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Abstract

We study the impact of organized crime on electoral competition. Assuming that the mafia is able to bring votes to the supported party in exchange of money, we show that (i) the strongest party is willing to pay the highest price to secure mafia services; (ii) the volume of electoral trade with the mafia increases with political competition and with the efficiency of the mafia.

Studying in detail parliamentary elections in Sicily for the period 1946-1992, we document the significant support given by the Sicilian Mafia to the Christian Democratic party, starting at least from the 1970s. This is consistent with our theoretical predictions, as political competition became much tighter during the 1970s and the Sicilian mafia experienced an extensive centralization process towards the end of the 1960s, which increased substantially its control of the territory. We also provide evidence that in exchange for its electoral support the mafia got economic advantages for its activities in the construction industry.

Keywords: electoral competition, mafia, Cosa Nostra, electoral fraud

JEL Classification: D72, K42, H42

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Politics and mafia are both powers which draw life from the control of the same territory; so they either wage war or come to some form of agreement.

Paolo Borsellino¹

1 Introduction

Organized crime is detrimental to the functioning of a society. Its negative impact on growth and economic activity is established in several recent studies (Dixit, 2004; Pinotti, 2012; Daniele and Marani, 2011; Albanese and Marinelli, 2013). The negative impact of organized crime is however not confined to the economy. One of the main features of mafias around the world is their relationship with the political power. The strong control of the territory achieved through the use of violence also challenges the functioning of democratic political institutions. For instance, criminal organization can directly influence policymakers with bribes and violent threats to obtain policies favorable to their business or looser judicial prosecution. This has been the case in Colombia during the Medellin cartel and it is arguably occurring currently in Mexico and Brazil (Dal Bó et al., 2006). The relationship between Mafia and democracy is paradoxical because on one side its presence weakens the democratic institutions but on the other side it exploits the spaces of democratic freedoms to strengthen its presence and weave the web of relationships with the political power (Allum and Siebert, 2003). The development of mafia in transition economies exemplifies this nexus: organized crime exploits the spaces opened by the lift of totalitarian control on political institutions as well as the inability of the transition countries to have strong institutions and rule of the law (Varese, 2001).

This paper addresses a far-reaching impact of organized crime: its intrusion into the electoral process, the very heart of democratic institutions. In his seminal work on organized crime, Gambetta (1993) points out how well-rooted criminal organizations using violence to control the territory find themselves in an ideal position to sell its services to politicians. Indeed, the tight hold of the territory enables an effective control on a consistent package of votes. In the words of Abadinsky (2012, p.116), “the mafia is able to control votes because in the environment in which it operates there is always fear of

¹Judge Paolo Borsellino has been on the frontline in the fight against mafia in 1980s. He was killed in a car bomb attack in Palermo on 19 July 1992, few months after his colleague Judge G. Falcone. This quote is taken from Abbate and Gomez (2007, p.36).

reprisals. Intimidations, surveillance of polling places, and sometimes rigged elections guarantee an outcome favourable to Mafia”.

Beyond the rhetoric adopted by politicians, when elections approach there is a strong incentive for parties to negotiate with organized crime to secure its electoral support. A conversation between the President of the parliamentary commission on mafia and the former *mafioso* Leonardo Messina well exemplifies the behavior of politicians with respect to organized crime (Commissione parlamentare di inchiesta sul fenomeno della mafia e sulle associazioni criminali similari, 1992, p.552):

Mr. Messina. *Usually, in public speeches, every politician claims to be against the mafia; you need to see what he actually does and the part he has to play. In Sicily, anyone who gets on the stage is against the mafia.*

President. *As for the last point, is this something that worries you?*

Mr. Messina. *No, it doesn't. The whole thing is a farce!*

There is a large body of anecdotal evidence, court cases, political investigations and press inquiries about the alleged existence of such underground electoral deals. Existing material, however, falls short of empirical investigation, as well as of a theoretical model explaining this relationship.

This leads to the contribution of this study. We examine the impact of organized crime on both electoral competition and electoral outcomes. Our contribution is both theoretical and empirical. First, to the best of our knowledge this is the first study formally analyzing parties' electoral competition in the presence of organized crime. Secondly, guided by our theoretical framework, we study in detail post-WWII (1946 - 1992) national elections in Sicily, and document the support to the Christian Democratic party provided by one of the most notorious criminal organization, the Sicilian mafia.

On the theory side, we highlight several interesting aspects of electoral competition in the presence of organized crime. First, we show that the infiltration of organized crime in elections negatively affects the welfare of voters and of *all* parties. Indeed, all parties would prefer fair electoral competition. The very presence of organized crime, however, creates a trap: parties are induced to compete for securing the backing of it by the fear of losing its consistent share of votes to their competitors. Second, the party gaining the support of organized crime increases its vote share, thereby manipulating the electoral outcome. Third, the electoral services of organized crime become more substantial (*i*) when its control is more effective, and (*ii*) when electoral competition increases. Finally,

we show that the electoral services provided by criminal organizations are more likely to be adopted by the strongest political party.

Moving to our empirical analysis, we provide evidence of an electoral support of the mafia to the Christian Democratic party (DC), the strongest party in post-war Italy: DC systematically captured more votes in Sicilian municipalities in which the mafia was operating. Interestingly, and in line with our theory, the evidence of the electoral deal with the mafia emerges in the 1970s, when electoral competition in Italy became stronger and the mafia assumed a more centralized structure, which reinforced the cartel of mafia families, reduced the conflicts between and inside families, and made the grasp of territory more efficient.

The magnitude of the impact is far from negligible: the Christian Democratic party gained between 3 and 8 percentage points on average in mafia-ridden municipalities after 1970 only.

As for the return of its electoral services, we provide evidence that in exchange for its support the mafia got economic advantages for its activities in the construction industry. We show in fact that the share of workers in the construction sector was significantly larger in mafia ridden municipalities than in the rest of Sicily.

This paper speaks to three broad strands of research. First, it contributes to the theoretical literature on electoral competition in the presence of special interests groups. The vast majority of this literature considers politicians as auctioneers receiving bribes proposals from different interest groups, and influencing policies according to the preferences of the highest bidder (e.g., Baron, 1994; Grossman and Helpman, 1994, 2001; Groseclose and Snyder, 1996). Hence, politicians extract the maximal rent from special interests groups. With respect to this literature, we show that when elections take place in the presence of organized crime the roles are reversed: it is the criminal organization, notably a set of individuals living outside the law and inflicting costs to the society, which can extract the maximal rent from politicians in exchange for votes. In fact organized crime acts as a monopolist on its territory and competition occurs between buyers, i.e. the political parties, of its services.

Second, we contribute to the literature on electoral fraud and vote coercion. The literature on electoral fraud has been recently reviewed by Lehoucq (2003). We shed new light on a specific sort of electoral fraud, relatively neglected so far: vote coercion by criminal organizations. Two recent papers addressing vote coercion are close to ours along several aspects. First, Baland and Robinson (2008) show how landlords were able to influence electoral outcomes by inducing their tenants to vote for one of the parties. In

their model, since landlords could monitor the voting behavior of their workers, parties bought preferably those “controllable” voters. In the same vein, in our model parties buy votes from the criminal organization as it controls votes. The second paper by (Acemoglu et al., 2013) explores the impact of the presence of non-state armed groups on electoral outcomes in Colombia, and shows that paramilitaries were delivering votes to candidates whose preferences are close to theirs. In this paper, we show that a analogous electoral deal can subsist even with a openly criminal organization, as the Sicilian mafia, and that a similar logic also applies to a mature democracy in which blatant electoral frauds are more difficult to implement.

Finally, this work extends the recent literature on the economics of organized crime. Beside the studies assessing the cost of organized crime mentioned above, the economic literature has investigated mainly its origins. Dixit (2004) investigated the emergence of extralegal arrangements and organizations in the absence of formal institutions (or when they are weak) and laws are difficult to enforce. Coordination problems arising in a lawless society from the possibility of cheating on agreements can be potentially alleviated either internally or with the emergence of a third party which is able to enforce the agreements and to reduce cheating behavior. Sometimes this role is taken by criminal organizations which use violence as their main feature (Gambetta, 1993; Franchetti, 1877). Other recent studies identifies peculiar conditions which favored the emergence of Sicilian mafia: land fragmentation (Bandiera, 2003), high land productivity and sulfur production (Del Monte and Pennacchio, 2012; Buonanno et al., 2012), and citrus production (Dimico et al., 2012) have all been identified as features which increased the demand for the private protection offered by the mafia.

The rest of the paper is organized as follows: in the next section we present our theoretical framework, then we provide the necessary background on Italian political competition and the Sicilian mafia, followed by the description of the data and the empirical results.

2 Theoretical Framework

We first set up a simple model of electoral competition. After solving the benchmark model, we study the change in our results in the presence of a mafia organization. A political system features two parties (party *A* and party *B*) who compete in a campaign game to win the support of the electorate under a proportional system. Parties compete on

the political arena to win the elections, characterized by proportional rule. The probability for the party to form the government is given by the share of votes gained in the elections (Austen-Smith, 2000; Baron and Diermeier, 2001). The electorate is divided into three groups: the supporters of party A , y_A , the supporters of party B , y_B and the swing voters $(1 - y_A - y_B)$ who are characterized by heterogeneous political preferences assumed to be uniformly distributed between 0 and 1. The two political parties (or coalitions) are assumed to be located at the extremes of the Hotelling line; party A at zero and party B at 1. The supporters of party $i = A, B$ gain utility r from voting their own party, while a voter located at x belonging to the rest of the population gains a utility of $r - x$ when voting for party A and $r - (1 - x)$ when voting for party B .²

2.1 Campaign competition between parties

Parties compete in binding promises about the provision of some public good in order to gain support among voters. Identifying with G the rent of being in office, the parties compete in promises to use a certain amount of these resources, p_i (with $i = A, B$), for public good provision.

So the expected rent of participating in the campaign competition is given by the residual rent parties gain if they form the government times the probability of forming the government, that is by the share of votes obtained. The latter is given by the sum of the votes of their supporters plus the share of the swing voters whose support they gain in the campaign competition. Formally, the expected rents for the two parties are as follows:

$$U_A = (G - p_A) \left(y_A + \frac{1}{2}(1 + p_A - p_B)(1 - y_A - y_B) \right) \quad (1)$$

$$U_B = (G - p_B) \left(y_B + \frac{1}{2}(1 + p_B - p_A)(1 - y_A - y_B) \right) \quad (2)$$

where, under the assumption of uniform distribution of political preferences, $\frac{1}{2}(1 + p_A - p_B)$ is the share of swing voters preferring (and voting) party A and $\frac{1}{2}(1 + p_B - p_A)$ is the share of swing voters supporting party B . Finally, $(1 - y_A - y_B)$ is the share of swing voters in the electorate.

The reaction functions of the two parties can be obtained from the first order conditions of expected rent maximization.

²We assume that r is large enough so that there is full turnout.

For party A the first order condition is:

$$\frac{\partial U_A}{\partial p_A} = (G - p_A)(1 - y_A - y_B) - 2y_A - (1 + p_A - p_B)(1 - y_A - y_B) = 0$$

and the reaction function is:³

$$p_A(p_B) = \frac{G - 1}{2} + \frac{p_B}{2} - \frac{y_A}{1 - y_A - y_B}$$

Notice that the larger the share of own supporters, the smaller the public good provision the party is willing to promise. This is due to U_A being submodular in y_A and p_A .⁴

$$\frac{\partial U_A}{\partial p_A \partial y_A} = -(G - p_A) - (1 - p_A + p_B) < 0.$$

For party B the first order condition is:

$$\frac{\partial U_B}{\partial p_B} = (G - p_B)(1 - y_A - y_B) - 2y_B - (1 - p_A + p_B)(1 - y_A - y_B) = 0$$

and the reaction function is:⁵

$$p_B(p_A) = \frac{G - 1}{2} + \frac{p_A}{2} - \frac{y_B}{1 - y_A - y_B}$$

The campaign competition equilibrium is defined by the two campaign promises of public good provision:

$$p_A^* = G - \frac{3 + y_A - y_B}{3(1 - y_A - y_B)} \quad (3)$$

$$p_B^* = G - \frac{3 - y_A + y_B}{3(1 - y_A - y_B)} \quad (4)$$

Notice that the party with a larger share of core supporters will promise lower public good provision. In other words, the stronger the unconditional support in the electorate, the larger the expected rents from office for a party. The percentage of swing voters

³The expected rent is strictly concave because $\frac{\partial^2 U_A}{\partial p_A^2} = -(1 - y_A - y_B) < 0$ and the second order condition is always met.

