A Few Signatures Matter: Barriers to Entry in Italian Local Politics

Santiago Pérez Vincent*

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Abstract

In current democracies, competition for public office is restricted by ballot access regulations meant to screen out frivolous candidates and simplify voters' choice. This paper examines the causal effect of signature requirements -a widespread ballot access regulation- and finds that their impact on electoral outcomes goes beyond the stated goals. I use data on Italian local elections and apply a regression discontinuity design (RDD) to estimate the effect of these requirements on electoral competition, candidates' selection and voters' participation. I find that signature requirements alter key dimensions of local elections: they reduce the number of candidates, decrease electoral competition, lead to a more experienced pool of candidates, and reduce voter turnout. The positive effects of this policy are observed in municipalities with dispersed political power, where signature requirements lead to fewer wasted votes and fewer spoiler candidates. The downside is observed in municipalities with concentrated councils: signature requirements increase the frequency of uncontested races and reduce voters' participation. Findings show how this institutional detail impacts on crucial elements of democracy and suggest that designing efficient electoral institutions needs a clear understanding of the local political context.

JEL codes: D72, H70, C14.
Keywords: signature requirements, running costs, electoral competition, voter turnout, regression discontinuity design.

*Department of Economics, Università Bocconi (santiago.perezvincent@unibocconi.it). I would like to thank Guido Tabellini for his guidance and support in his role of PhD supervisor. I would also like to thank Massimo Morelli and Salvatore Nunnari for their detailed comments on a previous version of the paper. I thank Jerome Adda, Matteo Alpino, Samuel Berlinski, Joseph-Simon Görlach, Selim Gulesci, Nenad Kos, Eliana La Ferrara, Thomas Le Barbanchon, Marco Manacorda, Tommy Murphy, Tommaso Nannicini, Riccardo Puglisi, and Diego Ubfal for the useful discussion and comments. All remaining errors are my own.

"In an ideal political democracy competition is free in the sense that no appreciable costs or artificial barriers prevent an individual from running for office, and from putting a platform before the electorate."

— Gary S. Becker, *Competition and Democracy*

"To simplify matters we have restricted the kind of competition for leadership which is to define democracy, to free competition for a free vote. (...) Between this ideal case which does not exist and the cases in which all competition with the established leader is prevented by force, there is a continuous range of variation within which the democratic method of government shades off into the autocratic one by imperceptible steps."

— Joseph A. Schumpeter, *Capitalism, Socialism and Democracy*

1 Introduction

Competition for public office is an essential feature of democracy. Yet, even in mature democracies, the right to be a candidate is restricted by ballot access regulations, such as signature requirements and filing fees. These regulations are meant to discourage frivolous candidates, who could confuse voters and lead to misrepresentation of the majority.[1]

This argument finds support in a set of recent studies which document features of multi-candidate elections that point to potential benefits of having few candidates, especially under plurality rule. First, the presence of vote splitting, which occurs when people with similar preferences fail to coordinate, vote for different candidates, and dilute their chances of winning. Hall and Snyder (2015) document that the number of *wasted votes* (that is, votes for candidates other than the top two) in US primary elections is significantly smaller when information levels are higher. This finding shows that the extent of strategic voting and coordination is limited by the availability of information regarding candidates' electoral chances, and that voters might sometimes "waste" their vote in sure losers. Second, the existence of *misvotes* due to voter confusion (Shue and Luttmer, 2009). Several works have documented the presence of ballot order and adjacency effects, where candidates (and, particularly, marginal ones) receive votes due to their favorable position on the ballot. Importantly, recent research shows that these effects impact disproportionately on some candidates and voters, and, therefore, could affect the electoral results (Ho and Imai, 2008; King and Leigh, 2009; Shue and Luttmer, 2009). Finally, the presence of

[1]Abrams (1996) examines the US Supreme Court's reviews of state ballot access laws, presenting arguments for and against them. In *Storer v. Brown* (1974), for example, the US Court recognized the "substantial state interest" in providing the electorate with an understandable ballot, and therefore supported "reasonable requirements for ballot position". In Italy, signature requirements are intended to prove the representativeness of candidates (*Istruzioni per la presentazione e l'ammissione delle candidature*, Italian Ministry of Internal Affairs).

expressive benefits and limited strategic behavior from voters. Pons and Tricaud (2017) show, in the context of French parliamentary and local elections, that third candidates reduce the vote share of the top candidate ideologically closest to them, frequently affecting the outcome of the election. In their words, the participation of a third candidate "often results in an outcome that harms a majority of her supporters (...) and a majority of voters".

A frequent institutional response to the need of limiting the number of candidates is requiring people to collect a certain amount of signatures to run for public office. This rule is now commonly accepted and has become the most widespread way to regulate the submission of candidacies in current democracies.[2] Indeed, the "Code of Good Practices in Electoral Matters" (European Commission for Democracy through Law, 2003) provides recommendations on how these signature requirements should be implemented, indicating that they are theoretically compatible with the principle of universal suffrage.

However, despite its ubiquity and acceptance, there is scarce well-identified evidence on whether these requirements achieve the stated goals or not. The existing literature focuses mainly in the United States, relying on selection-on-observables assumptions (Ansolabehere and Gerber, 1996; Stratmann, 2005) or difference-in-differences (Drometer and Rincke, 2009). This paper attempts to fill this gap. I use a regression discontinuity design (RDD) to estimate the causal effect of signature requirements on electoral outcomes in Italian municipalities, exploiting that signature requirements are only present in cities with more than 1000 inhabitants. I use information on more than 5000 mayoral elections in municipalities with 250 to 1750 inhabitants. I consider the period 1993-2000, when the jump in signature requirements did not coincide with any other policy change, allowing me to credibly identify the causal effect of these requirements.

The evidence sheds light on the impact and potential costs of these requirements in an interesting political context. In Italian municipalities just below the 1000-inhabitants threshold (where there are no signature requirements), not many candidates run for office and most of them obtain substantial support: 70 percent of electoral races have two candidates, and runners-up obtain more than 200 votes on average (33% vote share).[3] In this context, with arguably few frivolous or marginal candidates, I find that signature requirements reduce the number of candidates, but do not significantly reduce the frequency of

[2] Afghanistan, Albania, Algeria, Andorra, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Burundi, Canada, Croatia, Denmark, Ethiopia, Germany, Grenada, Guyana, Hungary, Iceland, Italy, Kazakhstan, Libya, Liechtenstein, Lithuania, Luxembourg, Mauritius, Mongolia, Montenegro, Netherlands, Norway, Palau, Paraguay, Poland, Russian Federation, Rwanda, Senegal, Slovenia, Suriname, Switzerland, Tonga, Turkey, Turkmenistan, Tuvalu, and United Kingdom are among the countries indicated by the Inter-Parliamentary Union (IPU) as requiring signatures or nominations from electors to participate in parliamentary elections. In some countries, these requirements apply only to independent candidates, or to just one of the chambers. Information obtained from: www.ipu.org (accessed: October 3rd, 2017).

[3] Figures computed from elections in municipalities with 850 to 1000 inhabitants.

elections with more than two candidates, the number of wasted votes, or the presence of potential spoiler candidates (that is, third candidates obtaining more votes than the difference between the winner and the runner-up). Instead, signature requirements lead to an increase in the number of unopposed races and a reduction in political competition (as measured by the winner's share and the winner's margin).

The estimated impact of signature requirements on the number of candidates and on electoral competition is statistically significant, robust across different RD specifications, and quantitatively relevant. The average number of candidates falls 0.23, a 11 percent drop relative to the mean observed just below the threshold. The frequency of unopposed races doubles, from 10 to 20 percent; and average winner's margin increases 14 percentage points, from 29 to 43 percent. These findings put into question the commonly-held view that "only the most marginal parties seem to have any difficulty gathering the requisite number of signatures".[4] The reduction in political competition and the fall in the number of non-marginal candidates go beyond the aim of avoiding frivolous candidates. These results point to a first risk of signature requirements: acting as a barrier to entry for serious potential candidates and reducing electoral contestation.

To further assess the impact of signature requirements on local politics, I estimate their effect on a set of candidates' and mayors' personal characteristics. The clearer findings in terms of political selection, which are less precise than those observed in electoral competition, point to signature requirements leading to a more experienced and older pool of candidates. There are no significant on measures of candidates' attractiveness (based on personal characteristics associated to winning elections) or incumbents' re-election rates. The absence of a significant change in these variables reinforces the idea that signature requirements do not discourage only frivolous or unattractive candidates.

The changes in the electoral landscape driven by signature requirements extend to voters. I find that signature requirements lead to a drop in turnout (4.7 percentage points), and to an increase in the number of blank and null votes. Estimates are statistically significant and robust to alternative RD specifications. These changes in voters' behavior could be explained both by a rational response to the fall in electoral competition -as in pivotal voter models (Palfrey and Rosenthal, 1983; Myatt, 2015) or ethical voter models (Feddersen and Sandroni, 2006; Coate and Conlin, 2004)- or by an expressive reaction to the absence of a candidate of choice (Pons and Tricaud, 2017). Even if the scenario does not allow me to assess the relative empirical validity of alternative models of voting behavior, it provides clear evidence of a strong reaction of voters to the characteristics of the electoral race. Importantly, these results point to a second risk of signature requirements and barriers to

[4] European Commission for Democracy through Law (2003). *Code of Good Practice in Electoral Matters*. Council of Europe Publishing. p.16.

entry in politics: reducing voters' engagement. Electoral participation is usually considered an essential feature of a healthy democracy, and, therefore, policies that have the potential of affecting it should be carefully evaluated.

The observed effects of signature requirements on electoral outcomes (especially those in the number and characteristics of candidates) can be understood through the lenses of citizen-candidate models (Osborne and Slivinski, 1996; Besley and Coate, 1997). These models provide a theoretical framework to examine how running costs influence the entry decision of potential candidates under plurality voting. For most parameter configurations, these models admit two-candidate elections, giving theoretical support to Duverger's law (Duverger, 1963). However, if running costs are too low, more people might decide to run for office and the presence of spoiler candidates turns into a possibility. If, instead, running costs are too high, one-candidate equilibria (with the sole candidate proposing extreme policies) become possible. Therefore, the normative value of a policy that modifies running costs should consider its impact on both these margins and the relative costs of having an excessive or an insufficient number of candidates.

I propose a framework that explicitly captures this trade-off and examines how it is affected by specific features of the political context. In the model, there is one sure candidate (representing group A) and two potential contenders (each one representing one of two groups with similar preferences, B and C).[5] If only one contender runs, voters in B and C support her and the expected outcome of the election reflects the relative size of A vs. B and C. There are no wasted votes and the majoritarian side always wins. If the two contenders run, they split their votes and increase the likelihood of a victory of candidate A. If no contender runs, candidate A runs unopposed and wins. Shortly, both too many and too few candidates lead to the potential misrepresentation of the majority.

Contenders' entry choice is affected by running costs and the expected probability of winning. An increase in running costs reduces the likelihood of observing three-candidate races at the expense of increasing the chances of having uncontested elections. The greater is the size of group A, the smaller is the expected loss of uncontested elections. The greater is the degree of coordination among the voters of the two contenders, the smaller is the expected loss of three-candidate races. The impact of an increase in running costs on each of these two margins depends, among other things, on contenders' winning chances and, therefore, on the relative size of the groups and on the ability of voters to coordinate.

