing districts. As for the period after 2004, a new electoral system was introduced in 2004 that can be neither classified as proportional nor majoritarian. We thus exclude such period from the analysis.

[36] We 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 include the war period.

Figure 4: Homicide rates in regions with and without an historical presence of criminal organizations, 1887-2012



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

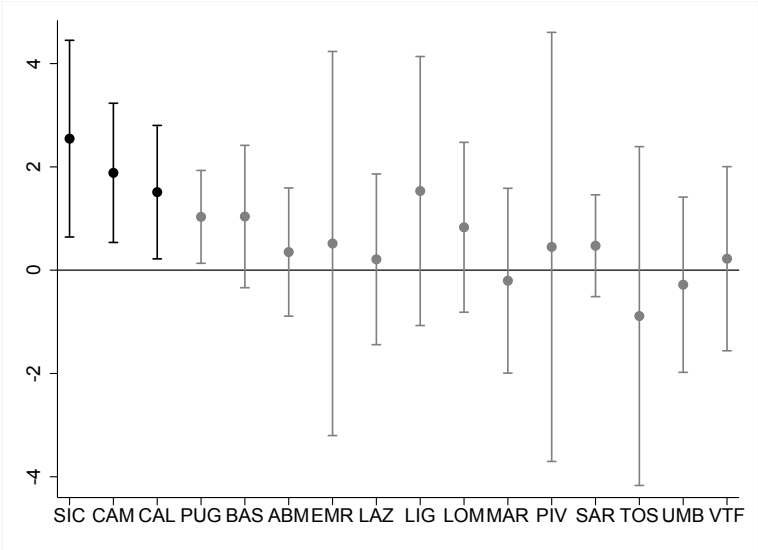
In order to quantify the extent of electoral cycles in violence, we first estimate a series of simple univariate regressions for each Italian region:

$$homicides_{r,t} = \alpha_r + \beta_r * elect_t + \varepsilon_{rt}, \tag{9}$$

where $homicides_{r,t}$ is the homicide rate per 100,000 inhabitants in region r and year t, and $elect_t$ identifies the period before the elections (as defined in Section 4.2). Figure **??** shows the region-specific estimated β_rs and the associated 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.

We then pool data from all regions and estimate the difference-in-differences equation (6). Estimated coefficients and heteroskedasticity-robust standard errors clustered by region are reported in Table 2. Since sandwich-type formulas a-la-White (1984) may lead

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 of the homicide rate per 100,000 inhabitants in each region on a measure of the electoral cycle. Black symbols denote regions with an historical presence of criminal 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 confidence intervals.

to incorrect inference when the number of clusters is small – we only have 16 regions – we also report, in square brackets, wild-bootstrapped p-values based on the procedure of Cameron et al. (2008); see also Cameron and Miller (2015).

According to the baseline specification in column (1), which only includes region fixed effects, the homicide rate in organized crime regions increases by 1.6 additional homicides per 100,000 inhabitants (statistically significant at the 5% confidence level) relative to other regions. This result is unaffected when including the log of regional GDP per capita, the log of population, and year fixed effects (thus dropping $elect_t$); see column (2).[37]

In column (3) we re-estimate the same specification for the log of murders (as opposed to the murder rate).[38] Since we are controlling on the right-hand side of the equation for the log of population, the coefficient of interest can now be interpreted in relative terms. In particular, according to this estimate during electoral period the homicide rate increases by 16 percent in organized crime regions relative to other regions. 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). Additional regressions reported

[37]Data on regional GDP per capita and population are available from Malanima and Daniele (2007) and ISTAT, respectively. These are the only control variables available at the regional level over the period 1887-2012.

[38]In 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.

Table 2: Electoral violence across Italian regions, 1887-2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	complete sample: 1887-2012				1887-1921	1922-45	1946-2012
elect	0.407**						
	(0.175)						
	[0.042]						
elect X orgcrime	1.574***	1.504***	0.149***		1.469***	-0.709	0.955***
	(0.310)	(0.284)	(0.038)		(0.282)	(1.737)	(0.131)
	[0.000]	[0.000]	[0.002]		[0.000]	[0.669]	[0.000]
elect X Sicily				1.992***			
				(0.209)			
				[0.000]			
elect X Calabria				1.338***			
				(0.204)			
				[0.000]			
elect X Campania				1.182***			
				(0.207)			
				[0.000]			
Observations	2,016	1,936	1,936	1,936	496	384	1,056
Controls and year FE	NO	YES	YES	YES	YES	YES	YES
R-squared	0.004	0.487	0.650	0.487	0.552	0.472	0.481

Note: This table shows the differential effect of electoral cycles on homicides in regions with an historical presence of criminal organizations. 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 *elect* is the fraction of months in each calendar year within 12 months of the following national election, and *orgcrime* is an indicator variable equal to 1 for regions with an historical presence of criminal organizations – Sicily, Calabria, and Campania – and equal to 0 otherwise. Columns (5), (6), and (7) include in the sample only the years before Fascism, during the Fascism and World-War II, and the Republican period after World War II, respectively (the exact period is indicated at top of each column). 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 clustered by region are reported in parenthesis. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively. We also report, in square brackets, wild-bootstrapped p-values based on the procedure of Cameron et al. (2008).

in Table A3 in Appendix 3 also include indicator variables for periods before regional (rather than national) elections and for periods after elections. In line with the results obtained for Sicily (Table A2) violence increases only before national elections.

The relatively long historical period covered by our data features considerable institutional variation. In columns (5) to (7) of Table 2 we compare the effect of interest under three different institutional regimes: parliamentary monarchy before 1922; the Fascist dictatorship between 1922 and 1945; and the Republican period after 1945. Homicides increase around electoral periods in organized crime regions (relative to other regions) in all periods except during Fascism. This finding is consistent with the fact that criminal organizations had very little chances of influencing elections during this period.[39]

Focusing on the democratic periods, in Table 3 we test the model predictions regarding the combined effect of voting rules and electoral competition. Columns (1)-(3) present estimates of equation (7) for elections held under different electoral systems. Under proportional rule (1945-1992) electoral violence intensifies when the gap between government and opposition parties gets narrower. If the two main coalitions 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 organized crime regions relative to other regions. An electoral advantage of 5 percentage points would reduce the differential in homicides to about 2.5 per 100,000 inhabitants.

In majoritarian elections, instead, electoral violence should *not* depend on the intensity of national-level electoral competition. This is indeed what we find when we re-estimate equation (7) for the periods in which a majoritarian system was in place: 1887-1913 (column 2), and 1994-2004 (column 3). In such periods, violence should instead be concentrated in contested districts. To test this model prediction, we estimate equation (8) on province-level data; estimated coefficients and heteroskedasticity-robust standard errors clustered by province are reported in columns (4)-(6) of Table 3.[40][41] A standard deviation increase in the fraction of voters residing in contested districts (0.32) increases the differential in homicides between organized crime and other regions during electoral periods from 1.2 to 3 (column 5).

Exploiting variation across provinces, it is also possible to extract region-specific arbitrary time trends by interacting $orgcrime_r$ with the set of year fixed effects; when doing so, the triple interaction coefficient remains identical (column 6). Finally, the province-level criminal statistics available since 1983 allow us to distinguish between homicides committed by criminal organizations and other homicides – a distinction introduced with

[39]The 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 A4 of Appendix 3.

[40]We do not report wild bootstrapped p-values for these coefficients because the number of provincial clusters (95) is sufficiently high to allow for correct inference using sandwich-type cluster-robust standard errors.

