Let the Voters Choose Women: Female Representation and Public Policy*

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Abstract

To address gender gaps in politics, a new policy introduces double preference voting conditioned on gender and guarantees a minimum presence of both genders on candidate lists. We focus on Italian local elections, which were subject to this policy for the first time in 2013, and we study its impact on the share of female councilors and on the composition of municipal spending. Using a regression discontinuity design, we estimate that the reform raises the share of elected female politicians by 19 percentage points. The result is mainly driven by the increase in preference votes cast for female candidates, suggesting a salient role of double preference voting in promoting female empowerment in politics. We also find that municipalities with a larger share of female councilors caused by the policy spend more on education and environment.

Keywords: gender quotas, municipal elections, regression discontinuity, local public expenditure.

JEL classification codes: D72, J45

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1 Introduction

Gender gaps dominate the political arena. According to the Global Gender Gap Index (World Economic Forum, 2016), the world has closed only 23% of the gender gap in politics. In Europe, women represent 28% of politicians in legislative bodies and 27% in government cabinets (European Commission, 2016). In Italy, women represent approximately 30% of members of Parliament.

How to promote female political empowerment? What are the economic consequences of achieving a stronger gender balance in politics? This paper examines a new policy, which in Italian municipal elections introduces double preference voting conditioned on gender, whereby voters can express two preferences, instead of one, if they vote for candidates of different gender. In addition, the policy foresees gender quotas on candidate lists to guarantee a substantial presence of female candidates. The law targets all Italian municipalities with more than 5,000 residents, allowing us to implement a regression discontinuity design around this threshold. We first estimate that the policy leads to a 19 percentage point increase in the share of elected female politicians. To investigate the working of the policy, we also hand-collect new data on candidate lists and preference votes, and find that the latter play an important role in promoting female political empowerment. We then perform a fuzzy regression discontinuity design on the allocation of public expenditure at local level. The results show that the gender composition of policy makers matters for economic decisions: municipalities with a larger share of female councilors caused by the policy invest more in education and environment.

Female under-representation in politics may result from various obstacles in a multi-step ladder process of political recruitment (Norris and Lovenduski, 1995). First, women may not be willing to or may not be interested in competing for political seats, for instance due to time constraints associated with child care duties (e.g., Schlozman et al., 1994). Alternatively, lack of self-confidence or external encouragement (Fox and Lawless, 2004) or lower returns on the political market for women (Júlio and Tavares, 2017) may motivate their absence from politics. Second, parties, in their role as gatekeepers, may not put women forward as candidates (e.g., Kunovich and Paxton, 2005). Third, voters may be biased against female candidates

and not cast votes for them (e.g., Schwindt-Bayer et al., 2010; Black and Erickson, 2004).

The promotion of female participation in politics is justified on the grounds of equity considerations (Stevens, 2007), since women represent 50% of the overall voting population. Moreover, female politicians are less corrupt and show higher cooperation and team working skills (Epstein et al., 2005; Brollo and Troiano, 2016). Female participation in politics may also create role models for other women, who may decide to pursue a political career (Gilardi, 2015). Most importantly, a gender-balanced political body may have an impact on the implemented policies and the allocation of resources across different programs. To appropriately test this hypothesis requires an institutional setting in which the gender balance among politicians is exogenously determined. For this reason, several contributions have exploited the random allocation of woman-reserved seats in Indian villages. Chattopadhyay and Duflo (2004) find that female policy makers allocate more resources to projects which support female needs, such as investment in fresh water. Duflo and Topalova (2004) find that villages with woman-reserved council head positions have more public goods, and the measured quality of these goods is at least as high as in non-reserved villages. Beaman et al. (2010) show that gender quotas increase investments in water infrastructure and education. These papers, however, consider a specific institutional set-up in which women politicians face weak political competition to get appointed. Other papers exploit closed mixed gender races to assess the impact of female representation on policies: results are not uncontroversial. In India, Clots-Figueras (2011) shows that female state-legislators elected to seats which can only be contested by candidates from scheduled castes and tribes implement policies which are more "women-friendly", while gender has no impact in general. The evidence for developed countries is limited. Ferreira and Gyourko (2014) show that having a female mayor in the United States does not change policy outcomes such as the size of the local government, the composition of municipal spending, employment, or crime rates. Similarly, Rehavi (2007) only finds marginal effects of female political leadership on policy in the United States.[1]

[1]Indirect evidence on the role of female politicians on public policies comes from the context

In this paper we study the introduction of double preference voting, coupled with gender quotas, as a new tool to increase female presence in political institutions. This policy generates exogenous variation in the gender composition of the political body. This, in turn, creates an appropriate institutional setting to assess the impact of female politicians on public policies.

The novelty of this policy measure is that it concentrates on voters' preferences, in addition to the more common gender quotas on candidate lists. Preference votes allow voters to select one candidate (or more) on the list in proportional representation systems and they were introduced in a number of countries[2] in past decades. Preference votes are argued to create a direct link between voters and candidates and raise accountability, due to a "threat" that politicians in top list positions are surpassed by candidates below them. In addition, parties may use preference votes cast for candidates in open list systems to test the popularity of politicians and then promote them to more powerful positions (Folke et al., 2016). However, preference votes appear to be highly ineffective, as voters continue to cast their preferences for the candidates at the top of the list (Farrell, 2001; Gallagher and Mitchell, 2005). There is evidence of general voters' predisposition to vote for male over female candidates or viceversa, which is often context-specific (Sanbonmatsu, 2002; Black and Erickson, 2003; Schwindt-Bayer et al., 2010). Up to date, there is no causal evidence on the effectiveness of policies targeting voters' preferences in achieving stronger female political empowerment.[3]

Gender quotas are the most common policy for tackling gender imbalance and are in place in a few countries, either at the national or the subnational level (Krook,

of direct democracy in Switzerland. Funk and Gathmann (2015) show that in Swiss referendum women support the allocation of larger expenditures on health and environmental protection.

[2]Austria, Belgium, the Czech Republic, Denmark, Estonia, Lithuania, Norway, the Netherlands, Slovakia, and Sweden. Since 2013, in French subnational elections voters can elect two members of the opposite sex on a "binôme"or tandem ballot, whose names are arranged in alphabetical order. This new system of nomination of both female and male candidates ("binôme") guarantees the achievement of parity in departmental councils.

[3]In terms of descriptive analysis, Kunovich (2012) shows that in the Polish open-list system preference votes cast by the electorate shift females higher up in the ranking, compared with the original one proposed by the party, and that these shifts result in a higher number of elected women. Shair-Rosenfield and Hinojosa (2014) show evidence from Chile which is consistent with a negative gender (female) bias among parties, but not among voters.

2009). They are often accompanied by additional measures to further support female political representation, such as zipping, i.e. a man and a women alternate in the list of candidates, placement mandates (Schmidt, 2009; Schwindt-Bayer, 2009) or list-proportional representation systems (Tripp and Kang, 2008). However, their effectiveness is under scrutiny (see Dahlerup and Freidenvall, 2008 for a discussion). De Paola et al. (2010 and 2014) show that gender quotas on candidate lists increased the share of female politicians elected to Italian municipal councils and voters' turnout. However, Bagues and Esteve-Volart (2012) study the case of the Spanish senate and find that women remain "pawns" in the political game. In fact, Bagues and Campa (2015) and Casas-Arce and Saiz (2015) show that female access to political institutions can be challenged by the strategic positioning of female candidates on male-dominated party lists.

Our paper contributes to the existing literature in several ways. First, we analyze the effects of a new policy that introduces in Italian local elections double preference voting conditioned on gender and guarantees a minimum presence of both genders on candidate lists. We find that it is effective in raising the number of elected female politicians. In particular, in local councils elected in municipalities with the policy, the women to men ratio rises to 40/60, as compared to a ratio below 30/70 in municipalities not subject to the policy. Second, we are the first to hand-collect Italian candidate level data, including ranking of candidates on the ballot, and the number of preference votes. This unique dataset allows us to provide evidence on the potential of policies that act on voters' choices. We find that the discontinuity in the share of female candidates around the threshold is of limited magnitude, whereas there is a significant and large increase in the share of preference votes cast for female candidates. Against the background of mixed evidence on the effectiveness of gender quotas, these results suggest that paying attention to voters, and not only to parties, may have immediate and sizable effects on female political empowerment. Last, our policy gives an appropriate setting to assess the role of women in policy decision making regarding local expenditure. Our paper is the first to establish that, in the presence of political competition, female policy makers affect the allocation of spending. We find that a larger share of resources go to education and the protec-

tion of the environment (consistently with the evidence on India). Since education and the protection of the environment are public goods with long term beneficial consequences for the society as a whole, our results suggest that gender differences in policy making may be associated with women's propensity to care about broader long-term societal interests, and not only about women's needs.