I then assess if the impact of signature requirements actually varies with the local political context. To do so, I use the distribution of council seats in the year 1992 (before

[5] The setting resembles that of a "divided majority" analyzed in different articles in the literature examining multicandidate elections (see, for example, Bouton and Ogden, 2017).

the jump in signature requirements was introduced) to build a measure of political concentration for each municipality in the sample, and estimate separately the RD effect in cities with low and high concentration. I consider the concentration of the political power since it is arguably related to the expected competitiveness of the election and to voters' ability to coordinate, two features considered in the described framework. In cities with dispersed political power, the introduction of signature requirements has a significant impact on the "correct" margin: the number of races with more than two candidates, the number of wasted votes, and the presence of potential spoiler candidates significantly drop at the cutoff, while there is no significant change in the number of uncontested races. In cities with concentrated political power, instead, the number of unopposed races more than doubles at the cutoff, and there are no significant changes on the other margin. The described framework provides a clear normative assessment of the results: signature requirements reduce the potential misrepresentation of the majority in cities with dispersed political power, and increase it in politically concentrated ones. On the positive side, the framework also implies that in politically concentrated settings, where favoritisms are clearer, the cost of having uncontested elections is smaller.

The differential impact on political competition across municipalities helps also to learn about the drivers of voters' participation. In cities with concentrated councils, where signature requirements lead to a jump in the frequency of unopposed races, turnout drops and the number of blank and null votes increases. Instead, voters' participation does not significantly change in cities with dispersed political power. This result links the two main risks of barriers to entry in politics, associating the fall in voters' participation to the increase in uncontested elections.

This paper is related to two strands of literature. First, to the set of articles examining barriers to entry in politics. Ansolabehere and Gerber (1996), Stratmann (2005), and Drometer and Rincke (2009) examine the impact of signature requirements (and other ballot access restrictions) in US elections. They find consistent evidence of these requirements reducing the number of candidates (especially those independent or from minor parties) in parliamentary elections. Other related papers have examined the role of campaign spending as a barrier to entry in politics (Milligan and Rekkas, 2008). In ongoing research, Avis, Ferraz, Finan and Varjao (2017) exploit a discontinuity in the rule establishing campaign spending limits for Brazilian mayoral candidates. They find that higher spending limits act as a barrier to entry, leading to fewer, more experienced and wealthier candidates. Their results on political competition and selection are similar to my findings, helping to draw a clear connection between two different forms of barriers to entry. They, however, do not observe changes in voters' participation.

Second, in terms of methodology, the paper relates to a growing strand of literature that uses RD designs based on population thresholds to assess the impact of different policies on political and economic outcomes. For Italian municipalities, recent articles have examined the effects of politicians' remuneration (Gagliarducci and Nannicini, 2013), electoral rules (Bordignon et al, 2016) and fiscal rules (Grembi et al, 2016). Eggers et al (2016) provide a brief review of this literature and warn about manipulation of population figures in Italy and other European countries, which could invalidate the RD assumptions and the causal interpretation of the results. In the case examined in this paper, population data is predetermined to the policy change, ruling out the possibility of strategic sorting around the threshold. Nonetheless, I provide different validity checks that reveal no evidence of manipulation.

This paper has two main contributions. First, it contributes to the literature on barriers to entry in politics by providing evidence of the impact of signature requirements based on a novel identification strategy, and for a setting significantly different than previously analyzed ones. Results highlight the importance of these institutional details for political outcomes: signature requirements change the observed extent of both electoral contestation and participation, two dimensions considered central to the functioning of democracies.

Second, it stresses the relevance of the interaction between institutional and political factors in shaping politicians' and voters' incentives, pointing to the need of understanding the local political context to design efficient institutions.

2 Signature Requirements in Italian Municipalities

Municipalities are the smallest administrative units in Italy and are in charge of the provision of public services (including several social services, and waste management). Each municipal government is composed by a mayor, an executive committee and a local council. These local institutions are regulated by national laws, which have been modified in different occasions during the last decades. In 1993, the National Parliament overhauled the municipalities' institutional framework, and established the direct election of the mayor in replacement of the existent parliamentary system.[6] The changes strengthened the role of the mayor, who became the "crucial player of municipal politics in Italy" (Bordignon, Nannicini and Tabellini, 2016), responsible for the administration and representation of the municipality, and with the right to appoint the members of the executive committee. The local council, also elected by the voters and previously the main local institution, remained

[6] Until 1993, citizens voted in a open list system for council members. The elected council would then choose the mayor. Law 81/1993 introduced the direct election of the mayor and established the institutional setting for Italian municipalities until the year 2000 (when it was replaced by *Legislative Decree 267/2000*). The law specified, among other things, the electoral rules, the requirements for potential candidates, and the responsibilities of elected officials and government bodies.

only as a supervisory body, controlling governmental activities and voting on the local budget.[7]

In municipalities with less than 15,000 inhabitants, each mayoral candidate must be accompanied by a single list of candidates for the local council. Elections consist of a single round and voters cannot split their decision: they vote jointly for mayor and council members. The candidate with most votes wins the mayor position, and her companion list gets 2/3 of the seats in the council.[8] To participate in the election, each candidate must file an administrative programme and a petition undersigned by a number of eligible voters (who cannot be among the list of candidates for the local council). Each citizen can only subscribe to one of the lists, and signatures must be certified either by a public notary or by the local authorities. The set of instructions for the presentation of political candidacies published by the Italian Ministry of Internal Affairs indicates that the collection of signatures is intended to ensure the representativeness of those who participate in the electoral race.[9] The amount of signatures needed depends on the population of the municipality, as computed by the last available national census, and jumps at nine different thresholds.

In municipalities with less than 1000 inhabitants, candidates do not need to present signatures. From that population threshold onwards, all candidates must collect some amount of subscriptions to participate in local elections: in particular, in municipalities with up to 2,000 inhabitants, candidates must collect and certify 30 signatures.[10]

The jumps in the number of signatures required facilitate the use of a regression discontinuity design to assess the causal effect of stricter ballot access restrictions on local political outcomes. However, in most cases, changes in signature requirements coincide with changes in other features of local institutions, compromising the plausibility of the identification assumptions.[11] In the 5,000 and 100,000 thresholds, mayors and council members remuneration increases. In the 10,000, 500,000 and one million thresholds, the size of the council increases. Out of the others, I focus the empirical analysis on the 1,000 inhabitants thresh-

[7]The council can terminate the mayoral term by approving a vote of no confidence. That decision, which is really infrequent in Italian municipalities, implies also the dissolution of the council itself.

[8]Only if the two most voted candidates receive the exact same amount of votes, there is a second round.

[9]*Istruzioni per la presentazione e l'ammissione delle candidature*. Italian Ministry of Internal Affairs. 2015. p.13

[10]The rule implies that, in municipalities with exactly 1,000 inhabitants, candidates must collect signatures from 3 percent of the local population. A 3-percent signature requirement is high relative to the uses in other Western democracies. In US, for example, those states with signature requirements generally ask for less than 1 percent of eligible voters (Ansolabehere and Gerber, 1996). The *Code of Good Practice in Electoral Matters* (European Commission for Democracy through Law, 2003) argues explicitly for signature requirements being lower than 1% of the constituency concerned.

[11]Gagliarducci and Nannicini (2013) and Eggers et al (2016) provide a description of the policy changes in Italian municipal institutions occurring at the different population thresholds. Their nonetheless detailed description overlooks the changes in signature requirements.

old for two main reasons. First, signature requirements are introduced at this threshold, thus permitting to compare two qualitatively different scenarios: *with* and *without* signature requirements (as opposed, for example, to the 2,000-inhabitants threshold where the change happens only in the intensive margin). The introduction of signature requirements implies that candidates go through a pre-electoral screening and have to deal with a greater amount of bureaucratic procedures (absent in municipalities below the threshold). Second, a practical consideration: sample size is large around the threshold and allows for a sensible statistical analysis.

For the empirical analysis, I consider just the period 1993-2000, since a law passed in October 2000 (*Legislative Decree 267/2000*) set a 10-percent increase in the mayors' wage at the 1,000-inhabitants threshold, introducing a potential confounding factor and compromising the soundness of the assumption needed to identify a causal effect. The law also reduced the number of signature required to be a candidate in municipalities with 1000 to 2000 inhabitants from 30 to 25. The period and the threshold chosen are particularly fit for the analysis for one additional reason: population figures used to determine the level of signature requirements come from the 1991 population census, and therefore were already determined when the jump in signature requirements at the 1,000-inhabitants threshold was introduced. Before 1993, signature requirements for council lists in municipalities with less than 5000 inhabitants were determined according to the following scale: 10 for municipalities with up to 2000 inhabitants, and 30 for the others.[12] No policies were set to change at the 1000-inhabitants threshold. This is crucial to overcome potential concerns on strategic manipulation of population figures that could invalidate the conclusions of the empirical analysis (I discuss this point further in Section 4.1).

3 Data and Empirical Strategy

To assess the impact of signatures requirements on local political outcomes, I collected information on Italian municipalities with population between 250 and 1750 inhabitants for the period 1993-2000. The sample consists of a total of 2693 municipalities (5408 electoral races), and includes information on electoral results, candidates' personal characteristics, municipal budgets, and socio-demographic indicators.

3.1 Data Sources

Municipal Elections. I obtained the information on municipal elections from the Historical Elections Archives published by the Italian Ministry of Internal Affairs. The information includes the names of all mayoral candidates, the number of eligible voters, the number of votes to each candidate, the number of blank and null votes, and the total seats in the local

[12] *Decree 570/1960*, and its subsequent modifications.

council obtained by each list in municipal elections since 1993.[13]

I use these data to compute different measures of electoral competition and voters' participation. The average number of candidates in the sample is slightly above two: 16.3 percent of the electoral races are uncontested, 64.9 percent have two candidates, and 18.8 percent have three or more. Turnout (computed as total votes over registered voters) is, on average, 80 percent.

Candidates' Characteristics. The Register of Local Administrators published by the Italian Ministry of Internal Affairs provides age, gender, party list, place of birth, and self-reported measures of educational attainment and occupation for all members of municipal governments (mayors, members of the executive committee, and councilmen) since 1985. I match this information using candidates' names in the electoral data to retrieve personal characteristics of 10,690 candidates (96.5 percent of the total) and to construct a measure of experience in municipal government for each candidate. Candidates' average age is 46.6 years; more than 90% of them are male; and they have, on average, 13 years of schooling (high school completed) and 5.3 years of experience in government (counting from 1985).

I complement candidates' personal information with data on the distribution of surnames by municipality computed from the universe of personal tax returns in 2005, originally used by Gagliarducci and Manacorda (2016). I use these data to compute the observed frequency of candidates' surnames as a measure of the depth of their social ties. The median candidate in the sample shares her surname with other 5 adults in the municipality, much more than the median tax-reporting adult in these municipalities (who has a unique surname).

Pre-1993 Councils Composition. I also use the information of the Register of Local Administrators to compute the composition of the local councils in the period 1985-1992.[14] I use the name of the party list of each council member to count the number of different groups in the council and to build a Herfindahl-Hirschman index of seat concentration. This index is a widely-used measure of concentration in legislatures. It is calculated as the sum of the square of the fractions obtained by each of the lists (i.e. $\Sigma_{i=1}^{N} s_i^2$, with s_i being the fraction of seats obtained by list i). The index takes its highest value (equal to 1) when one list has every seat in the legislature.

