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

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This Version, 17th February 2019

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.

*Matteo Gamalerio, m.gamalerio@ub.edu. I thank Mohit Agrawal, Matteo Alpino, Pablo Beker, Dan Bernhardt, Christopher Berry, Massimo Bordignon, Fernanda Brollo, Estelle Cantillon, Stefano DellaVigna, Mirko Draca, James Fenske, Claudio Ferraz, Dana Foarta, Dirk Foremny, Gonzalo Gaete, Juan Carlos Gozzi, Edoardo Grillo, Stuti Khemani, Eliana La Ferrara, Nicola Limodio, Alessandro Lizzeri, Ben Lockwood, Daniel Montolio, Helios Herrera, Niall Huges, Mario Jametti, Francesco Nava, Raphael Parchet, Luigi Pascali, Petra Persson, Torsten Persson, Giacomo Ponzetto, Marta Reynal-Querol, Edoardo Slerca, Jim Snyder, Pilar Sorribas-Navarro, Albert Sole Olle, Tilko A. Swalve, Silvana Tenreyro, Andrea Tesei, Davide Ticchi, Daniel Treisman, Federico Trombetta, Judit Vall Castello, Stephane Wolton, and all participants at the 2017 EEA-ESEM Congress in Lisbon, the 2016 Marco Fanno Alumni meeting in London, the 2017 RES Congress in Bristol, the 2017 RES Junior Symposium in Bristol, the 2017 Warwick PhD conference, the Warwick PhD seminar, the IEB seminar, the JRC seminar and the seminar at the University of Lugano for insightful comments. All mistakes are mine. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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. Finally, I provide suggestive evidence that educated politicians, compared to the less educated ones, reduce the size of the local government and positively affect income growth. These differences emerge only in municipalities where fiscal rules do not apply, which may explain why educated individuals are less likely to enter politics where fiscal rules apply. Alternative stories find less support in the data.

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.[1]

[1] 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

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 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).[2] This evidence suggests that imposing a constraint on how

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.

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

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 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 10 and 15 % 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 16 and 27 % 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).[3] [4]

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

[3]The results of the main specification survive a series of robustness checks: first, through a falsification test implemented using pre-2001 data, I show that municipalities just below and just above the 5000 threshold did not react differently to the introduction of fiscal rules in 1999. This indicates that high-wage and low-wage municipalities did not react differently to the introduction of fiscal rules, excluding a potential interaction between the two policies that may have affected the selection of politicians. This falsification test also provide evidence that the two groups of municipalities around 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.

[4]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.

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.[5]

The main results of this paper show that educated individuals are less likely to enter politics where fiscal rules apply. In the second part of the empirical analysis, I provide suggestive evidence that sheds lights on the motivations behind this behavior. More specifically, I use a regression discontinuity design (RDD) based on close mixed electoral competitions between graduate and non-graduate mayoral candidates to study how educated politicians affect fiscal policies and income growth. The RDD analysis is implented keeping the mixed electoral competitions between 2001 and 2012. The evidence from this exercise must be considered as suggestive and the results must be interpreted with caution. The motivation for this caution is that, while municipal characteristics are balanced in the RDD setting, the mayoral ones are not, given that graduate mayors also tend to have less political experience and to be more likely to work in high skills occupations. Thus, even though controlling for these mayoral characteristics does not change the estimated coefficients, the results may still be affected by unobservable individual characteristics not included in the data.

The results of this exercise show that, in municipalities not affected by fiscal rules, graduate mayors reduce the size of the municipal government. This reduction is implemented cutting total revenues more than total expenditures, and thus running a higher deficit. In addition, graduate mayors reduce taxes, fees on public services and current expenditures, a result which is consistent with the evidence provided by Gagliarducci and Nannicini (2013), and which signals that educated politicians try to reduce the financial burden on voters and the waste in municipal expenditures.[6]

These policy differences disappear in municipalities above the 5000 threshold, a result that suggests that fiscal rules may make more complicated for educated politicians to reach their goals in terms of fiscal policies, providing an explanation for the effect of fiscal rules on political selection. More specifically, this result suggests that fiscal rules, by introducing a constraint on deficit, seem to make more difficult to reduce the size of the government, which appears to be one of the goals of educated politicians. An explanation for why fiscal rules may

[5]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.

[6]As explained by Gagliarducci and Nannicini (2013) and by Bandiera, Prat, and Valletti (2009), in Italy, current expenditures are characterized by higher levels of passive waste.

make more complicated to reduce the size of the government can be found in the literature on the political economy of fiscal deficits (Eslava, 2011; Persson and Svensson, 1989; Pettersson-Lidbom, 2001), which describes how low-spending politicians may run deficits in order to force their successors into low expenditures levels. From this perspective, a constraint on deficit may make more difficult to reach a permanent reduction in public expenditures, as subsequent governments could easily go back to higher levels of expenditure in the future.

This should be particularly true when low-spending politicians expect to be replaced by high-spending politicians (Pettersson-Lidbom, 2001). To confirm this intuition, I show that the effect of graduate mayors on fiscal policies is driven by those mayors who are replaced by non-graduate (i.e. high spending) mayors at the next election, while the effect disappears if the next mayor is graduate. Finally, the fiscal decisions of graduate mayors seem to translate into a positive effect for the economy, as graduate mayors have a positive effect on income growth. This result suggests that fiscal rules, by reducing the discretion in setting fiscal policies, seem to make more difficult for educated politicians to stimulate the economy, a result that may further explain why educated politicians are less likely to enter politics where fiscal rules apply. Alternative expanations find less support in the data.[7]

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 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. Finally, fiscal rules seem to discourage pro-growth individuals to enter politics.

[7]More specifically, I show that the effect of fiscal rules on political selection is not due to different preferences for rents extraction between educated and less educated politicians. In fact, graduate mayors do not appear to be more corrupt, compared to non-grduate ones. In addition, I show that the differential impact of the education of the mayor on fiscal policies and income growth across municipalities below and above the 5000 threshold is not due to the wage increase that operates across the threshold.

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 [8]. 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 governments, whose budgets form part of the total budget of the State. The subnational rules in Italy were called the "Domestic Stability Pact" (DSP) [9].

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

[8] 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).

[9] 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.

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.[10] 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 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.

[10]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).

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 es-

tablishes 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 counfounding 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[11]. 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 ϕ_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 ϕ_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.

[11]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.

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; Brollo 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 descriptive evidence is produced comparing municipalities in a small bandwidth around the 5000 threshold (i.e. 250 inhabitants above and below the threshold). 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, while after 2001 the share of graduate politicians slightly increased in municipalities just below the 5000 threshold, the same share declined in municipalities just above the threshold. Hence, the effect of the wage on the selection of politicians seems to disappear after 2001, since when fiscal rules where 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, and in Figure 3. 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.[12]

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.[13]

The results of Table 1 indicates that fiscal rules induced a reduction in the share of graduate mayoral candidates which is between 10 and 15 % 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 between 16 and 27 % points, depending on the specification.[14]

Finally, the fact that fiscal rules affected both the share of graduate mayoral candidates

[12]Tables A5 and A6 show that the baseline results are robust if I add municipal covariates to the *Diff-in-Disc* model.

[13]In Table A7, I repeat the baseline exercise controlling for the dummy variable ($Introduction$) which is equal to 1 for the electoral years in which fiscal rules applied for all municipalities (i.e. 1999 and 2000), and its interaction with the dummy variable ($> 5000_i$). This alternative model enables me to estimate the effect of fiscal rules on the selection of politicians using as default years those years during which fiscal rules did not apply (i.e. comparing years starting from 2001 with years before 1999). The estimated coefficients are similar to those in Tables 1 and 2.

[14]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. This increasing trend is consistent with the descriptive evidence in Figure A1, which shows that the level of education in the Italian population was following an increasing trend as well.

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 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 interact all the variables in model 1 with a dummy variable equal to 1 for municipalities with a level of inherited deficit above the mean. The inherited deficit is measured as a fraction of total revenues.[15] 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

[15]To limit the impact of outliers, I winsorize the deficit at the 99 % levels.

municipalities that inherited a level of past deficit below the mean. 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.[16]

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 secton 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

[16] In Table A9, I repeat the same exercise adding municipal covariates. The results are essentially unchanged.

