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Gender quotas and the quality of politicians ☆

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ABSTRACT

We analyze the effects of the introduction of gender quotas in candidate lists on the quality of elected politicians, as measured by the average number of years of education. We consider an Italian law which introduced gender quotas in local elections in 1993, and was abolished in 1995. As not all municipalities went through elections during this period, we identify two groups of municipalities and use a Difference in differences estimation. We find that gender quotas are associated with an increase in the quality of elected politicians, with the effect ranging from 0.12 to 0.24 years of education. This effect is due not only to the higher number of elected women, who are on average more educated than men, but also to the lower number of low-educated elected men. The positive effect on quality is confirmed when we measure the latter with alternative indicators, it persists in the long run and it is robust to controlling for political ideology and political competition.

1. Introduction

This paper studies the effects of the introduction of gender quotas in candidate lists on the quality of elected politicians. Women are largely under-represented in political institutions. According to the most recent data, women represent only 19.8% of members of Parliaments in the world. In the European Parliament women are 35% of the members. When we consider the different European countries, in the Lower (or Single) House around 40% of members are female in Belgium, Denmark, Finland, Norway, Sweden and only 22% in Italy. The figures for the Upper House are not very different. Even in local governments, which are typically considered a first step for politicians' career, and possibly easier to access for women, in many countries the female presence is much lower than their share in the population would predict. In Italy, for instance, women represent 11% of mayors, 20% of members of municipal councils and 21% of members of executive committees in municipalities.

There are many arguments in favor of increasing female presence in politics. First, given that women represent half of the population, equal participation in political decision-making contributes to legitimizing the democratic body (Stevens, 2007). Second, as women's needs may be different from men's ones, a larger female presence may be justified as a way to redirect policy implementation and public spending towards specific areas (Funk and Gathmann, 2010; Rehavi, 2007). Additionally, female political leadership may also be beneficial in itself, if women adopt different behavior and practices which have a positive impact on the quality of institutions and organizations (Epstein et al., 2005).

There are also arguments against the introduction of affirmative action measures, such as gender quotas. Some of them are not specific to politics but also apply to business. One of the main claims is that female under-representation is just the result of individual choices, especially those related to fertility and motherhood. Thus, by equalizing outcomes rather than opportunities, affirmative action policies risk to promote less qualified individuals who will very likely perform poorly: gender

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quotas may increase equity at the expense of efficiency (Holzer and Neumark, 2000). As gender quotas do not necessarily obey to meritocracy, the average quality of those responsible for decision-making may decrease. Since the quality of politicians is crucial for good governance and consequently for performance, this consideration may be used against the introduction of gender quotas in politics.

In this paper we reverse the argument that gender quotas may have an adverse effect on the quality of selected representatives. On the contrary, focusing on politics, and measuring the quality of politicians primarily by their years of education, we show that gender quotas may increase the quality of elected politicians.

We perform an empirical analysis focused on the temporary adoption of gender quotas in candidate lists in Italy. Gender quotas were introduced in Italy in 1993 by the Law No. 81, and were abolished in 1995 by the Constitutional Court. The law imposed that in candidates' lists neither gender could represent more than 2/3 of the total number of candidates. Given that not all municipalities voted during the years 1993–1995 when the law was in force, we can identify two groups of municipalities, one affected by the quota and another one unaffected. This allows us to use a Difference in differences approach to investigate the effect of gender quotas on the quality of politicians. Given the reasonable assumption that there is a positive relationship between educational attainment and private sector's success, and between market and political skills (Galasso and Nannicini, 2011), we measure the quality of politicians in terms of human capital (see also Kotakorpi and Poutvaara, 2011). We thus compare the change in the average education of politicians across the two groups of municipalities before and after the policy is enforced. In this way we disentangle the effect of the quotas on politicians' quality from the temporal trend, which we assume to be common to the two groups. We find that, due to the introduction of the reform, the average education of elected politicians increased significantly more in municipalities affected by the policy. Namely, municipal councilors invested in their education around 2–3 months more in the treated group than in the control one. The effect is driven not only by the increase in the number of elected women, who are on average more educated than men, but also by the reduction in the number of low-educated elected men. Quality should therefore be an argument in favor rather than against the introduction of gender quotas. We propose alternative measures of the quality of politicians and several robustness checks to support our results.

The rest of the paper is organized as follows. Section 2 discusses the related literature. Section 3 describes the Italian institutional framework and the data. Sections 4 and 5 present the estimation strategy and the empirical results, respectively. Section 6 discusses the issues of binding quotas and of selection into treatment and control groups. Section 7 analyzes other outcome variables and performs some robustness checks. Finally, Section 8 concludes.

2. Related literature

Our paper crosses and combines two strands of the literature: the one on gender quotas and the one on the selection of politicians.

Starting from the first one, although there is a wide literature on different ways of implementing quotas and on the electoral success of women in legislative bodies (see Krook, 2009), analytical studies on the impact of gender quotas in politics are still few. Some papers focus on the reduction of gender stereotypes (e.g. Beaman et al., 2009). Others (e.g. De Paola et al., 2010; Campa, 2011; Casas-Arce and Saiz, 2011) analyze the impact of gender quotas on female representation. De Paola et al. (2010) show that the introduction of gender quotas in local elections in Italy in the period 1993–1995 increased female presence and, by exposing voters to female leadership, broke down negative stereotypes, generating a higher percentage of elected women, even after termination of the policy. In this paper we study the same policy experiment, but focus on the quality of politicians rather than on the number of elected women. Folke and Rickne (2012) suggest that in contexts in which political competition is weak, gender quotas may reduce barriers for women to get access to higher political offices. Gender quotas may also have an impact on local policies. Women and men have different preferences both as voters (Edlund and Pande, 2002; Lott and Kenny, 1999; Aidt et al., 2006; Bertocchi, 2011) and as policy-makers. Women seem to prefer a different allocation of public funds, favoring projects that support female needs (Chattopadhyay and Duflo, 2004; Rehavi, 2007; Funk and Gathmann, 2010; Clots-Figueras, 2011) and that provide more public goods (Duflo and Topalova, 2004).

The literature also looks at why gender quotas may be introduced in politics. Maniquet et al. (2008) show that in single-member districts incumbent politicians may want to introduce gender quotas to increase the probability of running against a woman and of being reelected, given voters' bias in favor of men candidates.[1]

Our paper is also related to the growing literature on the selection and quality of politicians. Several contributions emphasize that the association between political competition and politicians' quality is a crucial determinant of the quality of government. Besley and Preston (2007) show how the electoral contestability of a district, in terms of electoral bias in favor of one party, affects policy choices. As politicians' quality is not an easily quantifiable concept, different measures have been proposed in the literature. Galasso and Nannicini (2011) measure quality by years of schooling, previous market income, and local government experience and study the effect of political competition on the quality of government. They find that members of the Italian Parliament with higher ex-ante quality are more likely to run in contestable districts and their subsequent performance is better. Quality is measured by education and occupational qualifications in Kotakorpi and Poutvaara (2011).[2] Using data on Finnish politicians, they find that higher salary attracts better quality female candidates, while no effect is detected for males. Focusing on US mayoral elections in the period 1950–2005, Ferreira and Gyourko (2014) find that female mayors have higher political skills than male, and thus have an advantage as incumbents over comparable male candidates.

Other works show that education is positively correlated with the quality of government and discuss the impact of the latter on economic development (Djankov et al., 2003; Glaeser et al., 2004; Fortunato and Panizza, 2011). Recent studies also show that the identity of leaders, and especially their education, matters for growth (Jones and Olken, 2005; Besley et al., 2011). Gagliarducci and Nannicini (2013) find that better paid politicians are more skilled individuals and that they size government expenditure down. Merlo et al. (2010) show that there is a negative association over time between the salary of Italian politicians and their quality.

