

# Fiscal Rules and the selection of politicians: evidence from Italian municipalities\*

Matteo Gamalerio

Institut d'Economia de Barcelona (IEB), University of Barcelona

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## Abstract

Despite the wide adoption, there is little evidence on the consequences of fiscal rules for the quality of government. I use data from Italian municipalities to study how fiscal rules affect the selection of politicians. In 1999, the Italian government applied fiscal rules to all municipalities. In 2001, it removed them for municipalities with less than 5000 inhabitants. Using a Difference-in-Discontinuity design, which enables control for an institutionally mandated increase in the wage paid to politicians at the 5000 threshold, I show that fiscal rules negatively affect the level of education of politicians. The result highlights a trade-off to fiscal rules. Reducing policymaking discretion may alleviate inter-jurisdictional externalities, but it may also lower the quality of the political class.

**Keywords:** fiscal rules, selection of politicians, deficit, difference-in-discontinuity.

**JEL Classification:** C23, D72, H62, H70, H72.

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# 1 Introduction

This paper studies how fiscal rules designed to reduce incentives to accumulate public debt and run deficits can affect the selection of politicians. Using data on Italian municipalities, I show that fiscal rules has a negative effect on the level of education of politicians. In addition, I provide evidence that municipalities with a low level of past deficit drive this effect, a result that is consistent with a framework in which educated individuals enter politics if they can enjoy a sufficient level of discretion in setting fiscal policies. The paper also provides evidence that the introduction of fiscal rules effectively offsets the positive selection effect of the wage rise that operates across the sample of municipalities studied.

In recent years, the political economy literature has analysed the different mechanisms through which politicians are selected (Besley, 2005; Braendle, 2016), with the aim to understand which institutions succeed in attracting the most competent individuals into the political arena. From a theoretical point of view, this has been made possible by the introduction of the citizen-candidate framework developed by Besley and Coate (1997) and Osborne and Slivinski (1996). On the other side, the empirical literature has provided evidence about how different types of institutions like the wage paid to politicians (Besley, 2004; Ferraz and Finan, 2011; Gagliarducci and Nannicini, 2013; Kotakorpi and Poutvaara, 2011; Dal Bo et al., 2013; Fisman et al., 2013; Braendle, 2015), the role of outside earnings (Gagliarducci et al., 2010; Fedele and Naticchioni, 2013; Grossman and Hanlon, 2013), the role of monitoring institutions (Grossman and Hanlon, 2013), grants from higher levels of government and the level of fiscal autonomy (Brollo et al., 2013; Bordignon et al., 2015), electoral rules (Beath et al., 2015), gender quotas (Baltrunaite et al., 2014) and criminal organizations (Daniele and Geys, 2015) can affect the quality of individuals who enter politics. As far as I know, no study to date has investigated the potential effect of fiscal rules on the selection of politicians.<sup>1</sup>

Fiscal rules are rules that constrain fiscal policies. In particular, central governments use fiscal rules to discipline the fiscal behaviour of local governments, to reduce their incentives to accumulate debt and run deficits. As reported by Grembi et al. (2016), in recent years many countries have adopted rules to constrain the fiscal policies of local governments. These

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<sup>1</sup>A close paper is the one by Revelli (2016), who uses variation in tax limits across Italian municipalities to study their impact on turnout and local elections outcomes. My paper differs in that Revelli (2016) studies a different policy, which imposes a cap on the local income tax rate, while I analyse the effect of a constraint on the overall municipal budget balance. In addition, I provide new results on the selection of politicians.

include Argentina, Austria, Brazil, Canada, China, Colombia, Czech Republic, Denmark, Italy, Mexico, Poland, Spain, Sweden, and Turkey. Maybe the most famous rule is the European Stability Pact, which was introduced in 1997 by the European Union and applied on member countries. In spite of the wide use of fiscal rules, there is no definitive evidence in the economics literature about whether they foster fiscal stability. In fact, some studies (Alesina and Perotti, 1996, and Wyplosz, 2012) indicate that for reasons of commitment, fiscal rules may not work. From this point of view, the most recent advancement in the literature is Grembi et al. (2016), who, using data on Italian municipalities, have shown that fiscal rules can be effective in reducing the deficit run by local governments. Another recent paper is Coviello et al. (2018), who study the impact of fiscal rules on public infrastructure expenditures and the size of firms. As already mentioned, I am not aware of any study of the effect of fiscal rules on the selection of politicians.

The claim of this paper is that fiscal rules may affect the ex-ante quality of the political class. The intuition is that fiscal rules reduce the discretion in setting fiscal policies and they represent a constraint on what a politician can do. In addition, fiscal rules represent a constraint on economic outcomes affected by fiscal policies, such as public goods and income growth. Hence, fiscal rules can change the value of holding office, with heterogeneous effects on individuals with different outside options and different levels of competence, and in particular different levels of education. The focus on education is justified by the literature, which shows that education has a positive effect on socio-economic outcomes such as wages (Card, 1997) and measures of citizenship (Dee, 2004). More importantly for this paper, the literature has provided evidence that electing more educated political leaders can have a positive effect on economic growth (Besley et al., 2011) and on the production of public goods (Martinez-Bravo, 2017).<sup>2</sup> This evidence suggests that imposing a constraint on how fiscal policies can affect economic growth or the production of public goods can change the value of holding office for educated individuals.

Theoretically, the effect of fiscal rules on the selection of politicians can go in both directions, depending on how tight is the constraint. First, if the constraint binds too harshly, it becomes impossible to use fiscal policies to stimulate the economy or to produce public

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<sup>2</sup>In addition, education is an indicator extensively used in the political selection literature (e.g., Gagliarducci and Nannicini, 2013; Galasso and Nannicini, 2011).

goods. In this context, it becomes less important for voters to elect politicians that are more educated, and educated individuals may find less attractive to enter politics. On the other hand, a loose constraint just makes the job of politicians more complex. In this case, it becomes more important for voters to select educated politicians, and educated individuals may enter politics more frequently. In sum, whether fiscal rules have a positive or a negative effect on the quality of politicians is an empirical question.

To answer this question, I use data on Italian municipalities from 1993 to 2012. Italian municipalities are an interesting framework for the empirical question investigated in this paper. In fact, in 1999 the Italian government introduced fiscal rules, with the goal of limiting the incentives to accumulate debt and run deficits. These rules initially applied to all municipalities and were introduced under the name of “Domestic Stability Pact” (DSP). In 2001, the central government removed the rules for all municipalities with less than 5000 inhabitants. This was done to avoid imposing additional constraints on municipalities disadvantaged by economies of scale. This relaxation remained in place until 2013, when the cutoff was moved from 5000 to 1000.

This institutional framework would be ideal for a Regression Discontinuity Design, if fiscal rules were the only policy that changes at the 5000 threshold. However, as described by Gagliarducci and Nannicini (2013) and Grembi et al. (2016), at the same cutoff there is a sharp increase in the wage paid to the mayor and the municipal ministers, based on a policy introduced by the Italian government in the 1960s. This policy represents a confounding factor, as Gagliarducci and Nannicini (2013), using data on Italian municipalities between 1993 and 2001, have already shown that the wage increase at 5000 affects the selection of politicians attracting more educated individuals into politics. For this reason, following Grembi et al. (2016), I exploit the 2001 removal of fiscal rules for municipalities below 5000 to estimate a Difference-in-Discontinuity (*Diff-in-Disc*) model, which allows estimation of the effect of fiscal rules on political selection separately from that of the wage increase.

The main results show that fiscal rules have a negative effect on the level of education of politicians. In fact, starting from 2001, municipalities above the 5000 threshold, compared to those below the threshold, experienced a decrease in the share of politicians with a university degree. More in detail, fiscal rules induced a reduction in the share of graduate mayoral candidates, which is between 11 and 14 % points, depending on the specification considered.