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, 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 municipalitie 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. 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. I test this assumption in Table A8, in which I apply the *Diff-in-Disc* model to pre-treatment data (i.e. pre-2001 data) that go from 1993 to 2000. The main variable of interest in this exercise is the interaction term $(Introduction)*(> 5000)$, which is equal to one for municipalities above 5000 for the electoral terms starting from 1999. 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. In addition, Table A8 demonstrates that municipalities just below and just above the 5000 threshold did not react differently to the introduction of fiscal rules in 1999. This last assumption is required in order to show that over time there has not been any interaction between fiscal rules and the wage increase at the 5000 threshold (i.e. the two policies that change at the 5000 threshold).[17]

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

[17]The negative coefficients in front of the dummy variable *Introduction* indicates that on average the level of education of municipal politicians was declining around the introduction of fiscal rules. While this evidence is far from being conclusive, this negative coefficient may suggest that the introduction of fiscal rules was affecting politicians' education in all municipalities.

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 A10, 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 A11, 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.[18] Fourth, in Table A12, 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 Fiscal implications of educated vs non-educated political leaders

6.1 Empirical strategy

The results in section 5 indicates that more educated individuals are less likely to enter politics where fiscal rules apply. This section provide suggestive evidence that allows to understand the motivations behind this behaviour. More specifically, this section investigates whether educated politicians, comapared to the less educated ones, make different decisions in terms of fiscal policies and whether they differently affect the economy. In addition, this section provides suggestive evidence that the difference between more and less educated politicians disappear where fiscal rules apply. This evidence helps to understand the baseline results

[18]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 politically experienced politicians, who may be less educated.

described in section 5.

The evidence about the behaviour of more educated politicians is produced using a Regression Discontinuity Design (RDD) strategy based on close mixed electoral competitions in which graduate mayors compete against non-graduate ones. In fact, it is plausible to assume that in mixed races decided by a narrow margin, the election outcomes are determined by random factors and not by systematic municipal characteristics that could affect also budget outcomes. Hence, under certain assumptions, municipalities where mayors with a university degree barely lost can be used as a counterfactual for municipalities where they barely won. In other words, under certain conditions, Regression Discontinuity Design developed using mixed electoral competitions allows to control for observable and unobservable municipal characteristics.

Following the recent developments introduced by Calonico, Cattaneo and Titiunik (2014), Calonico, Cattaneo and Farrell (2018) and Gelman and Imbens (2018), I implement the following RDD strategy, which is estimated by local linear regression (LLR):

$$Y_{it} = \rho_0 + \rho_1 MV_{it} + \beta_0 Graduate_{it} + \beta_1 Graduate_{it} \cdot MV_{it} + \pi_0 X_{it} + \mu_t + \lambda_r + \eta_{it} \qquad (2)$$

where μ_t are electoral term fixed effects, λ_r region fixed effects and the dependent variable Y_{it} is represented by different budget outcomes measured in municipality i at time t. The treatment is captured by the dummy variable $Graduate_{it}$, which is equal to 1 for mayors with a university degree and 0 otherwise. The assignment to treatment is uniquely determined by the margin of victory MV_{it}, which is the difference between the vote share of the graduate candidate minus the votes share of the non-graduate one. At the threshold $MV_{it} = 0$ the level of education of the mayor sharply changes from 0 to 1, such that we have that $Graduate_{it} = 1$ and $MV_{it} > 0$ in municipalities in which the graduate candidate won and $Graduate_{it} = 0$ and $MV_{it} < 0$ in the opposite cases.

To implement RDD-LLR, model 2 is estimated on the sub-sample of municipalities in the interval $MV_{it} \in [-h, +h]$, where the optimal bandwidth h is calculated following Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth. In this setting, the coefficient of interest is β_0, which identifies the average treatment effect (ATE) of mayors with a college degree at the zero threshold $MV_{it} = 0$.

There are 3 main assumptions required for this identification to work properly. First, there

must be no sorting around the zero threshold $MV_{it} = 0$, such that voters in municipalities with narrow mixed electoral competitions are not able to manipulate the running variable MV_{it}. This is tested in Figures A4 and A5, in which the McCrary (2008) test on the continuity of the density of the running variable at the zero threshold $MV_{it} = 0$ excludes that sorting is happening across the threshold.

Second, all the observable municipal characteristics should vary smoothly at the zero threshold $MV_{it} = 0$. This assumption is required to guarantee that municipalities on one side of the threshold are a good counterfactual for municipalities on the other side of the cutoff. Tables A13 and A14 confirm that municipal covariates are balanced across the zero threshold.

Third, all the observable individual characteristics of the mayors should vary smoothly at the zero threshold $MV_{it} = 0$. This assumption is required to make sure that the estimated effect of the level of education of a mayor on budget outcomes is not due to other individual observable and unobservable characteristics. As we can see from Table A15, some individual characteristics of the mayor are not balanced around the zero threshold. This imbalance of individual covariates is an issue that raises the suspect that RDD-LLR estimates are not reliable (Alesina, Cassidy and Troiano, 2018; Brollo and Troiano, 2016). For this reason, the estimates in this section must be taken with caution and the evidence must be considered as being suggestive. Finally, to reduce the concern that the effect may be due to an imbalance in observable and unobservable mayoral characterteristics, the regressions in this section are repeated with and without mayoral and municipal characteristics collected in X_{it}.

The analysis of this second part of the paper is developed using the subsample of mixed electoral competitions between graduate and non-graduate mayoral candidates, considering only electoral terms between 2001 and 2012. In addition, to better connect the results of this part with the main results in section 5, the RDD analysis is implemented keeping only municipalities in a specific bandiwidth around the 5000 threshold. More specifically, the analysis is implemented keeping the municipalities between 3745 and 6255 inhabitants, which is the range obtained keeping the municipalities within the optimal bandwidth used in section 5. This leaves me with an initial sample of 940 electoral terms and 656 municipalities around the 5000 threshold. This initial sample is used to calculate the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth

around the $MV_{it} = 0$ threshold.

6.2 Results

This sub-section provides two types of evidence. First, it shows that, where fiscal rules do not apply, educated mayors, compared to less educated ones, make different choices in terms of fiscal policies. This evidence is reported in Tables 4, 5 and 6.[19] Second, it provides evidence that, where fiscal rules do not apply, graduate mayors seem to have a positive effect on income growth. This evidence is reported in Table 7.[20] Both the effect on fiscal policies and the effect on income growth disappear in municipalities that apply fiscal rules.

The results in Panel B and C of Table 4 suggest that graduate mayors, compared to non-graduate ones, reduce the size of government, as they raise less revenues and run lower expenditures. Panel A of Table 6 show that revenues are mainly reduced through a cut in taxes and fees, while Panel B shows that educated mayors reduce expenditures by cutting current expenditures. These results are consistent with those provided by Gagliarducci and Nannicini (2013), and they indicate that educated politicians may try to reduce the financial burden on voters and the waste in municipal expenditures (Gagliarducci and Nannicini, 2013; Bandiera, Prat, and Valletti, 2009). In addition, Panel A of Table 4 shows that graduate mayors run higher deficits, given that they reduce revenues more than expenditures.[21]

These differences disappear in municipalities where fiscal rules apply. This result suggests that fiscal rules, by limiting the deficit, may make more complicated to reduce the size of the government, which appears to be one of the goals of graduate mayors. An explanation for why this may be the case is provided by the literature on the political economy of fiscal deficits (Eslava, 2011; Persson and Svensson, 1989; Pettersson-Lidbom, 2001), which shows that low-spending politicians tend to run higher deficits to force their successors into low expenditures levels. This is particulary true when low-spending politicians expect to be replaced by high-spending politicians (Pettersson-Lidbom, 2001). To further reinforce this

[19] In Table A16, I provide evidence that these differences were not in place in the previous term (i.e. using past dependent variables).

[20] Table A17 shows that these differences were not in place in the past electoral term (i.e. using past dependent variables).

