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Author(s): ALBERTO ALESINA, SALVATORE PICCOLO and PAOLO PINOTTI

Source: *The Review of Economic Studies*, March 2019, Vol. 86, No. 2 (307) (March 2019), pp. 457-499

Published by: Oxford University Press

Stable URL: <https://www.jstor.org/stable/10.2307/26611521>

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Organized Crime, Violence, and Politics

ALBERTO ALESINA

Harvard University, IGIER, CEPR, and NBER

SALVATORE PICCOLO

University of Bergamo
and

PAOLO PINOTTI

Bocconi University, BAFFI-CAREFIN Center, Fondazione Debenedetti, and CEPR

First version received November 2016; Editorial decision May 2018; Accepted July 2018 (Eds.)

We develop a model explaining how criminal organizations strategically use pre-electoral violence as a way of influencing electoral results and politicians' behaviour. 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.

Key words: 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

1. INTRODUCTION

In many countries, criminal organizations capture parts of the polity. Captured politicians then distort the allocation of public investment towards the areas of influence of criminal organizations (Schelling, 1971; Barone and Narciso, 2015) and promote leniency acts in their favour

The editor in charge of this paper was Uta Schoenberg.

(Acemoglu *et al.*, 2013).¹ 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?

We develop a model in which pre-electoral violence against an “honest” party favours the “corrupt” party—*i.e.* the party preferred by the criminal organization. Violent acts signal the strength of the criminal organization and its willingness to use violence. This signal scares the candidates of the non-captured party and their campaign workers, and influences the behaviour of elected politicians.² We first characterize the extent of pre-electoral violence under different electoral rules and degree 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, the incentives to use violence depend on the relative strength of the honest and the corrupt party at the national level of the electoral competition; under a majoritarian rule, violence instead should be concentrated in marginal districts where there is head-to-head competition between the two parties. To some extent this is the same incentive which drives the decisions about where to direct government spending to win elections, for example, in models of political budget cycles.³ Akhmedov and Zhuravskaya (2004), Brender and Drazen (2005), Alt and Lassen (2006) provide evidence on this phenomenon; see Alesina and Paradisi (2017) on the specific case of Italy.

We test the predictions of our model using data from Italy, a country historically plagued by organized crime. We have detailed information on all victims of the Sicilian Mafia since World War II, including the victims’ occupation and the exact date and location of each murder. 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. Clearly, electoral violence may include many other activities besides homicides, like non-lethal attacks, disruption of campaign activities, arsons, etc. We focus on homicides because: (1) more data are available on these (extreme) events, and (2) they are less subject to the usual under-reporting issues.

Unfortunately, we do not have a detailed information on the victims of other active criminal organizations in Italy—the Camorra in Campania and the ‘Ndrangheta in Calabria. Therefore we compare, using a difference-in-differences methodology, homicide rates between regions with and without a significant presence of criminal organizations, during 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 coverage 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 except during the Fascist dictatorship (1922–43), when they had

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

2. 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 rule discouraging the use of violence against state officials, the Mafia leader Totò Riina in the 1970s weakened this rule, leading to the most violent period in the history of the Mafia. His successor Bernardo Provenzano showed more restraint to rely on violence to pressure the politicians.

3. For reviews of models of political budget cycles, see Shi *et al.* (2003) and, more recently, Alesina and Passalacqua (2016). Original work on political budget cycles is Rogoff (1990). Chapter 8 of Persson and Tabellini (2000) also provides a comprehensive, comparative analysis of electoral spending under proportional and majoritarian rule, respectively.

little or no chance to influence elections, the latter being irrelevant plebiscites for the Fascist party, the only one allowed to run. The 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, pre-electoral violence is concentrated in marginal districts.

We also investigate the effect of pre-electoral violence in changing electoral results and politicians' behaviour. We can address these questions only for Sicily, for which we have better data. For historical reasons (discussed in the next section), the Sicilian Mafia traditionally supported centre-right parties against left-wing parties and labour unions. Indeed, Mafia violence favoured center-right parties in elections. 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 neighbouring 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.

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 towards 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 of left-wing parties, who are the most likely targets of future violence. These MPs generally talk more about the Mafia, especially after homicides, but they avoid doing so (even more than other MPs) after political homicides. This is consistent with a signalling effect of Mafia violence on politicians who were not victims of the attacks themselves.

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.⁴ Dal Bó *et al.* (2006, 2007) build on the same idea, but allow the use of both monetary incentives and self-enforceable punishments within a unified framework, and they derive implications for the quality of public officials.⁵ The main implication of these models is that criminal organizations should perpetrate violence against politicians in office in order to influence political decisions.⁶ Our empirical results suggest that violence *before* elections is at least as valuable as violence *after* elections as a strategy for influencing political outcomes.

Using media reports on attacks against Italian local politicians (*i.e.*, mayors and city councillors) over the period 2010–14, Daniele and Dipoppa (2017) 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 calculations

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

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

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

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*”) each one of them 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 or no uncertainty about national parties’ stance towards criminal organizations. As we mentioned above (and discuss at length in the next section), important factions of Centre-Right parties—that is, 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, in order to influence not only the behaviour 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 (for instance, they may be more protected by the police).

Although we base our analysis on Italian data, the results we obtain are likely to apply more generally to countries plagued by organized crime. Indeed, evidence from terrorist attacks around the World confirms that the probability of deadly attacks against politicians (but not against other groups) increases relatively more during electoral periods in countries with a higher presence of criminal organizations compared to others. This effect is driven by democratic countries featuring free and open elections, while it is absent across non-democratic countries. Our initial results on this point, to be developed in further research, are presented in Appendix 3.

Our results contribute to the literature on the relationship between organized crime and the polity. Dell (2015) shows that drug-related violence increased in Mexican municipalities 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) investigate the complex inter-relationships between drug cartels, paramilitary groups, and political parties in Colombia. Turning to Italy, Di Cataldo and Mastroiocco (2016) estimate the effects of collusion between criminal organizations and local governments on the size and composition of public spending, and show that such collusion is more likely when the Right wins the elections. Relatedly, De Feo and De Luca (2017) and Buonanno *et al.* (2016) document the symbiotic relationship among the Sicilian Mafia and Centre-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 labour revolts and Mafia presence in the nineteenth 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 (2017) test the implications 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, our work focuses more on the practices used by criminal organizations to influence electoral results and politicians’ behaviour; 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 modelled for example by Persson and Tabellini (1999) and Lizzeri and Persico (2001).

The rest of the article 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. The Appendix contains the evidence across countries as well as additional proofs and empirical results.

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 membership 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”.⁷ 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.⁸

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 neighbourhood. 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 ‘Ndrangheta adopts a similar pyramidal model, whereas the Camorra has a more horizontal structure (Catino, 2014). 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 armoured cars. Finally, 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.

2.2. *Organized crime and Italian politics*

The origin of the Sicilian Mafia has been traced back to the demand for protection from southern landlords and urban elites, generated by the power vacuum that followed the defeat of the Kingdom of Two Sicilies (Gambetta, 1996; Bandiera, 2003; Dixit, 2003). During the period of parliamentary

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

8. Obviously, these figures greatly understate 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.

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 (centre-right) bloc resumed. This followed the birth of the so-called First Italian Republic (1946–93), which re-introduced free democratic elections (every five years) under universal suffrage with a proportional rule. In this period there was a competition between the Christian Democratic Party, who was always the leader of a ruling coalition along with several small parties, and the Communist Party. Some of the most prominent Sicilian members of the Christian Democratic Party 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 police and judicial system’s interference with Mafia activities (Falcone, 1991; Paoli, 2003; Lodato and Buscetta, 2007). The other criminal organizations—that is, 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 well-known and appeared in many judicial investigations. We explore this relationship by looking at prosecutors’ requests to proceed against a member of Parliament (*“Richieste di autorizzazione a procedere”*), which are required in order to lift Parliamentary immunity from judicial investigations.⁹ 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, eleven members of Parliament were investigated as active members of criminal organizations; *all of them* had been elected in the Christian Democratic Party or in its allied parties. In addition, 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 Christian Democrats and their allies were more likely to be investigated for all these types of crimes than politicians of the Left, even more so in Sicily, Campania, and Calabria. This finding is confirmed by Ordinary Least Squares (OLS) regressions of the probability of being investigated on a dummy for partisan affiliation, a dummy for being appointed in regions with a high presence of criminal organizations, and the interaction between the two.¹⁰

In 1992–93, widespread corruption scandals precipitated a crisis for Italian traditional parties 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 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. The Sicilian Mafia continued to support important factions of center right parties (Buonanno *et al.*, 2016).

2.3. *The strategy of violence*

In the first post-Fascism democratic elections for the Regional Government of Sicily on 20 April 1947, a coalition of Communist and Socialist parties clinched an unexpected victory over the Christian Democrats.¹¹ A few days later, on 1 May 1947, hundreds of Sicilian peasants were

9. We used the data originally collected by Golden (2007)—and used, among others, by Nannicini *et al.* (2013)—and added the types of crime described in each request.