[41]We do not have the available data to perform the same test for the pre fascist time period.

Table 3: Electoral violence under different types of electoral system

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	regional data, 1946-2012			provincial data, 1993-2004			org. crime murder?	
	1948-1992	1887-1921	1993-2004	majoritarian elections			yes	no
elect X orgcrime	4.303***	1.463***	1.610**	1.512**	1.254**			
	(1.098)	(0.332)	(0.585)	(0.578)	(0.416)			
	[0.000]	[0.000]	[0.000]					
elect X orgcrime X gap	-0.372***	-0.028	-0.007					
	(0.075)	(0.029)	(0.041)					
	[0.000]	[0.493]	[0.369]					
elect X orgcrime X swing					5.686**	5.459**	4.350***	1.109
					(1.911)	(2.408)	(1.049)	(1.457)
elect X swing					0.465**	0.418**	0.019	0.398*
					(0.171)	(0.181)	(0.016)	(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 regions with an historical presence of criminal organizations, under different electoral regimes and different levels of electoral competition. The units of observation are region-years in columns (1) to (3), and province-years in columns (4) to (8); the sample period is also indicated on top of each column. The dependent variable in columns (1) to (6) is the homicide rate per 100,000 inhabitants. In columns (7) and (8) we distinguish between homicides attributed to criminal organizations and other homicides, respectively. The main explanatory variable *elect* is the fraction of months in each calendar year within 12 months from the following national election; *orgcrime* is an indicator variable equal to 1 for regions with an historical presence of criminal organizations – Sicily, Calabria, and Campania – and equal to 0 otherwise; *gap* is the difference between the voting shares of the Left and Right coalitions in regions for which $orgcrime = 0$; finally, *swing* is the share of the electorate in each province living in electoral districts where the difference in vote shares between the Left and Right coalitions in 1994 was smaller than 5 percentage points. 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 clustered by region (columns 1-3) and province (columns 4-8) are reported in parenthesis. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively. In columns (1)-(3) we also report, in square brackets, wild-bootstrapped p-values based on the procedure of Cameron et al. (2008).

Article 416-bis of the Penal Code. The last two columns of Table 3 show that the effect of interest is entirely due to homicides committed by criminal organizations. (Remember that for the post 1983 period we have data which allow us to make this distinction for all regions of Italy)

5 The effects of violence on elections

In this section we test Predictions P3, P4, and P5 concerning the effect of mafia killings on electoral results and the behavior of appointed politicians. This analysis is restricted to Sicily because, detailed information on organized crime victims – notably, the distinction between politicians and other victims, and the exact date and location of the murder – are available only for this region.

5.1 Electoral results

5.1.1 Data and estimating equations

We relate electoral results in each municipality m and election t to the number of organized crime victims in the same municipality during the electoral period.

We estimate the following equation:

$$Left_{m,t} = \alpha * totvict_{m,t} + \beta * polvict_{m,t} + \gamma * Left_{m,t-1} + f_m + f_t + \varepsilon_{m,t}. \tag{10}$$

where $Left_{m,t}$ is the share of votes obtained by leftist parties in each Sicilian municipality m and election t; $totvict_{m,t}$ and $polvict_{m,t}$ are total and political victims, respectively, murdered by the Sicilian Mafia in municipality m in the 12 months up to election t; finally, f_m and f_t are municipality and year fixed effects. According to Prediction P3 of our model, we expect a negative effect of political homicides on voting for the Left. We will also allow such effect to propagate across neighboring municipalities.

5.1.2 Results

Estimated coefficients of equation (10) are reported in Table 4.[42] In columns (1) and (2), 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 during the electoral period (column 4).

[42] Observations are weighted by the size of the electorate, so results are representative at the regional level; heteroskedasticity-robust standard errors are clustered by municipality. Given the large number of clusters (390 municipalities) we no longer present bootstrapped p-values.

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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	all national elections, 1948-2013				Portella, 1947-48		spillovers, 1948-2013	
totvict	-0.003***	-0.002***	-0.002***				-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)				(0.001)	(0.001)
polvict		-0.022***	-0.024***				-0.024***	-0.024***
		(0.006)	(0.007)				(0.006)	(0.006)
Voting for the Left, previous election			0.513***	0.513***			0.514***	0.513***
			(0.035)	(0.035)			(0.035)	(0.035)
Dummy for at least 1 victim				-0.004				
				(0.004)				
Dummy for at least 1 political victim				-0.025***				
				(0.009)				
Distance from Portella (100s km)					0.001			
					(0.026)			
Elections 1948					-0.070***	-0.065***		
					(0.011)	(0.015)		
Distance from Portella X Election 1948					0.030**	0.029*		
					(0.012)	(0.016)		
totvict, spatial lag							-0.004*	-0.067
							(0.002)	(0.082)
polvict, spatial lag							-0.020*	-0.279*
							(0.010)	(0.169)
Constant	0.207***	0.208***	0.112***	0.112***	0.288***	0.286***	0.112***	0.112***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.034)	(0.005)	(0.009)	(0.009)
Observations	6,533	6,533	6,171	6,171	709	709	6,171	6,171
Municipality FE	YES	YES	YES	YES	NO	YES	YES	YES
Year FE	YES	YES	YES	YES	NO	NO	YES	YES
Spatial lag	NO	NO	NO	NO	NO	NO	neighbors	dist-weight
R-squared	0.788	0.789	0.854	0.854	0.024	0.927	0.854	0.854

Note: This table shows the effect of electoral violence by the Mafia on electoral results in Sicily. The unit of observation is municipality-election. The dependent variable is the vote-share obtained by the Left – the Italian Communist Party until 1992 and the Left coalition after 1992 – in each municipality and election after World War II. Columns (1)-(4) and (7)-(8) include in the sample all national elections between 1948 and 2013, while columns (5)-(6) include only the regional elections of 1947 and the national elections of 1948. The main explanatory variables *total* and *polvict* are, respectively, the total number of Mafia victims and the number of victims linked to political parties and/or trade unions (e.g., party members or local administrators) killed by the Mafia in a given municipality during the year before each election. The specifications in the last two columns of the table also include on the right-hand side the number of total and political victims in neighboring municipalities (column 7) and the number of victims in all other Sicilian municipalities weighted by their inverse distance, in 100s of kilometers (column 8). 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 columns (5) and (6) we focus on the events of Portella della Ginestra, already discussed in Section 2.3. 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.[43] The interaction coefficient in column (5) 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 regression (column 6).[44]

This last result suggests that the effect of political homicides propagates across municipalities – though such effect declines with distance. To investigate the extent of spatial spillovers more systematically, in the last two columns of Table 4 we augment equation (10) with spatial lags of the main explanatory variables. In column (7), the spatial lags includes homicides committed in any municipality neighboring to m, whereas in column (8) we include homicides committed in any Sicilian municipality weighted by the inverse distance from m (expressed in 100 kilometers). While the coefficients on the main explanatory variables *totvict* and *polvict* are totally unaffected, homicides committed in other municipalities also carry considerable weight for electoral results. Overall, the results in columns (5)-(8) are consistent with intimidating effects of electoral violence in municipalities not directly targeted by attacks. These effects are consistent with the signaling role of electoral violence – as modelled in our theoretical framework – over and above the destruction of (local) party and electoral machinery.

