Organized Crime, Violence, and Politics*

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Abstract

We develop a model explaining how criminal organizations strategically use pre-electoral violence as a way of influencing electoral results and politicians’ behavior. We then characterize the incentives to use such violence under different levels of electoral competition and different electoral rules. Our theory is consistent with the empirical evidence within Sicily and across Italian regions. Specifically, 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 the 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

You make war to live in peace.

Totò Riina, Mafia Boss

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1 Introduction

In many countries, criminal organizations capture parts of the polity. Captured politicians then may distort the allocation of public investment toward the areas of influence of criminal organizations (Schelling, 1971; Barone and Narciso, 2015) and promote leniency acts in their favor (Acemoglu et al., 2013).

But, how do criminal groups take over parts of the polity? How do their strategies vary with the institutional regime, the electoral system, and the intensity of political competition? How effective are such strategies?

To address these issues, we develop a model in which pre-electoral violence against an “honest” party favors the election of candidates from the “corrupt” party — i.e., the party preferred by the criminal organization. In this model, violence signals the strength of the criminal organization (and the willingness to use it). This signal scares the candidates running for the non-captured party and their campaign workers, and affects the behavior of appointed politicians.

We first characterize the extent of pre-electoral violence under different electoral rules and levels of electoral competition. As in models of strategic electoral spending (see, e.g., Persson and Tabellini, 1999; Lizzeri and Persico, 2001), under a single-district, proportional rule any incentives to use violence will depend on the relative strength of the honest and the corrupt party at the national level; under a majoritarian rule, violence instead should be concentrated in marginal districts where there is head-to-head competition between the two parties.

We test these predictions empirically using data from Italy, a country historically plagued by organized crime. We rely on two data sets. The first provides detailed information on all victims of the Sicilian Mafia after World War II, including their occupation and the exact date and location of each murder. Using these data, we uncover sizable increases in the number of murders perpetrated by the Sicilian Mafia in the year preceding an election. This effect is specific to victims linked with the polity — party candidates, campaign workers, activists, etc. — whereas there is no increase in, say, the number of entrepreneurs or judges killed by the Mafia.

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. Therefore we compare (difference-in-differences) homicide rates between regions with and without a significant presence of criminal organizations, respectively,

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1Extensive anecdotal evidence from Italy and Latin America is surveyed by Lupo (2013) and Solis and Aravena (2009), respectively.

2Chapter 8 of Persson and Tabellini (2000) provides a comprehensive, comparative analysis of electoral spending under proportional and majoritarian rule, respectively.

3Clearly, 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.
through electoral and non-electoral periods. Although regional homicide rates are a coarse measure of organized crime violence, they have the advantage of being available on a comparable basis for all Italian regions since 1887. In line with the results on Sicilian Mafia victims, we detect significant increases in homicides during electoral years, but only in regions with a significant presence of organized crime.

The historical depth of these data also allows us to compare the extent of pre-electoral violence under different institutional regimes, electoral systems, and levels of electoral competition. Interestingly, the presence of criminal organizations is associated with higher pre-electoral violence in all periods but during the Fascist dictatorship (1922-43), when they had little or no chance to influence electoral results — elections were actually plebiscites for the Fascist party, the only one allowed to run for election.

Incentives for pre-electoral violence also vary widely within democratic periods, due to rich variation in electoral rules and the degree of electoral competition. In line with the model’s predictions, pre-electoral violence increases with the level of competition at the national level under proportional elections; under majoritarian elections, it is concentrated in marginal districts. Overall, these findings confirm that criminal organizations strategically use violence for political reasons.

We also investigate the effectiveness of pre-electoral violence in changing electoral results and politicians’ behavior. We address this question in the context of Sicily, for which we have better measures of organized crime violence and where we can clearly identify the targets of such violence. For historical reasons (discussed in the next section), the Sicilian Mafia traditionally favored conservative, center-right parties against left-wing parties and labor unions.

We thus merge our data on Sicilian Mafia victims with electoral results at the municipality-level and then estimate the effect of Mafia violence on the vote share of leftist parties across Sicilian municipalities in all national elections after World-War II. One additional political homicide in a given municipality during the electoral period brings on average a 2.4 percentage point decrease in the vote share of the Left in the same municipality, and a similar effect in neighboring municipalities. These findings are consistent with event-study evidence from an infamous massacre of left-wing activists at Portella della Ginestra on Labor Day 1947. The following elections, in April 1948, witnessed a dramatic sway of votes away from leftist parties, more so in the municipalities closer to the massacre. These findings are consistent with a signaling effect of Mafia violence — as predicted by our model — in areas that were not directly hit by the attacks.

Finally, we estimate the effect of Mafia violence on anti-Mafia efforts by members of the national Parliament (MP) appointed in Sicily, as measured by the salience of Mafia-related issues in official parliamentary speeches. For this purpose, we collected 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 measured the occurrence
of “Mafia” and related words, on the (reasonable) premise that MPs mention organized crime to raise attention toward the problem, not to praise it.

Interestingly, homicides committed by the Mafia during electoral periods generally increase the Mafia’s salience in parliamentary debates over the following legislature, but political homicides have the opposite effect. Both effects are amplified for MPs on the Left, who are the most likely targets of future violence: they generally talk more about the Mafia, especially after homicides, but they avoid doing so (even more than other MPs) after political homicides. We detect similar effects after homicides committed while the legislature is in session. Overall, this evidence is also consistent with a signaling effect of Mafia violence on politicians who were not themselves victims of the attacks.

We are not the first to study violence as a political tool. Dal Bó and Di Tella (2003) show how interest groups may use violence to manipulate elected politicians. 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 they derive implications for the quality of public officials. The main implication of these models is that, in order to influence political decisions, criminal organizations should perpetrate violence against politicians in office. 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. This is not inconsistent with our results. In local elections, criminal organizations have much less information on parties and candidates. Based on our own calculations using data from the Italian Ministry of Interior (www.amministratori.interno.it), 75% of local politicians in office in 2014 were affiliated with a myriad of local party lists (“liste civiche”) operating in only one of the 8,100 Italian municipalities and having little or no connection with national parties. In this context, criminal organizations may find it optimal to wait until they are certain about local parties’ stance towards organized crime (i.e., after elections) before committing violence. By contrast, there is much less uncertainty about national parties’ stance towards criminal organizations. As we mentioned above (and discuss at length in the next section), important factions of Center-Right parties — i.e., the Christian Democrats until 1993 and the Forza Italia party since 1994 — were traditionally closer to the Mafia than leftist parties. That being so, it is more effective for criminal organizations to perpetrate violence before elections.

4See 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).

5This 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.

6See 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.
elections, in order to influence not only the behavior of appointed politicians but also
the chances of election of their preferred candidates. Also, it may be harder to threaten
national politicians after elections, in case they are eventually appointed to the national
parliament.

Our results contribute to the literature on the relationship between organized crime
and the polity. Dell (2015) shows that drug-related violence increases in Mexican munici-
palities after the appointment of mayors from the conservative party engaged in the “war
on drugs”. Acemoglu et al. (2013), Fergusson et al. (2013), and Galindo-Silva (2016) in-
vestigate the complex inter-relationships between drug cartels, paramilitary groups, and
political parties in Colombia. Turning to Italy, De Feo and De Luca (2013) and Buon-
nanno et al. (2014) document the symbiotic relationship among the Sicilian Mafia and
Center-Right parties in the First and Second Republic, respectively. Acemoglu et al.
(2017) provide a rationale for such a relationship based on a theory of the Mafia as the
“military arm” of the elites in the context of weak property rights’ protection; they test
that theory against data on labor revolts and Mafia presence in the XIX century. This
divide in party links with organized crime along partisan lines is, indeed, an important
premise of our theoretical and empirical analysis.

Finally, Pinotti (2013), Daniele and Geys (2015), and Daniele (2015) test the impli-
cations of “plata-o-plomo” strategies (Dal Bó et al. 2006, 2007) for the quality of the
political class. Consistent with the model’s predictions, they find that Italian politicians
in areas under the control of criminal organizations are negatively selected on outside
income opportunities. In contrast with this work, ours focuses more on the practices
used by criminal organizations to influence electoral results and politicians’ behavior; the
effectiveness of such practices; and how they vary with the type of institutional regime,
electoral rules, and level of political competition. In this respect, we also draw an analogy
between pre-electoral violence and targeted electoral spending, as modeled for example

The rest of the paper is organized 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. In Sections 4, 5 and 6 we test the
various empirical implications of our model. Section 7 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 organized crime
as a “stable association that exploits the power of intimidation granted by the mem-
bership in the organization, and the condition of subjugation and omertà 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 them in Sicily, Campania, and Calabria. These southern regions host three of the oldest and most powerful criminal organizations in the World: Mafia, Camorra, and 'Ndrangheta, respectively.

The definition in Article 416-bis highlights three fundamental features of these criminal organizations. First, they are governed by a complex hierarchical structure. For example, the Sicilian Mafia has a distinctively pyramidal structure. At the base there are 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 makes decisions regarding alliances or wars with other criminal organizations, the commission of terrorist attacks, or the murder of prominent politicians and public officials.

The second major feature is the power of intimidation. These criminal 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. They derive part of their profits from “the control of economic activities, concessions, authorizations, and public contracts”. According to the Italian judge Giovanni Falcone, who led the so-called Maxi Trial against the Sicilian Mafia in 1987, and was later killed for this reason, “more than one fifth of Mafia profits come from public investments” (Falcone, 1991). More generally, Schelling (1971) argued that public works and procurement contracts are attractive profit opportunities for criminal organizations. Empirically, 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,

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7The 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.

8Obviously, these figures greatly underststate the size of these organizations, as omertà limits whistle-blowing (Acconcia et al., 2014). In addition, 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 are much less powerful than Mafia, Camorra, and 'Ndrangheta, especially from a political perspective.

9The 'Ndrangheta adopts a similar pyramidal model, whereas the Camorra has a more horizontal structure (Catino, 2014).
and ‘Ndrangheta has been inextricably intertwined with political power since Italy’s Uni-

fication 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 [Gambetta 1996; Bandiera 2003; Dixit 2003].
During the period of parliamentary monarchy (1861-1921), the Sicilian Mafia acted as a
military force for the island’s ruling class, fighting against workers’ protests and revolts
[Acemoglu et al. 2017].