10. The results are presented in Table D1 of Appendix 4.

11. Sicily 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.

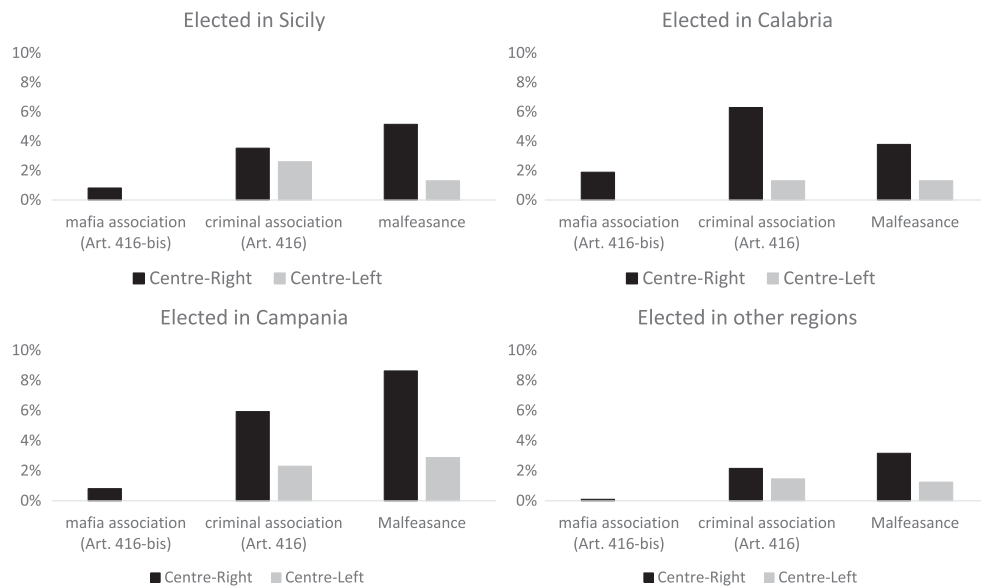


FIGURE 1

Members of the Italian Parliament investigated for criminal association and related crimes, 1945–93

Notes: 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.

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 and thirty-three wounded, some of whom died in the following days. It soon became clear 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 18 April 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 about 48% of the votes, up from 20.5% the year before. Other right-wing factions, such as the Fascist and the Monarchist parties also gained ground.

In 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-1970s, 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 have also engaged in violence and intimidation against local politicians and party members, so much that in 2013 the Italian Parliament instituted an ad hoc commission to investigate this phenomenon. The conclusions of the commission emphasize the prevalence of these episodes in Sicily, Campania, and Calabria (Lo Moro *et al.*, 2015).

2.4. Why national elections?

Criminal organizations may be interested in influencing national politics for several reasons. First, 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. Secondly, 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. Thirdly, the national government can adopt a variety of laws regulating public procurement and contract enforcement, making it easier or harder for criminal organizations to infiltrate public contracts. Fourthly, 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.

Since 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 than to affect 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. In the 1980s and 1990s the Medellín 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 U.S. The Ministry of Justice Rodrigo Lara and presidential candidate Luis Carlos Galán—both strong supporters of extradition—were killed, together with hundreds of lower level politicians and public officials. At the time of his assassination, Galán 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 Patriótica* party—were killed by the drug lords of both the Medellín and Cali cartels ([Americas Watch Committee, 1989](#); [Méndez, 1990](#)). Links between drug trafficking, organized violence, and Colombian politics persisted even after the defeat of such cartels—see, for example, [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 Felipe Calderón’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 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 thirty experts in six countries: Mexico, Guatemala, Costa Rica, Panama, the Dominican Republic, and the U.S. 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, the Dominican Republic, and Central America.¹² Similar patterns are found in many African countries, which exhibit a higher risk of civil violence during election cycles than in normal times—see, for example, [Goldsmith \(2015\)](#).

12. [Green \(2015\)](#) provides a thorough historical account of political violence by criminal groups in Latin America.

3. A MODEL OF ELECTORAL VIOLENCE

3.1. *Proportional electoral system*

Two political parties compete to attract a mass 1 of voters. Each vote is equal to one seat. One party is honest (h), the other (c) is captured by a criminal organization. The “party” is centralized and makes decisions about campaign efforts. When in office, party c favours 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 influences voters’ behaviour. 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 . The c party gets $1 - h(e, x)$.¹³ Only 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—for example, 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 unconditionally supports the honest party, it is easier to enforce honesty: an hypothesis consistent with Tabellini (2008). This assumption is not crucial for the equilibrium analysis of the game—that is, 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. The cost of effort is increasing in $\theta \in \{s, w\}$, which measures the organization’s military power and its willingness to use it. The parameter s stands for strong, w for weak, with $\Delta \equiv s - w \geq 0$.¹⁴

The relationship between effort cost and the organization’s military strength 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. Thus, in order to convince them to vote for the honest party more effort is required. Secondly, strong organizations may murder candidates of the honest party. If so, another candidate would have to run and probably be less capable of attracting votes because he or she is scared or, even more simply, because he or she is a second choice, thus the second rate candidate needs more effort to attract votes.¹⁵ Thirdly, 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.¹⁶

13. 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 Prat (2002) and Roemer (2006) for similar models.

14. The qualitative insights of the model remain true in a more general model with multiple types. More details are available from the authors.

15. 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.

16. Depending on the interpretation of the model—that is, whether the criminal organization intimidates voters, politicians, or both—there might be two types of violence one could think of: (i) general violence, namely, violence directed against the population as a whole; (ii) targeted violence, which is directed selectively against politicians and their entourage. The signaling model we are going to study can capture both interpretations (as discussed above), even though selective violence against politicians seems likely to be more effective in influencing elections. Voters (and their political preferences) are anonymous and non-pivotal, while politicians are typically more exposed and, as a consequence, more interested in knowing whether they are going to deal with a strong or a weak organization (see Section 3.3). Of course, a simpler model would suffice to capture the effect of general violence on voters. Yet, the signalling mechanism we highlight seems more compelling to study the interaction between politicians and criminal organizations.

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

$$\psi(e, x, \theta) = \frac{\theta e^2}{2(1+x)}. \quad (3.1)$$

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. Signalling occurs via pre-electoral violence, $v \geq 0$. The cost of electoral violence is $k(v, \theta) = \frac{v}{\theta}$, which is inversely related to the organization's military power.

The timing of the game is as follows:

1. Nature draws θ .
2. The criminal organization chooses electoral violence v .
3. Honest candidates observe v , 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 that are of greatest interest; in Appendix 1 we also examine pooling ones, and the off-path beliefs.

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

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

Let $\beta(v) \equiv \Pr[\theta = s | v]$ be the posterior of the honest party upon observing $v \geq 0$. In a separating equilibrium, $\beta(v_s^*) \equiv 1$ and $\beta(v_w^*) \equiv 0$. Upon observing v_θ^* , 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:

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

Under the quadratic specification (3.1), it follows that

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

In separating equilibria, with $\mathbb{E}[\theta | v_\theta^*] = \theta$, 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 Δ .¹⁷

Because violence is costly, we focus on the ‘least-costly’ separating equilibrium—also known as the “Riley outcome” (Fudenberg and Tirole, 1991)—in which the weak organization exerts no violence (*i.e.* $v_w^* = 0$). Hence, to find the equilibrium we simply need to determine v_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 $v_w^* \equiv 0$ while the strong one exerts $v_s^* \equiv b(1+x) \frac{\Delta}{s} > 0$.*

The equilibrium level of violence is increasing in the share x of voters who always support the honest party. In Appendix 1 we discuss multiplicity of equilibria including pooling outcomes and we also show that the equilibrium just described is the only one that survives the Cho and Kreps (1987) intuitive criterion.

3.2. Majoritarian system

Consider now a first-past-the-post system. Voters are split into N identical districts, each populated by a mass $\frac{1}{N}$ of voters and denoted by $i \in \{1, \dots, N\}$. 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 who always vote for h . The criminal organization still can be either strong or weak, and this characteristic is common to all districts. For the moment we posit that the information about θ revealed through the use of violence within district i does not affect the behaviour of politicians in the other districts. We relax this assumption later. We focus on the least costly separating equilibria in which only the strong organization engages in pre-electoral violence; the analysis of pooling equilibria is in Appendix 1. The cost of exerting violence for the organization is additively separable across districts: $v = \sum_{i=1}^N v_i$. We also assume:

- **Assumption A2.**

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

This means that the criminal organization’s maximization problem is separable across districts.¹⁸ Therefore, in order to characterize the equilibrium of the game we can focus on a

17. The outcome described above emerges in equilibrium when (v_s^*, v_w^*) satisfy the no-mimicking conditions of the organization, which ensures that types do not mimic each other—that is, 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.

18. 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

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.¹⁹ 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—that is,

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

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 $e_i = 0$. Hence, hereafter we focus on the most interesting case $x_i < 1/2$. In a separating equilibrium, the honest party wins the elections if and only if the utility of being appointed exceeds the corresponding effort cost. That is, as long as

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

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

$$\psi(\tfrac{1}{2} - x_i, x_i, w) \leq 1 < \psi(\tfrac{1}{2} - x_i, x_i, s). \quad (3.2)$$

Note that, under a majoritarian system, a weak criminal organization has an even stronger incentive not to exert violence in a separating equilibrium. This is because it makes no profit when x_i satisfies (3.2). A separating equilibrium (if it exists) must again be such that $v_{i,w}^* = 0 < v_{i,s}^*$, with $v_{i,s}^*$ 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 $\psi(\tfrac{1}{2} - x_i, x_i, w) > 1$ for some $x_i \in (0, \tfrac{1}{2})$.

