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## Runoff vs. plurality: Does it matter for expenditures? : Evidence from Italy

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*Runoff vs. Plurality: Does It Matter for  
Expenditures?  
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RUNOFF VS. PLURALITY: DOES IT MATTER FOR EXPENDITURES?  
EVIDENCE FROM ITALY

DAVIDE CIPULLO

# Runoff vs. Plurality: Does It Matter for Expenditures? Evidence from Italy\*

Davide Cipullo<sup>†</sup>

This version: October 11, 2018

## Abstract

This paper compares the runoff system and the plurality rule in terms of the size and composition of public expenditures. I use the change in the voting rule in Italian municipalities at 15,000 residents to implement a regression discontinuity design. The results show that municipalities under the runoff system spend at least 20 percent more than those under the plurality rule, and that this effect is primarily driven by a large increase in administrative spending. Additionally, the greater number of candidates and the larger coalitions indicate lower accountability under the runoff system than under the plurality rule.

**JEL Classification:** D72; E02; H39; H5

**Keywords:** Voting rules, Fiscal policy, Runoff, Plurality, Regression discontinuity design

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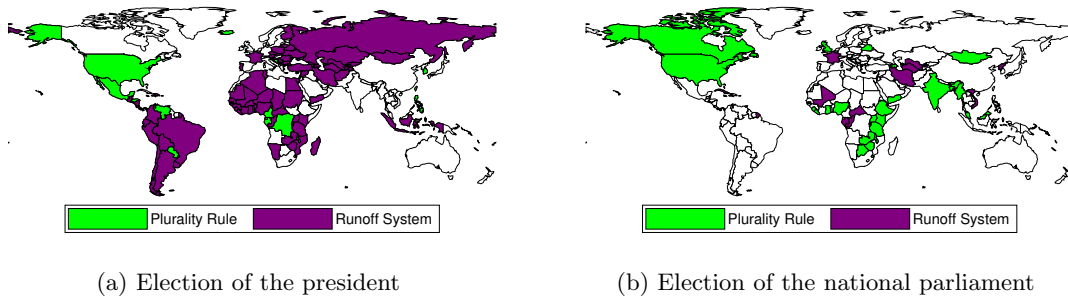
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# 1 Introduction

Democratic societies desire electoral rules to have two main qualities: accountability and representativeness. Accountability refers to the ease with which voters recognize who is in charge of the political power, which, in turn, affects voters' ability to control and eventually punish bad behavior. The more accountable an incumbent politician is, the more she is forced to implement policies preferred by voters and not by herself. Representativeness refers to the capability of accurately depicting voters' preferences in elective offices and encouraging the participation of small parties and their voters in the political process. In systems with high representativeness, a larger vote share is required to win; thus encouraging large governing coalitions that reflect the preferences of many voters, instead of only the decisive ones. [Persson and Tabellini \(2003\)](#) clarify the de facto existence of a trade-off between the two properties, as features of voting rules that enhance accountability often turn out to reduce representativeness and vice-versa, and they highlight how different voting systems may lead to different economic policies due to being more prone to accountability or to representativeness.

In this paper, I investigate whether different economic policies are implemented under the runoff (or dual ballot) system compared to the single-ballot plurality rule, applying a quasi-experimental approach to overcome the causality concerns of cross-country comparisons highlighted by [Acemoglu \(2005\)](#). More specifically, I explore how having the runoff system compared to the single-ballot rule affects the size of the government and the composition of spending. I do so in a setting of Italian municipalities, where mayors are elected according to voting rules assigned based on the number of residents. Municipalities below 15,000 inhabitants vote under a single-ballot plurality rule, whereas those above are assigned to the runoff system. Hence, the institutional framework represents an ideal situation for applying a sharp regression discontinuity (RD) design. The RD design has earlier been implemented using this source of variation (see e.g. [Bordignon et al. \(2016\)](#)) to address other research questions.

Both the plurality rule and the runoff system belong to the "majoritarian family", but the two systems are based on different electoral formulas. Under the plurality, the candidate who receives the largest vote share is announced as the winner. Under the runoff system, if none of the candidates surpasses a predetermined share of the votes, the top two vote recipients compete again in a second round, typically occurring a couple weeks later, to determine the winner. According to the Institute for Democracy and Electoral Assistance (IDEA), the runoff system is in place in 87 presidential democracies to select the head of state and in 17 countries to vote for the national legislative body; in contrast, the plurality rule is used to elect the president in 21 democracies,



Notes: Panel a shows, among presidential democracies, those that are assigned to the runoff system and those that are assigned to the plurality rule. Panel b shows the countries in which the runoff system or the plurality rule is used to elect members of the national parliament. Source: Author's elaboration on IDEA Electoral System Design Database (2018) and on Natural Earth geodata.

Figure 1: Runoff and plurality around the world

while 47 countries use it to elect the parliament. In the literature, the runoff system and the plurality rule have been broadly compared in terms of political outcomes such as the number of candidates and turnout, though there are several gaps in the literature in terms of their economic effects. Using the variation in the voting rule that the institutional framework generates in Italian towns, [Bordignon et al. \(2016\)](#) estimate a lower probability for the extreme-leftist party to join the center-left coalition during the first round and less variability in local taxation rates in the presence of the runoff system compared to municipalities subject to the plurality rule; in Brazilian towns, [Chamon et al. \(2018\)](#) find that the runoff is associated with more investments and lower current expenditure. [Bordignon et al. \(2016\)](#) also analyze the effects of the runoff on political variables. Their results show that in municipalities under the runoff the far-left party is less likely to form a coalition with moderate parties and that the number of mayoral candidates is larger compared to municipalities under the plurality.<sup>1</sup>

I find that the runoff system causes an increase in municipal expenditures of more than 20 percent, compared to the plurality rule. This effect is foremost driven by an increase in expenditure on administration and services, representing, on the one hand, broader spending and, on the other hand, spending that is the most related to the efficiency of the bureaucratic structure and political agents. In contrast, I do not find evidence of increases in more narrow expenditures such as culture and education, economic sectors and welfare.

<sup>1</sup>[Barone and De Blasio \(2013\)](#) find a moderate increase in turnout as well as older and better educated politicians under the runoff system, although their findings are not robust to different specifications; [Ferraresi et al. \(2015\)](#) find that when a municipality crosses the population threshold, current expenditure and per capita taxes are lower if the mayor does not need a broad coalition of parties in her support. Similar results are also obtained by [Bracco and Brugnoli \(2012\)](#), who additionally find that municipalities subject to a change in their voting system from the plurality rule to the runoff system are favored by upper-tier levels of government. In Section 4, I discuss how my empirical strategy relates to that in [Bordignon et al. \(2016\)](#) and to those in less recent research papers, highlighting my methodological contributions compared to theirs.

Electoral rules affect the economy through their impact on how individual preferences are transformed into policy decisions. Specifically, they regulate both the relationship between politicians and voters and that between different groups of voters, assigning different levels of decision power to different agents in the economy. The requirement to win a minimum share of votes under the runoff system can be expected to affect the accountability/representativeness trade-off, as it can lead to (1) larger coalitions; (2) more incentives for pork-barreling behavior; and (3) more candidates running for office during the first round. Specifically, these three forces might hold politicians less accountable since they need to seek a larger consensus among voters and parties. [Persson and Tabellini \(2003\)](#) and [Persson et al. \(2007\)](#) find, when comparing different electoral systems, that a decrease in accountability is associated with an increase in broad expenditures, at the expense of expenditures targeted to specific groups of voters.

Investigating the mechanisms, I find support for the argument that the lower accountability under the runoff system compared to the plurality rule plays a prominent role in determining the differences in fiscal policy. An alternative argument (see [Chamon et al. \(2018\)](#)), according to which more candidates would increase political competition and, thus, accountability, is not supported by the data. Specifically, coalitions are larger, and more parties are admitted to the municipal council under the runoff system compared to the plurality rule; however, neither the vote shares of the two first recipients nor turnout differs in the two groups. Moreover, political budget cycles are more pronounced under the runoff system than under the plurality rule, with a larger effect of the voting rule during election years, and the change in fiscal policy is larger for municipalities that are not financially constrained. The higher spending under the runoff system is compensated by an equal increase in revenues but not from taxation. These additional results confirm that the requirement to win a minimum share under the runoff impacts the fiscal policy through the incentives for politicians to seek for a broader support among voters and parties.

My results contribute to the existing literature that investigates how voting rules shape the size and the composition of the government by providing causal evidence within an area that, to date, has mostly focused on the comparison between other rules or outcomes, prevalently with a cross-country correlation approach. Italian municipalities are ideal for filling this gap because of an institutional setup that generates a natural experiment, the relatively large number of them (> 8,000) and the availability of high-quality and uniform balance sheet data from official sources.

The rest of the paper is organized as follows: in Section 2, I discuss how political differences between the runoff system and the plurality rule may affect spending and relate these differences to previous evidence on the link between voting rules and economic policy; in Section 3, I outline some details concerning the Italian institutional and political system. In Section 4, I describe

the empirical strategy and the data used; in Section 5, I provide some robustness checks, and I discuss the findings of this paper in relation to the previous literature and examine the potential mechanisms driving the results. In Section 6, I summarize what we learn from this analysis.

## 2 Hypothesis

Persson and Tabellini (2003) investigate the link between fiscal policy decisions and the accountability/representativeness trade-off by comparing countries under the proportional representation (PR) system, which favors representativeness, and countries subject to majoritarian systems, which favor politician accountability. Their results show that countries subject to PR rules have a larger public sector than those under majoritarian systems and that expenditures under the PR system are broader than in countries under majoritarian rules, in the sense that they are more likely to target society as a whole instead of narrow groups of voters.

A theoretical argument in support of these findings is that a larger and broader consensus among voters and parties is required for a candidate to win the electoral competition under the PR system than under majoritarian systems. Specifically, more heterogeneous governments in terms of represented interest groups or parties are supposed to generate a more expansive economic policy through two complementary channels. First, incumbent governments have strong incentives to seek support from more voters, by adjusting the fiscal policy for electoral purposes. Second, large coalitions increase representativeness, as the government represents a larger share of voters but does so at the expense of accountability because of the space for incumbent politicians to blame partners for eventual failures (Bawn and Rosenbluth, 2006) and because of inefficiencies due to within-coalition bargaining and competition (Persson et al., 2007).

Compared to the PR system, all majoritarian systems hold politicians accountable, as they are characterized by the winner-take-all principle and small districts; however, the level of accountability may differ, depending on whether the runoff system or the plurality rule is in place. The unique but crucial difference between the plurality rule and the runoff system is in the electoral formula. Specifically, the two-stage nature of the electoral competition under the runoff system affects both the entry decision and candidates' objective. The necessary condition for victory under the runoff system is to be one of the top two vote recipients in the first round and to eventually face a candidate with smaller support in the second round. During the first round, the focus is on share maximization to be admitted to the second round or the exclusion of less preferred opponents from it. During the second round, the number of competitors is fixed to two, and hence, the remaining candidates must attract the median voter or the endorsement of excluded candidates to win the



seat. In contrast, under the plurality rule, the winning candidate may not need the support of the median voter, as the requirement is to collect one vote more than all other candidates in a one-shot competition.

Therefore, the runoff system arguably increases representativeness compared to the plurality rule because of the larger support required to win the election, but this increase comes at the cost of higher incentives for pork-barreling behavior and a lack of accountability due to the predominance of coalition governments. Combined with the results from [Persson and Tabellini \(2003\)](#), who find an association between systems' encouraging representativeness at the cost of a reduction in accountability and larger public sectors and broader expenditures, I expect to find that the runoff system causes higher levels of public expenditures and less targeted spending than does the plurality rule.

## 3 Institutional Details

### 3.1 Municipalities

The Italian territory is divided into three within-country administrative levels (from the top to the bottom: 20 *Regions*, of which 5 have a special autonomy guaranteed by the constitution; 110 *Provinces* and approximately 8,100 *Municipalities*) with a high degree of financial autonomy and several competencies delegated from the central government. The number of municipalities is high in relation to the national population and the total surface, and there is a predominance of small towns (70.5percent have less than 5,000 residents). In all municipalities, the political authority is shared between the mayor (*Sindaco*), elected by the citizens every fifth year, and the executive board (*Giunta Comunale*), appointed and presided over by the elected mayor and the municipal council (*Consiglio Comunale*). Municipalities are assigned to several policies according to their official population, computed every ten years on the occasion of national censuses by the Italian Statistics Bureau (ISTAT) (see [Table B.1](#)).

Since 1990, the central government has recognized the autonomy of municipalities in determining local tax rates and the level of expenditure, although municipalities with more than 5,000 residents (as well as provinces, regions, and other public authorities) must avoid significant budget imbalances and limit their debt ([Law 448/1998](#)). This rule is known as the *Domestic Stability Pact* (DSP), as its aim is to make local administrations responsible for the achievement of the budget goals that the Stability and Growth Pact requires to EU members. The DSP was first introduced in 1999 and has subsequently been slightly modified by parliament.

Municipalities are responsible for education (up to the first cycle of the secondary level), culture

and tourism, housing and welfare subsidies, economic incentives and local police. Environmental policy and local transportation are a municipal competence only in large towns, whereas small towns must co-operate with their neighbors to provide these services. Regions and provinces can delegate further competencies to municipalities, but such delegation must be to all municipalities, regardless of size. The two most relevant taxes that municipalities levy are a real estate tax and a proportional labor income tax. Moreover, they receive a fee from the construction of new buildings in their territory as well as transfers from other public authorities and private agents, and they can also increase revenues by providing services to citizens, commuters and tourists.

National law ([Legislative Decree 267/2000](#)) determines budgetary rules of all local authorities, which have autonomy in deciding local tax rates and the prices of the services that they provide. All authorities must follow a common template established by law for both the budget plan and the balance sheet, and their own accountants must validate financial acts. Once the budget plan is approved, it can be modified at any time (with the exception of the last month of the year) by the municipal council, but extra-budget revenues or expenditures are not allowed. Expenditure items are reported according to the competence to which they refer, whereas revenues are classified in terms of the sources from which they derive.<sup>2</sup>

### 3.2 Voting rules

Since 1993, mayors have been elected using majoritarian rules. The plurality rule applies to municipalities below 15,000 inhabitants, whereas the runoff system applies to those above this threshold ([Law 81/1993](#)). Contextually, members of the municipal council are elected based on competing lists presented by mayoral candidates. Before 2000, legislatures lasted four years, whereas presently, the natural duration is five years, and election days are determined by the national government. Mayors are term-limited after two consecutive terms. If the legislature ends before the natural deadline, then the government nominates an extraordinary commissioner, who remains in office until the first available election day. However, early terminations are uncommon and arise only after a no-confidence vote by the council, the resignation of the mayor or of more than half of the councilors, or if the mayor obtains a prominent political position at a higher level during her time in office.