After a parenthesis during Fascism, when the regime launched a military campaign
to re-establish the State’s control over the island, the collaboration between the Sicilian
Mafia and the conservative (center-right) bloc resumed. This followed the birth of the
so-called First Italian Republic (1946-1993), which re-introduced free democratic elec-
tions (every five years) under universal suffrage and proportional electoral rule. The
political landscape of the First Republic was marked by competition between the Chris-
tian Democrats, who were always in the ruling coalition along with several small parties,
and the Communist Party. Some of the most prominent Sicilian members of the Chris-
tian Democrats accepted the Mafia’s support in order to reinforce their positions against
leftist opponents. In return, if elected they would use their influence to subvert the po-
lice and judicial system’s interference with Mafia activities [Falcone 1991; Paoli 2003;
Lodato and Buscetta 2007]. Influence over national-level politicians (as opposed to local
administrators) was particularly important because criminal laws concerning the length
and harshness of prison sentences, mandatory resettlement of Mafia members, seizures of
assets, and enforcement in general are all decided by the national Parliament. The other
criminal organizations — i.e., Camorra and ‘Ndrangheta — also established links with
politics, but their partisan leaning has been much more volatile over time.

The collusion between factions of the Christian Democrats and criminal organizations
is apparent from judicial investigations into members of the Italian Parliament. We
explore this relationship by looking at prosecutors’ requests to proceed against a member of
Parliament (“Richieste di autorizzazione a procedere”), which is required in order to lift
Parliamentary immunity from judicial investigations. The institution of Parliamentary
immunity was abolished in 1993, so our data only cover the period up to that year.
Since 1983, when Article 416-bis was introduced into the penal code, 11 members of
Parliament were investigated as active members of criminal organizations; all of them
had been elected by the Christian Democrats or their government allies. In addition,

10We 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.
many more politicians were investigated for “simple” criminal association (Article 416 of the Penal Code) or for malfeasance, which is often indicative of links with criminal organizations. Figure 1 shows that the Christian Democrats and their allies were more likely to be investigated for all of these types of crimes than 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.\footnote{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.

In 1992-93, widespread corruption scandals precipitated a crisis for Italian traditional 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 assigned 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 (which changed its name several times) to a new right wing
coalition. Even under this new political landscape, the Sicilian Mafia continued to support important factions of center right parties (Buonanno et al., 2014). Very often, such support took the form of violent terrorist attacks against leftist groups.

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. A few days later, on May 1, 1947, hundreds of Sicilian peasants were celebrating the victory during the traditional ‘Labor Day’ parade at Portella della Ginestra when machine-gun fire broke out from the surrounding hills. Eleven people were killed immediately and 33 wounded, some of whom died in the following days. Although the bandit and separatist leader Salvatore Giuliano was blamed for orchestrating the shooting, it soon appeared that the Sicilian Mafia had ordered the massacre (Lupo, 2013). Violence against left-wing activists and worker union members continued over the following months, up to the national elections of 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 and the numerous episodes of violence during the following months were 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, leader of the Italian Communist Party in Sicily. Similarly, beginning in the mid 1970’s, the Sicilian Mafia exerted heavy political pressures to prevent passage of national laws aimed at hardening imprisonment conditions for the members of criminal organizations. Between 1992 and 1995 the Sicilian Mafia undertook an aggressive intimidation campaign against national politicians, the aim being to force them to abolish Article 41-bis of the Penal Code. Other criminal organizations in Italy also have engaged in violence and intimidation against local politicians and party members, so much so that in 2013 the Italian Parliament instituted an ad-hoc commission to investigate this phenomenon. The conclusions of the commission emphasizes the prevalence of these episodes in Sicily, Campania, and Calabria (Lo Moro et al., 2015).

12Sicily is one of the five autonomous regions in Italy, whose “special status” included an elected regional government immediately after World War II. The other (non-autonomous) regions had regional governments only in 1970.
2.4 Why national elections?

There are several reasons why criminal organizations may be particularly interested in influencing national politics. First of all, national politicians set the level of enforcement in the regions where criminal organizations operate: they can deploy special police forces, incorruptible investigators and judges, or even the army. Second, the national government can vote special laws (e.g., Article 416-bis) that increase the length and harshness of prison terms for organized crime members. Third, government can also pass a variety of laws regulating public procurement and contract enforcement, making it easier or harder for criminal organizations to infiltrate public contracts. Fourth, reforms of the penal and commercial code voted by the national Parliament may deeply affect the (legal and/or illegal) businesses operated by criminal organizations.

As mentioned in the introduction, because the alignment of national parties with criminal organizations is common knowledge, pre-electoral violence may be particularly effective in influencing national elections — whereas ex-post, “plata-o-plomo” offers may be preferable for local elections. In addition, it may be much more difficult to intimidate national MPs relative to affecting local politicians appointed in municipal councils after elections. A national MP has more protection, lives most of the time in Rome, and is under closer scrutiny by the public opinion (so reputation costs for bending to the pressures of criminal organizations would be larger). For all these reasons, incentives to exert violence are particularly strong before national elections.

2.5 Not only Italy

The links between criminal organizations and politics, together with the systematic use of violence against political opponents, are widespread around the world.

For example, in the 1980s and 1990s the Medellin cartel of Pablo Escobar waged a systematic campaign of violence and intimidation against national-level politicians to block the extradition of Colombian drug-dealers (narcos) to the United States. Ministry of Justice Rodrigo Lara and presidential candidate Luis Carlos Galan — both strong supporters of extradition — were killed, together with hundreds of lower level politicians and public officials. At the time of his assassination, Galan was conducting his electoral campaign for the 1990 elections and was comfortably ahead in the polls. Like the Sicilian Mafia, Colombian drug cartels allied with rich landowners to combat advocates of social reform. As a consequence, thousands of left-wing activists — in particular, the members of the Union Patriotica party — were killed by the drug lords of both the Medellin and Cali cartels [Americas Watch Committee, 1989, Méndez, 1990]. The links between drug trafficking, organized violence, and Colombian politics persisted even after the defeat of such cartels — see, e.g., Acemoglu et al. (2013), Fergusson et al. (2013), and Galindo-Silva (2016) for evidence on recent years.
Mexico has experienced a similar wave of political terrorism after President Filipe Calderon’s National Action Party (PAN) 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). Dell (2015) draws a causal relationship between the (close) election of PAN mayors and drug-related violence.

Political violence by criminal groups is also widespread in other Latin American countries. Foglesong and Solis (2009) carried out a series of interviews with more than 30 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 those 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. Similar patterns are found in many African countries, which exhibit a higher risk of civil violence during election cycles than in normal times – see, e.g., Goldsmith (2015).

3 A model of electoral violence

3.1 Proportional electoral system

Two political parties compete to attract a mass 1 of voters. One party is honest (h), the other (c) has been captured by a criminal organization. From now on, we assume that the ‘party’ is centralized and makes decisions about campaign efforts. Each vote is equal 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. The electoral effort (e) exerted by the honest party during the electoral campaign determines voters’ behavior. 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., h’s ideological (sincere) voters. The c party gets \( 1 - h(e, x) \). For simplicity, we assume that only

\footnote{Green (2015) provides a thorough historical account of political violence by criminal groups in Latin America.}

\footnote{Consistent with the evidence reported in Section 2.1, assuming a single organization is natural, since decisions regarding the commission of terrorist attacks, generalized violence directed against civilians (i.e., non-mafia members), and the murder of prominent politicians and public officials are typically centralized and taken (cooperatively) by the members of the Cupola.}

\footnote{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 be convinced by campaign effort. See also Frat (2002) and Roemer (2006) for similar models.}
the honest party makes an effort to win swing voters (more on this below). The cost of exerting campaign effort is \( \psi(e, x, \theta) \) and is increasing and convex in \( e \). It is decreasing in \( x \) because when there is large share of secure votes for the \( h \) party, the \( c \) party faces higher costs of capturing swing voters. That is, 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 supports the honest party, 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 \( \psi(e, \theta) \) setting \( x = 0 \). However, the empirical implications of having the campaign effort a function of \( x \) are consistent 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.\(^{16}\) As a convention, \( s \) stands for strong, \( w \) stands for weak, with \( \Delta \equiv s - w \geq 0 \).\(^{17}\)

The relationship between effort cost and military strength of the organization captures several mechanisms that are likely to be at work simultaneously. First, the voters may be intimidated by violence, and thus may prefer to elect the corrupt party in order to avoid additional violence. Second, strong organizations may murder candidates of the honest party. If so, another candidate would have to run, and probably be less efficient at attracting votes because he is scared or, even more simply, because he is a second choice.\(^{18}\) Third, even if the party’s candidate is not killed, it is possible for organizations with strong military power to disrupt the electoral campaign by intimidating campaign workers. These disruptions increase the cost of effort, or reduce the electoral benefits for a given level of effort exerted.

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 holds the prior belief that the organization is strong with probability \( \beta \in [0, 1] \). The criminal organization would like to signal its military strength in order to increase the costs of effort of the \( h \) party. Signaling occurs via pre-electoral violence, \( \nu \geq 0 \). The cost of electoral violence is \( k(\nu, \theta) = \frac{\nu}{\theta} \), which is inversely related to the

\(^{16}\)As a matter of fact, the willingness to use violence directed against state officials, civilians and politicians has varied a lot in the history of the Mafia. For example, while the ‘old Mafia’ had a clear rule preventing the use of violence against state officials, the advent of Totò Riina in the 1970s overturned this rule, leading to the most violent period in the history of the Mafia. Interestingly, after the arrest of Riina, his successor and childhood friend Bernardo Provenzano halted murders of state officials and terrorist attacks, showing an opposite propensity to rely on violence to pressure politicians.

\(^{17}\)The qualitative insights of the model remain true in a more general model with multiple types. More details are available from the authors.