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*

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

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

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.

19. In case of a tie the honest party wins.

parties. By contrast, it is never optimal for the criminal organization to rely on costly violence if one of the two parties wins the election, no matter what e_i is. In this region of parameter values, we only have a pooling equilibrium. We characterize them in Appendix 1.

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

Remark 1 *So far we have assumed that captured politicians always know the organization type and always favour it once they are elected. Suppose, for example, that corrupt politicians do not know the type of 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 signalling their military strength. In fact, by exerting violence against 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 favour 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 behaviour 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 $\lambda_2 < \lambda_1$ (λ_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 λ_1 —the more attractive it is for the weak type too. Hence, the potential cost savings from only exerting violence in central districts is offset by the possibility of mimicking. This makes it hard for strong types to exploit information externalities between central districts and peripheral ones (see Appendix 1).*

3.3. Anti-organized crime efforts after elections

Now consider a two-period model. In the first period, the electoral game just analysed 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-modelled elections) ηa 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 $c(a, \theta)$ to the honest party.²⁰ This loss is increasing with the organization's type θ since the strongest organization has lower costs of exerting violence

20. Incentives to build reputation typically are analysed 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. Modelling such dynamic aspects of the game is outside the scope of our article.

(retaliate). The cost $c(\cdot)$ is obviously increasing in a —that is, 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.

In Appendix 1, we show that pooling equilibria do not satisfy the intuitive criterion. In a separating equilibrium (v_s^*, v_w^*) the optimal level of anti-organized crime effort solves the following:

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

By signalling 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 η and decreasing in the organization's type θ .

In the first stage, consider the proportional system. As before, in order to rule out uninteresting corner solutions—that is, 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:

$$\eta \leq \min \left\{ \frac{1}{2}, w\sqrt{2} \sqrt{\frac{1-x}{1+x} - \frac{1}{w}} \right\}, \quad (3.3)$$

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

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

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

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

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

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

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

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 $v_w^* \equiv 0$ while the strong one exerts $v_s^* \equiv b(1+x) \frac{\Delta}{s} + \eta \xi \Delta$, with $\xi > 0$. In this equilibrium $a^*(s) < a^*(w)$.*

The equilibrium level of violence v_s^* is increasing in the politicians' benefit from proposing anti-organized crime initiatives, η . A weak organization now has two reasons to mimic a strong one: by doing so, it reduces not only the campaigning effort of the honest party, but also the *ex post* anti-organized crime effort of the honest candidates who are 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—that is, $a^*(\theta) = \frac{\eta}{\theta}$. Hence, conditional on facing an organization of type θ , winning the election in district i is optimal for the honest candidates if and only if

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

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

$$\psi\left(\frac{1}{2} - x_i, x_i, w\right) - \frac{\eta^2}{2w} \leq 1 \leq \psi\left(\frac{1}{2} - x_i, x_i, s\right) - \frac{\eta^2}{2s}, \quad (3.4)$$

which is equivalent to equation (3.2) 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 equation (3.4) holds, under a majoritarian system the least-costly separating equilibrium exists and has the following features*

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

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 victims—excluding victims who are members of criminal organizations themselves—and their individual characteristics, the exact date of the murder, and the municipality in which it was committed.²¹ Appendix 2 lists the detailed sources that we used for constructing the data set. These data allow us to identify victims who were directly linked with the polity. In this group we include politicians as well as the party's campaign workers, committee members, and party activists. We also include labour union members and activists since the main Italian labour unions—particularly the largest one (CGIL)—have been traditionally linked to the Communist Party and its successors.

These data are accurate only for the victims of the Sicilian Mafia. 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.²² These numbers stand in contrast with other measures of the relative strength and political influence of the three organizations.²³ 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.

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 *Electoral period* _{t} equals to 1 in the twelve months up to a national election,

$$Victims_t = \alpha + \beta * Electoral\ period_t + \delta' X_t + \varepsilon_t, \quad (4.5)$$

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

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

22. For the complete list visit http://progettolegalita.it/it/prodotti_sociali/elenco_vittime_della_mafia.php.

23. 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.

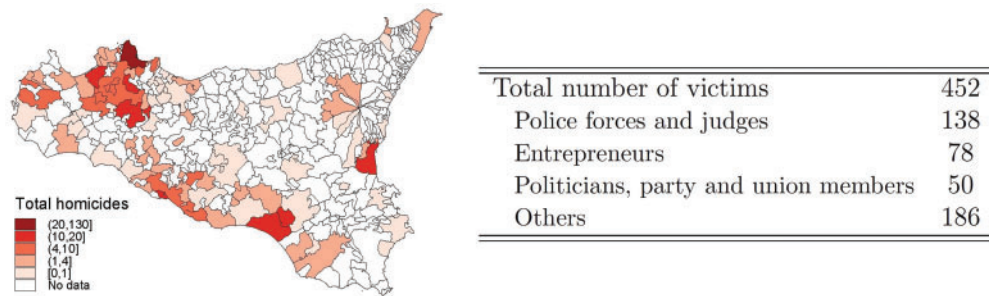


FIGURE 2

Victims of the Sicilian Mafia, 1945–2013

Notes: 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.

Consistent estimates of β require that the timing of national elections be uncorrelated with other (omitted) determinants of political murders in ε_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 by 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 (4.5), and we will consider different assumptions about the time series properties of the error term.

4.1.2. Results. Table 1 reports the coefficient β in equation (4.5), 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). In addition, it remains statistically significant when computing Newey-West standard errors, reported in square brackets, allowing for 12th-order autocorrelation (corresponding to one year). By contrast, there is no significant change in murders of entrepreneurs, police officers, and magistrates, as well as 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, equal to the exponentiated coefficient.

Table 2 presents a series of robustness checks. In Panels A and B we re-estimate equation (4.5) including additional indicator variables equal to 1 in the twelve months before regional elections and the twelve months after national elections, respectively. In both cases, the estimated increase in violence against politicians before national elections remains unaffected. Violence is also higher than average after national elections, but the change is small (half of the estimated increase before elections) and it is not statistically significant when we include additional control variables (columns 2–3).

TABLE 1
Timing of murders by the Sicilian Mafia, 1945–2013, for different categories of victims

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Politicians & labour unions			Entrep.	Police	Others	All victims
Panel A: OLS Regression							
<i>Electoral period</i>	0.075** (0.029) [0.044]	0.064** (0.025) [0.032]	0.065** (0.026) [0.032]	−0.021 (0.027) [0.030]	0.022 (0.072) [0.081]	0.040 (0.079) [0.070]	0.106 (0.113) [0.125]
R-squared	0.013	0.112	0.132	0.132	0.051	0.090	0.155
Durbin-Watson	1.526	1.664	1.703	1.955	1.860	1.933	1.817
Panel B: Prais-Winsten							
<i>Electoral period</i>	0.073** (0.035)	0.064** (0.029)	0.064** (0.029)	−0.020 (0.027)	0.018 (0.078)	0.041 (0.084)	0.106 (0.128)
R-squared	0.008	0.088	0.105	0.127	0.048	0.086	0.137
Durbin-Watson	2.043	2.009	2.002	2.005	2.010	1.997	2.007
Panel C: Poisson regression							
<i>Electoral period</i>	1.041*** (0.330)	0.756** (0.295)	0.652** (0.298)	−0.394 (0.290)	−0.019 (0.354)	0.115 (0.282)	0.077 (0.162)
Relative risk ratio	2.833	2.130	1.920	0.674	0.981	1.122	1.080
Pseudo R-squared	0.0328	0.229	0.236	0.321	0.215	0.195	0.229
Observations	828	828	804	804	804	804	804
time trends and month FE	NO	YES	YES	YES	YES	YES	YES
other controls	NO	NO	YES	YES	YES	YES	YES

Notes: 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, *Electoral period*, is a dummy equal to 1 in the twelve months up to a national election and equal to 0 otherwise, specifications in columns (2)–(7) control for a cubic polynomial in the number of months since January 1945 and twelve 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. Newey-West standard errors allowing for autocorrelation of order twelve (*i.e.* one year) are also reported, in square brackets, in Panel A.

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.²⁴ 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 analyse our results in different institutional settings, and to test the predictions

24. 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 D3 of Appendix 4.

TABLE 2
Timing of murders by the Sicilian Mafia, for different categories of victims (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Politicians			Entrep.	Police	Others	All victims
Panel A: Controlling for Regional Elections							
<i>Electoral period, national</i>	0.075** (0.032) [0.045]	0.064** (0.028) [0.034]	0.065** (0.028) [0.033]	−0.024 (0.026) [0.029]	0.029 (0.077) [0.088]	0.048 (0.087) [0.074]	0.118 (0.121) [0.131]
<i>Electoral period, regional</i>	0.002 (0.029) [0.044]	0.002 (0.027) [0.034]	−0.001 (0.026) [0.030]	0.021 (0.029) [0.033]	−0.041 (0.067) [0.082]	−0.049 (0.072) [0.065]	−0.071 (0.111) [0.122]
R-squared	0.013	0.112	0.132	0.132	0.052	0.090	0.156
Panel B: Controlling for Post-Electoral Period							
<i>Electoral period</i>	0.091*** (0.033) [0.052]	0.078*** (0.028) [0.037]	0.076*** (0.028) [0.036]	−0.022 (0.029) [0.032]	0.037 (0.069) [0.081]	0.072 (0.106) [0.095]	0.163 (0.132) [0.147]
<i>Postelections</i>	0.050* (0.030) [0.051]	0.042 (0.027) [0.041]	0.032 (0.026) [0.037]	−0.003 (0.032) [0.039]	0.043 (0.074) [0.086]	0.093 (0.103) [0.106]	0.165 (0.134) [0.154]
R-squared	0.018	0.116	0.134	0.132	0.052	0.092	0.158
Observations	828	828	804	804	804	804	804
time trends and month FE	NO	YES	YES	YES	YES	YES	YES
other controls	NO	NO	YES	YES	YES	YES	YES

Notes: This table 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 *Electoral period* is a dummy equal to 1 in the twelve months up to a national election and equal to 0 otherwise; *Electoral period, regional* is a dummy equal to 1 in the twelve months up to a regional election and equal to zero otherwise; and *Postelections* is a dummy equal to 1 in the twelve 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 twelve 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. Newey-West standard errors allowing for autocorrelation of order twelve (*i.e.* one year) are also reported, in square brackets.