In municipalities below 15,000 residents, mayors are elected with a single-ballot plurality rule. Each competitor must present a list of candidates for the council in her support, with at most as

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<sup>2</sup>Expenditure items are classified according to the subsequent competences: the administrative bureau, the justice administration, local police, education, culture, sports, tourism, transportation, the environment, welfare, and commerce. Each competence has a value reported as investment expenditure and a value reported as current expenditure. Revenue items are reported according to the subsequent sources: tax revenues, transfers, other current revenues, alienation of land revenues, revenues from new debts, and revenues from the provision of services.

many candidates as the dimension of the council. Choosing one of the mayoral candidates, voters automatically support her associated list for the council. The elected mayor receives a majority premium that guarantees a 60 percent majority in the municipal council for her list, whereas the remaining 40 percent is divided proportionally among the lists supporting defeated candidates who obtained at least 3 percent of valid votes.

In municipalities above 15,000 residents, mayors are elected according to the runoff system. Each candidate is allowed to present one or more lists of candidates for the council, and voters can cast a *disjoint* vote (i.e., to support a mayoral candidate and a list that does not support her). A candidate is elected mayor only if she receives the absolute majority of votes. If no one obtains an absolute majority, then after two weeks, a second round between the two candidates with the most votes occurs, and the winner is elected mayor. Excluded candidates are allowed to endorse one of the remaining contestants before the second round, conditional on her acceptance. The lists supporting the winner share (proportionally to their vote share in the first round) the 60 percent of the seats in the council, whereas the lists supporting defeated candidates who received more than 3 percent of valid votes share proportionally the remaining 40 percent.<sup>3</sup>

As shown in Figure B.1, there are numerous other rules that apply based on population thresholds. However, the closest population thresholds to that assigning the runoff are at 10,000 residents on its left and at 30,000 residents on its right; no other policies change at 15,000 residents (see also [Gagliarducci and Nannicini \(2013\)](#) and [Eggers et al. \(2018\)](#)).<sup>4</sup>

## 4 Empirical Strategy

### 4.1 Setup

A major challenge in credibly estimating the causal effects of political institutions on economic outcomes is that countries select their own institutional framework due to unobservable factors, such as cultural heritage, political experience, history, religion and common wisdom. Hence, any method of estimating the economic effect of institutions that does not completely consider these relations, such as traditional cross-country or within-country approaches, is likely to suffer from biases due to omitted confounders and reverse causality ([Acemoglu, 2005](#)). Therefore, in this paper, I apply a quasi-experimental approach, using the two different voting rules in place in Italian municipalities to select the mayor and the municipal council.

The runoff system is assigned to Italian municipalities solely on the basis of the predetermined

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<sup>3</sup>In the case of endorsement, the 60 percent premium is shared among all lists that supported the winner on the occasion of the second round.

<sup>4</sup>Source: [Legislative Decree 267/2000](#).

threshold of 15,000 residents in the official population, computed every ten years by the ISTAT, and no other policy is assigned based on the same threshold. Hence, the institutional framework is ideal for applying a sharp RD design and for consistently estimating the effect of the runoff system compared to the plurality rule. Indeed, conditional on the distance to 15,000 residents, municipalities close to and below the threshold and municipalities close to and above can be assumed to be equal in all other characteristics; hence, municipalities around the threshold are as good as randomly assigned to one of the voting rules.

I estimate the effect of the runoff system compared to the plurality rule on the size and the composition of public expenditures in Italian municipalities using different polynomial approximations and different bandwidths for local linear regressions. In the polynomial approach, I fit functions from the second to the fourth degree of the assignment variable, considering only municipalities between 10,000 and 20,000 residents to exclude other policy changes that may bias the results (e.g., the wages of the mayor and of the members of the executive board increase at 10,000 residents).<sup>5</sup> The fourth-order polynomial is likely to be affected by the concerns highlighted by [Gelman and Imbens \(2018\)](#), but results using that specification are helpful for understanding the validity of estimates obtained with the more reliable functional forms. For local linear regressions, I use a uniform kernel and three different bandwidth sizes (the [Calonico et al. \(2014\)](#) optimal bandwidth, 1000 and 500 residents) and provide plots with the estimated coefficients and the 95 percent confidence intervals for several other bandwidths between 500 and 3,000 residents.

I estimate the following baseline models:

(i) Spline Polynomial approximation if  $|A_{i,t}| \leq 5000$ :

$$y_{i,t,e} = \sum_{p=0}^{P_{max}} \alpha_p A_i^p + \sum_{p=0}^{P_{max}} \beta_p \mathbb{1}(A_i \geq 0) A_i^p + \mathbf{X}_i \boldsymbol{\Psi} + \delta_t + \theta_e + \epsilon_{i,t,e} \quad (1)$$

where  $P_{max} = \{2, 3, 4\}$  is the highest order of the polynomial function of  $A_i$  considered in each model.

(ii) Local linear regression if  $|A_i| \leq H$ :

$$y_{i,t,e} = \alpha_0 + \alpha_1 A_i + \beta_0 \mathbb{1}(A_i \geq 0) + \beta_1 \mathbb{1}(A_i \geq 0) A_i + \mathbf{X}_i \boldsymbol{\Psi} + \delta_t + \theta_e + \epsilon_{i,t,e} \quad (2)$$

where  $H = CCT$ ,  $H = 1000$ ,  $H = 500$  residents.<sup>6</sup>

<sup>5</sup>See [Eggers et al. \(2018\)](#) for a detailed discussion of *Confounded treatment bias* and [Gagliarducci and Nannicini \(2013\)](#) for an investigation of the effect of the increase in mayors' wage on fiscal policy.

<sup>6</sup>Here and in all tables, CCT stands for the optimal bandwidth calculated using the [Calonico et al. \(2014\)](#) criterion. For comparability, the CCT bandwidth reported in the tables is optimal for the logarithm of the yearly

In all specifications,  $A_i$  is the running variable (*Census population - 15,000*), and  $\mathbb{1}(A_i \geq 0)$  represents the runoff treatment variable. The coefficient of interest, measuring the effect of the runoff system on outcomes compared to the plurality rule, is  $\beta_0$ .  $\delta_t$  and  $\theta_e$  represent the year-specific and the election year-specific intercepts, respectively.  $\mathbf{X}_i$  represents a set of predetermined or time-unvarying municipal characteristics. In all models, standard errors are clustered at the municipality level.

Compared to the other papers in the literature that explore the effects of the runoff system compared to the plurality rule in Italian municipalities, my empirical strategy is very close to that of [Bordignon et al. \(2016\)](#), whereas it substantially differs from that of [Barone and De Blasio \(2013\)](#) and those of [Ferraresi et al. \(2015\)](#) and [Bracco and Brugnoli \(2012\)](#). Specifically, [Barone and De Blasio \(2013\)](#) consider only polynomial approximations using all municipalities, hence obtaining estimates potentially biased by the policy changes in place at other population thresholds, while [Ferraresi et al. \(2015\)](#) and [Bracco and Brugnoli \(2012\)](#) implement a RD with the inclusion of municipality fixed-effects, hence using the variation over time in municipalities that changed voting system between different censuses instead of a cross-section quasi-experimental variation. From an econometric perspective, the two papers exploiting within-municipality variation instead of a cross-section quasi-experimental variation are potentially affected by several sources of bias that may invalidate their results. Specifically, their empirical strategy rests on the strong assumption that a municipality just below the population threshold in the 1991 census is a good comparison for itself if it is assigned to the other voting rule ten years later. Second, one cannot ignore that they use a variation identified for only thirty towns that changed from the plurality rule to the runoff system and for five towns that changed from the runoff system to the plurality rule (see [Bracco and Brugnoli \(2012\)](#)).<sup>7</sup>

## 4.2 Data

I have a panel of 6,707 Italian municipalities from the 15 regions under the “Statuto Ordinario” observed between 2003 and 2012.<sup>8</sup> As noted above, I restrict the sample to municipalities of 10,000 to 20,000 residents (4,368 observations from 543 municipalities), while the further restriction for the local linear regression with a bandwidth  $H = 1,000$  refers to 804 observations from 99 municipalities. The population data are from the 2001 census, which has been used to assign each

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municipal expenditures per capita in a regression including covariates. Outcome-by-outcome [Calonico et al. \(2014\)](#) optimal bandwidths are reported for all other variables in the robustness checks.

<sup>7</sup>For this reason, investigating the mechanisms driving my results, I obtain contrasting evidence for some outcomes compared to [Barone and De Blasio \(2013\)](#), [Ferraresi et al. \(2015\)](#) and [Bracco and Brugnoli \(2012\)](#).

<sup>8</sup>The five regions whose special autonomy is guaranteed by the national constitution (*Friuli-Venezia Giulia; Sardegna; Sicilia; Trentino-Alto Adige* and *Valle d’Aosta*) are excluded because their municipalities follow different voting rules and are subject to different competencies and accounting procedures.

municipality to one of the voting rules for elections held between 2003 and 2012.<sup>9</sup> The balance sheets are from the Statistics Office of the Ministry of Internal Affairs and contain yearly information in 2005 Euro on the sources of revenues and the sectors of expenditure, their aggregate level, and preliminary budgets. The election data are from the Election Database of the Ministry of Internal Affairs. The socio-economic, demographic and geographic characteristics used as covariates are from the Statistical Municipal Atlas provided by the ISTAT and refer to the 1991 and 2001 population censuses, the 1990 agriculture census and the 2002 edition of the Statistics on Tourism.<sup>10</sup>

The prediction of the effect of the runoff system on the size of the government is tested using the natural logarithm of the total yearly municipal expenditure per capita as the outcome. To test the prediction of the composition of public spending, I aggregate different expenditure items in four categories and compare the runoff system and the plurality rule in terms of each of the four (again, in logarithmic terms). Specifically, the first group of jurisdictions concerns the sectors representing the efficiency of the bureaucratic structure of municipalities ("administration and services") and aggregates expenditures on the administrative bureau, the justice bureau and local police, as well as other services provided to all citizens; the second group refers to the commitment of politicians to the quality of life in their town ("culture and education") and aggregates expenditures on cultural activities, sports and education; the third considers expenditure undertaken with the aim of incentivizing economic agents with particular interests ("economy") and aggregates expenditures for incentives in commerce, transportation, tourism and environmental policies; and the fourth macro-area proxies for the attention paid by municipalities to disadvantaged individuals in society ("welfare") and is composed of only the expenditures on that item. Administration and services represent a *broad* area of expenditure, as it does not target any group of voters in particular, and is also related to the bureaucratic structure and potential inefficiencies of the political process. On the other hand, culture and education, the economy, and welfare are *narrow* sectors of expenditure, as they target groups of voters with certain interests or characteristics. The descriptive statistics of all outcomes are reported in Table 1.

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<sup>9</sup>Although the 1991 population census took place prior to the implementation and the beginning of the parliamentary discussion about the voting rules, the McCrary (2008) test estimates a discontinuity at the 15,000 residents' threshold. Hence, in this paper I do not consider elections whose voting system was assigned based on the 1991 census. The results of the McCrary (2008) test relative to the 1991 census are available upon request.

<sup>10</sup>Three groups of controls are included in the regressions: first, macro-region dummies and geographic time-invariant characteristics such as surface, altitude and mountainous surface; second, pre-treatment demographic characteristics: population density, the unemployment share, the retirement share, the share of students and the share of individuals over 65 years old in the population, and the share of employees in touristic activity; and, third, pre-treatment economic characteristics: the surface used for Denomination of Controlled and Guaranteed Origin (DOCG) wine production and the rural surface in 1990 and the touristic supply index in 1996. Touristic supply is measured in terms of the number of beds in accommodations; although computed for the first time in 1996, this measure does not vary much in the short run and is unlikely to be a potential outcome. See B.7 for details.

Table 1: Descriptive Statistics

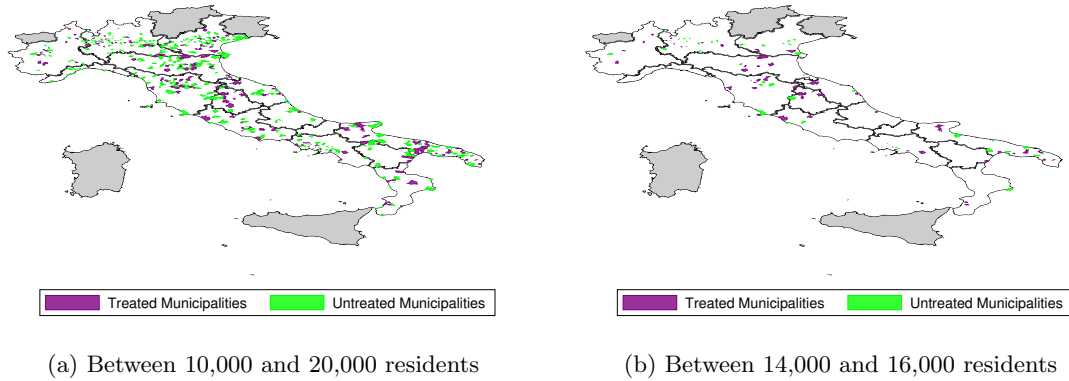
Variable	Mean	St. Dev.	Obs.
Expenditures	1,024	500.7	4,368
Administration and Services	393.4	183.4	4,368
Culture and Education	139.8	74.83	4,368
Economy	204.1	362.5	4,368
Welfare	113.9	64.67	4,368
Revenues	1,019	500.5	4,368
Tax Revenues	383.6	155.0	4,368
No-tax Revenues	736.9	495.1	4,368
Revenues from Transfers	241.6	170.3	4,368
Revenues from Services	91.57	73.14	4,368

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. All variables are expressed in 2005 euros. See Table B.6 for description of variables, their logarithmic transformation and data sources.