⁴For a definition of sub modularity see Amir (2005).

⁵As for party A , the expected rent of party B is strictly concave and submodular in y_B and p_B .

supporting party A is:

$$x^* = \frac{1}{2} - \frac{y_A - y_B}{3(1 - y_A - y_B)} \quad (5)$$

and the total share of votes for party A is:

$$s_A = y_A + x^*(1 - y_A - y_B). \quad (6)$$

We can compute the expected level of public good provision, equal to the sum of the public good expenditure promised by the two parties weighted by their probabilities of forming the government.

$$\begin{aligned} E[p] &= s_A p_A^* + (1 - s_A) p_B^* \\ &= G - \frac{3 - y_A + y_B}{3(1 - y_A - y_B)} - \frac{(y_A - y_B)(3 + y_A - y_B)}{9(1 - y_A - y_B)} \end{aligned} \quad (7)$$

The expected rents for the two parties are:

$$U_A^* = \frac{(3 + y_A - y_B)^2}{18(1 - y_A - y_B)} \quad (8)$$

$$U_B^* = \frac{(3 - y_A + y_B)^2}{18(1 - y_A - y_B)} \quad (9)$$

Intuitively, the expected rents for parties are increasing in the share of their core supporters and decreasing in the share of their competitor's core supporters. Moreover, both parties' rents negatively depend on the share of swing voters, as they have to compete in public good provision to convince those voters and so they are willing to spend more when they are a large fraction of the electorate.

2.2 Competition in the market for votes when mafia is available

In areas where organized crime has a firm control of the territory, a further alternative is available to parties. They can buy votes from the mafia which we assume is able to "convince" voters to support that specific party. There are several reasons to believe that a criminal organization, with a network of members infiltrated in the social and economic fabric of the territory, and using violence to affirm their power may shift votes to the supported party. As Gambetta (1993) highlighted, the market for votes with its problems

of verification and trust on both the buyer and seller side, is an ideal setting for mafia operations. Of course the level of electoral manipulation depends on the strength of its control on the territory, whether this control is unchallenged and on the size of the whole organization.

We model the interaction between the political parties and this intermediary in the market for votes as a four-stage game of perfect information where in the first stage the two political parties compete for mafia services by offering a price per vote m_i with $i = A, B$. In the second stage the criminal organization chooses the party to support by picking the most profitable offer. The third stage is the campaign competition which is played as explained in the previous section, while in the fourth stage the mafia chooses the amount of voters to persuade to switch their votes away from the other party and in favor of the party supported by the mafia. This activity is costly for the mafia which will choose the number of voters optimally (i.e., maximizing its profits). We look for the subgame-perfect equilibrium and solve the game by backward induction.⁶

Starting from the fourth stage, the mafia maximizes its profits by choosing the optimal quantity of votes to switch, given the price offered by the party winning the competition in the first stage. Assuming a quadratic cost function for the mafia, its profits are defined by:

$$\begin{aligned}\Pi_M &= m_i y_M - \frac{y_M^2}{2e} \\ \frac{\partial \Pi_M}{\partial y_M} &= m_i - \frac{y_M}{e} = 0 \\ y_M^* &= e m_i\end{aligned}$$

where m_i is the price per vote offered by party i , y_M are the votes controlled by the mafia to the advantage of party i , and e is an efficiency measure of the mafia organization. The higher the efficiency, the larger the number of votes provided by the mafia for any given price per vote paid by the political party.

In the third stage, there are two scenarios: one in which the criminal organization is working for party A , and the other where it supports party B .

⁶We assume voters' political preferences to be public knowledge. Relaxing this assumption produces qualitatively identical results, but unnecessarily complicates the algebra, making the interpretation of the close form solutions less accessible.

When mafia supports party A the rent functions of the two parties are:

$$U_A = (G - p_A) \left(y_A + y_M^* + \frac{1}{2}(1 + p_A - p_B)(1 - y_A - y_B) \right) - m_A y_M^*$$

$$U_B = (G - p_B) \left(y_B - y_M^* + \frac{1}{2}(1 + p_B - p_A)(1 - y_A - y_B) \right)$$

From the first order condition of expected rent maximization we obtain the reaction functions of the two parties:

$$p_A(p_B) = \frac{G - 1}{2} + \frac{p_B}{2} - \frac{y_A + y_M^*}{1 - y_A - y_B}$$

$$p_B(p_A) = \frac{G - 1}{2} + \frac{p_A}{2} - \frac{y_B - y_M^*}{1 - y_A - y_B}$$

The equilibrium public good provision promises are therefore given by:

$$p_A^{M^*} = G - \frac{3 + y_A - y_B + 2y_M^*}{3(1 - y_A - y_B)}$$

$$p_B^* = G - \frac{3 - y_A + y_B - 2y_M^*}{3(1 - y_A - y_B)}$$

where the superscript M indicates the party supported by the mafia.

Suppose now that the mafia supports party B . The rents of the two parties become:

$$U_A = (G - p_A) \left(y_A - y_M^* + \frac{1}{2}(1 + p_A - p_B)(1 - y_A - y_B) \right)$$

$$U_B = (G - p_B) \left(y_B + y_M^* + \frac{1}{2}(1 + p_B - p_A)(1 - y_A - y_B) \right) - m_B y_M^*$$

The reaction functions of the two parties are:

$$p_A(p_B) = \frac{G - 1}{2} + \frac{p_B}{2} - \frac{y_A - y_M^*}{1 - y_A - y_B}$$

$$p_B(p_A) = \frac{G - 1}{2} + \frac{p_A}{2} - \frac{y_B + y_M^*}{1 - y_A - y_B}$$

and the equilibrium campaign expenditures are given by:

$$p_A^* = G - \frac{3 + y_A - y_B - 2y_M^*}{3(1 - y_A - y_B)}$$

$$p_B^{M^*} = G - \frac{3 - y_A + y_B + 2y_M^*}{3(1 - y_A - y_B)}$$

In the second stage the mafia chooses the best of the offers made by the two parties. The party with the highest price per vote wins the competition.

Moving to the first stage, the parties choose the price per vote offered to the mafia. Substituting the equilibrium values of the campaign competition strategies and the optimizing behavior of the mafia in the expected utilities of party A we get:

$$V_A^M = \frac{4e^2m_A^2 + (3 + y_A - y_B)^2 + 4em_A(3 + y_A - y_B)}{18(1 - y_A - y_B)} - em_A^2 \quad (10)$$

$$V_A = \frac{(3 - 2em_B + y_A - y_B)^2}{18(1 - y_A - y_B)} \quad (11)$$

where V_A^M is the expected rent of winning the competition for mafia support by offering the price m_A , while V_A is the expected rent of losing the competition when the other party offers m_B to the mafia.

Similarly, we derive the expected utilities of party B :

$$V_B^M = \frac{4e^2m_B^2 + (3 - y_A + y_B)^2 + 4em_B(3 - y_A + y_B)}{18(1 - y_A - y_B)} - em_B^2 \quad (12)$$

$$V_B = \frac{(3 - 2em_A - y_A + y_B)^2}{18(1 - y_A - y_B)} \quad (13)$$

where, as before, V_B^M is the expected rent of winning mafia support offering m_B and V_B is the expected rent of losing the competition when party A offers m_A to the mafia.

Competition in stage 1 is a Bertrand competition where the two parties try to outbid the rival by offering a higher price for securing the mafia support. There is an upper limit, however, to the price offered by parties. In fact, by comparing V_i^M and V_i with $i = A, B$ with $m_A = m_B = m$ we can show that

$$V_A^M \geq V_A \text{ if } m \in \left[0, \frac{4(3 + y_A - y_B)}{9(1 - y_A - y_B)} \right]$$

and

$$V_B^M \geq V_B \text{ if } m \in \left[0, \frac{4(3 - y_A + y_B)}{9(1 - y_A - y_B)}\right]$$

When the price offered exceeds the upper bound of this set, party A prefers to lose the backing of the mafia to its rival.

However, there is also a minimum price the parties are willing to pay to the mafia. In fact, when the rival offers a very low price, each party can do better than just outbid the rival. Given that the price offered also determines the quantity of votes switched by the mafia, each party as an optimal (minimum) price which maximize their expected rent when they are unconstrained by the rival party; we could call this the monopsonist price. This minimum prices for the two parties are:

$$\underline{m}_A = \frac{3 + y_A - y_B}{9(1 - y_A - y_B) - 2e} \quad (14)$$

$$\underline{m}_B = \frac{3 - y_A + y_B}{9(1 - y_A - y_B) - 2e} \quad (15)$$

The reaction function of party A can therefore be defined as:

$$\hat{m}_A(m_B) = \min \left\{ \max \{ \underline{m}_A, m_B + \epsilon \}, \frac{4(3 + y_A - y_B)}{9(1 - y_A - y_B)} \right\} \quad (16)$$

Party B 's reaction function is instead:

$$\hat{m}_B(m_A) = \min \left\{ \max \{ \underline{m}_B, m_A + \epsilon \}, \frac{4(3 - y_A + y_B)}{9(1 - y_A - y_B)} \right\} \quad (17)$$

The following proposition highlights our first result concerning the first stage of the game.

Proposition 1. *The party with the largest share of core supporters always wins the competition to secure the backing of the mafia.*

Proof. By comparing the largest offer the two parties are willing to make as summarized in the equations of the two reaction functions (16) and (17), whenever $y_i > y_j$ party i has the highest evaluation of mafia service and is willing to outbid the rival party j . \square

The intuition of the result is quite straightforward. Since the party with the largest share of supporters chooses a lower electoral promise, its marginal rent is larger than the rival's and is therefore willing to pay a higher price to the mafia for each vote.

Under the assumption that party A has a larger share of supporters we can compute the equilibrium choices in all the stages of the game and the expected rent of the two parties. In the first stage, the equilibrium can be defined as follows:⁷

$$m_A^* = \frac{4(3 - y_A + y_B)}{9(1 - y_A - y_B)}$$

$$m_B^* = \epsilon, \text{ with } \epsilon \in (0, \frac{4(3 - y_A + y_B)}{9(1 - y_A - y_B)})$$

In the second stage the mafia chooses to support party A who made the highest bid in the first stage.

In the third stage of the game the two parties set the following promises of public good provision:

$$p_A^{**} = G - \frac{3 + y_A - y_B}{3(1 - y_A - y_B)} - \frac{2y_M}{3(1 - y_A - y_B)} = p_A^* - \frac{2y_M}{3(1 - y_A - y_B)} \quad (18)$$

$$p_B^{**} = G - \frac{3 - y_A + y_B}{3(1 - y_A - y_B)} + \frac{2y_M}{3(1 - y_A - y_B)} = p_B^* + \frac{2y_M}{3(1 - y_A - y_B)} \quad (19)$$

where p_A^* and p_B^* are the equilibrium value in the competition without the mafia analyzed in section 2.1.

The share of swing voters preferring party A is:

$$x^{**} = \frac{1}{2} - \frac{y_A - y_B}{3(1 - y_A - y_B)} - \frac{2y_M}{3(1 - y_A - y_B)} \quad (20)$$

$$= x^* - \frac{2y_M}{3(1 - y_A - y_B)}$$

where x^* is the share of swing voters voting for party A when the mafia is not available as defined in equation (5).