\(^{18}\)In practice, this second, “incapacitation” mechanism should be relatively less important. Violence is, indeed, not so extended in size or scope to be a physical impediment like it would be, say, in a civil war situation. The empirical evidence we provide in Sections 5 and 6 also points toward a greater importance of intimidation.
organization’s military power.

The timing of the game is as follows:

1. Nature draws $\theta$.
2. The criminal organization chooses electoral violence $\nu$.
3. Honest candidates observe $\nu$, update beliefs, and decide how much effort $e$ to invest in the campaign.
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. We focus on separating equilibria, which are of greatest interest; in Appendix 1 we also examine pooling ones, and specify the off-path beliefs.

Let $\nu^{*}_\theta$ denote the equilibrium intensity of violence when the type of the criminal organization is $\theta$. 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 $\nu^{*}_\theta$, at stage 3 the honest party chooses the effort level that maximizes the number of votes received by the party. Thus it solves the following problem

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

Under the quadratic specification [1], it follows that

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

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 (sincere) 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 $\Delta$\(^{19}\).

Because violence is costly, we focus on the ‘least-costly’ separating equilibrium — also known as the ‘Riley outcome’ \cite{FudenbergTirole1991} — in which the weak organization exerts no violence (i.e., $\nu^*_w = 0$). Hence, to find the equilibrium we simply need to determine $\nu^*_s$, which will be pinned down by the incentive compatibility constraints for given off-path beliefs (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 equilibrium level of violence is increasing in the share $x$ of ideological (sincere) voters that support the honest party no matter what. In Appendix 1 we discuss multiplicity of equilibria including pooling outcomes and we also show that the equilibrium just described is the only one that survives the Cho and Kreps \cite{ChoKreps1987} intuitive criterion.

### 3.2 Majoritarian system

Consider now a majoritarian, first-past-the-post system, where the voting population is split into $N$ identical districts, each populated by a mass $\frac{1}{N}$ of voters and denoted by $i \in \{1, \ldots, N\}$. In each district the candidate of one of the two parties 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 party 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, where $x_i$ measures the mass of a district $i$’s electors that always vote for $h$. The criminal organization still can be either strong or weak, and this characteristic is common to all districts, since it is the same organization everywhere (as discussed in Section 2.1). For the moment we posit that there are no informational externalities between districts. That is, the information about $\theta$ revealed through the use of violence within district $i$ does not affect the behavior of politicians in the other districts. We relax this assumption later.

We restrict our attention to the least costly separating equilibria in which only the strong organization engages in pre-electoral violence; the analysis of pooling equilibria

\(^{19}\)The outcome described above emerges in equilibrium when $(\nu^*_s, \nu^*_w)$ 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.
is discussed in Appendix 1. We also assume that the cost of exerting violence for the organization is additively separable across districts. That is, letting $\nu = \sum_{i=1}^{N} \nu_i$, we assume:

- **Assumption A2.**

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

  This means that the criminal organization’s maximization problem is separable across districts.\(^{20}\) Therefore, in order to characterize the equilibrium of the 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.\(^{21}\) 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 $x_i \geq 1/2$, because the honest party wins the election even if $e_i = 0$.\(^{22}\) 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

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

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

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

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

---

\(^{20}\)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. 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.

\(^{21}\)We posit that in the case of a tie the honest party wins the subsequent round of elections.

\(^{22}\)We are excluding here a situation in which the candidate of party $h$ is killed and the party cannot supply another candidate for which $x_i \geq 1/2$.  

15
profit when \( x_i \) satisfies \( \text{[2]} \). A separating equilibrium (if it exists) must again be such that \( \nu_{i,w}^* = 0 < \nu_{i,s}^* \), with \( \nu_{i,s}^* \) 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 \( x_i \in (0, \frac{1}{2}) \).

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 exists, which can be constructed easily 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 favor 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 additional 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 (potentially) captured 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 captured politicians also exert a campaigning effort that counterbalances the effort exerted on the swing voters by the honest candidates.

**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, as we explain next. Consider the simplest possible case where there are only two districts \(N = 2\) that differ not only by the share of people who 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. The information disclosed in district 2 reaches district 1 with probability \(\lambda_2 < \lambda_1\) (\(\lambda_2\) can be normalized to 0 without loss of generality). Intuitively, if it is profitable for a strong type to exert violence only 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 \(\lambda_1\) — 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-organized crime efforts after elections

Now consider a two-period model. In the first period, the electoral game just analyzed takes place; while in the second period, the honest party in office can exert a level \(a\) of ‘anti-organized crime’ effort that damages the criminal organization (e.g., enforcement activities). The anti-organized crime effort of captured candidates is normalized to zero. Higher values of \(a\) hurt the criminal organization more. The \(h\) party obtains a benefit (moral or for future, non-modeled elections) \(\eta a\) from exerting effort \(a\), with \(\eta \geq 0\). Yet, criminal organizations have an incentive to build violent reputation capital, with actual displays of violence against honest people. Accordingly, we assume that promoting initiative \(a\) costs \(c(\theta, a)\) to the honest party. This loss is increasing with the organization’s type \(\theta\) since the strongest organization has lower costs of exerting violence (retaliate). The cost \(c(\cdot)\) is obviously increasing in \(a\) — i.e., the higher the damage, the harsher the retaliation. We assume that \(c(\theta, a) = \frac{\theta a^2}{2}\). Neither the moral benefits nor the cost of opposing organized crime depend on the electoral system in place.

As before, we analyze pooling equilibria in Appendix 1, where we show that they do not satisfy the intuitive criterion. In a separating equilibrium \((\nu^s, \nu^s)\) the optimal level of anti-organized crime effort solves the following:

\[
\max_{a \geq 0} \{\eta a - \mathbb{E}[c(\theta, a) | \nu^s]\} \quad \Rightarrow \quad a^*(\theta) = \frac{\eta}{\theta},
\]

---

\(^{23}\)Incentives to build reputation typically are 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.
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 also manages to reduce the anti-organized crime effort of the honest candidates who are elected.

Hence, the second-period utility of an 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 $\eta$ and decreasing in the organization’s type $\theta$.

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

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

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

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

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

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

The second period utility of the $h$ party is equal to the net benefit of anti-criminal activities of each member of the party, multiplied by the share (number) of votes/members of the $h$ party in parliament. Under Assumption A4, the solution is

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

Effort is increasing in $\eta$ and is equal to the baseline case for $\eta = 0$. The expected utility of the criminal organization is

$$b(1-h(e^*_\theta,x)) - \frac{\nu^*_\theta}{\theta} - h(e^*_\theta, x) a^*(\theta),$$

First-stage utility

Second-stage loss

By imposing the standard incentive compatibility constraint (see Appendix 1) which guarantees that the weak type cannot profit from mimicking the strong one, we can show
the following result.

**Proposition 3.** Suppose that Assumption A1 and A4 hold. There always exists the least-costly separating equilibrium in which the weak type exerts no violence before elections
\[ \nu^*_w \equiv 0 \]
while the strong one exerts
\[ \nu^*_s = b(1 + x) \frac{\Delta}{s} + \eta \left( \frac{2(1 + x) + \eta^2}{2ws^2} (s + w) + sw(2x + bn) \right). \]

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

The equilibrium level of violence \( \nu^*_s \) is increasing in the politicians’ benefit from proposing anti-organized crime initiatives, \( \eta \). A weak organization now has two reasons to mimic a strong one: by so doing, it reduces not only the campaigning effort of the honest party, but also the ex post anti-organized crime 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.

The optimal level of anti-organized crime effort is the same in the majoritarian system as under the proportional system — i.e., \( a^*(\theta) = \frac{\eta}{\theta} \). Hence, conditional on facing an organization of type \( \theta \), winning the election in district \( i \) is optimal for the honest candidates if and only if
\[ 1 + \frac{\eta^2}{2\theta} \geq \psi(\frac{1}{2} - x_i, x_i, \theta). \]

The incentive to win the election is increasing in \( \eta \). In order to make the problem interesting for our purposes, we focus on the space of parameters where
\[ \psi(\frac{1}{2} - x_i, x_i, w) - \frac{\eta^2}{2w} \leq 1 \leq \psi(\frac{1}{2} - x_i, x_i, s) - \frac{\eta^2}{2s}, \]
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-organized crime effort 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

The model has five empirical implications that we can take to the data:

P1. Criminal organizations commit more political violence during electoral periods.

P2. In proportional systems, violence is positively related to the share of the honest party’s ideological voters, whereas in majoritarian first-past-the-post systems violence is concentrated in swing districts.

P3. Political violence leads to a lower (higher) share of votes for the honest (captured) party.

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

P5. Anti-organized crime effort will lead to retaliation, and the higher the willingness of the organization to retaliate, the lower the effort.

4 Organized crime and pre-electoral violence

4.1 Sicily

4.1.1 Data and estimating equation.

Several NGOs in Italy compile lists of organized crime’s victims — excluding victims who are themselves members of criminal organizations — and their individual characteristics, the exact date of the murder, and the municipality in which it was committed. Appendix 2 lists the detailed sources that we used for constructing the dataset. These data allow us to identify victims who were directly linked with the polity. We include in this group politicians as well as the party’s campaign workers, committee members, and party activists. We also include labor union members and activists, since the main Italian labor unions — particularly the largest one (CGIL) — traditionally have been linked closely with the Communist Party and its successors.

These data are accurate only for the victims of the Sicilian Mafia, which has received much greater attention in the public debate than the other Italian criminal organizations.

24The 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 across municipalities was 2,448 (7,386) inhabitants.
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 Legalità lists 353 victims of the Mafia, but only 34 and 31 victims of Camorra and ’Ndrangheta, respectively. These numbers stand in contrast to other measures of the relative strength and political influence of the three organizations. 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 2 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 2: Victims of the Sicilian Mafia, 1945-2013

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of victims</td>
<td>452</td>
</tr>
<tr>
<td>Police forces and judges</td>
<td>138</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>78</td>
</tr>
<tr>
<td>Politicians, party and union members</td>
<td>50</td>
</tr>
<tr>
<td>Others</td>
<td>186</td>
</tr>
</tbody>
</table>

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 the number of victims by category.

To test model Prediction P1 on electoral violence by criminal organizations, we regress 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 \( \varepsilon_t \) is an error term summarizing the effect of other factors omitted from the equation.