At the same time, fiscal rules negatively affect the probability of electing a graduate mayor, with a reduction between 19 and 29 % points, depending on the specification. In addition, the evidence provided suggests that fiscal rules offset the positive selection effect induced by the higher wage paid to mayors and municipal ministers above the 5000 threshold (Gagliarducci and Nannicini, 2013). The negative effect on both mayoral candidates and mayors is consistent with two alternative selection mechanisms. First, the effect on candidates suggests that fiscal rules could have made educated individuals less likely to enter politics (i.e. self-selection mechanism). Second, the effect on elected mayors suggests that fiscal rules could have made less important for voters to elect educated individuals (i.e. selection by part of voters).<sup>3 4</sup>

The claim of this paper is that the effect of fiscal rules on the selection of politicians is due to a reduction in the discretion in setting fiscal policies. To reinforce this intuition, I implement a heterogeneity analysis in which the main treatment is interacted with the level of inherited deficit. In fact, the same logic described for the effect of fiscal rules on the selection of politicians may apply to municipalities not affected by fiscal rules but burdened by a high inherited deficit, which also represents a constraint on fiscal policies. Consistent with this logic, the heterogeneity analysis shows that the main results are driven by the group of municipalities characterized by a low level of inherited deficit, while there are not differences across the threshold in the group of municipalities with a high level of past deficit.<sup>5</sup>

In conclusion, the results of this paper highlights an important trade-off to fiscal rules. Reducing policymaking discretion may alleviate inter-jurisdictional externalities, but it may also lower the quality of the political class by making politics less attractive for individuals with better outside options in the private sector. In addition, the results suggest that, while

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<sup>3</sup>The results of the main specification survive a series of robustness checks: first, through a falsification test, I show that municipalities just below and just above the 5000 threshold were on parallel trends before the 2001 relaxation. Then, I show that other potential outcomes and municipal characteristics are balanced around the 5000 threshold before and after 2001. Finally, I exclude the possibility of manipulative sorting of population figures around the 5000 threshold before and after 2001.

<sup>4</sup>In the Appendix, I also show that other politicians' characteristics are affected by fiscal rules. More specifically, characteristics correlated with education such as the past professional background and the age of the politicians change following the expected sign (i.e. a decrease in the share of politicians from high skills occupation and an increase in the share of older politicians). On the opposite, gender and past political experience are not affected by fiscal rules.

<sup>5</sup>In addition, the heterogeneity analysis rules out the possibility that the results are driven by the imbalance in the level of deficit around the 5000 threshold before and after 2001. In fact, the results are driven by a group of municipalities with similar low levels of past deficit.

paying politicians high wages may be a good idea, as more skilled individuals are attracted by high remunerations (Gagliarducci and Nannicini, 2013), competent persons may decide to enter politics for many different reasons. The evidence in this paper suggests that reducing the discretion in setting policies may have a negative effect on the selection of skilled individuals.

## 2 Institutional Setting

In Italy there are 8047 municipalities, of which 70.5 % have less than 5000 inhabitants. Municipalities are responsible for a large number of services: municipal police, infrastructure, transport, welfare, housing, environmental services (e.g. garbage collection), public utilities (e.g. water supply). They manage 10 % of total public expenditures and around 20 % of their revenues come from local taxes, while the rest are made up of discretionary transfers from higher levels of government <sup>6</sup>. Among local taxes, the most important are the property tax and a surcharge on the personal income tax of residents. The property tax was introduced in 1993 by Legislative Decree 504/1992, while the surcharge on the personal income tax was introduced in 1999.

Since 1993 (see Law 81 in 1993) mayors of Italian municipalities are directly elected by the voters. In municipalities below 15,000 inhabitants they are elected using a single round plurality rule, while a run-off system is used above the same threshold. Mayors are elected for a term of five years and for a maximum of two consecutive terms, i.e. they face a two-term limit. In the context of the municipal government, mayors are quite powerful, as they can choose and dismiss the ministers that form part of the municipal government. Besides that, if the municipal council wants to dismiss the mayor, new elections must be held.

The main focus of this paper is on the effect of fiscal rules on the selection of politicians. Fiscal rules for municipal governments were introduced in Italy in 1999, following the introduction of the European Stability and Growth Pact (SGP), which was signed in 1997 by different European countries. Some of the countries that adhered to the SGP, to respect the limits imposed by it, introduced subnational fiscal rules aimed at disciplining local govern-

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<sup>6</sup>In particular transfers come from provinces, regions and the central state. It is important to notice that the level of fiscal dependence on grants from higher levels of government has been historically heterogeneous between the North and the South of Italy. For example, in 2000 municipalities in the North were able to finance 70 % of their budget using local taxes and revenues, while in the South grants covered 60-70 % of total expenditures (Bordignon et al., 2015).

ments, whose budgets form part of the total budget of the State. The subnational rules in Italy were called the "Domestic Stability Pact" (DSP) <sup>7</sup>.

The DSP is intended to reduce the incentives of local governments to accumulate debt and run deficits. Table A1 describes the temporal evolution over time of the target and the limits imposed on the target for the years 1999 to 2012. As we can see, the target has not been constant over time, though, for most the years, the main target has been the balancing of local governments' budgets.<sup>8</sup> The limits imposed on the target have been changing over time: in some years municipalities were asked to apply a cap to the growth of the target with respect to a specific reference year, while in other years municipal governments were asked to cut the target by a specific amount. Besides that, in some years (e.g. 2007) the limits imposed on the target have been differentiated depending on the past fiscal performance of a municipality (i.e. one limit applied to virtuous municipalities, while another was applied to undisciplined towns).

As we can see from Table A1, in the first two years (1999-2000) fiscal rules applied to all municipalities, without distinction between small and large populations. In 2001, the central government removed the fiscal rules for all the municipalities below 5000 inhabitants, a decision taken to lift onerous constraints on municipalities disadvantaged by economies of scale. This decision by the central government remained valid until 2013, when the threshold was reduced from 5000 to 1000.

In this paper, I study the effect of fiscal rules on the selection of politicians, exploiting the 2001 removal of fiscal rules for municipalities below the 5000 threshold. As explained in Section 4, this is done using a Difference-in-Discontinuity approach (Grembi et al., 2016), as the presence of other policies that change at the 5000 threshold does not allow the use of a standard Regression Discontinuity Design model. In fact, as described in Table A2, which reports the legislative population thresholds that apply to municipalities with less than 15,000 inhabitants, the wages paid to the mayor and the municipal ministers change at the 5000

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<sup>7</sup>Domestic Stability Pact stays for the Italian *Patto Interno di Stabilita'*. The Law that introduced the DSP in Italy is the number 448, 23 December 1998, article 28.

<sup>8</sup>More specifically, as indicated by Grembi et al. (2016), the definition of budget balance used as a target for most of the year has been the so called fiscal gap, which is defined as municipal deficit net of transfers and debt service. Grembi et al. (2016) show that fiscal rules have been effective in reducing the fiscal gap. However, they also show that fiscal rules have been effective in reducing the deficit (i.e. without removing transfers and debt service).

threshold (Gagliarducci and Nannicini, 2013). This wage increase at the 5000 threshold is a policy that dates to the 1960s (Gagliarducci and Nannicini, 2013). As described in Section 4, the Difference-in-Discontinuity approach allows the estimation of the effect of fiscal rules on the selection of politicians while controlling for the wage increase.

### **3 Data**

The dataset used in the paper contains information about politicians of Italian municipalities with less than 15,000 inhabitants elected between 1993 and 2012. It includes the following characteristics of the municipal politicians: 1) gender; 2) age; 3) years of past political experience at all levels of politics; 4) political orientation (i.e. left, right or independent); 5) past professional background. All the information about the characteristics of municipal politicians is provided by the Home Office.

Information about the municipalities comes from the Italian Statistical Office (Istat), and it includes the following municipal characteristics: 1) share of population with a university degree measured in 2001; 2) share of the active population (i.e. population between 15 and 64 years old) measured in 2001; 3) share of elderly (i.e. population above 65 years old) measured in 2001; 4) income per capita measured in 2001; 5) number of firms per capita measured in 2005; 6) number of no-profit associations per capita measured in 2005; 7) area of municipality in square kilometers; 8) population density measured in 2001. All these variables are used as control variables in the analysis below.

The data on municipal budget outcomes used in the paper are taken from the Aida PA database, which is an online archive managed by the Bureau Van Dijk. The data contains information on all the fiscal items of the budget of all Italian municipalities, and it covers the year from 2000 up to 2012. Finally, data on average income and income growth at municipal level are provided by the Italian Ministry of Economics and Finance and cover the years from 2000 up to 2016.

### **4 Empirical Strategy**

This paper investigates the effect of fiscal rules on the selection of politicians. In particular, the goal is to study how the imposition of fiscal rules, which constrain the power and the

discretion of local governments, affects the types of people that decide to enter politics. The ideal framework to pursue this goal would be represented by an experiment through which fiscal rules are randomly assigned to different districts. However, running this kind of experiment would be unfeasible for financial and institutional reasons.

A close approximation to this experiment exploits an institutional framework that establishes population thresholds through which the assignment of fiscal rules changes. In particular, the presence of a certain population threshold, such that fiscal rules apply for local governments above the threshold but not for those below, enables a Regression Discontinuity Design (RDD) which compares local districts just above the threshold with those just below. Under this design, in the absence of sorting and if other variables and treatments do not change sharply at the specific threshold, the assignment of fiscal rules can be considered *as good as randomly assigned*.