Finally, in the fourth stage of the game the mafia chooses the optimal share of party B 's voters to convince to switch to party A :⁸

$$y_M^* = \frac{4(3 - y_A + y_B)e}{9(1 - y_A - y_B)} \quad (21)$$

⁷The proof is a straightforward application of the Bertrand competition solution.

⁸Here we are assuming that the mafia is able to identify both supporters of party B and swing voters convinced by party B 's campaign, and to convince y_M^* of them to vote for party A instead. So there is an upper limit to the share of voters that the mafia can switch, which is given by $y_B + x^{**}(1 - y_A - y_B)$.

As it is clear from equation (20), the fraction of swing voters choosing the party supported by the mafia is smaller than without mafia. The overall effect of mafia availability on the total share of votes gained by the supported party is summarized in the following Proposition.

Proposition 2. *The support of the mafia increases supported party's share of votes.*

Proof. The total share of votes gained by party A when mafia support is available is equal to

$$s_A^M = y_A + y_M^* + x^{**}(1 - y_A - y_B).$$

By substituting the equation (20) in the previous expression we get

$$\begin{aligned} s_A^M &= y_A + y_M^* + x^*(1 - y_A - y_B) - \frac{2y_M^*}{3(1 - y_A - y_B)}(1 - y_A - y_B) \quad (22) \\ &= y_A + x^*(1 - y_A - y_B) + \frac{1}{3}y_M^* > y_A + x^*(1 - y_A - y_B) = s_A \end{aligned}$$

where s_A , defined in equation (6), is the share of votes gained by party A when mafia support is not available. \square

Interestingly, the increase in the vote share of the party supported by the mafia does not imply an increase in the rent of that party. The following proposition summarizes the impact of the electoral involvement of the mafia on players' utilities.

Proposition 3. *The availability of mafia in the electoral market lowers the expected rent of both parties and voters.*

Proof. First we show that the expected rent of the two parties is lower when the mafia is available (as defined by equations 10 for party A and 13 for party B) than without the mafia (equations 8 and 9 for party A and B respectively).

For party B the comparison is straightforward since

$$V_B = \frac{(3 - 2em_A^* - y_A + y_B)^2}{18(1 - y_A - y_B)} < \frac{(3 - y_A + y_B)^2}{18(1 - y_A - y_B)} = U_B^*$$

For party A , rearranging equation (10) we have that

$$\begin{aligned} V_A^M &= \frac{(3 + y_A - y_B)^2}{18(1 - y_A - y_B)} + 4em_A^* \frac{em_A^* + 3 + y_A - y_B - \frac{9}{2}m_A^*(1 - y_A - y_B)}{18(1 - y_A - y_B)} \\ &= U_A^* + 4em_A^* \frac{em_A^* + 3 + y_A - y_B - \frac{9}{2}m_A^*(1 - y_A - y_B)}{18(1 - y_A - y_B)} \end{aligned}$$

Therefore, to show that $V_A^M < U_A^*$, it is enough to show that

$$em_A^* + 3 + y_A - y_B - \frac{9}{2}m_A^*(1 - y_A - y_B) < 0$$

Since $y_M^* = em_A^*$ and the value of m_A^* is defined in equation (18), we can rewrite the previous expression as follows:

$$\begin{aligned} y_M^* + 3 + y_A - y_B - 2(3 - y_A - y_B) &< 0 \\ y_M^* &< 3(1 - y_A + y_B) \end{aligned}$$

But since y_M^* can never be larger than the largest possible share of votes for party B , that is $y_B + (1 - y_A)$, it follows that

$$y_M^* \leq 1 - y_A + y_B < 3(1 - y_A + y_B)$$

which is enough to show that

$$V_A^M = U_A^* + 4em_A^* \frac{em_A^* + 3 + y_A - y_B - 9/2m_A^*(1 - y_A - y_B)}{18(1 - y_A - y_B)} < U_A^*.$$

As for the utility of voters, notice first that it monotonically increases in the amount of expected public good provision. Recall that the expected level of public good provision is given by the weighted sum of the promises made by the two parties where the shares of votes are the weights, which is:

$$\begin{aligned} E[p^M] &= s_A^M p_A^{**} + (1 - s_A^M) p_B^{**} \\ &= \left(s_A + \frac{y_M^*}{3} \right) \left(p_A^* - \frac{2y_M^*}{3(1 - y_A - y_B)} \right) \\ &\quad + \left(1 - s_A - \frac{y_M^*}{3} \right) \left(p_B^* + \frac{2y_M^*}{3(1 - y_A - y_B)} \right) \\ &= s_A p_A^* + (1 - s_A) p_B^* - \frac{4y_M^{*2}}{9(1 - y_A - y_B)} - (p_B - p_A) \frac{y_M^*}{3} + \frac{2y_M^*(2s_A - 1)}{3(1 - y_A - y_B)} \end{aligned}$$

where s_A , p_A^* and p_B^* are respectively the share of votes gained by party A , the public good promises by party A and B when the mafia is not available, as defined by the equations (6), (3) and (4). To complete the proof is enough to use the equation (7) that defines

the expected public good provision without the mafia and rearrange the terms such that

$$E[p^M] = E[p] - \frac{4y_M^*}{9(1 - y_A - y_B)} (y_M^* + y_a - y_B).$$

□

Proposition 3 clarifies that the involvement of the mafia in electoral matter is highly wasteful for society. First, despite the direct electoral advantages for the party supported by the mafia, *both* parties would *strictly* prefer fair competition in the electoral campaign. In the presence of the mafia, parties get trapped into a spiraling competition in which the only winner is the mafia acting as a monopolist.

Second, beside the direct restriction on electoral freedom, the presence of mafia also negatively affects voters through the decrease in expected public good provision. Since the party recurring to the electoral services provided by the mafia will substantially decrease the public good provision in case of gaining office, the overall impact on the expected public good provision is negative.

Finally the next Proposition, provides two interesting comparative statics results.

Proposition 4. *The electoral manipulation by the mafia and the electoral profits of the mafia increase in the efficiency of the mafia and in electoral competition.*

Proof. The first part of the proof is straightforward, as the higher the efficiency (measured by the parameter e) the larger the optimal number of votes provided by the mafia ($y_M^* = em_A^*$) and the higher mafia's profits.

For the second part of the proof, define the tightness electoral competition as the difference between party A and party B core supporters, $(y_A - y_B)$, with maximal competition occurring when both parties have the same share of core supporters. The price paid by the party winning the competition for mafia support is defined by equation (18) which is decreasing in $(y_A - y_B)$. So the smaller the difference between core supporters, the higher the price paid to the mafia, the larger the electoral manipulation y_M^* , and the larger the profits earned by the mafia. □

The first result in Proposition 4 is pretty intuitive: when the mafia is more efficient in controlling and delivering votes, then the amount of votes which will be manipulated at equilibrium increases. Similarly, the total profit for the mafia increases.

The second comparative statics addressed in the proposition is more subtle. Recall that the equilibrium price paid to the mafia by party A (endowed with a larger share of

core supporters) matches the highest price party B is willing to offer. Increasing electoral competition, i.e. making the two parties more and more alike, decreases the maximal price offered by A and increases the maximal price offered by party B . This, in turn, implies that the equilibrium price offered by party A will increase, leading to a larger number of votes manipulated by the mafia and an increase in its electoral profit.

Our simple theoretical framework produced a number of predictions which may be subject to empirical investigation. With the exception of Proposition 3, addressing the change in utilities for players and hence difficult to confront with an empirical verification, our theory can be extremely useful to guide our empirical study on the impact of the Sicilian mafia on Italian elections. Based on our analysis we formulate the following hypotheses:

1. The (electorally) strongest party gains the support of the mafia (Proposition 1);
2. The vote share of the strongest party is increased by the mafia, where the mafia is available (Proposition 2);
3. The tighter the electoral competition and the more efficient is the mafia, the larger the electoral manipulation operated by the mafia (Proposition 4);
4. The reward paid to the mafia in exchange of its electoral support increases in electoral competition and in the efficiency of the mafia (Proposition 4).

Before moving to the actual empirical analysis, a brief background should empower the reader with the fundamental information on the context considered.

3 Italian politics between 1946-1992 and the Sicilian mafia

3.1 Italian politics after WWII

Two key elements of Italian politics are crucial for understanding the involvement of the Sicilian mafia in the electoral market. First, the postwar Italian political system between 1946 and 1992 was characterized by the constant presence of the Christian Democratic party (DC) as the leading party in government. This party dominated government first in coalition with other small center parties, and from 1964 also with the Socialist party

(PSI). The primacy of DC was never questioned and the standard expectation was that this party would have ruled indefinitely. Or, at least this was the general belief until the 1970s when the main opposition party, the Communist party, PCI, became a much stronger competitor. In Figure 1 we plot the percentage gap between the two main parties from 1948 in all Italian regions except Sicily, and Sicily.

FIGURE 1 ABOUT HERE

Before the 1970 the gap between the vote shares for DC and PCI, the second largest party, was well above 10% throughout Italy. During the 1970s, however, the relative power of the two parties changed dramatically: the risk of a leftist government led by the PCI became more tangible. Interestingly, the reduction in the gap did not occur in Sicily. In the mid 1970s, the difference between the DC-PCI gap in Sicily and in the rest of Italy was above ten percentage points. The difference in electoral outcomes in Sicily and in the rest of the country may, of course, be explained by several factors, but the presence of these different patterns leaves the opportunity to explore further the role that the Sicilian mafia may have played in the electoral competition. The pattern in Figure 1 is broadly consistent with the predictions of the theoretical model: when electoral competition becomes stronger, the dominant party receives a more consistent electoral support from the mafia.

The second important feature of Italian politics during the period studied, is the trend in public investments. The size of government spending, especially in its discretionary component, started to increase steadily achieving its peak in the late 1960s (see Figure 2). This is likely to have loosened the budget constraint for parties enabling a variety of methods to potentially fund any electoral deal with the mafia, including public procurement contracts.

FIGURE 2 ABOUT HERE

3.2 The Sicilian mafia and its relationships with politics

According to one of the main prosecutors of the Sicilian mafia: “There is only one mafia, [...] *the* mafia, which is a criminal association. [It is] efficient and dangerous, structured in agglomerations, or groups or families or, even better, ‘cosche’.” (Tribunale di Palermo, 1981, p.208–9)⁹ Hence, the primary mafia enterprise is the family, “a territorial based

⁹Judge Terranova was killed in Palermo in 1979.

organization, which controls an area of a city or a village from where it takes its name.” (Tribunale di Palermo, 1985, p.73)

The family remained the main structure for long time and the relationship between families existed but were not structured and consisted of alliances, clustering of small families, and exchange of labor and services (Gambetta, 1993).

From the end of the 1950s a series of attempts were made in order to establish a structure able to co-ordinate the different families (Tribunale di Palermo, 1985). Before that there was no clear structure linking families and coordinating its criminal efforts: “[They] were a mosaic of small republics with topographical borders marked by tradition.”(Tribunale di Palermo, 1981, p.656)¹⁰ But it was only towards the end of the 1960s, after the first mafia war in 1962-63, that a real reorganization of *Cosa Nostra* started. Particularly important was in 1969 the killing of a boss who was held responsible of the first mafia war. According to justice witnesses the killing was executed by members of several families from Palermo, Catania and Caltanissetta, highlighting a new alliance across Sicily which would have given rise to the *Regional Commission* few years later. In 1970 three bosses are given the task to reorganize the families in the Palermo province and in 1973 its *Provincial Commission* is reorganized (Lupo, 1996, p.278-9). Few years later, in 1975, the “regional commission” was established with representatives from all the provincial commissions.(Lupo, 1996, p.279) Such a structure was also evidence that mafia organizations were now present in most of the island. However the strength of the criminal organization in the different provinces was still relevant. As Buscetta put it, “in a scale from 1 to 10, Palermo is 10, Agrigento 8, Trapani 8, Caltanissetta 6, Catania 4”.¹¹ (Lupo, 1996, p. 276)

With the consolidation of the centralized structure of *Cosa Nostra* a new phase characterized by high profile mafia killing came about, which culminated with the elimination of judges Falcone and Borsellino in 1992.