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:

$$Homicides_{r,t} = \beta(Electoral\ period_t * Organized\ crime_r) + \gamma'X_{r,t} + f_r + f_t + \varepsilon_{r,t}. \quad (4.6)$$

The dependent variable $Homicides_{r,t}$ is the homicide rate per 100,000 inhabitants in region r and year t . As in equation (4.5), *Electoral period* identifies the twelve months up to the elections. Since equation (4.6) is estimated on yearly data, we aggregate *Electoral period* accordingly; therefore, it varies between 0 and 1. The variable *Organized crime_r* is a dummy equal to 1 for Sicily, Calabria, and Campania, and equal to 0 for other regions; X_{rt} is a vector of additional determinants of the homicide rate (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-White (1984), may lead to incorrect inference when the number of clusters is small—we only have sixteen regions—so we also compute wild-bootstrapped p -values based on the procedure of Cameron *et al.* (2008); see also Cameron and Miller (2015).

The estimated coefficient β in equation (4.6) captures the differential change in homicides during the electoral period in regions with a historical presence of criminal organizations compared 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 (4.6) 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 (4.6) as follows:

$$\begin{aligned} \text{Homicides}_{r,t} = & \beta(\text{Electoral period}_t * \text{Organized crime}_r) + \\ & + \mu(\text{Electoral period}_t * \text{Organized crime}_r * \text{Gap}_t) \\ & + \gamma(\text{Organized crime}_r * \text{Gap}_t) + \\ & + \delta' X_{r,t} + f_r + f_t + \varepsilon_{r,t}, \end{aligned} \quad (4.7)$$

where Gap_t is the difference between the (percentage) vote shares of the Christian Democrats and the Italian Communist Party at the national level for the period 1948–92. A proportional electoral system was in place during this time. Therefore, we should expect a negative coefficient, μ . One potential problem is that the gap between the two main parties observed (*ex post*) in regions with organized crime 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 for which $\text{Organized crime}_r = 0$. This alternative measure should be independent from pre-electoral violence in organized crime regions. The specification also controls for the interactions of Gap_t with, respectively, Organized crime_r and $\text{Electoral period}_t$ (the latter interaction term is absorbed by year fixed effects).

On the other hand, in a majoritarian system 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 coalitions in the first elections held with the majoritarian system (1994) was less than 5%.

The resulting equation, to be estimated at the province-level, is

$$\begin{aligned} \text{Homicides}_{p,t} = & \beta(\text{Electoral period}_t * \text{Organized crime}_p) + \\ & + \mu(\text{Electoral period}_t * \text{Organized crime}_p * \text{Swing}_p) + \\ & + \eta(\text{Electoral period}_t * \text{Swing}_p) + \gamma' X_{p,t} + f_p + f_t + \varepsilon_{p,t}, \end{aligned} \quad (4.8)$$

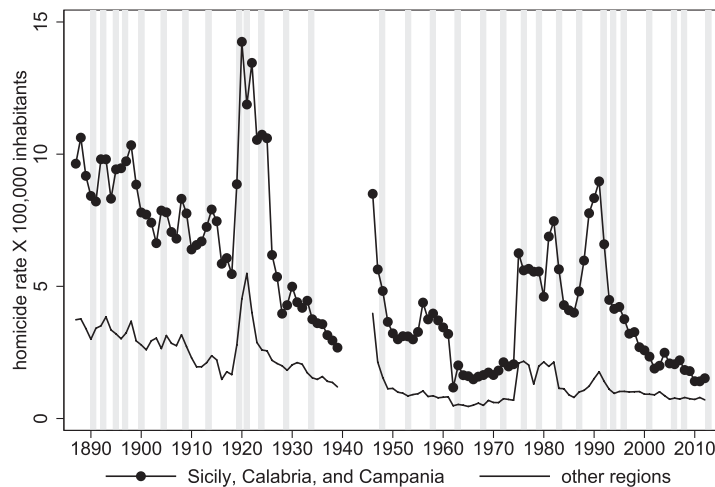


FIGURE 3

Homicide rates in regions with and without an historical presence of criminal organizations, 1887–2012

Notes: 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. Shaded areas correspond to electoral periods. The series does not include the years during World War II (1940–45).

where the sub-index p denotes provinces. This specification also controls for the interactions of $Swing_p$ with respectively, $Electoral\ period_t$ and $Organized\ crime_p$ (the latter interaction term is absorbed by province fixed effects). According to Prediction P2 of the model, the triple interaction coefficient μ should be positive during the period in which a majoritarian system was in place (1994–2004): returns to electoral violence are higher in provinces with more swing voters.²⁵

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.²⁶

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

$$Homicides_{r,t} = \alpha_r + \beta_r * Electoral\ period_t + \varepsilon_{rt}, \quad (4.9)$$

where $Homicides_{r,t}$ is the homicide rate per 100,000 inhabitants in region r and year t , and $Electoral\ period_t$ identifies the period before the elections (as defined in Section 4.2). Figure 4 shows the region-specific estimated β_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.

25. Although 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.

26. We 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 4 the same graph, also including the war period.

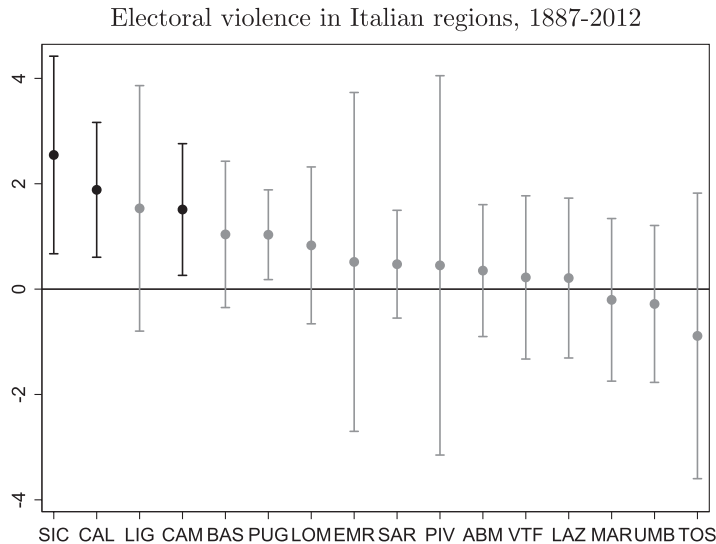


FIGURE 4

Electoral violence in Italian regions, 1887–2012

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

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 experienced the presence of criminal organizations, but only since the 1970s and on a smaller scale than in Sicily, Calabria, and Campania (Pinotti, 2015). The coefficient is not significantly different from zero for any other Italian region.

Next, we pool data from all regions and estimate the difference-in-differences equation (4.6). Estimated coefficients are reported in Table 3, together with heteroscedasticity-robust standard errors clustered by region (in parenthesis) and wild-bootstrapped p-values (in square brackets).

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) compared 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 *Electoral period_{it}*); see column (2).²⁷

In column (3) we re-estimate the same specification for the log of murders (as opposed to the murder rate).²⁸ Since we are controlling on the right-hand side of the equation for the log of population, the coefficient of interest can now be interpreted in relative terms. During electoral periods, the homicide rate increases by 16% in organized crime regions compared 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

27. 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.

28. In six 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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Complete sample: 1887–2012				1887–1913	1922–45	1946–2012
Electoral period	0.407** (0.175) [0.042]						
Electoral period × Organized crime	1.574*** (0.310) [0.000]	1.504*** (0.284) [0.000]	0.149*** (0.038) [0.002]		1.469*** (0.282) [0.000]	−0.709 (1.737) [0.669]	0.955*** (0.131) [0.000]
Electoral period × Sicily				1.992*** (0.209) [0.000]			
Electoral period × Calabria				1.338*** (0.204) [0.000]			
Electoral period × Campania				1.182*** (0.207) [0.000]			
Observations	2,016	1,936	1,936	1,936	496	384	1,056
Controls and year FE	NO	YES	YES	YES	YES	YES	YES
R-squared	0.004	0.487	0.650	0.487	0.552	0.472	0.481

Notes: This table shows the differential effect of electoral cycles on homicides in regions with a historical presence of criminal organizations. In all columns with the exception of (3), the dependent variable is the homicide rate per 100,000 inhabitants in each region and year; in column (3), the dependent variable is the logarithm of 1 plus the total number of murders in each region and year. The explanatory variable *Electoral period* is the fraction of months in each calendar year within twelve months of the following national election, and *Organized crime* is an indicator variable equal to 1 for regions with an historical presence of criminal organizations – Sicily, Calabria, and Campania – and equal to 0 otherwise. Columns (5), (6), and (7) include in the sample only the years before Fascism, during the Fascism and World-War II, and the Republican period after World War II, respectively (the exact period is indicated at top of each column). Region fixed effects are included in all regressions; in columns (2)–(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. \(2008\)](#).