[21] In Table 4, I use the same bandwidth for deficit, total revenues and total expenditures. The reason for this choice is to keep the same sample for the three variables, which allows to understand how the deficit is generated through a mismatch between revenues and expenditures. In Table A18, I repeat the exercise using three different bandwidths.

idea, Table 5 shows that the results in Table 4 are driven by graduate mayors that are replaced by a non-graduate mayor at the subsequent election, while the effect disappears if the next mayor is graduate. Finally, Table 7 shows that the fiscal decisions of graduate mayors seem to translate into a positive effect on income growth. All these results do not apply to municipalities affected by fiscal rules, an evidence that may explain why educated politicians are less likely to enter politics where fiscal rules apply.

6.3 Alternative interpretations

In this sub-section, I show that alternative explanations of why educated politicians are less likely to enter politics where fiscal rules apply find less support in the data. More specifically, I deal with two potential alternative explanations. First, educated mayors may be more corrupt than non-graduate ones. If this were the case, the introduction of fiscal rules may make more difficult to extract rents, reducing the value of holding office for more educated individuals. Second, the differential impact of graduate mayor on fiscal and economic outcomes in municipalities below and above the 5000 threshold may be due to the higher wage paid by municipalities above the 5000 threshold.

To deal with the first alternative interpretation, I use the web archive of one of the main Italian newspapers (La Repubblica), to find episodes of corruption linked to the mayors in my analysis. More specifically, using an algorithm based on the first and last names of the mayor, the name of the city, the years of the legislature and a series of key words recalling episodes of corruption, I create a database of newspapers' articles reporting episodes of corruption linked to the mayors in my dataset. I use this database to create a dummy variable equal to 1 for mayors found to be corrupt, and 0 otherwise. The coefficients reported in Table A20 are estimated using this dummy variable as dependent variable. As we can see from this Table, graduate mayors do not appear to be more corrupt, compared to non graduate ones.

The different results found for municipalities below and above the 5000 thresholds may be due to the different wage paid to the mayors by the two groups of municipalities (Gagliarducci and Nannicini, 2013). To rule out this possibility, I repeat the RDD exercise using only fiscal outcomes measured in the year 2000, which is the only year in my dataset in which municipalities below and above the 5000 threshold are affected equally by fiscal rules. On the opposite, in 2000, the wage increase across the 5000 threshold was already in place, given

that was introduced by a policy developed in the 1960s which has never been changed in real terms. The results of this exercise are reported in Table A19. As we can observe in this Table, once I analyse a year in which fiscal rules apply also in municipalities below 5000 inhabitants, all the differences in terms of fiscal policies between graduate and non-graduate mayors disappear. Even tough this evidence is produced with a small number of observations, a limitation that calls for some caution in interpreting these results, the estimates obtained through this exercise seem to rule out that the results of the second part of the analysis are due to the higher wage paid above the 5000 threshold.

7 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 if driven by municipalities characterized by low levels of inherited deficit, a result that it 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.

The second part of the empirical analysis shows that, where fiscal rules do not apply, educated politicians, compared to the less educated ones, reduce the size of the government and positively affects the local economy. These policy differences disappear where fiscal rules do not apply, a result that explains why educated politicians are less likely to enter politics where fiscal rules apply

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 suggest 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. Finally, fiscal rules seem to discourage pro-growth individuals to enter politics.

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

	(1)	(2)	(3)
Mayoral candidates with university degree			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	No	No	No
(> 5000)	0.087**	0.116*	0.109**
	(0.041)	(0.060)	(0.043)
(Post)	0.044	0.048	0.058*
	(0.033)	(0.049)	(0.034)
(Post)*(> 5000)	-0.104**	-0.150**	-0.125**
	(0.051)	(0.075)	(0.053)
Observations	3874	1886	8533
Bandwidth	1255	627.3	2509

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)
Mayors with university degree			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	No	No	No
(> 5000)	0.086	0.149*	0.077
	(0.058)	(0.083)	(0.061)
(Post)	0.102**	0.147**	0.098*
	(0.049)	(0.071)	(0.050)
(Post)*(> 5000)	-0.187**	-0.278***	-0.160**
	(0.074)	(0.104)	(0.077)
Observations	4299	2096	9909
Bandwidth	1393	696.6	2787

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)
Control Function	Linear	Linear
Bandwidth	h	h
Controls	No	No
Dependent variable	Share mayoral candidates with university degre	=1 for Mayors with university degree
(Post)*(> 5000)	-0.219***	-0.323***
(Deficit < mean)	(0.069)	(0.098)
(Post)*(> 5000)	0.027	-0.033
(Deficit > mean)	(0.074)	(0.111)
Difference	0.246**	0.290*
	(0.101)	(0.149)
Observations	3,874	4,299
Bandwidth	1255	1393

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 < mean)* = municipalities with a level of past deficit below the mean; 2) *(Deficit > mean)* = municipalities with a level of past deficit above the mean. 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) Difference = difference between coefficients of (Post)*(> 5000) across municipalities with past deficit below the mean and municipalities with past deficit above the mean. The outcome variable is the share of mayoral candidates with a university degree in column 1 and it is = 1 for mayors with a university degree in column 2. 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 4: The effect of graduate mayors on fiscal policies

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	No	Yes	No	Yes
Municipalities	Below 5000		Above 5000	
Panel A: Average deficit as a fraction of total revenues				
Graduate	0.024***	0.032***	-0.006	-0.009
	(0.008)	(0.010)	(0.007)	(0.009)
Observations	233	233	208	208
Bandwidth	11.90	11.90	15.72	15.72
Panel B: Log of total revenues per capita				
Graduate	-0.327***	-0.274***	-0.130	-0.008
	(0.104)	(0.087)	(0.088)	(0.071)
Observations	233	233	208	208
Bandwidth	11.90	11.90	15.72	15.72
Panel C: Log of total expenditures per capita				
Graduate	-0.304***	-0.244***	-0.136	-0.018
	(0.103)	(0.088)	(0.086)	(0.072)
Observations	233	233	208	208
Bandwidth	11.90	11.90	15.72	15.72

Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in columns 2 and 4: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 5: The effect of graduate mayors on deficit
Education of next mayor

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	No	Yes	No	Yes
Municipalities	Below 5000		Above 5000	
Panel A: Next mayor is not graduate				
Graduate	0.022*	0.033**	-0.002	-0.003
	(0.012)	(0.013)	(0.010)	(0.015)
Observations	75	75	69	69
Bandwidth	16.74	16.74	19.39	19.39
Panel B: next mayor is graduate				
Graduate	0.007	0.004	0.012	-0.075
	(0.009)	(0.009)	(0.013)	(0.045)
Observations	78	78	40	40
Bandwidth	14.21	14.21	9.420	9.420

Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. The outcome variable is the average deficit as a fraction of total revenues. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in columns 2 and 4: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 6: The effect of graduate mayors on fiscal policies
Composition fiscal policies

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	Yes	Yes	Yes	Yes
Municipalities	Below 5000		Above 5000	
Panel A: Revenues per capita				
Dependent variable	Log Taxes and fees	Log Grants	Log Taxes and fees	Log Grants
Graduate	-0.145*	-0.135	0.041	-0.072
	(0.080)	(0.101)	(0.075)	(0.154)
Observations	293	385	185	180
Bandwidth	15.85	22.91	12.88	12.17
Panel B: Expenditures per capita				
Dependent variable	Log Current expenditures	Log Capital expenditures	Log Current expenditures	Log Capital expenditures
Graduate	-0.108*	-0.185	0.048	-0.248
	(0.056)	(0.143)	(0.069)	(0.260)
Observations	315	286	185	146
Bandwidth	17.87	15.33	12.77	9.873