To the best of our knowledge, the relationship between the introduction of a law on gender quotas and the quality of politicians has not yet been tested empirically. The only exception is Besley et al. (2013), who construct a new dataset on Swedish municipalities and test the impact of the imposition of gender quotas by the central social-democratic party on its municipality groups on politicians' skills. There are however influential theoretical studies and experimental evidence. Julio and Tavares (2010) challenge the idea – as one could gather from Caselli and Morelli (2004) – that gender quotas in politics may decrease the average quality of politicians by inducing women with lower opportunity cost on the private labor market to become candidates. They argue that this reduction of quality is only a short-term effect, that dominates when the rewards from public office are low, or when they are high but women are significantly more discriminated in the political market than in the labor market. Otherwise, quotas may even

[1] Bagues and Esteve-Volart (2012) however provide evidence that challenges this view of the voters' bias in favor of men candidates.

[2] These measures may in general raise an issue of representation, i.e. to what extent more qualified politicians are representative of electorate. However, if quality matters for voters, high quality politicians do not necessarily have incentives in contrast with the goal of appropriately representing their electorate.

increase the average quality. In the experimental literature, affirmative actions, especially gender quotas, have been associated with the participation of high performance women with no efficiency losses (Niederle et al., 2008). Having an enlarged pool of candidates is positive for the quality of selected individuals (see the review by Croson and Gneezy, 2009).

3. The institutional framework and the data

3.1. Italian municipalities and the Law 81/1993

There are approximately 8100 municipalities in Italy. They vary significantly in terms of geographic, demographic and economic indicators. The municipal administration manages the registry of births and deaths, the registry of deeds, contracting for local roads and public works and, most importantly, social services. It is 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*).

In 1993 a law concerning the electoral system for municipalities and provinces was approved. According to the Law 81/1993, neither gender could represent more than 2/3 of the total number of candidates in electoral lists for municipal councils.[3] The quota system was introduced to balance the gender composition in representative institutions at local level. Since there are usually more men candidates, the law established that at least 1/3 of the positions in candidates' lists had to be reserved to women. In case the list did not comply with the quota requirement, it was refused.

The Law 81/1993 included other provisions besides gender quotas. It established that mayors were directly elected by their own constituents, whereas previously they had been appointed by municipal councilors. It also prescribed that in municipalities with less than 15,000 inhabitants mayors were elected according to a single ballot rule, whereas a dual ballot was mandatory in municipalities with more than 15,000 inhabitants.[4] The Law also substantially increased mayors' powers, as it allowed them to nominate their own executives from outside the elected council members, while previously their choice had been constrained to the pool of elected politicians.[5] In 1995 the provision regarding gender quotas was abolished by the Constitutional Court. The Judgment 422/1995 claimed that this provision was unconstitutional because in violation of the principle of equality between sexes. All the other reforms included in the Law were not modified.

As a result of the ruling, the provision on gender quotas was in place for a short period of time between March 25, 1993 and September 12, 1995. Local elections take place every five years and municipalities cannot affect their schedule.[6]

Given this fixed term feature, not all Italian municipalities were affected by the reform: some municipalities voted with gender quotas, and others did not, as if the law had never been enacted. Thereby, we identify the former as the treatment group (where *treatment* is defined as being exposed to gender quotas) and the latter as the control group.[7] The first group is composed of 7,643 municipalities, which voted at least once during the period in which the law was in force; the second group consists of the rest of the municipalities, in line with the strategy used by De Paola et al. (2010).

As only gender quotas were removed, while the other provisions introduced by the Law 81/1993 remained in place, we can safely claim that gender quotas are the only different institutional feature between our treatment and control group municipalities.

3.2. The data and descriptive analysis

In our analysis we use administrative data provided by the Italian Ministry of the Interior on gender, education level and previous jobs of all politicians elected in Italian municipalities from 1985 to 2009.[8] We use these data also to identify the political ideology of the majority in each municipal council and to build a measure of political competition. In addition, data regarding the size of the resident population over age 15, the employment rate (overall and female) and the education level in the municipality are taken from the 1991 and 2001 Italian Census of Population.[9]

To calculate the overall employment rate (*Employment rate*) and the education level defined as the share of university graduates (*Local education level*) we use the resident population over age 15. We measure political ideology using dummies for the political leaning of the majority in the council.[10] The variable *Left-wing majority* is a dummy for a left-wing parties' majority; the variable *Center-right majority* is a dummy for a center-right parties' majority; the variable *Civic list majority* is a dummy for councils in which the majority of members are politicians elected through civic lists and the variable *Coalition majority* is a dummy for councils in which seats are shared equally by two or more parties with different ideology. The degree of political competition is measured by the difference between the share of seats of the winning majority and that of the second largest group.

Table 1 reports averages of these variables in treated and control municipalities in 1991. The statistics show that, while the two groups do not differ in terms of resident population size, control municipalities are more likely to be in the South and they have a lower employment rate. Also, they are less likely to be governed by a left-wing majority

[3] For municipalities with less than 15,000 residents neither gender could represent more than 3/4 of the total number of candidates. As to the presentation of candidates' lists, note that a party has to present a list that consists of at most as many candidates as the number of seats in the council and at least as large as 3/4 of the number of seats for municipalities up to 15,000 inhabitants, and 2/3 for larger ones. The number of seats depends on the size of the resident population.

[4] In single-ballot municipalities, the candidate who gets the relative majority in the single election is appointed to be the mayor. 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 winner gets 2/3 of the seats in the council, while the rest of the seats are assigned to the remaining lists according to a proportionality criterion. In dual-ballot localities instead each candidate can be backed by a number of lists and not just one. If a candidate obtains an absolute majority (i.e. more than 50% of the votes cast) he or she becomes the mayor; if no candidate wins an absolute majority, then those ranked first and second go to a second round, in which they can seek the support of lists whose candidates have been eliminated. After having appointed the mayor, the council is formed. If the lists supporting the winning candidate receive over 50% but less than 60% of the votes, then they obtain 60% of the seats in the Council; otherwise, seats are assigned according to a proportionality rule.

[5] Other changes involve the reduction in the maximum number of seats in municipal councils and the change in the format of the electoral ballot.

[6] In the period 1993–1999 the mandate was shortened to four years. Note also that elections take place only in a specified time window of a year. If the term of the municipal council expires after this period, elections are delayed. This explains why in some municipalities the term may be longer than 4 or 5 years depending on the election we are focusing on.

[7] We may have a mixing between the two groups if the electoral campaign is run right before the adoption or the abolition of gender quotas. Taking into account that electoral campaigns officially last for 30 days and candidates' lists must be presented on the first day of the campaign, no such mixing occurs in our sample since no municipalities voted during the 30 days after March 25, 1993 and in the 30 days after September 12, 1995.

[8] There are a few observations with electoral date falling prior to 1985. Given that data collection started in 1985 and covered all Italian municipalities, some localities at this point of time were governed by municipal councils elected previously.

[9] In line with the methodology adopted by the Ministry of Interior in compiling data on local politicians in Italy, we use 1991 Census data for elections up to 1997, and 2001 Census data for election from 1998 onwards.

[10] Since Italian local elections are characterized by a large number of parties running for and winning the seats, in order to identify the majority we group parties according to their political leaning and then determine the majority in a given municipal council and also the remaining minority groups. Notice therefore that in a municipality with, for example, a left-wing majority we may often have councilors from several different left-leaning parties.

Table 1
Baseline covariates.

	Treatment	Control	Difference
Population	5926.5	5468.578	−457.9223
se	(431.1372)	(569.2139)	(1834.29)
N	7633	424	
Employment rate	0.4131087	0.3794542	−0.0336545***
se	(0.0010144)	(0.004436)	(0.0044293)
N	7633	424	
Local education level	0.0208052	0.0209489	0.0001437
se	(0.0001601)	(0.0006841)	(0.0006984)
N	7633	424	
Located in the South	0.2565746	0.4976526	0.2410779***
se	(0.004996)	(0.0242533)	(0.0219222)
N	7643	426	
Center-right majority	0.4317676	0.471831	0.0400634
se	(0.0056661)	(0.024215)	(0.0246715)
N	7643	426	
Left-wing majority	0.4737668	0.4225352	−0.0512316**
se	(0.0057117)	(0.0239607)	(0.0248459)
N	7643	426	
Civic list majority	0.068167	0.0751174	0.0069504
se	(0.0028831)	(0.0127855)	(0.0125793)
N	7643	426	
Coalition majority	0.0262986	0.0305164	0.0042179
se	(0.0018305)	(0.0083434)	(0.0079998)
N	7643	426	
Political competition	0.4561903	0.4313484	−0.0248418*
se	(0.0031258)	(0.0134588)	(0.0136161)
N	7643	426	

Note. Pre-treatment baseline covariates in treatment and control municipalities and their difference. Covariates are: population over age 15 (Population), employment rate (Employment rate), share of university graduates (Local education level), share of municipalities located in the South (Located in the South), share of municipalities with center-right majority (Center-right majority), with left-wing majority (Left-wing majority), with civic list majority (Civic list majority) and with coalition majority (Coalition majority), political competition (Political competition) defined as the difference between the seats' shares received by the majority and by the second largest minority group. Standard errors in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

Table 2
Descriptive analysis on the average years of education.

