Female Participation in Politics and Organized Crime Infiltration

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Abstract

This paper provides new and unexplored evidence of a negative link between an increasing female participation in politics and the infiltration of organized crime in government. We perform an empirical analysis over about 1700 Southern Italian municipalities between 1985 and 2013 exploiting two Italian law: law no. 164/1991 that allows to measure mafia infiltration in the Italian municipalities and law no. 81/1993 that creates an exogenous source of variation in the share of women in the Council that allows to correct for endogeneity bias. Increasing the female proportion in city Council of 10 percentage points reduces the probability of dissolution for mafia infiltration of about 1.7 percentage points; the negative effect remains confirmed over several robustness checks. This research adds a further reason in favour of the reduction of the gender gap in politics. In fact, policies aimed at legitimizing democracy, such as gender quotas in the electoral law, also have the indirect effect of strengthening institutions in the fight against organized crime, which is always a key government agenda.

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Keywords: Organized crime, gender gap, IV estimations, panel probit model.

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1. Introduction

Arguments in favour of an increasing female participation in politics deal with the legitimation of the democracy and the adoption of practices that improve the quality of institutions (Epstein et al., 2005). This paper studies the effect of an increasing female participation in government on the infiltration of organized crime in politics. To the best of our knowledge, this issue has not yet been investigated in the gender literature and it is very interesting to the light that, worldwide, women are still underrepresented in political institutions. Although the number has increased over the past 20 years, female heads of state or government are still a minority. At the beginning of 2019, approximately one fourth of the members of lower or single houses of parliament is a woman. At the end of 2018 women's membership of parliaments rose to 24%, representing an increase of 13% with respect to the two past decades. In 2018, the number of women presiding over houses of national parliaments was almost the 20%; similarly, only 18% of appointed ministers are women, and they are usually assigned portfolios related to environment, natural resources, and energy, followed by social sectors. This means that women are still largely excluded from the executive branches of government.[1]

Stimulating a more equal representation of women in government leads also to a gain in performance, since men and women tend to perform differently in the same contexts. Relying on the sociological and psychological theme that women, as the "fairer sex", have 'higher moral nature and propensity to bring their finer moral sensibilities on public life, and particularly on the conduct of politics' (Goetz, 2007), they are less likely to sacrifice the common good for personal (material) gain; therefore, they tend to be less corrupt than men and to promote more honest governments (Swamy et al., 2001; Dollar et al., 2001). This role of women in government may be particularly relevant because one of the most significant difficulties faced by governors is designing institutions that discourage their agents from acting opportunistically, at the expense of the public interest. Thus, increasing the direct female participation in government could help to mitigate the lack of responsiveness of governments and to enhance the quality of institutions and organizations (Staudt, 1998).

In this article we provide evidence of a further argument in favour of a greater representation of women in political institutions related to organized crime infiltration in politics. Although criminal organizations are usually involved in a wide range of illegal activities in the economy (these could include supplying illicit goods and services, extorting individuals or firms, and in some cases offering private security) they also try to influence politics. Organized crime, through violence (in very rare cases), threats and, above all, corruption, tries to infiltrate political bodies; the infiltration consists in constraining and influencing the choices of civil servants with the aim to manage the city life in terms of public procurements, public works, urban plants, housing, etc. The result is a huge economic gain.

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[1] European Parliamentary Research Service.

Thus, more women in politics, promoting more loyal and honest behaviors in governments, could be a constraint for criminal organization to infiltrate. More in detail, because of women have higher standards of ethical behavior and are more concerned with the common good, they may be naturally less tolerant toward all the form of violation or alteration of morality, like corruption (as well documented) and, in particular, crime (as we assert). Therefore, given that scholars ascribe to the weakness of institutions the cause of the infiltration of organized crime in politics, we address whether a greater share of women in political bodies may be an institutional enforcement in deterring the influence exercised by criminal organization on politicians.

We perform an empirical analysis on the effect of an increase in the fraction of women in political offices on the probability of mafia infiltration. We focus on the Southern Italian municipalities where the law no. 164/1991, that prescribes the dissolution of the local government for mafia infiltration, allows us to capture the presence of organized crime within political institutions. This law states that, in order to dissolve a municipality, the "Commissione Parlamentare Antimafia" has to ascertain, above all, the direct or indirect links of local administrators with organized crime or, alternatively, the conditioning that the mafia imposes on administrators. Looking at the sample of the Italian municipalities, it is possible to identify two groups: municipalities that have been dissolved at least once; municipalities that have never been dissolved. We estimate LPM and probit models where the binary dependent variable takes value of 1 if municipality has been dissolved and 0 otherwise (according to different operationalisations) and the regressor of interest is the share of women in political city Councils. To solve potential endogeneity problem due to omitted variable bias and reverse causality in the relation of interest, we exploit an exogenous variation in the share of women within municipal body due to law no. 81/1993 that introduced, in the local electoral law, the gender quotas. Thus, we use as instrument a dummy variable taking value 1 for municipalities affected by the gender quota reform and 0 otherwise; this instrument has predictive power for women's presence in municipal political body but does not directly affect mafia infiltration. The panel data analysis over about 1700 Italian Southern municipalities from 1985 to 2013 finds that an increase in the share of woman in municipal body decreases the probability of dissolution for mafia infiltration. Taking into account endogeneity with appropriate IV techniques, the average marginal effect (AME) shows that an increase in the female participation in Council of 10 percentage points, decreases the probability of dissolution for mafia infiltration of about 1.7 percentage points. These findings are robust to different operationalization of the binary dependent variable, to the sample restriction to more homogeneous units and to different threshold of populations, according to appropriate criteria. Moreover, differently from the studies that relating the presence of women in politics and the level of corruption that are performed at cross countries level, we focus (as several recent contributions on

the related topics do) on the local (micro) level that allows us to exploit the similarity of the institutional setting to strengthen identification issues.[2]

Beside the fairer virtues of women, a further explanation of our findings may be linked to the kind of public expenses women focus on. On one hand, a greater number of female in politics reflects into higher expenses in education and childcare, health care, environment; on the other hand, being this kind of public expenditures constrained, the resulting economic returns for organized crime are low. Thus, we can argue that where the share of women in a city council raises, there is a higher pressure to devolve public resources toward those kind of sectors (education, etc) in which is not profitable for organized crime to infiltrate.

Results provide an additional reason against the underrepresentation of female in politics. Therefore, policies targeted to reduce the underrepresentation of women in government and encouraging their participation in political life may have the further effect of deterring mafia infiltration in public organizations. A key related issue concerns the efficacy of that policies such, for example, gender quota laws. De Paola et al (2010) and Baltrunaite et al. (2014) have already demonstrated, in the same scenario of the Italian municipalities, that the gender quota increased the female share in city council and improved the quality of elected politicians. We tried to evaluate the effect of the gender quota law. Indeed, according to the estimation of the increase in the share of women in municipal body due to the gender quota law made by De Paola et al (2010) (almost 2 p.p.), our estimations predict a decrease in the probability of dissolution of about 5.9 p.p..

The rest of the paper is organized as follows. Section 2 discusses the related literature. Section 3 describes the Italian institutional framework, variables and data. Sections 4 and 5 present the empirical strategy and results, respectively. Section 6 discusses the issues related to results and performs some robustness checks. Finally, Section 7 concludes.