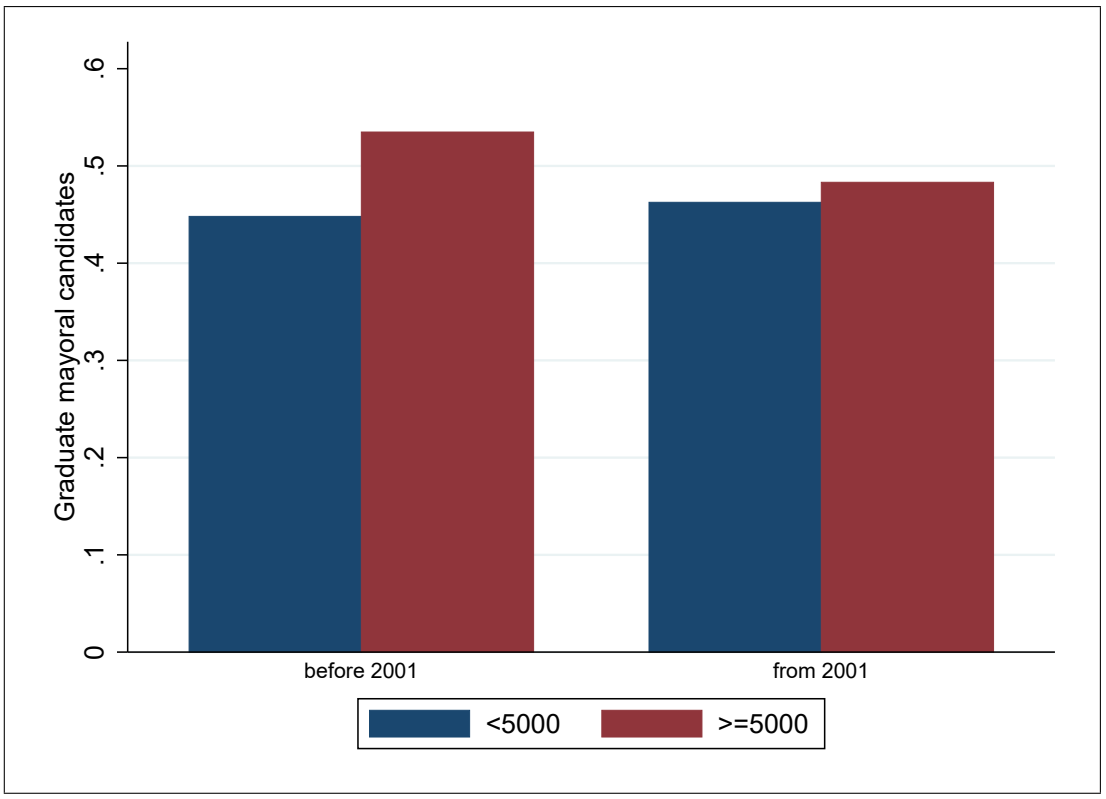
Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in all columns: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates included 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 7: The effect of graduate mayors on income growth

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	No	Yes	No	Yes
Municipalities	Below 5000		Above 5000	
Dependent variable: income growth				
Graduate	0.017*	0.017*	-0.010	-0.014
	(0.010)	(0.010)	(0.016)	(0.019)
Observations	287	287	133	133
Bandwidth	16.80	16.80	9.469	9.469

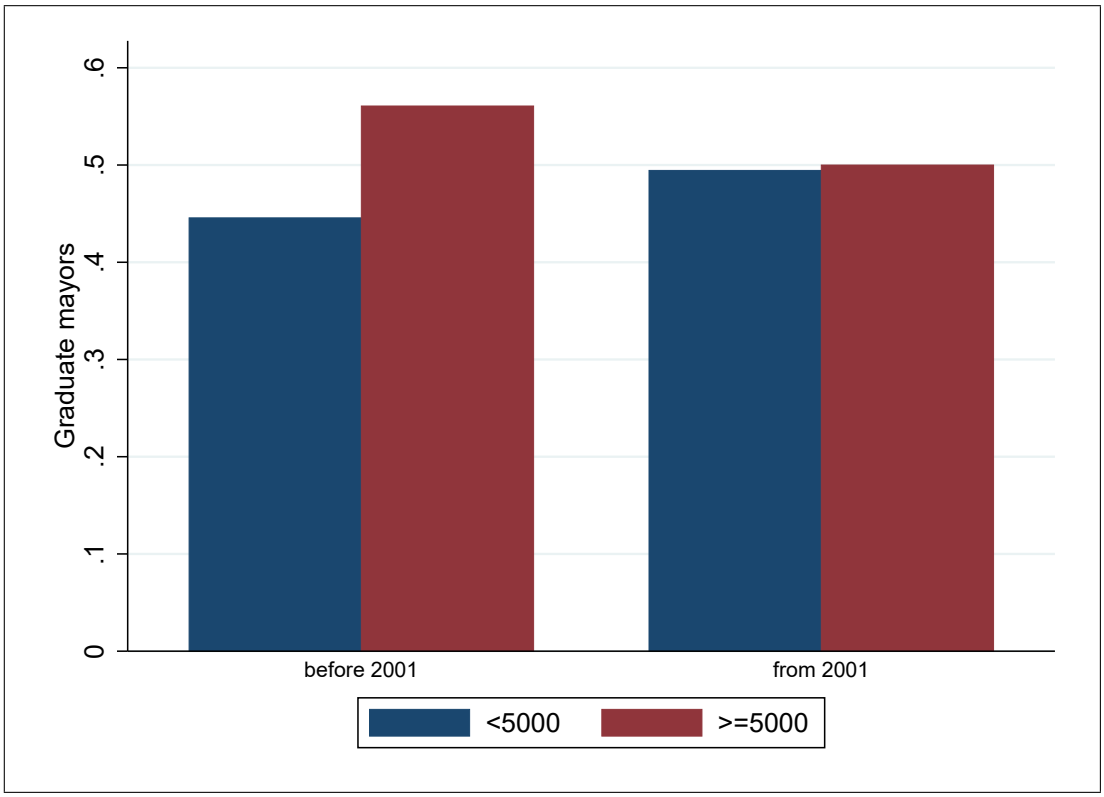
Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in columns 2 and 4: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 ***.

Figure 1: Share of graduate mayoral candidates



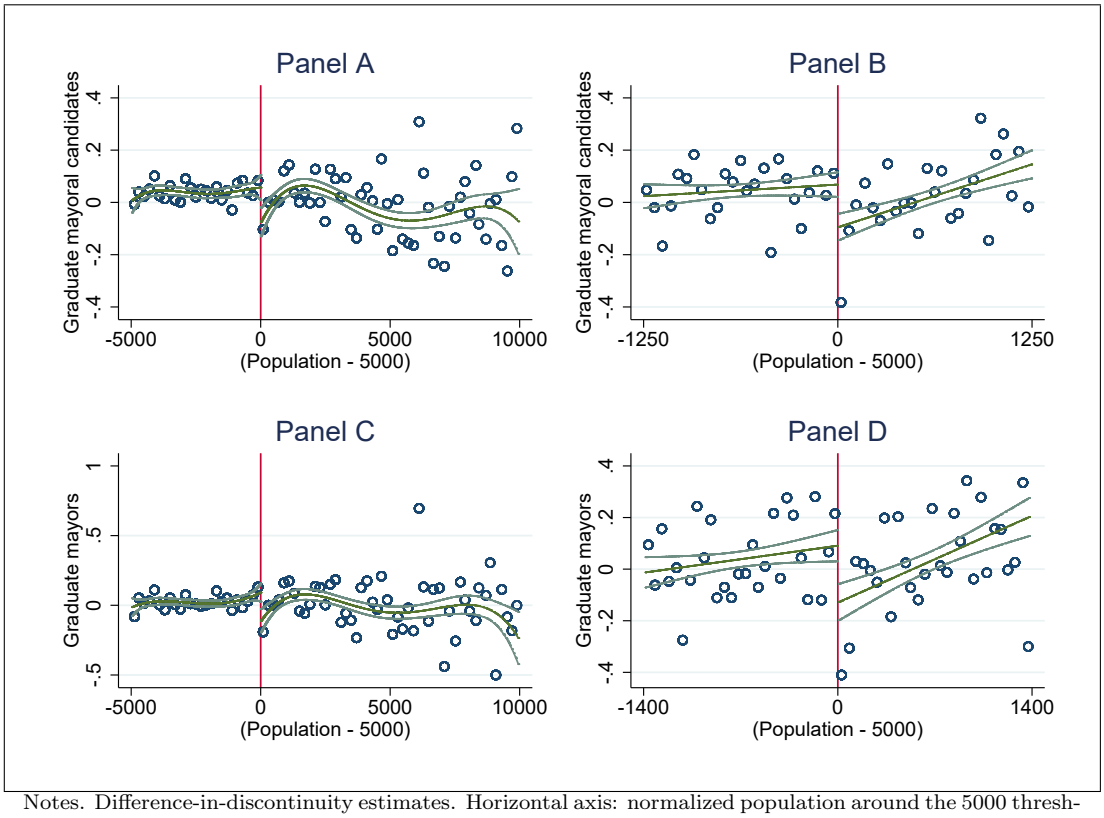
Notes. Municipalities between 4750 and 5250 inhabitants. Electoral years 1993-2012.