The paper is organized as follows: Section 2 presents the institutional setting and the details of Law 215/2012, Section 3 studies the impact of the policy on female politicians, Section 4 investigates the impact of the policy on local public spending. Section 5 concludes.

2 The institutional framework and the data

2.1 Law 215/2012

There are approximately 8,100 municipalities in Italy. They vary in terms of geographic, demographic and economic indicators. The municipal administration manages the registry of births and deaths, the registry of deeds, and decides over the level and allocation of local expenditure to different goals. These are expenditures on administration, justice, education, culture, roads, environment, social services and productive services. Expenditure is financed via own taxes and tariffs and via transfers from the central government. Municipalities are headed by a mayor, who is assisted by a legislative body, the municipal council (*Consiglio Comunale*), and an executive body, the executive committee (*Giunta Comunale*). Local elections take place every five years and municipal governments cannot affect their schedule.

The electoral rules of local Italian governments change at the 15,000 resident threshold. In order to keep the electoral institutions constant, we focus on municipalities with less than 15,000 residents. In these municipalities, a mayor is elected according to a single-ballot system.[4] The mayoral candidate who gets the relative majority is appointed. Under this scheme, each candidate for the mayor position can be backed by one list only, with a substantial victory bonus: the list supporting the

[4]In municipalities above the 15,000 resident threshold the mayor is elected according to the run-off system.

winner gets 2/3 of the seats in the municipal council, while the rest of the seats is assigned to the remaining lists according to a proportionality criterion. Candidate lists are formed by the local organization of a given party or by independently organized groups of citizens. The electoral system prescribes open lists, whereby voters vote for a party and can also cast a preference vote for an individual candidate from their preferred list, by writing down a candidate name on the ballot. The list consists of at most as many candidates as the number of seats in the council and at least as many candidates as 3/4 of the number of seats. The number of seats in municipal councils varies between 6 and 16, depending on the size of the resident population.

Italian Law 215 was passed in 2012 with the aim of increasing female presence on municipal councils. The measures introduced by the law apply to municipalities with more than 5,000 residents. The law introduces double preference voting conditioned on gender: voters are given the option of expressing their preference in favor of two candidates, instead of one, provided that they are of different gender. In other words, the ballot displays two empty lines, rather than one, to write down up to two candidates' names, provided they are of different gender.[5] To ensure the presence of candidates of both sexes, the law also establishes that neither gender can represent more than 2/3 of the total number of candidates on party lists for municipal councils. In practice, parties have to reserve at least 1/3 of the total number of positions for female candidates. In municipalities with resident population between 5,000 and 15,000, non-compliance is punished by removing the names of male candidates exceeding 2/3 of the total. The law was in force for the first time in the municipal elections in 2013.

2.2 Data

We collect three sets of data: on elected politicians, on candidate lists, and on local public expenditure. First, we collect data on elected politicians in the 4,599 Italian municipalities with less than 15,000 residents, which voted in 2013, 2014

[5]There is no prompting at the voting stage of how to cast a valid double preference vote. If two names of candidates of the same gender are written, the second one is considered null when votes are counted.

and 2015.[6] Table 1 describes the distribution of municipalities between treatment and control group, and across different geographical areas. For each municipality, we collect the publicly available data on the electoral results of the 2013, 2014 and 2015 elections, and the corresponding previous elections.[7] We have information on the total number and identity of elected councilors, the number of female elected councilors, and the political orientation of the majority party. Table 1, Panel B shows the share of elected female councilors in treated and control municipalities, and provides descriptive evidence on the higher presence of female councilors in municipalities subject to the policy: in these municipalities, municipal councils are more gender balanced, with women representing around 40% of the total number of councilors, against an average of 28% in municipalities which were not subject to the law.

Second, in order to better understand how the policy works, we collect data on candidate lists. These data are difficult to obtain, as they are only gathered by local electoral offices and they are not published by the Ministry of Interior or made available on the Internet. We restrict our attention to municipalities which voted in 2013, and we contact all electoral offices of the municipalities in our sample in order to request candidate lists presented by every party with the original (party-composed) candidate ordering and the number of preference votes each candidate on the lists obtained.[8] Table 2 summarizes the sample coverage in terms of number of municipalities and party lists in the 2013, and in the previous election.

Third, we collect data on local public expenditure from AIDA PA database (see Section A.1 in the Appendix for a detailed definition of the variables). We focus on

[6]Regions with special autonomy (*Regioni a Statuto Speciale*), with the exception of Sardinia, do not apply Law 215/2012. Therefore, we exclude municipalities in these regions (i.e., Sicily, Valle d'Aosta, Friuli-Venezia-Giulia and Trentino-Alto Adige) from our sample.

[7]Municipal elections take place every five years. However, as a municipal council may terminate its mandate earlier due to factors such as the unexpected death of the mayor or the resignation of the majority of the councilors, there are municipalities that voted more than once in the period under analysis.

[8]If there was no response, we searched for candidate lists published in local newspapers, or directly contacted members of the municipal council or local politicians. On several occasions, the lists could only be obtained by watching parties' electoral campaign video material. We have verified that there are no substantial differences in the observable characteristics between municipalities for which we were able to obtain candidate lists and those for which lists were not found.

spending commitments in the current and capital account in years 2014 and 2015 for municipalities which voted in 2013, and in year 2015 for municipalities which voted in 2014. This timing allows approximately a one-year lag between the election and the decision on commitments and guarantees that our analysis only includes decisions on local expenditure taken by the municipal council elected under the policy.[9] Descriptive statistics shown in Table 3 indicate that commitments in the current account are larger than those in the capital account, and that, on average, the largest expenditure item in the current account is administration, while in the capital account is environment.

[Tables 1, 2 and 3 here]

3 The impact of the policy on female politicians

In this section we investigate the effects of double preference voting conditioned on gender and gender quotas on the election of women to municipal councils.

3.1 Empirical strategy

We adopt a sharp regression discontinuity design in order to estimate the effect of Law 215/2012 on female presence in local politics. We exploit the fact that the measures included in the law, gender quotas and double preference voting conditioned on gender, only apply to municipalities with more than 5,000 residents. This results in a discontinuous variation in the institutional framework for municipalities of different size along a smoothly increasing forcing variable, namely, municipal population size. Our main regression equation is:

$$\begin{aligned} y_i = \alpha + \gamma_{01}\widetilde{x}_i + \gamma_{02}\widetilde{x}_i^{\,2} + \cdots + \gamma_{0p}\widetilde{x}_i^{\,p} + \psi Treatment_i + \\ \gamma_{11}\widetilde{x}_i * Treatment_i + \gamma_{12}\widetilde{x}_i^{\,2} * Treatment_i + \cdots + \\ \gamma_{1p}\widetilde{x}_i^{\,p} * Treatment_i + \varepsilon_i \end{aligned} \tag{1}$$

[9] Since data on spending commitments for 2016 are not yet available, we cannot include in the analysis on spending behavior municipalities that held elections in 2015.

where y_i is the outcome variable of interest, e.g., the share of elected female councilors in municipality i;[10] $\widetilde{x}_i$ is the resident population size in municipality i, centered at the 5,000 resident threshold; p is the order of the control polynomial function, with $p = 1, 2, 3, 4$; and $Treatment_i$ is an indicator for municipalities with more than 5,000 residents ("treated municipalities"). The coefficients on the polynomial terms γ are also indexed by 0 and 1 because we allow for different polynomial coefficients on the two sides of the cut-off. The main coefficient of interest is ψ, which estimates the local average treatment effect of the reform.

We rely on three sets of results:

1. We graphically investigate the existence of the discontinuity around the 5,000 resident cut-off. For this purpose, we plot local sample means of the dependent variable in small equidistant non-overlapping bins over the support of the resident population size $\widetilde{x}_i$, together with the quadratic polynomial fit for municipalities below and above the threshold, and the 95 per cent confidence interval.

2. We estimate Equation (1) using polynomials of different orders, ranging from 1 to 4, for the entire sample of municipalities (*parametric approach*).

3. We implement local linear regressions using the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) (*non-parametric approach*).[11]

While these different specifications serve the purpose of transparently showing the robustness of the results, we will focus on the estimates from local linear regressions when commenting on the magnitudes of the effects.

For the validity of the regression discontinuity, we first verify that there are no discontinuities at the 5,000 resident threshold in the distribution of demographic,

[10] We define our dependent variable in terms of shares instead of absolute numbers of councilors in municipality level analysis to take into account the possible differences in the size of the municipal council.