[13] The information was downloaded from the website: http://elezionistorico.interno.it/ (accessed on April 2nd, 2016). The data set does not include information on municipalities in Sicilia, Valle d'Aosta, Friuli-Venezia Giulia and Trentino-Alto Adige. The electoral information for these regions is not systematically reported in the consulted source.

[14] Electoral information for the municipalities in the sample is available only from 1993, after the change in the electoral system described in Section 2.

Socio-Demographic Indicators. I also use information from the Italian 1991 National Census published by the Italian National Institute of Statistics (Istat).[15] Importantly, from this census, I obtain the official number of inhabitants in each municipality. This figure is used to establish the number of signatures required to stand as candidate in local elections. I also obtain information on population density, age structure, and labor market conditions in the different municipalities.

3.2 Empirical Strategy

To estimate the impact of signature requirements on any political outcomes of interest it is necessary to solve the endogeneity problem that arises if these requirements are correlated with other (potentially unobservable) variables that also determine it (as it is likely to happen, for example, if signature requirements are a constant fraction of constituencies' population). I use a sharp regression discontinuity design (RDD) to deal with this potential endogeneity issue, exploiting that signature requirements are introduced at the 1000-inhabitants threshold. This institutional setting generates arguably exogenous variation in signature requirements, allowing me to estimate their causal effect on local political outcomes.

Following Hahn, Todd and Van der Klaaw (2001), I use the Rubin causal framework to state the identification assumption that allows me to estimate the (local) effect of signature requirements. Let $Y_i(r)$ be the potential outcome Y in municipality i given an institutional setting (r), which can be either "no signature requirements" (n) or "signature requirements" (s). The potential outcome is the value a variable would take under either institutional arrangement and might depend on population (P). I make the following assumption:

RDD Assumption. $E[Y_i(s)|P = p]$ and $E[Y_i(n)|P = p]$ are continuous in P at P_0.

The assumption states that the potential outcomes of the variables of interest do not show a discontinuity at the relevant threshold. Under this continuity assumption, a jump in these variables at that threshold can be interpreted as an effect of the introduction of signature requirements. Hence, the local average treatment effect at the threshold $\tau_{SRD} \equiv E[Y_i(s) - Y_i(n)|P = P_0]$ can be identified by:

$$\tau_{SRD} = \mu_+ - \mu_- \quad \text{with} \quad \mu_+ \equiv \lim_{p \to P_0^+} E[Y_i(s)|P = p] \quad \text{and} \quad \mu_- \equiv \lim_{p \to P_0^-} E[Y_i(n)|P = p]$$

For estimation and inference, I follow Calonico, Cattaneo, Farrell and Titiunik (2018) and use a covariate-adjusted local-linear estimator of τ_{SRD}. The covariate-adjusted estimator

[15] Census results are publicly available at Istat's website: www.istat.it

can lead to important efficiency gains relative to the standard unadjusted estimator. The consistency of this estimator requires, in addition to Assumption 1, that there is no RD treatment effect on the covariates (Calonico et al, 2018). The estimator is formally given by $\hat{\tau}_{SRD}(h) = b_0^+ - b_0^-$, with b_0^+ and b_0^- resulting from the following local linear least-squares estimation:

$$\underset{b_0^+, b_1^+, b_0^-, b_1^-, \gamma}{\arg\min} \sum_{i=1}^{n} (Y_i - \mathbf{1}_{(P<P_0)}(b_0^- - P_i b_1^-) - \mathbf{1}_{(P>P_0)}(b_0^+ - P_i b_1^+) - \gamma Z)^2 K_h\left(P_i - P_0\right)$$

where Z is a set of covariates, h is a positive bandwidth, $K_h(\cdot)$ is a kernel function, and $\mathbf{1}_{(\cdot)}$ denotes the indicator function. The kernel function (that assigns greater weights to observations close to P_0) and the bandwidth localize the fit of the regression near to the threshold. I estimate the regression using covariate-adjusted mean squared error optimal bandwidth (h), a triangular kernel, and compute robust (to choice of bandwidth) confidence intervals, which are shown to provide better empirical coverage than the alternatives available in the literature (Calonico et al, 2014b; Calonico et al, 2018). In the tables and in the appendix, I provide the robustness of the results to the use of a local quadratic regression and alternative bandwidths.

4 Empirical Results: The Effect of Signature Requirements on Local Politics

In this section, I present the RD estimates of the effect of signature requirements on different electoral outcomes. I first discuss a set of validity checks that support the plausibility of the RDD assumptions and the causal interpretation of the estimates.

4.1 Validity of RDD Assumptions

The two main threats to the RDD identification assumption are the presence of strategic sorting of units around the cutoff and the existence of multiple treatments occurring at the cutoff. Eggers et al (2016) discuss the potential problems of RD designs using population thresholds in the Italian context, and indicate there is suggestive evidence of manipulation around some of these thresholds. However, their evidence refers mainly to thresholds where municipal authorities' salaries change, something that does not occur in the setting analyzed in this paper. In the period 1993-2000, the only policy change at the 1000 population threshold was the introduction of signature requirements.[16] Furthermore, as stated

[16] Eggers et al (2016) provide a detailed list of different policies changing at specific population thresholds, but they overlook changes in signature requirements. The only jump they report at the 1000-inhabitants threshold is the increase in wages introduced in October 2000 (*Decreto Legislativo 267/2000*). I confirmed this by doing an independent institutional background check.

in Section 2, population figures used in this period to determine the level of signature requirements were those of the 1991 National Census. In 1991, there were no changes in municipalities' institutional framework at the 1000-inhabitants threshold.[17] The jump in signature requirements at the 1000-inhabitants threshold was introduced later, in 1993. The fact that population figures were already set when the bill was proposed in 1992 eliminates the possibility of strategic sorting around the threshold.[18] The draft of the bill sent to the legislature didn't mention explicit population thresholds for signature requirements, which were introduced in later readings.

Nonetheless, to further address these concerns, I check for the existence of a jump in the density of the running variable (population) at the 1000-inhabitants threshold, a sign of potential manipulation. Figure A.1 in the appendix displays the frequency of municipalities using two different bin widths (20 and 40 inhabitants), and shows no bunching around the threshold. I also formally test for the presence of a jump using the manipulation test proposed by Cattaneo, Jansson and Ma (2017). Table A.1 (appendix) reports the results of the test, using both a linear and a quadratic local polynomial density estimator: the null hypothesis of no jump cannot be rejected (p-values of 0.70 and 0.80, respectively).

To credibly interpret the RD estimates as causal effects it is also crucial that no other determinant of the outcomes of interest varies discontinuously at the 1000-inhabitants threshold (that is, that there are no multiple treatments). Importantly, as indicated above, no other policy changed at that threshold in the period of analysis. I also check for discontinuities in a set of pre-determined socio-demographic variables obtained from the 1991 National Census. Results, reported in Table A.2 in the appendix, show no signs of systematic discontinuities at the 1000-inhabitants threshold, providing further support to the validity of the empirical design. In Tables A.3 and A.4, I report the (placebo) RD effects on the set of region, year and month fixed-effects used as covariates in the main regressions. There are no significant jumps in these variables at the cutoff.[19]

Finally, Table A.5 shows the results of placebo regressions on the number of lists and the seat concentration in local councils for the period 1985-1992, when there were no changes in signature requirements. I find no evidence of a pre-existing jump in these outcomes at the 1000-inhabitants threshold.

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[17] *Decree 570/1960* and its subsequent modifications.

[18] *Bill C.72, April 23rd 1992, XI Italian Legislature*

[19] The continuity at the cutoff of these variables is needed for the covariate-adjusted estimator described in Section 3.2 to be consistent (Calonico et al, 2018).

4.2 Signature Requirements and Electoral Competition

I now examine the impact of signature requirements on the number of candidates and electoral competition. Table 1 reports the RD estimates for a set of outcomes of interest. Each row in the table corresponds to one dependent variable. Column (1) displays the estimates for the baseline specification: local linear regression using the mean-squared-error (MSE) optimal bandwidth proposed by Calonico, Cattaneo, Farrell and Titiunik (2018). Column (2) shows the estimate using a local quadratic regression and MSE optimal bandwidth. Column (3) reports estimates for local linear regressions and a fixed bandwidth of 150 inhabitants. As opposed to the first two, this last column provides estimates using the same effective sample and number of observations across all different outcomes. All regressions include municipality controls, and region, year and month fixed effects (reported in Tables A.2-A.4).

RD results show that signature requirements significantly reduce the number of candidates. The baseline estimate shows a fall in the number of candidates of 0.23, eleven percent of the mean in municipalities just below the threshold. To assess if the fall in the number of candidates is driven solely by marginal candidates, I construct two alternative measures: First, I compute the number of "non-marginal" candidates by counting candidates who obtain the votes of more than 25% of the eligible voters (that is around 230 votes in municipalities close to the threshold or more than 7 times the amount of signatures needed to run) or get at least 85% of winner's number of votes. The idea behind this variable is to leave aside frivolous candidates, and measure how many people with substantial popular support participate in the election. Second, I calcute the "effective" number of candidates (Laakso and Taagepera, 1979). This measure is given by the inverse of the sum of the squared vote shares of all candidates (that is, the inverse of the Herfindahl-Hirschman vote concentration index). If one candidate gets all of the votes, the effective number candidates is equal to one. If all candidates split votes in equal parts, the effective number of candidates is equal to the number of people running. These two measures should be unaffected (or almost) by the addition or exclusion of a candidate who receives a small share of votes. RD estimates indicate that signature requirements significantly reduce both of these measures, showing that also people who potentially receive substantial support are affected by the introduction of these requirements.

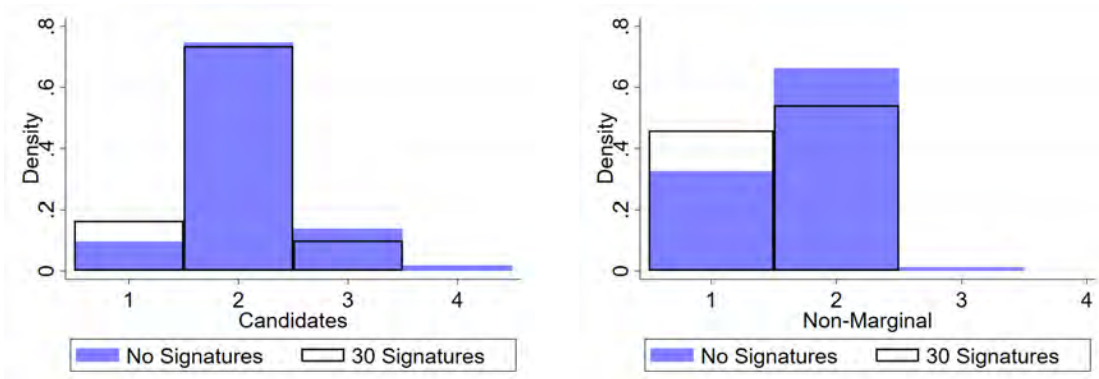
Under plurality rule, the potential benefits of reducing the number of candidates are relevant in elections with more than two candidates. It is in these cases when limited strategic behavior from voters might lead to a misrepresentation of the majority. In a recent paper, Pons and Tricaud (2017) show, in the context of French parliamentary and local elections, that the presence of a third candidate reduces the vote share of the top candidate ideologically closest to her, frequently affecting the outcome of the election. In the context analyzed here, most candidates belong to local parties without common denominations and it is not possible to sort them in terms of ideology. To assess if signature requirements are potentially reducing cases of misrepresented majorities, I estimate their effect on three aspects of elections: (a) the frequency of races with more than two candidates; (b) wasted votes (calculated as votes going to other than the two top candidates as a percentage of eligible voters); and (c) the frequency of elections where the number of wasted votes is larger than the difference between the winner and the runner-up. This last variable indicates the potential presence of a spoiler candidate. RD estimates show no significant impact of signature requirements on these dimensions. Coefficients are negative for the three variables across all different specifications, showing that signature requirements might be "simplifying" voters' problem by reducing the need of strategic considerations. However, standard deviations are large and it is not possible to reject the null hypothesis of no effect.