### 4.3 Identifying assumptions

The validity of the RD estimator rests on two identifying assumptions. First, conditional on the running variable, all other factors should be continuous at the threshold (*Continuity of potential outcomes*). Second, untreated municipalities should be unaffected by the treatment (*Stable Unit Treatment Value Assumption*, SUTVA). The institutional framework and the data at hand require a short discussion regarding some details that might, in principle, inflate or deflate the magnitude of the estimated coefficients, although without affecting the sign. I attempt to mitigate these concerns in the next few lines.

Specifically when population is used as the running variable, the continuity of potential outcomes requires (i) the absence of precise control over the assignment variable, (ii) a balancing of predetermined characteristics, and (iii) no other change in policies based on population in the sample under investigation. I test and discuss (i) and (ii) in Section 5. Regarding policy changes, it is worth noting that not only does the change in the voting rule at 15,000 residents concern the introduction of a second round to elect the mayor but it also marginally changes the voting rule for the council. Specifically, above the threshold, a mayoral candidate is allowed to be supported by several lists of candidates for the municipal council, and voters can cast a *disjoint* vote for the mayor and for the council. In principle, this empirical strategy does not make it possible to disentangle the effects, although the change in the voting rule for the council is arguably negligible compared to the voting rule for the mayor. Specifically, [Bordignon et al. \(2016\)](#) argue that the voting reform in both groups of municipalities had the aim of reinforcing the authority of mayors in contrast to the authority of municipal councils. Supporting this argument are the direct election of mayors with majoritarian rules, the absence of a confidence vote for the executive board to hold of-



Notes: Official population on the occasion of the 2001 population census. Municipalities between 10,000 and 20,000 residents (Figure 2a) and between 14,000 and 16,000 residents (Figure 2b). The five regions with special autonomy excluded from the sample are in gray. Source: Author's elaboration on ISTAT geodata.

Figure 2: Stable unit treatment value assumption

fice and the anticipated end of term in the event of a resignation. The argument of [Bordignon et al. \(2016\)](#) is reliable and supported by the fact that only 2.64 percent of legislatures in municipalities of 10,000 to 20,000 residents faced an early termination either due to a no-confidence vote or due to the resignation of the majority of the members of the municipal council. However, in terms of the scope of this analysis, it is important to bear this potential concern in mind, as one of the main channels through which voting rules are supposed to affect fiscal policy involves the coalition size. The SUTVA requires that untreated municipalities are unaffected by the treatment, and concerns over the fulfillment of this assumption arise when units in different groups can communicate or share information. [Bartolini and Santolini \(2009\)](#) find that municipalities in Italy react to policies implemented nearby. In particular, the small average size facilitates the information flow between different municipalities lying in the same economic or administrative district because of commuters and local mass media coverage. However, as shown in Figure 2, in the restricted sample that I consider, the problem is very limited, and the SUTVA is a reasonable assumption in this context because of the geographic distribution of municipalities, as the closer we are to the threshold of 15,000 residents, the fewer the municipalities that share boundaries.

## 5 Results

### 5.1 Size of the government and the composition of public expenditures

I present the results of the analysis both excluding and including covariates to show that estimated coefficients are not sensitive to their inclusion while precision improves substantially due to the



Table 2: Effect of the runoff voting system on the size of the Government

(a) Regression without covariates

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Expenditures	0.301** (0.118)	0.256** (0.109)	0.391*** (0.137)	0.108 (0.074)	0.216** (0.105)	0.248* (0.139)
$R^2$	0.285	0.307	0.375	0.116	0.122	0.122
Mean outcome	6.862	6.863	6.867	6.871	6.871	6.871
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	682	804	395	4368	4368	4368

(b) Regression with covariates

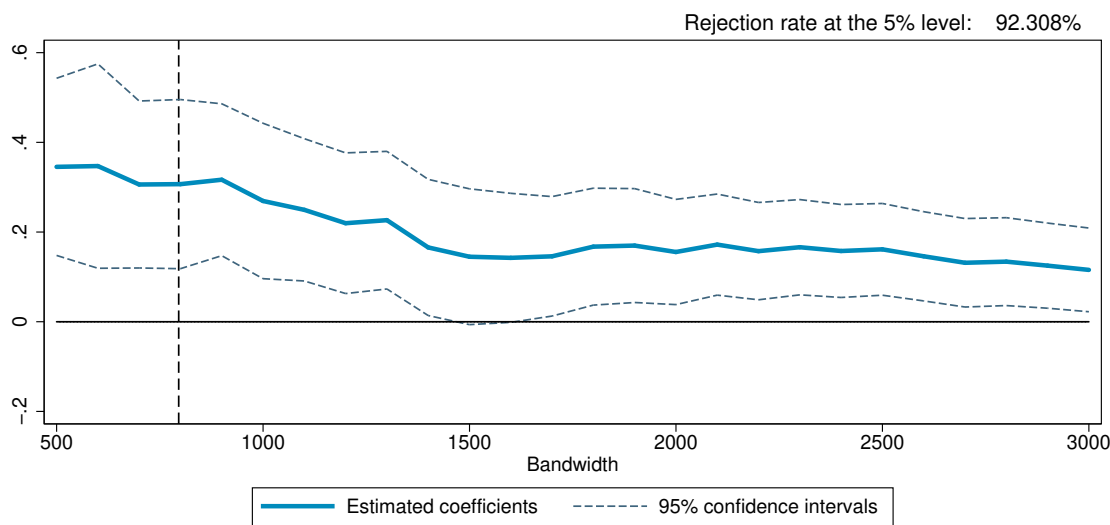
Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Expenditures	0.317*** (0.089)	0.269*** (0.088)	0.345*** (0.101)	0.129** (0.060)	0.231*** (0.085)	0.251** (0.117)
$R^2$	0.535	0.510	0.616	0.341	0.347	0.347
Mean outcome	6.862	6.863	6.867	6.871	6.871	6.871
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	682	804	395	4368	4368	4368

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies.. Estimation methods: spline polynomial approximation as in (1) and local-linear regression as in (2). Regressions in Panel B include the set of covariates described in section 4. Standard errors robust to clustering at the municipality level are in parentheses. \*,\*\*,\*\*\* represent the 10%, 5%, 1% significance levels.

reduction of standard errors. In Table 2 and Table 3, Panel (a) shows the result obtained without covariates, whereas Panel (b) shows the results obtained with covariates.<sup>11</sup> In these as well as in the following tables, column (1) reports estimates obtained using the Calonico et al. (2014) optimal bandwidth. Each column represents a different specification, whereas the rows in Table 3 represent different outcomes. For simplicity, I report only the estimated coefficients and standard errors for the treatment indicator, as well as the mean outcome in the restricted sample, providing insight on the baseline.

Table 2 shows the results for the effect of the runoff system on the size of the government. The results support the theoretical prediction that municipalities adjust the size of the public sector as a response to the voting rule. Municipalities assigned to the runoff system spend, on average, more than those under the plurality rule, although the coefficients and significance vary slightly between

<sup>11</sup>In both tables, the  $R^2$  increases substantially thanks to the introduction of covariates. According to Oster (2017), this is necessary to argue about the robustness of the estimates to their introduction.



Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the municipal expenditure per capita. The X axis represents the bandwidths used to fit the local linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regression, as in equation (2), with bandwidths ranging from 500 to 3,000 residents on each side of the threshold and covariates described in 4. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico et al. (2014). All regressions include the interaction terms between the runoff dummy and the assignment variable. Each estimation concerns a variation in the bandwidth of 20 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure 3: Sensitivity of the local linear regression to the chosen bandwidth

different specifications. The inclusion of control variables marginally attenuates the magnitude of the effect, while efficiency is substantially improved. Indeed, the increase in the level of spending plausibly lies above 20 percent, which is very large for entities at the sub-national level. In absolute terms, municipalities subject to the runoff system spend, on average, at least 150 euros per capita more than municipalities under the plurality rule. Figure 3, which plots the estimated coefficients and the 95 percent confidence intervals as a function of the bandwidths used to fit local linear regressions, provides further evidence of the overall robustness of the findings. First, the graph confirms that the effect is always positive. Second, the coefficients are sensitive to the chosen bandwidth only if the sample is small, while they are stable at approximately 15 percent for larger samples and significant at the 5 percent level for the large majority of bandwidths.

Table 3 shows the estimation results from the tests on the composition of local expenditures. Also in this case, the control variables improve efficiency and make it possible to capture the effects with more precision, without affecting the estimated coefficients. In Panel B, the estimated coefficients on administration and services follow the same pattern as those for the total level of expenditure, and the effect is even larger, with a magnitude above 20 percent in most specifications.

Table 3: Effect of the runoff voting system on the composition of public expenditure

(a) Regression without covariates

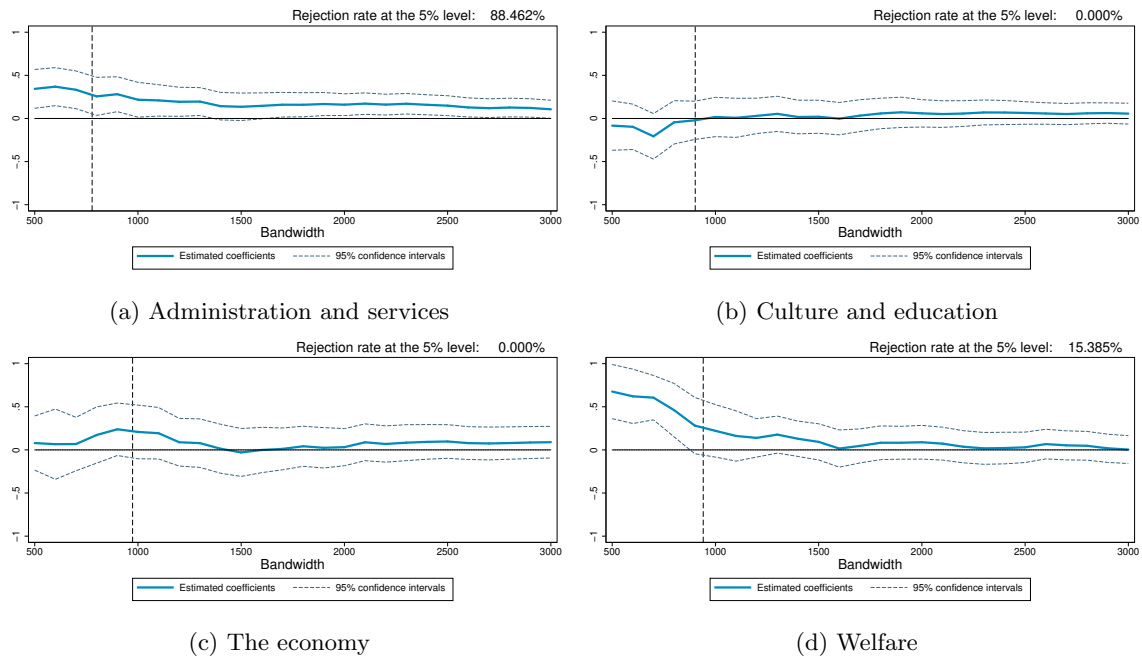
Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Admin. and Services	0.241*	0.193	0.403**	0.092	0.217*	0.279*
	(0.124)	(0.121)	(0.161)	(0.081)	(0.117)	(0.155)
$R^2$	0.277	0.281	0.377	0.146	0.153	0.153
Culture and Education	0.145	0.125	0.052	0.122	0.043	0.061
	(0.140)	(0.129)	(0.150)	(0.078)	(0.112)	(0.151)
$R^2$	0.513	0.530	0.475	0.358	0.359	0.360
Economy	0.228	0.210	0.139	0.041	0.111	0.052
	(0.223)	(0.200)	(0.221)	(0.130)	(0.168)	(0.213)
$R^2$	0.215	0.209	0.318	0.217	0.218	0.218
Welfare	0.353*	0.185	0.330	0.030	0.064	0.263
	(0.187)	(0.168)	(0.266)	(0.111)	(0.156)	(0.193)
$R^2$	0.520	0.492	0.605	0.369	0.370	0.372
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	682	804	395	4368	4368	4368

(b) Regression with covariates

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Admin. and Services	0.258**	0.217**	0.343***	0.129*	0.250**	0.303**
	(0.102)	(0.103)	(0.115)	(0.069)	(0.102)	(0.140)
$R^2$	0.490	0.460	0.585	0.328	0.334	0.336
Culture and Education	-0.014	0.017	-0.083	0.076	0.036	0.034
	(0.123)	(0.116)	(0.146)	(0.071)	(0.104)	(0.135)
$R^2$	0.586	0.586	0.591	0.432	0.432	0.432
Economy	0.210	0.209	0.080	0.097	0.127	0.060
	(0.161)	(0.159)	(0.160)	(0.105)	(0.138)	(0.176)
$R^2$	0.477	0.423	0.615	0.378	0.379	0.379
Welfare	0.429***	0.221	0.677***	0.035	0.115	0.288*
	(0.153)	(0.155)	(0.160)	(0.099)	(0.132)	(0.159)
$R^2$	0.605	0.567	0.749	0.431	0.431	0.433
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	682	804	395	4368	4368	4368

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita for each group of competencies defined in Section 4. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies. Estimation methods: spline polynomial approximation as in (1) and local-linear regression as in (2). Regressions in Panel B include the set of covariates described in section 4. Standard errors robust to clustering at the municipality level are in parentheses. \*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels.

Expenditures on culture and education and on economic incentives show neither economically nor statistically significant differences between municipalities subject to different voting rules, with



Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita in each of the macro-areas of expenditure described in Section 4. The X axis represents each of the bandwidths considered to fit the local linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regressions as in (2), with bandwidths ranging from 500 to 3,000 residents on each side of the threshold and covariates described in Section 4. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico et al. (2014). All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 20 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure 4: Sensitivity of the local linear regression to the chosen bandwidth

estimated coefficients close to zero under most of the specifications. The effect on welfare is positive and economically sizable under some of the specifications, but the results are not robust to different polynomial fits or choices of bandwidth. Figure 4 confirms the evidence depicted in the table. There is a unique clear, robust and significant positive effect on the expenditure on administration and services. Indeed, expenditure on welfare shows that the positive and significant coefficient estimated with some bandwidths rapidly go to zero when the sample size increases slightly, confirming that this sector of expenditure is likely to be unaffected by the voting rule.

Narrow sectors of expenditures targeting specific groups of individuals such as culture and education, the economy and welfare are unaffected by the change in the voting rule at the population threshold. The larger public sectors in the presence of the runoff system compared to the plurality rule are primarily due to the larger expenditure on administration and services, which represents a broader expenditure item and is the most connected to the political and bureaucratic structure of municipalities.