[11] All the results of the paper are robust to the adoption of the alternative bandwidth selector proposed by Calonico et al., (2014), Imbens and Kalyanaraman (2012) and Ludwig and Miller (2007).

occupational, and educational characteristics in the main sample of municipalities. The data are taken from the 2011 Italian Census data. The results of the graphical analysis are shown in Figures 1 and 2. The results of the local linear regressions in Table 4 show that municipal characteristics vary continuously with municipal population size.[12]

We then test the potential presence of sorting, i.e. the tendency of municipalities to strategically manipulate their population to fall on the preferred side of the cut-off. We implement a McCrary test (McCrary, 2008) and find no evidence of manipulation of the population size in the sample of Italian municipalities which voted in the period 2013-2015, as shown in Figure 3.

[Figures 1, 2, 3 and Table 4 here]

3.2 Results

We examine the share of elected female councilors (i.e. the number of elected female councilors over the total number of councilors) around the 5,000 resident threshold. Figure 4 shows a discontinuous jump in the share of elected female councilors in the municipalities above the cut-off, which were subject to the policy.[13]

[Figure 4 here]

We next estimate the magnitude of the change in the share of female councilors using the control polynomial (parametric) approach. Specifically, we use observations both close to and far from the cut-off point and estimate equation (1) with polynomials of orders 1 to 4 in the four columns of Table 5, Panel A. Polynomials are allowed to differ on the two sides of the cut-off. The results show that the estimated coefficient on the indicator *Treatment* is positive and remains statistically significant in all columns.

[12] We also check that there is no discontinuity in the political orientation of the majority party at the 5,000 resident threshold. We find that in most municipalities that held elections in the period 2013-2015 (4,195 out of 4,599) civic lists obtained the majority of seats and the shares of municipalities with a civic list, left-wing, center-left and right-wing majority are smooth around the 5,000 resident threshold. The results are available upon request.

[13] The discontinuity in the share of female councilors is robust and evident in analogous figures with polynomial fits of orders 1, 3 and 4.

[Table 5 here]

To test the existence of the discontinuity in the share of elected female councilors non-parametrically, we implement local linear regressions using a uniform kernel density estimator. In Table 5 Panel B, conventional estimates with conventional standard errors are presented in row 1. The results are consistent with the coefficients presented in Panel A. Moreover, the point estimate increases as we concentrate on observations closer to the 5,000 resident threshold. We also show biased-corrected estimates with conventional standard errors, and biased-corrected estimates with robust standard errors in rows 2 and 3 in Table 5, Panel B. The point estimate of the coefficient on the variable *Treatment* is 0.19 in these last specification and implies that municipalities that voted under the provisions of Law 215/2012 elected municipal councils with 19 percentage points more women. This corresponds to two more women in municipal councils, which is a rather sizable effect.[14]

3.3 The working of the policy

To understand the working of the policy, we restrict our attention to the 2013 election. Our purpose is to shed some light on how the expanded set of voters' choices interacts with party selection of candidates in fostering female presence in local politics. To this end, we use data on the gender composition of candidate lists, which are formed by parties, and we examine data on preference votes received by female candidates. Since for municipalities with more than 5,000 residents, the law requires that at least 1/3 of the candidates on each list are female, we investigate the presence of a discontinuity at this threshold in the share of women in candidate lists and in the share of preference votes for female candidates.

We run party-level regressions as in (1), where the subscript i is replaced by is and all variables are defined for party s in municipality i.[15] We start from investigating the behavior of the share of female candidates on list s in municipality i around the 5,000 threshold.

[14] The increase in female elected politicians is confirmed when we conduct the analysis separately in the subsample of municipalities in the North, Centre and South of Italy, which are characterized by a marked divide in female empowerment. The results are shown in Table A.1 in the Appendix.

[15] Civic lists can also run for seats. They are also considered under the wording "party lists".

Non-parametric estimates for the share of female candidates are shown in Table 6 Column 1: there is no significant discontinuity at the threshold, indicating that parties do not set the gender composition of the lists differently across the cut-off.[16]

[Table 6 here]

Although the share of female candidates does not change at the threshold, the likelihood of being elected may depend on the ranking of candidates, as politicians at the top of the list tend to obtain more preference votes and are therefore more likely to be elected (Farrell, 2001). Several studies (Bagues and Esteve-Volart, 2012; Casas-Arce and Saiz, 2015) show that, when constrained by gender quotas, parties manipulate the ranking of the candidates, placing women at the bottom, so that there is little change in the chances of being elected for male candidates, who usually form the existing party elite. On the contrary, Shair-Rosenfield (2012) shows that parties in India often place women on their lists higher than required by the law. Therefore, we investigate whether parties below and above the 5,000 resident threshold rank male and female candidates differently. If this is the case, the discontinuity we observe in the number of elected females at the cut-off may partially result from party decisions regarding the ranking of candidates.[17] We rely on Borda ranking which attributes a decreasing number of points to each candidate on the list, i.e. in a list with five candidates, the first one gets five points, the second one – four points, etc., and the last one – one point. We define a Borda score of female candidates as the sum of Borda points of female candidates over the total number of Borda points of all candidates on a given list. This measure exploits the information on the full ranking of candidates to detect systematic differences in candidates' placement, across lists of different length. The results of the regression analysis in Table 6 Column 2 show that there is no change at the threshold.[18] Overall, parties do not

[16]The results of parametric analysis are in line with the ones shown in Table 6. Figures A.1-A.4 in the Appendix present the graphical analysis for this and the other dependent variables shown in Table 6.

[17]We point out that 51% of the lists in our sample are ranked alphabetically and, therefore, are not very likely to exhibit a strategic placement of candidates by parties.

[18]We also consider an alternative measure of candidate placement based on the presence of at least one female candidate on the top two positions of the list. Once more, we do not find a discontinuity at the cut-off. The results are available upon request.

appear to be strategic in deciding the ranking of female candidates under the new constraints imposed by the policy.

We then turn to analyze preference votes to examine the role of double preference voting conditioned on gender in promoting female politicians. The regression results in Table 6 Column 3 show that the share of votes cast for female candidates on lists presented in municipalities subject to the policy increase by 14 percentage points.

We further investigate how preference votes cast for female candidates affect women's presence on municipal councils. In the Italian open lists system, the original party ranking of candidates is re-ordered according to preference votes cast by the electorate. This post-election ranking determines which candidates are elected and reflects the influence of the voters' decisions on the ultimate electoral outcome. To capture this influence, we calculate the Borda score using the post-election ranking of all candidates (elected and not elected) and use it as a dependent variable in the analysis. Table 6 Column 4 shows that there is a positive discontinuity in this measure at the cut-off. Recalling that parties do not rank female candidates differently across the threshold, this confirms that preference votes elicited by the reform do have an important role in promoting female presence on municipal councils.

To conclude our analysis on the role of voting behavior, we ask whether the reform increases the willingness of voters to vote and to express a preference for candidates. Table 7, columns 1 and 2 show that there is no discontinuous change in overall voters' turnout and voters' turnout by gender.[19] As to preference votes, since electoral data do not register whether a voter has expressed 0, 1, or 2 preferences, we assess the use of preference votes by computing the ratio of the total number of preference votes over the total number of votes cast in a municipality. Table 7, Column 3 shows that preference votes are indeed used more actively thanks to the reform. This may be directly due to the use of double preference voting (the number of voters who express a preference stays the same, but now they cast two preference votes) or to an increase in the number of voters expressing a single preference in favor of women (some voters now vote in favor of a woman, without a paired vote for a man). Since we find that there is no discontinuity at the cut-off in the number of votes cast for

[19]In addition, we find no evidence that voters are "confused" by this policy: the number of invalid ballots is not significantly different at the cut-off. Results are available upon request

male candidates,[20] double preference voting does not subtract preference votes from them. This supports the idea that voters express two preference votes, when allowed to do so.

[Table 7 here]

The increase in preference votes cast for women may come from a change in the selection of politicians, which increases the quality of candidates running for office. We cannot test this effect directly, because data on the personal characteristics of candidates are not public. Hence, we only study the quality of the elected councilors, as measured by the average years of education (Galasso and Nannicini, 2011; Baltrunaite et al., 2014). The following possibilities can arise. If the quality of both male and female candidates increases, the higher number of preferences for female candidates at the threshold cannot be explained by changes in quality. If only the quality of female candidates increases, we should expect that better-quality women obtain more preference votes, independently from the double preference voting mechanism, and are hence elected. However, we do not find any significant discontinuity at the cut-off in the quality of elected female councilors, as shown in Table 7 Column 4.[21] Finally, if only the quality of male candidates increases, we should expect an increase in the number of votes cast for male candidates, which we do not observe, as argued above.

In summary, there is evidence that voters do make use of the expanded set of choices guaranteed by double preference voting and that the latter plays an important role in guaranteeing that more women are elected to municipal councils.

3.4 Robustness checks

As a placebo exercise, we assess whether there are pre-existing differences in the share of female politicians that could confound our estimates of the policy effect.

[20] The results are available upon request.