Signature requirements have a clearer impact on a different margin: the frequency of unopposed races. The introduction of these requirements leads to a sharp increase in the number of one-candidate elections. RD baseline estimate indicates that the frequency of unopposed races doubles at the cutoff, jumping 10 percentage points (from 10 to 20 percent). This increase underscores one potential risk of stricter barriers to entry: reducing "too much" the number of candidates. While, as discussed above, having too many candidates might be prejudicial, it is harder to argue in favor of unopposed races. Electoral contestation and, in particular, the presence of at least two valid alternatives is usually considered an essential feature of well-functioning democracies.

Figure 1 shows the distribution of the number of candidates and "non-marginal" candidates in elections for municipalities just around the threshold (with 950 to 1050 inhabitants), and helps contextualize the above results. The histograms reveal two key facts about mayoral elections in these municipalities: First, even in the absence of signature requirements, there are few candidates running (almost 80 percent of the races have just two candidates). Second, most candidates get substantial support, with runners-up obtaining, on average, more than 230 votes (or almost 8 times the number of signatures needed to run in cities above the threshold). This electoral context implies that changes in the number of candidates are likely to result in important changes in the extent of political competition. Indeed, Table 1 shows that signature requirements lead to a significant fall in electoral competition, as measured by the winner's vote share (percentage of votes obtained by the winning candidate), and the winner's margin (the difference between the votes obtained by the winner and the runner-up divided by the sum of their votes). In the baseline specification, average winners' share increases 7.9 percentage points; and average winners' margin increases 14 percentage points, from 29 to 43 percent.

Figure A.2 provides the graphical representation of the regression discontinuity design. The jump at the 1000-inhabitants threshold can be clearly seen for each of the variables. To further assess the robustness of the results to different bandwidths, I estimate the RD

Figure 1: Signature Requirements and Number of Candidates



[a] Left panel: raw number of candidates. Right panel: non-marginal candidates (as defined in Section ??). Frequencies computed using information from elections in municipalities with 950 to 1050 inhabitants. Number of elections below (above) the threshold: 166 (170).

effects for each variable using bandwidths between 50 and 300 inhabitants (every 10 inhabitants). The different coefficients (and their 95% confidence interval) are displayed in Figure A.3. The graphs show that coefficients maintain their statistical significance and are relatively stable across specifications. Lastly, I estimate placebo RD effects at 300 arbitrary thresholds (specifically, at every value in the ranges 700-850 and 1150-1300) and I compare them with the true coefficient. This exercise helps to assess the reliability of the design by checking if there is evidence of systematic discontinuities at other cutoffs. The expectation is to find few jumps similar to the baseline results. Figure A.6 (first five graphs) shows the distribution of the placebo RD effects: for each variable, as expected, the distribution of the false coefficients is centered around zero and the value of the true coefficient lies at (or very close to) one of the extremes of the distribution. Table A.7 reports some summary statistics of the placebo effects and facilitates the comparison with the true coefficient.

Overall, results show that signature requirements have a large and significant impact on local electoral races, which goes beyond the goal of ensuring the representativeness of the candidates and avoiding frivolous ones. These findings underscore that signature requirements act also as a barrier to entry for serious potential candidates, who might be deterred from running for office. This is particularly important in settings as the analyzed here where the perks of office might not compensate the additional costs. This has two important implications: First, that the normative evaluation of this policy should carefully weigh the potential benefits of avoiding frivolous candidates against the potential costs of discouraging serious contenders. Second, that the fact that "only the most marginal parties seem to have any difficulty gathering the requisite number of signatures”[20] cannot be used as a sound criterion for such evaluation.

4.3 Signature Requirements and Selection

To further assess the impact of signature requirements on local politics, I estimate their effect on a set of candidates’ and mayors’ personal characteristics. Table 2 reports RD estimates of the effects for candidates’ characteristics (using averages across candidates for each election). Table 3 reports results for mayors. Both tables show estimates using alternative specifications, with each row corresponding to one dependent variable.

Signatures requirements do not impact on the gender distribution of candidates and mayors. More than 90% of candidates and mayors are male, both above and below the cutoff. The clearer findings in terms of political selection, which are still less precise than those observed in electoral competition, refer to governmental experience and age. Coefficients on age are consistently positive across specifications (both for mayors and candidates). This result is consistent with older candidates being more able to bear the costs associated to signatures collection, something that could be explained, for example, by them having better connections among neighbors or more spare time to devote to the associated bureaucratic procedures. I test this hypothesis by checking if the “surname frequency” (% of tax-reporting adults sharing the same surname of the candidate or mayor) of mayors and candidates increases at the cutoffs: coefficients are consistently positive but imprecise, giving no clear conclusions on whether signature requirements favor people with deeper social ties or not. Signature requirements do increase the average governmental experience of candidates. Baseline estimates show that candidates’ average experience in local government jumps almost 0.85 years at the cutoff, a 16% increase relative to the mean just below the threshold. This jump translates to a similar (but less precisely estimated) increase in mayors’ average governmental experience. Mayors’ average education, on the other hand, falls with the introduction of signature requirements.

To observe if, beyond changes in some specific characteristics, signature requirements impact on candidates’ general appeal or quality, I follow Avis et al (2017) and construct a measure of candidates’ “propensity to win”. I use electoral races in the period 1993-2000 in municipalities with 2000 to 3000 inhabitants (that are not included in the RD sample) to estimate how different personal characteristics (gender, age, schooling, experience in government, incumbency, and surname frequency) relate to the probability of winning an election. The model shows that schooling, experience in government and incumbency are strong predictors of electoral victory (Table A.6). I then use the estimated coefficients to

[20]European Commission for Democracy through Law (2003). *Code of Good Practice in Electoral Matters.* Council of Europe Publishing. p.16.

predict the "propensity to win" of each candidate in the RD sample. RD estimates show a slight increase in the average propensity to win at the cutoff, which is not statistically significant at standard confidence levels. The absence of a significant change is again consistent with signature requirements not just discouraging frivolous or unattractive candidates. As mentioned in the previous section, most candidates in these municipalities (both with and without signature requirements) receive a substantial amount of votes and therefore it is not surprising to see that the average probability of winning does not significantly change at the cutoff.

Finally, I then estimate the effects signature requirements on incumbents' behavior. In these period (1993-2000), incumbents did not face binding term-limits (since terms served as mayors previous to 1993 were not taken into consideration). Signature requirements do not significantly impact on incumbents' unconditional probability of re-running (Table 2, last row) or being re-elected (Table 3, last row). In this last case, coefficients are consistently positive across specification (pointing to signatures increasing incumbency advantage) but estimates are imprecise and the null hypothesis of no effect cannot be reject at standard confidence levels.

4.4 Signature Requirements and Voters' Participation

In addition to electoral competition and candidates' selection, I estimate the impact of signature requirements on voters' electoral participation. I consider three different variables: turnout, blank and null votes, and candidate votes (that is, votes casted for one of the candidates in the election). In all cases, I construct the variable as a percentage of registered voters. Table 4 reports the RD estimates for alternative specifications, and Figure A.4 provides graphical evidence of the effects. Baseline RD estimates indicate that signature requirements lead to a drop of 4.6 percentage points in turnout, and a 1.4 percentage points increase in null and blank votes. These effects add up to a large and significant fall in the number of candidate votes: 6 percentage points. All results are stable and statistically significant across different bandwidths (as shown in Figure A.5). Figure A.6 (last 3 graphs) shows the distribution of the RD effects estimated at placebo cutoffs for the different variables: again, as expected, placebo effects are centered around zero and the true effects lie at or very close the extremes of the distributions.[21]

The observed drop in turnout and in the number of candidate votes could be explained both by a rational response to the fall in electoral competition or by an expressive reaction

[21] In the case of turnout and valid votes, there seem to be some "discontinuities" at a few other thresholds (also evident in graphs (a) and (c) in Figure A.4). It is important for the reliability of the results that these jumps are far away from the 1000-inhabitants threshold and that only 4.6 percent (turnout) and none (candidate votes) of the placebo effects are larger in absolute value than the true one (A.7).

to the absence of a candidate of choice. These results are not informative of the relative empirical validity of alternative models of voting behavior, but they still provide some additional information. First, they show that voters respond to the characteristics of the electoral race (as it is fair to assume that signature requirements do not have a direct impact on voters' participation). Second, they confirm that the impact of signature requirements on competition and selection are non-trivial. Importantly, these results point to another risk of introducing barriers to entry in politics: reducing voters' engagement. Electoral participation is an essential feature of healthy democracies, and, therefore, policies that have the potential of affecting it should be carefully evaluated.

5 The Costs and Benefits of Signature Requirements

The observed effects of signature requirements on electoral outcomes (especially those in the number and characteristics of candidates) can be understood through the lenses of citizen-candidate models (Osborne and Slivinski, 1996; Besley and Coate, 1997). These models provide a theoretical framework to examine how running costs influence the entry decision of potential candidates under plurality voting. For most parameter configurations, these models admit two-candidate elections, giving theoretical support to Duverger's law (Duverger, 1963). However, if running costs are too low, more people might decide to run for office and the presence of spoiler candidates turns into a possibility. If, instead, running costs are too high, one-candidate equilibria (with the sole candidate proposing policies distant from the "median" position) become possible. Therefore, the normative value of a policy that modifies running costs should consider its impact on both these margins and the relative costs of having an excessive or an insufficient number of candidates.

I propose a theoretical framework to capture this basic trade-off. The main idea is that, in a plurality election, the effective competition is among two candidates, an intuition that, according to Riker (1982) goes back to Droop (1869).[22] The second idea is that adding a second candidate to a one-candidate election cannot reduce voters' welfare and might actually improve it. In elections with two candidates, the only non-weakly dominated strategy is to vote sincerely. Therefore, the extra candidate cannot harm voters: she will only be elected if preferred by the majority. The final idea is that third candidates can harm voters by splitting the votes of the supporters of one of the top two. As mentioned in the introduction, Hall and Snyder (2015) and Pons and Tricaud (2017), among others, provide empirical evidence on voting behavior in multi-candidate elections that support this last

[22]Droop (1869), as quoted in Riker (1982): "Each elector has practically only a choice between two candidates or sets of candidates. As success depends upon obtaining a majority of the aggregate voters of all the electors, an election is usually reduced to a contest between the two most popular candidates or sets of candidates. Even if other candidates go to the poll, the electors usually find out that their votes will be thrown away, unless given in favour of one or other of the parties between whom the election really lies."

point.