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)–(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 (compared to other regions) in all periods except 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 can actually 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 D2 of Appendix 4.

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

TABLE 4
Electoral violence across Italian regions (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)
	Regional versus national elections			Pre- versus post-electoral period		
Electoral period, regional	−0.159 (0.121) [0.372]					
Electoral period, regional × Organized crime	0.378 (0.385) [0.487]	0.281 (0.414) [0.647]	0.335 (0.560) [0.674]			
Electoral period × Organized crime			0.972*** (0.109) [0.000]			0.986*** (0.097) [0.000]
Postelections				0.271*** (0.055) [0.000]		
Postelections × Organized crime				0.043 (0.431) [0.783]	−0.049 (0.466) [0.788]	−0.201 (0.463) [0.516]
Observations	1,072	1,056	1,056	1,072	1,056	1,056
Controls and year FE	NO	YES	YES	NO	YES	YES
R-squared	0.001	0.475	0.482	0.004	0.475	0.481

Notes: 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 *Electoral period* is the fraction of months in each calendar year within twelve months of the following national election; *Electoral period, regional* is the fraction of months in each calendar year within twelve months of the following regional election; *Postelections* is the fraction of months in each calendar year within twelve months since the previous national election; finally, *Organized crime* 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. \(2008\)](#).

of equation (4.7) for elections held under different electoral systems. Under proportional rule (1946–92), electoral violence intensifies when the gap between government and opposition parties gets narrower. If the two main coalitions had equal chances of winning the elections (*i.e.* $Gap_t = 0$), then the homicide rate in the year before elections would increase by 4.3 additional homicides in organized crime regions compared 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 (4.7) for the periods in which a majoritarian system was in place: 1887–1918 (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 (4.8) on province-level data; the estimated coefficients and heteroscedasticity-robust standard errors clustered by province are reported in columns (4)–(6) of Table 5.²⁹ 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).³⁰

29. 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.

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

TABLE 5
Electoral violence under different types of electoral system

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Regional data, 1887–2012			Provincial data, 1993–2004		Org. crime murder?		
	1946–92	1887–1918	1993–2004	Majoritarian elections		Yes	No	
Electoral period × Organized crime	4.303*** (0.454) [0.000]	0.901*** (0.225) [0.000]	1.610*** (0.448) [0.000]	1.512*** (0.328)	1.254*** (0.297)			
Electoral period × Organized crime × Gap	−0.372*** (0.048) [0.000]	0.004 (0.007) [0.493]	−0.007 (0.039) [0.369]					
Electoral period × Organized crime × Swing					5.686** (2.217)	5.459** (2.258)	4.350*** (0.824)	1.109 (1.500)
Electoral period × Swing					0.465*** (0.173)	0.418** (0.170)	0.019 (0.015)	0.398** (0.173)
means of interacted variables:								
Gap	5.211	6.024	1.356					
Swing					0.196	0.196	0.196	0.196
Observations	752	448	192	1,140	1,140	1,140	1,140	1,140
Organized crime year FE	NO	NO	NO	NO	NO	YES	YES	YES
R-squared	0.541	0.592	0.412	0.132	0.157	0.247	0.188	0.178

Notes: 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)–(3), and province-years in columns (4)–(8); the sample period is also indicated on top of each column. The dependent variable in columns (1)–(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 *Electoral period* is the fraction of months in each calendar year within twelve months from the following national election; *Organized crime* 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 *Organized crime* = 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)–(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).

When exploiting variation across provinces, we can also interact *Organized Crime_{it}* with year fixed effects, thus allowing for differential trends between regions with and without organized crime, respectively. Even when adopting this more requiring specification, the estimated coefficient of *Electoral period_{it} × Organized crime_{it} × Swing_p* is unaffected (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.

Overall, this evidence is in line with the model predictions that violence against politicians should increase more during electoral periods in areas with a higher presence of organized crime compared to other areas, but only when elections are free and competitive. In Appendix 3 we show that the same empirical patterns hold across countries.

5. VIOLENCE AND ELECTORAL RESULTS

In this section we test prediction P3 of our model—namely, electoral violence should lower voting for the “honest” party opposed by the criminal organization. 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. For this reason, we focus this part of the analysis on Sicily. Furthermore, 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. This information is essential for the purposes of our empirical strategy.

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:

$$Left_{m,t} = \alpha * Total\ victims_{m,t} + \beta * Political\ victims_{m,t} + f_m + f_t + \varepsilon_{m,t}, \quad (5.10)$$

where $Left_{m,t}$ is the share of votes obtained by leftist parties in each Sicilian municipality m and election t ; $Total\ victims_{m,t}$ and $Political\ victims_{m,t}$ are total and political victims, respectively, murdered by the Sicilian Mafia in municipality m in the twelve months up to election t ; finally, f_m and f_t are municipality and election fixed effects. Observations are weighted by the size of the electorate, so results are representative at the regional level; heteroscedasticity-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 neighbouring municipalities by including spatial lags on the right-hand side of the equation.

5.2. *Results*

The estimated coefficients of equation (5.10) are reported in Table 6. In columns (1) and (2), we see both the total and the 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).³¹

Voting in one municipality also may be influenced by violence in neighbouring municipalities. In columns (4) and (5), we augment equation (5.10) with spatial lags of the main explanatory variables. In column (4), the spatial lags include homicides committed in any municipality neighboring m , whereas in column (5) we include homicides committed in any Sicilian municipality weighted by the inverse distance from m (expressed in hundreds of kilometers). The coefficients of *Total* and *Political victims* are 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

31. 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.

TABLE 6
Electoral violence and electoral outcomes in Sicily, 1947–2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All national elections, 1948–2013			Spillovers, 1948–2013		Portella, 1947–48	
Total victims	−0.003*** (0.001)	−0.002*** (0.001)	−0.002*** (0.001)	−0.002*** (0.001)	−0.002*** (0.001)		
Political victims		−0.022*** (0.006)	−0.024*** (0.007)	−0.024*** (0.006)	−0.024*** (0.006)		
Voting for the Left, previous election			0.513*** (0.035)	0.514*** (0.035)	0.513*** (0.035)		
Total victims, spatial lag				−0.004* (0.002)	−0.067 (0.082)		
Political victims, spatial lag				−0.020* (0.010)	−0.279* (0.169)		
Distance from Portella (100s km)						0.001 (0.026)	
Elections 1948						−0.070*** (0.011)	−0.065*** (0.015)
Distance from Portella × Elections 1948						0.030** (0.012)	0.029* (0.016)
Constant	0.207*** (0.009)	0.208*** (0.009)	0.112*** (0.009)	0.112*** (0.009)	0.112*** (0.009)	0.288*** (0.034)	0.286*** (0.005)
Observations	6,533	6,533	6,171	6,171	6,171	709	709
Municipality FE	YES	YES	YES	YES	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	NO	NO
Spatial lag	NO	NO	NO	Neighbours	Dist-weight	NO	NO
R-squared	0.788	0.789	0.854	0.854	0.854	0.024	0.927

Notes: 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 victims* and *Political victims* 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 their inverse distance, in hundreds of kilometers (column 5). All observations are weighted by the number of voters. Robust standard clustered by municipality are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

the 1948 election, and the interaction between these two variables.³² 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). By contrast, the votes obtained by the Left at the 1947 regional elections (before the massacre) do not vary significantly with distance from Portella della Ginestra (column 6).

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 signalling effect of Mafia violence—as predicted by our model—on top of a direct effect in those municipalities directly targeted by the attacks.

32. The location of Portella Della Ginestra is shown in Figure D2 of Appendix 4.

TABLE 7
Speeches held by MPs appointed in Sicily in the National Parliament 1948–2008, sample averages

Sample averages:	Data by MP-legislature (655 obs.)			Speech-level data (8,833 obs.)		
	All MPs	Left	Others	All MPs	Left	Others
Total number of words spoken	8499	11133	7439	630	720	586
Occurrences of Mafia-related words	5.273	11.787	2.651	0.391	0.763	0.209
Occurrences of Mafia-related words per 1,000 words	0.527	0.834	0.403	0.328	0.634	0.178

6. VIOLENCE AND POLITICIANS' BEHAVIOUR

In this section we test Predictions P4 and P5 concerning the effect of organized crime violence on the behaviour of appointed politicians—during the electoral period and during the entire legislature, respectively.