[21] This is also consistent with the findings in Baltrunaite et al. (2014), who do not find any significant effect of binding gender quotas on the quality of elected female politicians, as measured by their education level or previous occupation, but they find such an effect on the quality of male elected politicians.

We thus examine the potential discontinuity in the share of female councilors in the previous election. Table 8 shows that the share of female elected politicians does not exhibit any discontinuity at the cut-off in the previous election. The same result holds for the share of female candidates (see Table A.2 in the Appendix).

[Table 8 here]

We also deal with the threats to the interpretation of regression discontinuity design results, coming from "confounding policies" (Eggers et al., 2017). The possible confounding policy is the legislation which imposes a variation in the salary of the mayor at the same cut-off of 5,000 residents. However, we point out that our analysis focuses on municipal councilors, and not mayors, and compensation of municipal councilors is not regulated by the Italian law. Furthermore, the change in the mayor's salary at the 5,000 resident cut-off precedes the introduction of Law 215/2012 and it was already present in the elections before 2013-2015. As argued above, there are no discontinuities in the share of female councilors or of female candidates in these elections, confirming that the observed effects are not driven by differences in the mayor's salary. Finally, we also show that the result on elected female politicians are robust to adopting a difference-in-discontinuities design. Following the specification adopted by Grembi et al. (2016), we estimate a linear model:

$$\begin{aligned} y_{it} = \delta_0 + \delta_1 \widetilde{x_i} + Treatment_i(\gamma_0 + \gamma_1 \widetilde{x_i}) + \\ After_t[\alpha_0 + \alpha_1 \widetilde{x_i} + Treatment_i(\beta_0 + \beta \widetilde{x_i})] + \epsilon_{it} \end{aligned} \tag{2}$$

where y_i is the outcome variable of interest, namely the share of elected female councilors in municipality i, $\widetilde{x_i}$ is the resident population size in municipality i, centered on the 5,000 resident threshold, $Treatment_i$ is an indicator for municipalities with more than 5,000 residents ("treated municipalities") and $After_t$ is an indicator equal to 1 for the 2013 election and 0 for the previous election. The main coefficient of interest is β_0, which estimates the local average treatment effect of the reform. Positive, large and significant estimates in Table 9 show that the effect of the reform on women's empowerment holds true even when controlling for the discontinuity in the mayor's salary.

[Table 9 here]

4 The impact of the policy on public spending

We now assess the economic consequences of leveraging gender representation in local politics. We study how the presence of female politicians in municipal councils affects decisions on public spending. The analysis focuses on the allocation rather than the overall level of spending.[22] We focus on commitments, distinguishing between current and capital account. We consider the following expenditure categories: administration, justice, education, culture, roads, environment, social services and productive services. These categories span the entire set of expenditures in the municipality budget, as explained in the Appendix.

4.1 Empirical strategy

We adopt a fuzzy regression discontinuity design in order to estimate the effect of female local politicians on local public spending. We exploit the fact that the policy leads to an exogenous change in the gender composition of municipal councils above the 5,000 resident cut-off (see Section 3) and use it as an instrument for the share of female councilors. Then, in a two-stage-least-squares regression, we examine the effect of more gender-balanced municipal councils on the shares of local public spending on different items, separately in current and capital account. The regression framework is described by the following equations, estimated within an optimally selected bandwidth:

$$\begin{aligned} Female_i &= \gamma + \psi Treatment_i + g^p(\widetilde{x_i}) + \epsilon_i \\ y_{ij} &= \alpha + \delta Female_i + f^p(\widetilde{x_i}) + \varepsilon_i \end{aligned} \tag{3}$$

where y_{ij} is the outcome variable of interest, e.g., the share of current (capital) account spending on category j over the total (current and capital) spending of

[22] In fact, we do not find any evidence that total spending commitments change discontinuously at the threshold (see Figure 6a).

municipality i; $Female_i$ is the share of female councilors in municipality i; $f^p()$ and $g^p()$ are polynomial control functions allowed to differ on the two sides of the cut-off; p is the order of the control polynomial function; $\widetilde{x_i}$ is the resident population size in municipality i, centered at the 5,000 resident threshold; and $Treatment_i$ is an indicator for municipalities with more than 5,000 residents. The first equation in (3) describes the first-stage relationship, whereas the second one - the relationship(s) of interest. The vector of coefficients of interest is δ, which estimates the local average treatment effects of gender composition in municipal councils on each item of public spending. For each item j, we present the results of local linear regressions using the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017). We also present graphical analyses for selected outcomes, conducted as explained before.[23]

4.2 Results

Table 10 shows the results of the fuzzy regression discontinuity analysis. When we look at the current account spending (Panel A), we only find a small negative and significant effect of female politicians on spending on culture. However, the result is not robust when we implement the more demanding specification in row 3. When we turn to the capital account spending (Panel B), instead, we find a positive, significant and robust effect of female politicians on the share of spending on education and environment.[24] The results are confirmed in reduced form estimates in which, in line with the results in Section 3, we directly investigate the existence of the discontinuity in the outcome variable of interest at the 5,000 resident cut-off.[25] The effects are sizable and amount to 17% for the share of expenditure on education and 29% for the one on environment. In Figure 6 we graphically illustrate that, while other spending items in capital account are continuous at the cut-off of 5,000 residents, there is a visible discontinuity in the share of spending going to education and environment.

[23] In the interest of space, the other figures are available upon the request.

[24] The fact that significant effects only emerge in spending commitments in the capital account is in line with the constraints of the internal stability pact, which are not imposed on commitments in the capital account, and only apply to those in the current account.

[25] The results are available upon request.

As a placebo exercise, we investigate whether there are pre-existing discontinuities in the same variables before the introduction of the policy and we find none, as shown in Table 11. As a further robustness check, we adopt difference-in-discontinuities design. In line with the empirical strategy adopted in Section 3.4, Table 12 shows the results of a reduced form estimation as in equation (2).[26] Our results are confirmed also in this specification.

[Tables 11 and 12 here]

Our results suggest that women politicians may change the allocation of spending, as they devote more resources to public goods with long-term effects, such as education and environment. Resources going to these spending items are to the benefit of all. This allocation choice may be interpreted as an indication of a gender difference in time horizon, with women being long-term oriented even in the context of local politics, which is constrained by short-term electoral incentives.

5 Conclusions

This paper shows that the policy which introduces double preference voting conditioned on gender and guarantees a minimum presence of both genders on candidate lists, has a large, robust impact on women's political representation in Italian municipal governments. Specifically, our causally identified estimates suggest an increase of 19 percentage points in the share of female councilors. We provide evidence that the effect, to a large extent, comes from preference votes in favor of female candidates expressed by electorate in municipalities subject to the policy. In other words, if voters are given the option of casting a preference vote for one candidate of each gender, they do select female candidates more often. This increases empowerment of women in local politics. We show that, once elected, women allocate local public spending differently compared to men: female councilors care more about education and environment, showing a stronger long-term orientation.

[26] We note that the magnitudes of the results of the reduced form analysis are not directly comparable to the 2SLS estimates shown in Table 10.

The design of policies to promote women in politics has so far mostly focused on selection made by parties, prescribing, mainly, gender quotas on candidate lists. However, gender quotas on candidate list are not always effective (see Section 1), and when they are, the increase in female representation is of limited size (De Paola et al., 2010). Our results show that, combining gender quotas with measures which also target voters, such as double preference voting, leads to stronger effects on female representation and brings the municipal council composition close to gender equality. Moreover, in relation to the debate on the drivers behind low female presence in politics, we show that a policy acting on the demand side can achieve stronger female empowerment.

Female presence in politics is important for the outcome of decision making. It is not only a matter of higher representation, but also of different agendas. Interestingly, and differently from any previous study, our causally identified estimates allows to reveal a link between female representation and public policy in the context of a developed country. Our evidence on Italy, where access to political careers is determined by political competition, may apply to a broad set of other countries, sharing similar institutional characteristics.

Future research can cast light on the origins of this link. In our set-up, women invest more in education and environment: understanding to what extent this choice reflects a general female trait or a specific trait of female politicians opens new avenues of research.

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Tables and figures

Table 1: Descriptive statistics: municipalities and elected politicians

Panel A: Geographical coverage			
No. of municipalities voting in 2013:	Control	Treated	Total
North	132	65	197
South and islands	153	63	216
Center	34	21	55
Total	319	149	468
No. of municipalities voting in 2014:	Control	Treated	Total
North	2023	493	2,516
South and islands	473	99	572
Center	392	117	509
Total	2,888	709	3,597
No. of municipalities voting in 2015:	Control	Treated	Total
North	94	32	126
South and islands	295	74	369
Center	32	7	39
Total	421	113	534
Panel B: Share of female councilors			
Municipalities voting in 2013:	Control	Treated	Total
	0.22	0.39	0.28
	(0.19)	(0.11)	(0.19)
Municipalities voting in 2014:	Control	Treated	Total
	0.29	0.40	0.31
	(0.14)	(0.10)	(0.14)
Municipalities voting in 2015:	Control	Treated	Total
	0.27	0.42	0.30
	(0.14)	(0.09)	(0.14)

Notes. Panel A reports the number of municipalities which held elections in 2013, 2014 and 2015, distinguishing between treated and control groups, overall and separately for each different geographical areas. Panel B reports the means of the share of elected female councilors (with standard errors in parentheses) in municipalities which held elections in 2013, 2014 and 2015, distinguishing between treated and control groups.