The framework focuses on the "quantity" dimension of the pool of candidates, neglecting most of the discussion on its "quality". In classic citizen-candidate models (Osborne and Slivinski, 1996; Besley and Coate, 1997), changes in entry costs might impact on the profile of candidates without necessarily changing the number of candidates. The main intuition obtained from these models in this regard is that, as entry costs increase, equilibria with more extreme candidates become possible. The literature on politicians' wages and candidate selection also provides useful insights on the relationship between entry costs and the politicians' quality, especially if these costs are heterogeneous across candidates (Besley, 2004; Caselli and Morelli, 2001, 2004). In these cases, the joint distribution of entry costs and governmental ability become crucial to understand if increasing barriers to entry could increase or decrease the average quality of candidates. Despite the theoretically importance of these channels, I focus on the quantity dimension since results from the previous section indicate that, in the examined setting, the most relevant (and clearer) impacts of signature requirements occur in this margin. The following framework tries to capture how signature requirements might impact on the number of candidates and obtain normative implications, examining how some characteristics of the political context moderate this relationship.

General Setting. Individuals in a municipality elect their mayor under plurality voting: the person with the most votes among those who enter the election gets the position. They are divided in 3 groups $\{A, B, C\}$, each one with a preferred policy in the set $\{a, b, c\}$. Preferences are as following:

$$A : a \succ b \sim c \qquad\qquad B : b \succsim c \succ a \qquad\qquad C : c \succsim b \succ a$$

People in group A strongly prefer a over the other two alternatives (and they are indifferent between b and c). People in B weakly prefer b over c, and strongly prefer any of these two over policy a, while people in C weakly prefer c over b, but also strongly prefer any of these over a.

Each group is potentially represented by one candidate, who is committed to implement the group's preferred policy if elected. The model has two stages: an entry stage and a election stage. For simplicity, I assume that candidate A always participates in the election. Therefore, in the entry stage, only candidates B and C decide whether to enter or not in the electoral race.

Election Stage. Elections might have one, two or three candidates. In one-candidate elections, there is no uncertainty: candidate A runs alone and is elected mayor. In two-candidate elections, candidate A is only supported by her group regardless of who she is running against. She gets an expected share of votes equal to $\alpha \in (1/3, 2/3)$, which represents the fraction of citizens in group A. Her contender (candidate B or C) receives the support of the other two groups. The result of the election is influenced by the realization of a random variable $\mu \sim U[-\xi, \xi]$, which represents a popularity shock that drives the support of swing voters in the different groups.[23] The actual share of votes for candidate A is equal to $\alpha + \mu$, and the probability that she wins a two-candidate election is:

$$p_{A/2} \equiv \quad P(\alpha + \mu > 1/2) \quad = \frac{\alpha - 1/2 + \xi}{2\xi}$$

From the formula, we obtain that the greater is α, the higher are the chances that candidate A wins the election. In three-candidate elections, candidate A still receives a share $\alpha + \mu$ of the votes, but candidates B and C split the rest of the votes. I assume that with probability 1/2 each candidate receives a share $p \in (1/2, 1]$ of the votes. This simple voting behavior can be contrasted to the results by Bouton and Ogden (2017), who propose a model of ethical voting in multi-candidate elections in a "divided majority" setting.[24] In their model, there are two types of equilibria: a sincere voting one (each person supports her preferred candidate) and Duverger's law equilibria (voters in B and C coordinate over one of the two candidates). This last type of equilibria is less likely to occur whenever the utility differential between b and c is large, the utility differential between a and the other two policies is small, candidate A is a not an extremely serious threat, and groups B and C are of similar sizes. The difficulty to coordinate could be further augmented if there is limited strategic behavior from voters. Parameter p in this model captures all these different factors that might enhance or undermine the ability of voters in groups B and C to coordinate. In three-candidate races, the winning probability of candidate A:[25]

$$p_{A/3} \equiv \quad P(\alpha + \mu > p(1 - \alpha - \mu)) \quad = \frac{\alpha - \frac{p}{1+p} + \xi}{2\xi}$$

The expression shows that the greater is p and the smaller is α, the lower is the probability that candidate A wins in a three-candidate race. In the extreme case, with $p = 1$, candidate A's probability of winning is not affected by the entry of a third candidate.

Entry Stage. In the entry stage, candidates B and C decide simultaneously whether to enter the electoral race or not. Candidates are office-motivated. The value of office (V) is drawn from a distribution with cumulative density function F_V and is observed by both candidates before taking the entry decision. They compare the expected value of running (that is, the probability of winning multiplied by V) against the cost of doing so (given by parameter c). The pure-strategy Nash equilibrium of the game can be characterized by two

[23] In the following analysis, I restrict the attention to cases where $\xi > \max\{\frac{1}{2} - \alpha, \alpha - \frac{p}{1+p}\}$. This restriction implies that there is no sure winner. The uncertainty surrounding is large enough so that candidate A's probability of winning is strictly between 0 and 1. Parameter p is defined in the following paragraph.

[24] The situation described here corresponds to a "divided majority" setting whenever $\alpha \in (1/3, 1/2)$.

[25] Note that the contender that receives a share $1 - p$ of their votes never wins.

threshold values V_1 and V_2, such that for all $V < V_1$ neither of the potential contenders runs and for all $V > V_2$ both do it. The value of these two thresholds is given by:

$$V_1 = \frac{c}{p_{X,2}} \qquad\qquad V_2 = \frac{2c}{p_{X,3}}$$

with $p_{X,2} \equiv 1 - p_{A,2}$ and $p_{X,3} \equiv 1 - p_{A,3}$. The probabilities of observing a one-candidate race (p_1) and and a three-candidates race (p_3) are:

$$p_1 \equiv F_V(\frac{c}{p_{X,2}}) \qquad\qquad p_3 \equiv 1 - F_V(\frac{2c}{p_{X,3}})$$

The expressions show that running costs affect both the frequency of unopposed races and the frequency of elections with more than two candidates, and that this relationship is moderated by the distribution of the value of office (V) and contenders' expected probability of winning the election.

Normative Analysis. To obtain normative implications regarding the effects of signature requirements, I consider how the probability that the majority is misrepresented is affected by a change in running costs, and how this depends on the other characteristics of the political context. In races with one candidate, candidate A wins with probability one. However, in many cases, candidate A would lose if she faced the competition of one of the other two potential candidates. The difference in the probability that candidate A wins gives a measure of the "loss" of having a one-candidate race. This loss (L_1) is equal to:

$$L_1 \equiv |1 - p_{A,2}| = \frac{1/2 - \alpha + \xi}{2\xi}$$

The expression indicates that the greater is α (that is, the expected support of candidate A), the smaller is the loss of having a one-candidate race. Intuitively, if candidate A is the clear favorite and wins most contested elections, the loss of not having a contender is low.

In the case of three-candidate races, vote splitting and the associated wasted votes also generate a misrepresentation of the majority and candidate A wins more often than in two-candidate races. The loss of having three-candidates races (L_3) is:

$$L_3 = |p_{A,3} - p_{A,2}| = \xi \frac{1-p}{1+p}$$

The expression indicates that the greater is p (the more able are groups B and C to coordinate), the smaller is the loss of having a third candidate. In the extreme case, with $p = 1$, members of the groups B and C do not waste any vote and there is no loss of adding candidates. The overall loss (L), given a set of parameter values, is defined as the expected fraction of races where the majority is misrepresented:

$$
\begin{aligned}
L &\equiv p_1 \cdot L_1 + p_3 \cdot L_3 \\
L &\equiv F_V(\frac{c}{p_{X,2}})\frac{1/2-\alpha+\xi}{2\xi} + [1-F_V(\frac{2c}{p_{X,3}})]\xi\frac{1-p}{1+p}
\end{aligned}
$$

A change in running costs impacts on the extent of misrepresentation of the majority in two ways. The potential reduction of three-candidate races and wasted votes ("positive" margin) comes at the expense of an increase in the frequency uncontested elections ("negative" margin). The relative importance of these two forces depends on the political context, and, in particular, on the extent of coordination and concentration of the political groups. Assuming a uniform distribution with support $[0, \bar{V}]$ for the value of office V (with $\bar{V}$ large enough so that $p_3 > 0$) the expression of the losses can be expressed as:

$$
L = L_3 + \frac{c}{\bar{V}}[3 - 2\frac{p_{X,2}}{p_{X,3}}]
$$

This expression shows that, under this distributional assumption, the increase in running costs reduces the overall loss whenever the chances that a contender wins (B or C) are seriously affected by the inclusion of a third candidate, which occurs, for example, if p is sufficiently low:

$$
\frac{\partial L}{\partial c} < 0 \iff \frac{p_{X,3}}{p_{X,2}} < \frac{2}{3} \iff \frac{p}{1+p} < \frac{1}{3}(1+\alpha+\xi)
$$

6 Empirical Results: Political Concentration and Signature Requirements

I now assess if the impact of signature requirements actually varies with the local political context. I build a measure of political concentration for each municipality in the sample using information on the council seat distribution in the year 1992 (before the jump in signature requirements was introduced). I compute the Hirschman-Herfindahl seat concentration index (HHI) for each municipality, and consider separately those municipalities above and below an index equal to 0.40. This threshold ensures that in cities below it (that is, municipalities with "dispersed" political power) there were at least three groups in the council and there was no group with more than two thirds of the seats. I obtain RD estimates of the effect of signature requirements in each of the two subsamples. I consider the concentration of the political power as a feature related to some of the parameters introduced in the framework described in section 5. The presence of more groups and no absolute majorities in the council can be associated both to unclear favoritisms (low α) and to more dispersed preferences and lower coordination across groups (low p). The impact of signature requirements on the pool of candidates and electoral competition is therefore likely to depend on the extent of political concentration.

Municipalities with Dispersed Political Power.

I report RD results for municipalities with dispersed political power (that is, with a seat concentration lower than 0.40) in Table 5. In these municipalities, signature requirements significantly reduce the frequency of elections with more than 2 candidates. Baseline RD estimates show that the frequency of these races drops 0.16 percentage points at the cutoff, a 75% of the mean just below the threshold. Wasted votes and the frequency of races with potential spoiler candidates are also significantly reduced by the introduction of signature requirements. The RD coefficient on the number uncontested races is positive but smaller in absolute value and imprecise, and it is not possible to reject the null hypothesis of no effect at standard confidence levels. These results point to signature requirements acting on the "positive" margin and helping to simplify voters' problem, potentially reducing vote splitting and the misrepresentation of the majority. The change in candidates' characteristics and voter participation also point in this direction. The average candidates' propensity to win increases at the cutoff, pointing to less attractive candidates being discouraged. Furthermore, there are no significant changes in turnout and in the number of blank and null votes.

Municipalities with Concentrated Political Power.

Results for municipalities with concentrated political power are reported in Table 6. In these municipalities, signature requirements do not significantly affect the number of races with more than two candidates, the share of wasted votes or the fraction of elections with potential spoiler candidates. Instead, the frequency of unopposed races increases sharply at the cutoff. Baseline RD estimate shows that the frequency of one-candidate elections jumps 13 percentage points with the introduction of signature requirements, doubling with respect to the mean in municipalities below the threshold. These changes in the extent of political competition are accompanied by a drop in voters' electoral participation. Turnout falls 5.9 percentage points and the incidence of blank and null votes increases 2 percentage points at the cutoff. In municipalities with concentrated political power, signature requirements impact on the "negative" margin. These results highlight the potential costs of barriers to entry for potential candidates: reducing both electoral contestation and voters' participation, two essential dimensions of healthy democracies.

7 Concluding Remarks

This paper examines the causal effect of signature requirements on electoral competition, candidates' selection and voters' participation. I use data on small Italian municipalities and apply a regression discontinuity design (RDD), exploiting that these requirements are only present in municipalities with more than 1000 inhabitants.