The results are in line with empirical cross-country evidence from Persson and Tabellini (2003)

in comparing majoritarian and proportional voting rules. In the setting of this paper, a more expansive and broader fiscal policy is implemented under the runoff system compared to municipalities subject to the plurality rule. This effect may appear large in magnitude, but it is in line with other large effects found in the literature on fiscal policy variables in Italian municipalities (e.g., [Repetto \(2017\)](#) finds that an increase in voters' information leads to a one-third increase in expenditure on investment in the year before elections).

## 5.2 Robustness checks

In the Appendix, (Figure [A.3](#)), I provide the results from the [McCrary \(2008\)](#) test for the 2001 population census. This test cannot reject the null hypothesis of smooth density of the running variable around the 15,000-resident threshold. I also present evidence of the balancing of several baseline covariates (Table [B.4](#)). All of them are balanced under the majority of the specifications considered.

In addition, I present the results from several falsification tests. In each test, I assigned a *placebo* treatment to municipalities above a certain population threshold (13,000, 14,000, 16,000, and 17,000 residents) to investigate the potential presence of leaps in the outcomes driven by chance or due to large variability and to evaluate the goodness of fit of the different functional forms. The tests for the local linear regressions (Figures [A.11-A.15](#)) show that the leaps in the presence of placebo thresholds are almost never significant and that the coefficients are very close to zero. The falsification tests for the polynomial approximations (Table [B.5](#)) show that three out of 60 estimated coefficients are significant at the 10 percent level and that only two of them are significant at the 5percent but smaller in magnitude than the effects estimated in the main results.

Further checks, the results of which are not shown for the sake of brevity, include repeating the analysis excluding municipalities with a level of expenditure in the first and in the 99<sup>th</sup> percentiles and considering variables on a term-length basis instead of on a yearly basis. The estimated coefficients are marginally attenuated, and precision improves slightly.

## 5.3 Investigating mechanisms

The RD estimates confirm the theoretical predictions of larger and broader expenditure under the runoff system compared to the plurality rule. The effects are large in magnitude, relatively precise and robust to different specifications.

I now investigate the potential mechanisms motivating them in view of the different incentives and constraints that agents in the economy face under the two different voting rules. I proceed by

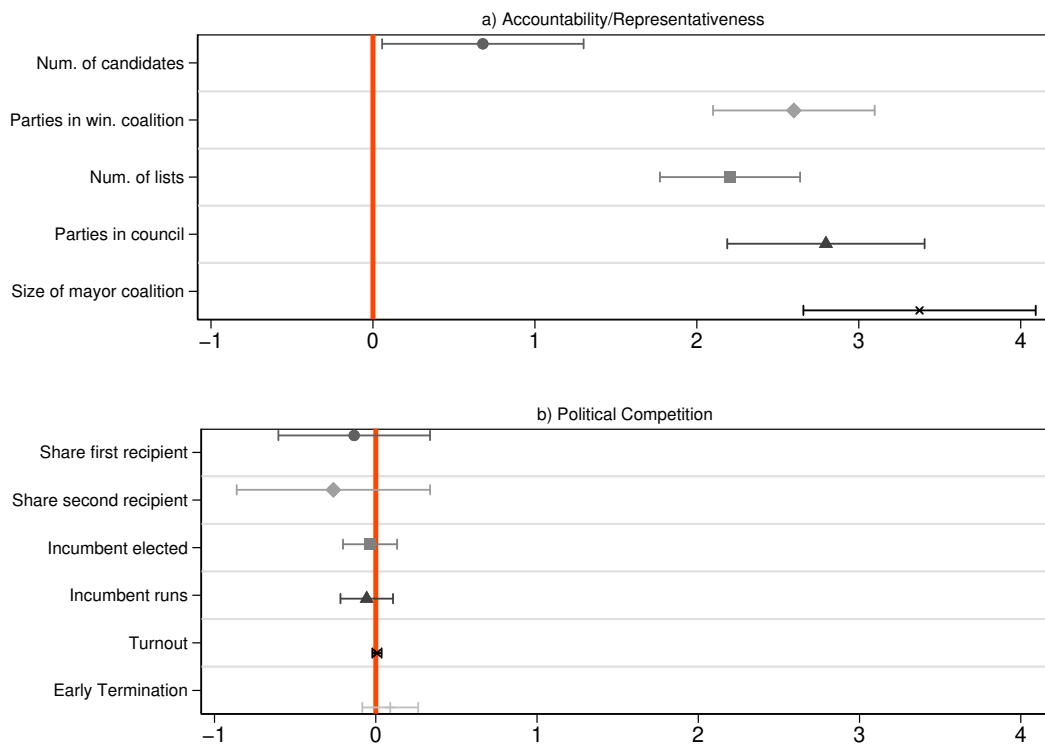
(i) presenting evidence that the two voting rules affect the level of accountability and representativeness; (ii) demonstrating that the runoff system does not generate more political competition (which would have led to opposite results for the fiscal policy outcomes), as found by [Chamon et al. \(2018\)](#) in Brazilian towns; and (iii) suggesting that incumbent politicians have more incentives to adjust the fiscal policy for electoral purposes under the runoff system than under the plurality rule.

(i) **Accountability and Representativeness**

A strong theoretical argument supporting the larger public sector and broader expenditures under the runoff system compared to the plurality rule involves a change in the trade-off between accountability and representativeness. Specifically, the minimum share requirement to win the election is supposed to favor coalition governments. Coalition governments reduce accountability because of the space for incumbent politicians to blame partners for eventual failures and because of within-coalition competition and bargaining. The evidence from [Table B.2](#) strongly supports all arguments. Here, I measure accountability and representativeness under the two voting systems by comparing the number of mayoral candidates and the number of lists that voters face on the ballot, the number of parties that are admitted to the council and the average size of the winning coalition at the time of the election and in the council. The winning coalitions are larger by more than three parties under the runoff system than under the single-ballot rule, and several of the additional lists are ultimately admitted to the municipal council, as the governing coalitions are composed of an additional 2.6-3.5 parties. Additionally, under the runoff system, the number of mayoral candidates increases by almost one unit (confirming the results from [Bordignon et al. \(2016\)](#)), and notably, the number of lists that each voter faces on the ballot increases by 7-8 units, whereas almost four more are admitted to the municipal council. Some effects are potentially inflated by minor details of the Italian voting rule, such as the limit to the number of lists for the council that a mayoral candidate can present under the plurality rule. However, the evidence suggests that larger representation can explain the different fiscal policies implemented under the runoff system.

(ii) **Measures of Political Competition**

The alternative argument ([Chamon et al., 2018](#)) suggesting that the larger number of mayoral candidates may also lead to more efficient fiscal policy because of higher political competition is not supported by the data in the Italian case. [Table B.3](#) provides evidence regarding different measures of political competition in terms of the vote share of the top two recipients, the probability that the incumbent will run for a second term and be re-elected, voter turnout during the first round and the probability of an early termination. There are neither statistically nor economically significant



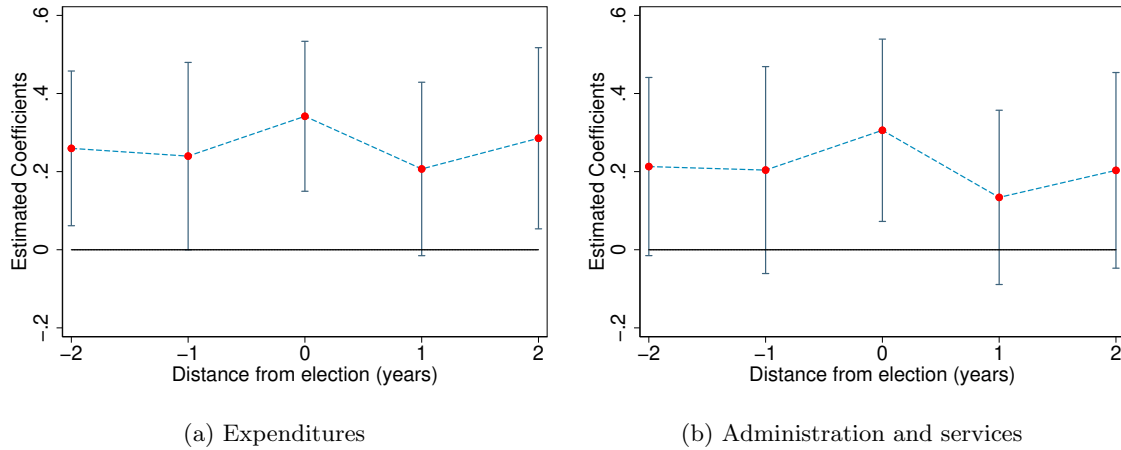
Notes: Election years between 2003 and 2012. Coefficients and 95 percent confidence intervals are expressed in units of standard deviation. Estimation method: local linear regression, as in (2), with a bandwidth of 1,000 residents on each side of the discontinuity and covariates described in Section 4. All regressions include the interaction terms between the runoff treatment and the assignment variable. Standard errors are clustered at the municipality level. See Tables B.2 and B.3 for detailed results.

Figure 5: Effects of runoff voting system on political outcomes. Sharp RD estimates

differences in any of the variables (see Figure 5 for a comparison between the standardized effects from this test and the previous test). First, despite the increase in the number of candidates and the fact that there is no longer a race for the plurality in place, the reduction in the vote share of the two top recipients during the first round is small and not significantly different from zero. However, support for a mayoral candidate is spread among more lists of candidates for the municipal council than under the plurality rule. Second, the probability that the incumbent mayor will run for a second term or be re-elected is slightly lower under the runoff, but the drop in probability is very small and nonsignificant. Third, there is neither a significant increase in turnout during the first round, as the larger number of candidates may suggest, nor a decrease, as suggested by the fact that, under the runoff system, the first round may not be the decisive round for assigning the seat.<sup>12</sup>

(iii) **Adjustment of Spending for Electoral Purposes** A mechanism complementing that

<sup>12</sup>The result on turnout contrasts with the findings from Barone and De Blasio (2013), who, however, use a specification likely to be affected by confounded treatment bias (see section 4 for detailed discussion).



Notes: Election years between 2003 and 2012. Estimation method: local linear regression, as in (2), with a bandwidth of 1,000 residents on each side of the discontinuity and covariates described in Section 4. I estimate (2) separately for each of the five years between one election date and the next. All regressions include the interaction terms between the runoff treatment and the assignment variable. For all regressions, graphs report estimated coefficients and 95 percent confidence intervals.

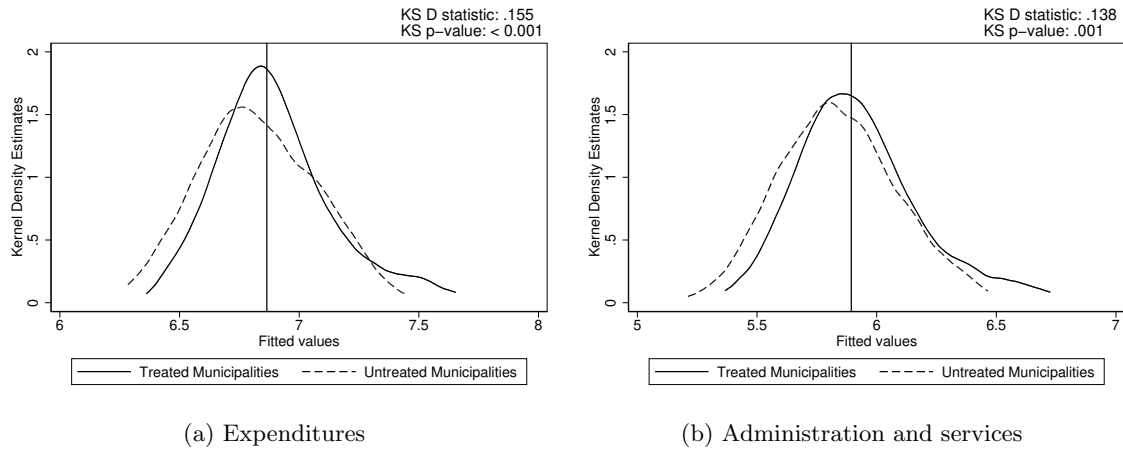
Figure 6: Electoral cycles

involving coalition size entails the possibility of more incentives for adjusting the expenditures for electoral purposes, to compensate for the larger support that the voting rule requires, at least during the second round. Specifically, incumbent politicians might be induced to please more voters than under the plurality. Given the unavailability of formal tests for this hypothesis, I present some informal but suggestive evidence, focusing on electoral cycles of municipal expenditures, on distributional treatment effects and on the effects of the runoff system on municipal revenues.

First, I investigate the possibility of a modification in the political budget cycles affecting Italian municipalities. The evidence from [Alesina and Paradisi \(2017\)](#) and [Repetto \(2017\)](#) shows an accentuated cyclical nature of municipal budgets, which signals a change in fiscal policy implemented by local politicians at the time in which voters care the most about their performances. Figure 6 plots estimated coefficients and the 95 percent confidence intervals from estimating (2) separately in each of the five years between one election date and the next. The cyclical behavior of expenditure is, for the treated municipalities, even more accentuated than it is for municipalities under the plurality rule and the treated municipalities spend more along all years of a term, but the difference is larger (though not significantly) during the election year, in which politicians try to attract voters.

Second, I explore whether my results are driven by municipalities that are less likely to be financially constrained by the presence of the DSP and that could thus have more space to adjust expenditures for electoral purposes. To that end, I investigate the eventual presence of the distributional treatment effect at the threshold, in the spirit of [Abadie \(2002\)](#) and [Abadie et al. \(2002\)](#).





Notes: Election years between 2003 and 2012. Estimation method: Fitted values for the treated and untreated municipalities are obtained with local linear regression, as in (2), with a bandwidth of 1,000 residents on each side of the discontinuity and covariates described in Section 4. The regressions include the interaction terms between the runoff treatment and the assignment variable. The vertical line represents the median for treated municipalities. The kernel density estimates use an Epanechnikov Kernel and bandwidth=0.08 log points. Each figure reports the D-statistic and the p-value from a formal Kolmogorov-Smirnov test.

