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ELECTORAL RULES AND VOTER TURNOUT

by Guglielmo Barone* and Guido de Blasio**

Abstract

The paper investigates the effect of electoral rules on voter turnout. It focuses on Italian municipalities, where voting schemes are differentiated by the size of the city: a single ballot system applies to municipalities with less than 15,000 inhabitants, while a dual ballot system is in place above that threshold. By exploiting this discontinuity, the paper finds that the dual ballot increases participation at the local polls, with an estimated effect of about 1 percentage point. The increase in voter turnout is associated with wider political representation, politicians of higher quality, greater fiscal discipline, and more robust local development. Finally, we document that the higher political participation triggered by local electoral rules extends to nationwide voting contexts.

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1. Introduction[1]

Voter participation has far-reaching political and economic consequences. Political scientists look at participation as a relevant indicator of the strength of citizens' engagement in the life of the community. Thus, low participation determines the lack of representativeness of democratic institutions and undermines the quality of the democratic process. For example, Lijphart (1997), in his widely cited presidential address to the American Political Science Association, states that "inequality of representation and influence (that) are not randomly distributed but systematically biased in favour of more privileged citizens - those with higher incomes, greater wealth, and better education - and against less advantaged citizens." The economic effects are very relevant too. For instance, democratic participation shapes income distribution and government size (Mueller and Stratmann, 2003) as well as increasing public sector efficiency (Borge et al., 2008). At the same time, voter turnout has declined in the US and in many other established democracies over the last decades and obviously this gives cause for concern. Italy is no exception: abstentionism at the parliamentary elections, which was slightly above 5 per cent at the beginning of the 1970s, steadily increased up to almost 20 per cent in the 2008 election.

For a long time economists have devoted their efforts to understanding voter participation better by using the expected utility maximization framework. A general conclusion is that from the rational, self-interested voter's perspective, the costs of voting usually exceed the benefits. Thus, theory predicts very low voter turnout but this prediction is far from being confirmed by the data. This discrepancy between theoretical predictions and empirical evidence is usually known as the "voting paradox" (Downs, 1957). Scholars tried to solve this puzzle by changing the basic model in various ways, ranging from the objective function to the rationality notion,

etc. (for a survey, see Dhillon and Peralta, 2002).[2] Paralleling the theoretical literature, empirical researchers examined a number of socio-economic, political and institutional variables that potentially affect voting (for a review, see Geys, 2006). Here, a few aspects are to be noted. First, the electoral system – the means by which votes are translated into seats in the process of electing politicians into office – is generally believed to have an effect on the number of people turning out to vote. Notwithstanding, the studies focused mainly on comparisons between proportional systems and majoritarian ones and no general agreement emerged (see also Katz, 1997).[3] Second, the size of the population involved in voting is seen as a first-order explanatory factor for turnout (see Owen and Grofman, 1984 or Mueller, 2003). For instance, smaller-scale elections are likely to display a higher turnout for a number of reasons: (*i*) voters know more about candidates and local issues and so information costs are lower; (*ii*) voters are more likely to be affected by future policies, and (*iii*) they are more exposed to social pressure. This implies that the effect of the population size for turnout has to be carefully differentiated out to gauge the role of different explanatory factors, such as the electoral rules. However, the existing empirical work usually draws conclusions on the basis of simple correlations (most of the time, cross-country correlations; in a few instances, cross-districts: Geys, 2006); therefore it fails to identify genuine causal links to turnout from a certain determinant, e.g. voting schemes.