5.2 Politicians' behavior

In this section we test Predictions P4 and P5 concerning the effect of organized crime violence – during the electoral period and during the entire legislature, respectively – on the behavior of appointed politicians, as measured by how often they openly talk about organized crime once they sit in the national parliament. In principle, one could talk about criminal organizations to praise them or to discount their importance; in practice, however, organized crime 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.

[43]The location of Portella Della Ginestra is shown in Figure A2 of Appendix 3.

[44]Notice that, in column (6), the votes obtained by the Left at the 1947 regional elections (before the massacre) do not vary significantly with distance from Portella della Ginestra.

Table 5: Speeches held by MPs appointed in Sicily in the National Parliament 1948-2013, sample averages

	data by MP-legislature (683 obs.)			speech-level data (8,833 obs.)		
Sample averages:	all MPs	Left	others	all MPs	Left	others
total number of words spoken	8499	11133	7439	630	720	586
occurrences of Mafia-related words	5.273	11.787	2.651	0.391	0.763	0.209
occurrences of Mafia-related words per 1,000 words	0.527	0.834	0.403	0.328	0.634	0.178

5.2.1 Data and estimating equations

We collected the transcripts of all speeches held in the national Parliament by MPs elected in Sicily from the main parties of the Left and Right during the period 1948-2008. We processed this huge amount of information — about 300,000 pages of transcripts — using an ad-hoc automatized routine that identified each single speech within the same debate. The work was made difficult and time consuming because of the poor physical state of parts of this documentation. For each speech, we counted the occurrences of the words "Mafia", "Camorra", "Ndrangheta", and "Cosa Nostra" over the total number of words pronounced in the same speech.[45]. We also record the exact date of each speech and the identity and partisan affiliation of the speaker. Overall, our dataset includes information on 8,833 speeches from 318 MPs appointed in Sicily over 14 legislatures.[46]

Summary statistics are reported in Table 5. MPs from the Left typically talk more about the Mafia and the other criminal organizations.

We regress anti-Mafia efforts – proxied by frequency of citing the Mafia – on violence committed by criminal organizations. According to Prediction P4 of our model, higher violence before elections should decrease anti-Mafia efforts by honest politicians during the following legislature. To test such prediction, we estimate the following equation:

$$talk_{i,l} = \alpha * totvict_l + \beta * polvict_l + \gamma * Left_i + \delta * totvict_l * Left_i + \phi * polvict_l * Left_i + \mu\prime X_{i,l} + \varepsilon_{i,t}, \tag{11}$$

where $talk_{i,l}$ are mentions of organized crime over the total number of words spoken by MP i during legislature l; $totvict_l$ and $polvict_l$ are the number of total and political victims, respectively, of the Mafia in the 12 months up to the elections starting legislature l; and $Left_i$ is an indicator variable for the political affiliation of the i-th MP. Therefore, α and β capture the average effect of electoral violence on the willingness to talk about organized crime across all MPs, whereas δ and ϕ represent the differential effects on leftist MPs – who are generally opposed by criminal organizations. According to Prediction P4, we thus expect $\beta < 0$ and $\phi < 0$.

In addition, Prediction P5 of our model relates political discourses about organized

[45] "Cosa Nostra" is another popular way of referring to the Sicilian Mafia (see, e.g., Dickie, 2004)

[46] The period 1948-2008 covers 15 legislatures, however transcripts from the 13th legislature (1996-2001) are not publicly available.

crime to violence committed by criminal organizations outside electoral periods. To test this additional prediction, we will also perform a finer grained analysis at the MP-speech level – rather than at the MP-legislature level as in equation (11). In particular, we will estimate the change in parliamentary discourses after (political) homicides committed by the Sicilian Mafia at any moment in time (i.e., also outside electoral periods).

5.2.2 Results

Columns (1)-(3) of Table 6 present estimates of equation (11) relating politicians' willingness to talk about the Mafia during the legislature to the number of Mafia homicides committed in the previous electoral period. In column (1), a higher number of homicides during the electoral period increases the salience of Mafia in parliamentary debates during the following legislature, though the coefficient is small – an additional victim brings a tenth of a standard deviation increase in the dependent variable. However, this is the combination of two opposite effects, shown in column (2). While homicides committed by the Mafia generally draw politicians' attention to the problem, political murders strongly discourage them from talking about it. Indeed, keeping constant the number of other homicides, an additional political murder brings a full standard deviation decrease in the dependent variable. These results confirm the hypothesis that (only) political homicides have an intimidating effect on MPs appointed in the elections. This effect is particularly strong for politicians of the Left, who are more at risk of future retaliation (column 3).

According to Prediction P5 of our model, violence committed outside electoral periods should also discourage politicians from fighting the Mafia. In columns (4)-(6) we re-estimate equation (11) at the speech-level. The dependent variable is the occurrence of Mafia-related words over the total number of words spoken by a given MP in day t, and *totvict* and *polvict* are the number of total and political victims, respectively, killed by the Mafia in the previous two weeks.[47]. Findings are very similar to those obtained at the MP-legislature level.

In the last three columns of Table 6, we exploit the structure of the speech-level dataset to control for additional (unobserved) heterogeneity across politicians and time periods. The main coefficients of interest are unaffected when including year fixed effects (column 7). When including also MP fixed effects the coefficient $Left$ is very close to zero (column 8), which is not surprising as individual fixed effects remove most variation in such variable. However, its interactions with *totvict* and *polvict* remain statistically significant, though somewhat reduced in magnitude; the same is true after including a full set of MP-by-year fixed effects (column 9). These findings suggest that violence discourages politicians' initiatives against the Mafia – in particular, from Left-wing MPs – even holding constant the composition of the Parliament.

[47]The results are qualitatively similar when considering smaller and larger time windows (one and three weeks, respectively); see Table A5 in the Appendix.

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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	MP-Legislature regression			Speech-level regression					
total number of words (x 1,000)	0.003	0.003	0.002	0.115***	0.115***	0.106***	0.106***	0.094***	0.099***
	(0.003)	(0.003)	(0.003)	(0.043)	(0.042)	(0.037)	(0.033)	(0.031)	(0.034)
totvict	0.019***	0.045***	0.035***	0.469***	0.511***	0.168**	-0.089	-0.034	-0.018
	(0.007)	(0.013)	(0.012)	(0.153)	(0.169)	(0.069)	(0.106)	(0.092)	(0.084)
polvict		-0.139***	-0.105**		-0.489**	-0.094	-0.045	-0.221*	-0.170
		(0.038)	(0.041)		(0.217)	(0.128)	(0.131)	(0.130)	(0.123)
Left			0.268			0.259**	0.250***	-0.094	-0.640
			(0.205)			(0.118)	(0.096)	(0.325)	(0.518)
totvict X Left			0.056			0.936**	0.920**	0.848***	0.838***
			(0.040)			(0.411)	(0.399)	(0.326)	(0.317)
polvict X Left			-0.167*			-1.092**	-1.144**	-0.619*	-0.678*
			(0.100)			(0.551)	(0.513)	(0.337)	(0.349)
Constant	0.358***	0.315***	0.233***	0.163***	0.164***	0.085**	0.664	1.290	0.428**
	(0.084)	(0.085)	(0.072)	(0.037)	(0.037)	(0.042)	(0.690)	(0.838)	(0.174)
Observations	655	655	655	8,833	8,833	8,833	8,833	8,833	8,833
Year FE	NO	NO	NO	NO	NO	NO	YES	YES	NO
MP FE	NO	NO	NO	NO	NO	NO	NO	YES	NO
MP x Year FE	NO	NO	NO	NO	NO	NO	NO	NO	YES
R-squared	0.009	0.027	0.045	0.009	0.009	0.020	0.046	0.027	0.007