Figure 2: Share of graduate mayors



Notes. Municipalities between 4750 and 5250 inhabitants. Electoral years 1993-2012.

Figure 3: The Effect of Fiscal Rules on the selection of politicians, difference-in-discontinuity



Notes. Difference-in-discontinuity estimates. Horizontal axis: normalized population around the 5000 threshold. Vertical axis: difference in the dependent variable of all post-reform elections (i.e. elections starting from 2001) with all the pre-reform elections (i.e. election before 2001). Scatter points are averaged over bins of 200 inhabitants in Panels A and C and 50 inhabitants in Panels B and D. In Panels A and C, 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. In Panel B and D, the central green line represents a linear function 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. Top graphs: Difference-in-discontinuity estimates for the share of graduate mayoral candidates. Bottom graphs: Difference-in-discontinuity estimates for graduate mayors.

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 numer of ministers that can be appointed in the municipal government; Size Council = numer 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
Politicians characteristics					
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
Municipal characteristics					
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)
Panel A: Characteristics municipal population								
Dependent variables	% university degree	% 15-64	% 65+	(log) income per capita	# firms	no-profit ass	area	population density
(Post)*(> 5000)	0.001	-0.007	0.005	0.084	0.004	0.672	-1.502	-52.144
	(0.003)	(0.006)	(0.010)	(0.063)	(0.005)	(1.614)	(5.547)	(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
Panel B: Geographical characteristics municipalities and deficit								
Dependent variables	NE	NW	CEN	SOU	deficit			
(Post)*(> 5000)	0.045	-0.023	0.064	-0.095	-0.010**			
	(0.080)	(0.093)	(0.055)	(0.089)	(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)
Mayoral candidates with university degree			
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	Yes	Yes	Yes
(> 5000)	0.066*	0.104*	0.079**
	(0.037)	(0.054)	(0.040)
(Post)*(> 5000)	-0.100**	-0.151**	-0.118**
	(0.046)	(0.068)	(0.049)
Observations	3,874	1,886	8,533
Bandwidth	1255	627.3	2509

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)
	Mayors with university degree		
Control Function	Linear	Linear	Quadratic
Bandwidth	h	h/2	2h
Controls	Yes	Yes	Yes
(> 5000)	0.064	0.122	0.047
	(0.056)	(0.078)	(0.059)
(Post)*(> 5000)	-0.182***	-0.260***	-0.154**
	(0.070)	(0.099)	(0.074)
Observations	4,299	2,096	9,909
Bandwidth	1393	696.6	2787

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 introduction fiscal rules and 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)	0.095**	0.076*	0.058	0.040
	(0.047)	(0.043)	(0.063)	(0.061)
(Post)	0.014		0.083	
	(0.035)		(0.051)	
(Post)*(> 5000)	-0.112**	-0.110**	-0.159**	-0.158**
	(0.054)	(0.049)	(0.077)	(0.073)
(Introduction)	-0.081**		-0.053	
	(0.039)		(0.048)	
(Introduction)*(> 5000)	-0.037	-0.035	0.082	0.073
	(0.060)	(0.058)	(0.075)	(0.073)
Observations	3,874	3,874	4,299	4,299
Bandwidth	1255	1255	1393	1393

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) (Introduction) = 1 for electoral terms starting from 1999; 5) (Introduction)*(> 5000) = interaction term between (> 5000) and (Introduction). 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: Falsification test: control 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)	0.095**	0.085**	0.058	0.040
	(0.047)	(0.043)	(0.063)	(0.061)
(Introduction)	-0.081**		-0.053	
	(0.039)		(0.048)	
(Introduction)*(> 5000)	-0.037	-0.037	0.082	0.079
	(0.060)	(0.058)	(0.075)	(0.073)
Observations	1,804	1,804	2,007	2,007
Bandwidth	1255	1255	1393	1393

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. Variables in the Table: 1) (> 5000) = 1 for municipalities with more than 5000 inhabitants; 2) (Introduction) = 1 for electoral terms starting from 1999; 3) (Introduction)*(> 5000) = interaction term between (> 5000) and (Introduction). 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 A9: The role of past deficit
Adding control variables

	(1)	(2)
Control Function	Linear	Linear
Bandwidth	h	h
Controls	No	No
Dependent variable	Share mayoral candidates with university degre	=1 for Mayors with university degree
(Post)*(> 5000)	-0.202***	-0.307***
(Deficit < mean)	(0.063)	(0.094)
(Post)*(> 5000)	0.017	-0.038
(Deficit > mean)	(0.068)	(0.107)
Difference	0.219**	0.268*
	(0.094)	(0.143)
Observations	3,874	4,299
Bandwidth	1255	1393

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 < mean)* = municipalities with a level of past deficit below the mean; 2) *(Deficit > mean)* = municipalities with a level of past deficit above the mean. 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) Difference = difference between coefficients of (Post)*(> 5000) across municipalities with past deficit below the mean and municipalities with past deficit above the mean. The outcome variable is the share of mayoral candidates with a university degree in column 1 and it is = 1 for mayors with a university degree in column 2. 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 A10: 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)	0.087**	0.068*	0.086	0.065
	(0.041)	(0.037)	(0.058)	(0.056)
(Post)	0.037		0.102**	
	(0.034)		(0.049)	
(Post)*(> 5000)	-0.095*	-0.093**	-0.199***	-0.194***
	(0.051)	(0.047)	(0.074)	(0.071)
Observations	3,689	3,689	4,093	4,093
Bandwidth	1255	1255	1393	1393

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 A11: 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
Panel A: mayoral candidates				
(Post)*(> 5000)	-0.127**	2.081**	0.001	
	(0.057)	(0.880)	(0.032)	
Observations	2624	4453	3423	
Bandwdith	857.5	1455	1112	
Panel B: mayors				
(Post)*(> 5000)	-0.147*	2.785*	0.051	-0.908
	(0.077)	(1.601)	(0.045)	(0.887)
Observations	2945	3260	3717	3547
Bandwdith	957.1	1054	1208	1149

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 politicial 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 A12: 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***	0.173***	0.140***	0.144***
	(0.010)	(0.011)	(0.014)	(0.015)
(Post)	0.037***	0.024***	0.025***	0.009
	(0.005)	(0.006)	(0.007)	(0.008)
(Post)*(> 5000)	-0.022**	-0.037***	-0.000	-0.004
	(0.010)	(0.011)	(0.016)	(0.017)
(Introduction)		-0.035***		-0.041***
		(0.006)		(0.008)
(Introduction)*(> 5000)		-0.060***		-0.026
		(0.014)		(0.020)
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) (Introduction) = 1 for electoral terms between 1999 and 2000; 5) (Introduction)*(> 5000) = interaction term between (> 5000) and (Introduction). 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 ***.