Table 2: Descriptive statistics: candidates

Panel A: 2013 election			
No. of municipalities:	Control	Treated	Total
voted	319	149	468
with all lists available	231	118	349
with preference votes available	231	118	349
with pre-election ranking available	189	108	297
No. of party lists:	592	446	1038
with pre-election ranking available	493	415	908
with non-alphabetical ranking	270	258	528
Panel B: Previous election			
No. of municipalities:	Control	Treated	Total
voted	319	149	468
with all lists available	113	80	193
No. of party lists	274	257	531

Notes. The table reports sample numerosity for the municipal 2013 election and for the previous one, distinguishing between treated and control municipalities. For the municipal 2013 election, Panel A reports the number of municipalities that voted (for which we have data on all elected councilors), the number of municipalities with lists available, with preference votes available, and with ranking available. It also reports the total number of party lists, the number of party lists with ranking available and, among them, those with non-alphabetical ranking. For the previous election, Panel B reports the number of municipalities that voted (for which we have data on all elected councilors), the number of municipalities with lists available, and the number of party lists.

Table 3: Descriptive statistics: shares of municipal spending

	Current account	Capital account
Administration	0.30	0.03
	(0.11)	(0.06)
Justice	0.03	0.00
	(0.02)	(0.01)
Education	0.08	0.03
	(0.05)	(0.06)
Culture	0.03	0.02
	(0.02)	(0.06)
Roads	0.09	0.06
	(0.04)	(0.09)
Environment	0.16	0.07
	(0.07)	(0.11)
Social	0.08	0.01
	(0.07)	(0.03)
Productive services	0.01	0.01
	(0.04)	(0.04)
Observations	3,965	3,965

Notes. The sample includes municipalities that held elections in 2013 and 2014.

Table 4: Socio-demographic characteristics

Panel A: Demographic characteristics				
	Females	Males	Children	Elderly
Treatment	0.031	−0.003	0.016	−0.035
	(0.027)	(0.025)	(0.016)	(0.041)
Bias-corrected	0.029	0.007	0.017	−0.044
	(0.027)	(0.025)	(0.016)	(0.041)
Robust SE	0.029	0.007	0.017	−0.044
	(0.029)	(0.028)	(0.018)	(0.045)
Bandwidth	759	829	899	745
Observations on the left	229	257	276	226
Observations on the right	156	170	183	153
Panel B: Educational status				
	Females w/upper secondary or more	Males w/upper secondary or more		
Treatment	0.003	0.021		
	(0.028)	(0.028)		
Bias-corrected	−0.000	0.017		
	(0.028)	(0.028)		
Robust SE	−0.000	0.017		
	(0.031)	(0.031)		
Bandwidth	796	770		
Observations on the left	244	233		
Observations on the right	163	158		
Panel C: Occupational status				
	Employed females	Employed males		
Treatment	−0.037	−0.028		
	(0.037)	(0.035)		
Bias-corrected	−0.035	−0.023		
	(0.037)	(0.035)		
Robust SE	−0.035	−0.023		
	(0.041)	(0.039)		
Bandwidth	813	795		
Observations on the left	249	244		
Observations on the right	167	163		

Notes. The table shows the results of non-parametric estimation (local linear regressions) on municipal demographic, educational and occupational characteristics. The sample includes municipalities with less than 15,000 residents that held elections in the period 2013-2015, within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017). Conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. * p<0.1, ** p<0.05, *** p<0.01.

Table 5: Female presence on municipal councils

	Panel A: Parametric Approach			
Dependent variable:	Share of female councilors			
	(1)	(2)	(3)	(4)
Treatment	0.135***	0.130***	0.151***	0.162***
	(0.009)	(0.014)	(0.018)	(0.023)
Polynomial order	1	2	3	4
Observations	4,599	4,599	4,599	4,599
R-Squared	0.122	0.122	0.123	0.124
	Panel B: Non-parametric Approach			
Dependent variable:	Share of female councilors			
	(1)			
Treatment	0.182***			
	(0.022)			
Bias-corrected	0.191***			
	(0.022)			
Treatment (bias-corrected, robust SE)	0.191***			
	(0.025)			
Bandwidth	863			
Observations on the left	268			
Observations on the right	176			

Notes. The table shows the results of parametric and non-parametric estimation. The dependent variable is the share of female councilors over the total number of councilors. In Panel A, the sample includes all municipalities with less than 15,000 residents that held elections in the period 2013-2015. Columns 1-4 include polynomials of orders 1-4, respectively, in the resident population, centered on the 5,000 resident threshold. Polynomials are allowed to differ on the two sides of the cut-off. Only the coefficient of interest *Treatment* is reported. In Panel B, conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. The sample includes municipalities voting in the period 2013-2015 within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. * p<0.1, ** p<0.05, *** p<0.01.

Table 6: Working of the policy

	Non-parametric Approach			
Dependent variable:	Female candidates	Borda score	Preference votes	Post-election Borda score
	(1)	(2)	(3)	(4)
Treatment	0.019	−0.027	0.146**	0.126**
	(0.054)	(0.092)	(0.059)	(0.064)
Bias-corrected	0.007	−0.033	0.140**	0.132**
	(0.054)	(0.092)	(0.059)	(0.064)
Treatment (bias-corrected, robust SE)	0.007	−0.033	0.140*	0.132*
	(0.067)	(0.111)	(0.073)	(0.078)
Bandwidth	1,342	1,336	1,310	1,400
Observations on the left	71	52	69	60
Observations on the right	93	78	93	80

Notes. The dependent variable is the share of female candidates over the total number of candidates on list s in municipality i in column 1; the Borda score of female candidates on list s in municipality i - in column 2; the share of preference votes cast for female candidates on list s in municipality i - in column 3; the post-election Borda score of female candidates on list s in municipality i - in column 4. Conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. The sample includes all lists presented in municipalities with less than 15,000 residents that held elections in 2013 within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. * p<0.1, ** p<0.05, *** p<0.01.

Table 7: Voting behavior

	Non-parametric Approach			
Dependent variable:	Voters	Female voters	Use of preferences	Female education
	(1)	(2)	(3)	(4)
Treatment	234.097	126.122	0.754***	0.396
	(232.555)	(120.324)	(0.244)	(1.196)
Bias-corrected	288.804	154.873	0.849***	0.533
	(232.555)	(120.324)	(0.244)	(1.196)
Treatment (bias-corrected, robust SE)	288.804	154.873	0.849***	0.533
	(257.942)	(133.675)	(0.262)	(1.461)
Bandwidth	1,374	1,349	986	1,833
Observations on the left	35	34	16	44
Observations on the right	39	39	25	54

Notes. The dependent variable is the number of voters in municipality i in column 1; the number of female voters in municipality i in column 2; the number of preference votes over the total number of votes in municipality i in column 3; the average number of years of education of elected female councilors in municipality i in column 4. The sample includes municipalities with less than 15,000 residents that held elections in 2013. Conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. The sample includes municipalities voting in 2013 within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. * p<0.1, ** p<0.05, *** p<0.01.