I find that signature requirements significantly reduce the number of candidates, decrease electoral competition, and lead to a more experienced pool of candidates. Signature requirements lead also to a large drop in voters' electoral participation, measured both as turnout and the number of candidates votes. The different results point to signature requirements acting as a barrier to entry for serious potential candidates and not only as a screening tool for frivolous ones. The positive effects of this policy are observed in municipalities with dispersed political power, where signature requirements lead to fewer wasted votes and fewer potential spoilers. The downside is observed in municipalities with concentrated councils: signature requirements increase the frequency of uncontested races and reduce voters' participation.

These findings highlight that the potential impact of signature requirements goes beyond the goals of ensuring the representativeness of candidates and avoiding frivolous ones. The normative evaluation of this policy should therefore carefully weigh the benefits of avoiding frivolous candidates against the costs of discouraging non-marginal ones, a trade-off that, as argued, is likely to be affected by local political factors.

From a broader perspective, the paper serves to: (a) highlight the importance of institutional details: the introduction of signature requirements have a large and significant impact on local electoral races, changing the observed extent of both contestation and participation (two dimensions considered central to the functioning of democracies); and (b) provide an interesting example and explanation about the need to understand the local political environment in order to design efficient institutions.

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Table 1: Effects of Signature Requirements on Number of Candidates and Competition

	Mean	Obs.	(1)	(2)	(3)
Candidates	2.08	1304	-0.23***	-0.22**	-0.21***
			(0.0779)	(0.0967)	(0.0826)
Effective Cands.	1.89	1144	-0.18***	-0.18***	-0.18***
			(0.0622)	(0.0629)	(0.0626)
Non-Marginal	1.69	1088	-0.25***	-0.26***	-0.25***
			(0.0752)	(0.0807)	(0.0757)
> 2 Candidates	0.16	1189	-0.067	-0.054	-0.059
			(0.0490)	(0.0582)	(0.0492)
Wasted Votes	0.021	1171	-0.0091	-0.0088	-0.0084
			(0.00718)	(0.00806)	(0.00711)
Potential Spoiler	0.083	972	-0.025	-0.028	-0.038
			(0.0344)	(0.0382)	(0.0327)
Unopposed	0.095	1974	0.10***	0.11**	0.12**
			(0.0380)	(0.0485)	(0.0499)
Winner's Share	0.63	1136	0.079***	0.079***	0.080***
			(0.0232)	(0.0247)	(0.0236)
Winner's Margin	0.29	1304	0.14***	0.15***	0.15***
			(0.0414)	(0.0479)	(0.0446)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(4), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table 2: Effects of Signature Requirements on Candidates' Characteristics

	Mean	Obs.	(1)	(2)	(3)
Female	0.10	1308	0.0027	-0.00045	-0.0017
			(0.0342)	(0.0393)	(0.0351)
Age (Yrs.)	45.0	1821	1.69*	2.17*	2.09*
			(0.885)	(1.254)	(1.080)
Education (Yrs.)	13.4	1596	0.0026	-0.041	-0.10
			(0.300)	(0.340)	(0.354)
Surname Freq.	0.018	1286	0.0035	0.0052	0.0040
			(0.00379)	(0.00459)	(0.00393)
Gov. Experience	5.13	1304	0.85**	1.10*	0.90*
			(0.430)	(0.570)	(0.466)
Propensity to Win	0.47	2008	0.014	0.016	0.011
			(0.0158)	(0.0191)	(0.0201)
Sindaco (Re-run)	0.62	1800	0.011	-0.025	-0.0099
			(0.0463)	(0.0596)	(0.0544)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(4), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table 3: Effects of Signature Requirements on Mayors' Characteristics

	Mean	Obs.	(1)	(2)	(3)
Female	0.089	1514	0.0046	-0.0044	0.0073
			(0.0422)	(0.0488)	(0.0479)
Age (Yrs.)	45.5	1843	2.40*	2.97*	2.70*
			(1.257)	(1.786)	(1.595)
Education (Yrs.)	13.8	1262	-0.82*	-0.82*	-0.82*
			(0.463)	(0.474)	(0.484)
Surname Freq.	0.018	1359	0.0012	0.0038	0.0019
			(0.00404)	(0.00480)	(0.00419)
Gov. Experience	6.09	1282	1.07*	0.95	1.04
			(0.622)	(0.768)	(0.653)
Propensity to Win	0.56	1961	0.019	0.024	0.025
			(0.0227)	(0.0327)	(0.0290)
Sindaco (Re-elected)	0.52	2033	0.054	0.073	0.076
			(0.0457)	(0.0661)	(0.0596)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(4), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table 4: Effects of Signature Requirements on Voters' Participation

	Mean	Obs.	(1)	(2)	(3)
Turnout	0.82	1119	-0.046***	-0.042***	-0.047***
			(0.0132)	(0.0136)	(0.0133)
Blank/Null	0.057	1907	0.014**	0.015	0.015
			(0.00707)	(0.00979)	(0.00936)
Candidates' Votes	0.76	1171	-0.060***	-0.055***	-0.062***
			(0.0166)	(0.0161)	(0.0169)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(4), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table 5: Municipalities with Dispersed Political Power: Effects of Signature Requirements on Electoral Competition and Voters' Participation

	Mean	Obs.	(1)	(2)	(3)
Candidates	2.13	493	-0.26***	-0.30**	-0.25**
			(0.0977)	(0.128)	(0.105)
Effective Cands.	1.95	485	-0.26***	-0.28**	-0.26***
			(0.0852)	(0.111)	(0.0920)
Non-Marginal	1.70	502	-0.20**	-0.30**	-0.24**
			(0.0949)	(0.126)	(0.104)
> 2 Candidates	0.20	533	-0.16**	-0.15**	-0.14**
			(0.0614)	(0.0667)	(0.0658)
Wasted Votes	0.030	520	-0.030***	-0.029**	-0.028**
			(0.0104)	(0.0115)	(0.0111)
Potential Spoiler	0.14	516	-0.15***	-0.18***	-0.14**
			(0.0535)	(0.0688)	(0.0579)
Unopposed	0.079	685	0.059	0.12	0.088
			(0.0575)	(0.0871)	(0.0744)
Turnout	0.82	709	-0.019	-0.026	-0.028
			(0.0155)	(0.0190)	(0.0188)
Blank/Null	0.060	557	0.0045	0.0049	0.00047
			(0.0131)	(0.0149)	(0.0142)
Candidates' Votes	0.76	607	-0.026	-0.028	-0.028
			(0.0224)	(0.0249)	(0.0256)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(4), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

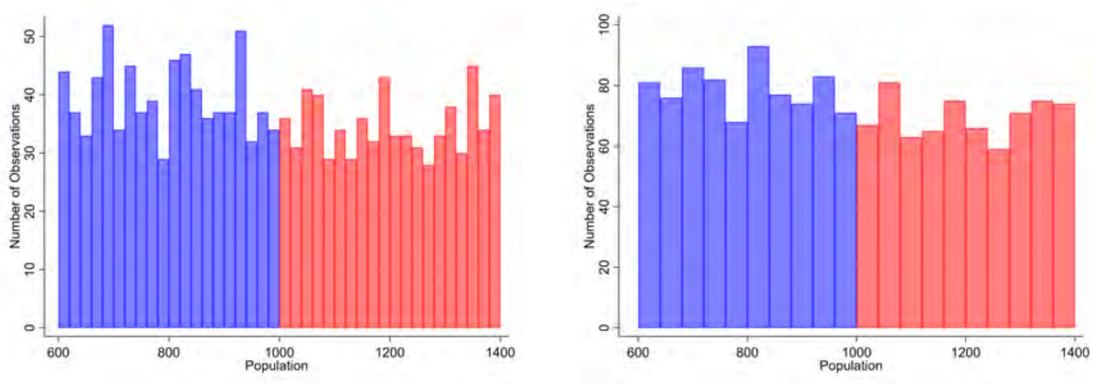
Table 6: Municipalities with Concentrated Political Power: Effects of Signature Requirements on Electoral Competition and Voters' Participation

	Mean	Obs.	(1)	(2)	(3)
Candidates	2.04	888	-0.20**	-0.16	-0.19*
			(0.0935)	(0.122)	(0.101)
Effective Cands.	1.84	754	-0.16**	-0.14	-0.15**
			(0.0704)	(0.0874)	(0.0713)
Non-Marginal	1.69	782	-0.26***	-0.27**	-0.27***
			(0.0852)	(0.104)	(0.0897)
> 2 Candidates	0.13	701	-0.0032	0.033	0.0038
			(0.0585)	(0.0707)	(0.0592)
Wasted Votes	0.014	658	0.0022	0.0063	0.0016
			(0.00781)	(0.00907)	(0.00771)
Potential Spoiler	0.032	449	0.032	0.058*	0.028
			(0.0265)	(0.0307)	(0.0275)
Unopposed	0.11	1145	0.13***	0.13**	0.16***
			(0.0484)	(0.0635)	(0.0587)
Turnout	0.81	632	-0.059***	-0.050***	-0.058***
			(0.0167)	(0.0167)	(0.0165)
Blank/Null	0.055	1194	0.020**	0.022**	0.028**
			(0.00874)	(0.0109)	(0.0115)
Candidates' Votes	0.76	640	-0.087***	-0.070***	-0.086***
			(0.0202)	(0.0201)	(0.0202)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(4), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

A Appendix

Figure A.1: Validation Check: Density of the Running Variable (Histogram)



[a] Left panel: distribution of municipalities by population (1991 census), using 20-inhabitants bins. Right panel: distribution of municipalities by population (1991 census), using 40-inhabitants bins

Table A.1: Validation Check: Density of the Running Variable (Manipulation Test)

	(1) b/se/p	(2) b/se/p
Density Jump	-.0000511	-.0000388
	(.0001041)	(.0001426)
	[0.623]	[0.786]
N	2693	2693
Effective N	1009	1315
Polynomial Order	1	2

[a] Results of manipulation test using the local polynomial density estimators proposed in Cattaneo, Jansson and Ma (2017). Robust standard errors reported between parentheses. P-Value reported between squared brackets.
[b] Stars denote significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table A.2: Validation Check: Continuity in Predetermined Variables (I)

	Mean	Obs.	(1)	(2)	(3)
Density	87.5	1788	77.3	77.8	82.0
			(0.853)	(0.898)	(0.876)
Men-Women	96.9	1268	-1.36	-1.47	-1.67
			(-1.098)	(-1.100)	(-1.287)
Less 6yr. (%)	5.14	1800	0.17	0.42	0.34
			(0.804)	(1.427)	(1.325)
More 75yr. (%)	9.88	1445	0.27	0.20	0.45
			(0.468)	(0.289)	(0.713)
Family Size	2.57	1676	0.059	0.055	0.054
			(1.130)	(0.986)	(0.867)
BA Degree (%)	14.5	1288	0.15	0.33	0.23
			(0.148)	(0.318)	(0.222)
Labor Force (%)	46.9	1235	-0.78	-0.52	-0.84
			(-0.656)	(-0.380)	(-0.688)
Unemp. (%)	15.1	1479	1.44	0.73	2.23
			(0.688)	(0.339)	(0.965)
High-Skill (%)	15.5	1760	0.24	0.58	0.68
			(0.276)	(0.510)	(0.614)
Middle-Skill (%)	51.3	1256	-1.12	-0.59	-1.23
			(-0.474)	(-0.252)	(-0.517)
Low-Skill (%)	10.7	1088	-0.64	-1.13	-0.78
			(-0.417)	(-0.726)	(-0.530)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One