Table A13: Balance test on municipal covariates
RDD, below 5000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Characteristics municipal population								
Dependent variables	% university degree	% 15-64	% 65+	(log) income per capita	# firms	no-profit ass	area	population density
Graduate	-0.003	0.010	-0.010	-0.043	0.004	-1.340	2.090	-130.602
	(0.004)	(0.008)	(0.010)	(0.070)	(0.005)	(2.009)	(8.977)	(84.397)
Observations	296	251	259	292	305	245	272	243
Bandwidth	16.10	12.95	13.40	15.77	16.78	12.63	14.47	12.46
Panel B: Geographical characteristics municipalities								
Dependent variables	NE	NW	CEN	SOU				
Graduate	0.124	0.035	-0.076	-0.021				
	(0.095)	(0.109)	(0.097)	(0.099)				
Observations	292	272	303	334				
Bandwidth	15.82	14.51	16.66	18.84				

Notes. RDD estimates of the impact of fiscal rules on municipal covariates. Municipalities between 3745-5000 inhabitants. Electoral years between 2001 and 2012. Treatment variable in the Table: Graduate = 1 for mayors with a university degree. Year of election fixed effects included in all columns. Municipal dependent variables in Panel A: 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. In Panel B, the dependent variables are geographical dummy variables for different areas of Italy (i.e. North-West, North-East, Centre, South). 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 A14: Balance test on municipal covariates
RDD, above 5000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Characteristics municipal population								
Dependent variables	% university degree	% 15-64	% 65+	(log) income per capita	# firms	no-profit ass	area	population density
Graduate	-0.004	-0.004	0.013	0.031	-0.009	-5.178	-6.040	-8.123
	(0.005)	(0.008)	(0.012)	(0.109)	(0.007)	(3.441)	(12.816)	(92.691)
Observations	191	207	176	147	173	140	133	206
Bandwidth	13.52	15.31	11.66	9.691	11.44	9.243	8.795	15.28
Panel B: Geographical characteristics municipalities								
Dependent variables	NE	NW	CEN	SOU				
Graduate	-0.004	-0.022	0.098	-0.051				
	(0.107)	(0.148)	(0.107)	(0.181)				
Observations	173	191	179	134				
Bandwidth	11.41	13.48	11.90	8.936				

Notes. RDD estimates of the impact of fiscal rules on municipal covariates. Municipalities between 5000-6255 inhabitants. Electoral years between 2001 and 2012. Treatment variable in the Table: Graduate = 1 for mayors with a university degree. Year of election fixed effects included in all columns. Municipal dependent variables in Panel A: 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. In Panel B, the dependent variables are geographical dummy variables for different areas of Italy (i.e. North-West, North-East, Centre, South). 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 A15: Balance test on mayoral covariates
RDD

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: municipalities below 5000								
Dependent variables	female	age	pol experience	high skill	unemployed	independent	left	right
Graduate	0.108	-2.771	-5.295***	0.355***	-0.099	0.095	-0.082	-0.014
	(0.074)	(2.271)	(1.911)	(0.100)	(0.069)	(0.106)	(0.068)	(0.090)
Observations	325	281	302	264	318	243	242	259
Bandwidth	18.50	14.97	16.54	13.81	18.13	12.49	12.43	13.40
Panel B: municipalities above 5000								
Dependent variables	female	age	pol experience	high skill	unemployed	independent	left	right
Graduate	0.072	0.043	-5.536***	0.370***	-0.008	0.152	-0.081	-0.018
	(0.089)	(2.989)	(1.848)	(0.121)	(0.096)	(0.127)	(0.097)	(0.093)
Observations	178	190	204	182	191	148	150	187
Bandwidth	11.80	13.23	14.64	12.15	13.48	9.835	10.10	12.76

Notes. RDD estimates of the impact of fiscal rules on mayoral covariates. Municipalities between 3745-6255 inhabitants. Electoral years between 2001 and 2012. Treatment variable in the Table: Graduate = 1 for mayors with a university degree. Year of election fixed effects included in all columns. Mayoral dependent variables: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) high skills job = 1 if mayor worked in a high skills occupation in the past; 5) unemployed = 1 if mayor is unemployed; 6) independent = 1 if mayor is not affiliated to national political parties; 7) Left = 1 for mayors affiliated to left-wing national parties; 8) Right = 1 for mayors affilated to righ-wing national parties.

Table A16: The effect of graduate mayors on fiscal policies
Placebo test on past dependent variables

	(1)	(2)	(3)
Control Function	Linear	Linear	Linear
Bandwidth	h	h	h
Covariates	Yes	Yes	Yes
Panel A: municipalities below 5000			
Dependent variables	Deficit	Log Revenues	Log Expenditures
Graduate	-0.003	-0.113	-0.132
	(0.007)	(0.086)	(0.093)
Observations	225	252	228
Bandwidth	11.32	13.17	11.42
Panel B: municipalities above 5000			
Dependent variables	Deficit	Log Revenues	Log Expenditures
Graduate	-0.011	0.057	0.050
	(0.010)	(0.097)	(0.086)
Observations	143	178	200
Bandwidth	9.486	11.82	14.23

Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Dependent variables from previous term: 1) in column 1, average deficit as a fraction of total revenues; 2) in column, log of total revenues per capita; 3) in column 3, log of total expenditures per capita. Year of election and Region fixed effects included in all columns. Mayoral covariates included in all columns: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 A17: The effect of graduate mayors on income growth
Placebo test on past dependent variables

	(1)	(2)
Control Function	Linear	Linear
Bandwidth	h	h
Covariates	Yes	Yes
Dependent variable: income growth from previous term		
Graduate	0.004	0.030
	(0.016)	(0.032)
Observations	152	117
Bandwidth	13.09	14.19

Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. The dependent variable is income growth measured in the previous term. Year of election and Region fixed effects included in all columns. Mayoral covariates included in all columns: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 A18: The effect of graduate mayors on fiscal policies
Different bandwidths

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	No	Yes	No	Yes
Municipalities	Below 5000		Above 5000	
Panel A: Average deficit as a fraction of total revenues				
Graduate	0.024***	0.032***	-0.006	-0.009
	(0.008)	(0.010)	(0.007)	(0.009)
Observations	233	233	208	208
Bandwidth	11.90	11.90	15.72	15.72
Panel B: Log of total revenues per capita				
Graduate	-0.287**	-0.291***	-0.074	0.061
	(0.110)	(0.096)	(0.110)	(0.089)
Observations	215	215	153	153
Bandwidth	10.59	10.59	10.30	10.30
Panel C: Log of total expenditures per capita				
Graduate	-0.314***	-0.266***	-0.084	0.054
	(0.105)	(0.088)	(0.111)	(0.095)
Observations	229	229	152	152
Bandwidth	11.50	11.50	10.24	10.24

Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in columns 2 and 4: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 A19: The effect of graduate mayors on fiscal policies
In year 2000

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	No	Yes	No	Yes
Municipalities	Below 5000		Above 5000	
Panel A: Average deficit as a fraction of total revenues				
Graduate	-0.011	-0.011	0.011	0.000
	(0.016)	(0.020)	(0.021)	(0.033)
Observations	107	107	59	59
Bandwidth	14.79	14.79	10.03	10.03
Panel B: Log of total revenues per capita				
Graduate	-0.011	0.165	-0.212	-0.056
	(0.143)	(0.130)	(0.156)	(0.236)
Observations	107	107	59	59
Bandwidth	14.79	14.79	10.03	10.03
Panel C: Log of total expenditures per capita				
Graduate	-0.021	0.154	-0.201	-0.055
	(0.143)	(0.130)	(0.154)	(0.232)
Observations	107	107	59	59
Bandwidth	14.79	14.79	10.03	10.03