2. Literature Review

Our research question combines two branches of literature: first, the gender gap and the under-representation of women in politics; second, the institutional improvements against organized crime infiltration in government. The under-representation of women is extremely evident in political institutions. The causes lie in a number of reasons like the higher entry cost for participating in political life, the violation of the traditional role of women, the choice by political parties do not candidate women because voters may dislike female participation in politics. Reducing the under-representation of women in government, achieving ethics or social justice goals, contributes to legitimate democracy (Stevens, 2007); recent works have shown that it may also impact performance

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[2] For example, Hung-En Sung (2003) considers that the reduction of corruption is not due to an increase in the share of women but to an increase in the degree of democracy of a country that, as its first effect, produce a growth of female participation in political and public life (not fair sex but fair system).

and governmental quality. Women are geared toward certain kind of public spending (Rigon and Tanzi, 2011); they are more likely to implement policies such as childcare, water provision, health, and environment (Clots-Figueras, 2011; Funk and Gathmann, 2015; Rehavi, 2007); they tend to increase the quality of elected politicians (Baltrunaite et al., 2014) and the electoral participation (De Paola et al., 2014), but when they run local administrations, those latter tend to be less stable (Gagliarducci and Paserman, 2012). Interesting for our purpose is the gender dimension of corruption. The two seminar papers by Swamy et al. (2001) and Dollar et al. (2001) round a negative correlation between the women's presence in parliament and corruption in cross section analysis. Very recently, the paper of Jha and Sarangi (2018) first addressed the question of causality, providing robust evidence that women's presence in parliaments have a casual and negative impact on corruption.

The second strands of the literature we are dealing with is that of organized crime infiltration in politics. In recent years the study of the organized crime has become an important research topic among social scientists. Until the paper of Becker (1968), scholars neglected the activity of the organized crime, especially from an empirical point of view. In addition to the well-known social and psychological costs, economic literature focused on criminal organization from different perspectives. Some works have investigated the origins of organized crime and found them in the distribution of natural resources and in the weakness of institutions (Bandiera, 2003; Dimico et al., 2012; Konrad and Skaperdas, 2012; Buonanno et al., 2015). Another branch has argued that, through violence and predatory activities destroying physical and human capital, criminal organizations are detrimental for economic growth (Pinotti, 2015a).[3] Daniele and Geys (2015) have found that the mechanism underlying the effect of criminal organization on socio-economic outcomes lies in the lower politicians' quality caused by active criminal pressure.

Politicians are one of the target of the violence perpetrated by organized crime in several countries. Dal Bó and Di Tella (2003) and Dal Bó et al. (2006, 2007) have shown that once elections have taken place and the winner takes office, criminal organizations use violence to influence policymaking, that is, to "induce a given policy maker to change his action from that preferred by society to that preferred by the criminal groups" (Dal Bó and Di Tella, 2003). Kugler et al., (2005) showed that criminal organizations with enough economic and military power may affect policies by either bribing or intimidating politicians in office. The empirical evidence is growing. The work of Acemoglu et al. (2013) provides result of the influence of armed groups on the Colombian government during the period 1991–2006. Very recently, Daniele and Dipoppa (2017) have provided empirical evidence to the Dal Bó and Di Tella (2003) and Dal Bó et al. (2006, 2007) thesis. Indeed, they have demonstrated

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[3] Organized crime also affects firm productivity (Albanese and Marinelli, 2013), government efficiency (Godson and Williams, 1998; Allum and Siebert, 2003), credit access (Bonaccorsi di Patti, 2009), foreign direct investment (Daniele and Marani, 2011), money laundering (Schneider, 2010) and electoral competition (De Feo and De Luca, 2013).

that attacks of organized crime on politicians in the Southern Italian regions remarkably increase immediately after elections because, in this period, important decisions must be taken from officials just appointed. Daniele (2017) has highlighted a decline in the average politicians' quality from a given Italian municipality following the murder of a politician by organized crime within that municipality, meaning that criminal organizations may distort the political selection process by inducing the election of lower-ability politicians.

However, this kind of violence exercised by organized crime (that is, the politicians' homicides) represents an exceptional case. Generally, corruption and threats are the two major instruments criminal organizations use to influence politicians. Although corruption is a shadow phenomenon, it is certainly easier to investigate than threats[4] because of the availability of statistics on corruption (at national and international level).[5] For example, Pinotti (2015b) provides evidence about the existence of a systematic positive relationship between organized crime and corruption across countries.

Therefore, organized crime tries to infiltrate political bodies. The greater the weakness of institutions, the greater the effect of organized crime on politicians. To the light that an increasing participation of women in political life may be an institutional strengthening, this is the first work that adds a gender dimension to the fight against organized crime which is part of government agenda around the world. According to the statement that women are more likely to exhibit "helping" behavior (Eagly and Crowley, 1986) and score more highly on "integrity tests" (Ones and Viswesvaran, 1998), to vote according to social issues (Goertzel, 1983) and to exercise an extremely positive influence on the behavior of their male colleagues (by restraining, disciplining and elevating the latters' behavior), a higher representation of women leads to the adoption of policies and practices which have a positive impact on the quality of institutions, organisations, and society as a whole; in this sense, women may be a constraint for organized crime infiltration. Therefore, we test the hypothesis that the relationship between the presence of women in politics and organized crime infiltration could be negative.

3. Institutional framework, Variables and Data

In order to examine the impact of women's participation in politics on the scale of mafia infiltration in government, we focus on Italian municipalities in Calabria, Campania, Puglia and Sicilia, the Southern Italian regions where organized crime (in the form of, respectively, 'ndrangheta, camorra, sacra corona unita, mafia) has traditionally been concentrated. Restricting the sample to the Southern of Italy allows us to work with sufficiently similar municipalities in terms of those unobserved characteristics (political culture, social capital) that can affect estimations (Sberna, 2011). We
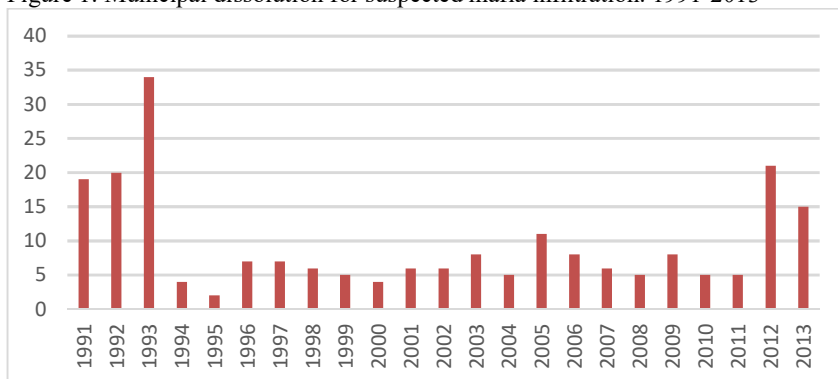
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[4] Unfortunately there are no comparable data on intimidation of politicians across countries.
[5] At cross-country level, Transparency International provides the Corruption perceptions index; the ICRG provides the Corruption index; the World Bank provides the Control of Corruption index. Italian Institute of Statistics (ISTAT) provides the number of crimes against public administration (crimes of embezzlement and misappropriation) that is used as a measure of corruption.

construct a data set including yearly observations for about 1700 Italian municipalities over the period 1985–2013.