Note: This table shows the effect of electoral violence by the Mafia on parliamentary speeches by MPs appointed in Sicily since 1948. The main dependent variable is the occurrence of Mafia-related words ("Mafia", "Camorra", "Ndrangheta", and "Cosa Nostra") per 1,000 words spoked by each MP. In columns (1)-(3) the unit of observation is the MP-legislature and the main explanatory variables *totvict* and *polvict* are, respectively, the total number of Mafia victims and the number of victims linked to political parties and/or trade unions (e.g., party members or local administrators) killed by the Mafia in Sicily during the year before each election. In columns (4)-(9) the unit of observation is the MP-speech and the main explanatory variables *totvict* and *polvict* are total and political victims, respectively, killed by the Mafia in the two weeks before each speech. *Left* is an indicator variable for MPs of the Left. Additional fixed effects by year, MP, and MP-year are included in columns (7)-(9) – as indicated on the bottom of each column. Robust standard errors clustered by MP are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

Overall, the results in Tables 4 and 6 suggest that violence by the Sicilian Mafia influences political outcomes through both an "extensive" and an "intensive" margin. On the extensive margin, political homicides shift votes away from parties opposed by the Mafia – namely, left-wing parties. On the intensive margin, politicians from Sicily that are eventually appointed in the national Parliament are discouraged from taking action against it.

6 Conclusions

Criminal organizations in Italy use pre-electoral violence to facilitate the election of captured politicians. Since they use violence as a political tool, they rationally use it in different ways depending on the electoral rules and the existing electoral balance between captured and honest parties. Also we show that violence reduces the effort of the honest politician when in office.

As we discuss at the beginning, this is not only an Italian phenomenon. We are beginning to investigate pre-electoral violence in other countries as well. Thus far, we find suggestive evidence that, indeed, we observe a surge of killings in pre-electoral periods in democracies. Preliminary results are available from the authors and this will be the

subject of future research.

References

Acconcia, Antonio, Giovanni Immordino, Salvatore Piccolo, and Patrick Rey, "Accomplice Witnesses and Organized Crime: Theory and Evidence from Italy," *The Scandinavian Journal of Economics*, 2014, *116* (4), 1116–1159.

Acemoglu, Daron, Giuseppe De Feo, and Giacomo De Luca, "Weak States: Causes and Consequences of the Sicilian Mafia," Technical Report 2017.

_ , James A Robinson, and Rafael J Santos, "The monopoly of violence: Evidence from Colombia," *Journal of the European Economic Association*, 2013, *11* (s1), 5–44.

Americas Watch Committee, *The Killings in Colombia*, Human Rights Watch, 1989.

Bandiera, Oriana, "Land reform, the market for protection, and the origins of the Sicilian mafia: theory and evidence," *Journal of Law, Economics, and Organization*, 2003, *19* (1), 218–244.

Barone, Guglielmo and Gaia Narciso, "Organized crime and business subsidies: Where does the money go?," *Journal of Urban Economics*, 2015, *86*, 98–110.

Bernheim, B Douglas and Michael D Whinston, "Menu auctions, resource allocation, and economic influence," *The quarterly journal of economics*, 1986, pp. 1–31.

Bó, Ernesto Dal and Rafael Di Tella, "Capture by threat," *Journal of Political Economy*, 2003, *111* (5), 1123–1154.

_ , Pedro Dal Bó, and Rafael Di Tella, "Plata o Plomo?: Bribe and Punishment in a Theory of Political Influence," *American Political Science Review*, 2006, *100* (01), 41–53.

_ , _ , and _ , "Reputation when threats and transfers are available," *Journal of Economics & Management Strategy*, 2007, *16* (3), 577–598.

Buchanan, James M, Robert D Tollison, and Gordon Tullock, *Toward a theory of the rent-seeking society* number 4, Texas A & M Univ Pr, 1980.

Buonanno, P., G. Prarolo, and P. Vanin, "Organized Crime and Electoral Outcomes in Sicily," Working Papers wp965, Dipartimento Scienze Economiche, Universita' di Bologna September 2014.

Cameron, A Colin and Douglas L Miller, "A practitioners guide to cluster-robust inference," *Journal of Human Resources*, 2015, *50* (2), 317–372.

_ , **Jonah B Gelbach, and Douglas L Miller**, "Bootstrap-based improvements for inference with clustered errors," *The Review of Economics and Statistics*, 2008, *90* (3), 414–427.

Catino, Maurizio, "How Do Mafias Organize?," *European Journal of Sociology*, 2014, *55* (02), 177–220.

Cho, In-Koo and David M Kreps, "Signaling games and stable equilibria," *The Quarterly Journal of Economics*, 1987, pp. 179–221.

Coate, Stephen, "Political competition with campaign contributions and informative advertising," *Journal of the European Economic Association*, 2004, *2* (5), 772–804.

Collier, Paul and Pedro C Vicente, "Violence, bribery, and fraud: the political economy of elections in Sub-Saharan Africa," *Public Choice*, 2012, *153* (1-2), 117–147.

Corbetta, Piergiorgio and Maria Serena Piretti, *Atlante storico-elettorale d'Italia: 1861-2008*, Zanichelli, 2009.

Daniele, Gianmarco, "Strike one to educate one hundred: organized crime, political selection and politicians' ability," Working Papers 2015/37, Institut d'Economia de Barcelona (IEB) 2015.

_ **and Gemma Dipoppa**, "Mafia, Elections and Political Violence," *Available at SSRN 2812591*, 2016.

Dickie, John, *Cosa Nostra: A History of the Sicilian Mafia*, New York: Palgrave Macmillan, 2004.

Dixit, Avinash, "On Modes of Economic Governance," *Econometrica*, 2003, *71* (2), 449–481.

Ellman, Matthew and Leonard Wantchekon, "Electoral competition under the threat of political unrest," *Quarterly Journal of Economics*, 2000, pp. 499–531.

Falcone, Giovanni, "Cose di Cosa Nostra, in collaborazione con Marcelle Padovani," *Milan: Rizzoli*, 1991.

Feo, Giuseppe De and Giacomo De Luca, "Mafia in the ballot box," 2013.

Foglesong, Todd and Luis Guillermo Solis, "Organized Crime and its Impact on Democratic Societies," 2009.

Fudenberg, Drew and Jean Tirole, "Game theory, 1991," *Cambridge, Massachusetts*, 1991, *393*.

Gambetta, Diego, *The Sicilian Mafia: the business of private protection*, Harvard University Press, 1996.

Golden, Miriam, "Charges of Malfeasance, Preference Votes, Government Portfolios, and Characteristics of Legislators, Chamber of Deputies, Republic of Italy, Legislatures I-XI: Preference Votes, 1948-1994," Technical Report, Harvard University 2007.

Goldsmith, Arthur A, "Elections and civil violence in new multiparty regimes. Evidence from Africa," *Journal of Peace Research*, 2015, *52* (5), 607–621.

Green, W John, *A History of Political Murder in Latin America: Killing the Messengers of Change*, Suny Press, 2015.

Grossman, Gene M and Elhanan Helpman, "Protection for Sale," *American Economie Review*, 1994, *84* (4), 833–850.

Knoke, David, *Political networks: the structural perspective*, Vol. 4, Cambridge University Press, 1994.