	Before	After	Difference
Panel A: all politicians			
Treatment group	11.06965	11.6555	−0.5858493***
se	(0.0204582)	(0.0187622)	(0.0277464)
N	7643	7729	
Control group	11.40774	11.8739	−0.4661613***
se	(0 .087257)	(0.0784806)	(0.1173584)
N	426	426	
Difference	0.3380901***	0.2184021***	
se	(0.0890699)	(0.0820141)	
Total N	8069	8155	
Panel B: female politicians			
Treatment group	12.56099	12.65095	−0.089964**
se	(0.0368054)	(0.0269111)	(0.044554)
N	5658	7255	
Control group	13.03318	13.20246	−0.1692784
se	(0.1626731)	(0.1363827)	(0.2108495)
N	278	353	
Difference	0.4721975***	0.5515119***	
se	(0.1699135)	(0.1256534)	
Total N	5936	7608	
Panel C: male politicians			
Treatment group	10.93606	11.41226	−0.4762032***
se	(0.021118)	(0.0204208)	(0.0293722)
N	7643	7723	
Control group	11.30201	11.6555	−0.3534865***
se	(0.0899294)	(0.0854079)	(0.1240234)
N	426	426	
Difference	0.3659516***	0 .2432349***	
se	(0.091935)	(0.0892323)	
Total N	8069	8149	

Note. The average number of years of education of municipal councilors in treatment and control group municipalities at the last election before the adoption of gender quotas (*Before* period) and the first election after the adoption of this provision (*After* period). For treated (control) municipalities, *After* elections are held when the gender quota is in force (no longer in force). Panel A shows the results for all politicians, Panel B — for females and Panel C — for males. Standard errors are in parentheses. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

and show less competition in local politics. This is further discussed in Section 7.

Table 2 shows descriptive statistics on the average years of education of the elected councilors in the two groups of municipalities, which we use as a proxy for the quality of politicians. The averages are calculated using data on the politicians elected in the last election before the adoption of the law (*Before*) and in the first election immediately after it (*After*). In Panels B and C of Table 2 we distinguish between female and male politicians.

The statistics show that the education level of the elected councilors is on average higher in the control group, both in the *Before* and *After* periods. The temporal change is positive for both groups of municipalities, and it seems to be larger for the treatment group. All differences are statistically significant to conventional levels. The average years of education of the elected male politicians exhibit a similar pattern. Interestingly, the elected female councilors have on average completed roughly two years of schooling more than the male ones for all the groups considered.[11] There is little evidence that the temporal change in the years of education of the elected females was positive.

Before turning to our empirical strategy, we provide evidence of the impact of gender quotas on the share of elected women in order to check that gender quotas increase female presence in Italian municipal councils. We first look at how female presence evolves in the two groups of municipalities before and after the adoption of gender quotas and find it increases in both groups of municipalities, as shown in the Appendix, Table A.1. The rise of the share of elected women in municipalities that vote with gender quotas is, however, more pronounced than in municipalities that do not. We also provide graphical evidence of the shift in the distribution of the share of elected women across the *Before* and *After* election for treated municipalities. Fig. 1a illustrates the rightward shift of the distribution, resulting from an increase in the number of municipalities with higher shares of women. Finally, we plot the development of the share of elected female councilors across the two groups of municipalities over time. Since the mandate of local governments is five years and the reform took place in 1993, we divide our data into five-year intervals in such a way that the 1993 reform falls at the beginning of the third one.[12] Then, we calculate the share of female

[11] Note that women have a higher level of education also when we look at the entire population and not just at elected politicians: for instance, in the Nineties the share of women holding a secondary school degree was between 6 and 12 percentage points higher than the share of men.

[12] More precisely, the first data point for the treatment and the control group is the average over elections taking place before 1988, the second data point — over elections taking place during the period 1988–1992, the third — 1993–1997, the fourth — 1998–2002, and the fifth — 2003–2009. Given the length of the electoral term and the staggered pattern of Italian local elections (see Fig. 2), by taking averages over such periods we can in fact observe all municipalities voting within this period at least once. Moreover, elections pooled into such five-year averages are not very distant in time.

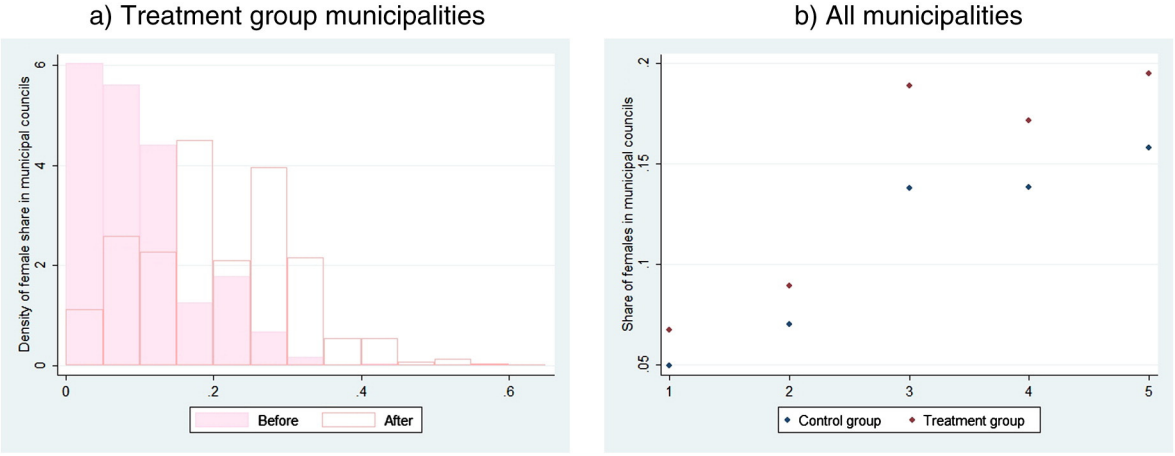

Fig. 1. Share of females in municipal councils.

municipal councilors for each period and each group. Fig. 1b shows that the treatment prompts a different evolution in the share of female municipal councilors across the two groups, while the pre-treatment trends for the two groups of municipalities are parallel.[13] This evidence supports the existence of a link between quotas on candidates' lists and the increase in the share of female elected politicians.[14] Since women have on average more years of education than men, this finding indicates one potential channel through which gender quotas may have affected the quality of elected politicians.

4. Empirical strategy

We analyze the impact of the reform on the average quality of politicians, as measured by years of education of elected municipal councilors. We identify municipalities which were exposed to gender quotas as the treatment group and municipalities which never voted with gender quotas as the control group and use a Difference in differences estimation. We run a number of municipality-level regressions and compare the change in the average education level of municipal councilors across the two groups of municipalities in elections right before and right after the introduction of the reform. We focus on the short-term effects of the policy, since it is more likely that within a short time period there were no sharp changes in the institutional environment other than the reform which could have differentially affected the quality of elected politicians.[15] We also analyze the effects on the education level of the elected female and male politicians separately.