In order to capture criminal organization infiltration in the Italian municipalities, we consider the local government dissolutions for mafia infiltration (see, among others, Acconcia et al., 2014; Daniele and Geys, 2015). In 1991, Italian national government, because of a period of intense mafia-related killings, imposed an emergency measure (Buonanno et al., 2015). Law no. 164/1991 states that the national government can decree the dissolution of municipal administration "*when evidence emerges regarding direct or indirect links between members of the local government and criminal organisations [. . .] jeopardising the free will of the electoral body and the sound functioning of the municipal administration*".[6] In particular, the dissolution of an administration is proposed by a parliamentary commission within the Ministry of Interior ("Commissione Parlamentare Antimafia") to the President of the Republic, who issues the official decree of municipal dissolution after the approval of the government cabinet. Upon the removal of a city Council, three external commissioners are assigned to govern the administration during the next 12-18 months, possibly extended to 24. Then, a new local government is elected. Data referring to the municipal dissolution for mafia infiltration according to law no. 164/1991 are publicly available on the Italian Parliament's "Commissione Parlamentare Antimafia" website. [7] Figure 1 shows the number of municipal dissolutions for suspected mafia infiltration per year in the timeframe 1991-2013. Figure 2 illustrates the number of municipal dissolutions from 1991 to 2013 divided by the four Regions.[8]

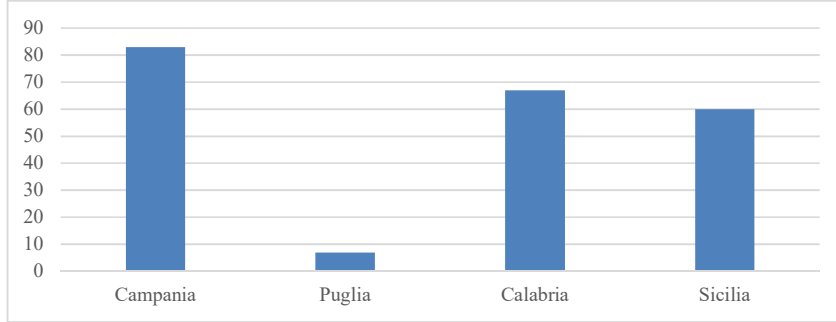Figure 1: Municipal dissolution for suspected mafia infiltration. 1991-2013

Notes: Data derive from the website of the Italian Parliament 'Commissione Parlamentare Antimafia' (http://www.camera.it/_bicamerali/leg15/commbicantimafia/documentazionetematica/23/schedabase.asp). On the vertical axis there is the number municipal dissolution. Our elaboration.

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[6] http://www.gazzettaufficiale.it/eli/id/1991/07/25/091A3362/sg
[7] http://www.camera.it/_bicamerali/leg15/commbicantimafia/documentazionetematica/23/schedabase.asp
[8] Note that, during the considered time span, only seven municipalities were dissolved outside the examined regions.

Figure 2: Municipal dissolution for suspected mafia infiltration by Regions. 1991-2013

Between 1991 and 2013, 216 local governments were dismissed because of (suspected) mafia infiltration.[9] Their greatest part is in Campania; Sicilia and Calabria show almost the same number of dissolutions and Puglia counts just 7 dissolutions. As suggested by Pinotti (2015), the relative low number of municipal dissolutions in Puglia is justified by the fact that, while in Sicilia, Calabria and Campania criminal organizations date back to more than 150 years ago, in Puglia criminal activities start growing since '70.

The variable representing municipal dissolution (the dependent variable in the empirical analysis) is a dummy taking value 1 if the municipality has dissolved and 0 otherwise. In the following we experiment a number of different implementation of the dependent variable in order to assess the robustness of our result. We identify the dissolved municipalities as the treatment group and the others as the control group.

Municipal dissolution could provide an imperfect measure of mafia infiltration in municipalities. In fact, not all the local administrations infiltrated by organized crime are detected and dissolved; therefore, in our analysis, these municipalities will be part of the control group determining a bias of the estimated effect of women presence in municipalities' political body towards zero. Moreover, sometimes the decree of municipal dissolution is cancelled because there are no enough proofs of the link between criminal groups and municipal administrations: these municipalities have been removed from the treated group and included in the control group. Ultimately, no problem will arise even if a local administration has been erroneously dissolved for suspected mafia infiltrations and the decree of dissolution has not been cancelled; in fact, this municipality will belong to the treatment group and will contribute to bias estimates towards zero. Hence, our findings will only represent a lower bound of the investigated effect; in fact, excluding any possible mismatch listed above, results should be stronger.

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[9] Among these, 40 municipalities were dissolved more than once.

The regressor of interest is the share of women in the municipal political body (in the empirical analysis called *Women*). The political structure of a municipality is composed of three different bodies: the Municipal Council, the Mayor and the Municipal Executive. Municipal Council issues municipal laws and it is elected (as well as the Mayor[10]) by citizens every five years[11] and its size is statutory according to the municipalities' population size. The Mayor is a member of the Municipal Council, he/she is responsible for the governance of the administration and for public order, civil defense, electoral and registry offices and other duties delegated by higher-order political body; moreover, the Mayor issues decrees and ordinances. The Municipal Executive is elected by the Mayor and cooperates with him/her at the municipal management; it has a residual role in carrying out all the task not directly attributed by law to the Municipal Council or Mayor. The Municipal Executive is smaller than the Municipal Council and its size is decided by the Mayor within a statutory maximum number.

In order to compute the share of women in a municipality, we divide the sum of the number of females in these three bodies by the sum of all their members, considering relevant for our analysis the full political body of municipalities. Indeed, Law no. 164/1991 states that a municipality can be dissolved because of emerging evidence regarding direct or indirect links between local administration and criminal organizations. According to the Decree 267/2000 (Art. 77), local administrators are the Mayor, the Municipal Council members ("consiglieri") and the aldermans ("assessori" - the Municipal Executive members).

Data on local administrations are provided by the Italian Ministry of Interior.[12] In particular, information on every local election from 1985 to 2017 are publicly available on the website. For every municipality, information about year of elections, size of the municipal Council and executive, name, age, gender, role in the administration, political party, job and education level of each member of the administration are provided.

In the time span the analysis refers to, a relevant institutional change in the municipal election occurred: the introduction of the gender quota with law 81/1993. The reform prescribed, firstly, inter alia, the election of the Mayor by universal suffrage; then, it established (art.5, subsequently modified by L 15/10/1993, n.415, art.2) that, for municipalities with more than 15000 inhabitants, no more than 2/3 of the candidates of an electoral list could be of the same sex, while for municipalities with less than 15000 inhabitants the threshold was fixed to 3/4. The main reason for the introduction of gender quotas law was the overcoming of unequal political participation. Hence, the provision of the law was aimed at promoting gender equality in politics and, in order to let the voter choose freely,

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[10] Before the 1993 the Mayor was elected by the member of Municipal Council.
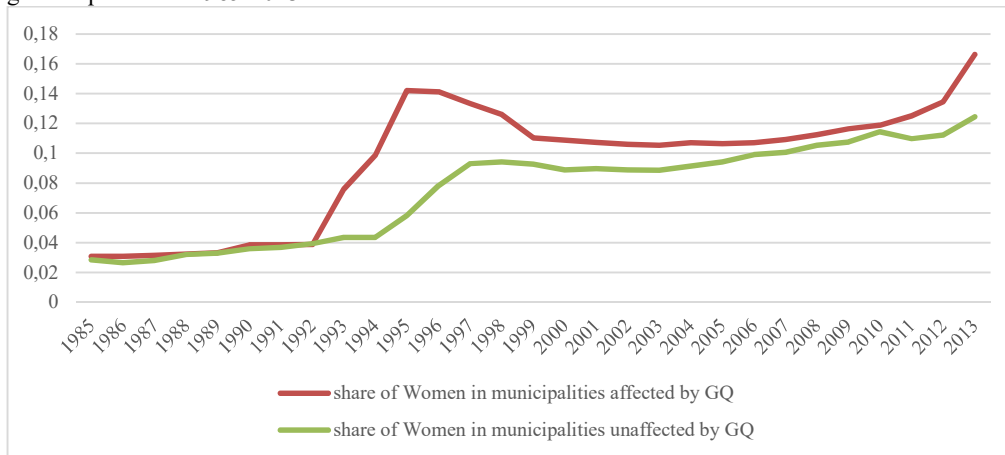[11] The term was shortened to four years between 1993 and 2000 (L 25/3/1993, n.81, art.2; DLgs 18/8/2000, n.267, art.51).
[12] https://dait.interno.gov.it/elezioni/open-data?f%5B0%5D=node%253Afield_argomento%3A180

the quotas were only related to participation in the electoral lists and did not ensure women election (Parliamentary Debate – "Discussione Parlamentare" – n° 33724). [13] In September 1995, the Constitutional Court (Sentence no. 422) declared the gender quotas unconstitutional because prejudicial to art. 3 and art. 51 of the Italian Constitution, which enshrine the fundamental principle of equal access to elective offices; hence, no preferential treatment could be done on a sex-basis. [14] Therefore, the law was only enforced during the municipal elections taken between March 25, 1993 and September 12, 1995. [15] In the four regions of interest, 85% of municipalities voted during the gender quotas law enforcement.