In this paper, I study the effect of fiscal rules on the selection of politicians using data from Italian municipalities. As described in Section 2, in 1999 the Italian government introduced fiscal rules aimed at reducing incentives to accumulate debt and run deficits. These rules initially applied to all Italian municipalities. In 2001, the rules were removed for municipalities with less than 5000 inhabitants, and this difference across the 5000 threshold remained valid until 2013.

This institutional setup, in the absence of other policies changing across the 5000 threshold, would be appropriate for an RDD approach applied to the electoral terms between 2001 and 2012. However, as described in section 2, fiscal rules are not the only policy that changes at the 5000 threshold. At the same threshold there is a rise in the wage of the mayor and executive officers, which dates to the 1960s.

This wage increase is a confounding policy which would invalidate the RDD approach, as it would be not possible to disentangle the effect of fiscal rules from that of the wage increase. In fact, Gagliarducci and Nannicini (2013), using data on Italian municipalities between 1993 and 2001, have shown that the wage increase at 5000 affects the selection of politicians, attracting more educated individuals into politics. For these reasons a standard RDD approach is not appropriate in this context.

However, as described by Grembi et al. (2016), the removal of fiscal rules in 2001 for municipalities below 5000 can be exploited to implement a Difference-in-Discontinuity (*Diff-*

*in-Disc*) approach, which allows estimation of the effect of fiscal rules separately from that of the wage increase. The *Diff-in-Disc* approach represents a recent methodology (Lalive, 2008; Campa, 2011; Leonardi and Pica, 2013; Casas-Arce and Saiz, 2015; Grembi et al., 2016) which combines the *pre/post treatment* variation typical of a Difference-in-Differences design with a *just below/just above a threshold* variation that characterizes an RDD approach. In the context of the Italian municipalities, the idea is to combine the change generated by the 2001 reform with the just below/just above 5000 threshold variation. This strategy, under some assumptions described below, enables estimation of the effect of fiscal rules on the selection of politicians, while controlling for the wage increase, which is constant in real terms over time. Hence, in this framework, the *Diff-in-Disc* approach represents the closest approximation to an experiment through which the assignment of fiscal rules can be considered *as good as randomly assigned*.

In particular, following Grembi et al. (2016), I estimate the following empirical model:

$$Y_{it} = \rho_0 + \rho_1 R_{it} + (> 5000_i) * (\beta_0 + \beta_1 R_{it}) + (Post_t) * [\pi_0 + \pi_1 R_{it} + (> 5000_i) * (\phi_0 + \phi_1 R_{it})] + \eta_{it} \quad (1)$$

where  $R_{it} = P_{it} - P_{5000}$  is the normalized population which measures the distance of municipality  $i$  from the 5000 threshold  $P_{5000}$  at time  $t$ . The population  $P_{it}$  comes from the most recent census produced by the Italian Statistical Office (Istat), which is either in 1991 or 2001. The dummy variable  $(> 5000_i)$  is 1 if municipality  $i$  is above the 5000 threshold, while  $(Post_t)$  is a temporal dummy variable which is equal to 1 for elections starting from 2001<sup>9</sup>. The temporal dummy variable  $(Post_t)$  has been built in this way because the selection of (new) politicians can happen only during electoral years, as it is quite rare that new politicians are selected during the electoral mandate (i.e. far away from elections). The treatment variable is the interaction term between  $(> 5000_i)$  and  $(Post_t)$ . Thus, the coefficient of interest is  $\phi_0$ , which represents the *Diff-in-Disc* estimator and it captures the effect of fiscal rules on the selection of politicians, through a comparison between municipalities that continue to apply fiscal rules and municipalities that are exempt from their application starting from 2001. The dependent variable  $Y_{it}$  measures the level of education of politicians.

Following the recent developments of Gelman and Imbens (2018), the coefficient of interest

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<sup>9</sup>For example, for a municipality that voted in 1995, 1999, 2004 and 2009 during the years of interest,  $(Post_t)$  is equal to 0 for the electoral terms 1995 and 1999 and equal to 1 for the electoral years 2004 and 2009.

$\phi_0$  is estimated by local linear regression (LLR). This means that equation 1 is estimated using the subsample of observations which lie in the interval  $R_{it} \in [-h, +h]$  around the threshold, where the optimal bandwidth  $h$  is calculated following the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth. In the analysis below, I show that the estimates are robust to the use of different bandwidths.

Finally, this identification strategy requires three main assumptions. First, there must not be manipulative sorting of the running variable  $R_{it}$  around the 5000 threshold before and after 2001, such that municipalities must not be able to self-select themselves and decide on which side of the cut-off to stay. This is tested below with a density test (McCrary, 2008) of the population around the 5000 threshold, using both the 1991 and 2001 population censuses. Besides that, following Grembi et al. (2016), I also run the same continuity test on the difference in the densities of the 2001 and 1991 census populations. Second, other potential outcomes and municipal characteristics must be balanced around the 5000 threshold before and after 2001. This is tested below by running model 1 using municipal characteristics as dependent variables. Finally, municipalities just below and just above the 5000 threshold must be on parallel trends in the periods before the removal of the fiscal rules in 2001. In particular, as indicated by Grembi et al. (2016), there must be no interaction between fiscal rules and the confounding policy, which is the differential wage paid across the 5000 threshold. This assumption is required in order to demonstrate that high-wage and low-wage municipalities did not react differently to the introduction of fiscal rules. This is tested below with a falsification test using the introduction of fiscal rules in 1999 and running the *Diff-in-Disc* model using pre-2001 data. If this last assumption was valid, this falsification test should deliver a zero effect.

## 5 Results

### 5.1 Sample and descriptive statistics

This study uses data on politicians elected in Italian municipalities with less than 15,000 inhabitants during the years from 1993 to 2012. There are various reasons for this choice of the sample. First, municipalities with less than 15,000 inhabitants use a single-ballot majoritarian electoral system, while municipalities above the threshold use a run-off system. To keep

electoral institutions constant, I exclude municipalities with more than 15,000 inhabitants. Second, in 2013, the Italian government applied fiscal rules also to municipalities between 1000 and 5000 inhabitants. For this reason, I exclude the electoral terms after 2012. Third, in 1993, following a huge corruption scandal called *Mani Pulite* (*Clean Hands*), new electoral municipal laws and a municipal property tax were introduced (Bordignon, Gamalerio and Turati, 2019). Thus, I exclude years before 1993. Finally, municipalities from Special Regions (i.e. Sardegna, Sicilia, Valle d’Aosta, Trentino-Alto Adige, Friuli-Venezia Giulia) are excluded, given that they have different political and fiscal institutions.

This leaves me with an initial sample of 26,064 electoral terms and 6166 municipalities, which I use to calculate the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth around the 5000 threshold. Table A3 reports the summary statistics of this sample, distinguishing between municipalities below and municipalities above the 5000 threshold.

## **5.2 The effect of fiscal rules on the selection of politicians: main results**

This sub-section provides evidence about how fiscal rules affect the characteristics of individuals who enter politics. The focus is on the level of education, which is an indicator extensively used in the literature on political selection (Besley, 2005; Besley and Reynal-Querol, 2011; Brolo et al., 2013; Gagliarducci and Nannicini, 2013). In addition, the focus on education is justified by the evidence that shows how educated leaders matter for economic growth (Besley et al., 2011) and the production of public goods (Martinez-Bravo, 2017), which are economic outcomes potentially affected by fiscal rules.

The first piece of evidence is reported in Figures 1 and 2, which give a preliminary idea about how the level of education of politicians evolved in the years before and after the 2001 relaxation of fiscal rules. The evidence is produced using a regression discontinuity design (RDD) separately for the years before and after 2001. Two facts can be highlighted. First, the share of graduate politicians in the years before 2001 is higher in municipalities just above the threshold. This is consistent with the fact that municipalities above 5000 pay a higher wage to the mayor and the municipal ministries, which enables them to attract more skilled politicians (Gagliarducci and Nannicini, 2013). Second, the discontinuity around the 5000

threshold disappears in the years starting from 2001. Hence, the effect of the wage on the selection of politicians seems to disappear after 2001, since when fiscal rules were retained only for municipalities just above the 5000 threshold.