---

21 For the complete list visit http://progettolegalita.it/it/prodotti_sociali/elenco_vittime_della_mafia.php.
26 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). 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.
Consistent estimates of $\beta$ require that the timing of national elections be uncorrelated with other (omitted) determinants of political murders in $\varepsilon_t$. The timing of national elections is exogenous to local conditions in Sicily. They are regularly held every five years, though early elections are called if the government loses parliamentary support (our results are robust to excluding early 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 on equation (5), and we will consider different assumptions about the time-series properties of the error term.

4.1.2 Results

Table 1 reports the coefficient $\beta$ 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), the Sicilian Mafia kills on average one additional politician in the year before a national election (0.075 per month $\times$ 12 months). The average number of political murders over the entire 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 we include 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 during electoral periods (columns 4-7).

In Panel B we use the Prais-Winsten estimator to address the presence of autocorrelation in the OLS residuals (evidenced by the values of the Durbin-Watson statistics in Panel A); this has no effect on our results. The same holds for the Poisson regressions in Panel C, which also reports the relative risk of being killed by the Mafia before elections and in other periods, as shown by the exponentiated coefficient of the Poisson regression.

Table 2 presents a series of robustness checks. In Panels A and B we re-estimate equation (5) including additional indicator variables always equal to 1 in the 12 months before regional elections ($regelect$) and the 12 months after national elections ($postelect$), respectively. In both cases, there is no effect on the estimated increase in violence against politicians before national elections. However, although there is no increase in violence before regional elections, the coefficient of $postelect$ is positive in the univariate regression (column 1, Panel B), but much smaller than before elections; it is only marginally significant in the univariate regression (p-value equal to 0.096); and it is not statistically significant when we include obvious control variables (columns 2-3).
Table 1: Timing of murders by the Sicilian Mafia, 1945-2013, for different categories of victims

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>politicians &amp; labor unions</td>
<td>entrep.</td>
<td>police</td>
<td>others</td>
<td>all victims</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel A: OLS regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>elect</td>
<td>0.075**</td>
<td>0.064**</td>
<td>0.065**</td>
<td>-0.021</td>
<td>0.022</td>
<td>0.040</td>
<td>0.106</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.025)</td>
<td>(0.026)</td>
<td>(0.027)</td>
<td>(0.072)</td>
<td>(0.079)</td>
<td>(0.113)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.013</td>
<td>0.112</td>
<td>0.132</td>
<td>0.132</td>
<td>0.051</td>
<td>0.090</td>
<td>0.155</td>
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<tr>
<td>Durbin-Watson</td>
<td>1.526</td>
<td>1.664</td>
<td>1.703</td>
<td>1.955</td>
<td>1.860</td>
<td>1.933</td>
<td>1.817</td>
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<tr>
<td>Panel B: Prais-Winsten</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>elect</td>
<td>0.073**</td>
<td>0.064**</td>
<td>0.064**</td>
<td>-0.020</td>
<td>0.018</td>
<td>0.041</td>
<td>0.106</td>
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<tr>
<td></td>
<td>(0.035)</td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.027)</td>
<td>(0.078)</td>
<td>(0.084)</td>
<td>(0.128)</td>
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<td>R-squared</td>
<td>0.008</td>
<td>0.088</td>
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<td>0.127</td>
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<td>0.086</td>
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<td>Durbin-Watson</td>
<td>2.043</td>
<td>2.009</td>
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<td>2.010</td>
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<td>Panel C: Poisson regression</td>
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<td></td>
</tr>
<tr>
<td>elect</td>
<td>1.041***</td>
<td>0.756**</td>
<td>0.652**</td>
<td>-0.394</td>
<td>-0.019</td>
<td>0.115</td>
<td>0.077</td>
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<td></td>
<td>(0.330)</td>
<td>(0.295)</td>
<td>(0.298)</td>
<td>(0.290)</td>
<td>(0.354)</td>
<td>(0.282)</td>
<td>(0.162)</td>
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<td>Relative risk ratio</td>
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<td>[2.130]</td>
<td>[1.920]</td>
<td>[0.674]</td>
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<td>[1.080]</td>
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<td>0.195</td>
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<td>804</td>
<td>804</td>
<td>804</td>
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<tr>
<td>time trends and month FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<td>YES</td>
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<td>YES</td>
</tr>
</tbody>
</table>

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 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.
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<td>0.078***</td>
<td>0.076***</td>
<td>-0.022</td>
<td>0.037</td>
<td>0.072</td>
<td>0.163</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.028)</td>
<td>(0.028)</td>
<td>(0.029)</td>
<td>(0.069)</td>
<td>(0.106)</td>
<td>(0.132)</td>
</tr>
<tr>
<td>$regelect_t$</td>
<td>0.050*</td>
<td>0.042</td>
<td>0.032</td>
<td>-0.003</td>
<td>0.043</td>
<td>0.093</td>
<td>0.165</td>
</tr>
<tr>
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<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.032)</td>
<td>(0.074)</td>
<td>(0.103)</td>
<td>(0.134)</td>
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<tr>
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<td>0.052</td>
<td>0.092</td>
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<td><strong>Panel B: controlling for post-electoral period</strong></td>
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<td>0.078***</td>
<td>0.076***</td>
<td>-0.022</td>
<td>0.037</td>
<td>0.072</td>
<td>0.163</td>
</tr>
<tr>
<td></td>
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<td>(0.028)</td>
<td>(0.028)</td>
<td>(0.029)</td>
<td>(0.069)</td>
<td>(0.106)</td>
<td>(0.132)</td>
</tr>
<tr>
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<td>0.032</td>
<td>-0.003</td>
<td>0.043</td>
<td>0.093</td>
<td>0.165</td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.032)</td>
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<td>(0.103)</td>
<td>(0.134)</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
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<td>0.127</td>
<td>0.048</td>
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<td>804</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>other controls</strong></td>
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<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

**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 following a national 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, 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. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.
4.2 Italian regions and provinces

4.2.1 Data and estimating equations

We use the homicide rate to investigate electoral violence cycles in other regions with a significant presence of organized crime: Campania and Calabria, in addition to Sicily. Italy is comprised of 20 regions and 110 provinces, corresponding to levels 2 and 3, respectively, of Eurostat’s NUTS classification of territorial units.\footnote{During our sample period, the number of regions increased from 16 to 20, and the number of provinces from 95 to 110. Each new province and region was part of an existing one. 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 of Appendix 3.}

Using official print publications from the Italian National Statistical Institute (ISTAT), we have reconstructed yearly series of homicide rates at the regional level going back to 1887, and at the provincial level since 1983. Clearly, the overall homicide rate does not distinguish between homicides committed by criminal organizations and other homicides, nor 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, thus allowing us to analyze our results in different institutional settings, and to test the predictions of the model in that respect. Note that the province-level data available since 1983 also allow us to distinguish homicides that judicial authorities have attributed to criminal organizations.

We can thus compare the increase in homicides during electoral periods in regions with and without an historical presence of organized crime, respectively, 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 \(t\). As in equation (5), \(elect_t\) identifies the 12 months up to the elections. Because equation (6) is estimated on yearly data, we set \(elect_t\) equal to the fraction of the year falling within the 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 \(elect_{t-1} = 2/3\). The variable \(orgcrime_r\) is a dummy equal to 1 for Sicily, Calabria, and Campania, and equal to 0 for other regions; \(X_{r,t}\) is a vector of additional determinants of the homicide rate (log population and GDP per capita); \(f_r\) and \(f_t\) are region and year fixed effects, respectively. We allow errors to be arbitrarily correlated over time within each region. Sandwich-type formulas for clustered standard errors, a-la-\cite{White:1984}, may lead to incorrect inference when the number of clusters is small — we have only 16 regions — so we also compute wild-bootstrapped p-values based on the procedure of \cite{Cameron:2011}.
The estimated coefficient $\beta$ 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. The long time series also allows us to compare the size of this effect under different regimes: parliamentary monarchy before 1922, in which the Parliament was elected with democratic elections (though with restricted suffrage, for instance excluding women); the Fascist dictatorship between 1922 and 1945; and the Republican period after 1945 (First Republic 1946-1993 and Second Republic afterwards). We estimate equation (6) separately for each sub-period.

In the case of democratic elections, our model relates the size of the effect of interest to the level of electoral competition and the type of electoral system. We measure electoral competition using data on electoral results for all national elections since 1948, available at the municipality level from the Italian Ministry of Interior. From Corbetta and Piretti (2009), we also obtained the results of previous elections (1890-1934), but the latter are available only at the regional level. These data allow us to measure the difference in votes — as an inverse measure of electoral competition — between the main parties (or coalitions) of the Left and Right. According to Prediction P2 of the model, with 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:

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

where $gap_t$ is the difference between the (percentage) vote shares of the Christian Democrats and the Italian Communist Party at the national level for the period 1948 to 1992. A proportional electoral system was in place during this time. Therefore, we should expect a negative coefficient, $\mu$. One potential problem is that the gap between the two main parties observed (ex-post) in regions with $orgcrime_r = 1$ would respond to pre-electoral violence, which is the dependent variable in the equation: indeed, this is the main premise of our analysis. For this reason, we measure $gap_t$ within the sub-sample of regions with $orgcrime_r = 0$. This alternative measure should be independent of pre-electoral violence in organized crime regions. 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, on the other hand, pre-electoral violence should be concentrated in “swing” electoral districts. Homicide data are not available at that level of geographical disaggregation. Therefore, we exploit the province-level data available since 1983. Each province includes multiple districts, and no electoral district crosses provincial borders. So we compute the variable $swing_p$ as the fraction of the electorate
in province $p$ residing in swing districts, defined as districts in which the gap between the Left and Right coalition in the first elections held with the majoritarian system (1994) was less than 5 percent.