6.1. *Data and estimating equations*

Our measure of politicians' behaviour 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 is only 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” 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 data set includes information on 8,833 speeches from 318 MPs appointed in Sicily over fourteen legislatures. The period 1948–2008 covers fifteen legislatures; however, transcripts from the thirteenth 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 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:

$$\begin{aligned}
 Talk_{i,l} = & \alpha * Total\ victims_l + \beta * Political\ victims_l + \gamma * Left_{i,l} + \\
 & + \delta (Total\ victims_l * Left_{i,l}) + \phi (Political\ victims_l * Left_{i,l}) + \mu' X_{i,l} + \varepsilon_{i,l},
 \end{aligned} \tag{6.11}$$

where $Talk_{i,l}$ are mentions of organized crime over the total number of words spoken by MP i during legislature l ; $Total\ victims_l$ and $Political\ victims_l$ are the number of total and political victims, respectively, in the twelve months leading up to the elections starting legislature l ; and $Left_{i,l}$ 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, α and β capture the effect of electoral violence on the willingness to talk about organized crime for MPs from other parties, whereas δ and ϕ represent the differential effect for MPs of the Left. According to Prediction P4, we thus expect $\beta < 0$ and $\phi < 0$.

Finally, according to Prediction P5 of our model, violence committed outside electoral periods should also discourage politicians from fighting the Mafia. To test this additional prediction, we will re-estimate equation (6.11) at the speech-level, regressing the occurrence of Mafia-related words over the total number of words spoken by a given MP in day t on the number of total and political victims, respectively, killed by the Mafia in the previous weeks.

6.2. Results

Columns (1)–(3) of Table 8 present estimates of equation (6.11), 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).

In columns (4)–(6) we re-estimate equation (6.11) 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 *Total victims* and *Political victims* are the number of total and political victims, respectively, killed by the Mafia in the previous two weeks.³³ 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 data set 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 *Total victims* and *Political victims* 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.³⁴

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

33. The results are qualitatively similar when considering smaller and larger time windows (one and three weeks, respectively); see Table D3 in the Appendix.

34. In Appendix Table D4 we look at the effects of electoral violence on the composition of appointed MPs—in terms of education, experience, gender, and age (we obtained these data from Merlo et al., 2010). We detect negative but very modest effects on MPs' experience and age, and no effects on educational attainment.

TABLE 8
Electoral violence and parliamentary debates about the mafia, 1948–2008

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

Notes: 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 *Total victims* and *Political victims* 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 *Total victims* and *Political victims* 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.

the national Parliament are discouraged from taking action against the Mafia. This latter finding also points at a signalling 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

Criminal organizations strategically use pre-electoral violence 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, we have shown that criminal organizations reduce the effort of the honest politicians in office.

We have focused on Italy and especially on the Sicilian Mafia, but our results do not seem to be specific to Italy. In Appendix 3, we show that the probability of deadly terrorist attacks against politicians increases during electoral periods in democracies with stronger criminal organizations compared to other countries. We plan to explore this line of research more in the future.

Appendix A: Proofs

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

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

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

$$b[1 - h(e_s^*, x)] - k(\hat{v}, w) = b[1 - h(e_w^*, x)] - k(v_w^*, w) \Leftrightarrow \\ \hat{v}(v_w^*) = v_w^* + b(1+x) \frac{\Delta}{s}.$$

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

$$\beta(v) = 1 \Leftrightarrow v \geq \hat{v}, \\ \beta(v) = 0 \Leftrightarrow v < \hat{v}.$$

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

$$\hat{v}(0) = \underline{v} \equiv b(1+x) \frac{\Delta}{s}.$$

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

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

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

The intuitively plausible PBE identified in Proposition 1 is not unique: many other separating equilibria exist. In fact, note that, for any equilibrium candidate such that $v_s^* > 0 = v_w^*$, incentive compatibility requires

$$\pi_s^* = b[1 - h(e_s^*, x)] - k(v_s^*, s) \geq b[1 - h(e_w^*, x)] \Leftrightarrow v_s^* \leq \bar{v}^* \equiv b(1+x) \frac{\Delta}{w},$$

for the strong type. And, equivalently,

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

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

The least-costly separating equilibrium (\underline{v}^*) is more appealing than the others—*i.e.*, any $v^* \in (\underline{v}^*, \bar{v}^*]$ —for two reasons. First, it maximizes the criminal organization's expected profit (which is immediate to verify). Secondly, 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, $\beta(v) = 1$ for some $v \neq v_s^*$ is compelling in the Cho-Kreps sense whenever

$$\pi_w^* > b[1 - h(e_s^*, x)] - k(v, w), \\ \pi_s^* \leq b[1 - h(e_s^*, x)] - k(v, s).$$

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

$$\pi_w^* \leq b[1 - h(e_s^*, x)] - k(v, w), \\ \pi_s^* > b[1 - h(e_s^*, x)] - k(v, s).$$

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 \mathcal{S} of separating equilibria, it can be shown that every $v_s^* > \underline{v}^*$ fails to satisfy its requirements except for the least-costly one. In fact, consider any $v \in [\underline{v}^*, v_s^*]$, so that $\beta(v) = 0$. First, note that $v \leq v_s^*$ implies

$$\pi_s^* = b[1 - h(e_s^*, x)] - k(v_s^*, s) \leq b[1 - h(e_s^*, x)] - k(v, s).$$

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

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

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

By construction, the least-separating equilibrium cannot be discarded by the Cho-Kreps intuitive criterion—*i.e.*, it survives the test. Indeed, at any $v < \underline{v}^*$, by incentive compatibility

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

and, by construction,

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

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

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

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

and

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

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

Consider now pooling equilibria such that the criminal organization always chooses v^* regardless of its type. In this case, honest politicians base their effort choice on the prior, that is, $\beta(v^*) = \beta$. Hence, the electoral effort chosen by the honest candidates in any of these (candidate) equilibria solves the following maximization problem

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

where

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

The solution for is:

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

In equilibrium we must have:

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

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

$$b[1 - h(e^*, x)] - k(v^*, w) \geq b[1 - h(e_w^*, x)] \Leftrightarrow v^* \leq \bar{v}^p \equiv \frac{b(1+x)\beta\Delta}{\beta s + (1 - \beta)w}. \quad (\text{A1})$$

This is because there cannot exist a pooling equilibrium such that $\beta(0) = 1$. Hence, $\beta(0) = 0$ in any pooling equilibrium. Condition (A1) 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, $\beta(v) = \beta$ whenever $v \geq v^*$, and $\beta(v) = 0$ otherwise. Under these beliefs, a strong organization never profits from revealing its type if the weak organization does not because for any $v^* \leq \bar{v}^p$ it must be

$$b[1 - h(e^*, x)] - k(v^*, s) > b[1 - h(e^*, x)] - k(v^*, w) \geq b[1 - h(e_w^*, x)],$$

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.³⁵ Let π_θ^p be type θ 's equilibrium expected profit in a pooling equilibrium. The idea is that since the pooling outcome is sustained by beliefs such that $\beta(v) > 0$ for every $v > v^*$, and the strong type has lower costs of violence, there always exists a $v' > v^*$ such that

$$\pi_s^p = b[1 - h(e^*, x)] - k(v^*, s) > b[1 - h(e_w^*, x)] - k(v', s),$$

$$\pi_w^p = b[1 - h(e^*, x)] - k(v^*, s) \leq b[1 - h(e_w^*, x)] - k(v', w),$$

but yet $1 - \beta(v') > 0$, 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. \parallel

Proof of Proposition 2 First, note that condition (3.2) can be rewritten as

$$\frac{1}{s} < \psi(\frac{1}{2} - x_i, x_i, 1) < \frac{1}{w}, \quad (\text{A2})$$

where

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

which is strictly decreasing in x_i for any $x_i \in [0, \frac{1}{2}]$. Hence, (A2) is satisfied only if s is not too small—that is, $\frac{1}{s} < \lim_{x_i \rightarrow 0} \frac{[\frac{1}{2} - x_i]^2}{2(1 + x_i)} = \frac{1}{8}$ —and if $x_i \in [\underline{x}, \bar{x}]$, with

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

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

Recall that, under assumption A2, the objective function of the criminal organization is separable across districts. Hence, focus (without loss of generality) on a generic district i , and assume that $x_i \in [\underline{x}, \bar{x}]$. 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 $v_{i,w}^* = 0$, so that $\pi_{i,w}^* = 0$. By contrast, the strong type can allow the corrupt party to win the election. Hence, its equilibrium profit is

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

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

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

which defines the set of separating equilibria

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

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

The least-costly separating equilibrium characterized in Proposition 2 not only maximizes the organization's expected profit, but it is also the only one that survives the Intuitive Criterion. To see why, consider any $v_{i,s}^* \in \mathcal{S}'$ strictly larger than \underline{v}^* , sustained by off-equilibrium beliefs such that $\beta(v) = 1$ for every $v \geq v_{i,s}^*$, and $\beta(v) = 0$ otherwise. Consider a deviation $v \in [\underline{v}^*, v_{i,s}^*]$. The following is true

$$\pi_{i,s}^* = \frac{b}{N} - k(v_{i,s}^*, s) \leq \frac{b}{N} - k(v, s),$$

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

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

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

35. 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, for example, Bolton and Dewatripont (2005, Ch. 3.1.).