To confirm the intuition that comes from this descriptive evidence, I implement the *Diff-in-Disc* analysis and I run model 1 on the sample of municipalities individuated by the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth estimator. The baseline results from the *Diff-in-Disc* analysis are reported in Tables 1 and 2. In both Tables, I report the estimates obtained running model 1 using the optimal bandwidth and half of the optimal bandwidth with a linear function in the running variable, and the coefficients obtained using the double of the optimal bandwidth with a quadratic function in the running variable. I do not control for municipal covariates in Tables 1 and 2.<sup>10</sup>

Two main results emerge from Tables 1 and 2. First, the positive coefficients in front of the dummy variable ( $> 5000_i$ ) indicates that in the years before 2001 (i.e. in the years in which fiscal rules applied in the same way across the 5000 threshold), municipalities just above 5000 were selecting more educated politicians. This is consistent with the evidence in Figures 1 and 2 and with the analysis implemented by Gagliarducci and Nannicini (2013). Second, the negative coefficients in front of the interaction term between ( $> 5000_i$ ) and ( $Post_t$ ) suggests that the application of fiscal rules after 2001 in municipalities above 5000 offset the positive selection effect induced by the higher wage paid.

The results of Table 1 indicates that fiscal rules induced a reduction in the share of graduate mayoral candidates which is approximately between 11 and 14 % points, depending on the specification considered. The results of Table 2 suggests that fiscal rules negatively affect the probability of electing a graduate mayor, with a reduction which is approximately between 19 and 29 % points, depending on the specification.<sup>11</sup>

Finally, the fact that fiscal rules affected both the share of graduate mayoral candidates and the share of graduate mayors is consistent with two alternative mechanisms in the selection of politicians. On one hand, the reduction in the discretion in setting fiscal policies

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<sup>10</sup>Tables A5 and A6 show that the baseline results are robust if I add municipal covariates to the *Diff-in-Disc* model.

<sup>11</sup>The positive coefficient in front of the dummy variable ( $Post_t$ ) indicates that on average the level of education of municipal politicians was following an increasing trend.

could have made politics less attractive for more educated individuals, through a self-selection channel consistent with the negative effect of fiscal rules on the share of graduate mayoral candidates. Second, when fiscal rules represent a strong constraint on fiscal policies, it may be less important for voters to select more qualified individuals, leading to the election of a smaller share of educated politicians.

### **5.3 The role of past deficits**

This sub-section provides the results of a heterogeneity analysis implemented interacting the treatment variable with the level of municipal inherited deficit. There are two reasons for implementing this analysis. First, the results of sub-section 5.2 indicates that educated individuals are less likely to enter politics where fiscal rules applied. The claim of this paper is that this is due to a reduction in the level of discretion in setting fiscal policies. The same logic should apply to municipalities not constrained by fiscal rules but which inherited a high level of deficit, which can reduce the discretion in setting fiscal policies as well. Thus, if the main claim of this paper is correct, we should expect the baseline effect to be driven by the group of municipalities that inherited low deficits, while there should not be differences across the threshold in the group of municipalities with a high level of past deficit.

Second, Grembi et al. (2016) show that fiscal rules have been effective in reducing the deficit of Italian municipalities. This result suggests that, as described in sub-section 5.4, in the elections after 2001, the level of deficit is not balanced between municipalities just above and just below the 5000 threshold. This imbalance represents a potential threat to the identification strategy used in this paper, because starting from 2001 different levels of deficit below and above the threshold may have a direct effect on the selection of politicians.

Table 3 reports the results of the heterogeneity analysis for both mayoral candidates and mayors. To implement the analysis, I re-run model 1 after splitting the sample between municipalities with a level of inherited deficit above the median and municipalities with a level of inherited deficit below the median. The results in Table 3 clearly show that the effect of fiscal rules on the selection of politicians is driven by the sub-sample of municipalities that inherited a level of past deficit below the median. This result is consistent with the idea that more educated politicians enter politics with a higher probability where they can enjoy a high level of discretion in setting fiscal policies. Finally, the evidence in Table 3 seem to rule

out the possibility that the effect on the selection of politicians is due to differential levels of past deficits across the 5000 threshold after 2001, given that the effect is driven by a group of municipalities with similar low levels of inherited deficit.<sup>12</sup>

## 5.4 Robustness checks

This sub-section describes a series of robustness checks and potential alternative stories and specifications considered in the analysis. First, as described in section 4, the *Diff-in-Disc* specification requires three main assumptions to be met. The first assumption is that there must not be manipulative sorting of the running variable  $R_{it}$  around the 5000 threshold before and after 2001, such that municipalities must not be able to self-select themselves and decide which side of the cut-off to stay on. In Figure A2, I present scatters and 4th-order polynomial estimates for Assumption 1 to test the null hypothesis of the continuity of the density of the population around the 5000 threshold. This test is applied to both 1991 and 2001 census populations, which are the two different measures of population used in the empirical analysis. In the top two graphs of Figure A2, there is no evidence of discontinuity at the 5000 threshold. To ensure that there has not been sorting over time, with the municipality trying to manipulate population numbers between the 1991 Census and the 2001 one, in Figure A2, I also test the continuity of the difference between the density of the 2001 census population and the density of the 1991 census population. As we can observe in the bottom graph, there is no evidence of sorting or discontinuity. These results are consistent with those of Grembi et al. (2016).

The second assumption required for the *Diff-in-Disc* estimator is that other potential outcomes and municipal characteristics must be balanced around the 5000 threshold before and after 2001. This assumption is required in order to guarantee that the effects found on the selection of politicians are not driven by other observable and/or unobservable factors. This is tested running the *Diff-in-Disc* model 1 using municipal characteristics as dependent variables. The results are reported in Table A4, which is divided into two panels. First, Panel A reports the results of different characteristics of the municipal population. As we can see, all the characteristics are balanced around the 5000 threshold before and after 2001. Second,

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<sup>12</sup>In Table A8, I repeat the same exercise adding municipal covariates. The results are essentially unchanged.

Panel B describes the balance tests for geographical characteristics of the municipalities in the sample of interest. As we can see, all these geographical dummy variables are balanced around the 5000 threshold before and after 2001. The only variable that is not balanced in Table A4 is the level of deficit, which is lower in municipalities that apply fiscal rules after 2001. In sub-section 5.3, I show that this imbalance does not seem to represent a threat to the identification strategy used in this paper.

Third, municipalities just below and just above the 5000 threshold must be on parallel trends prior to the removal of fiscal rules in 2001. I test this assumption in Table A7, in which I add to the *Diff-in-Disc* model the interaction term  $(Pre)*(> 5000)$ , which is equal to one for municipalities above 5000 for the election immediately before the 2001 fiscal rules removal. This exercise shows that municipalities just below and just above the 5000 threshold were on parallel trends in the periods before the removal of the fiscal rules in 2001.

Finally, I implement the following four robustness checks. First, to make sure that the results found are not due to random chances, I run a series of *Diff-in-Disc* local linear regressions at 500 fake thresholds below and 500 fake thresholds above the 5000 threshold (i.e. thresholds from 4900 to 4400, and from 5100 to 5600). Figure A3 reports the c.d.f. of the t-statistics obtained from these regressions. As we can see, the c.d.f. indicates that most of the t-statistics lie in the interval  $(-2,2)$ , suggesting that it is not possible to find statistically significant results when the diff-in-disc model is run at fake thresholds. Second, as indicated in Table A1, for all the years studied, the target of the fiscal rules was the balance of the budget. The years 2005 and 2006 represent an exception. To obtain estimates relative to a homogeneous set of fiscal rules, in Table A9, I estimate the *Diff-in-Disc* model excluding these two years. As we can see, the results are unchanged if 2005-2006 are excluded.

Third, in Table A10, I run the *Diff-in-Disc* model on other personal characteristics of local politicians, such as past professional background, age, gender and past political experience. For the characteristics that are more potentially correlated with education, the estimated coefficient goes in the expected direction (i.e. a decline in the share of politicians from high skills occupations and an increase in the share of older individuals). On the other hand, gender and years of political experience do not seem to be affected by fiscal rules.<sup>13</sup> Fourth,

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<sup>13</sup>For data limitations, it was possible to reconstruct the past political experience only for elected mayors, and not for mayoral candidates. The lack of an effect for political experience rules out a potential alternative interpretation of the results, which is that the application of fiscal rules may require the selection of more

in Table A11, I report the estimates obtained running a simple difference-in-differences model on the entire original sample. As we can see, while the results go in the same direction of the *Diff-in-Disc* model, the parallel trends assumption does not seem to apply in this context. The violation of this assumption provides a justification for the use of the *Diff-in-Disc* model.

## 6 Conclusion

This paper investigates the effect of fiscal rules on the selection of politicians. Using data on Italian municipalities, it shows that fiscal rules negatively affect the level of education of municipal politicians. The effect is driven by municipalities characterized by low levels of inherited deficit, a result that is consistent with a framework in which educated politicians enter politics only if they can enjoy a sufficient level of policy discretion. In addition, the result suggests that fiscal rules offset the positive selection effect determined by the wage increase that operates at the 5000 threshold.