Leaver, Clare, "Bureaucratic minimal squawk behavior: Theory and evidence from regulatory agencies," *The American Economic Review*, 2009, pp. 572–607.

LIBERA, *Memoria. Nomi e storie delle vittime innocenti delle mafie*, Edizioni Gruppo Abele, 2015.

Lo Moro, Doris, Marcello Gualdani, and Vittorio Zizza, "Commissione parlamentare di inchiesta sul fenomeno delle intimidazioni nei confronti degli amministratori locali," Technical Report, Italian Senate 2015.

Lodato, Saverio and Tommaso Buscetta, *La mafia ha vinto: intervista con Tommaso Buscetta*, Mondadori, 2007.

Lupo, Salvatore, *History of the Mafia*, Columbia University Press, 2013.

Malanima, P and V Daniele, "Il prodotto delle regioni e il divario Nord-Sud in Italia (1861-2004)," *Rivista di politica economica*, 2007.

Méndez, Juan E, *The "Drug War" in Colombia: The Neglected Tragedy of Political Violence*, Human Rights Watch, 1990.

Molzahn, Cory, Viridiana Ríos, and David A Shirk, "Drug violence in Mexico: Data and analysis through 2014," *Trans-Border Institute, University of San Diego, San Diego*, 2015.

Nannicini, Tommaso, Andrea Stella, Guido Tabellini, and Ugo Troiano, "Social capital and political accountability," *American Economic Journal: Economic Policy*, 2013, *5* (2), 222–250.

Paoli, Letizia, *Mafia brotherhoods: Organized crime, Italian style*, Oxford University Press, 2003.

Pinotti, Paolo, "Organized Crime, Violence, and the Quality of Politicians: Evidence from Southern Italy," *Lessons from the Economics of Crime: What Reduces Offending?*, 2013, p. 175.

_ , "The economic costs of organised crime: evidence from southern Italy," *The Economic Journal*, 2015, *125* (586), F203–F232.

Prat, Andrea, "Campaign spending with office-seeking politicians, rational voters, and multiple lobbies," *Journal of Economic Theory*, 2002, *103* (1), 162–189.

Roemer, John E, "Party competition under private and public financing: A comparison of institutions," *Advances in theoretical economics*, 2006, *6* (1), 1–31.

Schelling, Thomas C, "What is the business of organized crime?," *The American Scholar*, 1971, pp. 643–652.

Shirk, David and Joel Wallman, "Understanding Mexico's Drug Violence," *Journal of Conflict Resolution*, 2015.

Solis, Luis Guillermo and Francisco Rojas Aravena, "Organized Crime in Latin America and the Caribbean," 2009.

Tabellini, Guido, "The Scope of Cooperation: Values and Incentives," *The Quarterly Journal of Economics*, 2008, *123* (3), 905–950.

White, H, *Asymptotic theory for econometricians*, Academic Press, Orlando (CA), 1984.

Appendix 1: Proofs

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

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

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

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

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

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

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

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

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

$$\hat{\nu}\left(0\right)=\underline{\nu}^* \equiv b\left(1+x\right)\frac{\Delta}{s}.$$

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

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

with $b\left(1+x\right)\frac{\Delta}{w} > \underline{\nu}^*$. Hence, the separating equilibrium that is least costly requires a level of violence equal to $b\left(1+x\right)\frac{\Delta}{s}$.

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

$$\pi_s^*=b\left[1-h\left(e_s^*,x\right)\right]-k\left(\nu_s^*,s\right) \geq b\left[1-h\left(e_w^*,x\right)\right] \quad \Leftrightarrow \quad \nu_s^* \leq \overline{\nu}^* \equiv b\left(1+x\right)\frac{\Delta}{w},$$

for the strong type. And, equivalently,

$$\pi_w^* = b\left[1 - h\left(e_w^*, x\right)\right] \geq b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu_s^*, w\right) \quad \Leftrightarrow \quad \nu_s^* \geq \underline{\nu}^* \equiv b\left(1 + x\right)\frac{\Delta}{s},$$

for the weak type. One can find off-equilibrium beliefs that support any ν_s^* such that $\nu_s^* \in \mathcal{S} \equiv [\underline{\nu}^*, \overline{\nu}^*]$. Essentially, this requires $\beta(\nu) = 1$ for every $\nu \geq \nu_s^*$, and $\beta(\nu) = 0$ otherwise.

The least-costly separating equilibrium ($\underline{\nu}^*$) is more appealing than the others — i.e., any $\nu^* \in (\underline{\nu}^*, \overline{\nu}^*]$ — for two reasons. First, it maximizes the criminal organization's expected profit (which is immediate 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

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

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

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

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

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

Meaning that when a deviation is (equilibrium) *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 $\nu_s^* > \underline{\nu}^*$ fails to satisfy its requirements except for the least-costly one. In fact, consider any $\nu \in [\underline{\nu}^*, \nu_s^*]$, so that $\beta(\nu) = 0$. First, note that $\nu \leq \nu_s^*$ implies

$$\pi_s^* = b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu_s^*, s\right) \leq b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, s\right).$$

Moreover, by incentive compatibility, for every $\nu \in \mathcal{S}$

$$\pi_w^* = b\left[1 - h\left(e_w^*, x\right)\right] \geq b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, w\right).$$

Meaning that a reasonable system of off-equilibrium beliefs should be such that $\beta(\nu) = 1$ for every $\nu \in [\underline{\nu}^*, \nu_s^*]$, 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, at any $\nu < \underline{\nu}^*$, by incentive compatibility

$$\pi_w^* = b\left[1 - h\left(e_w^*, x\right)\right] < b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, w\right),$$

and, by construction,

$$\pi_s^* = b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\underline{\nu}^*, s\right) < b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, s\right),$$

so that $\beta(\nu) = 0$ for $\nu < \underline{\nu}^*$ is plausible in the Cho-Kreps sense.

By the same token, it can be shown that for any $\nu > \underline{\nu}^*$, incentive compatibility implies that

$$\pi_w^* = b\left[1 - h\left(e_w^*, x\right)\right] > b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, w\right),$$

and

$$\pi_s^* = b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\underline{\nu}^*, s\right) > b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, s\right),$$

So that $\beta(\nu) = 1$ for $\nu > \underline{\nu}^*$ is plausible in the Cho-Kreps sense.

Consider now pooling equilibria such that 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

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

where

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

The solution for is:

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

In equilibrium we must have:

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

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 $\frac{1+x}{w}$ without the need to exert violence.