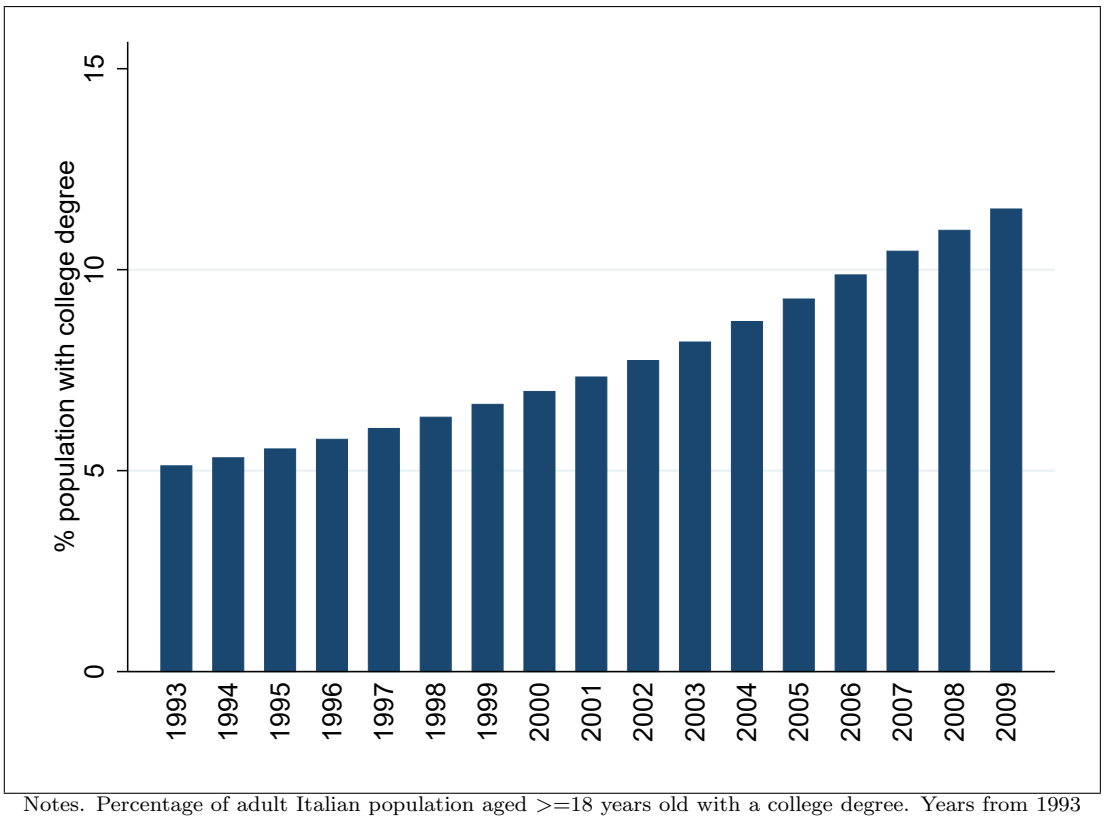
Notes. Municipalities between 3745-6255 inhabitants. Year 2000. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in columns 2 and 4: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 A20: The effect of graduate mayors on corruption

	(1)	(2)	(3)	(4)
Control Function	Linear	Linear	Linear	Linear
Bandwidth	h	h	h	h
Covariates	No	Yes	No	Yes
Municipalities	Below 5000		Above 5000	
Dependent variable = 1 if mayor corrupt				
Graduate	-0.090	-0.019	-0.295*	-0.196
	(0.108)	(0.110)	(0.165)	(0.196)
Observations	292	292	158	158
Bandwidth	15.82	15.82	10.51	10.51

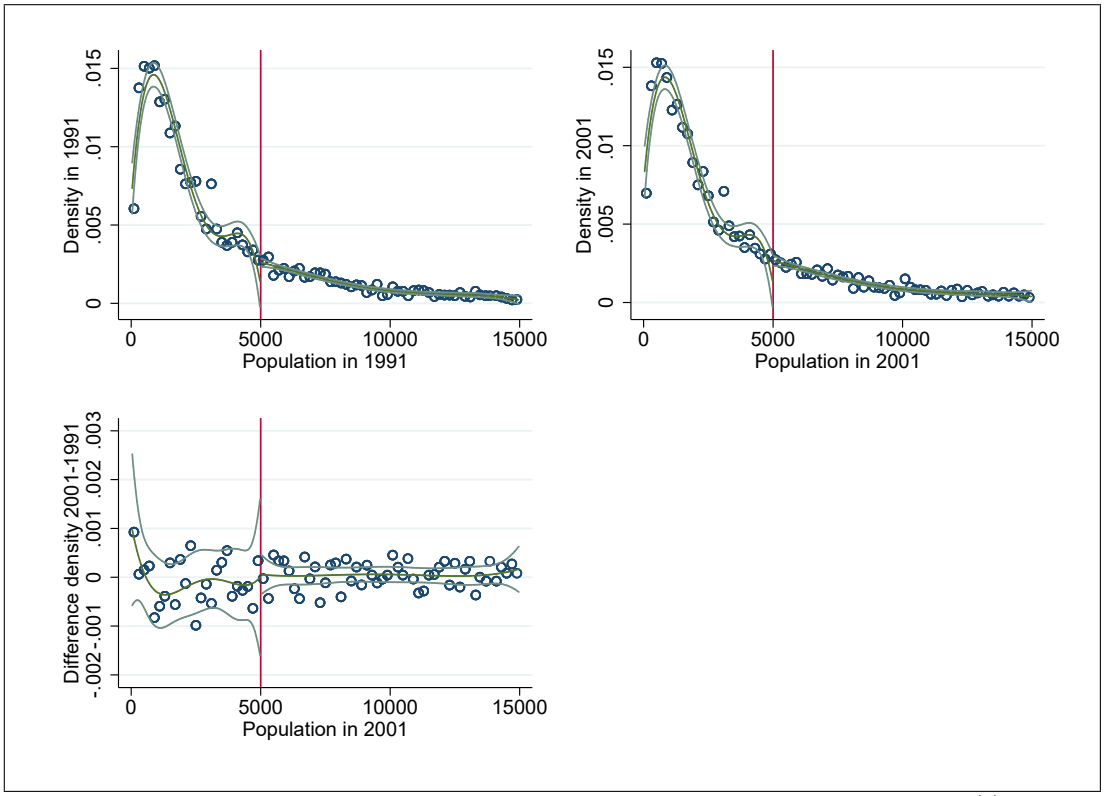
Notes. Municipalities between 3745-6255 inhabitants. Electoral terms between 2001 and 2012. Treatment variable: Graduate is a dummy variable =1 when the mayor has a university degree, 0 otherwise. Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) and Calonico, Cattaneo and Farrell (2018) MSE-optimal bandwidth h selector. Year of election and Region fixed effects included in all columns. Mayoral covariates included in columns 2 and 4: 1) female = 1 if mayor is a woman; 2) age = age of the mayor at the beginning of the term; 3) political experience = years of past political experience of the mayor at any level of politics; 4) independent = 1 if mayor is not affiliated to national political parties; 5) high skills job = 1 if mayor worked in a high skills occupation in the past; 7) unemployed = 1 if mayor is unemployed. Municipal covariates 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 ***.

Figure A1: Percentage Italian population with a college degree



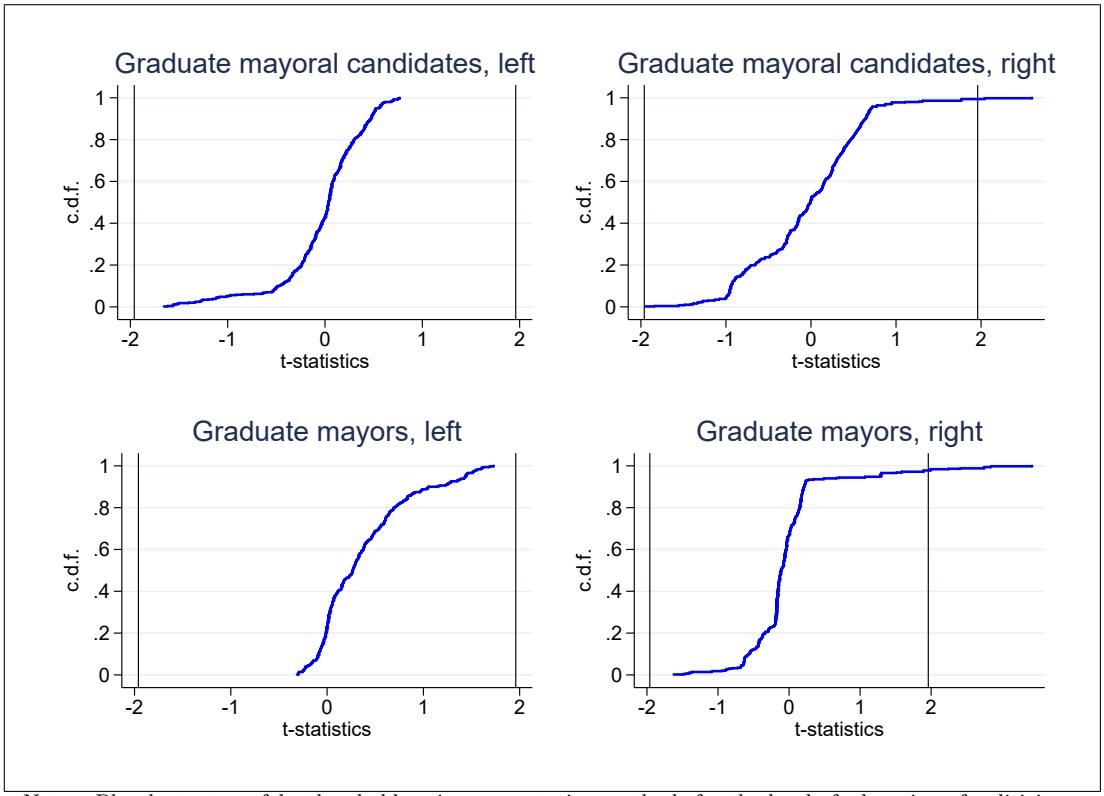
Notes. Percentage of adult Italian population aged >=18 years old with a college degree. Years from 1993 to 2009. Source: Italian Statistical Office (Istat).