In conclusion, this paper indicates a trade-off to fiscal rules. Reducing discretion may alleviate inter-jurisdictional externalities, but it may also lower the quality of the political class by making the political office less attractive for individuals with a better outside option. In addition, the paper suggests that, while paying politicians high remunerations may be a good idea, competent persons may enter politics for many different reasons. The evidence in this paper suggests that reducing policymaking discretion may have a negative effect on the selection of politicians.

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politically experienced politicians, who may be less educated.

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Table 1: Effect of fiscal rules on the education of mayoral candidates

	(1)	(2)	(3)
<i>Mayoral candidates with university degree</i>			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	No	No	No
(> 5000)	0.085** (0.040)	0.106* (0.058)	0.095** (0.042)
(Post)	0.053* (0.032)	0.043 (0.048)	0.049 (0.033)
(Post)*(> 5000)	-0.109** (0.049)	-0.137* (0.073)	-0.108** (0.051)
Observations	4,059	1,978	9,110
Bandwidth	1313	656.6	2627

Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between (> 5000) and Post. The outcome variable is the share of mayoral candidates with a university degree. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table 2: Effect of fiscal rules on the education of mayors

	(1)	(2)	(3)
<i>Mayors with university degree</i>			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	No	No	No
(> 5000)	0.066 (0.057)	0.152* (0.082)	0.073 (0.060)
(Post)	0.112** (0.048)	0.155** (0.070)	0.109** (0.049)
(Post)*(> 5000)	-0.188*** (0.072)	-0.289*** (0.103)	-0.167** (0.076)
Observations	4,408	2,142	10,345
Bandwidth	1438	718.9	2876

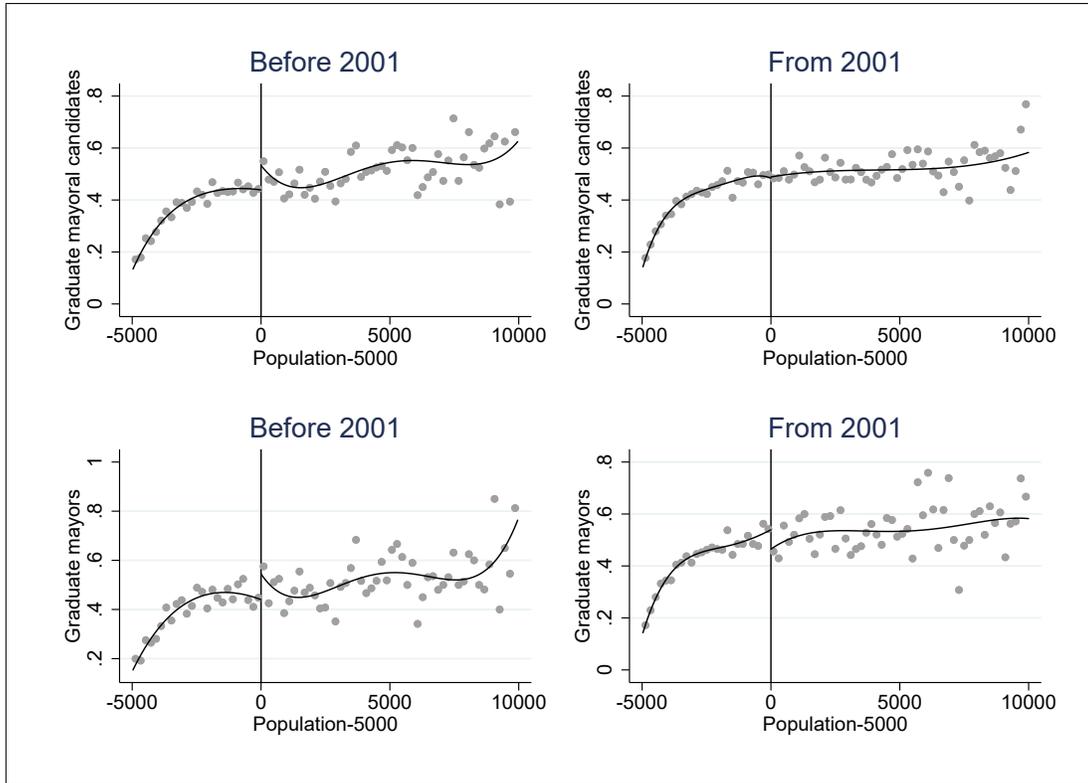
Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between > 5000 and Post. The outcome variable is = 1 for mayors with a university degree. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table 3: The role of past deficit

	(1)	(2)	(3)	(4)
Dependent variable	<i>Mayoral candidates with university degree</i>		<i>Mayors with university degree</i>	
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Controls	No	No	No	No
Sample	<i>Deficit &lt; median</i>	<i>Deficit &gt; median</i>	<i>Deficit &lt; median</i>	<i>Deficit &gt; median</i>
( > 5000)	0.106*	0.069	0.084	0.050
	(0.058)	(0.055)	(0.079)	(0.083)
(Post)	0.079*	0.038	0.199***	0.035
	(0.045)	(0.045)	(0.067)	(0.070)
(Post)*( > 5000)	-0.201***	-0.028	-0.317***	-0.074
	(0.070)	(0.069)	(0.101)	(0.105)
Observations	2,029	2,030	2,201	2,207
Bandwidth	1313	1313	1438	1438

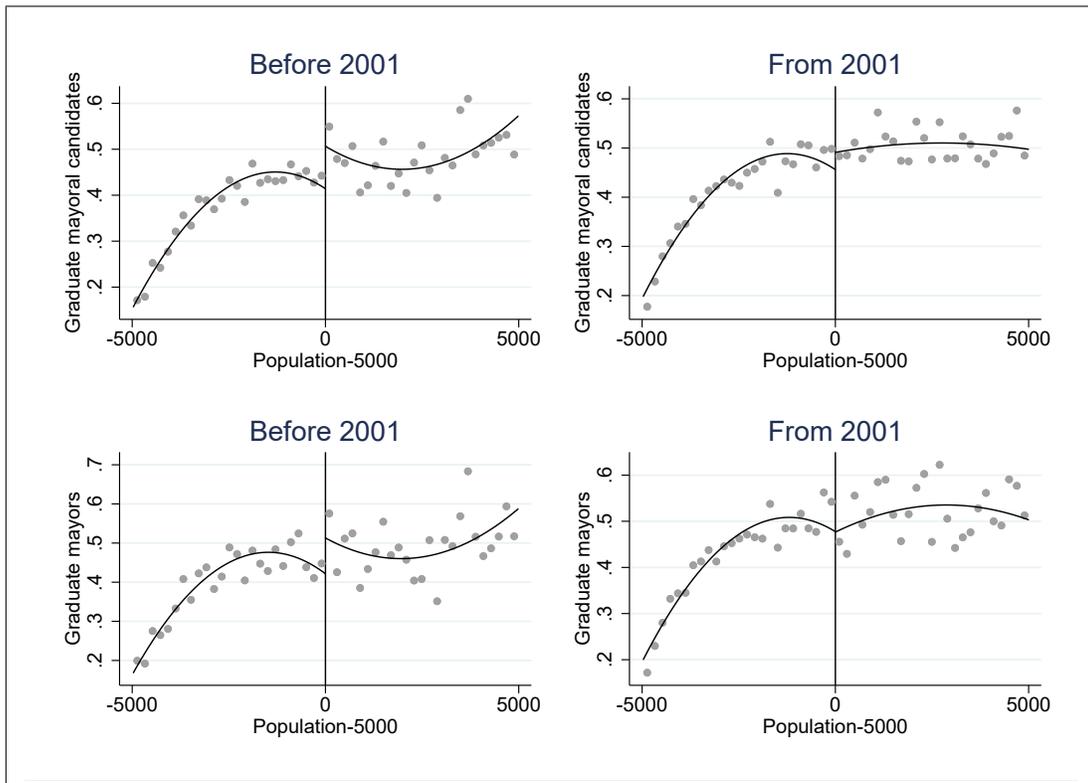
Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Sub-samples: 1) (*Deficit < median*) = municipalities with a level of past deficit below the median; 2) (*Deficit > median*) = municipalities with a level of past deficit above the median. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*( > 5000) = interaction term between > 5000 and Post. The outcome variable is the share of mayoral candidates with a university degree in column 1-2 and it is = 1 for mayors with a university degree in column 3-4. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Figure 1: RDD evidence: all municipalities below 15,000



Notes. Rdd estimates. Horizontal axis: normalized population around the 5000 threshold. Vertical axis: share of graduate mayoral candidates in the top graphs and dummy=1 for graduate mayors in the bottom graphs. Scatter points are averaged over bins of 200 inhabitants. The central black line represents a split fourth-order polynomial of the outcome variable in the normalized population, fitted separately on each side of the threshold.