The relationship between the mafia and the political and administrative powers in Sicily dates back to the XIX century. For instance, in 1893 Marquis Notarbartolo di San Giovanni, former mayor of Palermo and governor of Banco di Sicilia, was stabbed to death by mafia killers allegedly by the request of MP Palizzolo who was first found guilty and then eventually acquitted for lack of sufficient evidence after a ten-year long trial.¹²

¹⁰This passage is reported in Gambetta (1993, p.110).

¹¹Notice that he does not mention Messina, Siracusa and Ragusa.

¹²See Dickie (2004, pp. 87–130) for an interesting account of the Palermo high society where this murdered occurred, as well as of the trial. See also Salvemini (2000) for a crude account of

At the beginning of the fascist dictatorship the relationships with the political power were interrupted by a tough repression started in 1925 by the prefect Mori, but mafia was not eradicated.¹³ After WWII many old mafiosi who survived the Fascism supported the Sicilian separatist movement, which eventually did not succeed. Meanwhile, a new political force was emerging as the leading Italian governing party, the DC. Until the 1960s, however, there was no structured relationship with one party for all the mafia families which were reorganizing in the postwar years.

But things change in the late 1960s. As reported by several mafiosi turned justice witnesses, from the seventies the *Regional Commission* started to suggest to the families of *Cosa Nostra* the parties and the politicians to support at the elections (Arlacchi, 2010, p. 182). In 1969, MP Salvo Lima and his acolytes, which constituted the most majority faction of Sicilian DC, joined the Andreotti faction in Sicily, which was later supported also by Vito Ciancimino, mayor of Palermo and MP. It has been established by several tribunals these two politicians were the main references for the most important mafia families of Palermo and Corleone, respectively. Therefore, even though some mafia families had always maintained relationships with politicians on an individual basis, the constitution of the mafia cartel on one side, and the aggregation of the most relevant mafia friends in the same political family on the other, made the relationship between the mafia underworld and the DC stronger and more significant.¹⁴

How was the actual control of votes working in a system characterized by an Australian secret ballot?

There were several methods to get circumvent vote secrecy. A first sophisticated technique, known as the “*rotating ballot*” works like this: All papers have to be placed in an envelope before being dropped into the ballot box, and these envelopes have to be signed by the election official. The *uomo di rispetto* obtains such signed envelope before the election; on election day he assembles all the voters dependent on him at his house (...). He then motions the first one up to him and hands him the envelope which already

the relationship of the political establishment and the main national political figures who held the political power in Italy in the two decades from 1890 to 1910.

¹³It is interesting to notice that when the inquests touched the Sicilian Fascist party, in 1928, he was promoted senator.

¹⁴The late MP Giulio Andreotti has been incriminated and later acquitted for “having contributed in non-occasional manner to protecting the interests and reaching the aims of the criminal association known as *Cosa Nostra*.” However the court ruled that he “made himself available to mafiosi in authentic, stable and friendly way until the spring of 1980” when the murder of the DC president of the Sicilian Region, Piersanti Mattarella, occurred. (Dickie, 2004, p.322–3)

contains a checked ballot. The voter has to take this to the polling station, where he is officially hand an envelope by the electoral official. He then secretly switches the two and drops the previously prepared one into the box. With the new envelope he returns to his patron's house, where the process is repeated." (Hess, 1973, p.155-156)

Another methods, particularly used in the period considered in this paper, exploited some peculiar features of the multi-preference proportional system. Schneider and Schneider (1976) highlight how a electoral system where voters can vote for some candidates from a list, opens the possibility to vote control by asking voters to cast their vote in a particular order. Furthermore, since the district for each polling station is usually very small (500 voters on average) [...], it is possible to verify quite easily if the votes has been cast as agreed. Schneider and Schneider (1976) report what they saw in the polling stations in Villamaura, Palermo which they visited in occasion of the parliamentary elections in 1968. They took note of the votes expressed on the ballot papers and highlighted that "while many voters had made their choices in the same order, there where many papers which showed particular combinations revealing the vote control [...]. Our impression has been confirmed by party members present at the ballot." (Schneider and Schneider, 1976, p. 221)

These and alternative methods, some of which resorting to direct intimidation, empowered the mafia with a precious package of votes to trade with politicians in exchange for favorable policies and lucrative businesses.

4 Data

We gathered electoral data for all 370 Sicilian municipalities.¹⁵ The electoral data is taken from *Atlante storico-elettorale d'Italia* (Corbetta and Piretti, 2009), a collection of all electoral results for Italian election from 1861 to 2008. We focus only on 12 National elections in the period after the end of WWII: 1946-1992, the period referred to as "First Republic". After 1992 a political earthquake took place in Italy changing radically the spectrum of parties in the political arena and some key feature of the electoral system, which make any comparison challenging. More specifically, our dependent variable is the share of votes obtained by DC, computed for each election as the number of votes obtained in a given municipality, divided by the total number of valid votes expressed in

¹⁵Notice that, given the proportional nature of the electoral system, manipulating the vote in Sicily would have an impact on the overall Italian electoral results.

that municipality. Figure 3 reports the average share of votes obtained by DC across the 12 elections considered by municipality.

FIGURE 3 ABOUT HERE

The data on the distribution of the mafia across Sicily are taken from a report by the military police (*Carabinieri*) submitted in 1987 to a parliamentary committee (Comando Generale dell'Arma dei Carabinieri, 1987). This report analyzes the activities of organized crime in Italy and its evolution in the mid 1980s. In one of the attachments, the *Carabinieri* list the *main* mafia families, and provide for each of them the name of the boss and the town where it was based.¹⁶ Gambetta (1993, p.82), used the data provided by this report to show how the distribution of the Sicilian mafia has changed little in its centenary history; however these data have never been used for empirical investigations. 80 out of 390 Sicilian municipalities were identified as mafia strongholds of the main families. Of these families 19 were based in the city of Palermo, 29 in the rest of the Palermo province, 36 families in the Agrigento province, 15 in the Trapani province, 5 in the Caltanissetta province, and 4 each in the Catania and Messina provinces. We create a dummy variable which takes on value one when the municipality is listed in the report as the stronghold of a mafia family. In Figure 4 we display in blue mafia municipalities according to this source. Alternative measures for the mafia are used in this work. A measure of mafia prevalence in 1900 by municipality is derived by Cutrera (1900), and it is used to instrument for more recent mafia distribution.¹⁷ The measure based on Cutrera (1900) ranges from 0 (no mafia), to 3 (for municipalities with strong mafia presence).¹⁸

¹⁶In those years the knowledge of the structure of *Cosa Nostra* was greatly enhanced by the testimony of several important *mafiosi* turned justice witnesses. Their contribution was vital for the most important trial against the Sicilian mafia, the *maxiprocesso* (maxi trial) which started in 1986 and ended in the December 1987 when 342 alleged *mafiosi* were sentenced to a total of 2665 years in addition to 19 life sentences. In January 1992 the Italian Supreme Court largely confirmed the verdict of the maxi trial and few months later two of the prosecutors, Judges G. Falcone and P. Borsellino, were murdered in two separate bomb attacks.

¹⁷Police inspector Antonino Cutrera analyzed in his work the origins and the characteristics of the mafia, its role in the recent Sicilian history, the initiation rituals and its structure. Based on his knowledge of the mafia both in Palermo and in the rest of the highland he depicted a map of the presence and intensity of the mafia in 289 municipalities and villages.

¹⁸In 1900 Sicily had 357 municipalities organized in 7 provinces. Cutrera identified 84 municipalities where there was no mafia, 66 where there was little presence, 70 where the mafia was of minor importance, and 69 municipalities with a major presence of the mafia. 68 municipalities were unclassified. According to Cutrera, in 38% of the municipalities in the Palermo province

FIGURE 4 ABOUT HERE

Finally, we also use a news-based measure of the presence of mafia compiled by a centre of study on the mafia at the University of Messina (Centro studi e documentazione sulla criminalità mafiosa, Università di Messina, 1994). They produced a map with the details of all the mafia families cited on the news, and the municipalities where they had an influence on. As for our main measure of mafia presence, this is a dummy variable taking up value one for municipality where the mafia operates.

We collect an extensive set of socio-economic and education controls, computed by interpolation for elections years, from the official Census for 1951, 1961, 1971, 1981, 1991, and 2001.

The full list of controls is described in Table 1.

TABLE 1 ABOUT HERE

5 Empirical strategy

In line with the previous discussion, to identify the impact of the mafia on electoral outcomes, we regress the share of votes awarded to the DC ($Share\ DC_{it}$) in Italian parliamentary elections on our proxy recording the presence of the mafia at the municipality level. To capture the increase in the efficiency of the mafia and in the electoral competition around the 1970s, we add a dummy variable which takes on value one for all elections following 1970 (*after1970*), and the interaction term composed by the mafia proxy and *after1970*. Along the predictions of our model, secondary sources guided our choice of the 1970 cutoff point. In section 7 we show that the data also support our choice.

The empirical identification strategy relies on the comparison of the electoral performance of the DC across municipalities with high mafia prevalence and those with low mafia prevalence, before and after 1970. In Figure 5 we report the difference between the average DC share after and before 1970. A visual comparison with Figure 4 reveals that the area around Palermo and Trapani (NW of the map), historical stronghold of the Sicilian mafia, experienced an increase in DC shares after 1970, in line with our expectations.

there was a major presence of the mafia, while this was the case in 44% of the municipalities in the Trapani province, 41% in the Girgenti (the old name of Agrigento) province, 29% in the Caltanissetta province, 15% in the Catania province, 7% in the Messina province. No municipality was classified as having a major mafia presence in the Siracusa province.

FIGURE 5 ABOUT HERE

Formally, our base empirical model can be written as follows:

$$Share\ DC_{it} = \alpha_1 mafia_i + \alpha_2 after1970 + \gamma mafia_i * after1970 + \delta_t + \epsilon_{it} \quad (23)$$

where (δ_t) is a set of year dummies capturing the time specific variance in electoral outcomes. The coefficients of interests are α_1 and γ . The former captures the average impact of the mafia on the electoral performance of the DC, whereas the latter identifies any additional effect kicking in after 1970. According to our theory, both coefficients are expected to be positive.

We gradually augment our basic specification with nine dummies for Sicilian provinces, the set of time-varying contemporaneous socio-economic controls, and the set of time-varying contemporaneous education controls.

In an alternative specification we replace provincial dummies with neighbor-pair fixed effects and basically compare DC electoral performance in directly neighboring municipalities, with and without mafia operations (Acemoglu et al. 2012). This allows us to control for any unobserved confounding factor common across municipality boundaries.

Finally, we run a municipality fixed-effect specification, which we consider our most trustworthy model. Obviously, the effect of mafia on DC results drops from the equation given the time-invariant nature of our mafia measures. We concentrate, however, on the interaction term identifying the effect of mafia on DC electoral results after 1970.

A significant correlation in equation (23), however, may not represent a causal relationship. First, it may be explained by reversed causality: the mafia may proliferate in areas in which the DC have strong support, or alternatively may be used by the DC in municipality in which they feel electorally disadvantaged. Second, despite our comprehensive sets of control and the municipality fixed effects specifications, there may still be omitted variables that are correlated both with the presence of mafia and the vote for DC. In addition, it is not unlikely that mafia prevalence is measured with error. If this is the case, our results may suffer from an attenuation bias. To address these concerns, we turn to an instrumental variable strategy. We instrument for our mafia proxy using a measure of mafia presence as recorded by Cutrera (1900) (*mafia* 1900), when the DC did not exist yet. The interaction term is instrumented with *mafia* 1900 * *after* 1970.