Figure 7: Distributional treatment effect

In Figure 7, I present the empirical density function for the treated and untreated municipalities, using fitted values from (2) with a bandwidth of 1,000 residents to control for the difference in the assignment variable. The estimated effect of the runoff system on fiscal policy is much larger in municipalities below the median of the distribution than in those above the median. Specifically, for both expenditures and the administration and services sector, we observe that the shift to the right is more pronounced for the bottom deciles of the distribution. This finding confirms that policymakers respond more to a change in the voting rule if they are not constrained by high levels of expenditure due to the specific needs of the population that are potentially unrelated to the electoral competition. Municipalities that, instead, are in the upper tail of the distribution are most likely to be financially constrained by the presence of the DSP, which reduces the space to adjust spending for electoral purposes.

Third, in the presence of a balance budget requirement, such as that of the DSP, larger expenditures must be managed by an equal increase in revenues. However, voters may punish politicians who set higher tax rates to finance pork-barreling behavior or coalition inefficiencies. Hence, municipalities subject to the runoff system should have larger revenues than those under the plurality rule, but additional revenues should not come from taxation. In Table 4, I test the effect of the runoff system on municipal revenues, using (1) and (2) and outcomes in logarithms of the per capita yearly amount. First, revenues increase by more than 20 percent, very similarly to expenditures under all specifications, confirming that the DSP is effective. Second, the effect of the runoff

Table 4: Effect of the runoff voting system on municipal revenues

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Revenues	0.304*** (0.092)	0.262*** (0.090)	0.331*** (0.100)	0.127** (0.061)	0.233*** (0.086)	0.240** (0.118)
$R^2$	0.530	0.503	0.621	0.331	0.337	0.338
Tax Revenues	0.035 (0.083)	-0.018 (0.086)	0.005 (0.084)	-0.007 (0.056)	-0.006 (0.081)	-0.077 (0.102)
$R^2$	0.701	0.667	0.766	0.577	0.577	0.580
No-tax Revenues	0.399*** (0.108)	0.378*** (0.105)	0.489*** (0.126)	0.181** (0.074)	0.348*** (0.101)	0.385*** (0.132)
$R^2$	0.575	0.560	0.650	0.459	0.466	0.466
Revenues from transfers	0.203 (0.131)	0.248** (0.121)	0.344* (0.198)	0.097 (0.087)	0.327*** (0.121)	0.424*** (0.145)
$R^2$	0.733	0.740	0.778	0.723	0.725	0.725
Revenues from services	0.227 (0.175)	0.267 (0.177)	0.295 (0.226)	0.109 (0.107)	0.242 (0.149)	0.083 (0.198)
$R^2$	0.346	0.297	0.430	0.230	0.233	0.237
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	682	804	395	4368	4368	4368

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the natural logarithm of the yearly municipal revenues per capita. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, macro-region and election year dummies, and the set of covariates described in section 4. Estimation methods: spline polynomial approximation as in (1) and local-linear regression as in (2). Standard errors robust to clustering at the municipality level are in parentheses. \*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels.

system compared to the plurality rule on tax revenues is never distinguishable from zero, while revenues from other sources increase substantially (approximately 30-35 percent) when crossing the population threshold. In particular, we observe a large increase in the transfers that municipalities receive. These results are consistent with [Bracco and Brugnoli \(2012\)](#) and previous evidence from the literature investigating the manipulation of transfers from central administrative levels to targeted municipalities (see [Lizzeri and Persico \(2001\)](#), [Gagliarducci et al. \(2011\)](#), [Carozzi and Repetto \(2016\)](#)), but they do not exclude the possibility that private transfers favor incumbent politicians on the ballot despite a larger pool of contestants.<sup>13</sup> Additionally, revenues from services are observably larger under the runoff system, but the effect is not significant.

<sup>13</sup>Municipalities in Italy are allowed to receive transfers from the private sector. Examples are projects financed by local banking institutions or cases in which the construction of new buildings is allowed, conditional on compensation from the company to the municipality for the additional provision of the public good needed.

## 6 Concluding Remarks

This paper contributes to the literature investigating the economic effects of institutions by comparing the levels and composition of public expenditures under the two most widely implemented majoritarian voting rules. I used a quasi-experimental variation to circumvent the potential sources of bias of cross-country comparisons in terms of reverse causality and omitted confounders. Italian municipalities represent an ideal institutional framework to implement a RD design and to credibly identify the causal effect of voting rules on the size and composition of the public sector.

Voting rules are among the major components of the democratic process and have a potential impact on economic policy through the changes in politicians' and voters' behavior that they generate. Specifically, the difference in the electoral formula between the runoff system and the single-ballot rule changes the focus of the electoral competition to a two-stage race with different goals. Under the runoff system, the focus in the first round is the share maximization to be admitted to the second round; in contrast, in the second round, the number of candidates is fixed to two, and a candidate needs the support of the median voter to win. This difference can be expected to reduce accountability because of the need of greater support among voters and parties and the predominance of large coalitions encouraged by the incentives for pact-building. Accountability may be further reduced by the increase in the number of candidates predicted by Duverger's hypothesis, which increases the cost of information on different policies for voters and incentivizes candidates to compete on ideology. Additionally, the minimum share requirement to win may incentivize the adjustment of fiscal policy for electoral purposes because of the need to attract more voters.

Robust quasi-experimental evidence shows that the runoff system causes an increase of more than 20 percent in municipal expenditures, foremost driven by the larger size of the administrative structure of municipalities under the runoff system compared to those subject to the plurality rule. On the one hand, the administrative structure represents a broad area of expenditure, confirming provisions borrowed from [Persson and Tabellini \(2003\)](#); on the other hand, it is the sector most likely to be affected by the inefficiencies of the political process. No robust effect on other sectors of expenditure has been found.

The role of larger coalitions and more parties in reducing accountability is confirmed by additional results on the political variables. Additionally, the adjustment of fiscal policies for electoral purposes is suggested by the evidence that political budget cycles under the runoff system are accentuated compared to municipalities under the plurality rule and the evidence that the effect on expenditures is larger in municipalities that are not financially constrained. Moreover, revenues

also increase but not from taxation, in line with the idea that voters dislike tax increases.

The findings of this paper are opposite to the ones in [Chamon et al. \(2018\)](#), who find smaller current expenditure in municipalities exposed to the runoff system than the ones under the plurality in Brazilian towns. In their study, which considers a developing country and a population threshold set at 200,000, accountability of local politicians is low under both voting systems compared to my setup, focused on a large economy and a population threshold set at 15,000 residents. Thus, the variation in accountability across voting rules, that seems to be the mayor driving factor of the effect on fiscal policy is much attenuated in the case of [Chamon et al. \(2018\)](#).

The results show that a tighter fiscal policy is implemented under the plurality rule than under the runoff system; however, policy recommendations in terms of institutional design are difficult to draw. Indeed, economic *disadvantages* are realized by beneficial political features borrowed from both the proportional and majoritarian families and by the fact that the risk of extreme governing majorities is mitigated under the runoff system ([Bordignon et al. \(2016\)](#), [Bordignon et al. \(2017\)](#)). Specifically, on the one hand, the runoff system favors the participation in political competition and elective offices of small parties and their voters, and it requires the winning candidate to be supported, at least as a second-best solution, by the majority of voters; on the other hand, the vote occurs over individual candidates, in small districts, and with the winner-take-all principle.

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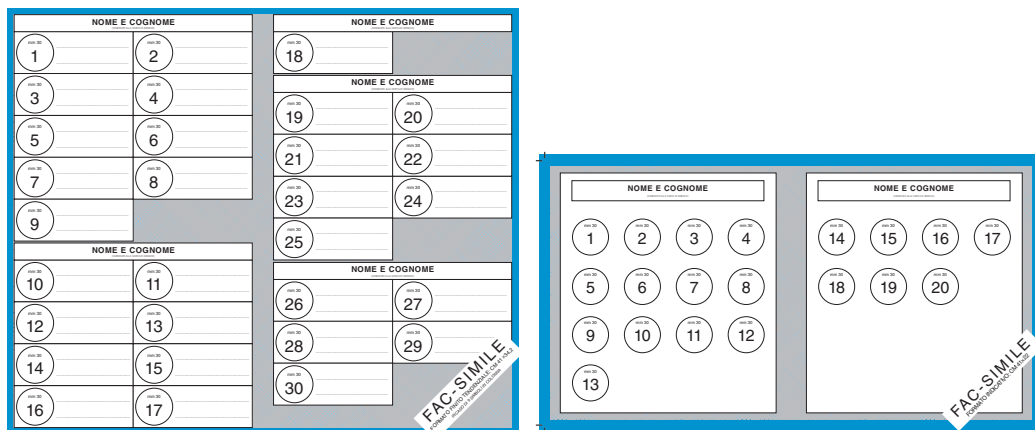
# Appendix

## A Figures



Notes: Source: [Italian Ministry of Internal Affairs](#).

Figure A.1: Ballot in municipalities under the plurality rule

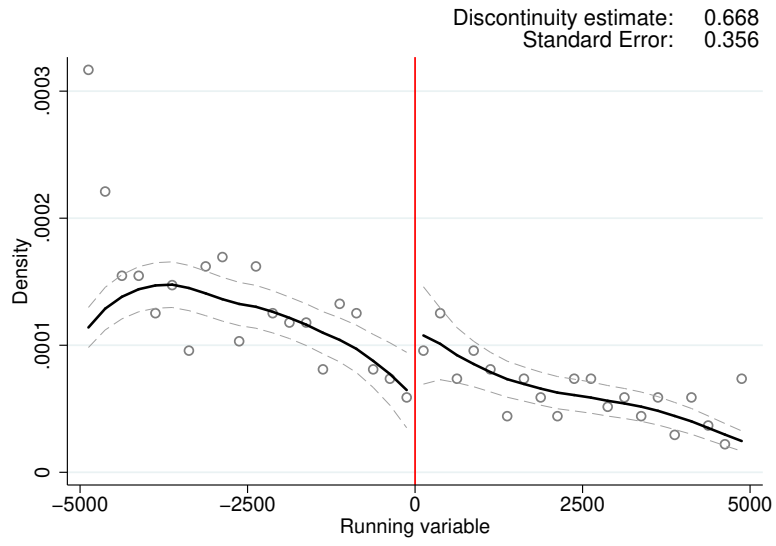


(a) First round

(b) Second round

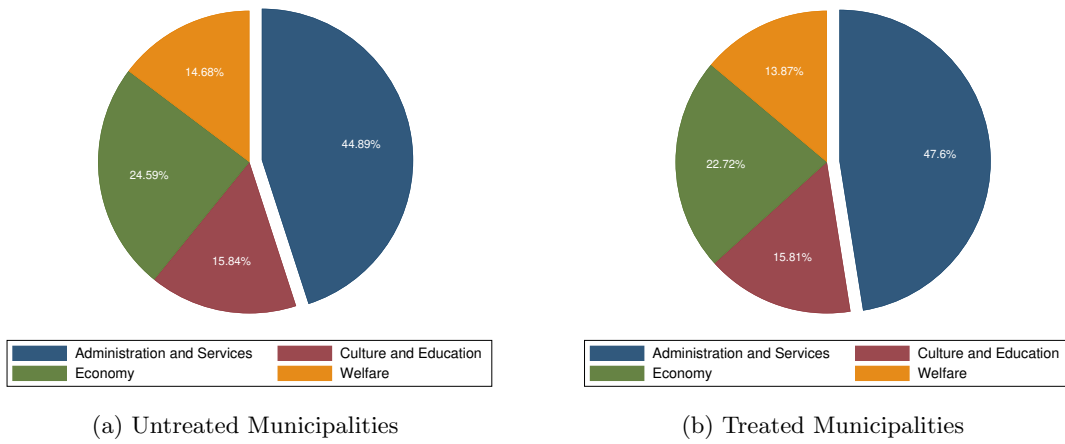
Notes: Source: [Italian Ministry of Internal Affairs](#).

Figure A.2: Ballot in municipalities under the runoff system



Notes: Municipalities between 10,000 and 20,000 residents. Plots represent the estimated density of the official population around the 15,000 residents' threshold in the occasion of the 2001 population Census. Formal log-density discontinuity and standard errors are computed performing a formal [McCrary \(2008\)](#) with optimal bandwidth.

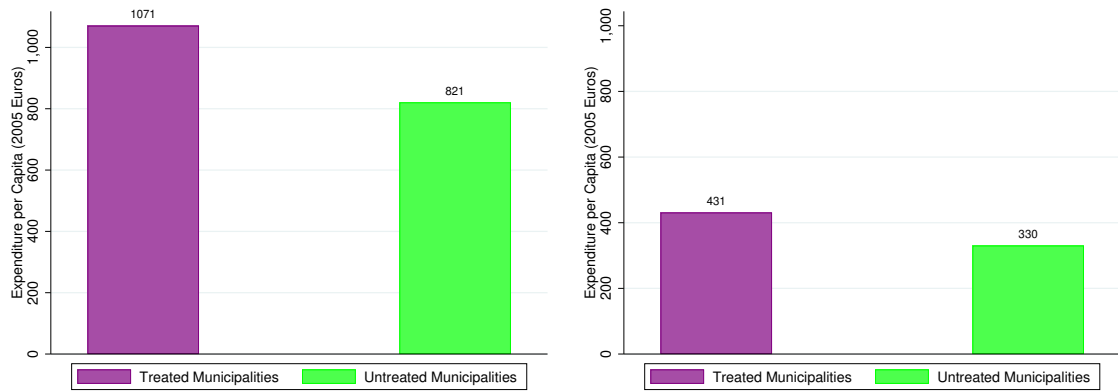
Figure A.3: McCrary Density test for Manipulation of the Running Variable



Election years between 2003 and 2012. Municipalities between 14,000 and 16,000 residents.