The resulting estimating equation is

$$\text{homicides}_{p,t} = \beta \ast \text{elect}_t \ast \text{orgcrime}_p + \mu \ast \text{elect}_t \ast \text{orgcrime}_p \ast \text{swing}_p + \gamma' \text{X}_{p,t} + f_p + f_t + \varepsilon_{p,t},$$

(8)

where the sub-index $p$ denotes provinces. This specification also controls for the interactions of $\text{swing}_p$ with, respectively, $\text{elect}_t$ and $\text{orgcrime}_p$ (the latter interaction term is absorbed by province fixed effects). According to Prediction P2 of the model, the triple interaction coefficient $\mu$ 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.28

4.2.2 Results

Figure 3 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.29

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

$$\text{homicides}_{r,t} = \alpha_r + \beta_r \ast \text{elect}_t + \varepsilon_{rt},$$

(9)

where $\text{homicides}_{r,t}$ is the homicide rate per 100,000 inhabitants in region $r$ and year $t$, and $\text{elect}_t$ identifies the period before the elections (as defined in Section 4.2). Figure 4 shows the region-specific estimated $\beta_r$’s and the associated confidence intervals. Sicily, Calabria, and Campania exhibit spikes in the homicide rate during the electoral period — 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 organized crime regions and 2.5 in other regions. The coefficient is positive and significantly different from zero for Puglia too, and it is close to statistically significant for Basilicata. These two regions also have experienced the presence of criminal organizations, but only since

28Although a majoritarian system had also been in place before Fascism, the data on electoral results and homicides for that period are available only at the regional level, so we cannot exploit heterogeneity in the fraction of voters living in swing districts. A new electoral system was introduced in 2004 which cannot be clearly classified as either proportional or majoritarian. We thus exclude that period from the analysis.

29We exclude homicides during World War II because the victims of the civil war between Fascists and partisans were recorded as homicides during this period. However, this is clearly a distinct phenomenon from homicides outside the war period. For completeness, we reproduce in Appendix 3 the same graph, also including the war period.
Figure 3: 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 column (3) we re-estimate the same specification for the log of murders (as opposed to the murder rate). Since we are controlling on the right-hand side of the equation for the log of population, the coefficient of interest now can be interpreted in relative terms. During electoral periods, the homicide rate increases by 16 percent in organized crime regions, 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.

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 1% confidence level) relative to other regions. This result is not affected by including the log of regional GDP per capita, the log of population, and year fixed effects (thus dropping $elect_t$); see column (2). 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 entire period 1887-2012.

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 the number of homicides in all observations by 1.

---

30 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 entire period 1887-2012.

31 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 the number of homicides in all observations by 1.
Table 3: Electoral violence across Italian regions, 1887-2012

<table>
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<tr>
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<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
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<tr>
<td>elect</td>
<td>0.407**</td>
<td>(0.175)</td>
<td>[0.042]</td>
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<td></td>
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<tr>
<td>elect × orgcrime</td>
<td>1.574***</td>
<td>(0.310)</td>
<td>[0.000]</td>
<td></td>
<td>1.469***</td>
<td>(0.282)</td>
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<td>1.992***</td>
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<td>[0.000]</td>
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<td></td>
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<td>elect × Calabria</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>1.338***</td>
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<tr>
<td>elect × Campania</td>
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</tr>
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<td></td>
<td>1.182***</td>
<td>(0.207)</td>
<td>[0.000]</td>
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<td>YES</td>
</tr>
<tr>
<td>R-squared</td>
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<td>0.487</td>
<td>0.650</td>
<td>0.487</td>
<td>0.552</td>
<td>0.472</td>
<td>0.481</td>
</tr>
</tbody>
</table>

Note: This table shows the differential effect of electoral cycles on homicides in regions with an historical presence of criminal organizations. In all columns except (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 a 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).
regions relative to other regions. In column (4) we estimate separate interaction terms for Sicily, Calabria, and Campania. All three coefficients are statistically significant and of the same order of magnitude (between 1 and 2 additional homicides per 100,000 inhabitants). The additional regressions reported in Table 4 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 2), violence only increases before national elections. We discussed how to explain this result in our introduction.

The relatively long historical period covered by our data features considerable institutional variation. In columns (5) to (7) of Table 3 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. We observe that 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 chance of influencing elections during the Fascist period. The results for the Fascist period actually can be considered a placebo test. As an additional (successful) placebo test, we run our analysis for other types of (predatory) crimes. These results are reported in Table A2 of Appendix 3.

Focusing only on the democratic periods, Table 5 presents the model predictions regarding the combined effect of voting rules and electoral competition. Columns (1)-(3) show estimates of equation (7) for elections held under different electoral systems.
Table 4: Electoral violence across Italian regions (robustness)

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<td>pre- vs. post-electoral period</td>
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<td>regelect</td>
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<td>(0.134)</td>
<td>[0.372]</td>
<td></td>
<td></td>
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</tr>
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<td>(0.560)</td>
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<td>[0.647]</td>
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<td>0.986****</td>
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<tr>
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<td>(0.109)</td>
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<td>(0.097)</td>
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</tr>
<tr>
<td></td>
<td>[0.000]</td>
<td></td>
<td></td>
<td>[0.000]</td>
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<tr>
<td>postelect</td>
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<td></td>
<td>0.271****</td>
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<td></td>
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<td>(0.055)</td>
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<td>[0.000]</td>
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<td></td>
</tr>
<tr>
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<td>-0.049</td>
<td>-0.201</td>
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<td>(0.463)</td>
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<td>[0.516]</td>
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<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>R-squared</td>
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<td>0.482</td>
<td>0.004</td>
<td>0.475</td>
<td>0.481</td>
</tr>
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</table>

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 explanatory 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>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1948-1992</td>
<td>1887-1921</td>
<td>1993-2004</td>
</tr>
<tr>
<td>Elect X Orgcrime</td>
<td>4.303***</td>
<td>1.463***</td>
</tr>
<tr>
<td>(1.098)</td>
<td>(0.332)</td>
<td>(0.585)</td>
</tr>
<tr>
<td>Elect X Orgcrime X Gap</td>
<td>-0.372***</td>
<td>-0.028</td>
</tr>
<tr>
<td>(0.075)</td>
<td>(0.029)</td>
<td>(0.041)</td>
</tr>
<tr>
<td>Elect X Swing</td>
<td>0.465**</td>
<td>0.418**</td>
</tr>
<tr>
<td>(0.171)</td>
<td>(0.181)</td>
<td>(0.193)</td>
</tr>
</tbody>
</table>

Means of interacted variables:

<table>
<thead>
<tr>
<th>Gap</th>
<th>5.211</th>
<th>1.512</th>
<th>1.356</th>
<th>0.196</th>
<th>0.196</th>
<th>0.196</th>
</tr>
</thead>
</table>

**Observations**: 752

**Mafia Region X Year FE**: NO

**R-squared**: 0.143

**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 explanatory main 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 an 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.

32 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.

Under proportional rule (1948-1992), 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., \( \text{gap}_t = 0 \)), then 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 contrast, in majoritarian elections electoral violence should not depend on the intensity of national-level electoral competition. Indeed, this is what we find when we re-estimate equation (7) for the periods in which a majoritarian system was in place: 1887-1921 (column 2) and 1994-2004 (column 3). In these periods, violence instead should be concentrated in contested districts. To test this prediction, we estimate equation (8) on province-level data; the estimated coefficients and heteroskedasticity-robust standard errors clustered by province are reported in columns (4)-(6) of Table 5. 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) [33].

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 Article 416-bis of the Penal Code. The last two columns of Table 5 show that the effect of interest is entirely due to homicides committed by criminal organizations.

5 The effects of violence on electoral results

We restrict this analysis to Sicily for two important reasons. First, the data on Sicilian Mafia victims allow us to distinguish between political and non-political murders, and to identify the exact timing and location of such murders. Second, as we discussed in Section 2.2, the Sicilian Mafia always opposed leftist parties, whereas the political leanings of Camorra and 'Ndrangheta have been more volatile. This distinction allows us to define an interesting outcome, namely the vote share of leftist parties in Sicily.

5.1 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:

\[
Left_{m,t} = \alpha \ast totvict_{m,t} + \beta \ast polvict_{m,t} + \gamma \ast Left_{m,t-1} + f_m + f_t + \varepsilon_{m,t}, \tag{10}
\]

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. 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. 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 by including spatial lags on the right-hand side of the equation.

As explained above, we do not have the available data to perform the same test for the pre-Fascist time period.
5.2 Results

The estimated coefficients of equation (10) are reported in Table 6. In columns (1) and (2), we see 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).

Table 6: Electoral violence and electoral outcomes in Sicily, 1947-2013

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>totvict</td>
<td>-0.003***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>polvict</td>
<td>-0.022***</td>
<td>-0.024***</td>
<td>-0.024***</td>
<td>-0.024***</td>
<td>-0.024***</td>
<td>-0.024***</td>
</tr>
<tr>
<td>(0.006)</td>
<td>(0.007)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>Voting for the Left, previous election</td>
<td>0.513***</td>
<td>0.513***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.035)</td>
<td>(0.035)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>totvict, spatial lag</td>
<td>-0.004*</td>
<td>-0.067</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.062)</td>
<td>(0.082)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>polvict, spatial lag</td>
<td>-0.020*</td>
<td>-0.279*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.010)</td>
<td>(0.169)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance from Portella (100s km)</td>
<td>0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.026)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elections 1948</td>
<td>-0.070***</td>
<td>-0.065***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.011)</td>
<td>(0.015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance from Portella X Election 1948</td>
<td>0.030**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.012)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.207***</td>
<td>0.208***</td>
<td>0.112***</td>
<td>0.112***</td>
<td>0.288***</td>
<td>0.286***</td>
</tr>
<tr>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.034)</td>
<td>(0.005)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>6,533</td>
<td>6,533</td>
<td>6,171</td>
<td>6,171</td>
<td>709</td>
<td>709</td>
</tr>
<tr>
<td>Municipality FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Year FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Spatial lag</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>neighbors</td>
<td>dist-weight</td>
<td>NO</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.788</td>
<td>0.789</td>
<td>0.854</td>
<td>0.854</td>
<td>0.024</td>
<td>0.927</td>
</tr>
</tbody>
</table>

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)-(5) include in the sample all national elections between 1948 and 2013, while columns (6)-(7) 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 spatial lags of such variables are computed as the number of total and political victims in neighboring municipalities (column 4) and the number of victims in all other Sicilian municipalities weighted by the inverse distance from (expressed in hundreds of kilometers). The coefficients on the main explanatory variables totvict and polvict are

---

34 All results are also robust to coding Mafia violence using a dummy for observing at least one (political) homicide during the electoral period, as opposed to the discrete number of (political) homicides. These results are available upon request.
unaffected. At the same time, homicides committed in other municipalities also carry considerable weight for electoral results.