Since being exposed or not to gender quotas was induced by an exogenous change in the institutional setting, we consider the treatment and the control group status unrelated to other unobserved municipality characteristics affecting the dependent variable. The existence of common trends prior to the reform between the two groups of municipalities is the key to our identification. Formally, we state this as follows:

Assumption 1. In the absence of the reform the difference in the outcome between the treatment and the control group would remain the same.

$$E[\varepsilon_{ist}|Treatment_i, After_t, X_{it}, \mu_s] = 0 \quad (1)$$

where $Treatment_i$ is a dummy variable for municipalities affected by gender quotas; $After_t$ is a dummy variable for elections taking place after the introduction of the reform; X_{it} is a vector of municipal characteristics, μ_s is a vector of province fixed effects and ε_{ist} is an error term. Index i refers to municipality, s refers to province, and t refers to electoral year.

Due to staggered election dates, in our analysis we also require that, in the absence of the reform, the treatment group has the same change in outcome as the control group during different time periods.

Assumption 2.

$$\Delta_i E(Y_{0i}|Treatment_i = 1, X_{it}, \mu_s) = \Delta_j E\left(Y_{0j}|Treatment_j = 0, X_{jt}, \mu_s\right) \quad (2)$$

where i and j are the indices for treatment and control group municipalities; Δ_i and Δ_j indicate differences taken between *Before* and *After* election dates for, respectively, treatment and control group municipalities. In other words, we assume that the change in the (untreated) outcome in the control group, for instance, from year 1992 to year 1997 can be used as a proxy for the change in the untreated outcome in the treatment group, for instance, from year 1989 to year 1994.[16]

To support the above conditional statements, we examine the residuals from the regression of the average years of education on the vector of controls X_{it} and on the vector of province fixed effects μ_s. We compare the averages of these residuals for the two groups of municipalities in the two elections of the pre-reform period (this is the maximum number of elections that we have for each municipality in that period, given the limited time-span of our dataset) and we find that they are not statistically different across the two groups of municipalities. Thus, the unpredicted part of the average councilors' education in the elections before the quota is the same in treatment and control municipalities, which supports our identification.

[13] De Paola et al. (2010) document the effects of gender quotas on female presence in municipal councils. Using our different empirical strategy, based on the last election before the policy and the first election right after it, which we describe in Section 4, we find the positive effects of gender quotas on the share of elected women reported in De Paola et al. (2010). The results are shown in the Appendix, Table A.2.

[14] This link is not uncontroversial. Krook (2009) concludes that "quota laws themselves are rarely sufficient for spurring dramatic changes in the number of women elected" (page 204). Dahlerup and Freidenvall (2008) highlight that the success of gender quotas depends on the level of enforcement, the type of electoral system and the real will of parties to move towards more equal representation.

[15] This empirical strategy is different from De Paola et al. (2010), who look at the long-run effects of the reform. We also exploit all the available data rather than two observations for each locality in the robustness analysis. Note that some municipalities voted twice during the period when the reform was in place. For them, we keep both observations after the introduction of quotas. When we exclude the second post-quota election from the sample, the results are confirmed.

[16] In Section 5 we attempt to compare elections closer in time for the two groups of municipalities in order to indirectly validate this assumption.

The baseline Difference in differences estimator is of the form:

$$Y_{ist} = \alpha + \gamma Treatment_i + \varphi After_t + \beta Treatment_i * After_t + X_{it}\delta + \mu_s + \pi_{st} + \varepsilon_{ist} \quad (3)$$

where Y_{ist} is the outcome of interest and measures the average years of education of politicians elected in locality i, in province s, in year t. The variable *Treatment* allows us to control for the unobserved time-invariant characteristics that may differ across municipalities in the two groups, whereas *After* captures the temporal trend common to both groups, including the impact of other provisions of the 1993 reform that affected all Italian municipalities. $Treatment_i * After_t$ is the interaction term between the two dummies and measures the treatment effect of our interest. X_{it} is a vector of control variables including the population size, its square, the share of university graduates and the share of employed resident population at the municipal level. μ_s are the dummies for each province and account for the characteristics that are common to municipalities in the same province and are constant over time. π_{st} is the interaction between province dummies and the dummy *After*: it accounts for time and province-varying shocks in politicians' education. The inclusion of π_{st} allows us to control that these do not contribute to the identification of our parameter of interest β.[17] Finally, ε_{ist} is an error term.

5. Results

Table 3 presents the results of our main specification. Panel A focuses on the effect of the reform on the average years of education of all members of the municipal councils; Panel B and Panel C look at female and male politicians, respectively, to investigate the existence of differential effects according to the gender of the elected politician. In all panels, column 1 reports estimates of Eq. (3) without considering control variables, province and province-*After* dummies; column 2 includes province dummies; column 3 adds control variables and, finally, column 4 uses the full specification in Eq. (3).[18] Standard errors are clustered at the province level.[19]

In Table 3, Panel A, the coefficient on the *Treatment* variable is statistically significant and negative: this indicates that the members of the municipal councils have on average more years of education in non-gender-quota municipalities. However, the coefficient becomes virtually zero if we include province dummies, i.e., within provinces, variation in the average education of the elected politicians across treatment and control groups seems essentially random. We observe a positive time trend in the level of education of elected politicians. The *After* coefficient is statistically significant and positive in columns 1 to 3, indicating an improvement of the quality of elected politicians. Most importantly, the coefficient on the interaction term *Treatment* * *After* is statistically significant and positive in all columns. The estimates suggest that the reform improved the average level of education of elected municipal councilors. Namely, after the introduction of the reform the average education of municipal councilors in the treatment group municipalities increased by 0.12 to 0.24 years more than in the control group. This corresponds to approximately 2–3 additional months of education on average.[20] The coefficient of interest is smaller in column 1 than in columns 2 to 4, where we gradually strengthen our identification. Given that an improved specification should allow removing biases, this pattern is consistent with the presence of a downward bias in our initial estimate. An upward bias from a catching-up effect for treatment municipalities on a hypothetically concave path for years of education is indeed not very likely, given that the average years of education of elected politicians are around 11–2 years less than those required for the completion of high school and 6 years less than those necessary for the achievement of a tertiary degree.

Focusing on female politicians, Table 3, Panel B, shows that the coefficient of interest is not significant. Thus, we cannot claim that in the treatment municipalities the education level of elected women evolved differently after the reform compared to the control group. On the contrary, the results in Table 3, Panel C, show that the quality of male politicians increased by 0.12–0.25 years more in the treatment group than in the control group, in line with our estimates in the baseline analysis.

To better qualify our result, we compute the variance of the years of education in municipal councils and use it as dependent variable. Table 4 shows that in the treated municipalities the variance increased less than in the control group municipalities. Given that the average level of education increases and the variance goes down, gender quotas guarantee a higher number of educated councilors. In other words, the increase in the average education of politicians does not hinge on the entry of a small number of individuals with an exceptionally high level of education.

Table 3
Effects of gender quotas.

Average years of education of council members				
	(1)	(2)	(3)	(4)
Panel A: all politicians				
Treatment	−0.338***	−0.0660	−0.0750	−0.0665
	(0.122)	(0.0910)	(0.0785)	(0.0797)
After	0.466***	0.462***	0.346***	0.522***
	(0.0741)	(0.0665)	(0.0757)	(0.108)
Treatment * After	0.120*	0.133**	0.240***	0.222***
	(0.0711)	(0.0662)	(0.0760)	(0.0781)
Observations	16,224	16,224	16,200	16,200
R-squared	0.029	0.248	0.420	0.426
Panel B: female politicians				
Treatment	−0.472**	−0.233	−0.233	−0.176
	(0.185)	(0.164)	(0.151)	(0.152)
After	0.169	0.114	0.0762	−1.741***
	(0.185)	(0.175)	(0.168)	(0.168)
Treatment * After	−0.0793	−0.0801	−0.0137	−0.103
	(0.177)	(0.171)	(0.163)	(0.168)
Observations	13,544	13,544	13,521	13,521
R-squared	0.002	0.093	0.135	0.144
Panel C: male politicians				
Treatment	−0.366***	−0.0720	−0.0814	−0.0742
	(0.126)	(0.0941)	(0.0818)	(0.0838)
After	0.353***	0.346***	0.225***	−0.688***
	(0.0808)	(0.0755)	(0.0852)	(0.0902)
Treatment * After	0.123	0.137*	0.248***	0.232**
	(0.0786)	(0.0762)	(0.0867)	(0.0902)
Observations	16,218	16,218	16,194	16,194
R-squared	0.018	0.236	0.404	0.409
Province FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Province FE * After	No	No	No	Yes

Note. OLS regressions of average years of education of council members. Panel A shows the results for all politicians, Panel B — for females and Panel C — for males. The sample contains the last election before the adoption of gender quotas and the first election after it for every Italian municipality. Columns 2–4 include province dummies; columns 3–4 control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported); column 4 includes interactions between province dummies and the dummy After. Standard errors clustered at province level in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

[17] An alternative empirical strategy would be to include municipality fixed effects and use the within-municipality variation to estimate the coefficient of interest. However, with only two time observations for each municipality, this strategy would not allow to separately estimate municipality-specific shocks in politicians' education and the effects of the introduction of gender quotas. Instead, we use municipality fixed effects in the long-run analysis in which we include more than two observations for each municipality (Section 3).