Figure A.4: Composition of public expenditures



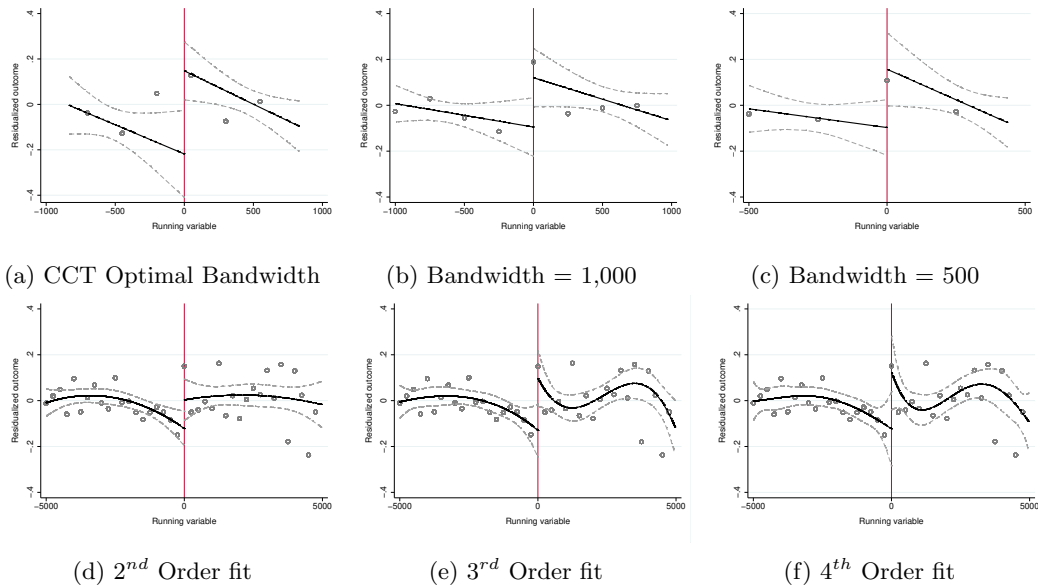


(a) Expenditure

(b) Administration and Services

Notes: Election years between 2003 and 2012. Estimation method: Fitted values for the untreated municipalities are obtained with local-linear regression as in equation (2) with bandwidth of 1,000 residents on each side of the discontinuity, and no covariates. Fitted values for the treated municipalities are obtained adding to the untreated municipalities the estimated coefficient from equation (2) with bandwidth of 1,000 residents on each side of the discontinuity, and covariates described in Section 4. All values are then transformed to per 2005 per capita euros through an exponential transformation. Regressions include the interaction terms between the runoff treatment and the assignment variable.

Figure A.5: Magnitude of the effect in monetary terms



(a) CCT Optimal Bandwidth

(b) Bandwidth = 1,000

(c) Bandwidth = 500

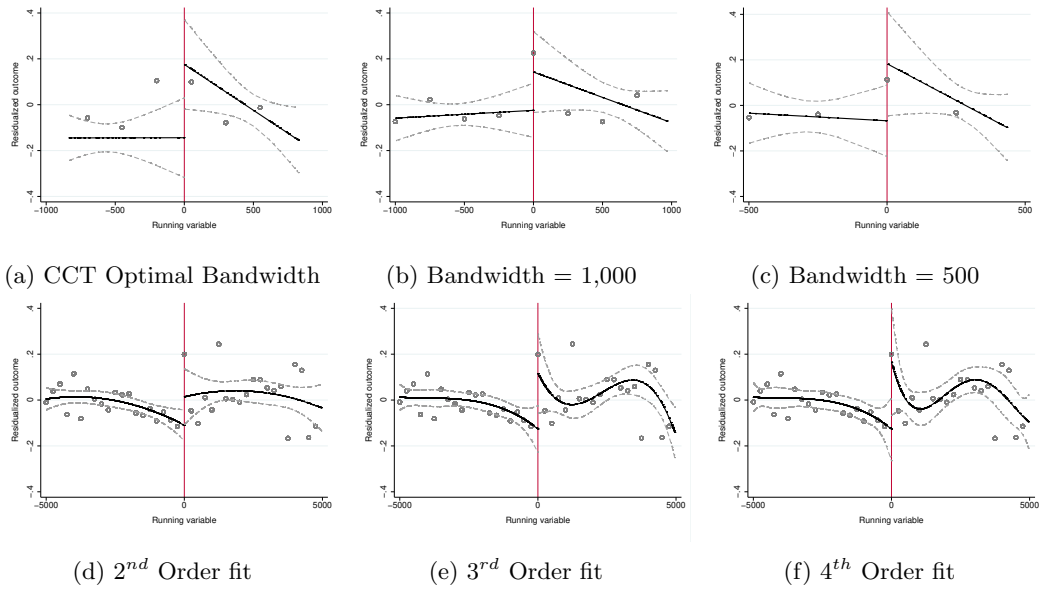
(d) 2<sup>nd</sup> Order fit

(e) 3<sup>rd</sup> Order fit

(f) 4<sup>th</sup> Order fit

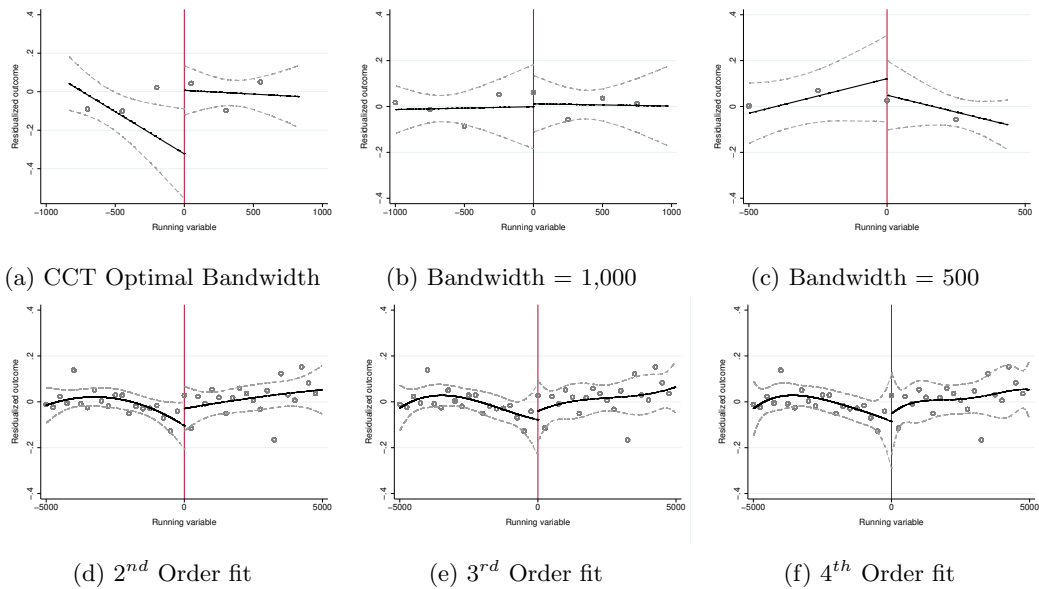
Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the residual from the regression of the natural logarithm of the yearly municipal expenditure per capita on the set of covariates described in Section 4. Estimation methods: local-linear regression as in equation (2) in Panels a, b and c; spline polynomial approximation as in equation (1) in Panels d, e and f. The Calonico et al. (2014) optimal bandwidth; 1,000; 500 residents on each side of the threshold are the bandwidths for the local-linear regressions. All regressions include the interaction terms between the runoff dummy and the function of the assignment variable. Standard errors are clustered at the municipality level.

Figure A.6: RD Plots - Expenditures



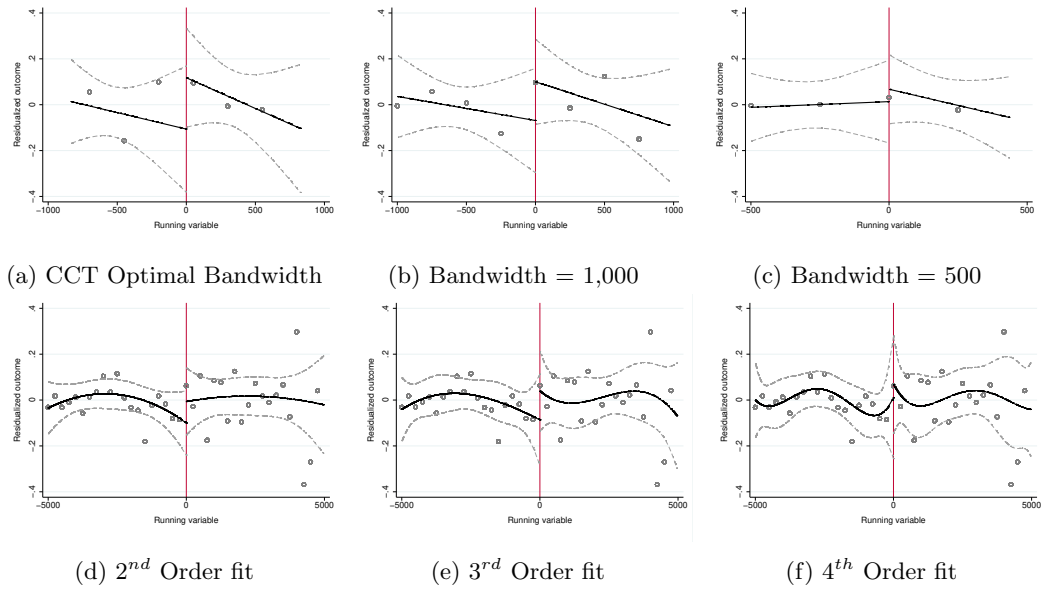
Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the residual from the regression of the natural logarithm of the yearly municipal expenditure per capita in the Administration and Services macro-area as defined in Section 4 on the set of covariates described in Section 4. Estimation methods: local-linear regression as in equation (2) in Panels a, b and c; spline polynomial approximation as in equation (1) in Panels d, e and f. The Calonico et al. (2014) optimal bandwidth; 1,000; 500 residents on each side of the threshold are the bandwidths for the local-linear regressions. All regressions include the interaction terms between the runoff dummy and the function of the assignment variable. Standard errors are clustered at the municipality level.

Figure A.7: RD Plots - Administration and Services



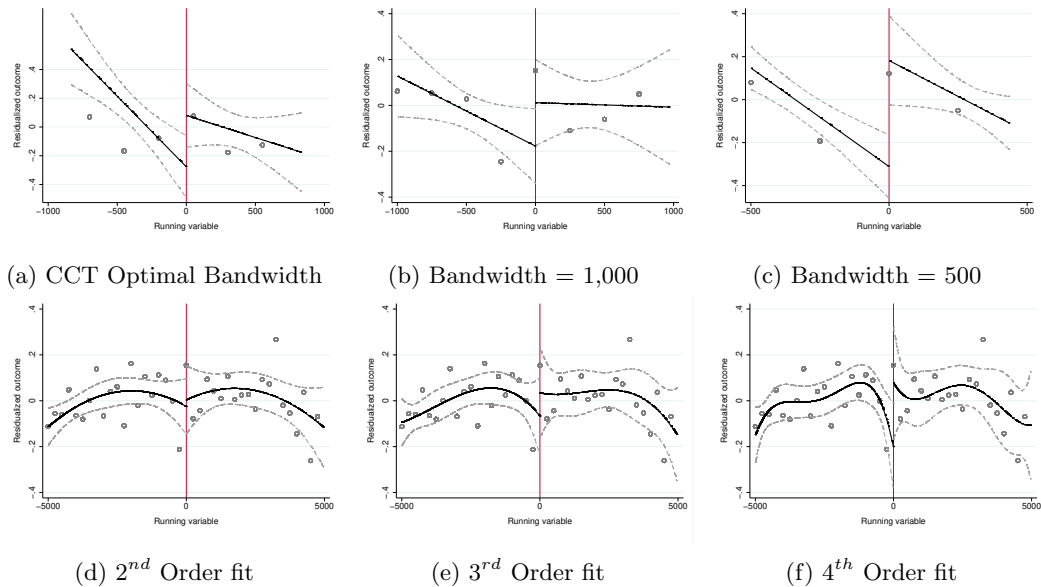
Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the residual from the regression of the natural logarithm of the yearly municipal expenditure per capita in the Culture and Education macro-area as defined in Section 4 on the set of covariates described in Section 4. Estimation methods: local-linear regression as in equation (2) in Panels a, b and c; spline polynomial approximation as in equation (1) in Panels d, e and f. The Calonico et al. (2014) optimal bandwidth; 1,000; 500 residents on each side of the threshold are the bandwidths for the local-linear regressions. All regressions include the interaction terms between the runoff dummy and the function of the assignment variable. Standard errors are clustered at the municipality level.

Figure A.8: RD Plots - Culture and Education



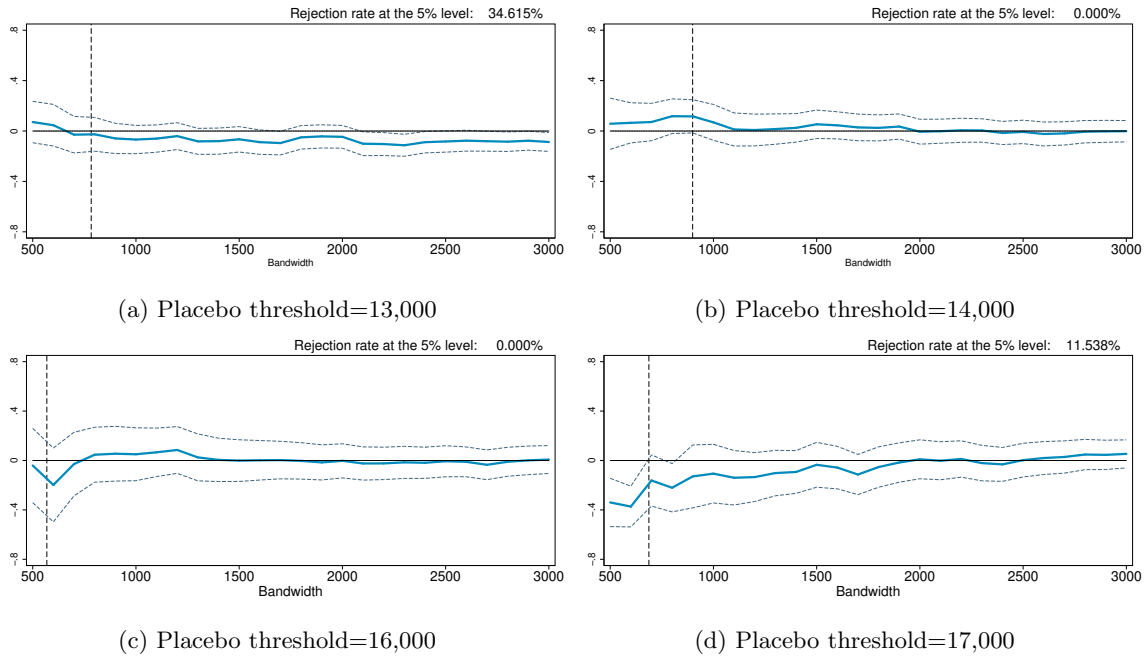
Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the residual from the regression of the natural logarithm of the yearly municipal expenditure per capita in the Economy macro-area as defined in Section 4 on the set of covariates described in Section 4. Estimation methods: local-linear regression as in equation (2) in Panels a, b and c; spline polynomial approximation as in equation (1) in Panels d, e and f. The Calonico et al. (2014) optimal bandwidth; 1,000; 500 residents on each side of the threshold are the bandwidths for the local-linear regressions. All regressions include the interaction terms between the runoff dummy and the function of the assignment variable. Standard errors are clustered at the municipality level.