Figure 2: Rdd evidence: municipalities below 10,000



Notes. Rdd estimates. Horizontal axis: normalized population around the 5000 threshold. Vertical axis: share of graduate mayoral candidates in the top graphs and dummy=1 for graduate mayors in the bottom graphs. Scatter points are averaged over bins of 200 inhabitants. The central balck line represents a split second-order polynomial of the outcome variable in the normalized population, fitted separately on each side of the threshold.

# A1 Appendix [For Online Publication]

Table A1: Fiscal rules in Italy: the Domestic Stability Pact (DSP)

Year	Target	Limits on target	Reference Year	Covered municipalities
1999	Budget Balance	growth: 0 %	1997	All
2000	Budget Balance	growth: 0 %	1998	All
2001	Budget Balance	growth: max 3 %	1999	> 5000
2002	Budget Balance	growth: max 2.5 %	2000	> 5000
	Current Expenditures	growth: max 6 %	2000	
2003	Budget Balance	growth: 0 %	2001	> 5000
2004	Budget Balance	growth: max 1.7 %	2003	> 5000
2005	Total Expenditures	growth: 10 %/11.5 %	2002-2004	> 5000
2006	Current Expenditures	cut: -6.5 %/-8 %	2004	> 5000
	Capital Expenditures	growth: max 8.1 %	2004	
2007	Budget Balance	cut: 0 %/-8 %	2003-2005	> 5000
2008	Budget Balance	cut: 0 %/-8 %	2003-2005	> 5000
2009	Budget Balance	cut: 0 %/-70 %	2007	> 5000
2010	Budget Balance	cut: 0 %/-110 %	2007	> 5000
2011	Budget Balance	Budget balance = 0	-	> 5000
2012	Budget Balance	Budget balance = 0	-	> 5000

Notes. Domestic Stability Pact: fiscal rules decided by the Italian central government which apply year by year to the covered municipalities. Columns definition: Target = target decided by the central government for a specific year; Limits on target = these are the limits on the target that the municipal government must apply. *Growth* sets a cap for the increase of the target in a specific year with respect to the the reference year. *Cut* indicates that the municipal government must cut the target by that amount in that specific year with respect to the the reference year. When, in a specific year, there are two limits on target it means that these apply differentially depending on the past fiscal performance of a municipality (i.e. one limit applies to virtuous municipalities, while the other applies to undisciplined towns); Covered municipalities = this indicates the municipalities that must apply the fiscal rules. Legislative sources: annual national budget law (Legge Finanziaria) from 1999 to 2012. Other sources: Grembi et al. (2016); Chiades and Mengotto (2013). As described by Grembi et al. (2016), the main definition of budget balance used during the years as been the so called fiscal gap, which is defined as municipal deficit net of transfers and debt service.

Table A2: Legislative population thresholds in Italy:  
Municipalities below 15,000

Population	Wage Mayor	Wage Ministers	Size Government	Size Council
< 1000	1,291	15 %	4	12
1000-3000	1,446	20 %	4	12
3000-5000	2,169	20 %	4	16
5000-10,000	2,789	50 %	4	16
10,000-15000	3,099	55 %	6	20

Notes. Legislative population thresholds that apply to Italian municipalities with less than 15000 inhabitants. Columns definition: Population = municipal population as measured by the last Census; Wage Mayor = it is the wage paid to the mayor, expressed in Euros at 2000 prices; Wage Ministers = wage paid to the ministers as a percentage of the wage of the mayor; Size Government = maximum number of ministers that can be appointed in the municipal government; Size Council = number of seats in the municipal council. All the wage thresholds date back to 1960, except the 1000 and 10,000 thresholds, which were introduced in 2000. Sources: Gagliarducci and Nannicini (2013); Grembi et al. (2016).

Table A3: Descriptive statistics:  
Municipalities below 5000 vs. Municipalities above 5000

	(1) Below 5000	(2) obs	(3) Above 5000	(4) obs	(5) p-value
<i>Politicians characteristics</i>					
Female mayors	0.088	4848	0.095	1318	0.199
Age mayors	48.235	4848	47.807	1318	0.031
High skills job mayors	0.227	4848	0.314	1318	0.000
Graduate mayors	0.373	4848	0.519	1318	0.000
Political experience mayors	8.252	4848	8.172	1318	0.494
Female mayoral candidates	0.105	4848	0.109	1318	0.267
Age mayoral candidates	48.106	4848	48.139	1318	0.830
High skills job mayoral candidates	0.213	4848	0.313	1318	0.000
Graduate mayoral candidates	0.356	4848	0.506	1318	0.000
<i>Municipal characteristics</i>					
South	0.251	4848	0.292	1318	0.002
Centre	0.135	4848	0.167	1318	0.003
North-West	0.503	4848	0.305	1318	0.000
North-East	0.108	4848	0.234	1318	0.000
Population density	146.346	4848	497.971	1318	0.000
Area	25.222	4848	43.254	1318	0.000
No profit associations	9.136	4848	33.898	1318	0.000
Firms per capita	0.075	4848	0.081	1318	0.000
Income per capita	9103	4848	10,294	1318	0.000
% elderly	0.228	4848	0.177	1318	0.000
% 15-64 years old	0.643	4848	0.677	1318	0.000
% graduate	0.043	4848	0.051	1318	0.000

Notes. Municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. *Below 5000* = 1 for municipalities below 5000 inhabitants. *Above 5000* = 1 for municipalities above 5000 inhabitants. Columns (1) and (3) report the mean values for the two samples; *obs* is the number of observations; *p-value* is the p-value of the difference between the means of the two samples.

Table A4: Balance test on municipal covariates  
*Diff-in-Disc*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: Characteristics municipal population</i>								
Dependent variables	% university degree	% 15-64	% 65+	(log) income per capita	# firms	no-profit ass	area	population density
(Post)*(> 5000)	0.001 (0.003)	-0.007 (0.006)	0.005 (0.010)	0.084 (0.063)	0.004 (0.005)	0.672 (1.614)	-1.502 (5.547)	-52.144 (74.527)
Bandwidth	856.5	809.5	699.2	1110	660.7	934.9	1027	737.1
Observations	2625	2443	2102	3421	1994	2928	3203	2210
<i>Panel B: Geographical characteristics municipalities and deficit</i>								
Dependent variables	NE	NW	CEN	SOU	deficit			
(Post)*(> 5000)	0.045 (0.080)	-0.023 (0.093)	0.064 (0.055)	-0.095 (0.089)	-0.010** (0.005)			
Bandwidth	942.5	916.4	1222	901.8	1293			
Observations	2954	2844	3755	2799	3062			

Notes. Diff-in-disc estimates of the impact of fiscal rules on municipal covariates. Municipalities between 0-15,000. Electoral years between 1993 and 2012. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between > 5000 and Post. The outcome variable is the share of mayoral candidates with a university degree. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A5: Effect of fiscal rules on the education of mayoral candidates  
Adding control variables

	(1)	(2)	(3)
<i>Mayoral candidates with university degree</i>			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	Yes	Yes	Yes
( $> 5000$ )	0.061* (0.037)	0.092* (0.053)	0.066* (0.038)
(Post)*( $> 5000$ )	-0.101** (0.045)	-0.138** (0.066)	-0.099** (0.047)
Observations	4,059	1,978	9,110
Bandwidth	1313	656.6	2627

Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Variables in the Table: 1) ( $> 5000$ ) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*( $> 5000$ ) = interaction term between ( $> 5000$ ) and Post. The dummy variable (Post) is not reported here because it is absorbed by year of election fixed effects. The outcome variable is the share of mayoral candidates with a university degree. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Year of election and Regions fixed effects added in all columns. Control variables in all columns: 1) share of population with a university degree measured in 2001; 2) share of active population (i.e. population between 15 and 64 years old) measured in 2001; 3) share of elderly (i.e. population above 65 years old) measured in 2001; 4) log of income per capita measured in 2001; 5) number of firms per capita; 6) number of no-profit associations per capita; 7) area of municipality in square km; 8) population density measured in 2001. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A6: Effect of fiscal rules on the education of mayors  
Adding control variables

	(1)	(2)	(3)
<i>Mayors with university degree</i>			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	Yes	Yes	Yes
( $> 5000$ )	0.043 (0.055)	0.126 (0.077)	0.042 (0.058)
(Post)*( $> 5000$ )	-0.182*** (0.069)	-0.261*** (0.097)	-0.157** (0.073)
Observations	4,408	2,142	10,345
Bandwidth	1438	718.9	2876

Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Variables in the Table: 1) ( $> 5000$ ) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*( $> 5000$ ) = interaction term between ( $> 5000$ ) and Post. The dummy variable (Post) is not reported here because it is absorbed by year of election fixed effects. The outcome variable is = 1 for mayors with a university degree. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Year of election and Regions fixed effects added in all columns. Control variables in all columns: 1) share of population with a university degree measured in 2001; 2) share of active population (i.e. population between 15 and 64 years old) measured in 2001; 3) share of elderly (i.e. population above 65 years old) measured in 2001; 4) log of income per capita measured in 2001; 5) number of firms per capita; 6) number of no-profit associations per capita; 7) area of municipality in square km; 8) population density measured in 2001. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A7: The effect of fiscal rules on the education of politicians  
Controlling for pre-trends

	(1)	(2)	(3)	(4)
Dependent Variables	Share mayoral candidates with university degree		= 1 for Mayors with university degree	
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Controls	No	Yes	No	Yes
(> 5000)	0.113** (0.048)	0.073 (0.045)	0.072 (0.064)	0.029 (0.062)
(Post)	0.035 (0.037)		0.115** (0.052)	
(Post)*(> 5000)	-0.138** (0.057)	-0.113** (0.053)	-0.194** (0.079)	-0.168** (0.076)
(Pre)	-0.036 (0.032)		0.005 (0.035)	
(Pre)*(> 5000)	-0.057 (0.047)	-0.023 (0.046)	-0.012 (0.055)	0.027 (0.054)
Observations	4,059	4,059	4,408	4,408
Bandwidth	1313	1313	1438	1438

Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between (> 5000) and Post; 4) (Pre) = 1 for election immediately before 2001 fiscal rules removal; 5) (Pre)\*(> 5000) = interaction term between (> 5000) and (Pre). The outcome variable is the share of mayoral candidates with a university degree in columns 1 and 2, while it is = 1 for mayors with a university degree in columns 3 and 4. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Year of election and Regions fixed effects added in columns 2 and 4. Control variables in columns 2 and 4: 1) share of population with a university degree measured in 2001; 2) share of active population (i.e. population between 15 and 64 years old) measured in 2001; 3) share of elderly (i.e. population above 65 years old) measured in 2001; 4) log of income per capita measured in 2001; 5) number of firms per capita; 6) number of no-profit associations per capita; 7) area of municipality in square km; 8) population density measured in 2001. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A8: The role of past deficit

	(1)	(2)	(3)	(4)
Dependent variable	<i>Mayoral candidates with university degree</i>		<i>Mayors with university degree</i>	
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Controls	Yes	Yes	Yes	Yes
Sample	<i>Deficit &lt; median</i>	<i>Deficit &gt; median</i>	<i>Deficit &lt; median</i>	<i>Deficit &gt; median</i>
( > 5000)	0.065 (0.053)	0.059 (0.052)	0.042 (0.076)	0.041 (0.079)
(Post)*(> 5000)	-0.175*** (0.063)	-0.030 (0.065)	-0.282*** (0.096)	-0.088 (0.103)
Observations	2,029	2,030	2,201	2,207
Bandwidth	1313	1313	1438	1438

Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Sub-samples: 1) (*Deficit < median*) = municipalities with a level of past deficit below the median; 2) (*Deficit > median*) = municipalities with a level of past deficit above the median. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between > 5000 and Post. The outcome variable is the share of mayoral candidates with a university degree in column 1-2 and it is = 1 for mayors with a university degree in column 3-4. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Control variables in all columns: 1) share of population with a university degree measured in 2001; 2) share of active population (i.e. population between 15 and 64 years old) measured in 2001; 3) share of elderly (i.e. population above 65 years old) measured in 2001; 4) log of income per capita measured in 2001; 5) number of firms per capita; 6) number of no-profit associations per capita; 7) area of municipality in square km; 8) population density measured in 2001. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A9: The effect of fiscal rules on the education of politicians  
Excluding 2005-2006

	(1)	(2)	(3)	(4)
Dependent Variables	Share mayoral candidates with university degree		= 1 for Mayors with university degree	
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Controls	No	Yes	No	Yes
(> 5000)	0.085** (0.040)	0.063* (0.037)	0.066 (0.057)	0.044 (0.055)
(Post)	0.048 (0.033)		0.111** (0.049)	
(Post)*(> 5000)	-0.101** (0.050)	-0.095** (0.046)	-0.200*** (0.073)	-0.193*** (0.070)
Observations	3,865	3,865	4,196	4,196
Bandwidth	1313	1313	1438	1438

Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2000, excluding 2005 and 2006. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between (> 5000) and Post. The outcome variable is the share of mayoral candidates with a university degree in columns 1 and 2, while it is = 1 for mayors with a university degree in columns 3 and 4. The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Year of election and Regions fixed effects added in columns 2 and 4. Control variables in columns 2 and 4: 1) share of population with a university degree measured in 2001; 2) share of active population (i.e. population between 15 and 64 years old) measured in 2001; 3) share of elderly (i.e. population above 65 years old) measured in 2001; 4) log of income per capita measured in 2001; 5) number of firms per capita; 6) number of no-profit associations per capita; 7) area of municipality in square km; 8) population density measured in 2001. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A10: The effect of fiscal rules on other characteristics

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	$h$	$h$	$h$	$h$
Covariates	No	No	No	No
Dependent Variables	High skill	Age	Female	Pol Experience
<i>Panel A: mayoral candidates</i>				
(Post)*(> 5000)	-0.102* (0.052)	1.952** (0.857)	-0.014 (0.032)	
Observations	3,077	4,700	3,568	
Bandwdith	985.1	1527	1158	
<i>Panel B: mayors</i>				
(Post)*(> 5000)	-0.136** (0.069)	4.178*** (1.509)	0.066 (0.043)	-0.719 (0.865)
Observations	3,703	3,659	4,139	3,701
Bandwdith	1218	1198	1339	1204

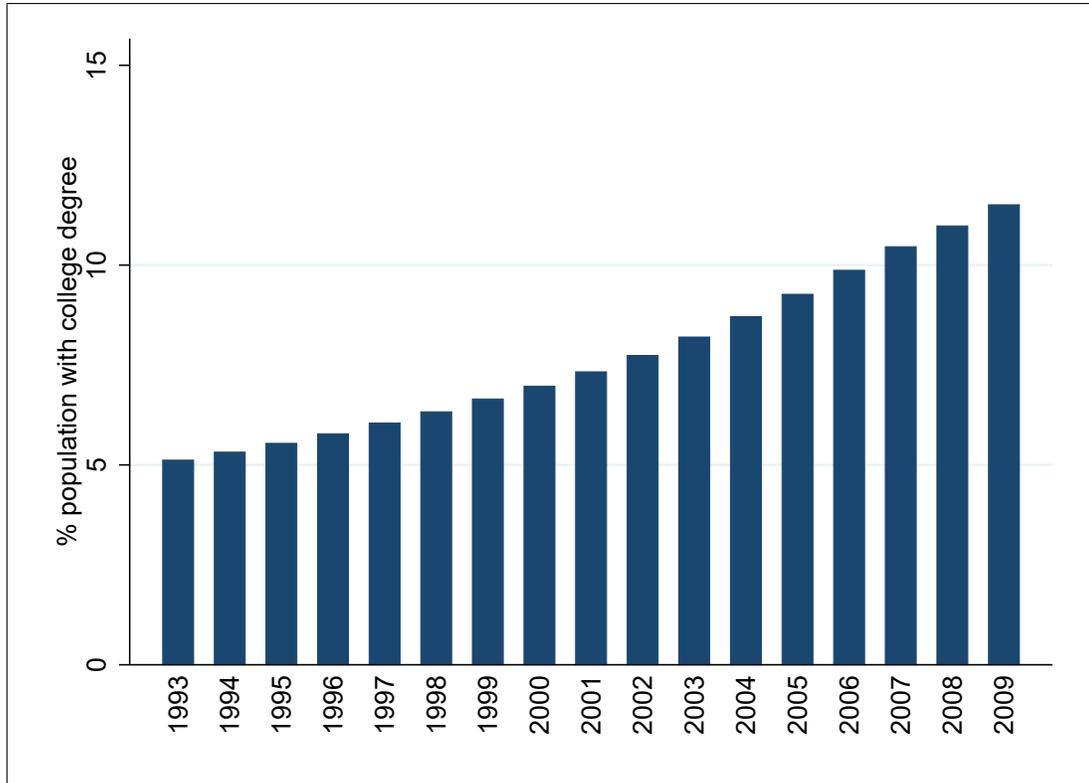
Notes. Diff-in-disc estimates of the impact of fiscal rules on the education of politicians. Original sample: municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2000, excluding 2005 and 2006. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between (> 5000) and Post. The outcome variables are: 1) high skill = for politicians from high skill occupations; 2) Age = age of the politicians; 3) Female = 1 for female politicians; 4) Pol Experiences = years of political experience at any level of politics (for mayors only). The bandwidth is calculated using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth  $h$  selector. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Table A11: The effect of fiscal rules on the education of politicians  
Difference-in-differences estimates