6 Empirical results

Table 2 reports the results of estimating equation (23).¹⁹ The first two columns suggest that municipalities in which the mafia operates feature less support for the DC but this effect is mitigated after 1970, when allegedly the deal with the mafia deepened. Interestingly, when we add contemporaneous socio-economic controls in column (3), the coefficient for *mafia* turns insignificant, whereas the interaction term remain positive and significant. In all remaining specifications this remains true: after 1970 the DC systematically obtain a larger share of votes in municipalities where the mafia operates. Controlling for municipality neighbor-pair fixed effects and municipality fixed effects confirms this pattern (columns (5) and (6), respectively). The magnitude of the effect is substantial. According to results reported in column (6), after 1970 the presence of the mafia increases in average the share of votes obtained by the DC by roughly 3 percentage points, which compares with the average obtained by this party in Sicily of around 44% across the entire period considered.

TABLE 2 ABOUT HERE

In the last two columns of Table 2 we show our IV results. We report only the most demanding specifications, where we use the full set of controls and control for neighbor-pair and municipality fixed-effects. In both specifications, the first stage F-tests are very large and always above 10.²⁰

The 2SLS estimations confirms OLS findings: after 1970 the DC systematically obtain a larger share of votes in municipalities where the mafia operates. The magnitude of the influence is larger than the one found with OLS. According to the results reported in column (8), where we control for municipality fixed effects, after 1970 the presence of the mafia increases by around 6 percentage points the share of votes gained by the DC.

All specifications document a dramatic increase in the electoral manipulation by the mafia in favor of the DC after 1970. This is consistent with the predictions of our model that the organizational restructuring of the mafia coupled with the increase of electoral competition would have increased the influence of the mafia on electoral outcomes.

Interestingly, our estimated impact of the mafia on electoral results are remarkably similar to the accounts reported by ex mafia members. For instance, the justice witness Antonino Calderone reports that, “only in the province of Palermo” the mafia can count

¹⁹All standard errors in the paper are clustered at the municipality level.

²⁰All first stage results are available upon request.

on “75,000-100,000 votes in favor of political parties and friendly politicians” (Arlacchi, 2010, p.183). The electorate of the Province of Palermo, an area with a high density of mafia prevalence, slightly exceeds one million voters. The 6-8 additional percentage points, awarded in average to the DC in municipalities with mafia activities (columns (7)-(8)), imply that the mafia is able to move about 60,000-80,000 votes in that province!

In Table 3 we replicate the last four columns of Table 2 adding the lagged dependent variable to our list of controls. Our results remain qualitatively identical and working out the average impact of mafia on DC electoral performance after 1970, we obtain a remarkably similar magnitude.

TABLE 3 ABOUT HERE

7 Robustness checks

We perform three types of robustness checks. First, we test if our results hold with alternative proxies for mafia presence. Second, we check whether our choice about the cutoff point after which the electoral deal becomes relevant is to be identified around 1970, as suggested by secondary sources and by our theoretical framework. Third, we run a falsification test checking whether we can obtain similar results when considering alternative political parties.

The first set of robustness checks concerns the adoption of alternative measures for the mafia presence. In the first four columns of Table 4 we repeat the most demanding estimations of Table 2 adopting the news-based measure of the mafia presence (Centro studi e documentazione sulla criminalità mafiosa, Università di Messina, 1994). The results are entirely consistent with our findings. The magnitude of the effects is almost identical, both for the OLS and the 2SLS estimates. Similarly, in the last column of Table 4, we substitute our mafia proxy with the measure of the mafia presence in 1900 as recorded by Cutrera (1900). We replicate the most demanding specifications using municipality fixed effects. Results are qualitatively identical. Taking into account the different range of the measure of mafia in 1900 (0-3), also the magnitude is very similar. In municipality with a strong presence of the mafia ($mafia(1900) = 3$), the DC obtains in average about 3 additional percentage points. We consider the test adopting the measure of mafia in 1900 particularly powerful as it also constitutes a “substitute” to our IV strategy. The measure of mafia presence in 1900 is less likely to be endogenous in the model explaining the vote shares of the DC roughly seventy years later.

TABLE 4 ABOUT HERE

Next, we check whether the data also support our choice of 1970 as starting point for the electoral deal between the mafia and the DC. In our analysis we identified 1970 as a likely date for the starting point of the electoral deal between the DC and the mafia. This choice was guided by our theoretical framework which indicates that the restructuring of the Sicilian mafia coupled with the sharp increase in electoral competition should have increased substantially the profitability of the electoral deal. In Table 5 we replicate our OLS and 2SLS best specifications (columns (6) and (8)) of Table 2 for different cutoff points, ranging from 1960 to 1980. The OLS estimates (columns (1)-(4)) detect an increase in DC shares in mafia municipalities already earlier than 1970, while the IV estimates (columns (5)-(8)) identify between 1965 and 1970 as the key point in which the electoral deal with the mafia takes off (there is only one election taking place in this period, namely in 1968). A significant coefficient for early cutoff interaction terms (i.e. with *after1960* or *after1965*), however, does not necessarily imply that the electoral support by the mafia was already granted earlier than 1970. A sharp increase in DC share after 1970 would lead to weakly significant interaction terms also for earlier years. To verify whether the increase in DC shares really occurred in the 1970s and not later, we replace our interaction term *mafia * after1970*, with two controls in which *mafia* is interacted with the dummies *70s* and *80s*, taking up value 1 for elections in the periods 1970-1979 and 1980-1992, respectively. Columns (9) and (10) report the results of this exercise, providing evidence of an increase of DC share in mafia municipalities already in the 1970s.

TABLE 5 ABOUT HERE

A potential objection to this test and more generally to our results concerns the relevance of our mafia measure across the period considered. Our main measure for capturing the presence of the mafia has been released in 1987. This is likely to better capture the geographic distribution of the mafia in the period immediately preceding 1987. This would, in turn, explain why we find evidence of the electoral deal in the period 1970-1992, in which our measure is more representative, and not in the 1946-1970. To address this legitimate concern we repeat the test in column (9) of Table 5 replacing our proxy for mafia with the measure of mafia presence in 1900, which by no means suffers from this criticism. The results, reported in column (11), confirm that in the 1970s DC shares increased in mafia municipalities.

We also test whether our result is driven by the structural change in some of our variables not duly controlled for in our main specification. In Table 6 we split our sample in two subsamples, before and after 1970, and run our model separately on the two subsamples. The variable of interest is now *mafia*. Taking into account that we are reducing the sample by half, our results are largely confirmed. Before 1970 we find no significant impact of the mafia on DC shares. After 1970, our mafia coefficients are always significant for IV estimations, and they are significant for OLS when using the 1987 and 1990 measures of mafia.

TABLE 6 ABOUT HERE

If the electoral deal between the mafia and the DC (the strongest party) was exclusive, we should not find any similar positive impact of the presence of mafia on the votes obtained by other political parties. In Table 7 we repeat our estimations substituting the dependent variable with the share of votes obtained by the right-wing party Italian Social Movement (MSI) in columns (1)-(4), and the Communist party (PCI) in columns (5)-(8). All specifications adopt the full set of controls. The OLS results (columns (1), (2), (5) and (6)) weakly suggest that after 1970 the PCI was getting systematically less votes in municipalities where mafia is active. The 2SLS results, instead, suggest that after 1970 the MSI was relatively worse off in municipalities with mafia. We can infer with a certain confidence that the deal with the mafia seemed exclusive prerogative of the DC, at least in the period considered. Once more, this is consistent with our theory which predicts the strongest party to have an advantage in securing the mafia support.

TABLE 7 ABOUT HERE

8 Disentangling electoral competition

Proposition 4 in our theoretical section identified two elements increasing the volume of the electoral deal between the strongest party and the mafia: the efficiency of the mafia itself and strong electoral competition. In the previous sections, we jointly captured these two effects by looking at the impact of mafia on DC shares after 1970, based on secondary sources which suggest an increase in competition and in mafia efficiency around 1970. It is, however, interesting to isolate the two effects and assess what element has been more determinant in the Sicilian context.

In this section we amend our empirical model adding a control for electoral competition. As a measure of electoral competition we adopt the Herfindahl-Hirschman Index (HHI), calculated by squaring the vote shares of each party competing in the electoral arena, and then summing the resulting numbers. Intuitively, the larger the HHI, the lower the electoral competition. To minimize endogeneity, we compute the HHI for each of the elections in our sample on the vote shares obtained by the parties for the whole country excluding Sicily. We introduce the HHI interacted with our mafia measure in our model. The direct HHI effect is captured by the year fixed effects. Given the structure of the HHI and according to Proposition 4, we expect the coefficient of the new interaction term to be negative: the weaker the electoral competition (higher HHI), the smaller the volume of votes moved by the mafia on behalf of DC. In other words, we expect the additional votes obtained by DC in mafia municipalities to positively respond to increase in electoral competition.

The results of this exercise are reported in Table 8, where we replicate all specification of Table 2 with the addition of $Mafia * HHI$. All OLS specifications produces statistically significant effects both for the interaction term $Mafia * after1970$, now capturing the impact of the increase in mafia efficiency only, and for the competition measure. Both effects go in the expected direction. The increase in mafia efficiency experienced at the end of 1960s led to an increase in the volume of votes moved in support of DC. The negative coefficient of $Mafia * HHI$ implies that stronger electoral competition (lower HHI) increases DC vote shares in mafia municipalities, in line with our theoretical predictions.

TABLE 8 ABOUT HERE

The magnitude of the two effects is non negligible. A decrease by one standard deviation of HHI predicts an increase of DC shares in mafia municipalities by 0.8%. To enable a meaningful comparison across the two effects, we compute the average change in electoral competition before and after 1970 and recover the impact on DC performance in mafia municipalities due to the competition effect only: according to the results in column (6) the average increase in electoral competition between the two periods raised DC average shares in mafia municipalities by close to 0.6%. This compares to the 2% increase of DC shares in mafia municipalities resulting from the increase in mafia efficiency (using the coefficient of $Mafia * after1970$ reported in column (6)). The effect of the increase in mafia efficiency seems to largely dominate in terms of magnitude, at least for the Sicilian case.

This is further confirmed by our IV estimates, reported in the last two columns of Table 8, where the coefficients for our measure of electoral competition remain of the same sign but turn insignificant, whereas the coefficients capturing the effect of mafia after 1970 increase in size.

9 Electoral trade and construction work

So far we identified a clear relationship between the presence of the mafia and the electoral support received by the DC, which suggests the existence of a tacit electoral deal. Identifying the second part of this deal, and hence the empirical evidence of a change in the electoral profits of the mafia, is much more challenging. There are a plethora of channels which may have been used by the DC to reward the support of the mafia: softer legislation on mafia related crimes, direct intervention to protect mafia members at different levels of the judicial trials in which they are involved, and lower investments in mafia controlling activities (e.g., police presence on the territory) are among the most relevant channels (Gambetta 1993). Unfortunately, these channels do not easily lend themselves to quantitative analysis.

An admittedly partial and imperfect test is to look at the magnitude of typical mafia *legal* economic activities which can be either fostered or constrained by the public authorities. One such economic activity is represented by public construction. Mafia is known to infiltrate and capture a substantial share of public procurement, and regularly reinvest much of the revenue from illicit activities in private construction. Public authorities may allow wilder urban expansion overriding existing regulations, or obscurely award public contracts to mafia-related entrepreneurs to pay back for the electoral support received by the mafia.