Table 8: Female presence on municipal councils before the reform

	Panel A: Parametric Approach			
Dependent variable:	Share of female councilors			
	(1)	(2)	(3)	(4)
Treatment	0.007	−0.010	0.002	−0.002
	(0.008)	(0.012)	(0.017)	(0.021)
Polynomial order	1	2	3	4
Observations	4,599	4,599	4,599	4,599
R-Squared	0.013	0.014	0.015	0.015
	Panel B: Non-parametric Approach			
Dependent variable:	Share of female councilors			
	(1)			
Treatment	−0.013			
	(0.016)			
Bias-corrected	−0.016			
	(0.016)			
Treatment (bias-corrected, robust SE)	−0.016			
	(0.019)			
Bandwidth	1,965			
Observations on the left	700			
Observations on the right	358			

Notes. The table shows the results of parametric and non-parametric estimation. The dependent variable is the share of female councilors over the total number of councilors in the election prior to 2013(2014/2015) for municipalities voting in 2013(2014/2015). In Panel A, the sample includes all municipalities with less than 15,000 residents that held elections in the period 2013-2015. Columns 1-4 include polynomials of orders 1-4, respectively, in the resident population, centered on the 5,000 resident threshold. Polynomials are allowed to differ on the two sides of the cut-off. Only the coefficient of interest *Treatment* is reported. In Panel B, conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. The sample includes municipal election voting in the period 2013-2015 within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 9: Difference in discontinuities

Dependent variable:	Share of female councilors	
	(1)	(2)
Treatment × After	0.128***	0.190***
	(0.010)	(0.028)
Local		X
Observations	9,198	890
R-Squared	0.164	0.314

Notes. The table shows the results of difference-in-discontinuities estimation (Grembi et al., 2016). The dependent variable is the share of female councilors over the total number of councilors. The sample includes municipal elections in the period 2013-2015 and previous municipal elections. The results are computed for the entire sample in column 1, and for the sample of municipalities within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents in column 2. Standard errors clustered at municipal level in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 10: Shares of spending

	Panel A: Current account							
	Administration	Justice	Education	Culture	Roads	Environment	Social	Product. services
Treatment	−0.162	−0.016	−0.056	−0.055**	−0.043	−0.145	0.043	0.005
	(0.115)	(0.019)	(0.060)	(0.027)	(0.036)	(0.110)	(0.095)	(0.030)
Bias-corrected	−0.157	−0.017	−0.043	−0.046*	−0.047	−0.149	0.024	0.014
	(0.115)	(0.019)	(0.060)	(0.027)	(0.036)	(0.110)	(0.095)	(0.030)
Robust SE	−0.157	−0.017	−0.043	−0.046	−0.047	−0.149	0.024	0.014
	(0.130)	(0.021)	(0.072)	(0.032)	(0.039)	(0.125)	(0.112)	(0.036)
Observations on the left	230	219	250	255	211	227	243	257
Observations on the right	145	139	165	167	137	144	159	168
	Panel B: Capital account							
	Administration	Justice	Education	Culture	Roads	Environment	Social	Product. services
Treatment	−0.045	0.022	0.163**	0.073	−0.017	0.283**	0.002	−0.001
	(0.062)	(0.014)	(0.075)	(0.056)	(0.062)	(0.120)	(0.025)	(0.030)
Bias-corrected	−0.044	0.024*	0.176**	0.084	−0.037	0.286**	0.000	−0.002
	(0.062)	(0.014)	(0.075)	(0.056)	(0.062)	(0.120)	(0.025)	(0.030)
Robust SE	−0.044	0.024	0.176**	0.084	−0.037	0.286**	0.000	−0.002
	(0.074)	(0.018)	(0.089)	(0.068)	(0.069)	(0.144)	(0.029)	(0.038)
Observations on the left	253	237	263	278	231	247	247	280
Observations on the right	165	152	170	176	145	161	161	177

Notes. The table shows the results of non-parametric estimation (local linear regressions), within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017). The sample includes all municipalities with less than 15,000 residents that held elections in 2013 and 2014. The dependent variable in Panel A (Panel B) is the share of current account (capital account) spending in a given category over the total spending in a given municipality. For municipalities which voted in 2013, the share is computed as the average share over the period 2014 and 2015 and for municipalities which voted in 2014 as the share of spending in 2015. Only the coefficient of interest *Treatment* is reported. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 11: Shares of municipal spending before the reform

	Current account		**Capital account**	
	Education	Environment	Education	Environment
Treatment	−0.481	0.001	−0.055	−0.247
	(3.379)	(0.773)	(0.295)	(0.457)
Bias-corrected	−2.417	−0.012	0.010	−0.225
	(3.379)	(0.773)	(0.295)	(0.457)
Robust SE	−2.417	−0.012	0.010	−0.225
	(3.978)	(0.920)	(0.347)	(0.531)
Observations on the left	232	365	429	413
Observations on the right	146	211	240	232

Notes. The table shows the results of non-parametric estimation (local linear regressions), within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017). The sample includes the preceding election for all municipalities with less than 15,000 residents that held elections in 2013 and 2014. The dependent variable in columns 1 and 2 (columns 3 and 4) is the share of current account (capital account) spending in a given category over the total spending in a given municipality in the year subsequent to the election. Only the coefficient of interest *Treatment* is reported. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 12: Difference in discontinuities: shares of municipal spending

Dependent variable:	Education		Environment	
	(1)	(2)	(3)	(4)
Treatment × After	0.014***	0.031**	0.013*	0.031
	(0.005)	(0.014)	(0.008)	(0.019)
Local		X		X
Observations	8,000	873	8,000	823
R-Squared	0.015	0.010	0.030	0.022

Notes. The table shows the results of difference-in-discontinuities estimation. The dependent variable is the share of capital account spending on education (environment) in columns 1 and 2 (in columns 3 and 4). The sample includes municipal elections in the period 2013-2015 and previous municipal elections. In columns 1 and 3, results are computed for the entire sample. In columns 2 and 4, the sample includes municipalities within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. Standard errors clustered at municipal level in parentheses.* p<0.1, ** p<0.05, *** p<0.01.

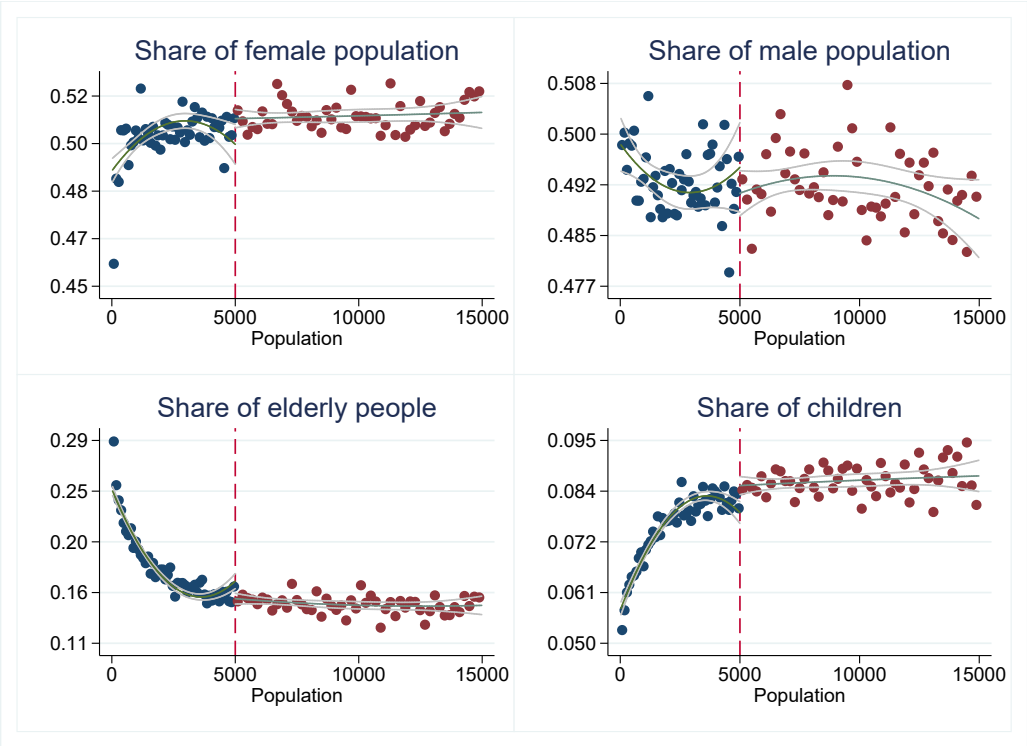


Figure 1: Demographic characteristics

Notes. The figure plots the binned averages of demographic municipal characteristics (share of women, men, elderly and children over the municipal population) against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals. The sample includes Italian municipalities with population below 15,000 residents that held elections in the period 2013-2015.