	(1)	(2)	(3)	(4)
Dependent Variables	Share mayoral candidates with university degree		= 1 for Mayors with university degree	
(> 5000)	0.159*** (0.010)	0.177*** (0.012)	0.140*** (0.014)	0.146*** (0.016)
(Post)	0.037*** (0.005)	0.035*** (0.006)	0.025*** (0.007)	0.022*** (0.008)
(Post)*(> 5000)	-0.022** (0.010)	-0.040*** (0.012)	-0.000 (0.016)	-0.006 (0.019)
Pre		-0.005 (0.005)		-0.005 (0.006)
(Pre)*(> 5000)		-0.037*** (0.011)		-0.011 (0.015)
Observations	26,064	26,064	26,064	26,064
Controls	No	No	No	No

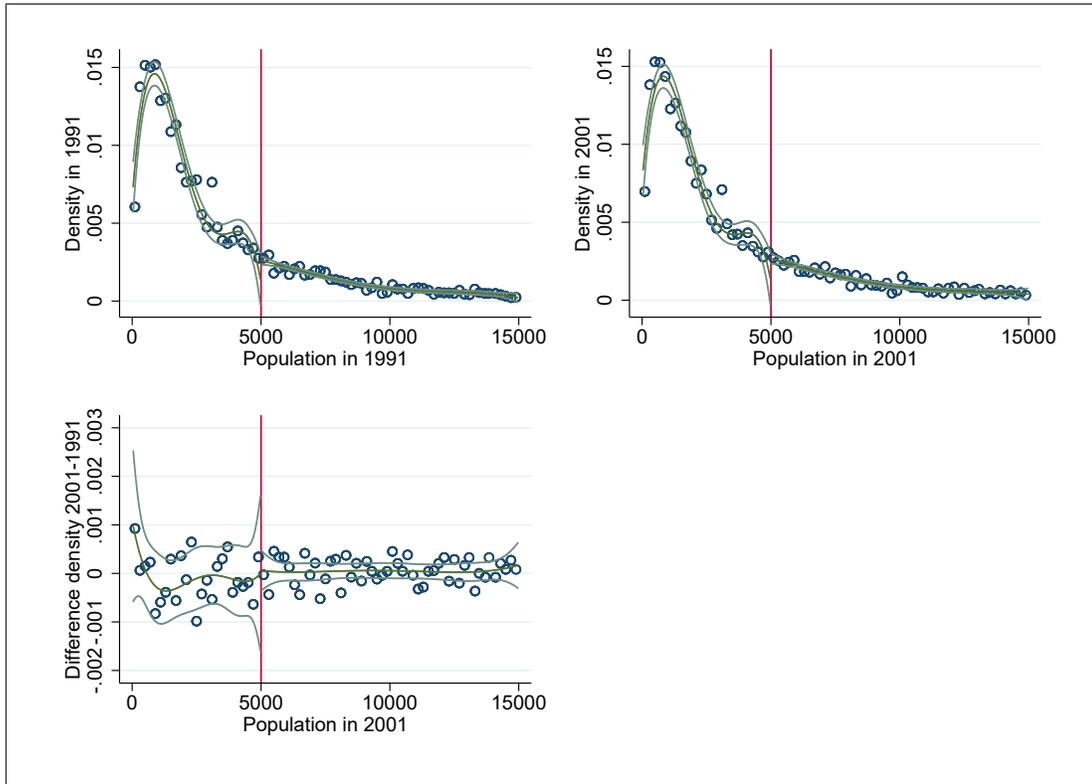
Notes. Difference-in-differences estimates of the impact of fiscal rules on the education of politicians. Municipalities between 0 and 15,000 inhabitants. Electoral terms between 1993 and 2012. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Post) = 1 for electoral terms starting from 2001; 3) (Post)\*(> 5000) = interaction term between (> 5000) and Post; 4) (Pre) = 1 for election immediately before 2001 fiscal rules removal; 5) (Pre)\*(> 5000) = interaction term between (> 5000) and (Pre). The outcome variable is the share of mayoral candidates with a university degree in columns 1 and 2, while it is = 1 for mayors with a university degree in columns 3 and 4. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by \*, at the 5% level by \*\*, and at the 1% level by \*\*\*.

Figure A1: Percentage Italian population with a college degree



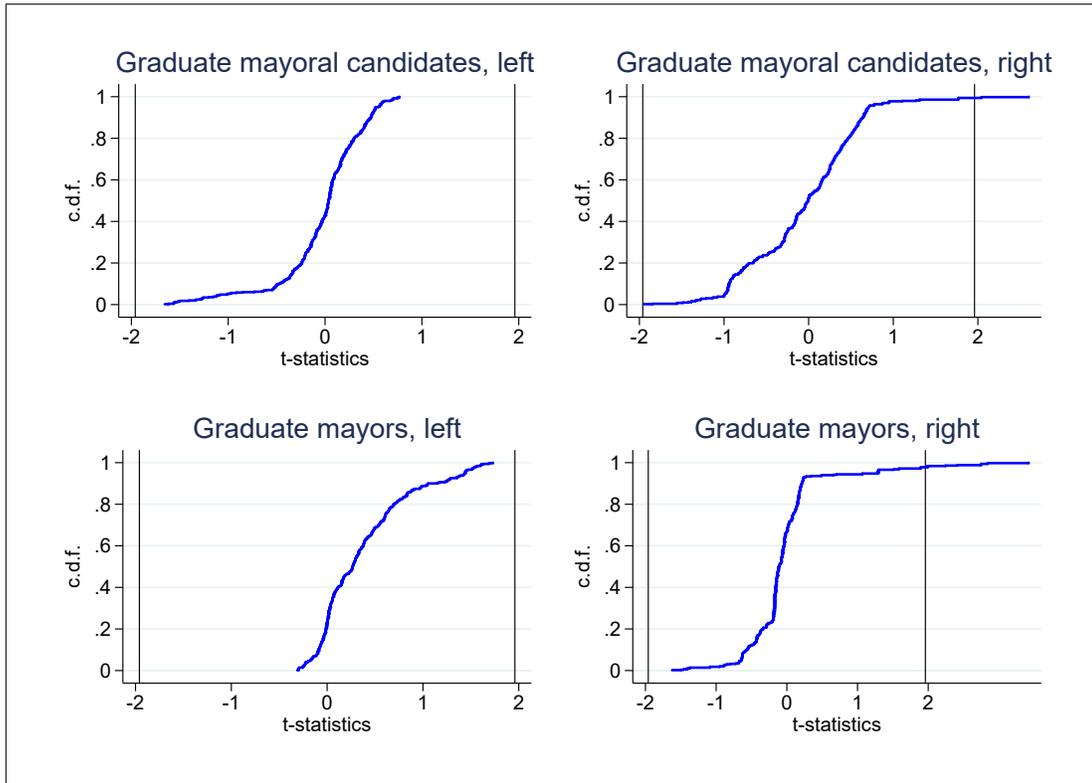
Notes. Percentage of adult Italian population aged  $\geq 18$  years old with a college degree. Years from 1993 to 2009. Source: Italian Statistical Office (Istat).

Figure A2: Density test on the running variable



Notes. Discontinuity test for the density of the population at the 5000 threshold. Top graphs: (1) density test for the population as measured by the 1991 Census; (2) density test for the population as measured by the 2001 Census. Bottom graph: (1) discontinuity test for the difference between the density of the 2001 Census population and the density of the 1991 Census population. The central green line represents a split fourth-order polynomial of the outcome variable in the normalized population, fitted separately on each side of the threshold. The grey lines represent the 95 percent confidence interval.

Figure A3: Diff-in-Disc  
Placebo thresholds



Notes. Placebo tests at fake thresholds using permutation methods for the level of education of politicians. The figure reports the c.d.f. of the t-statistics of a set of diff-in-disc regressions at 500 fake thresholds below and 500 fake thresholds above the 5000 threshold (i.e. thresholds from 4900 to 4400, and from 5100 to 5600). The diff-in-disc model is run using a local linear regression. The vertical lines indicate t-statistics of -2 and 2. The top graphs report the c.d.f. of the t-statistics for the share of mayoral candidates with a university degree (respectively to the left and to the right of the 5000 threshold). The bottom graphs report the c.d.f. of the t-statistics for the share of mayors with a university degree (respectively to the left and to the right of the 5000 threshold).