In this paper, we add to the empirical literature on the determinants of voter turnout by investigating the role of the dual ballot system (as opposed to the single ballot one) in a quasi-experimental setting.[4] The single ballot and the dual ballot are electoral systems widely implemented all over the world, both at the national (for instance, the French president is elected with a dual ballot) and sub-national level (Cox, 1997). On the other hand, the consequences of the two systems in terms of turnout are surprisingly under investigated. Under a dual ballot (or runoff) scheme, voters cast two sequential votes. First, they vote for one of the

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[2] One way to reconcile theory and data is to assume that the act of voting enters positively the utility function because, for example, of civic values which citizens have internalized. In this sense voter participation is strictly related to the concepts of social capital and civic engagement.
[3] For instance, majoritarian systems might deter participation because supporters of the smaller parties are led to believe that their vote is of no importance (Ladner and Milner, 1999). However, proportional systems might also discourage participation insofar as they are more likely to produce multiparty (coalition) governments, which reflect not only the will of the voters but also the result of political deal-making (Blais and Carty, 1990).
[4] Other papers that make use of randomized or quasi-randomized empirical strategies are Gerber and Green (2000), Gentzkow (2006), Hastings et al. (2007); and Funk (forthcoming). However, they do not focus on the role of electoral rules.

candidates who is standing for election. The two candidates who obtain the most votes then compete again in a second round, which defines the winner. By contrast, under a single ballot rule the winning candidate is selected in the first round, following a competition with several other contenders. The institutional setup that characterizes Italy's municipalities is ideal to test whether the dual ballot rule shapes voter turnout: since 1993, there have been two different electoral schemes according to the size of the town. A single ballot applies to municipalities with less than 15,000 inhabitants, while a dual ballot is in place above that threshold. This allows us to exploit a sharp change in electoral rules to identify a causal effect through a Regression Discontinuity Design (RDD).

There are many reasons why the difference between single round and runoff elections are likely to matter for voter turnout. The two systems have different implications with respect to the number of parties/participants in the political competition. This idea can be traced back to Duverger's (1954) conjecture according to which simple-majority single-ballot rules tend to favour the emergence of a two party system while a simple majority with a second ballot (or proportional representation) supports multipartyism. Osborne and Slivinsky (1996) and Wright and Riker (1989) emphasize that since it weakens the incentives for political entities to merge, the dual ballot should be characterized by a higher number of parties compared with the single ballot.[5] The higher number of parties, in turn, might foster voter participation through greater representativeness but, at the same time, there might be a negative effect because the dual ballot could also encourage the formation of governments different from the will of the electorate. Therefore, *a priori,* the net effect is unknown.

The political science literature also suggests that the dual ballot might shift the voters' focus from the views and ideologies of parties and/or lists towards the personal qualities of the individual candidates. As only two candidates run for office, voters are granted a more effective right to choose. In turn, political parties are stimulated to support good candidates (even picked from outside their own ranks) to attract, in the second round, the votes of those

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[5] This can be illustrated with the help of a simple example, taken from Chamon et al. (2008). Consider a single ballot and suppose that 60 per cent of the electorate is left-leaning. If there is only one left-leaning and one right-leaning party contesting the election, the former should easily win. If there are, however, two competing left-leaning parties, the right-leaning one may be able to achieve a relative majority. In this case, under the single ballot the two left-leaning parties should get together and support a single candidate. Under a dual ballot, conversely, the presence of two left-leaning candidates should not affect the final outcome and therefore a higher supply of candidates is warranted.

who had preferred a difference runner in the first round. Once in the office, the focus on individuals rather than parties makes it easier for the voters to judge politicians according to their performance, thus reinforcing the link between performance and reappointment (Seabright, 1996).[6] On the whole, to the extent that the dual ballot favours the rise of a more capable class of politicians and more effective mechanisms of transparency and accountability, people might feel less distant from politics and participation might benefit. By the same token, the impact of electoral rules on voter turnout might be a consequence of the perceived contribution of a given set of rules for the effectiveness of the policies implemented by the elected bodies. Since the seminal work by Persson and Tabellini (2000) electoral systems have mainly been compared in terms of their fiscal implications (see Milesi-Ferretti et al. 2002). In particular, the dual ballot has been associated with greater fiscal prudence (see: Chamon et al., 2008; Bordignon et al., 2010). To the extent that better performance on the part of local governments is spurred by a certain electoral system, turnout can increase because better-managed municipalities enhance the sense of civic duty of the residents, along the lines suggested by Barone and Mocetti (2011).