That is

$$b\left[1-h\left(e^{*},x\right)\right]-k\left(\nu^{*},w\right)\geq b\left[1-h\left(e_{w}^{*},x\right)\right]\quad\Leftrightarrow\quad\nu^{*}\leq\overline{\nu}^{p}\equiv\frac{b\left(1+x\right)\beta\Delta}{\beta s+\left(1-\beta\right)w}. \tag{12}$$

This is because there cannot exist a pooling equilibrium such that $\beta(0)=1$. Hence, $\beta(0)=0$ in any pooling equilibrium. Condition (12) 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 does not because for any $\nu^{*}\leq\overline{\nu}^{p}$ it must be

$$b\left[1-h\left(e^{*},x\right)\right]-k\left(\nu^{*},s\right)>b\left[1-h\left(e^{*},x\right)\right]-k\left(\nu^{*},w\right)\geq b\left[1-h\left(e_{w}^{*},x\right)\right],$$

nor can it gain by pretending to be a weak type. Indeed, any level of violence higher than the equilibrium one is always attributed (off-equilibrium) 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.[48] 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 $\nu>\nu^{*}$, and the strong type has lower costs of violence, there always exists a $\nu'>\nu^{*}$ such that

$$\pi_{s}^{p}=b\left[1-h\left(e^{*},x\right)\right]-k\left(\nu^{*},s\right)>b\left[1-h\left(e_{w}^{*},x\right)\right]-k\left(\nu',s\right),$$

$$\pi_{w}^{p}=b\left[1-h\left(e^{*},x\right)\right]-k\left(\nu^{*},s\right)\leq b\left[1-h\left(e_{w}^{*},x\right)\right]-k\left(\nu',w\right),$$

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. ■

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

$$\frac{1}{s}<\psi(\tfrac{1}{2}-x_{i},x_{i},1)<\frac{1}{w}, \tag{13}$$

[48] Of 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.).

where

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

which is strictly decreasing in x_i for any $x_i \in \left[0, \frac{1}{2}\right]$. Hence, (13) is satisfied only if s is not too small — i.e., $\frac{1}{s} < \lim_{x_i \to 0} \frac{\left[\frac{1}{2} - x_i\right]^2}{2(1+x_i)} = \frac{1}{8}$ — and if $x_i \in [\underline{x}, \overline{x})$, with

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

and $\underline{x} > 0$ 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 $x_i \in [\underline{x}, \overline{x}]$. 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 $k\left(\nu^*_{i,s}, s\right)$.

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 $\nu^*_{i,s} = \underline{\nu}^* \equiv \frac{wb}{N}$.

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 $\underline{\nu}^*$, 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 $\nu \in [\underline{\nu}^*, \nu^*_{i,s}]$. The following is true

$$\pi^*_{i,s} = \frac{b}{N} - k\left(\nu^*_{i,s}, s\right) \leq \frac{b}{N} - k\left(\nu, s\right),$$

and by incentive compatibility, for every $\nu \in \mathcal{S}'$ it must be

$$\pi^*_{i,w} = 0 \geq \frac{b}{N} - k(\nu, w).$$

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, by incentive compatibility for every $\nu < \underline{\nu}^*$ it must be

$$\pi^*_{i,w} = 0 < \frac{b}{N} - k(\nu, w),$$

and, by construction,

$$\pi^*_{i,s} = \frac{b}{N} - k(\underline{\nu}^*_{i,s}, s) < \frac{b}{N} - k(\nu, s).$$

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 for every $\nu > \underline{\nu}^*$, incentive compatibility implies

$$\pi^*_{i,w} = 0 > \frac{b}{N} - k(\nu, w),$$

while, by construction,

$$\pi^*_{i,s} = \frac{b}{N} - k(\underline{\nu}^*, s) > \frac{b}{N} - k(\nu, s).$$

Hence, $\beta(\nu) = 1$ for $\nu > \underline{\nu}^*$ 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 (2) 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

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

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. ■

Proof of Proposition 3. As seen in the baseline model, the intuitively plausible PBE identified in Proposition 3 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

$$\pi_s^* \equiv b\left[1-h\left(e_s^*,x\right)\right] - k\left(\nu_s^*,s\right) - h\left(e_s^*,x\right)a^*\left(s\right) \geq b\left[1-h\left(e_w^*,x\right)\right] - h\left(e_w^*,x\right)a^*\left(w\right) \quad \Leftrightarrow$$

$$\nu_s^* \leq \overline{\nu}^* \equiv b\left(1+x\right)\frac{\Delta}{w} + \eta\frac{\left(2\left(1+x\right)+\eta^2\right)\left(s+w\right)+sw\left(2x+b\eta\right)}{2w^2s}\Delta$$

for the strong type. And, equivalently,

$$\pi_w^* \equiv b\left[1-h\left(e_w^*,x\right)\right] - h\left(e_w^*,x\right)a^*\left(w\right) \geq b\left[1-h\left(e_s^*,x\right)\right] - k(\nu_s^*,w) - h\left(e_s^*,x\right)a^*\left(s\right) \quad \Leftrightarrow$$

$$\nu_s^* \geq \underline{\nu}^* \equiv b\left(1+x\right)\frac{\Delta}{s} + \eta\frac{\left(2\left(1+x\right)+\eta^2\right)\left(s+w\right)+sw\left(2x+b\eta\right)}{2ws^2}\Delta$$

for the weak type. Hence, $\underline{\nu}^*$ identifies the least-costly separating equilibrium.

Notice that $\overline{\nu}^* > \underline{\nu}^*$ since $s > w$. Hence, one can find off-equilibrium beliefs that support any ν_s^* such that $\nu_s^* \in \mathcal{S} \equiv [\underline{\nu}^*, \overline{\nu}^*]$. Essentially, this requires $\beta(\nu) = 1$ for every $\nu \geq \nu_s^*$, and $\beta(\nu) = 0$ otherwise. As already seen in the proof of Proposition 1, 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, consider any $\nu \in [\underline{\nu}, \nu_s^*]$, so that $\beta(\nu) = 0$. By construction

$$\pi_s^* = b\left[1-h\left(e_s^*,x\right)\right] - k\left(\nu_s^*,s\right) - h\left(e_s^*,x\right)a^*\left(s\right) \leq b\left[1-h\left(e_s^*,x\right)\right] - k\left(\nu,s\right) - h\left(e_s^*,x\right)a^*\left(s\right).$$

Moreover, for any $\nu \in \mathcal{S}$, incentive compatibility implies that

$$\pi_w^* = b\left[1-h\left(e_w^*,x\right)\right] - h\left(e_w^*,x\right)a^*\left(w\right) \geq b\left[1-h\left(e_s^*,x\right)\right] - k\left(\nu,w\right) - h\left(e_s^*,x\right)a^*\left(s\right).$$

Hence, that a reasonable system of off-equilibrium beliefs should be such that $\beta(\nu) = 1$ for every $\nu \in [\underline{\nu}^*, \nu_s^*]$, 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. Therefore, 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, at any $\nu < \underline{\nu}$, incentive compatibility requires

$$\pi_w^* < b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, w\right) - h\left(e_s^*, x\right) a^*\left(s\right),$$

and, by construction,

$$\pi_s^* < b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, s\right) - h\left(e_s^*, x\right) a^*\left(s\right),$$

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

By the same token, for any $\nu > \underline{\nu}$, incentive compatibility implies that

$$\pi_w^* > b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, w\right) - h\left(e_s^*, x\right) a^*\left(s\right),$$

and

$$\pi_s^* > b\left[1 - h\left(e_s^*, x\right)\right] - k\left(\nu, s\right) - h\left(e_s^*, x\right) a^*\left(s\right),$$

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

The analysis of the pooling equilibria follows the same logic as in the proof of Proposition 1 and is omitted for brevity. ■

Proof of Proposition 4. First, note that condition (4) can be satisfied only if η is not too large — i.e., if

$$\psi(\tfrac{1}{2} - x_i, x_i, s) - \frac{\eta^2}{2s} > 0 \quad \Rightarrow \quad \eta < \sup_{x_i \in \left[0, \frac{1}{2}\right]} \left(\tfrac{1}{2} - x_i\right) \sqrt{\frac{1}{1 + x_i}} = \frac{1}{2}.$$