Figure 3 shows the mean, over municipalities, of the share of women in political body from 1985 to 2013 for municipalities affected/unaffected by the gender quota law. Until 1992 the two lines overlap; then, in 1993, the share of woman in municipalities affected by the gender quota law sharply increases. In line with the findings of De Paola et al., (2010), even if in force only for two years, the effects of the gender quota legislation persisted after the abrogation of the law and also municipalities unaffected by the gender quota law experienced a continuously growing pattern in the share of women.

Figure 3: mean, over municipalities, of the share of women in political body for municipalities affected/unaffected by the gender quota law. 1985-2013

Notes: on the vertical axis there is the mean (over municipalities) of the share of women in political body from 1985 to 2013. Red line: municipalities affected by the gender quota law; green line: municipalities unaffected by the gender quota law. Our elaboration.

Table 1.1 shows the descriptive statistics of the share of woman in political body of dissolved and no-dissolved municipalities. Looking at the mean difference between the two groups, the t-test reveals

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[13] https://storia.camera.it/lavori/sedute/4-dicembre-1992-s11-33724
[14] All other provisions of law no. 81/1993 were unaffected by the Judgement of Constitutional Court.
[15] There could be a potential mixing between the two groups of municipalities. There could be some municipalities preparing electoral lists before the period when gender quotas were in place but that voted with gender quota. Similarly, there could be some municipalities that actually had their electoral lists prepared and promoted during the period when gender quotas were in place but voted in their absence. Notice however that, considering that electoral campaigns officially last for 30 days, we have no such mixing in our sample since no municipalities voted during the 30 days after March 25, 1993 and in the 30 days after September 12, 1995.

that the mean of the share of women in municipalities that have never been dissolved is statistically greater than that one in the dissolved municipalities (at 1% significance level).

Table 1.1: T-test on the mean of female representation in Southern Italy municipal government in dissolved and no-dissolved municipalities

	Mean of the share of women
No-dissolved municipalities	0.109
Dissolved municipalities	0.091
Difference	0.018***

Notes: the mean and the standard deviation of the share of women are calculated starting from 1991 when the municipalities' dissolution for mafia infiltration starts. * shows significance at 1% significance level.

Table 1.2 shows that the mean of the share of women of dissolved municipalities in the years outside the dissolution is statistically higher than the mean of the share of women in the year of dissolution (at 1% significance level).

Table 1.2: Mean of female share in dissolved municipal according to the year of dissolution/out of the year of dissolution

Dissolved municipalities	Mean of the share of women
years out of dissolution	0.092
years of dissolution	0.067
Difference	0.025***

Notes: the mean of the share of women are calculated starting from 1991 when the municipalities' dissolution for mafia infiltration starts. * shows significance at 1% significance level.

Therefore, this supports the intuition about a relation between women presence in political administrations and mafia infiltration. We also tested that the mean of the share of women in municipalities dissolved more than once is not significantly different from the share of women in municipalities dissolved only once.

For empirical analysis, following Daniele and Geys (2015), we use a set of variables controlling for municipalities characteristics. They are[16]:

1) population size (in natural log) in order to control for the size of municipalities (*ln_pop*);

2) municipal unemployment rate in 2001, in natural log (*ln_unemployment*);

3) ratio of young to old inhabitants in 2001, calculated as the number of >65 for every 100 inhabitants under age 15, in natural log (*ln_young/old*).

Table 2 below summarizes the descriptive statistics of all the variables.

Table 2: Variables statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
Women	0.102	0.091	0	0.58	N = 41620 (n=1695; T=25)
Ln_pop	8.351	1.176	5.11	13.9	N = 42219 (n=1692; T=25)
Ln_unemployment	3.058	0.374	0.39	3.93	N = 37582 (n=1642; T=22)
Ln_young/old	4.748	0.447	3.09	6.35	N = 37582 (n=1642; T=22)

Notes: the statistics are calculationg starting from 1989 because of the definition of the the binary dependent variable used for the baseline analisis (see below).

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[16] Daniele and Geys found that the probability of municipal dissolution significantly increases with population size and unemployment rate; instead, this probability is decreasing with respect to the ratio young-to-hold inhabitants.

4. Empirical strategy

We analyse the impact of the female quotas in political body of Southern Italian municipalities on the probability of dissolution for mafia infiltration. As shown in figure 1, the dissolution did not take place at the same time for each municipalities; the panel structure of our dataset allows us to take it into account and consider possibly unobserved time-specific event.

The baseline specification is the following (with subscript i referring to municipalities and t to time)

$$\Pr(y_{i,t} = 1 | W_{i,t}, X_{i,t}) = \beta_0 + \beta_1 W_{i,t} + \beta_2 X_{i,t} + \delta_i + \delta_t + T\delta_r + \varepsilon_{i,t} \qquad (1)$$

where $y_{i,t}$ is a binary variable taking value 1 for municipalities put under commissioners every year from the appointment of the elected administration to the year of dissolution due to (presumed) mafia infiltration, and 0 otherwise (that is, it takes value 1 from 1 to maximum 5 times according to the fact that the dissolution occurred respectively at the beginning or at the end of the legislative period of the administration put under commissionaire, and 0 otherwise). This is because the law no. 164/1991 prescribes to dissolve the municipalities if the local administrator *in force* have direct and indirect link with criminal organization. $W_{i,t}$ is the share of women in municipal political body (thereafter *Women*) of municipality i at time t, $X_{i,t}$ is the set of controls for characteristics of municipality i at time t (listed above), δ_i are municipality fixed effects (in order to control for unobserved heterogeneity across municipalities), δ_t are year fixed effects; $T\delta_r$ is a regional specific time trend (in order to control for any potential differential temporal developments across Regions) and $\varepsilon_{i,t}$ is the idiosyncratic error term.

We run a first set of municipality-level regressions using linear probability and probit models. Estimating Eq. (1) through LPM and probit can produce biased results because of possible endogeneity. Endogeneity issues can appear if some unobservable characteristics at the municipal level are correlated with both the gender of the appointed members of the political body and the probability of dissolution. If it is the case, models can bias the estimations. In addition, results may be biased by the reverse causality issue, since higher/lower probability of municipal dissolution could affect the voters' predilection regarding the gender of politicians.

The potential endogeneity is treated by using the instrumental variables approach. Following Braga and Scervini (2017), we instrument the share of women in the Municipal political body with the implementation of the gender quota law. The introduction of the gender quota law, as described in section 3, creates an exogenous source of variation in the gender composition of the Municipal political body (both between municipalities and over time) that is potentially correlated with the gender of the elected politicians, but not correlated with our outcomes of interest.[17] There are at least

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two reasons to believe in the validity of the instrument. Firstly, neither in the text of the law or in parliamentary debates, the introduction of the gender quotas has been considered as a possible tool to affect organized crime infiltration in municipalities. Secondly, local elections take place every 5 years [18] and municipalities cannot change their scheduled time. In specific circumstances, the legislature ends before natural terms and anticipated elections take place; from then on, the elections (always after 5 years) will be mismatched compared to the regular year of vote of the other municipalities. Therefore, it is hardly possible that a municipality adapted the election schedule to vote according (or not) to the gender quotas law. For these reasons, we can safely maintain that the instrument is uncorrelated with the dependent variable. Moreover, the findings of De Paola et al. (2010) and the path depicted in figure 3 confirm that the gender quota law affects the share of women over the entire period of analysis.