Once more, it is interesting to consider what mafiosi turned to justice witnesses say on the issue. In a testimony Leonardo Messina, discussing his family's involvement in the control of votes in the province of Caltanissetta, claims that they did it in exchange of money or other favors, but that "[...] the ultimate goal is public procurement contracts".²¹

We do not have data on public procurement contracts by municipality, nor on the direct urban expansion. Instead, we use the share of workers in construction over the total labor force as a proxy of construction activities. It is reasonable to assume that

²¹This is taken from his testimony in front of the parliamentary commission on the mafia (Commissione parlamentare di inchiesta sul fenomeno della mafia e sulle associazioni criminali similari, 1992, p.553)

if more construction works were allowed in the municipalities in which mafia operated, more labor force would be employed in this sector. Also, if public construction contracts are awarded to mafia controlled enterprises, we would expect these firms to employ a disproportionate number of workers from mafia stronghold municipality, as they would give a preference to mafia members, their families and friends.

We regress the share of workers in construction over the total labor force on our proxy recording the presence of mafia at municipality level, the dummy variable *after1970*, and the interaction term composed by the mafia proxy and *after1970*.

Formally, our base empirical model can be written as follows:

$$Share\ construction_{it} = \alpha'_1\ mafia_i + \alpha'_2\ after1970 + \gamma'\ mafia_i * after1970 + \delta'_t + \epsilon'_{it}$$

where the coefficients of interests are α'_1 and γ' . We expect both coefficients to track the trend identified in the electoral deal between the mafia the Christian Democrats. In particular, we expect the interaction term to be positive and significant, suggesting an increase in construction works in municipalities with the presence of the mafia after 1970.

We add the full set of controls as in the model on electoral outcomes, excluding the share of workers in other sectors to avoid mechanic correlation. To address potential endogeneity, we perform a 2SLS estimation in which current mafia presence is instrumented by historical mafia prevalence (Cutrera, 1900). Finally, we repeat our estimation substituting our mafia proxy directly with the measure of mafia provided by Cutrera (1900) and with the alternative measure proposed by the Centro studi e documentazione sulla criminalità mafiosa, Università di Messina (1994).

All results are reported in Table 9.

TABLE 9 ABOUT HERE

Overall our results are consistent with the our theoretical prediction: the interaction term is consistently positive and significant, suggesting that municipality where the mafia operates have systematically a larger share of labor force employed in the construction sector. According to the results reported in column (3) where we control for municipality fixed effects, the average increase in the share of workers in construction due to the presence of the mafia is close to one percentage point, whereas the IV estimation (column (5)) predicts an increase by 2 percentage points. Both effects are economically substantial given that in average 12% of the labor force is employed in construction in Sicily across

the entire period considered. Like for the estimates on electoral results, adopting the alternative measure of mafia proposed by the University of Messina (1994) and based on Cutrera (1900) yields extremely similar results (columns (6)-(8)).

The effect on construction activities may, however, capture a general trend in economic activities in mafia municipalities and have little to do with the electoral deal we are studying. To consider seriously this alternative interpretation of our results, we run a falsification test, in which our dependent variable is replaced by the share of workers in the communication sector over the labor force, and the share of workers in the industry sector over the labor force. Table 10 reports the results of this test. Occupation in the communication sector does not display any differential trend in mafia municipalities (columns (1)-(4)). The increase in mafia efficiency, instead, seems to have hampered after 1970 the development of the industrial sector in municipalities hosting mafia activities (columns (5)-(8)).

TABLE 10 ABOUT HERE

More importantly, based on the results on Table 10, we can be fairly confident that the increase in construction activities after 1970 in municipalities in which the mafia operates, may at least partially be the byproduct of the electoral deal linking DC, steadily at the government in the period considered, and the mafia.

10 Conclusions

In this paper we study the impact of organized crime on electoral competition. We identify two determinants affecting the extent to which parties engage in electoral deals with criminal organization: first, parties recur to organized crime when it has a tighter control of the territory, i.e. when it is more effective in controlling votes; secondly, deals with organized crime become more salient and more decisive in the presence of strong electoral competition. Using Sicily as a case, we document the impact on the Sicilian mafia on Italian National Elections in the period 1946-1992. We find evidence consistent with the existence of a tacit electoral deal between the mafia and the Christian Democrats: starting from the 1970s, the Christian Democratic party gained consistently larger vote shares in municipalities in which the mafia operates. The results are robust to a variety of specifications (including an instrumental variable model) and to the adoption of alternative measures for the presence of the mafia. The magnitude of the impact is substantial as the

Christian Democrats obtained in average about six additional percentage point in municipality hosting mafia activities. This is likely to have contributed to the permanence of the party in the government throughout the Italian First Republic (1946-1992).

Our empirical findings are consistent with our theoretical predictions, as political competition increased dramatically during the 1970s and the Sicilian mafia experienced an extensive centralization process towards the end of the 1960s, which increased substantially its control of the territory.

What did the mafia get in exchange for its support? This side of the electoral deal is more difficult to disentangle as the channels through which politicians may have payed back are multiple. We provide suggestive evidence that one channel may have been turning an eye blind on construction activities violating existing regulations, or awarding public contracts on construction to companies with close ties with the mafia.

The end of the First Republic brought the electoral deal with the Christian Democrats to an abrupt termination. The extent to which the mafia has been left out from the political sphere in the Second Republic, starting with the 1994 elections has still to be assessed, although there is some anecdotal and judicial evidence that the deal has simply been redirected towards new political entities.

References

- Abbate, L. and Gomez, P. (2007). *I complici: tutti gli uomini di Bernardo Provenzano da Corleone al Parlamento*. Fazi Editore, Rome: Italy.
- Acemoglu, D., Robinson, J. A., and Santos, R. J. (2013). The monopoly of violence: Evidence from colombia. *Journal of the European Economic Association*, 11:5–44.
- Albanese, G. and Marinelli, G. (2013). Organized crime and productivity: Evidence from firm-level data. *Rivista Italiana degli Economisti*, in press.
- Allum, F. and Siebert, R. (2003). Organized crime: A threat to democracy? In Allum, F. and Siebert, R., editors, *Organized Crime and the Challenge to Democracy*, volume 29 of *Routledge/ECPR Studies in European Political Science*, pages 1–21. Routledge, Abingdon: UK.
- Amir, R. (2005). Supermodularity and complementarity in economics: An elementary survey. *Southern Economic Journal*, 71(3):636–660.
- Arlacchi, P. (2010). *Gli uomini del disonore*. Il Saggiatore, Milano: IT, 2nd edition.
- Austen-Smith, D. (2000). Redistributing income under proportional representation. *Journal of Political Economy*, 108(6):1235.
- Baland, J.-M. and Robinson, J. A. (2008). Land and power: Theory and evidence from chile. *The American Economic Review*, 98(5):1737–1765.
- Bandiera, O. (2003). Land reform, the market for protection, and the origins of the sicilian mafia: Theory and evidence. *Journal of Law, Economics, and Organization*, 19(1):218–244.
- Baron, D. P. (1994). Electoral competition with informed and uninformed voters. *The American Political Science Review*, 88(1):33–47.
- Baron, D. P. and Diermeier, D. (2001). Elections, governments, and parliaments in proportional representation systems. *The Quarterly Journal of Economics*, 116(3):933–967.
- Buonanno, P., Durante, R., Prarolo, G., and Vanin, P. (2012). Poor institutions, rich mines: Resource curse and the origins of the sicilian mafia. Working Papers wp844, Dipartimento Scienze Economiche, Universita' di Bologna.

- Centro studi e documentazione sulla criminalità mafiosa, Università di Messina (1994).
Mappa approssimativa delle famiglie e degli associati di stampo mafioso in sicilia.
- Comando Generale dell'Arma dei Carabinieri (1987). Relazione del comandante generale dell'arma dei carabinieri alla commissione parlamentare sul fenomeno della mafia.
- Commissione parlamentare di inchiesta sul fenomeno della mafia e sulle associazioni criminali similari (1992). Verbale della seduta di venerdì 4 dicembre 1992.
- Corbetta, P. and Piretti, M. (2009). *Atlante storico-elettorale d'Italia (1861-2008)*. Zanichelli, Bologna: IT.
- Cutrera, A. (1900). *La mafia e i mafiosi*. Reber, Palermo:IT.
- Dal Bó, E., Dal Bó, P., and Di Tella, R. (2006). "plata o plomo?": Bribe and punishment in a theory of political influence. *The American Political Science Review*, 100(1):41–53.
- Daniele, V. and Marani, U. (2011). Organized crime, the quality of local institutions and fdi in italy: A panel data analysis. *European Journal of Political Economy*, 27(1):132–142.
- Del Monte, A. and Pennacchio, L. (2012). Agricultural productivity, banditry and criminal organisations in post-unification italy. *Rivista Italiana degli Economisti*, 17(3):347–378.
- Dickie, J. (2004). *Cosa Nostra: A History of the Sicilian Mafia*. Palgrave Macmillan, New York, N.Y.
- Dimico, A., Isopi, A., and Olsson, O. (2012). Origins of the sicilian mafia: The market for lemons. Working Papers in Economics 532, University of Gothenburg, Department of Economics.
- Dixit, A. K. (2004). *Lawlessness and Economics: Alternative Modes of Governance*. Princeton University Press, Princeton, NJ.
- Franchetti, L. (1877). *Condizioni Politiche e Amministrative della Sicilia*. Barbera, Firenze:IT.
- Gambetta, D. (1993). *The Sicilian Mafia: The Business of private protection*. Harvard University Press.

- Groseclose, T. and Snyder, James M., J. (1996). Buying supermajorities. *The American Political Science Review*, 90(2):303–315.
- Grossman, G. M. and Helpman, E. (1994). Protection for sale. *American Economic Review*, 84(4):833–850.
- Grossman, G. M. and Helpman, E. (2001). *Special Interest Politics*. MIT Press, Cambridge, MA and London.
- Hess, H. (1973). *Mafia and Mafiosi: The structure of Power*. Saxon House, Farnborough, Hants: UK.
- Lehoucq, F. (2003). Electoral fraud: Causes, types, and consequences. *Annual Review of Political Science*, 6(1):233–256.
- Lupo, S. (1996). *Storia della Mafia*. Donzelli Editore, Roma.
- Picci, L. (2005). Dataset on public investment in the italian provinces. available at <http://www.spbo.unibo.it/picci/kpub>.
- Pinotti, P. (2012). The economic costs of organized crime: evidence from southern italy. Temi di discussione (Economic working papers) 868, Bank of Italy, Economic Research and International Relations Area.
- Salvemini, G. (2000). *Il ministro della mala vita*. Bollati Boringhieri.
- Schneider, J. and Schneider, P. (1976). *Culture and Political Economy in Western Sicily*. Academic Press, New York:NY.
- Tribunale di Palermo (1981). Sentenza di rinvio a giudizio contro leggio luciano + 115, (14/08/1965). In *Documentazione Allegata alla Relazione Conclusiva della Commissione Parlamentare D’Inchiesta sul Fenomeno della Mafia in Sicilia*, volume 4, Tomo XVI, pages 187–244. Senato Della Repubblica, Rome:IT.
- Tribunale di Palermo (1985). Ordinanza-sentenza nel procedimento penale contro abbate giovanni + 706. In Stajano, C., editor, *Mafia: L’atto d’accusa dei giudici di Palermo*. Editori Riuniti, Rome:IT, second edition.
- Varese, F. (2001). *The Russian Mafia. Private Protection in a New Market Economy*. Oxford University Press, Oxford: UK.