Rewrite (4) as

$$\frac{1}{s} + \frac{\eta^2}{2s^2} < \psi(\tfrac{1}{2} - x_i, x_i, 1) < \frac{1}{w} + \frac{\eta^2}{2s^2} \tag{14}$$

where, as in the proof of Proposition 2,

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

which is strictly decreasing in x_i for any $x_i \in \left[0, \frac{1}{2}\right]$. Notice that

$$\frac{1}{s} + \frac{\eta^2}{2s^2} < \frac{1}{w} + \frac{\eta^2}{2s^2}.$$

Hence, (13) can be satisfied only if s is not too small, that is

$$\frac{1}{s} + \frac{\eta^2}{2s^2} < \lim_{x_i \to 0} \frac{\left[\frac{1}{2} - x_i\right]^2}{2\left(1 + x_i\right)} = \frac{1}{8},$$

and if $x_i \in [\underline{x}, \overline{x})$, with $\overline{x}$ being solution of

$$\frac{1}{s} + \frac{\eta^2}{2s^2} = \psi(\tfrac{1}{2} - x_i, x_i, 1),$$

and $\underline{x}$ being solution of

$$\psi(\tfrac{1}{2} - x_i, x_i, 1) = \frac{1}{w} + \frac{\eta^2}{2s^2}.$$

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 $x_i \in [\underline{x}, \overline{x}]$. 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 $\nu_w^* = 0$, so that it makes no profit — i.e.,

$$\pi_w^* = -a^*\left(w\right),$$

since there will be, in the second period, anti-organization activity $a^*\left(w\right)$ by the honest politician winning the elections. By contrast, in a separating equilibrium, the strong type can allow the corrupt party to win the election. Hence, its (equilibrium) profit is

$$\pi_s^* \equiv \frac{b}{N} - k(\nu_s^*, s) - a^*\left(s\right).$$

A separating equilibrium in which $\nu_s^* > 0$ can exist if, and only if, the following incentive compatibility constraints hold

$$\frac{b}{N} - k(\nu_s^*, s) - a^*\left(s\right) \geq -a^*\left(w\right) \geq \frac{b}{N} - k(\nu_s^*, w) - a^*\left(s\right),$$

implying that

$$\frac{wb}{N} + \eta\frac{\Delta}{s} \leq \nu_s^* \leq \frac{wb}{N} + \eta\frac{\Delta}{w}$$

This defines the set of separating equilibria.

As before, the off-equilibrium beliefs that support each of these equilibria are such that $\beta\left(\nu\right) = 1$ for every $\nu \geq \nu_s^*$, and $\beta\left(\nu\right) = 0$ otherwise. The least-costly separating

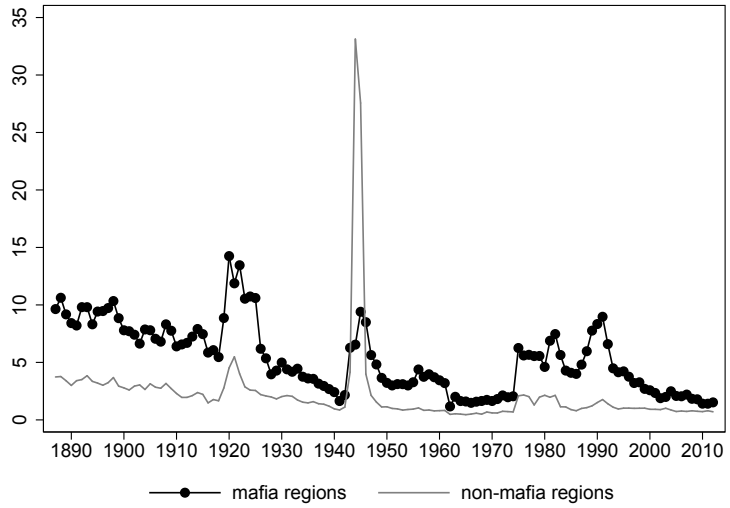
equilibrium is such that $\nu_s^* = \frac{wb}{N} + \eta\frac{\Delta}{s}$; it maximizes the organization's expected profit and is the only one that survives the Intuitive Criterion, which is not satisfied by none of the pooling equilibria. The proof follows the logic used to show Proposition 2 and is thus omitted for brevity. ■

Appendix 2: Lists of victims of the Sicilian Mafia

Organization	Web Address
Fondazione Progetto Legalitá	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

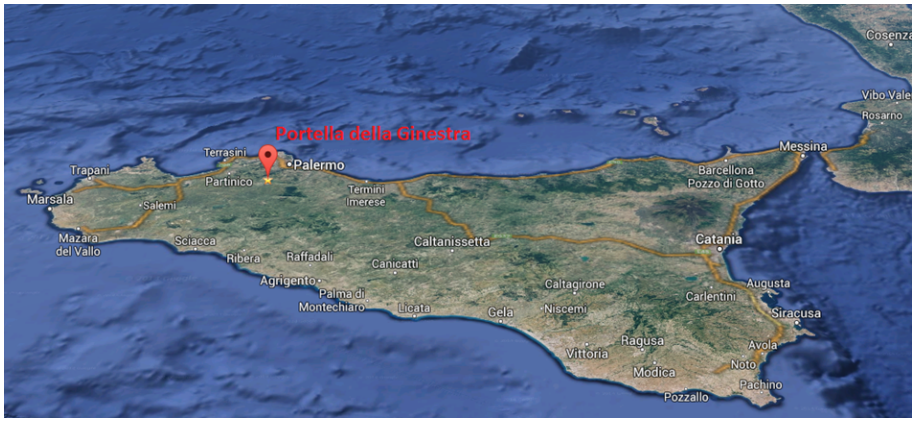
Appendix 3: Additional figures and tables

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.

Figure A3: Administrative borders of Italian provinces and regions

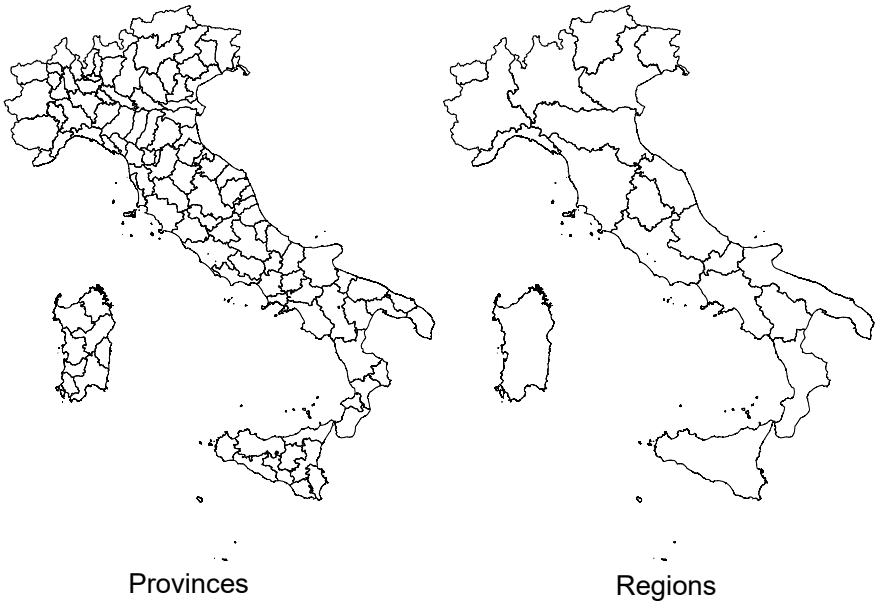


Table A1: Judicial investigations for mafia-related crimes and political alignment of members of the Italian Parliament, 1945-1993