A similar picture emerges when we focus on the events of Portella della Ginestra. In column (6) of Table 6, we regress the vote share of the Left in the regional elections of 1947 and 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.35 The interaction coefficient 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 we include municipality fixed effects, thus dropping the distance from Portella from the regression (column 7).36

In columns (4)-(7), the evidence about a decrease in voting for the Left in municipalities not directly hit by the attacks is consistent with a signaling effect of Mafia violence — as predicted by our model — on top of a direct effect in those municipalities directly targeted by the attacks. We explore this signaling effect further by looking at the behavior of appointed politicians.

6 The effects of violence on 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.

6.1 Data and estimating equations

Our measure of politicians’ behavior is their willingness to talk openly about organized crime once they sit in the national parliament. In principle, one could praise criminal organizations, or discount their importance; in practice, however, organized crime overwhelmingly is mentioned with negative connotations and indications of the need to take measures against it (at least in official discourse). Therefore, the willingness to bring up the problem in the national parliament is a good proxy for anti-Mafia efforts.

We collected the transcripts of all 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 then processed this huge amount of information — about 300,000 pages of transcripts — using an ad-hoc automated routine that identified each MP’s speech within the same debate. The work was made even more 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”.35

35The location of Portella Della Ginestra is shown in Figure A2 of Appendix 3.
36Notice that, in column (7), the votes obtained by the Left at the 1947 regional elections (before the massacre) do not vary significantly with distance from Portella della Ginestra.
Table 7: Speeches held by MPs appointed in Sicily in the National Parliament 1948-2013, sample averages

<table>
<thead>
<tr>
<th>Sample averages:</th>
<th>data by MP-legislature (683 obs.)</th>
<th>speech-level data (8,833 obs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all MPs</td>
<td>Left</td>
</tr>
<tr>
<td>total number of words spoken</td>
<td>8,499</td>
<td>11,133</td>
</tr>
<tr>
<td>occurrences of Mafia-related words</td>
<td>5.273</td>
<td>11.787</td>
</tr>
<tr>
<td>occurrences of Mafia-related words per 1,000 words</td>
<td>0.527</td>
<td>0.834</td>
</tr>
</tbody>
</table>

over the total number of words in the same speech. We also recorded 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. The period 1948-2008 covers 15 legislatures, however transcripts from the 13th legislature (1996-2001) are not publicly available.

The summary statistics are reported in Table 7. MPs from the Left typically talk more about the Mafia and the other criminal organizations, which is consistent with the premise that they are the “honest” party.

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 levels of violence before elections should decrease anti-Mafia efforts by honest politicians during the following legislature. Thus we estimate the following equation:

\[
talk_{i,l} = \alpha \cdot \text{totvict}_l + \beta \cdot \text{polvict}_l + \gamma \cdot \text{Left}_i \cdot \text{L} + \delta \cdot \text{totvict}_l \cdot \text{Left}_i + \phi \cdot \text{polvict}_l \cdot \text{Left}_i + \mu \cdot X_{i,l} + \epsilon_{i,l},
\]

where \( talk_{i,l} \) are mentions of organized crime over the total number of words spoken by MP \( i \) during legislature \( l \); \( \text{totvict}_l \) and \( \text{polvict}_l \) are the number of total and political victims, respectively, in the 12 months leading up to the elections starting legislature \( l \); and \( \text{Left}_i \) is an indicator variable for the political affiliation of the \( i \)-th MP in legislature \( l \) (a few MPs change political affiliation between different legislatures). Therefore, \( \alpha \) and \( \beta \) capture the average effect of electoral violence on the willingness to talk about organized crime across all MPs, whereas \( \delta \) and \( \phi \) 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 discourse about organized crime to violence committed by criminal organizations at any time. To test this additional prediction, we perform a finer grained analysis at the MP-speech level, rather than at the MP-legislature level as in equation (11). In particular, we estimate the change in parliamentary discourse after (political) homicides committed by the Sicilian Mafia at any moment in time (i.e., also outside electoral periods).
Table 8: Electoral violence and parliamentary debates about the mafia, 1948-2013

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MP-Legislature regression</td>
<td>Speech-level regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>total number of words (x 1,000)</strong></td>
<td>0.003 (0.003)</td>
<td>0.033 (0.003)</td>
<td>0.002 (0.003)</td>
<td>0.115*** (0.043)</td>
<td>0.115*** (0.042)</td>
<td>0.106*** (0.037)</td>
<td>0.106*** (0.033)</td>
<td>0.094*** (0.031)</td>
<td>0.099*** (0.034)</td>
</tr>
<tr>
<td><strong>totvict</strong></td>
<td>0.019*** (0.007)</td>
<td>0.045*** (0.013)</td>
<td>0.052*** (0.012)</td>
<td>0.469*** (0.153)</td>
<td>0.511*** (0.169)</td>
<td>0.168** (0.069)</td>
<td>0.168** (0.106)</td>
<td>0.099** (0.092)</td>
<td>0.098** (0.084)</td>
</tr>
<tr>
<td><strong>polvict</strong></td>
<td>-0.139*** (0.038)</td>
<td>-0.105** (0.041)</td>
<td>0.049** (0.0217)</td>
<td>-0.489** (0.128)</td>
<td>-0.094 (0.131)</td>
<td>-0.045** (0.130)</td>
<td>-0.221* (0.123)</td>
<td>-0.170 (0.123)</td>
<td></td>
</tr>
<tr>
<td><strong>Left</strong></td>
<td>0.268 (0.205)</td>
<td>0.259** (0.118)</td>
<td>0.259*** (0.096)</td>
<td>0.518 (0.325)</td>
<td>0.518 (0.325)</td>
<td>0.518 (0.296)</td>
<td>0.518 (0.326)</td>
<td>0.518 (0.326)</td>
<td></td>
</tr>
<tr>
<td><strong>totvict X Left</strong></td>
<td>0.056 (0.040)</td>
<td>0.936** (0.411)</td>
<td>0.936** (0.399)</td>
<td>0.317 (0.326)</td>
<td>0.317 (0.326)</td>
<td>0.317 (0.326)</td>
<td>0.317 (0.326)</td>
<td>0.317 (0.326)</td>
<td></td>
</tr>
<tr>
<td><strong>polvict X Left</strong></td>
<td>-0.167* (0.100)</td>
<td>-1.092** (0.551)</td>
<td>-1.092** (0.543)</td>
<td>-0.678* (0.337)</td>
<td>-0.678* (0.337)</td>
<td>-0.678* (0.337)</td>
<td>-0.678* (0.337)</td>
<td>-0.678* (0.337)</td>
<td></td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.358*** (0.084)</td>
<td>0.315*** (0.085)</td>
<td>0.243*** (0.072)</td>
<td>0.163*** (0.037)</td>
<td>0.164*** (0.037)</td>
<td>0.085** (0.042)</td>
<td>0.085** (0.042)</td>
<td>0.085** (0.042)</td>
<td>0.426** (0.174)</td>
</tr>
</tbody>
</table>

Observations: 655 655 655 8,833 8,833 8,833 8,833 8,833 8,833
Year FE: NO NO NO NO NO NO NO YES YES
MP x Year FE: NO NO NO NO NO NO NO NO YES
R-squared: 0.009 0.027 0.045 0.060 0.060 0.020 0.020 0.020 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 spoken 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.

6.2 Results

Columns (1)-(3) of Table 8 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), we see that a higher number of homicides during the electoral period increases the salience of Mafia in parliamentary debates during the following legislature, but the coefficient is small — one additional victim brings one tenth of a standard deviation increase in the dependent variable. However, this result 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 about 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 also should 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. Our findings are very similar to those obtained at the MP-legislature level.

In the last three columns of Table 8, 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 we include year fixed effects (column 7). When we also include MP fixed effects, the coefficient $Left$ is very close to zero (column 8). This is not surprising, as individual fixed effects remove most variation in such variable. However, its interactions with $totvict$ and $polvict$ remain statistically significant, but somewhat smaller; the same is true after we include a full set of MP-by-year fixed effects (column 9). These findings suggest that violence discourages politicians’ initiatives against the Mafia — in particular, among Left-wing MPs — even after holding constant the composition of the Parliament.

Overall, the results in Tables 6 and 8 suggest that violence by the Sicilian Mafia influences political outcomes both through 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 who are eventually appointed in the national Parliament are discouraged from taking action against the Mafia. This latter finding also points at a signaling effect of organized crime violence, as hypothesized by our model and consistent with the evidence on electoral effects in municipalities that were not directly targeted by the attacks (columns 4-7 of Table 6).

7 Conclusions

We have shown that criminal organizations strategically use pre-electoral violence as a signaling device to intimidate honest politicians and to facilitate the election of captured ones. Consistent with the data, our model shows that since violence is a political tool, criminal organizations (rationally) use it in different ways depending on the electoral rules and the existing electoral balance between captured and honest parties. Moreover, beyond influencing elections, we have shown that criminal organizations reduce the anti-Mafia effort of the honest politicians in office by signaling their military strength (and the willingness to use it) through pre-electoral violence.

These results seem not to be specific to Italy, but they are likely to apply more generally to other countries plagued by organized crime. We are currently beginning to investigate pre-electoral violence in other countries as well. Consistent with the evidence

\[37\]The results are qualitatively similar when considering smaller and larger time windows (one and three weeks, respectively); see Table A3 in the Appendix.

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gathered for the present paper, we observe higher pre-electoral violence in countries with a higher presence of criminal organizations relative to other countries. In addition, that difference is driven by countries with democratic elections. Our preliminary results are available from the authors, and this will be the subject of future research.