[a] In columns (1)-(3), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table A.3: Validation Check: Continuity in Predetermined Variables (II)

	Mean	Obs.	(1)	(2)	(3)
Piedmont	0.28	1736	-0.084	-0.068	-0.092
			(-1.311)	(-0.930)	(-1.179)
Lombardy	0.24	1340	-0.024	-0.042	-0.017
			(-0.302)	(-0.536)	(-0.202)
Veneto	0.025	1387	0.024	0.020	0.0078
			(0.767)	(0.555)	(0.228)
Liguria/Emilia-Romagna	0.060	1779	0.023	0.021	0.012
			(0.580)	(0.376)	(0.235)
Tuscany	0.018	1310	0.019	0.014	0.016
			(1.380)	(0.971)	(1.183)
Umbria/Marche	0.032	1619	0.036	0.035	0.014
			(0.893)	(0.812)	(0.305)
Lazio	0.049	1158	0.013	0.017	0.021
			(0.511)	(0.636)	(0.841)
Abruzzo	0.053	1676	0.0059	-0.010	-0.0012
			(0.161)	(-0.218)	(-0.0279)
Molise	0.049	1684	-0.0034	0.0039	0.0067
			(-0.120)	(0.123)	(0.218)
Campania	0.070	1676	-0.0014	0.0048	0.042
			(-0.0305)	(0.0873)	(0.769)
Apulia/Basilicata	0.023	1736	0.016	0.0054	0.0087
			(0.717)	(0.202)	(0.347)
Calabria	0.049	2072	0.0097	0.0034	0.012
			(0.282)	(0.0830)	(0.282)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One

[a] In columns (1)-(3), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table A.4: Validation Check: Continuity in Predetermined Variables (III)

	Mean	Obs.	(1)	(2)	(3)
1993	0.063	1569	0.022	0.019	0.023
			(0.838)	(0.600)	(0.763)
1994/1995	0.42	1340	-0.021	-0.019	-0.023
			(-0.665)	(-0.539)	(-0.700)
1996	0.011	1617	0.017	0.015	0.019
			(1.563)	(1.068)	(1.450)
1997	0.086	1430	0.011	0.0040	0.017
			(0.349)	(0.125)	(0.495)
1998/1999	0.38	1583	-0.0061	-0.016	-0.026
			(-0.173)	(-0.371)	(-0.630)
May	0.011	1838	0.0088	-0.0041	-0.00037
			(0.672)	(-0.212)	(-0.0221)
June	0.44	1565	-0.011	-0.0046	-0.028
			(-0.411)	(-0.160)	(-0.879)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One

[a] In columns (1)-(3), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Table A.5: Validation Check: Continuity in Predetermined Variables (IV)

	Mean	Obs.	(1)	(2)	(3)
Council Concentration (HHI)	0.54	1344	0.0014	0.0086	0.013
			(0.0331)	(0.0413)	(0.0365)
Lists in Council	3.28	1707	0.10	0.094	0.050
			(0.164)	(0.237)	(0.208)
Bandwidth			MSE	MSE	150 Inhab.
Polynomial Order			One	Two	One
Fixed Effects			Yes	Yes	Yes

[a] In columns (1)-(3), each figure reports the estimate of a separate regression. Robust standard errors adjusted for clusters at the municipality level are in parentheses. Estimates are obtained from local regressions with triangular kernel. The MSE bandwidth is the mean squared error optimal bandwidth computed using the procedure by Calonico, Cattaneo, Farrell and Titiunik (2018). The effective number of observations for this bandwidth is reported (Obs.). Mean is the average value of the dependent variable for municipalities with 850 to 1000 inhabitants. Regressions include municipality controls, and region, year and month fixed effects. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

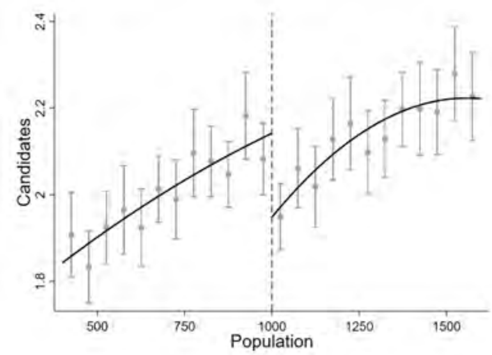
Table A.6: Candidates' Characteristics and Propensity to Win Election

	Coeff.	Mg. Effect
Female	-0.096	-0.031
	(0.0742)	(0.0239)
Age (Yrs.)	0.037**	0.012**
	(0.0170)	(0.00555)
Age (Yrs.) Squared	-0.00047***	-0.00015***
	(0.000177)	(0.0000579)
College	0.33***	0.11***
	(0.0672)	(0.0220)
High School	0.16**	0.053**
	(0.0661)	(0.0214)
Gov. Experience	0.028***	0.0093***
	(0.00706)	(0.00229)
Politician	0.13**	0.045**
	(0.0594)	(0.0203)
Sindaco	1.09***	0.40***
	(0.0663)	(0.0226)
Surname Freq.	0.75	0.25
	(0.951)	(0.311)
Constant	-1.51***	
	(0.401)	
Observations	4077	4077

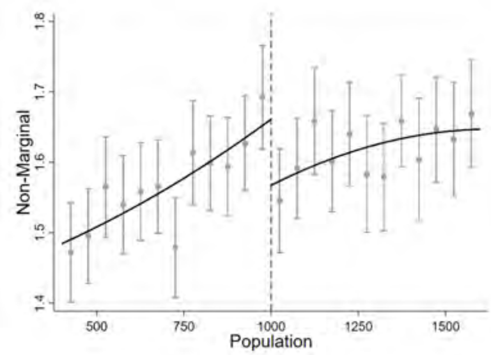
[a] Column (1) reports the coefficient of a probit model with dependent variable an indicator of winning the election. Column (2) reports the marginal effect at the covariates mean. The model is estimated using information on electoral races during the period 1993-2000 in municipalities with 2000 to 3000 inhabitants. Stars denote statistical significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Figure A.2: The Effect of Signature Requirements on Political Competition

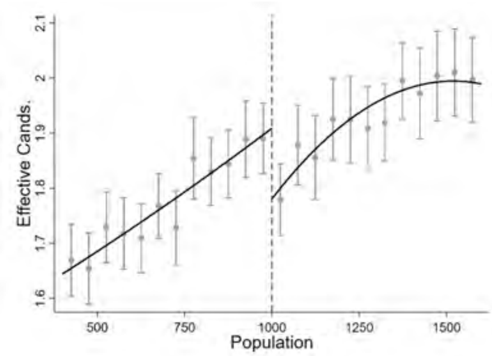
(a) Number of Candidates



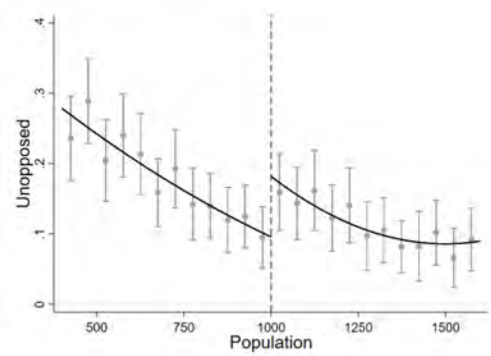
(b) Non-Marginal Candidates



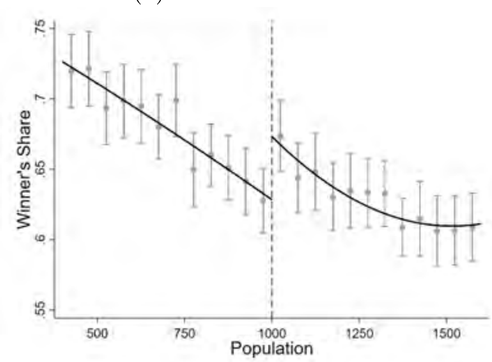
(c) Effective Candidates



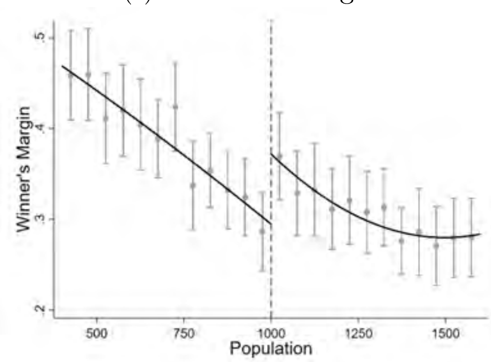
(d) Races with One Candidate



(e) Winner's Share



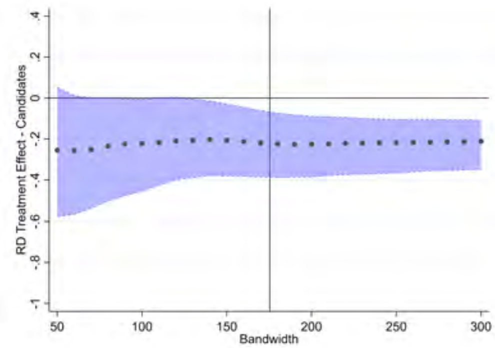
(f) Winner's Margin



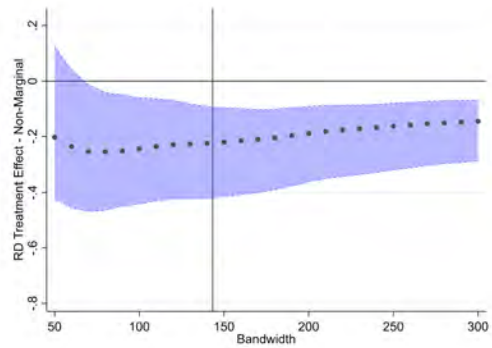
The above figures provide a graphical representation of the regression discontinuity design. The dependent variables are indicated in the title of each graph, as defined in section 4.2. The horizontal axis indicates municipalities' population size according to the 1991 Census. Each point denotes the average of the dependent within a 50-inhabitants bin and its 95% confidence interval. The line shows a second-order global polynomial estimated on each side of the discontinuity.