[18] To investigate the sensitivity of our results to our set of controls, we also run specifications in which controls are excluded one at a time. The results are unaffected.

[19] The results are robust to clustering the standard errors at the municipal level.

[20] Results in Table 3 are confirmed when we weight the average years of education in the municipal council by the number of municipal councilors elected in a given municipality.

Table 4
Effects of gender quotas.

Variance of years of education of council members				
	(1)	(2)	(3)	(4)
Treatment * After	−0.761**	−0.782**	−0.777**	−1.127***
	(0.305)	(0.307)	(0.308)	(0.326)
Observations	16,191	16,191	16,167	16,167
R-squared	0.063	0.088	0.096	0.107
Province FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Province FE * After	No	No	No	Yes

Note. The table reports the Difference in differences coefficient from OLS regressions of variance of years of education of council members. Treatment and After dummies are included in the regression, but their coefficients are not reported. The sample contains the last election before the adoption of gender quotas and the first election after it for every Italian municipality. Columns 2–4 include province dummies; columns 3–4 control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported); column 4 includes interactions between province dummies and the dummy After. Standard errors clustered at province level are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

To decompose the changes that lead to the 0.22 estimate of the effect of gender quotas (see Table 3, Panel A, column 4) we propose a simple numerical calculation. When quotas are binding, we see more female candidates in lists and, potentially, among the elected. The gender quotas-driven increase in female presence estimated in Table A.2 is around 4%. Since female politicians have approximately 1.5 years more of education than an average politician in the period before the implementation of the policy (see Table 2, Panels A and B), having more women in municipal councils can contribute to the increase in the average level of education by 0.06 (1.5 years * 4%). To explain the remaining 0.16 of the estimated effect, we suppose male candidates' education does not change in the period the reform is in place, but voters choose the most skilled among them. Even when elected females substitute men in the four lowest percentiles in the male education distribution, the increase of the average education level amounts to 0.13.[21] The residual effect of 0.03 can be attributed to the increase in the average education of the men candidates in the lists. When gender quotas are in place, the quality of the pool of candidates who run for local elections is affected, as also suggested by Besley et al. (2012).

To further complement the regression analysis in Table 3, we plot the kernel densities of the education levels of elected male politicians in the treatment group in the pre-quota period and in the post-quota period. Fig. 3a shows that the entire distribution shifts to the right: the largest difference between the two kernel densities lies in the right tail of the distribution. We next replicate the same analysis for all elected politicians (males and females) in the treatment group in the pre-quota and post-quota periods. Note that the changes shown in Fig. 3b are very similar to those in kernel densities shown for the only-male sample. This is consistent with the gender quotas' effect coming mainly through the election of more educated males.[22]

To conclude, our results show that the introduction of gender quotas increased the average education level of politicians in the municipalities affected by the policy due to the election of fewer low educated men.[23]

6. Discussion

In the following section we provide further evidence to support our identifying assumptions. We discuss the extent to which gender quotas are binding and capable of increasing the quality of elected politicians. We next address selection issues related to the early termination of municipal councils.

6.1. Effectiveness of quotas

A possible concern is that gender quotas are not the driving mechanism since they are imposed on candidates' lists and do not stipulate the share of females among elected politicians. If gender quotas are not binding, i.e. if the minimum share of women in candidates' lists is already fulfilled prior to the implementation of the law, they cannot generate the observed improvement in the quality of politicians. To address this issue, ideally we should have the lists of candidates for all parties in the *Before* election for treated municipalities and verify whether the required share of women is met. Unfortunately, candidates' lists are not collected either by the Ministry of Interior or by municipalities themselves in a systematic manner. Thus, we collect information on candidates' lists by inspecting paper copies of local newspapers for the period of the *Before* election. We are able to find 1221 lists for 351 treated municipalities.[24] This is the first attempt to collect data on Italian candidates to municipal councilors' positions. Though the outcome is partial, as the sample of municipalities covered is small and not representative of the treated group, we find that there are no municipalities in which all lists collected are non-binding. We then consider only the list of the party that wins the *Before* election in each municipality, since municipal councils draw more heavily from the winning lists. Thus, these winning lists being binding or not does matter for the effectiveness of the policy. In our sample, only 9% of these lists is non-binding. These data are suggestive that gender quotas did impose changes in the party nomination process.

On top of collecting information on candidates' lists at the party level, we use our dataset to calculate the share of elected females in the *Before* election in the party which won the majority of seats. When it exceeds the quota requirement, quotas are non-binding, since the share of women candidates on the list must have been larger than the quota. In our sample, there are 116 treated municipalities with such majority party lists.[25] We explicitly check if quotas effects are present for these municipalities by comparing them to the control group in our regression analysis. The coefficient of interest is very small and insignificant in Table 5, column 1. Alternatively, if we exclude these municipalities from our analysis, results are unchanged, consistently with a zero effect for these municipalities (Table 5, column 2).

6.2. Early termination and selection issues

Fig. 2 shows that the fixed term feature in the election dates induces a cyclical pattern, with many elections in some years, and very few in others. As early termination of municipal councils is a relevant reason

[21] We calculate it as the difference between the male average education level in the period before the policy was implemented and the average male education level in the distribution obtained by eliminating the four lowest education percentiles, weighted by the share of men in the municipal councils.

[22] This exercise is limited to some extent, since we are not taking into consideration changes in the control group. Note that we do not show the education distribution for female councilors, since it is implicit from the comparison between Fig. 3a and b that the change for women is virtually null. This is, in fact, consistent with the zero estimate of the effect of the reform in Table 3, Panel B.

[23] We also implemented the analysis using the share of politicians that have acquired at least a high school diploma as dependent variable. The results do not change and are shown in the Appendix, Table A.3. We cannot use the share of elected politicians that acquired a tertiary degree because their presence is extremely low in our sample.

[24] The listing of municipalities, candidates and their parties is available upon request.

[25] In principle, quotas are non-binding in a municipality if all party lists presented at the election satisfy the quota requirement. Focusing on the winning party we are less restrictive in identifying municipalities with non-binding quotas.

Table 5
Effectiveness of quotas and selection issues.