References


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


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


Appendix 1: Proofs

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

\[ \pi^*_\theta \equiv b [1 - h (e^*_\theta, x)] - k (\nu^*_\theta, \theta) = \begin{cases} b \left[ 1 - x - \frac{1+x}{\pi} \right] - \nu^*_\pi & \Leftrightarrow \theta = s, \\ b \left[ 1 - x - \frac{1+x}{w} \right] - \nu^*_w & \Leftrightarrow \theta = w. \end{cases} \]

In order to construct equilibria we must now specify off-path beliefs. Note that, for any \( \nu^*_w \), 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

\[ b \left[ 1 - h (e^*_s, x) \right] - k (\hat{\nu}, w) = b \left[ 1 - h (e^*_w, x) \right] - k (\nu^*_w, w) \Leftrightarrow \hat{\nu} (\nu^*_w) = \nu^*_w + b (1 + x) \Delta \frac{s}{s}. \]

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

\[ \beta (\nu) = 1 \Leftrightarrow \nu \geq \hat{\nu}, \]

\[ \beta (\nu) = 0 \Leftrightarrow \nu < \hat{\nu}. \]

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

\[ \hat{\nu} (0) = \nu^*_s \equiv b (1 + x) \Delta \frac{s}{s}. \]
Note that this level of violence also satisfies the incentive compatibility constraint of the strong type — i.e.,

\[ b [1 - h (e^*_s, x)] - \frac{\nu^*_s}{s} \geq b [1 - h (e^*_w, x)] \quad \iff \quad \nu^*_s \leq b \frac{\Delta}{w} (1 + x), \]

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

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

\[ \pi^*_s = b [1 - h (e^*_s, x)] - k (\nu^*_s, s) \geq b [1 - h (e^*_w, x)] \quad \iff \quad \nu^*_s \leq \nu^* \equiv b (1 + x) \frac{\Delta}{w}, \]

for the strong type. And, equivalently,

\[ \pi^*_w = b [1 - h (e^*_w, x)] \geq b [1 - h (e^*_s, x)] - k (\nu^*_s, w) \quad \iff \quad \nu^*_s \geq \nu^* \equiv b (1 + x) \frac{\Delta}{w}, \]

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

The least-costly separating equilibrium (\( \nu^* \)) is more appealing than the others — i.e., any \( \nu^* \in (\nu^*, \nu^*) \) — 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

\[ \pi^*_w > b [1 - h (e^*_s, x)] - k (\nu, w), \]

\[ \pi^*_s \leq b [1 - h (e^*_s, x)] - k (\nu, s). \]

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

\[ \pi^*_w \leq b [1 - h (e^*_s, x)] - k (\nu, w), \]

\[ \pi^*_s > b [1 - h (e^*_s, x)] - k (\nu, s). \]
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 \( S \) of separating equilibria, it can be shown that every \( \nu^*_s > \nu^* \) fails to satisfy its requirements except for the least-costly one. In fact, consider any \( \nu \in [\nu^*, \nu^*_s] \), so that \( \beta (\nu) = 0 \). First, note that \( \nu \leq \nu^*_s \) implies

\[
\pi^*_s = b [1 - h (e^*_s, x)] - k (\nu^*_s, s) \leq b [1 - h (e^*_s, x)] - k (\nu, s).
\]

Moreover, by incentive compatibility, for every \( \nu \in S \)

\[
\pi^*_w = b [1 - h (e^*_w, x)] \geq b [1 - h (e^*_s, x)] - k (\nu, w).
\]

Meaning that a reasonable system of off-equilibrium beliefs should be such that \( \beta (\nu) = 1 \) for every \( \nu \in [\nu^*, \nu^*_s] \), which is in contradiction with the fact that \( \nu^*_s \) 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 \( S \) 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 \( \nu < \nu^* \), by incentive compatibility

\[
\pi^*_w = b [1 - h (e^*_w, x)] < b [1 - h (e^*_s, x)] - k (\nu, w),
\]

and, by construction,

\[
\pi^*_s = b [1 - h (e^*_s, x)] - k (\nu^*_s, s) < b [1 - h (e^*_s, x)] - k (\nu, s),
\]

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

By the same token, it can be shown that for any \( \nu > \nu^* \), incentive compatibility implies that

\[
\pi^*_w = b [1 - h (e^*_w, x)] > b [1 - h (e^*_s, x)] - k (\nu, w),
\]

and

\[
\pi^*_s = b [1 - h (e^*_s, x)] - k (\nu^*_s, s) > b [1 - h (e^*_s, x)] - k (\nu, s),
\]

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

Consider now pooling equilibria such that the criminal organization always chooses \( \nu^* \) 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

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

A3
where
\[ \mathbb{E} [\theta | \nu^*] = \beta s + (1 - \beta) w. \]

The solution for is:
\[ e^* = \frac{1 + x}{\beta s + (1 - \beta) w}. \]

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

For any \( \nu^* \) 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
\[
\text{This is because there cannot exist a pooling equilibrium such that } \beta(0) = 1. \text{ Hence, } \beta(0) = 0 \text{ in any pooling equilibrium. Condition (12) is in fact a necessary condition for a pooling equilibrium to exist, otherwise a weak organization would always profit from revealing its type. As before, it is possible to find appropriate out-of-equilibrium beliefs that support each of these levels of violence as a pooling equilibrium. For example, } \beta(\nu) = \beta \text{ whenever } \nu \geq \nu^*, \text{ and } \beta(\nu) = 0 \text{ otherwise. Under these beliefs, a strong organization never profits from revealing its type if the weak organization does not because for any } \nu^* \leq \overline{\nu}^p \text{ it must be}
\]
\[
\left[ 1 - h(e^*, x) \right] - k(\nu^*, w) \geq b \left[ 1 - h(e_w^*, x) \right] - k(\nu^*, w) \Rightarrow \nu^* \leq \overline{\nu}^p \equiv \frac{b(1 + x)\beta \Delta}{\beta s + (1 - \beta) w}. \tag{12}
\]

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.\(^{38}\) Let \( \pi^p_\theta \) be type \( \theta \)'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

\(^{38}\)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.).
that

\[ \pi^p_s = b [1 - h (e^*, x)] - k (\nu^*, s) > b [1 - h (e^*_w, x)] - k (\nu', s), \]

\[ \pi^p_w = b [1 - h (e^*, x)] - k (\nu^*, s) \leq b [1 - h (e^*_w, x)] - k (\nu', w), \]

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

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

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

\[ \frac{1}{s} < \psi \left( \frac{1}{2} - x_i, x_i, 1 \right) < \frac{1}{w}, \tag{13} \]

where

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

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

Hence, a separating equilibrium in which \(\nu^*_i,s > 0\) can exist if, and only if, the following incentive compatibility constraints hold

\[ \frac{b}{N} - k (\nu^*_i,s, s) \geq 0 \geq \frac{b}{N} - k (\nu^*_i,s, w). \]

This defines the set of separating equilibria

\[ \nu^*_i,s \in S' \equiv \left[ \frac{wb}{N}, \frac{sb}{N} \right]. \]

A5
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 \( \nu^*_i,s = \nu^* \equiv \frac{wb}{N} \).

The least-costly separating equilibrium characterized in Proposition 2 not only max-
imizes 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 \( \nu^* \), 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 \( \nu \in [\nu^*, \nu^*_i,s] \). The following is true 
\[
\pi^*_i,s = \frac{b}{N} - k(\nu^*_i,s, s) \leq \frac{b}{N} - k(\nu, s),
\]
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 \( \nu < \nu^* \) it must be 
\[
\pi^*_i,w = 0 < \frac{b}{N} - k(\nu, w),
\]
and, by construction, 
\[
\pi^*_i,s = \frac{b}{N} - k(\nu^*_i,s, s) < \frac{b}{N} - k(\nu, s).
\]
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 \( \nu > \nu^* \), incentive compatibility 
implies 
\[
\pi^*_i,w = 0 > \frac{b}{N} - k(\nu, w),
\]
while, by construction, 
\[
\pi^*_i,s = \frac{b}{N} - k(\nu^*, s) > \frac{b}{N} - k(\nu, s).
\]
Hence, \( \beta(\nu) = 1 \) for \( \nu > \nu^* \) 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 dis-
tricts the \( c \) party can win if the criminal organization signals its type — i.e., \( \alpha_i \) 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 \( \nu^* \), 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

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

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. \( \blacksquare \)

**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

\[
\pi_{s}^* \equiv b \left[ 1 - h(e_{s}^*, x) \right] - k(\nu_{s}^*, s) - h(e_{s}^*, x) a^*(s) \geq b \left[ 1 - h(e_{w}^*, x) \right] - h(e_{w}^*, x) a^*(w) \iff \nu_{s}^* \leq \nu^* \equiv b (1 + x) \frac{\Delta}{w} + \eta \frac{(2 (1 + x) + \eta^2) (s + w) + sw (2 x + b \eta)}{2w^2 s} \Delta
\]

for the strong type. And, equivalently,

\[
\pi_{w}^* \equiv b \left[ 1 - h(e_{w}^*, x) \right] - h(e_{w}^*, x) a^*(w) \geq b \left[ 1 - h(e_{s}^*, x) \right] - k(\nu_{s}^*, w) - h(e_{s}^*, x) a^*(s) \iff \nu_{s}^* \geq \nu^* \equiv b (1 + x) \frac{\Delta}{s} + \eta \frac{(2 (1 + x) + \eta^2) (s + w) + sw (2 x + b \eta)}{2ws^2} \Delta
\]

for the weak type. Hence, \( \nu^* \) identifies the least-costly separating equilibrium.