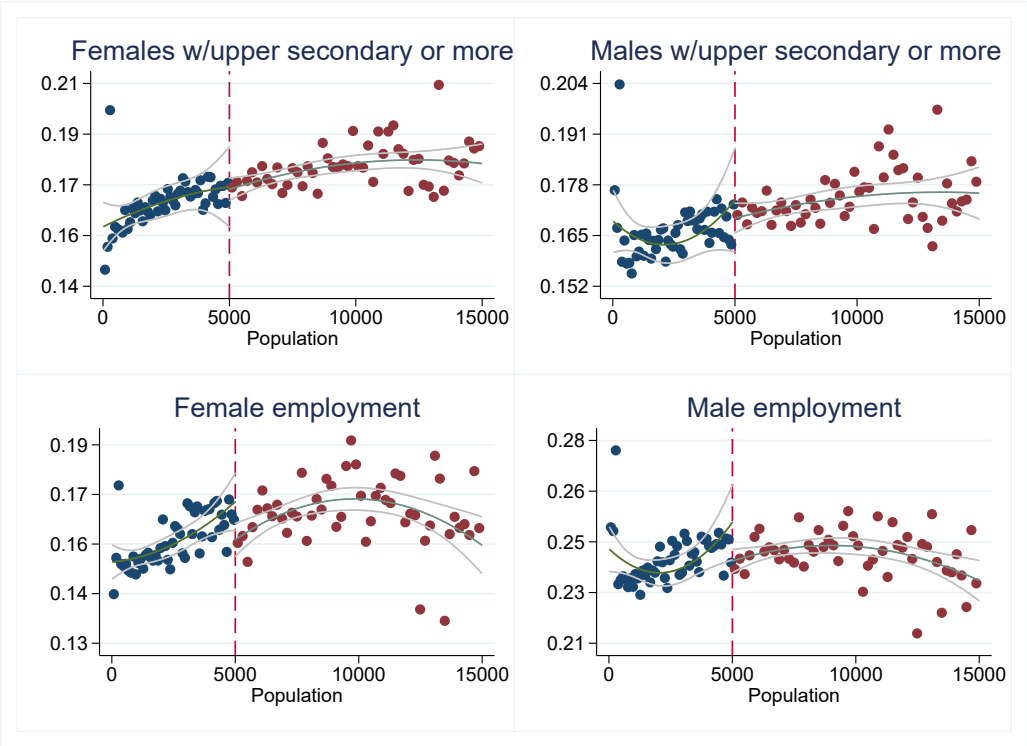


Figure 2: Socio-demographic characteristics

Notes. The figure plots the binned averages of educational and occupation municipal characteristics (share of females and males with upper secondary or higher degree, female and male employment rate) against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals. The sample includes Italian municipalities with population below 15,000 residents that held elections in the period 2013-2015.

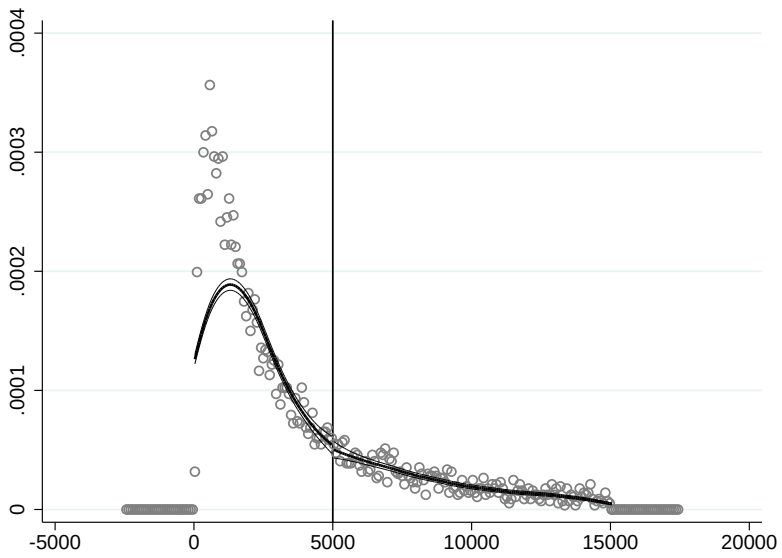


Figure 3: McCrary test

Notes. The figure plots the density of the municipal population. The sample includes Italian municipalities with population below 15,000 residents that held elections in the period 2013-2015.

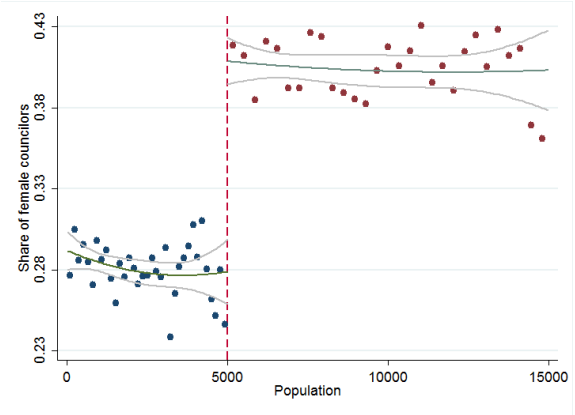


Figure 4: Female councilors

Notes. The figure plots the binned averages of the share of female councilors against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals. The sample includes Italian municipalities with population below 15,000 residents that held elections in the period 2013-2015.

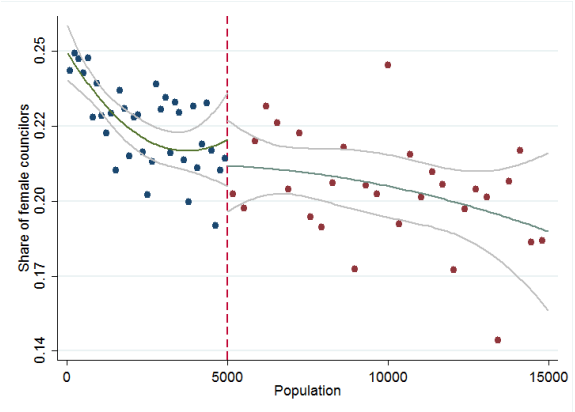
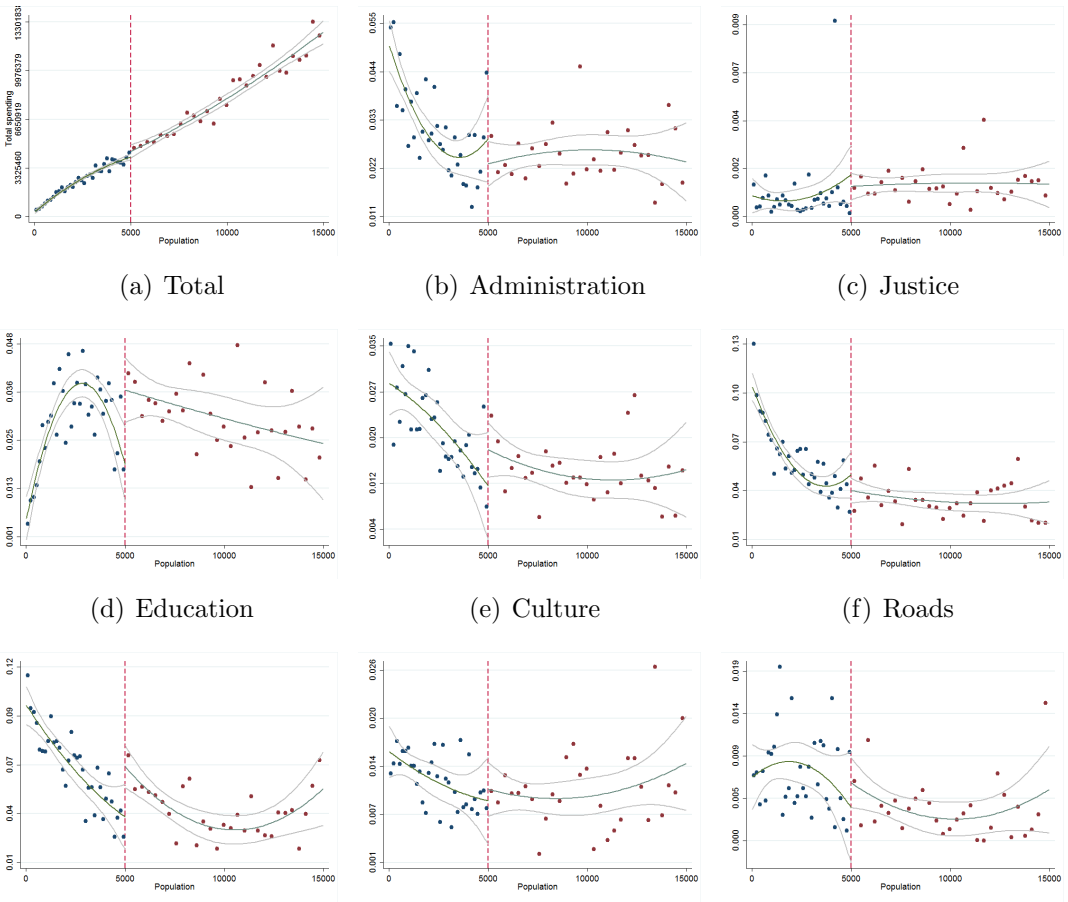


Figure 5: Female councilors before the reform

Notes. The figure plots the binned averages of the share of female councilors in the previous mandate against the municipal population, for Italian municipalities with population below 15,000 residents that held elections in the period 2013-2015, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.



(a) Total (b) Administration (c) Justice

(d) Education (e) Culture (f) Roads

(g) Environment (h) Social services (i) Productive services

Figure 6: Local spending

Notes. The sample includes municipalities voting in 2013 and 2014. The figure plots the binned averages of the total spending and the shares of capital account spending in a given category in 2014 and 2015 against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.