By contrast, the least costly separating equilibrium is consistent with Cho-Kreps because, by incentive compatibility for every $v < \underline{v}^*$ it must be

$$\pi_{i,w}^* = 0 < \frac{b}{N} - k(v, w),$$

and, by construction,

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

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

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

$$\pi_{i,w}^* = 0 > \frac{b}{N} - k(v, w),$$

while, by construction,

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

Hence, $\beta(v) = 1$ for $v > \underline{v}^*$ 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. \parallel

Information externalities. Consider the most interesting case in which in both districts the c party can win if the criminal organization signals its type—that is, α_i that satisfies condition (3.2) for $i = 1, 2$. Clearly, when $\lambda_1 = \lambda_2 = 0$ the organization exerts the same level of violence in both districts—that is, $v_{i,s}^* = \frac{wb}{2}$ and $v_{i,w}^* = 0$. 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 v^* , only in district 1, in order to exploit the informational externality between districts while saving on the cost of signalling in district 2. In this case, the equilibrium expected payoff of the strong organization is

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

which does not induce mimicking by the weak type when

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

Restricting attention (as before) to the least-costly separating equilibrium—i.e., $v^* = \frac{bw}{2} (1 + \lambda_1)$ —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 signalling cost in district 1. ■

Proof of Proposition 3 As seen in the baseline model, the intuitively plausible PBE identified in Proposition 3 is not unique: many other separating equilibria exist. In fact, note that, for any equilibrium candidate such that $v_s^* > 0 = v_w^*$, incentive compatibility requires

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

$$v_s^* \leq \bar{v}^* \equiv \frac{b(1+x)\Delta}{w} + \eta \frac{(1+x) \left[\eta^2 (sw + s^2 + w^2) + \eta bsw(s+w) \right] + 2sw((s+w)(1+x) + swx)}{2w^3 s^2} \Delta$$

for the strong type. And, equivalently,

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

$$v_s^* \geq \underline{v}^* \equiv \frac{b(1+x)\Delta}{s} + \eta \frac{(1+x) \left[\eta^2 (sw + s^2 + w^2) + \eta bsw(s+w) \right] + 2sw((s+w)(1+x) + swx)}{2s^3 w^2} \Delta$$

for the weak type.

Notice that $\bar{v}^* > \underline{v}^*$ since $s > w$. Hence, \underline{v}^* identifies the least-costly separating equilibrium once we set

$$\xi \equiv \frac{(1+x) \left[\eta^2 (sw + s^2 + w^2) + \eta bsw(s+w) \right] + 2sw((s+w)(1+x) + swx)}{2s^3 w^2}.$$

One can find off-equilibrium beliefs that support any v_s^* such that $v_s^* \in \mathcal{S} \equiv [\underline{v}^*, \bar{v}^*]$. Essentially, this requires $\beta(v) = 1$ for every $v \geq v_s^*$, and $\beta(v) = 0$ 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). Secondly, it is the only one that meets the Cho and Kreps (1987) intuitive criterion. To see why, let $v_s^* > \underline{v}^*$ be the candidate equilibrium, and consider any $v \in [\underline{v}^*, v_s^*]$ such that $\beta(v) = 0$. By construction

$$\pi_s^* = b[1 - h(e_s^*, x)] - k(v_s^*, s) - h(e_s^*, x)a^*(s) \leq b[1 - h(e_s^*, x)] - k(v, s) - h(e_s^*, x)a^*(s).$$

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

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

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

By construction, the least-separating equilibrium cannot be discarded by the Cho-Kreps intuitive criterion—that is, it survives the test. Indeed, at any $v < \underline{v}^*$, incentive compatibility requires

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

and, by construction,

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

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

By the same token, for any $v > \bar{v}^*$, incentive compatibility implies that

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

and

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

for any $v > \bar{v}^*$, so that $\beta(v) = 1$ for $v > \bar{v}^*$ 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. \parallel

Proof of Proposition 4 First, note that condition (3.4) can be satisfied only if η is not too large—that is, if

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

Rewrite (3.4) as

$$\frac{1}{s} + \frac{\eta^2}{2s^2} < \psi(\tfrac{1}{2} - x_i, x_i, 1) < \frac{1}{w} + \frac{\eta^2}{2s^2} \quad (\text{A3})$$

where, as in the proof of Proposition 2,

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

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, equation (A2) can be satisfied only if s is not too small, that is

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

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

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

and \underline{x} being solution of

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

Recall that, under assumption A2, the objective function of the criminal organization is separable across districts. Hence, focus (without loss of generality) on a generic district i , and assume that $x_i \in [\underline{x}, \bar{x}]$. 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 $v_w^* = 0$, so that it makes no profit—that is,

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

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

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

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

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

implying that

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

This defines the set of separating equilibria.

As before, the off-equilibrium beliefs that support each of these equilibria are such that $\beta(v) = 1$ for every $v \geq v_s^*$, and $\beta(v) = 0$ otherwise. The least-costly separating equilibrium is such that $v_s^* = \frac{wb}{N} + \eta \frac{\Delta}{s}$; 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. \parallel

Appendix B: Lists of victims of the Sicilian Mafia

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

Appendix C: Electoral violence and organized crime across countries

We investigate the relationship between electoral violence and presence of criminal organizations exploiting rich data on terrorist attacks around the World from the Global Terrorist Database (GTD) and information on organized crime presence and election dates across countries.

The GTD is a comprehensive source covering about 170,000 terrorist attacks in 135 countries since 1970. It was initially started by researchers at Pinkerton Global Intelligence Services—mainly comprising retired military personnel—and is currently hosted at the University of Maryland. Using information from wire services, government reports, and major international newspapers, the GTD reports the location and date of each attack as well as the number of victims; importantly for our purposes, it distinguishes between politicians and other victims. Based on this information, we constructed a balanced panel of deadly attacks against politicians and non-politicians at the monthly-level. At least one deadly attack was reported in 10% of country-month observations, and at least one deadly attack against politicians in 4% of country-month observations.³⁶

Turning to organized crime, we exploit information from the Executive Opinion Survey, which is conducted annually by the World Economic Forum among business and political leaders.³⁷ Since 2006, the survey includes a question on the presence of criminal organizations: “In your country, to what extent does organized crime (mafia-oriented racketeering, extortion) impose costs on businesses? [1 = to a great extent; 7 = not at all].” We average this score across all waves of the survey (2006–2013) and reverse it to be increasing in the presence of organized crime—that is, equal to 1 (7) for countries that are least (most) affected.

36. The data are publicly available at <https://www.start.umd.edu/gtd/>, see [LaFree and Dugan \(2007\)](#) for a description of the project.

37. The reports, including a description of the survey and its results, are publicly available at <http://www.weforum.org/gc>.

TABLE C1
Electoral violence and organized crime across 125 countries, 1970–2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Attacks against politicians				Other terrorist attacks			
	All countries	Democr.	Non-demo.		All countries	Democr.	Non-demo.	
Organized crime	0.028*** (0.008)				0.053*** (0.013)			
Electoral period	−0.011 (0.009)	0.004 (0.041)	0.031 (0.045)	−0.111 (0.068)	0.006 (0.011)	−0.056 (0.057)	0.032 (0.058)	−0.336*** (0.097)
Electoral period × Organized crime	0.008* (0.005)	0.009** (0.005)	0.011** (0.005)	0.003 (0.009)	0.004 (0.005)	0.003 (0.004)	0.002 (0.004)	−0.004 (0.009)
Observations	67,250	58,371	31,130	24,932	67,250	58,371	31,130	24,932
Controls & FEs	NO	YES	YES	YES	NO	YES	YES	YES
R-squared	0.023	0.018	0.027	0.026	0.032	0.047	0.061	0.081

Notes: This table shows the differential effect of electoral cycles on homicides in countries higher and lower presence of organized crime, respectively. The dependent variable in columns (1)–(4) is a dummy for observing at least one terrorist attack against a politician in a given country and month, whereas the dependent variable in columns (5)–(8) is a dummy for observing at least one attack against any target. The explanatory variable *Electoral period* is equal to 1 in the 12 months up to an election, and *Organized crime* is the presence of criminal organizations in the country, as measured by the Executive Opinion Survey of the World Economic Forum. In columns (2)–(4) and (6)–(8), we also include country, year, and calendar month fixed effects, and additional control variables: logarithms of GDP per capita and population in each country and year, and their interactions with *Electoral period*. Columns (3) and (7) include in the sample only democratic countries while columns (4) and (8) include in the sample only non-democratic countries, as measured by the Polity IV score. Robust standard errors clustered by country are reported in parenthesis. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

The resulting sample after merging the two datasets covers 125 countries over the period 1970–2015. Using this information, we estimate the following equation:

$$Attacks_{c,t} = \alpha Electoral\ period_{c,t} + \beta (Electoral\ period_{c,t} * Organized\ crime_c) + \gamma' X_{c,t} + f_c + f_t + \varepsilon_{c,t}$$

where $Attacks_{c,t}$ is a dummy for having at least one terrorist attack in country c and month t ; $Organized\ crime_c$ is the presence of criminal organizations in country c ; $Electoral\ period_{c,t}$ is an indicator variable equal to 1 in the twelve months up to an election in country c ; the vector of control variables $X_{c,t}$ includes log GDP per capita and log population as well as their interaction with *Electoral period*; and f_c and f_t are country and month fixed effects, respectively.³⁸

The results are reported in Table C1. The baseline specification in column (1) confirms that, during electoral periods, the risk of attacks against politicians increases relatively more in countries with higher presence of criminal organizations. This finding is robust to controlling for additional covariates as well for country and time fixed effects (column 2). According to these estimates, an increase in the presence of organized crime corresponding to the interquartile range of our cross-country measure—corresponding to the change from U.K. to Serbia—would increase the probability of observing (at least) one attack against politicians by 15.5 percentage points over the entire electoral year, or a doubling of the baseline probability across country-year observations (17%).