	(1)	(2)	(3)	(4)	(5)	(6)
	mafia association (Article 416-bis)		criminal association (Article 416)		malfeasance (corruption, abuse)	
mafia region	0.009***		0.029***		0.032***	
	(0.003)		(0.008)		(0.009)	
Left	-0.001*	-0.001	-0.007*	-0.002	-0.019***	-0.015***
	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)
Left X mafia region	-0.009***	-0.009***	-0.021*	-0.024**	-0.024**	-0.027**
	(0.003)	(0.003)	(0.011)	(0.011)	(0.011)	(0.011)
Constant	0.001*		0.021***		0.032***	
	(0.001)		(0.003)		(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 other 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 murders by the Sicilian Mafia, for different categories of victims (robustness)

	(1)	(2)	(3)	(4)	(5)
	politicians	entrep.	police	others	all victims
Panel A: controlling for regional elections					
elect	0.065**	-0.024	0.029	0.048	0.118
	(0.028)	(0.026)	(0.077)	(0.087)	(0.121)
regelect	-0.001	0.021	-0.041	-0.049	-0.071
	(0.026)	(0.029)	(0.067)	(0.072)	(0.111)
R-squared	0.132	0.132	0.052	0.090	0.156
Panel B: controlling for post-electoral period					
elect	0.076***	-0.022	0.037	0.072	0.163
	(0.028)	(0.029)	(0.069)	(0.106)	(0.132)
postelect	0.032	-0.003	0.043	0.093	0.165
	(0.026)	(0.032)	(0.074)	(0.103)	(0.134)
R-squared	0.134	0.132	0.052	0.092	0.158
Observations	804	804	804	804	804

Note: This table shows examines the robustness of the results in Table 1 to controlling for the timing of regional elections (Panel A) and for indicator variables for the post-electoral period (Panel B). The dependent variable is the number of victims in each month, distinguishing between different groups indicated on top of each column. The main explanatory variable $elect_t$ is a dummy equal to 1 in the 12 months up to a national election and equal to zero otherwise; $regelect_t$ is a dummy equal to 1 in the 12 months up to a regional election and equal to zero otherwise; and $postelect_t$ is a dummy equal to 1 in the 12 months following a national election and equal to zero otherwise. All specifications include also a cubic polynomial in the number of months since January 1945, 12 month-specific fixed effects, and the log of regional GDP per capita and population. 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.

Table A3: Electoral violence across Italian regions (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)
	regional vs. national elections			pre- vs. post-electoral period		
regelect	-0.134					
	(0.134)					
	[0.372]					
regelect X orgcrime	0.354	0.281	0.335			
	(0.389)	(0.414)	(0.560)			
	[0.487]	[0.647]	[0.674]			
elect X orgcrime			0.972***			0.986***
			(0.109)			(0.097)
			[0.000]			[0.000]
postelect				0.271***		
				(0.055)		
				[0.000]		
postelect X orgcrime				0.043	-0.049	-0.201
				(0.431)	(0.466)	(0.463)
				[0.783]	[0.788]	[0.516]
Observations	1,072	1,056	1,056	1,072	1,056	1,056
Controls and year FE	NO	YES	YES	NO	YES	YES
R-squared	0.001	0.475	0.482	0.004	0.475	0.481

Note: This table shows the differential effect of electoral cycles on homicides in regions with an historical presence of criminal organizations. The dependent variable is the homicide rate per 100,000 inhabitants in each region and year. The explanantory variable *elect* is the fraction of months in each calendar year within 12 months of the following national election; *regelect* is the fraction of months in each calendar year within 12 months of the following regional election; *postelect* is the fraction of months in each calendar year within 12 months since the previous national election; finally, *orgcrime* is an indicator variable equal to 1 for regions with an historical presence of criminal organizations – Sicily, Calabria, and Campania – and equal to 0 otherwise. Region fixed effects are included in all regressions; in columns (2)-(3) and (5)-(6) we also include year fixed effects and the logarithms of GDP per capita and population in each region and year. Robust standard errors clustered by region are reported in parenthesis. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively. We also report, in square brackets, wild-bootstrapped p-values based on the procedure of Cameron et al. (2008).

Table A4: Other crimes across Italian regions during electoral periods

	(1)	(2)	(3)	(4)	(5)	(6)
	theft	rob	ext	kidnap	drug	total
elect X orgcrime	29.294	-0.011	0.299	0.258	-0.303	-3.062
	(53.977)	(8.715)	(0.289)	(0.265)	(4.430)	(89.320)
	[0.632]	[0.999]	[0.338]	[0.453]	[0.949]	[0.981]
Observations	896	592	592	592	592	896
R-squared	0.824	0.479	0.719	0.802	0.826	0.863

Note: This table shows the differential effect of electoral cycles on several types of crimes (indicated on top of each column) in regions with an historical presence of criminal organizations. The dependent variables are crime rates per 100,000 inhabitants in each region and year. The explanatory variable *elect* is the fraction of months in each calendar year within 12 months of the following national election, *orgcrime* is an indicator variable equal to 1 for regions with an historical presence of criminal organizations – Sicily, Calabria, and Campania – and equal to 0 otherwise. All specifications include the logarithms of GDP per capita and population as well as region and year fixed effects Robust standard errors clustered by region are reported in parenthesis. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively. We also report, in square brackets, wild-bootstrapped p-values based on the procedure of Cameron et al. (2008).

Table A5: Electoral violence and parliamentary debates about the mafia (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)
	time window: +/- 1 week			time window: +/- 3 weeks		
total number of words (x 1,000)	0.117***	0.109***	0.108***	0.114***	0.104***	0.104***
	(0.044)	(0.038)	(0.033)	(0.042)	(0.036)	(0.032)
totvict	0.521***	0.231**	-0.002	0.462***	0.179***	-0.052
	(0.153)	(0.102)	(0.131)	(0.140)	(0.063)	(0.110)
polvict	-0.408*	-0.055	-0.088	-0.443**	-0.110	-0.099
	(0.246)	(0.211)	(0.190)	(0.181)	(0.114)	(0.117)
Left		0.351**	0.335***		0.236**	0.231***
		(0.158)	(0.128)		(0.110)	(0.089)
totvict X Left		-0.954	-1.108*		-0.953**	-1.018**
		(0.591)	(0.585)		(0.467)	(0.435)
polvict X Left		0.770**	0.759**		0.793**	0.763**
		(0.361)	(0.352)		(0.343)	(0.328)
Constant	0.198***	0.089**	0.646	0.143***	0.073*	0.666
	(0.046)	(0.042)	(0.687)	(0.037)	(0.044)	(0.696)
Observations	8,833	8,833	8,833	8,833	8,833	8,833
Year FE	NO	NO	YES	NO	NO	YES
R-squared	0.007	0.015	0.044	0.009	0.019	0.046

Note: This table shows the effect of electoral violence by the Mafia on parliamentary speeches by MPs appointed in Sicily since 1948. The main dependent variable is the occurrence of Mafia-related words ("Mafia", "Camorra", "Ndrangheta", and "Cosa Nostra") per 1,000 words spoked by each MP. The unit of observation is the MP-speech and the main explanatory variables *totvict* and *polvict* are total and political victims, respectively, killed by the Mafia in the week before each speech (columns 1-3) and in the three weeks before each speech (columns 4-6). *Left* is an indicator variable for MPs of the Left. Additional fixed effects by year, MP, and MP-year are included in columns (7)-(9) – as indicated on the bottom of each column. Robust standard errors clustered by MP are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.