We address the endogeneity of the share of women in municipal Council with the control function approach, which is consistent in non-linear models (Rivers and Vuong 1988; Wooldridge 2002).[19] The approach consists of a two-stage procedure: in the first stage the potential endogenous variables are regressed on all the assumed exogenous explanatory variables and the instrument; in the second stage, the predicted residuals are used as additional regressors in the structural equation with the potential endogenous variables.

In the empirical model, the instrumental variable is a dummy taking value 1 for all the municipalities during the years affected by the gender quota law and 0 otherwise (thereafter GQ).[20] We estimate the following two stage model:

$$W_{i,t} = \alpha_0 + \alpha_1 GQ_{i,t} + \alpha_2 X_{i,t} + \delta_i + \delta_t + T\delta_r + u_{i,t} \qquad (2)$$

$$\Pr(y_{i,t} = 1) = \beta_0 + \beta_1 W_{i,t} + \beta_2 X_{i,t} + \beta_3 Res + \delta_i + \delta_t + T\delta_r + \varepsilon_{i,t} \quad (3)$$

In the first stage, the endogenous variable, $W_{i,t}$ is regressed on the instrumental variable, $GQ_{i,t}$ and the set of regressors $X_{i,t}$; in the second stage, the dummy variable $y_{i,t}$ is regressed on the $W_{i,t}$, the same set of regressors $X_{i,t}$, and the predicted residuals (Res).

5. Results

Firstly, we show estimation results of LPM and probit models considering the share of women *Women* as exogenous. LPM is the easier to use and interpret because the coefficient of the regressor of interest directly expresses the variation of the probability that $y=1$ for a given variation in the regressor.

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[18] In the time span 1993-1999 the electoral period was shortened to four years.
[19] This approach allows to take into account of endogeneity in panel data probit estimations.
[20] For municipalities that never voted their Council under gender quota law, the *GQ* takes value 0 in the entire period; for municipalities in which the Council where elected under gender quotas the *GQ* takes value 1 in that election and 0 for previous and following elections.

However, the LPM is not very useful for predictive purposes because the probability can take value below 0 or above 1. Therefore, probit model correct for this non-linearity of the binary variables. We show both linear and non-linear model because it is interesting to see how the implications of these models differ. Given the definition of the binary dependent variable, the estimation period starts in 1989 (because before 1989 the value of the binary dependent variable is 0 for all the municipalities) and ends in 2013. Results are shown in table 3.

The first four columns of table 3 show the results of LPM, while the last four show probit estimations. For both estimation techniques, columns (1) and (5) report estimates of Eq. (1) without considering control variables, region specific time trend and year FE; columns (2) and (6) include year FE; columns (3) and (7) add region specific time trend and, finally, columns (4) and (8) use the full specification including control variables in order to minimize the possibility of omitted variable bias.

Table 3. Panel estimation. Dependent variable: y=1 if dissolved; y=0 if never dissolved

	LPM - FE				Probit			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Women	-0.07***	-0.03**	-0.03**	-0.02	-3.53***	-2.21***	-2.52***	-2.65***
	(-4.78)	(-2.27)	(-2.15)	(-1.49)	(-4.22)	(-2.61)	(-3.06)	(-2.86)
Constant	0.02***	0.02***	0.16	1.16	-3.95***	-4.30***	-3.91***	-1.31
	(17.52)	(7.27)	(1.22)	(1.26)	(-18.12)	(-12.99)	(-18.73)	(-0.69)
Year FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region specific time trend	No	No	Yes	Yes	No	No	Yes	Yes
Municipality controls	No	No	No	Yes	No	No	No	Yes
AME					**-0.082*****	**-0.049*****	**-0.057*****	**-0.055*****
N. obs.	41420	41420	41270	35515	41420	41420	41420	36722
Municipalities	1695	1695	1695	1642	1695	1695	1695	1642

Notes. The dependent variable is the dummy *y* taking value 1 for municipalities put under commissioners every year from the appointment of the elected administration to the year of dissolution due to mafia infiltration, and 0 otherwise. t-test values and standardised normal z-test values are in parentheses respectively for LMP and Probit model; robust standard errors clustered at municipal level. AME: average marginal effect. Significant coefficients are indicated by * (10% level), ** (5% level) and *** (1% level).

For LPM, we reject the null of the Hausman test, therefore only FE estimations are reported. The available probit estimation for a binary dependent variable fits only random-effects models; we use the Chamberlain and Mundlak correction in order to fit (pseudo) fixed-effects model.[21] Every estimated equation has robust standard errors clustered at municipal level.

A first look at table 3 shows that the coefficient on *Women* is negative and highly significant everywhere, meaning that an increase in the share of women in the municipal political body decreases the probability of dissolution for mafia infiltration of municipalities. LPM estimates show a decrease

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[21] We used the Stata command `xtprobit` for RE probit estimation. Random effects approach is valid if the regressors are not correlated with the individual effects. If such a correlation exists, the estimated coefficients are biased. Therefore, we used Chamberlain's random effects probit model (Chamberlain, 1982; Chamberlain, 1984; Mundlak, 1978). The Chamberlain and Mundlak correction prescribes the inclusion in the estimated equation of the mean terms, over the full time period, of regressors that should capture the correlation between the unobserved heterogeneity and the covariates that renders the random effect model inconsistent. We also performed RE probit estimations that do not change the main results. They are available upon request.

in the coefficient of *Women* when we gradually strengthen the model from (1) to (4). More precisely, an increase in the share of women in municipal body of 10 percentage points decreases the probability of dissolution of 0.7 p.p. in the most parsimonious specification and of 0.2 p.p. in the most complete one. Given that an improved specification should allow removing biases, this pattern is consistent with the presence of an upward bias in the most parsimonious specification. Consistent with the findings of the linear estimation, in probit model we find a significant and negative association between the share of women in municipal Council and the probability of dissolution. In order to give easier interpretation of the coefficient of interest in the probit model, in table 3 we report the estimation of the AME (average marginal effect). Since probit is a non-linear model, the investigated effect will differ from individual to individual. The AME computes it for each individual and, then, computes the average. In column (5), the average impact of a 10 p.p. increase of women in Council is a decrease in the probability of dissolution of 0.82 p.p.. The relationship of interest is robust to the improvement of the model specification by including year FE, regional trend and controls; the full specification in (8) reduces the AME: a rise of 10 p.p. in the share of women, decreases the probability of dissolution by 0.55 p.p. Results in (8) tells us that one standard deviation (0.091) increase in the share of women in the Council lowers the probability of dissolution of 0.50 p.p. Finally, the variation in the mean of the share of women between dissolved and no-dissolved municipalities (respectively 0.091 and 0.109, as in table 1) decreases the probability of dissolution of 1.55 p.p.[22]

Endogeneity

As said above, an endogeneity problem may arise because of omitted variables and reverse causality issues. We deal with this problem using the control function approach. Table 4 shows the results of the best estimations as in Eq. (2) and (3) according to the different definitions of the dependent variable we use. In columns (1)-(3) the binary dependent variable is defined as in table 3: it takes value 1 for municipalities put under commissioners every year from the appointment of the elected administration to the year of dissolution due to (presumed) mafia infiltration, and 0 otherwise. Here, as in table 3, the presentation of estimations starts with the most parsimonious model and, then, the specification is gradually strengthened.