Interestingly, this sizable effect is entirely driven by democratic countries featuring open and free elections, as measured by the Polity IV index; see column (3). By contrast, there is no significant effect in non-democratic countries (column 4).³⁹ Also, we do not detect any spike in terrorist attacks not targeting politicians (columns 5–8).

Overall, these findings dovetail nicely with the evidence across Italian regions: organized crime increases violence against politicians during electoral periods, but only in democratic regimes with free and open elections.

38. Differently from regression (4.6) across Italian regions, *Electoral period* is not absorbed by year fixed effects, because electoral cycles are not synchronized across countries.

39. Following the guidelines of the Polity Project, countries are classified as democratic when they score above 5 on a scale of −10 to 10.

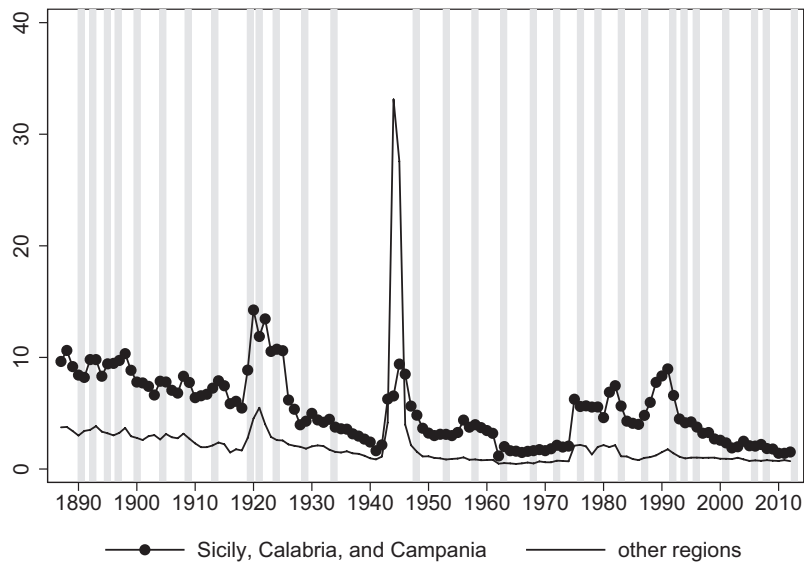


FIGURE D1

Homicide rates in regions with and without an historical presence of criminal organizations, 1887–2012

Notes: 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. Shaded areas correspond to electoral periods.

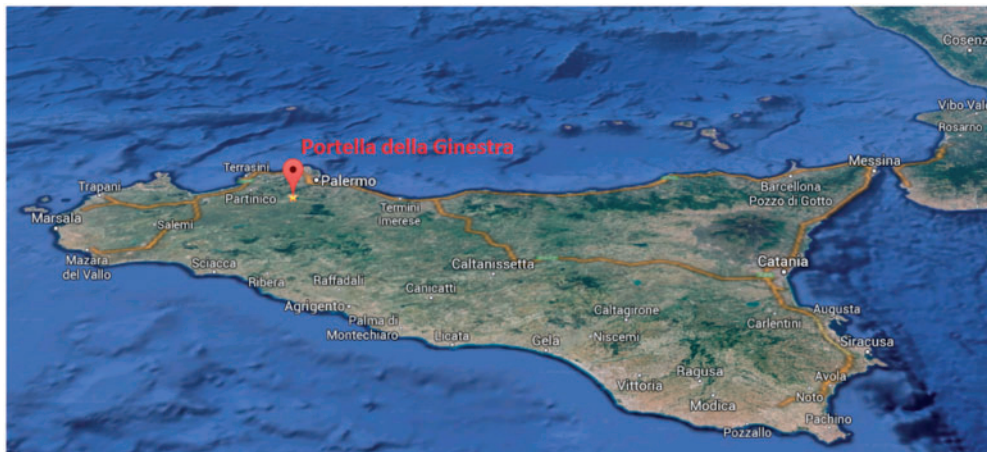


FIGURE D2

The Massacre of Portella della Ginestra

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



FIGURE D3

Administrative borders of Italian provinces and regions

TABLE D1

Judicial investigations against Italian MPs for membership in criminal organizations and related crimes, 1948–93

	(1)	(2)	(3)	(4)	(5)	(6)
	Organized crime (Article 416-bis)		Criminal association (Article 416)		Malfeasance (corruption, abuse)	
Organized crime	0.009*** (0.003)		0.029*** (0.008)		0.032*** (0.009)	
Left	−0.001* (0.001)	−0.001 (0.001)	−0.007* (0.004)	−0.002 (0.004)	−0.019*** (0.004)	−0.015*** (0.004)
Left × Organized crime	−0.009*** (0.003)	−0.009*** (0.003)	−0.021* (0.011)	−0.024** (0.011)	−0.024** (0.011)	−0.027** (0.011)
Constant	0.001* (0.001)	0.001** (0.000)	0.021*** (0.003)	0.012** (0.005)	0.032*** (0.003)	0.009*** (0.003)
Observations	6,043	6,033	6,043	6,033	6,043	6,033
Region FE	NO	YES	NO	YES	NO	YES
Legislature FE	NO	YES	NO	YES	NO	YES
R-squared	0.006	0.014	0.006	0.045	0.009	0.056

Notes: 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* 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 1948–93. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

TABLE D2
Other crimes across Italian regions during electoral periods

	(1)	(2)	(3)	(4)	(5)	(6)
	Theft	Rob	Ext	Kidnap	Drug	Total
Electoral period \times Organized crime	29.294 (53.977) [0.632]	−0.011 (8.715) [0.999]	0.299 (0.289) [0.338]	0.258 (0.265) [0.453]	−0.303 (4.430) [0.949]	−3.062 (89.320) [0.981]
Observations	896	592	592	592	592	896
R-squared	0.824	0.479	0.719	0.802	0.826	0.863

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

TABLE D3
Electoral violence and parliamentary debates about the Mafia (robustness)

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

Note: This table shows the effect of electoral violence by the Mafia on parliamentary speeches by MPs appointed in Sicily since 1948. The main dependent variable is the occurrence of Mafia-related words (“Mafia”, “Camorra”, “Ndrangheta”, and “Cosa Nostra”) per 1,000 words spoken by each MP. The unit of observation is the MP-speech and the main explanatory variables *Total victims* and *Political victims* 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. Robust standard errors clustered by MP are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

TABLE D4
Electoral violence and characteristics of appointed politicians

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Education (college=1)		Experience		Gender (female=1)		Age	
Total victims before elections	−0.001 (0.003)	0.000 (0.003)	0.012 (0.046)	0.002 (0.052)	0.001 (0.001)	0.000 (0.001)	0.100 (0.070)	0.139* (0.073)
Political victims before elections	−0.002 (0.010)	0.003 (0.011)	−0.505*** (0.114)	−0.558*** (0.137)	−0.005 (0.005)	−0.002 (0.005)	−0.581*** (0.220)	−0.718*** (0.234)
Left		−0.130** (0.063)		−3.460*** (0.605)		0.042 (0.027)		−3.896*** (1.346)
Left X Total victims		−0.009 (0.007)		0.002 (0.068)		0.003 (0.004)		−0.268* (0.160)
Left X Political victims		−0.018 (0.026)		0.239 (0.181)		−0.014 (0.012)		0.682 (0.554)
Constant	0.762*** (0.033)	0.805*** (0.038)	6.736*** (0.384)	7.804*** (0.449)	0.037*** (0.012)	0.024* (0.013)	49.123*** (0.713)	50.370*** (0.864)
Observations	655	655	655	655	655	655	655	655
R-squared	0.001	0.056	0.036	0.093	0.002	0.017	0.011	0.065

Notes: This table shows the effect of electoral violence by the Mafia on the selection of MPs appointed in Sicily since 1948 – in terms of education, experience, gender, and age. In particular, we regress the characteristics of each MP in a given legislature (indicated on top of each column) on *Total victims* and *Political victims*—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. Robust standard errors clustered by MP are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence levels, respectively.

Appendix D: Additional figures and tables

Acknowledgments. We thank the Editor (Uta Schoenberg) and four anonymous referees for excellent comments. For useful suggestions we are also grateful to Ylenia Brilli, Paolo Buonanno, Ernesto Dal Bo, Melissa Dell, Rafael Di Tella, Claudio Ferraz, Jeggrey Frieden, Nicola Gennaioli, Gulen Karakoc, Armando Miano, Luisa Patruno, Aldo Pignataro, Shanker Satyanath, Andrei Shleifer, Francesco Sobbrino, Guido Tabellini, and seminar participants at Harvard, Boston University, NBER, Barcelona GSE Summer Forum, Bocconi, Universitat de Barcelona, EEA-ESEM, Toulouse, Paris School of Economics, Transatlantic Workshop on the Economics of Crime, Workshop on Economics of Crime and Conflict in Bergamo, and Political Economy of Conflict and Development in Villars. Gabriele Borg, Elisa Facchetti, Armando Miano, Giorgio Pietrabissa, and Benjamin Villanyi provided excellent research assistance. Donna Zerwitt edited the manuscript with her usual great touch. We gratefully acknowledge financial support from MIUR under the PRIN Grant 2015TPM9, and from the Albertini family, Unicredit and Universities Foundation, and Einaudi Institute for Economics and Finance.

Supplementary Data

Supplementary data are available at *Review of Economic Studies* online.

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