Average years of education of council members				
	(1)	(2)	(3)	(4)
Treatment ∗ After	−0.0009	0.224***	0.220***	0.223***
	(0.191)	(0.0786)	(0.0777)	(0.0803)
EarlyTermination			0.263***	0.415***
			(0.0481)	(0.0587)
EarlyTermination ∗ After				−0.299***
				(0.0481)
Observations	1,080	15,968	16,200	16,200
R-squared	0.510	0.427	0.429	0.429
Province FE	Yes	Yes	Yes	Yes
Province FE∗ After	Yes	Yes	Yes	Yes

Note. The table reports the Difference in differences coefficient from OLS regressions of average years of education of council members. Treatment and After dummies are included in the regression, but their coefficients are not reported. All columns include province dummies, control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported) and include interactions between province dummies and the dummy After. The specification in column 3 includes the dummy EarlyTermination which is equal to one for municipalities in which municipal council terminated before the natural end of the mandate in the period before the 1993 reform. EarlyTermination ∗ After is the interaction between After and EarlyTermination dummies. The sample in column 1 only uses treatment group municipalities with non-binding quotas and control group municipalities. The sample in column 2 excludes treatment group municipalities with non-binding quotas. Standard errors clustered at province level are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

for the staggered pattern in Italian local elections,[26] it may be associated with the definition of our treatment and control groups. If prior to the 1993 reform there is a relationship between early termination and female presence in municipal councils, this may lead to selection. Gagliarducci and Paserman (2012) study gender interactions in Italian municipalities in the period 1993–2003 and show that councils headed by female mayors are more likely to terminate prematurely. They consider three causes of early termination: the resignation of the council, the resignation of the mayor, and a no-confidence vote. They also document an association between the gender composition of the municipal councils and their duration. One may suspect that these relations between gender of politicians and the duration of the mandate can affect selection into treatment and control groups. We propose two exercises to address these concerns. First, electoral rules for the choice of the mayor changed substantially in 1993 (see Section 3.1), which is the start of the period of analysis in Gagliarducci and Paserman (2012). For the earlier period, in which our treatment and control groups are defined, of the three causes of early termination discussed by Gagliarducci and Paserman (2012), only the resignation of the council leads to the end of local governments and hence, to new elections. We examine this cause of premature termination across the treatment and control group municipalities in elections before 1993 and find no statistically significant differences. As a second exercise, we explicitly control in our regressions for the early termination of municipal councils in the *Before* elections. Our findings are robust to the inclusion of the dummy for the prematurely terminated councils, as shown in Table 5, column 3. Hence, a pre-existing relationship between early termination and the gender of local politicians is not likely to generate selection into the two groups. In column 4 we also control for the interaction between early termination before the reform and the dummy *After*. Our term of interest is unaffected, whereas the coefficient of the *EarlyTermination ∗ After* interaction signals that the municipalities in which councils terminated early exhibit a less pronounced temporal change in the average education of politicians.

7. Other outcomes and robustness analysis

When using education as the measure of politicians' quality we follow previous studies. To investigate whether our results are confirmed using alternative proxies for quality, we examine the effects of gender quotas on other outcomes: the skill-intensity of councilors' previous occupation and their future political careers.[27] We then exploit the longitudinal dimension of the data to analyze the long-run effects of quotas. Finally, we present a number of robustness checks to further corroborate our analysis.

7.1. Previous occupation

We have information on the previous occupation of the elected politicians and we use it to build a measure of politicians' quality. We consider all politicians who were engaged in entrepreneurial, professional or other skill-intensive activities[28] before obtaining a seat in a municipal council.[29] A higher proportion of politicians whose previous occupation is skill-intensive would be interpreted as an indicator of a higher quality of the political body.[30]

We replicate the same regression specifications as in our main analysis. We report the estimated coefficients of the interaction term from the full specification of Eq. (3) in Table 6, columns 1 to 3. The effect of gender quotas is positive and significant and amounts to an additional 3 percentage point increase in the share of high-skill politicians elected in the councils of treated municipalities. When we distinguish by gender, the coefficients in columns 2 and 3 suggest an increase of both male and female politicians' quality. Note that we did not find an effect on the quality of female politicians when the latter is measured by the years of education. This different result is consistent with the fact that in Italy gender differences in the labor market are much larger than the ones observed in education. Women with high education indeed are not perfectly matched into high-skilled jobs. Thus, measuring the quality of female politicians by years of education or by type of occupation may deliver different results.

7.2. Political careers

The reelection probability is considered a good proxy of politicians' quality, since more able individuals, at least in theory, are rewarded by votes from the electorate (see, for instance, Besley, 2005).[31] However, being repeatedly elected can also have a different interpretation: strong political persistence may hamper the entrance of more competent politicians, who may threaten the survival of the existing, and often men-dominated, elites (Besley et al., 2013). This interpretation may be more salient in localities characterized by low levels of political competition, in which strong single party majorities prevail. Therefore, high reelection rates in such municipalities may be a signal of low political quality rather than the opposite.

[26] This is not a specific feature of elections around the time of the adoption of the reform, because such pattern is already visible in the mid-Eighties and therefore it is not the result of local politicians manipulating the date of elections with the specific goal to hold them with or without gender quotas.

[27] Gender quotas may also affect political participation. The impact of this gender quotas' reform on turnout is examined by De Paola et al. (2014), who adopt our identification strategy.

[28] The full list of occupations included in this category is in the Appendix, Table A.4.

[29] Some papers analyze the presence of professional groups in politics as a potential determinant of the quality of governance: for instance, Braendle and Stutzer (2010) focus on the presence of public servants in German Laender Parliaments; Gehlbach et al. (2010) look at businessmen; and Rosenson (2006) at lawyers.

[30] The importance of the professional background for politicians' quality and their performance is confirmed by Dreher et al. (2009), who show that the professional background of a head of government matters for the implementation of market-liberalizing reforms.

[31] Some studies suggest that the time in office could also be a good measure of the quality of politicians (see Gagliarducci and Paserman, 2012). However, in our set-up, duration in office and belonging to the treatment or the control group are intertwined. For this reason, we do not consider the duration in office as an appropriate outcome variable in our analysis.

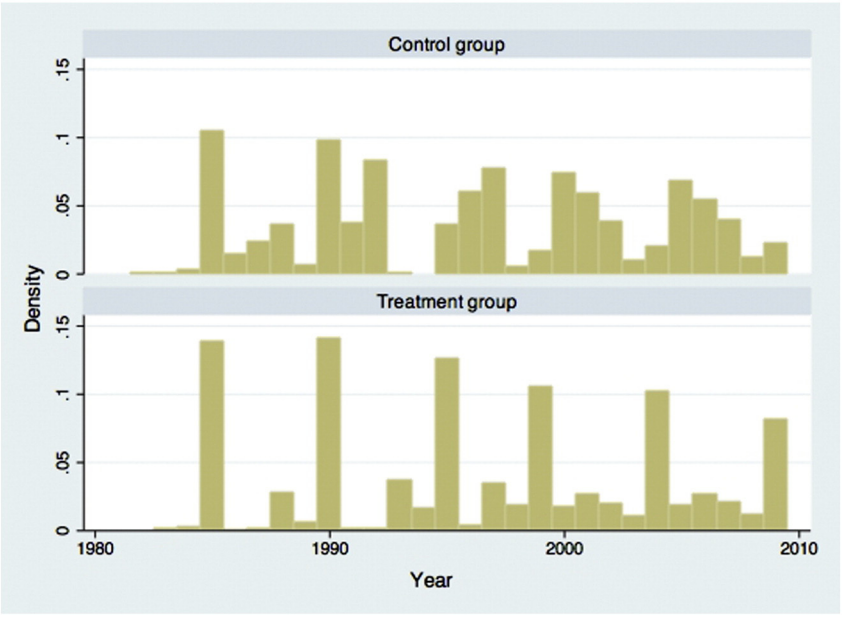

Fig. 2. Elections in control and treatment municipalities.

We incorporate this idea in our analysis of the reelection rates of municipal councilors and check separately how the gender quotas' effect varies according to the level of electoral competition in municipalities. The dependent variable is the share of municipal councilors that are re-elected in a subsequent municipal election. The measure of electoral competition is the difference between the number of seats of the winning majority and that of the second largest party group. The larger this difference is, the lower the level of political competition. We interact the competition measure with our variables of interest and implement a full triple interaction model on the reelection probability.

Results in Table 6, columns 4 to 6, show that gender quotas did not affect the share of reelected politicians, since the coefficient of *Treatment* ∗ *After* is not significant. The coefficient on the triple interaction *Treatment* ∗ *After* ∗ *Compete*, instead, shows that the effect becomes negative as the level of electoral competition decreases. In other words, gender quotas reduced the reelection probability in places in which the level of political competition is low. As in these environments it is more likely that political elites are entrenched, we interpret this result as a sign of improvement of politicians' quality. To illustrate the size of the quotas' effect, moving from a perfectly competitive council (the majority and the minority parties' shares of the seats are close to 50%) to a very uncompetitive council (one party occupies all the seats) reduces the share of reelected politicians by 10 percentage points.