The definition of the dependent binary variable given above creates an asymmetry across municipalities. Moreover, it restricts the mafia infiltration only to the dissolved administration. However, despite of the time of detection by the "Commissione Parlamentare Antimafia", organized crime could have been infiltrated some time before. In order to take into account these features, we proposes three further definitions of the dependent variable: 1) $y_{i,t}$ takes value 1 in the year of

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[22] For Women=0.091, $Pr(y=1|W=0.091)=\Phi(-2.65*0.091)=\Phi(-0.24)=0.4052$. For Women=0.109, $Pr(y=1|W=0.109)=\Phi(-2.65*0.109)=\Phi(-0.28)=0.3897$. Therefore, the variation in the probability is equal to $0.3897-0.4052=-0.0155$.

commissioners and in the 4 year preceding the dissolution of the government, and 0 otherwise; 2) $y_{i,t}$ takes value 1 in the year of commissioners and in the 9 year preceding the dissolution of the government, and 0 otherwise; 3) $y_{i,t}$ takes value 1 in the year of commissioners and in the entire period back to 1985, and 0 otherwise. The first definition completely remove the asymmetry across municipalities; the second one remove the asymmetry for municipalities put under commissioner starting from 1994; the third one maintains a sort of asymmetry and consider that mafia infiltrated in local government since the entire period back to 1985. All the three definitions hypothesize a time-invariant effect of mafia infiltration over the period taken into account (respectively 5, 10 and the entire period back to 1985). According to these new operationalisations of the dependent variable, in columns (4)-(6) of table 4 we show the results of the full specification.

In the upper part of table 4 we show the results of the first (panel FE) stage estimation where the variable *Women* is regressed on the gender quota dummy. In all regressions, standard errors are clustered at the municipal level and robust to heteroscedasticity.

In line with previous research (De Paola et al., 2010), the coefficient of *GQ* is positive and highly significant everywhere, meaning that municipalities whose Council was elected when the gender quota law was in force have a higher share of women in charge. Table 4 shows a set of tests for the validity of instruments for all the specifications. The F-test of weak identification assures that the power of the instrument is extremely high. The Kleibergen-Paap test of under-identification rejects the null hypothesis that the equation is under-identified indicating that the model is identified. Finally, the Anderson-Rubin test for the significance of the endogenous regressors in the structural equation rejects the null hypothesis that the coefficients of the endogenous regressors in the structural equation are jointly equal to zero and that the overidentifying restrictions are also valid. Therefore, tests just presented do not show any sign of a weak instrument problem.

The second stage estimation is a panel data probit with the Chamberlain and Mundlak correction. In all regressions, standard errors are calculated using the delta method.[23] Look at the first 3 columns. There is strong evidence that the probability of dissolution of a municipality decreases when there is a larger share of women in its administration. When we progressively include controls, the magnitude of the estimated AME of *Women* decreases: an increase of 10 p.p. in the share of women reduces the probability of dissolution by 1.79 to 1.67 p.p. Applying the Rivers-Vuong test, we check the endogeneity of the variable of interest: the coefficient of the residuals (*Res*) are significantly different from zero (except in (1)), therefore the IV estimation is the most appropriate one.

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[23] We also perform estimations of specification (1), (2) and (3) where standard errors are calculated by bootstrap method. The AME does not change. Results are not shown.

Table 4. IV estimations.

Dep.Var. Women	Panel FE - 1° stage regression					
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
GQ	0.04***	0.07***	0.07***	0.07***	0.07***	0.07***
	(19.5)	(30.4)	(31.1)	(32.1)	(32.1)	(32.1)
Region specific time trend	No	Yes	Yes	Yes	Yes	Yes
Municipality controls	No	No	Yes	Yes	Yes	Yes
N. obs.	38641	38641	34524	38845	38845	38845
F-test	379.9***	926.1***	969.3***	1027.3***	1027.3***	1027.3***
Chi² Kleibergen-Paap	300.5***	926.7***	970.1***	1028.1***	1028.1***	1028.1***
Chi² Anderson-Rubin Wald test	5.65**	18.22***	15.51***	9.22***	12.83***	4.82**
Dep.Var. y	Probit - 2° stage estimation					
Women	-8.56***	-8.02***	-8.36***	-8.03***	-7.68***	-4.36***
	(-2.32)	(-3.46)	(-3.49)	(-3.90)	(-4.38)	(-3.18)
Constant	-3.48***	-2.73***	2.42	2.47	2.59	0.26
	(-7.02)	(-13.5)	(1.10)	(1.11)	(1.02)	(0.24)
Region specific time trend	No	Yes	Yes	Yes	Yes	Yes
Municipality controls	No	No	Yes	Yes	Yes	Yes
AME	**-0.179****	**-0.175****	**-0.167****	**-0.174****	**-0.164****	**-0.054***
N. obs.	38641	38641	34524	34524	34524	34534
Res	5.24	5.87***	6.15***	5.89***	6.19***	2.92**

Notes. The dependent variable of the 1° stage estimation: *Women*. Columns (1)-(3): the dependent variable of the 2° stage is the dummy taking value 1 for municipalities put under commissioners every year from the appointment of the elected administration to the year of dissolution due to mafia infiltration, and 0 otherwise. Column (4): the dependent variable of the 2° stage is the dummy taking value 1 in the year of commissioners and in the 4 year preceding the dissolution of the government, and 0 otherwise. Column (5): the dependent variable of the 2° stage is the dummy taking value 1 in the year of commissioners and in the 9 year preceding the dissolution of the government, and 0 otherwise. Column (6): the dependent variable of the 2° stage is the dummy taking value 1 in the year of commissioners and in the entire period back to 1985, and 0 otherwise. T-test values and standardised normal z-test values are in parentheses respectively for the first and second stage. Standard errors are calculated with the delta method; are clustered at the municipal level and robust to heteroscedasticity. AME: average marginal effect. Significant coefficients are indicated by * (10% level), ** (5% level) and *** (1% level).

Results show that, in the third scenario (column (6)), the average marginal effect of women presence in municipalities on mafia infiltration is lower in magnitude and less significant compared to the other two hypothesized cases. As expected, when organized crime has been infiltrated in a municipality for a very long time, it's harder for women to break the ties between the administration and mafia, as suggested by the lower coefficient of the investigated effect.

The municipalities' controls are the log of municipal population size, the log of municipal unemployment rate and the log of young-to-old inhabitants' ratio. Population size does not play a role in the probability of dissolution. The unemployment rate has positive and significant sign meaning that an increase in unemployment increases the probability of mafia infiltration; the young-to-old inhabitants' ratio has significant and reverse effect.[24]

To sum up, we argue that women may discourage organized crime infiltration because of their higher sense of morality that translates into an improvement in the quality of institutions. We provide a

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[24] Coefficients of control variables are not shown in table 4.

further possible explanation of our result based on the interest of women to certain kinds of spending. Indeed, an increase in the share of women in politics alter the public budget structure towards expenses in education and childcare (Svaleryd, 2009), health care (Rehavi, 2007), environment (Funk and Gathmann, 2010). As the literature on corruption suggests (Mauro, 1998; Baraldi, 2008; Delavallade, 2006; Cordis, 2014), being this kind of public expenses constrained, they cannot guarantee huge economic gains if managed under the influence of organized crime, differently from public works, urban plans, etc. Therefore, where the share of women in local government increases, there is a higher pressure to devolve public resources toward these kind of sectors (education, health, etc) for which is not profitable for organised crime to infiltrate. Alternatively, one can argue that women in position of power within their organizations may design and implement more stringent laws and policies against organized crime than men and, thus, enforce that organization; however, this argument seems does not fit well our scenario in which only the 16% of the municipalities under study have had (in at least one legislative term) a female Mayor.