Appendix

A.1 Description of the variables

The AIDA PA database contains information on balance sheets of all Italian municipalities for the period 2000-2015, with detailed information on the sources of income and expenditure items. AIDA PA collects information on both capital and current account expenditures for 12 main categories:

- Administration (e.g., spending in administrative bodies, personnel, registry office, statistical and electoral services).
- Justice (e.g., judicial offices and prisons).
- Local police.
- Education (e.g., spending on kindergarten, primary, middle and high school).
- Culture (e.g., libraries, museums, and cultural activities).
- Sport (e.g., swimming pools, stadiums, recreational and sport events).
- Tourism.
- Roads (e.g., spending on traffic circulation and connected services, public lighting and public transports).
- Environment (e.g., spending on urban planning, social housing, water supply, waste disposal, environment protection).
- Social services (e.g., childcare, services for the elderly and social assistance).
- Economic development (e.g., spending on services linked to trade, manufacturing, craftsmanship, etc).
- Productive services (e.g., spending on gas and electricity distribution, heating, etc).

In the analysis, we focus on spending commitments and look at the shares of spending designated for 8 main purposes. We aggregate several small spending outcomes into more generic groups, as follows. The share of spending on justice comprises spending on justice and local police, the share of spending on productive activities comprises spending on productive activities and services for economic development, the share of spending on culture comprises spending on culture, sport and tourism.

A.2 Additional results

Table A.1: Female presence on municipal councils: geographical areas

	Non-parametric Approach		
Dependent variable:	Share of female councilors		
	(1)	(2)	(3)
Treatment	0.137***	0.159***	0.215***
	(0.028)	(0.060)	(0.028)
Bias-corrected	0.147***	0.160***	0.211***
	(0.028)	(0.060)	(0.028)
Treatment (bias-corrected, robust SE)	0.147***	0.160**	0.211***
	(0.032)	(0.077)	(0.034)
Area	North	Center	South
Bandwidth	986	2,061	1,886
Observations on the left	187	110	152
Observations on the right	118	46	94

Notes. The dependent variable is the share of female councilors over the total number of councilors. Columns 1, 2 and 3 show the results for municipalities in the North, Center and South, respectively. Conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. The sample includes municipalities voting in the period 2013-2015 within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. * p<0.1, ** p<0.05, *** p<0.01.

Table A.2: Female presence on candidate lists before the reform

	Non-parametric Approach
Dependent variable:	Share of female candidates
	(1)
Treatment	−0.038
	(0.053)
Bias-corrected	−0.035
	(0.053)
Treatment (bias-corrected, robust SE)	−0.035
	(0.065)
Bandwidth	1,236
Observations on the left	43
Observations on the right	52

Notes. The table shows the results of non-parametric estimation. The dependent variable is the share of female candidates over the total number of candidates on party lists presented in the election prior to 2013. Conventional RD estimates with a conventional variance estimator, bias-corrected RD estimates with a conventional variance estimator, and bias-corrected RD estimates with a robust variance estimator are reported. The sample includes municipalities voting in 2013 within the optimal bandwidth selected by one common MSE-optimal bandwidth selector (Calonico et al., 2017) around the cut-off of 5,000 residents. * p<0.1, ** p<0.05, *** p<0.01.

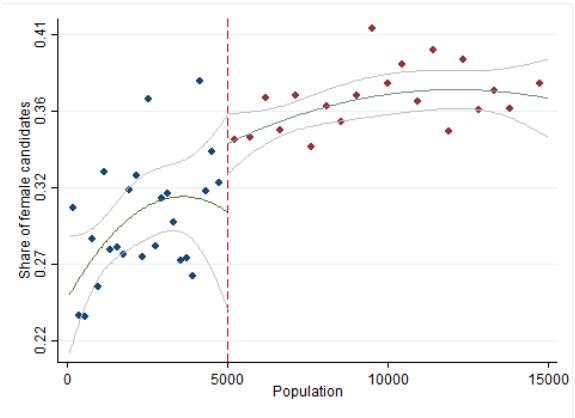


Figure A.1: Female candidates

Notes. The figure plots the binned averages of the share of female candidates against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.

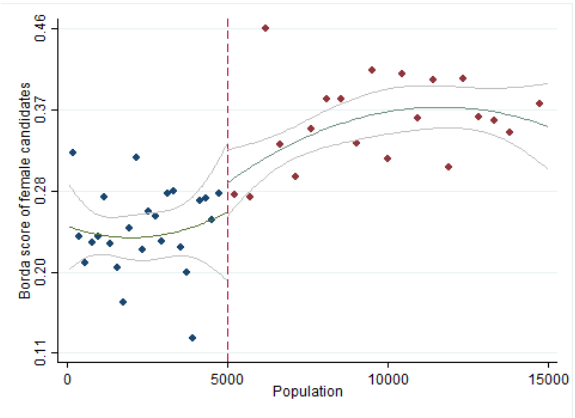


Figure A.2: Placement of female candidates

Notes. The figure plots the binned averages of the Borda score of female candidates on party lists against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.

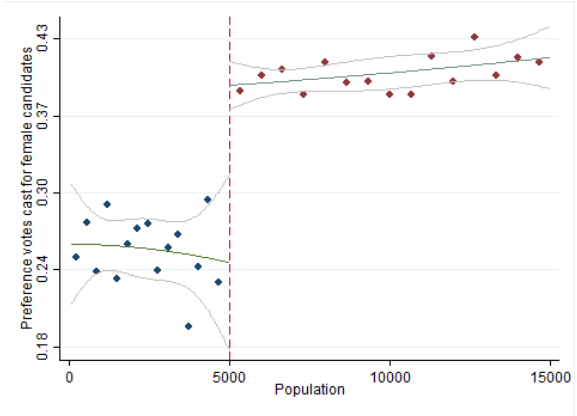


Figure A.3: Preference votes cast for female candidates

Notes. The figure plots the binned averages of the share of preference votes cast for female candidates over the number of preference votes for all candidates on a given list against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.

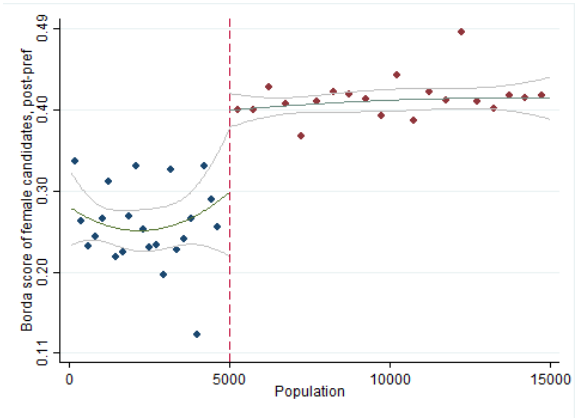


Figure A.4: Post-election placement of female candidates

Notes. The figure plots the binned averages of the Borda score according to the post-election ranking, based on preference votes, of female candidates against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.

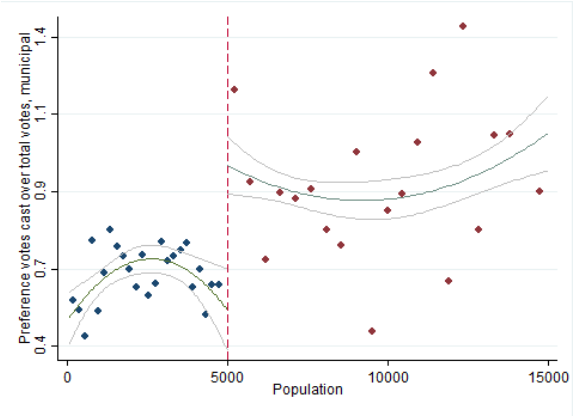


Figure A.5: Use of preference votes

Notes. The figure plots the binned averages of the share of preference votes over the total votes cast in a given municipality against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.

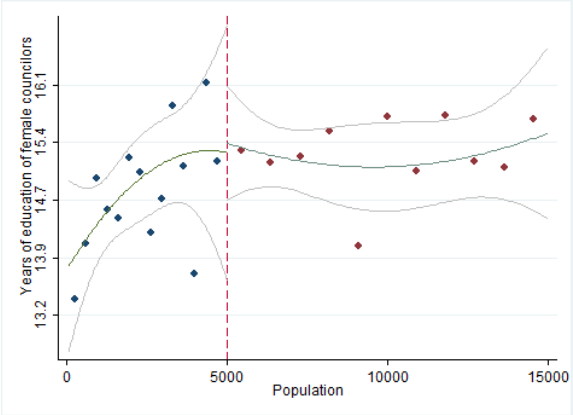


Figure A.6: Education of female councilors

Notes. The figure plots the binned averages of the years of education of elected female councilors against the municipal population, together with the quadratic polynomial fit on both sides of the 5,000 resident cut-off and the 95% confidence intervals.