Another possibility that we explore is that the municipal council may be a stepping-stone in political careers and some councilors may, in fact, advance at province, regional or national level. To track their further careers, we complement our dataset with data on politicians elected to these higher levels. We then measure the quality of a given municipal council by the share of politicians elected at a higher level. The regression analysis shows that gender quotas do not significantly affect the share of politicians reelected at a higher level. This holds true also when we look at female and male politicians separately. These findings are likely due to the fact that seats in provincial, regional and national bodies are much fewer than at local level.[32]

Finally, we look at turnover rates, defined as the share of politicians that are new to municipal councils.[33] Table 6, column 7 shows that gender quotas increased turnover. We further decompose the effect by gender in columns 8 and 9 and discover that this finding is mainly driven by male politicians. Women turnover rates, instead, appear to be unaffected by the gender quotas' reform. This is consistent with the idea that gender quotas helped to renew the existing class of male politicians.[34]

7.3. Long-run analysis

We analyze the long-run effects of the introduction of gender quotas and study whether the positive effects on the quality of politicians are persistent over time. Exploiting the longitudinal dimension of our data, we repeat the same regression specifications of Eq. (3). Table 7, columns 1 to 3, reports the coefficient of interest from the full specification for all politicians, and then separately by gender. We find evidence that the gender quotas' effect persisted over a long time horizon. In line with the results in Section 5, the coefficient of interest in regressions for all members of councils is positive and statistically significant. The results for female and male politicians are also confirmed.

Further, we adopt an alternative strategy to estimate the long-term effects of gender quotas. Since in this part of analysis we are exploiting a longer time dimension of the data, we estimate regressions with municipality fixed effects. Table 7, columns 4 to 6, reports the coefficient of interest from fixed-effects regressions with control variables and five-year trends, for all politicians and then separately by gender. The coefficient of interest remains significant and stable across different specifications.

7.4. Political variables

We check the robustness of our results to the inclusion of measures of political ideology and political competition, which can have an impact

[32] All the results that are not reported in the paper are available upon request.

[33] We cannot create this variable for 1391 municipalities due to a limited time span of our data. In these municipalities, the first election observed in the data is the last election before the gender quotas and thus is used in Difference in differences estimation. Due to the fact that our dataset does not cover earlier elections, we cannot identify politicians who are new to the council.

[34] The increase in female presence may be associated with a decrease of the average age of politicians. A thorough analysis of this issue is presented in Baltrunaite et al. (2014).

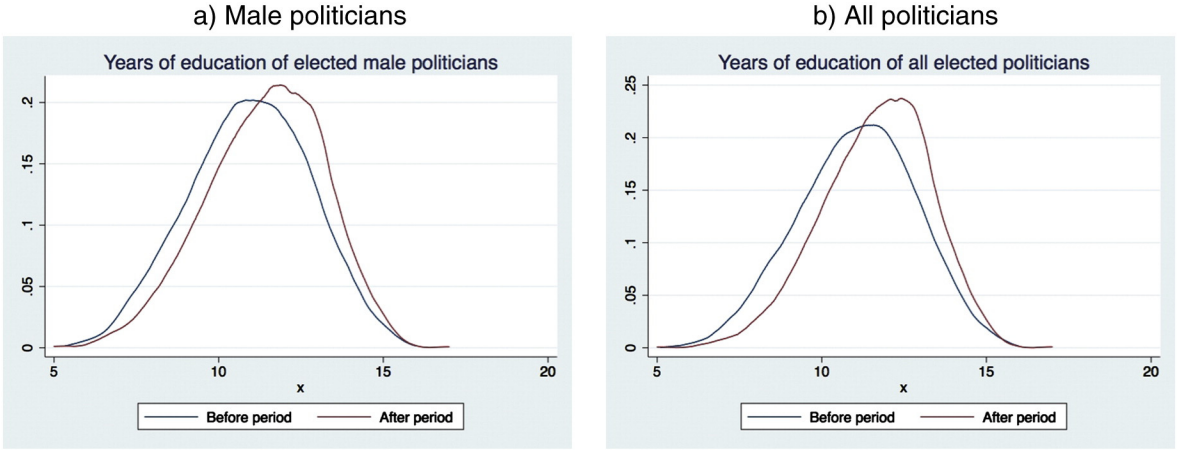

Fig. 3. Kernel density plots for the treatment group.

Table 6
Other outcome variables.

	Previous occupation			Reelection			Turnover		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	Female	Male	All	Female	Male	All	Female	Male
Treatment ∗ After	0.0300***	0.0548**	0.0320***	0.0165	−0.00368	0.0240	0.0449***	0.0135	0.0474***
	(0.00693)	(0.0216)	(0.00706)	(0.0180)	(0.0433)	(0.0196)	(0.0121)	(0.0274)	(0.0122)
Treatment ∗ After ∗ Compete				−0.105***	−0.130*	−0.105***			
				(0.0340)	(0.0775)	(0.0364)			
Observations	16,200	13,684	16,200	16,200	13,686	16,200	14,811	10,394	14,810
R-squared	0.290	0.077	0.278	0.260	0.060	0.264	0.457	0.087	0.453
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE∗ After	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. The dependent variable in columns 1 to 3 is the share of councilors with previous high-skill job (see Table A.4 in Appendix for a detailed list of occupations); in columns 4 to 6 — the share of councilors that are reelected in subsequent municipal elections; in columns 7 to 9 — the turnover rate. Columns 1, 4 and 7 show the results for all councilors, columns 2, 5 and 8 — for female councilors and columns 3, 6 and 9 — for male councilors. Columns 1 to 3 and columns 7 to 9 report the Difference in differences coefficient from OLS regressions. Treatment and After are included in the regression, but their coefficients are not reported. Columns 4 to 6 report the Difference in differences coefficient and the triple Difference in differences coefficient from OLS regressions. Compete is the difference between the seats' shares of the majority and the second largest party group. Treatment, After and the pairwise interactions with the variable Compete are included in the regression, but their coefficients are not reported. The sample contains the last election before the adoption of gender quotas and the first election after it for every Italian municipality. All columns include province dummies and interactions between province dummies and the dummy After. All columns control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported). Standard errors clustered at province level are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

on politicians' quality. First, one may argue that, given the staggered timing of municipal elections in the treatment and control group, the effects on the politicians' quality are mainly driven by changes in the winning parties' ideology. When we include dummies for the political leaning of the majority in the council,[35] Table 8, columns 1 to 3, shows that our results are robust and suggests that they are not driven by differences in the winning parties' composition across elections taking place on different dates.

Second, we control for our measure of the level of political competition. As shown in previous studies, the latter has a positive impact on the quality of politicians. Table 8, columns 4 to 6, shows that a stronger political competition is associated with a higher average level of education of municipal councilors and that our results on the effect of quotas are robust.

7.5. Other robustness checks

We first show that the effects of gender quotas are not driven by systematic differences between treatment and control municipalities in their geographical distribution or population size. In our sample 74% of the treatment group and 50% of the control group are formed by municipalities located in the Center-North. We thus replicate our main regression including a dummy for municipalities located in the South (and all the relevant interactions) and results are broadly consistent with the ones reported in Table 3. We then check the distribution of municipalities according to their population size.[36] We find that such distribution is similar to the overall distribution of municipalities across the treatment and the control group, with the exception of the largest municipalities (above 250,000 inhabitants) which all belong to the treatment group. When we run the regression excluding them, the results are unchanged.

Further, to corroborate Assumption 2, we replicate the analysis in Table 3, Panel A, focusing on a subsample of elections ranging from 1989–1990 to 1994–1995 for the treatment group and from 1991–1992 to (the end of) 1995–1997 for the control group. This is an attempt

[35] The distribution of councils according to this dimension can be found in Table 1.

[36] Namely, we consider the seven population thresholds prescribed by the law which correspond to a different number of seats in the municipal council and check for the distribution of treatment and control municipalities in each of the seven groups.

Table 7
Long-run analysis: 1985–2009.