As shown in figure 3, starting from the gender quota institutional reform (in 1993) there has been an increasing trend in the share of women in political body of municipalities that is partially due to the introduction of the gender quota law that affected all the Italian municipalities (De Paola et al., 2010). We can evaluate, according to the estimated coefficients in column (3) table 4, the effect of this increasing trend in the share of women on the probability of interest. Taking the difference in the mean of the share of women (over municipalities) between 1992 and 2013, we find that the probability of dissolution for mafia infiltration decreased of 28.4 p.p.[25] However, this sizable result includes not only the effect due to gender quotas law but also other confounding factors related to temporal trends. In order to disentangle the impact of the reform, we rely on the work of De Paola et al. (2010) in which they show that the fraction of women elected in municipalities directly affected by the gender quota law increased by around 2 p.p. more than in those municipalities not affected by the reform;[26] therefore, increasing the share of women in 1992 of 2 p.p., the probability of dissolution reduces of 5.9 p.p..[27] This finding corroborates the idea that introducing affirmative measures aimed at reducing women underrepresentation in politics (as gender quotas) may promote further positive result from human/socio/economic perspectives linked to the deterrence of organized crime infiltration.

6. Discussion and Robustness checks

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[25] The mean of the share of women in 1992 is 0.038; that in 2013 is 0.16. For Women=0.038, $Pr(y=1|W=0.038)=\Phi(-8.36*0.038)=\Phi(-0.32)=0.3745$. For Women=0.16, $Pr(y=1|W=0.16)=\Phi(-8.36*0.16)=\Phi(-1.34)=0.0901$. Therefore, the variation in the probability is equal to $0.0901-0.3745=-0.284$.

[26] De Paola et al. (2010) consider all the Italian municipalities in their analysis but they show that there is not difference in the effect of the gender quota reform in the North and South of Italy.

[27] We increase the share of women in 1992 by 2 p.p. and make the same calculation as before: $Pr(y=1|W=0.038) - Pr(y=1|W=0.058)$.

In the following section we provide further evidence for qualifying and supporting our results.

We firstly discuss if a female Mayor has an adjunctive role in deterring mafia infiltration. We add to the baseline specification a dummy to control for the gender of the Mayor. The dummy is not significantly different from zero but this result should be interpreted with caution.[28] Our data tell us that only in 4 dissolved municipalities the Mayor is female; in all the other 212 dissolved administrations the Mayor is man.

Subsequently we focus on the turnover[29] of local politicians. Daniele and Geys (2015) highlighted an interesting evidence in the four Southern Italian regions under analysis in the 1985–2011 period. They find a very high turnover rate of local politicians: more than the 70% of them leave local governments within the space of one five-year term, while more than the 90% leave within 10 years. Moreover, the two authors calculate that prior to the dissolution of their government for mafia infiltration, the average turnover rate in mafia-connected municipalities is not significantly different from that in all other municipalities, giving evidence that the high turnover rate is not caused by mafia infiltration. A high turnover rate of politicians can be the result of a scarce political competition at elections (Carrillo and Mariotti, 2001) that, in its turn, can be related to organized crime via corruption. Indeed, literature showed a negative relationship between political competition and corruption: policy distortions resulting from lobbying activities are likely to be greater when there is little electoral competition (Polo, 1998); moreover, an intense political competition induces a greater accountability of incumbent politicians for his actions in office that translates in a greater incentive for good performance under the threat to be easily removed and replaced (Persson et al.,1997). Therefore, one can argue that a higher turnover rate is positively related to mafia infiltration through corruption. Referring to this literature, we ask if the low tenure in office of local politician in Italian municipalities may affect the positive impact of women on organized crime infiltration. In order to test this concern, we introduce in the model a variable measuring the turnover rate in local government (thereafter *turnover*) and an interaction term between the turnover rate and the share of women in council (thereafter *Women*turnover*). Results are in table 9 where the first column shows estimation over the full sample and the second column shows estimation when we exclude from the analysis all 31 municipalities that witnessed repeated dissolutions. The first stage estimation is not reported, however the instrument is significant and there is no sign of weakness of the instrument.

The interaction variable is positive and highly significant meaning that a higher turnover rate of politicians may hamper the beneficial effect of women of organized crime; however, the magnitude of the coefficient is very low.

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[28] The coefficient of *Women* remains negative and highly significant.
[29] The turnover rate is the share of politicians that are new to municipal council.

Table 9. Second stage IV estimations.

Dep.Var. y	Probit IV – 2° stage estimation	
	Full sample	Once dissolved municipalities
Women	-9.51***	-11.22***
	(-3.39)	(-3.10)
Constant	-4.48***	-3.37**
	(-3.08)	(-1.97)
Turnover	-0.01	-0.01
	(-0.78)	(-1.30)
Women*turnover	0.08**	0.11**
	(2.32)	(2.41)
Region specific time trend	Yes	Yes
Municipality controls	Yes	Yes
AME (Women)	**-0.198***	**-0.185***
AME (Women_turnover)	**0.001**	**0.001***
N. obs.	33292	32737
Res	7.30***	9.79***

Notes. First stage estimation is not shown. The dependent variable of the 1° stage estimation: *Women*. In the second stage the dependent variable $y_{i,t}$ takes value 1 for municipalities put under commissioners every year from the appointment of the elected administration to the year of dissolution due to mafia infiltration, and 0 otherwise. Standardised normal z-test values are in parentheses; robust standard errors clustered at municipal level. AME: average marginal effect. Significant coefficients are indicated by * (10% level), ** (5% level) and *** (1% level).

6.1 Impact on dissolutions unrelated to (suspected) mafia infiltration

An important issue concerns the dissolution for mafia infiltration as our measure of organized crime infiltration in city government and the validity of the interpretation of results. Indeed, city councils can also be dismissed for reasons unrelated to mafia infiltration. The reasons for dismissals include: resignation by elected officials (resignation of the mayor/resignation of more than 50% of council members); failure to organize elections; special cases of ineligibility of the mayor; failure to pass the annual budget; political crisis in the ruling coalitions. Such dissolutions are fairly common[30] and lots of municipalities witness at least one dissolution of their local government unrelated to mafia infiltration.[31] Independently of their effects on mafia infiltration, it might be possible that women in city council have negative impact on the dissolution *per se*, as well as on mafia infiltration. Therefore, if women in city council impact in the same way both the dissolution of a local government as such and for mafia infiltration, the fairness of women as well as their interest toward special kind of public expenditure, may not have the supposed deterring effect. In this case our dependent variable could be a not valid one. We check this important aspect by performing regressions where the dependent variable is a dummy taking value 1 in the year of local government's dissolution for reasons unrelated to mafia infiltration, and zero otherwise. Results are in table 5.

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[30] During the period 1990-2013, the city councils dismissed for reasons unrelated to mafia infiltration have been the 47% of the entire sample. The most common reason was the resignation by elected officials.

[31] We do not distinguish between different reasons for government dissolution, thus we treat all non-mafia dissolutions as one group.

Table 5. Second stage IV estimations.

Dep.Var. y	Probit - 2° stage estimation	
	(1)	*(2)*
Women	6.67***	5.99***
	(13.42)	(12.14)
Constant	-2.05***	-5.76***
	(-38.07)	(-11.07)
Region specific time trend	Yes	Yes
Municipality controls	No	Yes
AME	**0.452*****	**0.412*****
N. obs.	27996	25168
Res	-5.61***	-4.77***

Notes. The dependent variable of the 1° stage estimation: *Women*. The dependent variable is a dummy taking value 1 in the year of local government's dissolution for reasons unrelated to mafia infiltration, and zero otherwise. Normal z-test values are in parentheses; robust standard errors clustered at municipal level. AME: average marginal effect. Significant coefficients are indicated by * (10% level), ** (5% level) and *** (1% level).