11 Tables and Figures

Table 1: Descriptive statistics

| Variable | Observations | Mean | Standard Deviation | Min | Max |
|---|--------------|----------|--------------------|----------|----------|
| <i>Dependent variable:</i> | | | | | |
| Votes Share of Christian Democrats | 4440 | .4445997 | .1285866 | .0383795 | .9375488 |
| <i>Mafia measures:</i> | | | | | |
| Mafia (1987) | 4440 | .2108108 | .4079303 | 0 | 1 |
| Mafia 1994 | 4440 | .2783784 | .4482512 | 0 | 1 |
| Mafia 1900 | 3696 | 1.396104 | 1.144984 | 0 | 3 |
| <i>Socio-economic controls:</i> | | | | | |
| Log(population) | 4440 | 8.685123 | 1.055002 | 5.578975 | 13.46046 |
| Share of population under 25 | 4440 | .4153026 | .0598082 | .2163483 | .5922572 |
| Share of population over 60 | 4440 | .1698943 | .0539556 | .0422634 | .4071822 |
| Share of widow population | 4440 | .0629075 | .0125928 | .0311317 | .1323493 |
| Share of homemaker population | 4440 | .2374992 | .0940455 | .0129376 | .5100978 |
| Houses without basic services per capita | 4440 | .0337927 | .06476 | 0 | .4596563 |
| Public servants over labor force | 4440 | .0665321 | .0386736 | .0066778 | .3083968 |
| Bank employees over labor force | 4440 | .006274 | .0055725 | 0 | .0451353 |
| Transportation workers over labor force | 4440 | .0375049 | .0291148 | 0 | .3990381 |
| Construction workers over labor force | 4440 | .122627 | .0712673 | 0 | .4364844 |
| Industry workers over labor force | 4440 | .1171493 | .0628072 | 0 | .4512137 |
| Agricultural workers over labor force | 4440 | .4712278 | .2181784 | .0215335 | 1 |
| Male in search of first occupation over labor force | 4440 | .0714561 | .0566912 | 0 | .5355995 |
| <i>Education controls:</i> | | | | | |
| Share of illiterate population | 4440 | .1321973 | .0776433 | .0080819 | .447615 |
| Share of population with university degree | 4440 | .0103832 | .0091148 | 0 | .0979253 |
| Share of female population with university degree | 4440 | .0037076 | .0043231 | 0 | .0429713 |

Table 2: The impact of mafia on DC electoral results

| Dependent variable: Votes Share of Christian Democrats | | | | | | | | |
|--|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mafia | -0.0337*** (0.0128) | -0.0442*** (0.0132) | -0.00858 (0.0135) | -0.00836 (0.0136) | -0.00684 (0.0114) | | 0.0389 (0.0377) | |
| Mafia*after1970 | 0.0226** (0.0108) | 0.0226** (0.0108) | 0.0323*** (0.0110) | 0.0320*** (0.0111) | 0.0308*** (0.0110) | 0.0282*** (0.0105) | 0.0849*** (0.0311) | 0.0629** (0.0299) |
| After1970 | 0.0611*** (0.00981) | 0.0611*** (0.00982) | 0.0205 (0.0265) | -0.00159 (0.0313) | 0.0123 (0.0323) | 0.0738 (0.0536) | 0.121*** (0.0467) | 0.174** (0.0727) |
| Socio-economic controls | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Province FE | | ✓ | ✓ | ✓ | | | | |
| Neighbor-Pair FE | | | | | ✓ | | ✓ | |
| Municipality FE | | | | | | ✓ | | ✓ |
| OLS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 2SLS | | | | | | | ✓ | ✓ |
| Observations | 4,440 | 4,440 | 4,440 | 4,440 | 4,440 | 4,440 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 370 | 370 | 370 | 370 | 308 | 308 |
| R-squared | 0.079 | 0.130 | 0.228 | 0.231 | 0.339 | 0.191 | 0.106 | 0.126 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (7)-(8): Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.

Table 3: Controlling for the lagged dependent variable

| Dependent variable: Votes Share of Christian Democrats | | | | |
|--|------------------------|------------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| Mafia | 0.00104 (0.00441) | | 0.0259* (0.0155) | |
| Mafia*after1970 | 0.0135*** (0.00441) | 0.0163*** (0.00555) | 0.0337** (0.0133) | 0.0343** (0.0165) |
| Lagged share DC | 0.641*** (0.0159) | 0.434*** (0.0201) | 0.606*** (0.0183) | 0.416*** (0.0237) |
| After1970 | 0.0145 (0.0117) | -0.0422*** (0.0159) | 0.0279** (0.0134) | 0.0469** (0.0231) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ |
| Neighbor-Pair FE | ✓ | | ✓ | |
| Municipality FE | | ✓ | | ✓ |
| OLS | ✓ | ✓ | | |
| 2SLS | | | ✓ | ✓ |
| Observations | 4,070 | 4,070 | 3,388 | 3,388 |
| Municipalities | 370 | 370 | 308 | 308 |
| R-squared | 0.652 | 0.710 | 0.486 | 0.249 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (3)-(4): Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.

Table 4: Alternative measures of mafia

| Dependent variable: Votes Share of Christian Democrats | | | | | |
|--|----------------------|-----------------------|-----------------------|----------------------|------------------------|
| | (1) | (2) | (3) | (4) | (5) |
| Mafia 1994 | -0.0121 (0.0109) | | 0.0630 (0.0474) | | |
| Mafia 1994*after1970 | 0.0240** (0.0101) | 0.0240** (0.00955) | 0.0981*** (0.0354) | 0.0694** (0.0330) | |
| Mafia 1900*after1970 | | | | | 0.00944** (0.00444) |
| After1970 | 0.0134 (0.0322) | 0.0792 (0.0534) | 0.156*** (0.0522) | 0.198*** (0.0710) | 0.183** (0.0734) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ | ✓ |
| Neighbor-Pair FE | ✓ | | ✓ | | |
| Municipality FE | | ✓ | | ✓ | ✓ |
| OLS | ✓ | ✓ | | | ✓ |
| 2SLS | | | ✓ | ✓ | |
| Observations | 4,400 | 4,400 | 3,696 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 308 | 308 | 308 |
| R-squared | 0.338 | 0.599 | 0.031 | 0.118 | 0.605 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (3)-(4): Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.

Table 5: Starting point for the electoral deal

| Dependent variable: Votes Share of Christian Democrats | | | | | | | | | | | |
|--|---------------------|----------------------|------------------------|------------------------|--------------------|---------------------|----------------------|----------------------|-----------------------|----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| Mafia*after1960 | 0.0225* (0.0126) | | | | 0.0510 (0.0346) | | | | | | |
| Mafia*after1965 | | 0.0251** (0.0115) | | | | 0.0565* (0.0315) | | | | | |
| Mafia*after1975 | | | 0.0302*** (0.00984) | | | | 0.0720** (0.0293) | | | | |
| Mafia*after1980 | | | | 0.0302*** (0.00923) | | | | 0.0613** (0.0268) | | | |
| Mafia*70s | | | | | | | | | 0.0198* (0.0104) | 0.0496* (0.0282) | |
| Mafia*80s | | | | | | | | | 0.0374*** (0.0119) | 0.0808** (0.0353) | |
| Mafia 1900*70s | | | | | | | | | | | 0.00726* (0.00425) |
| Mafia 1900*80s | | | | | | | | | | | 0.0119** (0.00512) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| OLS | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | ✓ |
| 2SLS | | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| Observations | 4,440 | 4,440 | 4,440 | 4,440 | 3,696 | 3,696 | 3,696 | 3,696 | 4,440 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 370 | 370 | 308 | 308 | 308 | 308 | 370 | 308 | 308 |
| R-squared | 0.190 | 0.191 | 0.192 | 0.191 | 0.128 | 0.127 | 0.124 | 0.128 | 0.192 | 0.163 | 0.212 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year and municipality fixed effect; excluded instruments in column (5)-(8): Mafia 1900*after1960, Mafia 1900*after1965, Mafia 1900*after1975, Mafia 1900*after1980, respectively; excluded instruments in column (10): Mafia1900*y70s, and Mafia1900*y80s; F-test of first stages always larger than 10.

Table 6: Splitting the sample in before and after 1970

| Dependent variable: | Votes Share of Dc before 1970 | | | | | Votes Share of Dc after 1970 | | | | |
|-------------------------|-------------------------------|--------------------|---------------------|--------------------|----------------------|------------------------------|----------------------|--------------------|----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Mafia | -0.00807 (0.0109) | 0.0396 (0.0415) | | | | 0.0244** (0.0105) | 0.116*** (0.0401) | | | |
| Mafia 1994 | | | -0.0141 (0.0109) | 0.0531 (0.0546) | | | | 0.0120 (0.0104) | 0.160*** (0.0592) | |
| Mafia 1900 | | | | | 0.00520 (0.00645) | | | | | 0.00962* (0.00520) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Neighbor-Pair FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| OLS | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| 2SLS | | ✓ | | ✓ | | | ✓ | | ✓ | |
| Observations | 2,220 | 1,848 | 2,220 | 1,848 | 1,848 | 2,220 | 1,848 | 2,220 | 1,848 | 1,848 |
| Municipalities | 370 | 308 | 370 | 308 | 308 | 370 | 308 | 370 | 308 | 308 |
| R-squared | 0.384 | 0.065 | 0.385 | 0.050 | 0.421 | 0.386 | 0.106 | 0.384 | -0.071 | 0.496 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (2), (4), (7) and (9); Mafia 1900; F-test of first stages always larger than 10.

Table 7: Falsification test - the impact of mafia on votes shares of MSI and PCI

| Dependent variable: | Votes Share of MSI | | | | Votes Share of PCI | | | |
|-------------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|---------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mafia | -0.0111*** (0.00412) | | -0.00172 (0.0139) | | 0.00486 (0.00942) | | -0.0243 (0.0278) | |
| Mafia*after1970 | -0.00517 (0.00436) | -0.00480 (0.00415) | -0.0270** (0.0112) | -0.0278** (0.0110) | -0.0102* (0.00586) | -0.00900* (0.00523) | -0.0100 (0.0158) | -0.0109 (0.0138) |
| After1970 | 0.114*** (0.00929) | 0.105*** (0.0170) | 0.00884 (0.0136) | 0.0627*** (0.0210) | 0.217*** (0.0222) | 0.125*** (0.0265) | 0.0291 (0.0332) | -0.0833** (0.0338) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Neighbor-Pair FE | ✓ | | ✓ | | ✓ | | ✓ | |
| Municipality FE | | ✓ | | ✓ | | ✓ | | ✓ |
| OLS | ✓ | ✓ | | | ✓ | ✓ | | |
| 2SLS | | | ✓ | ✓ | | | ✓ | ✓ |
| Observations | 4,440 | 4,440 | 3,696 | 3,696 | 4,440 | 4,440 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 308 | 308 | 370 | 370 | 308 | 308 |
| R-squared | 0.502 | 0.517 | 0.053 | 0.024 | 0.642 | 0.653 | 0.134 | 0.080 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (3)-(4), (7)-(8): Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.

Table 8: Disentangling the effect of electoral competition

| Dependent variable: Votes Share of Christian Democrats | | | | | | | | |
|--|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mafia | 0.0146 (0.0188) | 0.00419 (0.0192) | 0.0443** (0.0189) | 0.0449** (0.0189) | 0.0471** (0.0192) | | 0.0701 (0.0598) | |
| Mafia*after1970 | 0.0168* (0.0101) | 0.0168* (0.0101) | 0.0263** (0.0104) | 0.0260** (0.0105) | 0.0247** (0.0105) | 0.0227** (0.00990) | 0.0817*** (0.0297) | 0.0624** (0.0286) |
| Mafia*HHI | -0.185*** (0.0693) | -0.185*** (0.0693) | -0.203*** (0.0701) | -0.204*** (0.0699) | -0.207*** (0.0708) | -0.189*** (0.0707) | -0.120 (0.192) | -0.0207 (0.186) |
| After1970 | 0.0624*** (0.00981) | 0.0624*** (0.00982) | 0.0232 (0.0266) | 0.000938 (0.0314) | 0.0148 (0.0323) | 0.0747 (0.0536) | 0.121*** (0.0468) | 0.173** (0.0728) |
| Socio-economic controls | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Province FE | | ✓ | ✓ | ✓ | | | | |
| Neighbor-Pair FE | | | | | ✓ | | ✓ | |
| Municipality FE | | | | | | ✓ | | ✓ |
| OLS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 2SLS | | | | | | | ✓ | ✓ |
| Observations | 4,440 | 4,440 | 4,440 | 4,440 | 4,440 | 4,440 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 370 | 370 | 370 | 370 | 308 | 308 |
| R-squared | 0.079 | 0.130 | 0.229 | 0.232 | 0.340 | 0.193 | 0.107 | 0.127 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (7)-(8): Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.