Figure A.9: RD Plots - Economy



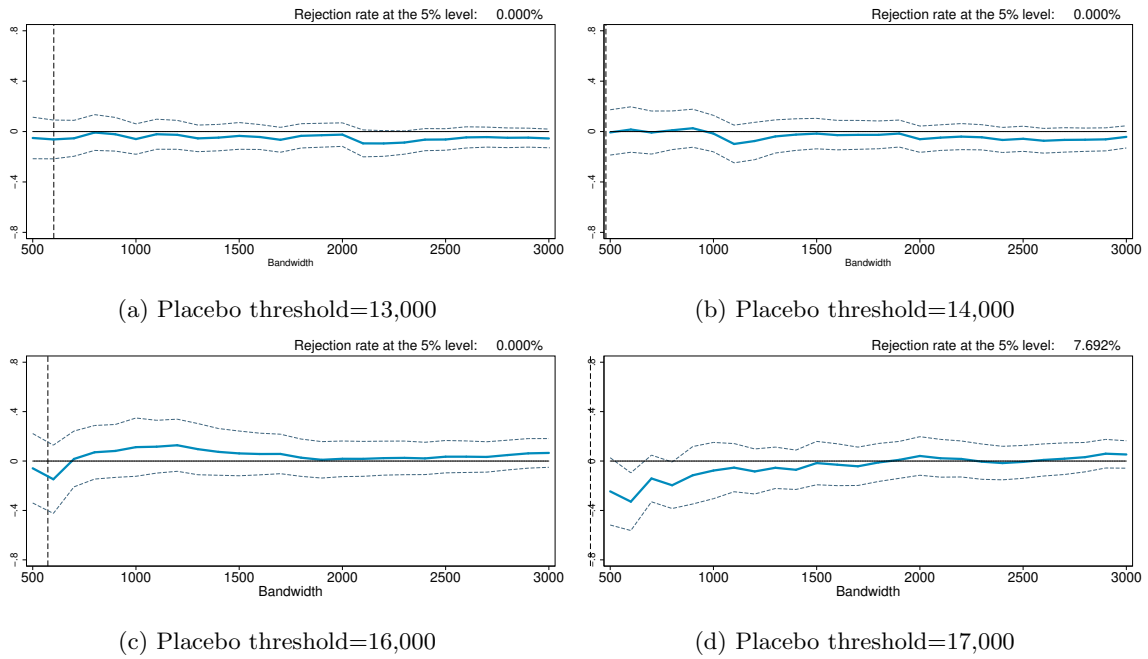
Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. The dependent variable is the residual from the regression of the natural logarithm of the yearly municipal expenditure per capita in the Welfare macro-area as defined in Section 4 on the set of covariates described in Section 4. Estimation methods: local-linear regression as in equation (2) in Panels a, b and c; spline polynomial approximation as in equation (1) in Panels d, e and f. The Calonico et al. (2014) optimal bandwidth; 1,000; 500 residents on each side of the threshold are the bandwidths for the local-linear regressions. All regressions include the interaction terms between the runoff dummy and the function of the assignment variable. Standard errors are clustered at the municipality level.

Figure A.10: RD Plots - Welfare



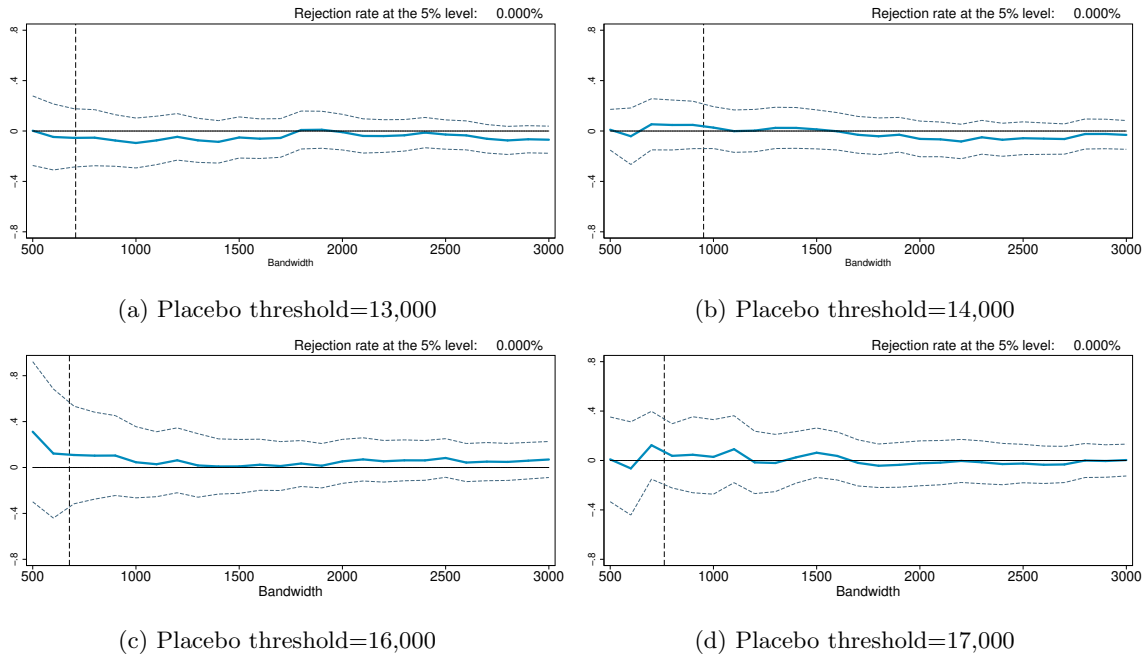
Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita. The X ax represents each of the bandwidths considered to fit the local-linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local-linear regressions as in (2), with bandwidth going from 500 to 3,000 residents on each side of the threshold, and covariates described in Section 4. The dashed vertical line represents the bias-corrected optimal bandwidth as in Calonico et al. (2014). All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure A.11: Falsification tests for the local-linear regression - Expenditures



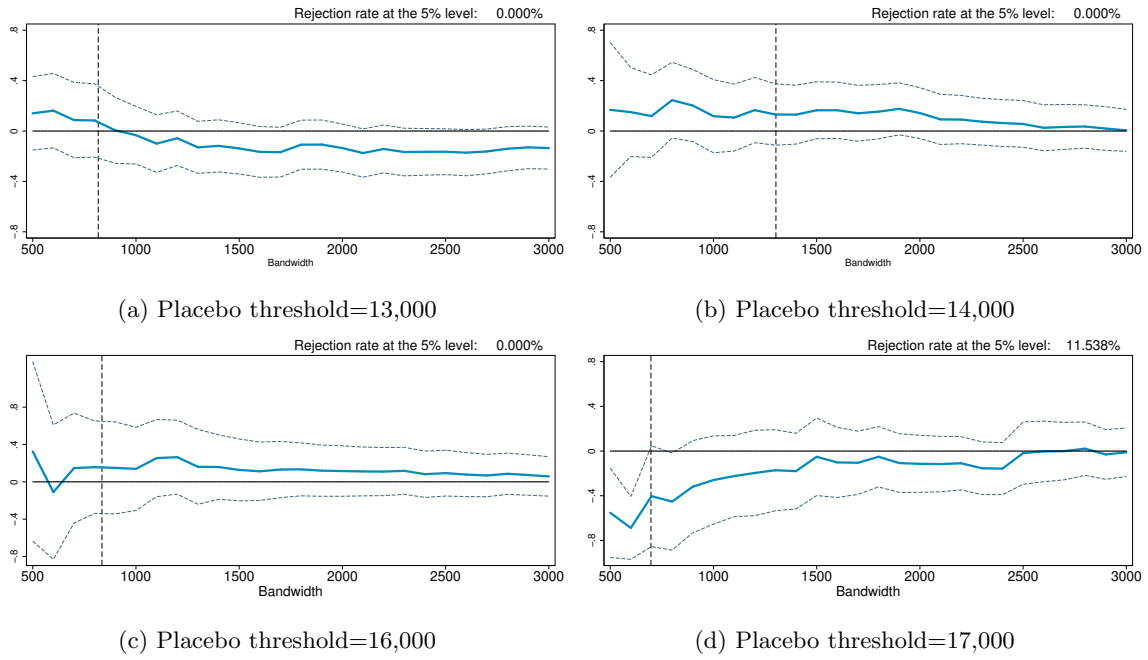
Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita in the Administration and Services macro-area as defined in Section 4. The X axis represents each of the bandwidths considered to fit the local-linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local-linear regressions as in (2), with bandwidth going from 500 to 3,000 residents on each side of the threshold, and covariates described in Section 4. The dashed vertical line represents the bias-corrected optimal bandwidth as in Calonico et al. (2014). All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure A.12: Falsification tests for the local-linear regression - Administration and Services



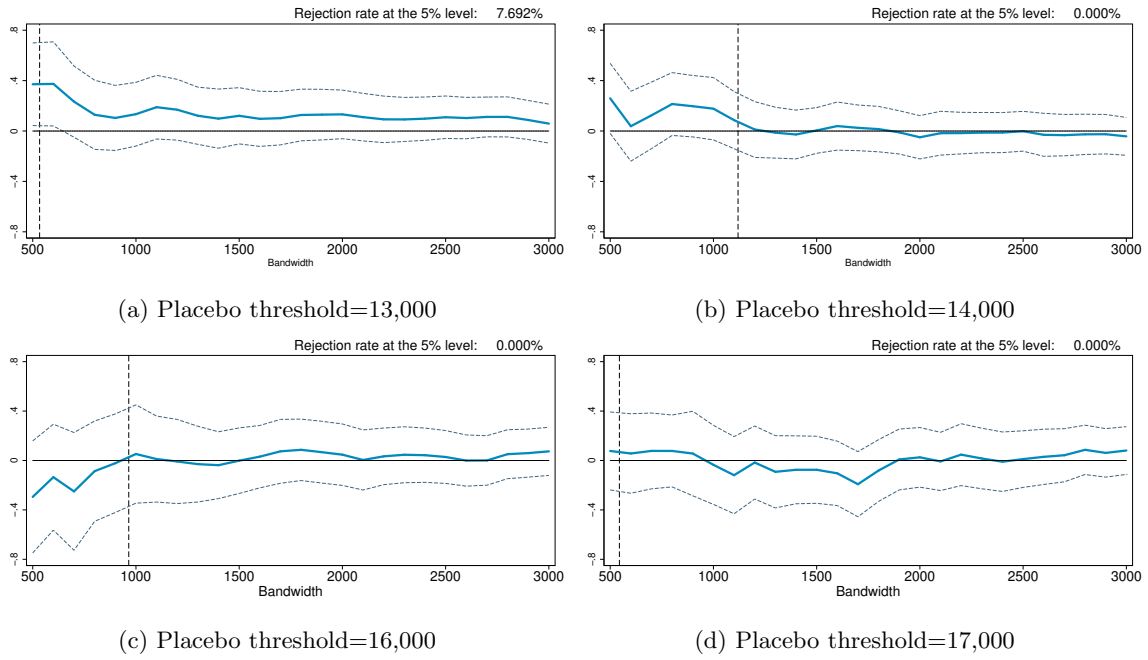
Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita in the Culture and Education macro-area as defined in Section 4. The X axis represents each of the bandwidths considered to fit the local-linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local-linear regressions as in (2), with bandwidth going from 500 to 3,000 residents on each side of the threshold, and covariates described in Section 4. The dashed vertical line represents the bias-corrected optimal bandwidth as in Calonico et al. (2014). All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure A.13: Falsification tests for the local-linear regression - Culture and Education



Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita in the Economy macro-area as defined in Section 4. The X ax represents each of the bandwidths considered to fit the local-linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local-linear regressions as in (2), with bandwidth going from 500 to 3,000 residents on each side of the threshold, and covariates described in Section 4. The dashed vertical line represents the bias-corrected optimal bandwidth as in Calonico et al. (2014). All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure A.14: Falsification tests for the local-linear regression - Economy



Notes: Election years between 2003 and 2012. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita in Welfare. The X ax represents each of the bandwidths considered to fit the local-linear regression. The blue line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local-linear regressions as in (2), with bandwidth going from 500 to 3,000 residents on each side of the threshold, and covariates described in Section 4. The dashed vertical line represents the bias-corrected optimal bandwidth as in Calonico et al. (2014). All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure A.15: Falsification tests for the local-linear regression - Welfare



## B Tables

Table B.1: Policies assigned on the base of population thresholds

<b>Residents</b>	<b>Policy change</b>
$\geq 1,000$	Wage of the Mayor and of the executive officers
$\geq 3,000$	Size of the Council
$\geq 3,000$	Wage of the Mayor
$\geq 5,000$	Wage of the Mayor and of the executive officers
$\geq 5,000$	Domestic Stability Pact
$\geq 5,000$	Voting Rule (from 2013)
$\geq 10,000$	Wage of the Mayor and of the executive officers
$\geq 15,000$	Voting Rule
$\geq 30,000$	Size of the Council
$\geq 30,000$	Wage of the Mayor
$\geq 30,000$	Neighborhood councils (allowed)
$\geq 50,000$	Wage of the Mayor and of the executive officers
$\geq 100,000$	Size of the Council and of the Executive board
$\geq 100,000$	Wage of the Mayor
$\geq 100,000$	Neighborhood councils (mandatory)
$\geq 250,000$	Size of the Council and of the Executive board
$\geq 250,000$	Wage of the Mayor
$\geq 500,000$	Size of the Council and of the Executive board
$\geq 500,000$	Wage of the Mayor

Notes: Policy changes assigned on the base of population threshold during the period under investigation in the paper. Notice that some thresholds have been changed since. Source: [Legislative Decree 267/2000](#).

Table B.2: Effect of the runoff voting system on accountability and representativeness.