Notice that \( \nu^* > \nu^* \) since \( s > w \). Hence, one can find off-equilibrium beliefs that
support any $\nu^*_s$ such that $\nu^*_s \in S \equiv [\nu^*, \nu^*]$. 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 $\nu \in [\nu, \nu^*_s]$, so that $\beta(\nu) = 0$. By construction

$$\pi^*_s = b \left[ 1 - h(e^*_s, x) - k(\nu^*_s, s) - h(e^*_s, x) a^*(s) \right] \leq b \left[ 1 - h(e^*_s, x) - k(\nu, s) - h(e^*_s, x) a^*(s) \right].$$

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

$$\pi^*_w = b \left[ 1 - h(e^*_w, x) - h(e^*_w, x) a^*(w) \right] \geq b \left[ 1 - h(e^*_s, x) - k(\nu, w) - h(e^*_s, x) a^*(s) \right].$$

Hence, that a reasonable system of off-equilibrium beliefs should be such that $\beta(\nu) = 1$ for every $\nu \in [\nu^*, \nu^*_s]$, which is in contradiction with the fact that $\nu^*_s$ 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 $S$ 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 $\nu < \nu$, incentive compatibility requires

$$\pi^*_w < b \left[ 1 - h(e^*_s, x) - k(\nu, w) - h(e^*_s, x) a^*(s) \right],$$

and, by construction,

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

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

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

$$\pi^*_w > b \left[ 1 - h(e^*_s, x) - k(\nu, w) - h(e^*_s, x) a^*(s) \right],$$

and

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

for any $\nu > \nu$. So that $\beta(\nu) = 1$ for $\nu > \nu$ 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 $\eta$ is not
too large — i.e., if
\[
\psi\left(\frac{1}{2} - x_i, x_i, s\right) - \frac{\eta^2}{2s} > 0 \implies \eta < \sup_{x_i \in [0, \frac{1}{2}]} \left(\frac{1}{2} - x_i\right) \sqrt{\frac{1}{1 + x_i}} = \frac{1}{2}.
\]

Rewrite (4) as
\[
\frac{1}{s} + \frac{\eta^2}{2s^2} < \psi\left(\frac{1}{2} - x_i, x_i, 1\right) < \frac{1}{w} + \frac{\eta^2}{2s^2}
\]
where, as in the proof of Proposition 2,
\[
\psi\left(\frac{1}{2} - x_i, x_i, 1\right) \equiv \frac{\left(\frac{1}{2} - x_i\right)^2}{2(1 + x_i)},
\]
which is strictly decreasing in \(x_i\) for any \(x_i \in [0, \frac{1}{2}]\). 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
\[
\frac{1}{s} + \frac{\eta^2}{2s^2} < \lim_{x_i \to 0} \frac{\left[\frac{1}{2} - x_i\right]^2}{2(1 + x_i)} = \frac{1}{8},
\]
and if \(x_i \in [\underline{x}, \overline{x}]\), with \(\overline{x}\) being solution of
\[
\frac{1}{s} + \frac{\eta^2}{2s^2} = \psi\left(\frac{1}{2} - x_i, x_i, 1\right),
\]
and \(\underline{x}\) being solution of
\[
\psi\left(\frac{1}{2} - x_i, x_i, 1\right) = \frac{1}{w} + \frac{\eta^2}{2s^2}.
\]

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.,
\[
\pi_w^* = -a^*(w),
\]
since there will be, in the second period, anti-organization activity \(a^*(w)\) 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
\[
\pi_s^* \equiv \frac{b}{N} - k(\nu_s^*, s) - a^*(s).
\]

A9
A separating equilibrium in which \( \nu_s^* > 0 \) can exist if, and only if, the following incentive compatibility constraints hold

\[
\frac{b}{N} - k(\nu_s^*, s) - a^*(s) \geq -a^*(w) \geq \frac{b}{N} - k(\nu_s^*, w) - a^*(s),
\]

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 \( \beta(\nu) = 1 \) for every \( \nu \geq \nu_s^* \), and \( \beta(\nu) = 0 \) 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. ■

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### Appendix 2: Lists of victims of the Sicilian Mafia

<table>
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<tr>
<th>Organization</th>
<th>Web Address</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>VittimeMafia</td>
<td><a href="http://www.vittimemafia.it/">http://www.vittimemafia.it/</a></td>
</tr>
</tbody>
</table>
Appendix 3: Additional figures and tables

Figure A1: 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.

Figure A2: The Massacre of Portella della Ginestra

Note: The map indicates the location of the Massacre of Portella della Ginestra, on Labour Day 1947.
Table A1: Judicial investigations against Italian MPs for membership in criminal organizations and related crimes, 1945-1993

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<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>organized crime region</td>
<td>0.009***</td>
<td></td>
<td>0.029***</td>
<td></td>
<td>0.032***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td></td>
<td>(0.008)</td>
<td></td>
<td>(0.009)</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>-0.001*</td>
<td>-0.001</td>
<td>-0.007*</td>
<td>-0.002</td>
<td>-0.019***</td>
<td>-0.015***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.004)</td>
<td>(0.004)</td>
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<td>(0.004)</td>
</tr>
<tr>
<td>Left X org. crime region</td>
<td>-0.009***</td>
<td>-0.009***</td>
<td>-0.021*</td>
<td>-0.024**</td>
<td>-0.024**</td>
<td>-0.027**</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.011)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.001*</td>
<td></td>
<td>0.021***</td>
<td></td>
<td>0.032***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td></td>
<td>(0.003)</td>
<td></td>
<td>(0.003)</td>
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</tr>
</tbody>
</table>

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
R² 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 organized crime, the region in which they were appointed, and their party affiliation. The dependent variable is a binary indicator equal to one for MPs investigated for various types of crime (indicated on top of each column) and equal to zero otherwise. The explanatory variables organized crime 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: Other crimes across Italian regions during electoral periods

<table>
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<tr>
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<th>(6)</th>
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</thead>
<tbody>
<tr>
<td>theft</td>
<td>29.294</td>
<td>-0.011</td>
<td>0.299</td>
<td>0.258</td>
<td>-0.303</td>
<td>-3.062</td>
</tr>
<tr>
<td>rob</td>
<td>(53.977)</td>
<td>(8.715)</td>
<td>(0.289)</td>
<td>(0.265)</td>
<td>(4.430)</td>
<td>(89.320)</td>
</tr>
<tr>
<td>ext</td>
<td>[0.632]</td>
<td>[0.999]</td>
<td>[0.338]</td>
<td>[0.453]</td>
<td>[0.949]</td>
<td>[0.981]</td>
</tr>
<tr>
<td>kidnap</td>
<td>0.299</td>
<td>(8.715)</td>
<td>0.258</td>
<td>(4.430)</td>
<td>(89.320)</td>
<td>896</td>
</tr>
<tr>
<td>drug</td>
<td>0.258</td>
<td>(4.430)</td>
<td>(89.320)</td>
<td>896</td>
<td>R-squared</td>
<td>0.824</td>
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<tr>
<td>total</td>
<td>-3.062</td>
<td>(89.320)</td>
<td>(89.320)</td>
<td>896</td>
<td>0.479</td>
<td>0.719</td>
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<tr>
<td>Observations</td>
<td>896</td>
<td>592</td>
<td>592</td>
<td>592</td>
<td>592</td>
<td>896</td>
</tr>
</tbody>
</table>

Note: This table shows the differential effect of electoral cycles on several types of crimes (indicated on top of each column) in regions with a 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 a 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 A3: Electoral violence and parliamentary debates about the Mafia (robustness)

<table>
<thead>
<tr>
<th></th>
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<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>time window: +/- 1 week</td>
<td>total number of words (x 1,000)</td>
<td>0.117***</td>
<td>0.109***</td>
<td>0.108***</td>
<td>0.114***</td>
<td>0.104***</td>
</tr>
<tr>
<td></td>
<td>(0.044)</td>
<td>(0.038)</td>
<td>(0.033)</td>
<td>(0.042)</td>
<td>(0.036)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>totvict</td>
<td>0.521***</td>
<td>0.231**</td>
<td>-0.002</td>
<td>0.462***</td>
<td>0.179***</td>
<td>-0.052</td>
</tr>
<tr>
<td></td>
<td>(0.153)</td>
<td>(0.102)</td>
<td>(0.131)</td>
<td>(0.140)</td>
<td>(0.063)</td>
<td>(0.110)</td>
</tr>
<tr>
<td>polvict</td>
<td>-0.408*</td>
<td>-0.055</td>
<td>-0.088</td>
<td>-0.443**</td>
<td>-0.110</td>
<td>-0.099</td>
</tr>
<tr>
<td></td>
<td>(0.246)</td>
<td>(0.211)</td>
<td>(0.190)</td>
<td>(0.181)</td>
<td>(0.114)</td>
<td>(0.117)</td>
</tr>
<tr>
<td>Left</td>
<td>0.351**</td>
<td>0.335***</td>
<td>0.353***</td>
<td>0.236**</td>
<td>0.231***</td>
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</tr>
<tr>
<td></td>
<td>(0.158)</td>
<td>(0.128)</td>
<td>(0.128)</td>
<td>(0.110)</td>
<td>(0.089)</td>
<td></td>
</tr>
<tr>
<td>totvict X Left</td>
<td>-0.954</td>
<td>-1.108*</td>
<td>-0.953**</td>
<td>-1.018**</td>
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<td></td>
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<tr>
<td></td>
<td>(0.591)</td>
<td>(0.585)</td>
<td>(0.585)</td>
<td>(0.467)</td>
<td>(0.435)</td>
<td></td>
</tr>
<tr>
<td>polvict X Left</td>
<td>0.770**</td>
<td>0.750**</td>
<td>0.793**</td>
<td>0.763**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.361)</td>
<td>(0.352)</td>
<td>(0.352)</td>
<td>(0.343)</td>
<td>(0.328)</td>
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</tr>
<tr>
<td>Constant</td>
<td>0.198***</td>
<td>0.089**</td>
<td>0.646</td>
<td>0.143***</td>
<td>0.073*</td>
<td>0.666</td>
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<td></td>
<td>(0.046)</td>
<td>(0.042)</td>
<td>(0.687)</td>
<td>(0.037)</td>
<td>(0.044)</td>
<td>(0.696)</td>
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<td>Observations</td>
<td>8,833</td>
<td>8,833</td>
<td>8,833</td>
<td>8,833</td>
<td>8,833</td>
<td>8,833</td>
</tr>
<tr>
<td>Year FE</td>
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<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.007</td>
<td>0.015</td>
<td>0.044</td>
<td>0.009</td>
<td>0.019</td>
<td>0.046</td>
</tr>
</tbody>
</table>

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.