Figure A2: Density test on the running variable



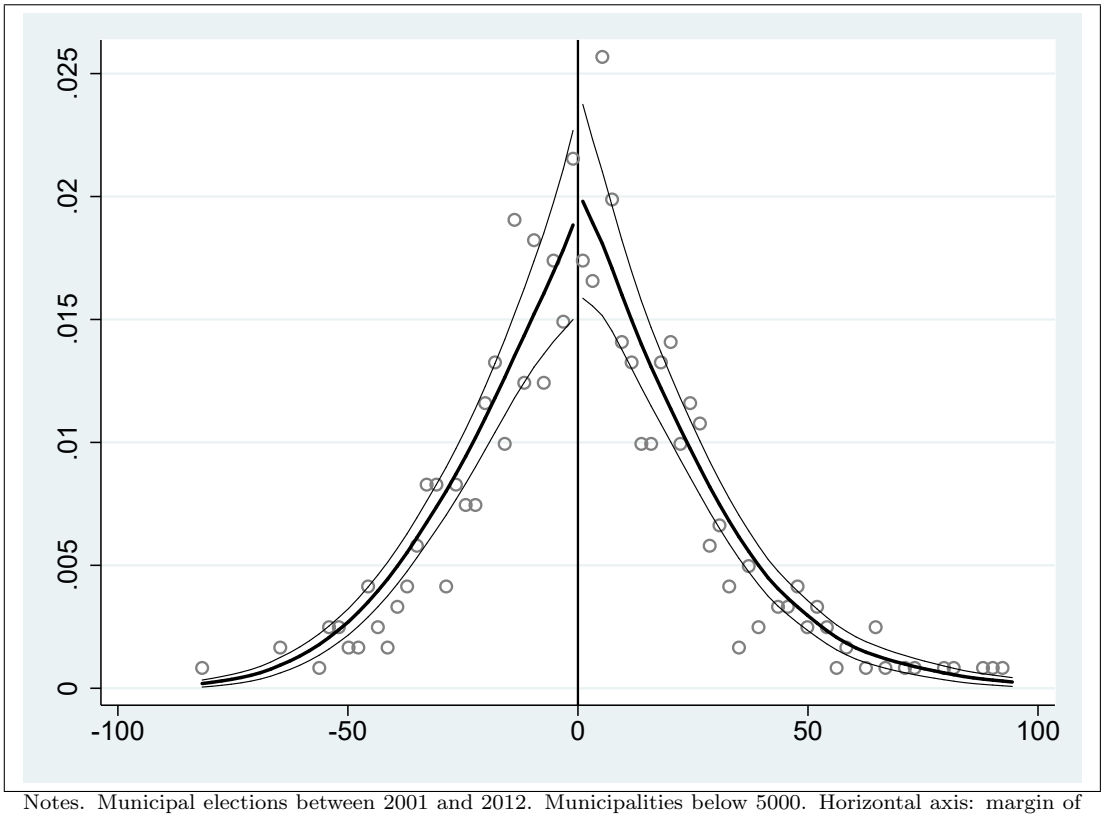
Notes. Discontinuity test for the density of the population at the 5000 thresold. Top graphs: (1) density test for the population as measured by the 1991 Census; (2) density test for the population as measured by the 2001 Census. Bottom graph: (1) discontinuity test for the difference between the density 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



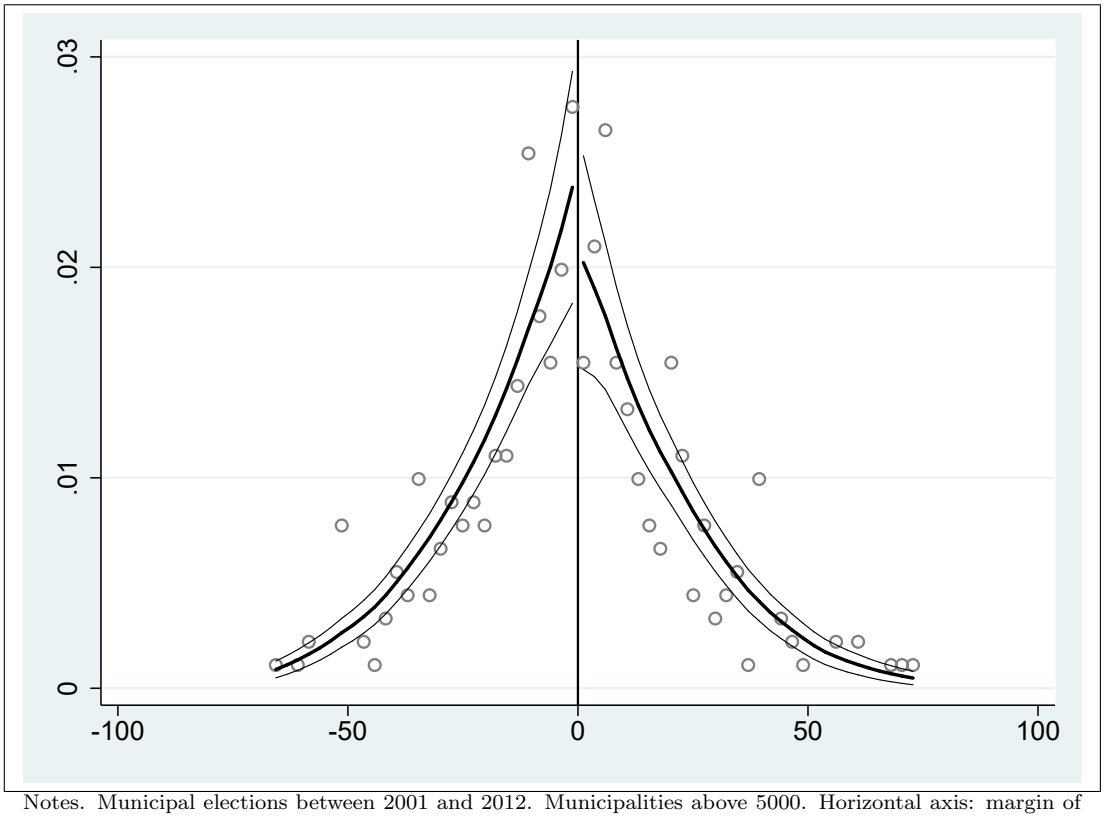
Notes. Placebo tests at fake thresholds using permutation methods for the level of education of politicians. The figure reports the c.d.f. of the t-statistics of a set of diff-in-disc regressions at 500 fake thresholds below and 500 fake thresholds above the 5000 threshold (i.e. thresholds from 4900 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).

Figure A4: McCrary (2008) test on the margin of victory
Municipalities below 5,000



Notes. Municipal elections between 2001 and 2012. Municipalities below 5000. Horizontal axis: margin of victory MV_{it} of a candidates with a college degree vs. a candidate without a college degree. Vertical axis: density of the margin of victory MV_{it}. $MV_{it} > 0$ when the winning candidate has a college degree, $MV_{it} < 0$ when the winning does not have a college degree.

Figure A5: McCrary (2008) test on the margin of victory
Municipalities above 5,000



Notes. Municipal elections between 2001 and 2012. Municipalities above 5000. Horizontal axis: margin of victory MV_{it} of a candidates with a college degree vs. a candidate without a college degree. Vertical axis: density of the margin of victory MV_{it}. $MV_{it} > 0$ when the winning candidate has a college degree, $MV_{it} < 0$ when the winning does not have a college degree.