Here, we replicate the IV analysis (with the control function approach) as in table 4. Column (2) adds to column (1) the municipality controls. We show only the second stage; all the tests on the validity of the instrument (not shown) confirm that there is no signal of weakness of the instrumental variable. The results are very meaningful and greatly strengthen the interpretation of the findings we just gave. They indicate that the share of women in city council has positive significant effect on the local government dissolutions due to factors unrelated to mafia infiltration. Considering a 10 p.p. increase in the share of women, the average marginal effect is measured as more than 4 p.p. This result is in line with that of Gagliarducci and Paserman (2012) and strongly suggests that only the probability of dissolution due to mafia infiltration is negatively related to an increase in the share of women in local government, and not the probability of dissolution of the local government as such.

6.2 Sample restriction

We undertake further robustness checks of our findings by restricting the sample to more homogeneous municipalities in order to control for other factors that might confound the impact of the share of women on the probability of municipalities' dissolution for mafia infiltration. First of all, we restrict the control group to municipalities in the neighbourhood of that ones included in the treatment group. In order to do that, we take the data by ISTAT on the neighboring municipalities[32] and, for each dissolved municipality, we take its neighboring. Therefore, we construct a new dataset made of 580 municipalities observed in the period 1985-2013. In column (1) of table 6 we carry out the main specifications of our model on this restricted sample using the baseline definition of the binary dependent variable. The impact of the female presence in municipal body is significant and the sign remains negative. Its impact on the probability of dissolution is more than 3 time greater than

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[32] ISTAT, "Matrici di contiguità", https://www.istat.it/it/archivio/137333.

that in the full sample of control municipalities (as shown by the AME). Therefore, the magnitude of results were driven by comparing groups of municipalities that are more or less heterogeneous.

Table 6. Second stage IV estimations.

	Probit IV - 2° stage estimation		
	Neighbourhood	*Excluding Puglia*	*Population<15000*
Dep.Var. y	*(1)*	*(2)*	(3)
Women	-9.33***	-7.96***	-5.42**
	(-3.41)	(-3.29)	(-2.07)
Constant	2.78	2.75	2.05
	(1.48)	(1.21)	(0.73)
Region specific time trend	Yes	Yes	Yes
Municipality controls	Yes	Yes	Yes
AME	**-0.599*****	**-0.183*****	**-0.085****
N. obs.	10850	28900	28799
Res	6.93***	5.78**	3.14

Notes. The dependent variable of the 1° stage estimation: *Women*. The dependent variable $y_{i,t}$ takes value 1 for municipalities put under commissioners every year from the appointment of the elected administration to the year of dissolution due to mafia infiltration, and 0 otherwise. Standardized normal z-test values are in parentheses; robust standard errors clustered at municipal level. AME: average marginal effect. Significant coefficients are indicated by * (10% level), ** (5% level) and *** (1% level).

In the light of analysing a more homogeneous sample of municipalities, figure 2 suggests to exclude Puglia from the sample because of its very low number of municipalities into the treatment group (the dissolved ones) and high number of municipalities in the control group (the no-dissolved ones). Column (2) shows that the estimation results confirm that of the baseline analysis in sign and magnitude of the AME.

A further robustness check focus on a threshold of populations in order to overcome a weakness of the main analysis. That is, according to the law 164/1991 and the decree 267/2000, local administrators we consider to compute the share of women comprise the Mayor, the Municipal Council members and the members of Municipal Executive. However, they form the elective local political body only in municipalities under 15000 inhabitants; in municipalities above 15000 inhabitants, the elective body is only made of the Mayor and the Municipal Council members. Moreover, only the Municipal Council is the elective body affected by the gender quota law of 1993. Indeed, there are no gender restrictions on the Mayor and the Municipal Executive that is appointed directly by the Mayor. However, for municipalities under 15000 inhabitants, the Municipal Executive is nominated among the members of Municipal Council, and, thus, all the political body is affected by the gender quota law. Therefore, we restrict the sample to municipalities whose population is under 15000 inhabitants. In this way the sample perfectly fits the requirements of the gender quota and municipal dissolution laws we exploit. We expect no relevant changes in the results because of two reasons: 1) municipalities below 15000 inhabitants are almost the 85% of the entire sample; 2) the size of the Municipal Executive is very small, and there is low variability of the share of women in that office. Column (3) shows estimation results. The significant negative impact of the women presence in political body on mafia infiltration is confirmed. Comparing the estimated AME with that in the corresponding main analysis, here it is lower. This could probably due to the different gender

threshold stated by the law no. 81/1993. Indeed, the law prescribes a different threshold of gender quotas according to the size of the municipalities. For municipalities above 15000 inhabitants the threshold for a gender presence in an electoral list is 2/3, while in municipalities below 15000, this threshold is 3/4. Therefore, is reasonable to believe that this different prescription led to different electoral outcome in terms of female presence in local political body; precisely, the threshold of 2/3 presumably led to a greater share of woman in the political body then the threshold of 3/4. Therefore, higher gender threshold may imply greater push in female presence in politics and, consequently, greater indirect effect in the deterrence against organized crime infiltration.

6.3 Falsification test for the validity of the instrument

As a falsification test to check the validity of the gender quota law as instrumental variable, we randomise the share of women appointed to the Council in two different ways: (i) we randomly assign the observations on the share of women across the whole sample; (ii) we randomise the share of women appointed to the Council within every municipality across years. Running the first stage of the full specification of the model, in both cases we find that the gender quota is no longer significant as well as the F-test of the weak identification (respectively, $Prob > F = 0.8133$ and $Prob > F = 0.9820$). This suggests that we identified the right source of variability to explain changes in women's representation in local government.

7. Concluding remarks

In Italy, as in the rest of the world, women are still underrepresented in politics, at national and local level. Lots of studies have dealt with the gender gap and results are almost unanimous in saying that women often have overtaken men in education and performance. The female underrepresentation in politics is, thus, a considerable loss for the society as a whole. In recent year, a large number of countries have introduced gender quotas in their electoral rules with the aim of increasing the share of women in governments in order to legitimate democracy and stimulate voters to believe in female potential in politics. Policy measures, such as gender quotas, may be seen also as institutional reinforcements in the light of the results of our research. Indeed, this paper provides new and unexplored evidence on the effect of politician's gender on mafia infiltration in Southern Italian municipalities. We test the hypothesis that women can deter organized crime infiltration because of two reasons: firstly, given their higher standards of ethical behavior, they are less tolerant toward all the form of violation or alteration of morality; secondly, an increase in the share of women in a city council translates into higher public expenses towards education and childcare, health care, environment sectors where is not profitable for organized crime to infiltrate. Given that the literature on organized crime ascribes its proliferation to the weakness of institutions, we argued that, being women a constraint for organized crime infiltration, policies increasing female participation in

political life can be seen also as an institutional strengthening. In the baseline analysis, we perform several estimations on about 1700 municipalities relating the probability of dissolution for mafia infiltration and the share of woman in political body. We rely on two Italian laws; one, the law no. 164/1991, allowing to measure mafia infiltration in the Italian municipalities and law no. 81/1993, allowing to correct for endogeneity bias by creating an exogenous source of variation in the share of women in the municipal political body. We find that an increase in the share of women decreases the probability of municipal dissolution. The AME of such increase is higher when we deal with endogeneity than in the exogenous treatment. This result is confirmed over different estimation techniques and improvement in the specification of the model. It is also robust to the further definitions of the binary dependent variable and sample selection.

Thus, this analysis offers additional reasons to implement policies aimed at reducing women underrepresentation in political life also to the light that such policies may have a very large range of socio-economic benefits and are almost costless.

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