Figure A.3: Robustness: RD Effects for Different Bandwidths

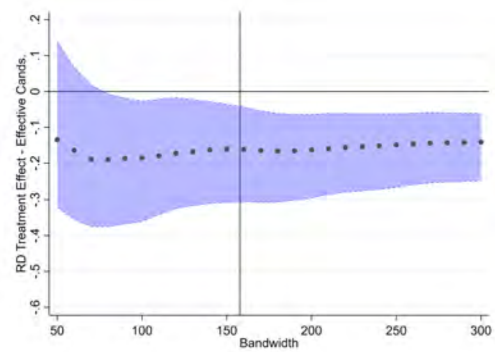
(a) Number of Candidates



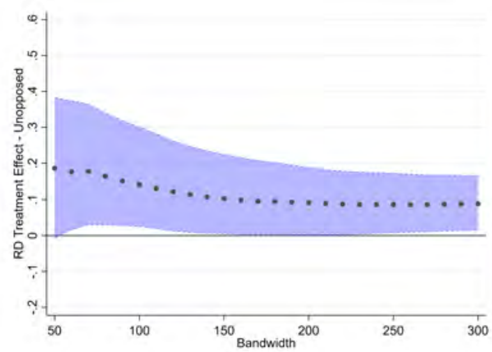
(b) Non-Marginal Candidates



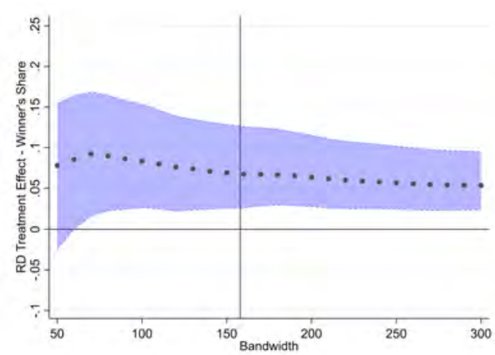
(c) Effective Candidates



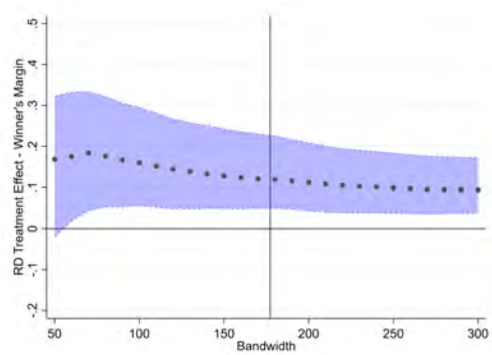
(d) Uncontested Races



(e) Winner's Share



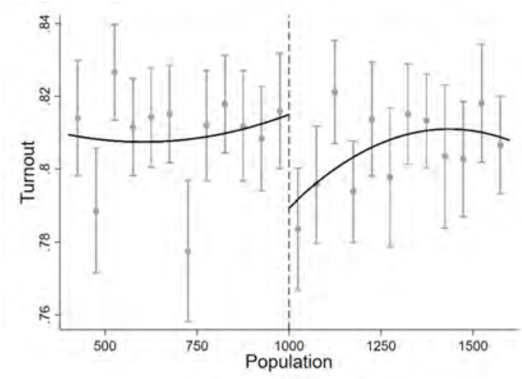
(f) Winner's Margin



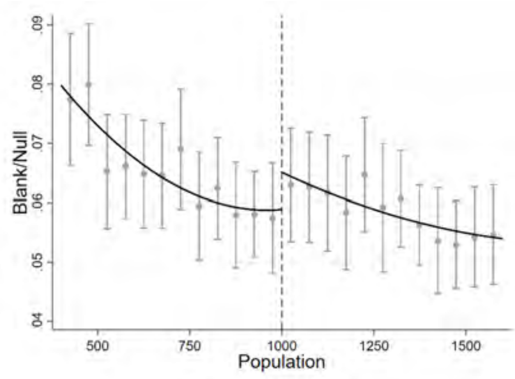
The above figures show the sensitivity of the estimated coefficients to the bandwidth choice. Dots represent the estimated treatment effect of the signature requirements using different bandwidths (reported in x-axis). All estimates are obtained from local linear regressions with triangular kernel. Regressions include municipality controls, and region, year and month fixed effects. The shaded areas represent the 95% confidence interval. The vertical line indicates the value of the MSE optimal bandwidth (Calonico et al, 2018).

Figure A.4: The Effect of Signature Requirements on Political Participation

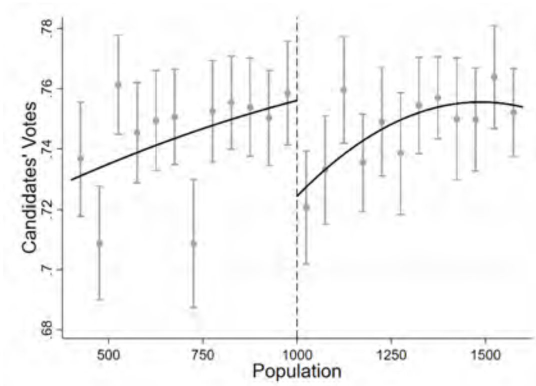
(a) Turnout



(b) Null and Blank Votes



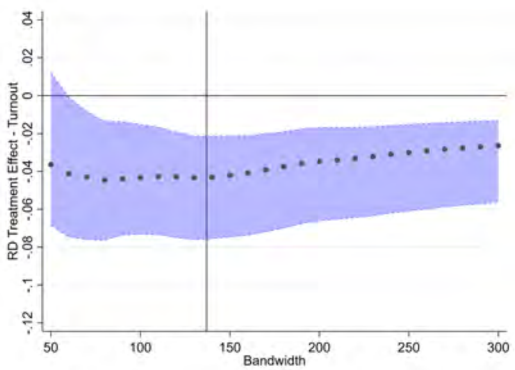
(c) Candidate Votes



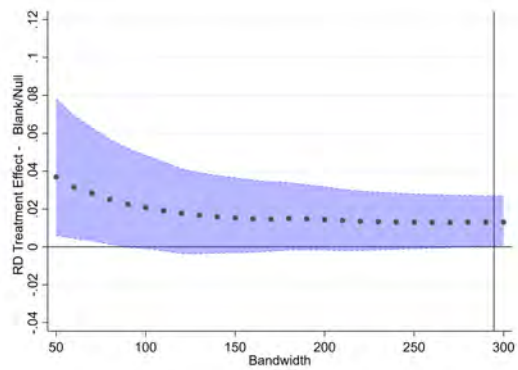
The above figures provide a graphical representation of the regression discontinuity design. The dependent variables are (a) turnout, (b) the percentage of blank and null votes, and (c) the percentage of valid votes. The horizontal axis indicates municipalities' population size according to the 1991 Census. Each point denotes the average of the dependent within a 50-inhabitants bin and its 95% confidence interval. The line shows a second-order global polynomial estimated on each side of the discontinuity.

Figure A.5: Robustness: RD Effects for Different Bandwidths

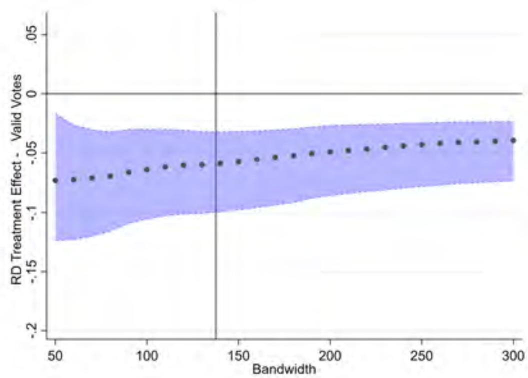
(a) Turnout



(b) Null and Blank Votes



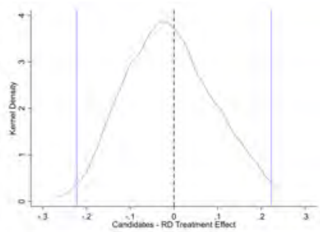
(c) Candidate Votes



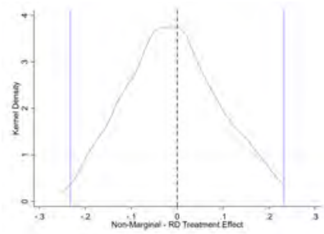
The above figures show the sensitivity of the estimated coefficients to the bandwidth choice. Dots represent the estimated treatment effect of the signature requirements using different bandwidths (reported in x-axis). All estimates are obtained from local linear regressions with triangular kernel. Regressions include municipality controls, and region, year and month fixed effects. The shaded areas represent the 95% confidence interval. The vertical line indicates the value of the MSE optimal bandwidth (Calonico et al, 2018).

Figure A.6: Robustness: RD Effects at Placebo Thresholds (Main Variables)

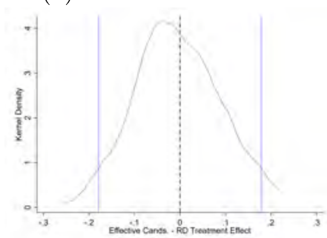
(a) Number of Candidates



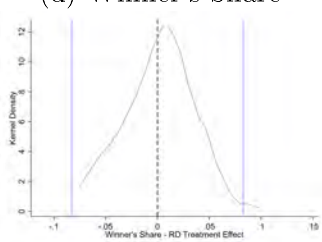
(b) Non-Marginal Candidates



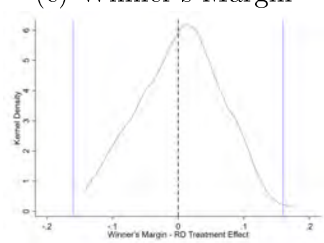
(c) Effective Cands.



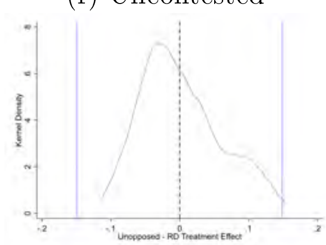
(d) Winner's Share



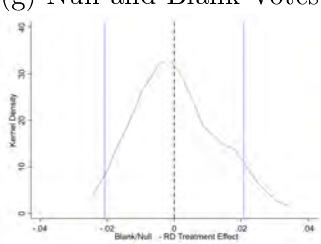
(e) Winner's Margin



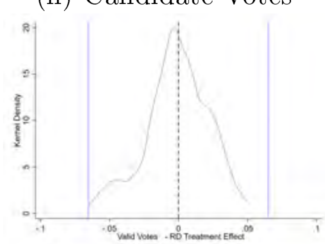
(f) Uncontested



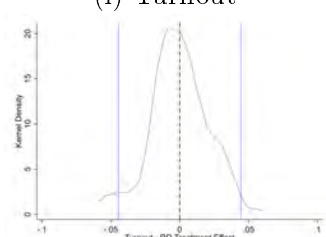
(g) Null and Blank Votes



(h) Candidate Votes



(i) Turnout



The above figures provide the kernel density of the point estimates computed at 300 placebo cutoffs (for each population value in ranges 700-850 and 1150-1300). The vertical blue lines show the value of the true coefficient and its opposite. The vertical dotted line indicates value zero. All estimates (both the true coefficient and the placebo ones) are obtained from local linear regressions with a 150-inhabitants bandwidth. Regressions include municipality controls, and region, year and month fixed effects.

Table A.7: Robustness: RD Effects at Placebo Thresholds (Main Variables)

	True Cutoff		Placebo Cutoffs (Coefficients)		
	(1) Coeff.	(2) p-value	(3) Mean	(4) SD	(5) % > |True|
Candidates	-0.22	0.052	-0.0090	0.098	0.0099
Effective Cands.	-0.18	0.041	-0.0042	0.092	0.056
Non-Marginal	-0.23	0.019	-0.0096	0.10	0.0033
Unopposed	0.15	0.036	0.0017	0.058	0.0033
Winner's Share	0.083	0.012	0.0013	0.033	0.0066
Winner's Margin	0.16	0.0099	0.0026	0.063	0.0066
Turnout	-0.044	0.0027	-0.000092	0.021	0.046
Blank/Null	0.021	0.11	0.00055	0.012	0.089
Candidates' Votes	-0.065	0.00075	-0.00065	0.022	0

Each row in the table corresponds to one dependent variable. Columns (1) and (2) report the RD coefficient computed at the true cutoff (1000 inhabitants) and its p-value. Columns (3) and (4) report the mean and standard deviation of RD coefficients computed at 300 placebo cutoffs (for each population value in ranges 700-850 and 1150-1300). Column (5) indicates the fraction of placebo coefficients that have an absolute value greater than the absolute value of the true coefficient. All estimates (both the true coefficient and the placebo ones) are obtained from local linear regressions with a 150-inhabitants bandwidth. Regressions include municipality controls, and region, year and month fixed effects.