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Num. of candidates	0.928** (0.372)	0.846** (0.391)	0.739* (0.426)	0.455* (0.259)	0.706** (0.339)	0.880** (0.427)
$R^2$	0.261	0.266	0.470	0.258	0.259	0.260
Parties in winning coalition	3.776*** (0.394)	3.799*** (0.368)	3.432*** (0.479)	3.322*** (0.243)	3.467*** (0.304)	3.460*** (0.338)
$R^2$	0.772	0.748	0.811	0.789	0.789	0.789
Num. of lists	7.820*** (0.898)	7.957*** (0.787)	7.078*** (1.179)	6.901*** (0.508)	7.528*** (0.663)	7.716*** (0.815)
$R^2$	0.776	0.782	0.796	0.807	0.808	0.808
Parties in municipal council	4.274*** (0.530)	4.422*** (0.485)	4.156*** (0.664)	3.192*** (0.358)	3.620*** (0.436)	4.117*** (0.548)
$R^2$	0.759	0.727	0.837	0.676	0.678	0.679
Size of governing coalition	3.319*** (0.361)	3.122*** (0.334)	3.585*** (0.470)	2.658*** (0.240)	2.766*** (0.301)	2.946*** (0.361)
$R^2$	0.838	0.818	0.862	0.809	0.810	0.811
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	539	656	300	3814	3814	3814

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies, and the set of covariates described in section 4. Estimation methods: spline polynomial approximation as in (1) and local-linear regression as in (2). Standard errors robust to clustering at the municipality level are in parentheses. \*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels.

Table B.3: Effect of the runoff voting system on political competition

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Vote share first	-0.006	-0.021	-0.027	0.008	-0.001	-0.039
	(0.037)	(0.037)	(0.040)	(0.022)	(0.029)	(0.036)
$R^2$	0.305	0.259	0.391	0.124	0.125	0.129
Vote share second	-0.024	-0.025	-0.017	-0.005	-0.010	-0.003
	(0.033)	(0.029)	(0.036)	(0.018)	(0.025)	(0.031)
$R^2$	0.217	0.221	0.423	0.090	0.092	0.093
Incumbent elected	-0.109	-0.036	-0.066	0.014	-0.032	-0.019
	(0.088)	(0.084)	(0.118)	(0.052)	(0.073)	(0.095)
$R^2$	0.358	0.346	0.430	0.230	0.231	0.231
Incumbent runs	-0.120	-0.056	-0.051	0.037	-0.025	-0.020
	(0.086)	(0.082)	(0.117)	(0.053)	(0.074)	(0.096)
$R^2$	0.354	0.346	0.423	0.228	0.229	0.229
Turnout	-0.001	0.007	-0.006	0.008	0.009	-0.007
	(0.016)	(0.014)	(0.015)	(0.009)	(0.013)	(0.016)
$R^2$	0.589	0.560	0.714	0.429	0.429	0.431
Early Termination	0.043	0.090	0.266**	0.069	0.057	0.092
	(0.099)	(0.087)	(0.127)	(0.043)	(0.061)	(0.080)
$R^2$	0.180	0.155	0.387	0.110	0.110	0.111
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	662	782	383	4252	4252	4252

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. Dependent variables are expressed in terms of standard deviation units. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies, and the set of covariates described in section 4. Estimation methods: spline polynomial approximation as in (1) and local-linear regression as in (2). Standard errors robust to clustering at the municipality level are in parentheses. \*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels.

Table B.4: Balance of Covariates.

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
Rural Surface	0.036 (0.098)	0.113 (0.094)	0.041 (0.156)	0.129** (0.062)	0.022 (0.082)	0.127 (0.109)
Altitude	121.420 (73.101)	101.914 (65.566)	63.627 (109.668)	47.980 (41.543)	71.044 (58.698)	28.275 (75.421)
Density	0.002 (0.002)	0.001 (0.001)	0.000 (0.002)	0.001 (0.001)	0.001 (0.001)	0.002 (0.002)
Docg	0.693 (1.184)	0.183 (0.831)	0.856 (0.640)	-1.564** (0.796)	-0.744 (0.973)	-0.905 (1.138)
Elderly	0.018 (0.014)	0.020* (0.012)	0.020 (0.019)	0.013 (0.009)	0.008 (0.011)	0.017 (0.015)
Farms	116.550 (330.242)	41.339 (281.365)	-157.533 (478.764)	56.585 (153.130)	-102.442 (234.376)	72.899 (341.481)
Migrants	-0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Mount Surface	0.190 (0.146)	0.189 (0.132)	0.149 (0.202)	0.113 (0.092)	0.274** (0.126)	0.172 (0.156)
Retired	0.038 (0.026)	0.045* (0.023)	0.023 (0.036)	0.029** (0.014)	0.024 (0.019)	0.037 (0.028)
Students	-0.005 (0.006)	-0.004 (0.006)	-0.006 (0.009)	-0.004 (0.004)	0.001 (0.005)	-0.004 (0.007)
Surface	28.031 (25.682)	22.026 (23.181)	8.540 (34.865)	18.724 (14.175)	21.582 (19.940)	29.377 (26.781)
Tourism	-0.005 (0.004)	-0.006 (0.004)	0.001 (0.007)	-0.003 (0.003)	-0.005 (0.004)	-0.004 (0.005)
Touristic supply	0.041 (0.133)	-0.010 (0.125)	-0.045 (0.144)	-0.017 (0.082)	-0.069 (0.100)	0.010 (0.107)
Unemployment	0.012 (0.012)	0.011 (0.011)	0.019 (0.017)	0.006 (0.006)	0.008 (0.009)	0.013 (0.012)
Running Variable	Linear	Linear	Linear	Quadratic	Cubic	Quartic
Bandwidth	838	1000	500	5000	5000	5000
BW Selector	CCT	Manual	Manual	Manual	Manual	Manual
Obs.	682	804	395	4368	4368	4368

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. In each regression, the dependent variable is one of the baseline covariates described in Section 4. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies. Estimation methods: spline polynomial approximation as in (1) and local-linear regression as in (2) without additional covariates. Standard errors robust to clustering at the municipality level are in parentheses. \*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels.

Table B.5: Falsification tests for the spline polynomial approximations. Sharp RD Estimates

(a) Placebo threshold at 13,000 residents				(b) Placebo threshold at 14,000 residents			
Dep. Var.	(1)	(2)	(3)	Dep. Var.	(1)	(2)	(3)
Expenditures	-0.103 (0.0484)	-0.0611 (0.0615)	-0.0531 (0.0718)	Expenditures	-0.00426 (0.0504)	0.0641 (0.0625)	0.0360 (0.0747)
Admin. and Services	-0.0961 (0.0531)	-0.0691 (0.0719)	-0.0507 (0.0906)	Admin. and Services	-0.0649 (0.0501)	-0.0203 (0.0617)	-0.0331 (0.0776)
Culture and Educ.	-0.0602 (0.0732)	-0.0860 (0.0998)	-0.109 (0.122)	Culture and Educ.	-0.00849 (0.0634)	-0.0217 (0.0782)	0.0135 (0.0932)
Economy	-0.156 (0.102)	-0.0831 (0.131)	-0.0314 (0.157)	Economy	0.0498 (0.104)	0.140 (0.135)	0.0928 (0.165)
Welfare	0.0982 (0.0972)	0.184 (0.130)	0.285 (0.158)	Welfare	-0.00877 (0.0873)	0.0490 (0.111)	0.143 (0.141)
Running Variable Bandwidth BW Selector	Quadratic 5000 Manual	Cubic 5000 Manual	Quartic 5000 Manual	Running Variable Bandwidth BW Selector	Quadratic 5000 Manual	Cubic 5000 Manual	Quartic 5000 Manual
Obs.	4368	4368	4368	Obs.	4368	4368	4368

(c) Placebo threshold at 16,000 residents				(d) Placebo threshold at 17,000 residents			
Dep. Var.	(1)	(2)	(3)	Dep. Var.	(1)	(2)	(3)
Expenditures	-0.00849 (0.0754)	0.00913 (0.103)	0.0559 (0.132)	Expenditures	-0.0633 (0.0676)	-0.177 (0.0809)	-0.150 (0.0889)
Admin. and Services	0.0152 (0.0782)	0.0437 (0.105)	0.0233 (0.134)	Admin. and Services	-0.0395 (0.0678)	-0.0698 (0.0792)	-0.131 (0.0912)
Culture and Educ.	0.0982 (0.0941)	0.0646 (0.129)	0.0699 (0.167)	Culture and Educ.	0.0625 (0.0896)	0.0506 (0.121)	0.0792 (0.148)
Economy	0.101 (0.135)	0.116 (0.183)	0.212 (0.234)	Economy	-0.0777 (0.137)	-0.297 (0.192)	-0.328 (0.224)
Welfare	0.0295 (0.111)	0.0141 (0.149)	0.0749 (0.186)	Welfare	0.00378 (0.118)	-0.135 (0.149)	-0.0221 (0.170)
Running Variable Bandwidth BW Selector	Quadratic 5000 Manual	Cubic 5000 Manual	Quartic 5000 Manual	Running Variable Bandwidth BW Selector	Quadratic 5000 Manual	Cubic 5000 Manual	Quartic 5000 Manual
Obs.	4368	4368	4368	Obs.	4368	4368	4368

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies, and covariates described in Section 4. Estimation methods: spline polynomial approximation as in (1). Standard errors robust to clustering at the municipality level are in parentheses. \*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels.

Table B.6: Descriptive Statistics and description of the variables. Balance sheets.

<b>Variable</b>	<i>Mean</i>	<i>St. Dev.</i>	<i>Obs.</i>	<b>Definition</b>	<b>Source</b>	<b>Unit of Measure</b>
Expenditures	6.871	0.331	4,368	Yearly expenditures per capita (total)	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Administration and Services	5.907	0.345	4,368	Administration + Road Maintenance + Services + Local Police + Justice	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Culture and Education	4.808	0.528	4,368	Culture + Education + Sport	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Economy	5.068	0.710	4,368	Development + Territory + Tourism	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Welfare	4.573	0.601	4,368	Welfare	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Revenues	6.866	0.331	4,368	Yearly revenues per capita (total)	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Tax Revenues	5.877	0.376	4,368	Tax Revenues	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
No-tax Revenues	6.483	0.490	4,368	Alienations + Credits + Services + Extraordinary revenues + Private and public transfers	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Revenues from Transfers	5.102	1.011	4,368	Private and public transfers	Statistical Office - Italian Ministry of Internal Affairs	Per capita log
Revenues from Services	4.370	0.479	4,368	Revenues from provision of Services	Statistical Office - Italian Ministry of Internal Affairs	Per capita log

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents.

Table B.7: Descriptive Statistics and description of the variables. City characteristics.

Variable	Mean	St. Dev.	Obs.	Definition	Source	Unit of Measure
Rural Surface	0.588	0.274	4,368	Rural Surface	ISTAT - Municipalities' Statistical Atlas	Km2
Altitude	159.7	158.5	4,368	Meters above the sea level	ISTAT - Pop. Census	Meters
Density	0.00353	0.00361	4,368	Population/Surface	ISTAT - Pop. Census	Inh./Km2
Docg	1.294	4.126	4,368	Surface used for DOCG and DOC productions	ISTAT - Municipalities' Statistical Atlas	Km2
Elderly	0.140	0.0403	4,368	Share of over 65 in the population	ISTAT - Pop. Census	Perc. points
Farms	637.0	567.3	4,368	Number of farms	ISTAT - Municipalities' Statistical Atlas	Number
Migrants	0.00491	0.00386	4,368	Share of migrants in the population	ISTAT - Pop. Census	Perc. points
Mount. Surface	0.184	0.351	4,368	Mountainous Surface	ISTAT - Municipalities' Statistical Atlas	Km2
Retired	0.151	0.0515	4,368	Share of retired in the population	ISTAT - Pop. Census	Perc. points
Students	0.0723	0.0128	4,368	Share of students in the population	ISTAT - Pop. Census	Perc. points
Surface	49.89	49.97	4,368	Total surface of the municipal territory	ISTAT - Pop. Census	Km2
Tourism	0.0147	0.0120	4,368	Share of employed in tourism	ISTAT - Pop. Census	Perc. points
Touristic Supply	0.0883	0.305	4,368	N° of sleeping accommodations per capita	ISTAT - Pop. Census	Weighted average Number*Category
Unemployment	0.0278	0.0167	4,368	Unemployment Share	ISTAT - Pop. Census	Perc. points
Early Termination				1 if the term ends before fifth year	Statistical Office - Italian Ministry of Internal Affairs	Indicator

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents.

Table B.8: Descriptive Statistics and description of the variables. Election results.

Variable	Mean	St. Dev.	Obs.	Definition	Source	Unit of Measure
Num. of candidates	3.770	1.330	4,368	Num. of mayoral candidates	Statistical Office - Italian Ministry of Internal Affairs	Number
Parties in winning coalition	2.244	2.063	4,368	Number of Parties in the winning coalition	Statistical Office - Italian Ministry of Internal Affairs	Number
Num. of lists	6.228	4.634	4,368	Number of lists that compete for the local council	Statistical Office - Italian Ministry of Internal Affairs	Number
Parties in municipal council	3.853	1.956	3,814	Number of Parties elected in the municipal council	Statistical Office - Italian Ministry of Internal Affairs	Number
Size of governing coalition	1.648	1.373	3,814	Number of parties in the council supporting the mayor	Statistical Office - Italian Ministry of Internal Affairs	Number
Vote share of first recipient	0.515	0.114	4,368	Votes in support of the first recipient / Valid votes	Statistical Office - Italian Ministry of Internal Affairs	Perc. points
Vote share of second recipient	0.318	0.0872	4,363	Votes in support of the second recipient / Valid votes	Statistical Office - Italian Ministry of Internal Affairs	Perc. points
Incumbent elected	0.121	0.326	4,247	1 if the incumbent wins next election	Statistical Office - Italian Ministry of Internal Affairs	Indicator
Incumbent runs	0.128	0.334	4,269	1 if the incumbent runs next election	Statistical Office - Italian Ministry of Internal Affairs	Indicator
Turnout	0.780	0.0540	4,368	Voters / Population	Statistical Office - Italian Ministry of Internal Affairs	Perc. Points
Early termination	0.0701	0.255	4,252			

Notes: Election years between 2003 and 2012. Municipalities between 10,000 and 20,000 residents.