Table 9: The impact of mafia on construction activities

| Dependent variable: Share of construction workers over labor force | | | | | | | | |
|--|-----------------------|------------------------|------------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mafia | -0.00448 (0.00541) | -0.00847* (0.00476) | | 0.0411* (0.0218) | | | | |
| Mafia*after1970 | 0.0114** (0.00499) | 0.0105** (0.00500) | 0.00919** (0.00450) | 0.0371** (0.0145) | 0.0220* (0.0118) | | | |
| After1970 | | 0.100*** (0.0129) | -0.00274 (0.0190) | 0.115*** (0.0247) | -0.0482** (0.0240) | -0.00104 (0.0190) | -0.0404* (0.0240) | -0.0439* (0.0233) |
| Mafia 1994*after1970 | | | | | | 0.00829** (0.00388) | 0.0245* (0.0132) | |
| Mafia 1900*after1970 | | | | | | | | 0.00337* (0.00177) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Province FE | ✓ | | | | | | | ✓ |
| Neighbor-Pair FE | | ✓ | | ✓ | | | | |
| Municipality FE | | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| OLS | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| 2SLS | | | | ✓ | ✓ | | ✓ | |
| Observations | 4,440 | 4,440 | 4,440 | 3,696 | 3,696 | 4,440 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 308 | 308 | 308 | 370 | 308 | 308 |
| R-squared | 0.633 | 0.670 | 0.757 | 0.316 | 0.560 | 0.757 | 0.554 | 0.772 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (4), (5), (7); Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.

Table 10: Falsification test - The impact of mafia on other sectors

| Dependent variable: | Share of communications workers over labor force | | | | Share of industry workers over labor force | | | |
|-------------------------|--|-----------------------|-------------------------|----------------------|--|------------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mafia | 0.00141 (0.00393) | | -0.0227 (0.0138) | | 0.00266 (0.00470) | | 0.0149 (0.0169) | |
| Mafia*after1970 | 0.00129 (0.00219) | 0.000193 (0.00192) | -0.000665 (0.00573) | 0.00306 (0.00463) | -0.0145*** (0.00535) | -0.0111** (0.00512) | -0.0317** (0.0145) | -0.0293** (0.0143) |
| After1970 | -0.0212*** (0.00514) | 0.0111 (0.00914) | -0.0362*** (0.00892) | 0.0116 (0.0109) | -0.0663*** (0.0128) | -0.109*** (0.0241) | -0.121*** (0.0218) | -0.147*** (0.0334) |
| Socio-economic controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Education controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Neighbor-Pair FE | ✓ | | ✓ | | ✓ | | ✓ | |
| Municipality FE | | ✓ | | ✓ | | ✓ | | ✓ |
| OLS | ✓ | ✓ | | | ✓ | ✓ | | |
| 2SLS | | | ✓ | ✓ | | | ✓ | ✓ |
| Observations | 4,440 | 4,440 | 3,696 | 3,696 | 4,440 | 4,440 | 3,696 | 3,696 |
| Municipalities | 370 | 370 | 308 | 308 | 370 | 370 | 308 | 308 |
| R-squared | 0.524 | 0.438 | 0.168 | 0.233 | 0.596 | 0.434 | 0.478 | 0.353 |

Notes: Cluster robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All specifications control for year fixed effect; excluded instruments in columns (3)-(4) and (7)-(8): Mafia 1900 and Mafia 1900*after1970; F-test of first stages always larger than 10.



Figure 1: Percentage gap between DC and PCI.

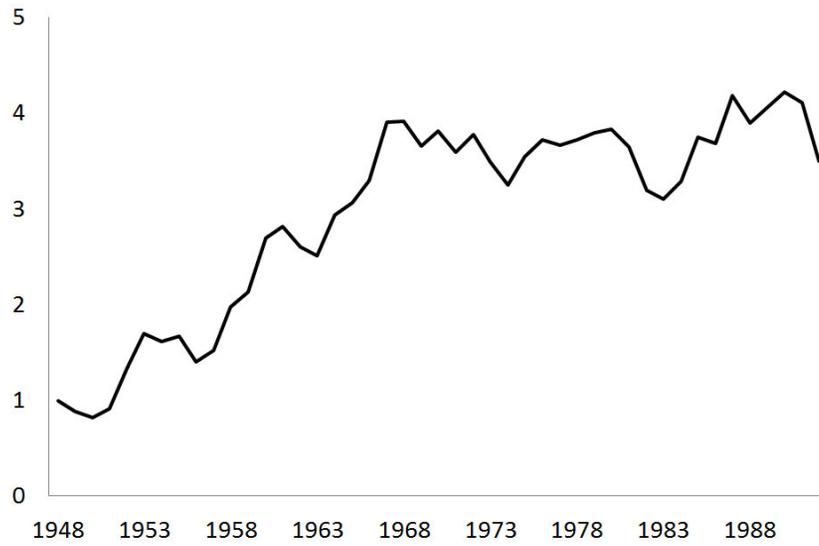


Figure 2: Public investment in real terms in Italy (1948=1) (Picci, 2005).

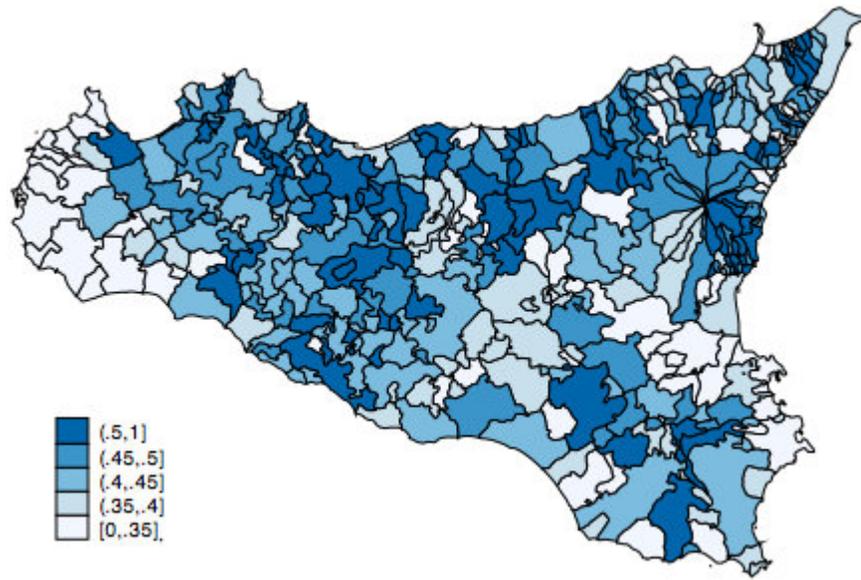


Figure 3: Average DC vote share between 1946 and 1992 in Sicily.

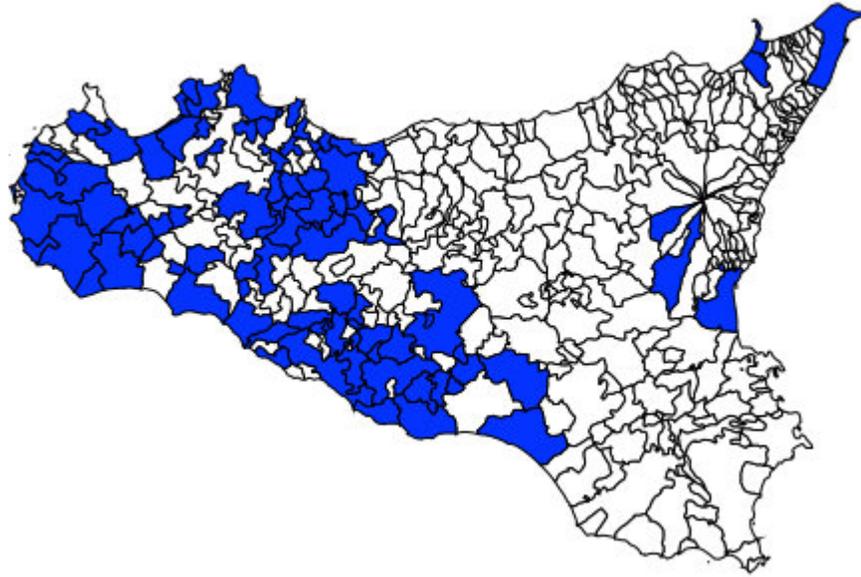


Figure 4: Mafia distribution in Sicily (Carabinieri 1987).

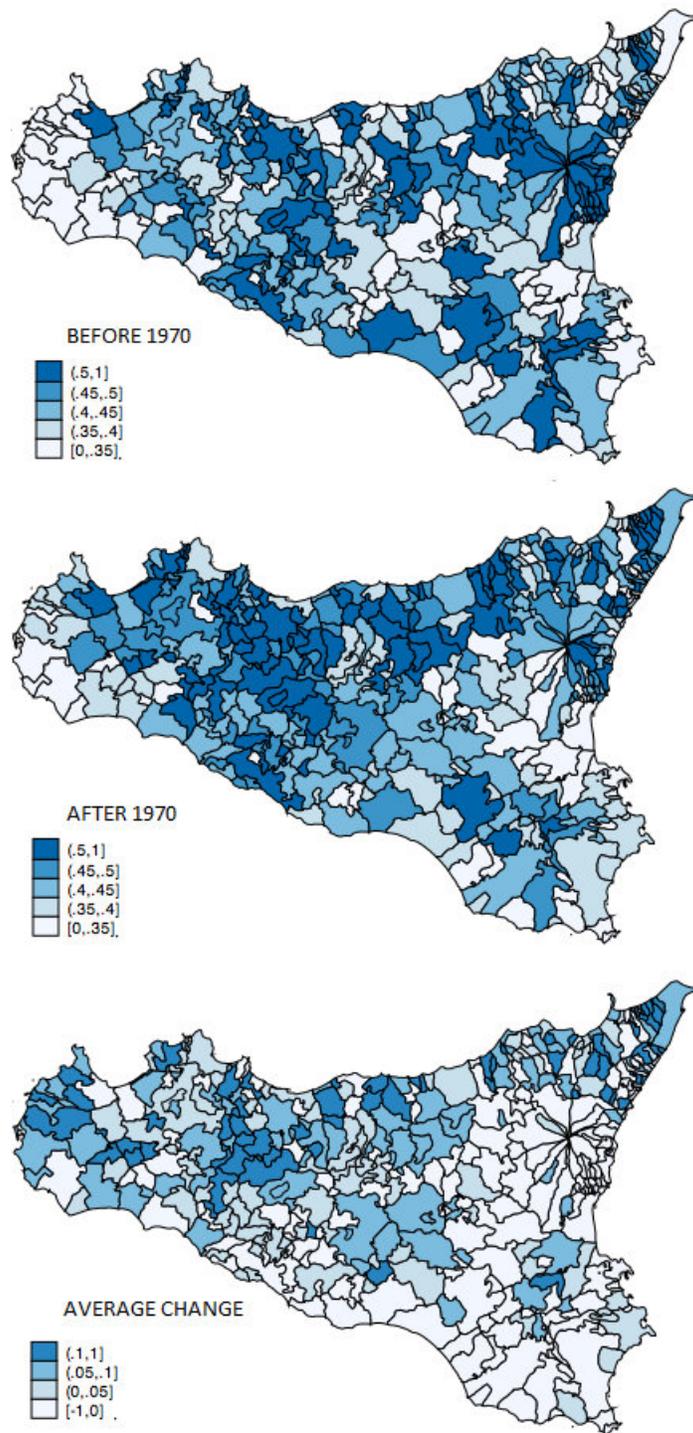


Figure 5: The change in DC vote shares before and after 1970.