Average years of education of council members						
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Female	Male	All	Female	Male
Treatment * After	0.146**	0.00150	0.140**	0.224***	0.182	0.203***
	(0.0586)	(0.149)	(0.0630)	(0.0567)	(0.184)	(0.0600)
Observations	45,113	37,699	45,098	45,113	37,699	45,098
R-squared	0.424	0.147	0.399	0.350	0.051	0.284
Province FE	Yes	Yes	Yes			
Province FE * After	Yes	Yes	Yes			
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE				Yes	Yes	Yes
5-year trend				Yes	Yes	Yes

Note. The table reports the Difference in differences coefficient from OLS regressions of average years of education of council members. Treatment and After dummies are included in the regression, but their coefficients are not reported. The sample contains all elections during the period 1985–2009 for every Italian municipality. Columns 1–3 include province dummies and interactions between province dummies and the dummy After. Columns 4–6 include municipality dummies and dummies for 5-year periods. All columns control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported). Columns 1 and 4 show the results for all councilors, columns 2 and 5 — for female councilors, column 3 and 6 — for male councilors. Standard errors clustered at province level are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

to minimize the time distance between elections in the two groups. Our main results are confirmed.

Finally, as an additional check to limit concerns about selection into the treatment versus the control group we implement a test introduced by Altonji et al. (2005), adapted to the continuous case by Bellows and Miguel (2009). The results of the test allow us to conclude that the selection on unobservables should be twice as large as the selection on observables in order to completely eliminate the estimated effect of the gender quota. Since this is unlikely, we are more confident in causally interpreting our findings.

8. Concluding remarks

We investigate the effect of gender quotas on the quality of politicians. We analyze the temporary adoption of gender quotas in candidate lists in Italian municipalities and we try to identify the causal effect of this policy. We show that the introduction of gender quotas in candidate lists increased the average education level of elected politicians, primarily by increasing the number of elected women and reducing the number of low-educated elected men. The positive effect on quality is confirmed also when we measure the latter with alternative indicators, it is robust to the inclusion of political ideology and political competition and it persists in the long run. Overall, our results suggest that gender quotas are not per se detrimental to quality, rather the opposite.

As women have caught up and often overtaken men in some areas of educational participation and performance, the existence of gender gaps in politics may result in a considerable loss for society, coming from an unexploited female potential. Gender quotas may represent an effective mechanism to have more educated individuals elected. Thus, as long as we expect more educated individuals to perform better as politicians, gender quotas may be beneficial for the entire society.

Table 8
Political variables.

Average years of education of council members						
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Female	Male	All	Female	Male
Treatment * After	0.207***	−0.115	0.216**	0.195**	−0.123	0.202**
	(0.0770)	(0.168)	(0.0886)	(0.0769)	(0.169)	(0.0889)
Left-wing majority	0.122***	0.0327	0.106***			
	(0.0342)	(0.0507)	(0.0357)			
Civic list majority	−0.0878	−0.0896	−0.102			
	(0.0608)	(0.0832)	(0.0622)			
Coalition majority	0.355***	0.347**	0.327***			
	(0.0725)	(0.162)	(0.0767)			
Political competition				−0.757***	−0.446***	−0.829***
				(0.0505)	(0.0767)	(0.0516)
Observations	16,200	13,521	16,194	16,200	13,521	16,194
R-squared	0.428	0.145	0.411	0.440	0.146	0.424
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE * After	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Note. OLS regressions of average years of education of council members. Treatment and After dummies are included in the regression, but their coefficients are not reported. The sample contains the last election before the adoption of gender quotas and the first election after it for every Italian municipality. All columns include province dummies and interactions between province dummies and the dummy After. All columns control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported). Columns 1–3 include dummies for left-wing majority (Left-wing majority), civic list majority (Civic list majority) and coalition majority (Coalition majority). Center-right majority is used as excluded category. Columns 4–6 control for electoral competition (Political competition) defined as the difference between the seats' shares received by the majority and by the second largest party group. Columns 1 and 4 show the results for all councilors, columns 2 and 5 — for female councilors and columns 3 and 6 — for male councilors. Standard errors clustered at province level in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

Appendix A

Table A.1
Share of females in municipal councils.

	Before	After	Difference
Treatment group	0.0893178	0.1985826	−0.1092647***
se	(0.0008842)	(0.0011696)	(0.0014685)
N	7643	7729	
Control group	0.0737792	0.1401945	−0.0664153***
se	(0.0036802)	(0.0052823)	(0.0064379)
N	426	426	
Difference	−0.0155386***	−0.0583881***	
se	(0.0038447)	(0.0051341)	
Total N	8069	8155	

Note. The share of female politicians in treatment and control group municipalities at the last election before the adoption of gender quotas (Before period) and at the first election after the adoption of this provision (After period). For treated (control) municipalities, After elections are held when the gender quota is in force (no longer in force). Standard errors are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

Table A.2
Female presence in municipal councils.

Share of female councillors				
	(1)	(2)	(3)	(4)
Treatment	0.0155***	0.000715	0.000687	−0.00120
	(0.00406)	(0.00290)	(0.00291)	(0.00287)
After	0.0664***	0.0659***	0.0662***	0.0359***
	(0.00535)	(0.00507)	(0.00504)	(0.00648)
Treatment * After	0.0428***	0.0430***	0.0428***	0.0466***
	(0.00596)	(0.00585)	(0.00581)	(0.00608)
Observations	16,224	16,224	16,200	16,200
R-squared	0.262	0.364	0.366	0.380
Province FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Province FE * After	No	No	No	Yes

Note. OLS regressions of share of females in municipal councils. The sample contains the last election before the adoption of gender quotas and the first election after it for every Italian municipality. Columns 2–4 include province dummies; columns 3–4 control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported); column 4 includes interactions between province dummies and the dummy After. Standard errors clustered at province level are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

Table A.3
Share of municipal councilors with a high school diploma.

All politicians				
	(1)	(2)	(3)	(4)
Treatment	−0.0293**	−0.00252	−0.00322	−0.00375
	(0.0131)	(0.0103)	(0.00876)	(0.00889)
After	0.0469***	0.0467***	0.0347***	0.0302**
	(0.00845)	(0.00762)	(0.00931)	(0.0128)
Treatment * After	0.0201**	0.0213***	0.0323***	0.0330***
	(0.00823)	(0.00759)	(0.00927)	(0.00978)
Observations	16,224	16,224	16,200	16,200
R-squared	0.027	0.227	0.358	0.364
Province FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Province FE * After	No	No	No	Yes

Note. OLS regressions of share of municipal councilors that have achieved at least a high school diploma (or equivalent). The sample contains the last election before the adoption of gender quotas and the first election after it for every Italian municipality. Columns 2–4 include province dummies; columns 3–4 control for the municipality employment rate, the share of university graduates, population over age 15 and its square (coefficients of the control variables are not reported); column 4 includes interactions between province dummies and the dummy After. Standard errors clustered at province level are in parenthesis. The following symbols indicate different significance levels: *** — significant at 1%, ** — significant at 5%, * — significant at 10%.

Table A.4
Skill-intensive occupations.

Code	Description
111	Full and associate professors
112	High school teachers
113	Secondary school teachers
115	Headmasters
121	Writers, reporters, publicists
122	Painters, sculptors
124	Musicians, orchestral players, opera artists, actors
141	Surgeons (general)
142	Surgeons (specialized)
143	Dentists
144	Pharmacists
151	Magistrates
152	Lawyers and solicitors
153	Notaries
162	Veterinarians
163	Biologists, animal scientists, naturalists
171	Physicists, astronomers, geologists
172	Chemists
173	Construction engineers
174	Engineers
175	Architects
181	Mathematicians, statisticians, economists and sociologists
182	Chartered accountants
211	Entrepreneurs and chief executive officers (transport, credit, service and industry sector)
212	Entrepreneurs and chief executive officers (business)
213	Entrepreneurs and chief executive officers (public services)
214	Directors (transport, credit, service and industry sector)
215	Managers
216	Directors (public services)
217	Directors (public administration)

Note. Data from the Italian Ministry of the Interior, Department for Territorial and Internal Affairs.

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