Our results show that, compared with the single ballot, the dual ballot does increase the political participation of the residents. The estimated magnitude of the effect is non-negligible: it is roughly equal to 1 percentage point. We also document that the increase in turnout is associated with a number of occurrences at the local level: the runoff rule leads to wider political representation, politicians of higher calibre, greater fiscal discipline, and stronger local development, as measured by population and non-tradable price growth. Finally, and very interestingly, our results suggest that the impact on voter turnout is persistent and, hence, not limited to local elections: dual ballot municipalities also exhibit higher voting participation at parliamentary elections. Thus, the latter result provides some support for the idea that turnout reflects civic duty values (and that those values can be encouraged). Overall, and in light of the concerns about the widespread reduction of voter turnout in many countries, we believe that our findings might have important implications for the design of institutions.

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[6] Taking stock of the 2001 Italian municipal elections in the 103 provincial capitals, Baldini (2002) observes that "the dual ballot resulted in voters having more influence and mayors getting more power becoming at the same time more accountable."

The rest of the paper is structured as follows. The next section describes the electoral systems in Italian municipalities. Section 3 explains the methodology used to identify the causal effect of electoral rules. Section 4 illustrates the data. Section 5 presents the empirical evidence: first, it substantiates the empirical design and, then, it provides the results. Section 6 concludes.

2. Municipal electoral systems in Italy

Since 1993, in Italian municipalities residents have voted directly for whom they want to be mayor. The mayor can, in turn, appoint and dismiss the members of his/her cabinet (*assessori* or councillors), who can also be recruited from outside the council. However, what is more relevant to our purposes is that electoral rules vary according to the *size* of the municipality:

- *Below the threshold of 15,000 inhabitants*, a single ballot applies. The candidate who wins the relative majority in the single election is appointed mayor. Under this system, each candidate for the seat of mayor can be backed by one list only and there is a substantial victory bonus: the list supporting the winner gets two-thirds of the seats in the council, while the rest of the seats are assigned to the remaining lists according to a criterion of proportionality.

- *Above the threshold of 15,000 inhabitants*, a dual ballot applies. Under this system, a number of lists instead of just one can back each candidate. There is no direct link between lists and mayoral candidates: voters can split their vote by opting for one mayoral candidate and a list associated with a different candidate (a disjoint vote).[7] If a candidate obtains an absolute majority (that is, over 50 per cent of the votes cast) he or she becomes the mayor; if no candidate wins an absolute majority, then those ranked first and second in the vote go through to a second round, in which they can seek the support of lists whose candidates have been eliminated. After the mayor has been appointed, the council is elected. If the lists supporting the winning candidate have received over 50 per cent but less than 60 per cent of the votes,

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[7] Voters can also abstain in the election for the council, voting only for the mayoral candidate. However, voting for only one list automatically implies a preference for the mayoral candidate supported by that list.

then they receive 60 per cent of the seats in the Council; otherwise, seats are assigned by the criterion of proportionality.[8]

The establishment of two different municipal electoral systems is explained by budgetary reasons. Compared with the single ballot, the dual ballot entails substantial extra outlays, such as the fixed costs for the polls and the double counting process. Therefore, in an effort to minimize the impact on the public finances for small towns, it was decided to apply a single ballot system to municipalities below the threshold of 15,000 inhabitants. After the approval of the reform in March 1993, the new rules began to be implemented gradually, according to the schedule for the new elections envisaged at the local level.

3. Methodology

Our goal is to evaluate whether variations in local electoral rules make a difference to the participation of citizens at elections. As explained above, Italian municipal electoral rules are differentiated by the size of the town: a single ballot applies to municipalities of below 15,000 inhabitants, while a dual ballot system is in place above that cutoff. We exploit this discontinuity to investigate the causal impact of local electoral rules on voter turnout. In principle, different sized municipalities can vary in terms of many observed and unobserved characteristics that can be correlated with measures of political participation. For instance, the literature on turnout highlights the fact that the size of the voting context negatively affects voter behaviour, because it increases transaction costs and waters down social pressure (see, however, Glaeser, 2004, for a different perspective). By applying a regression discontinuity design (RDD), we are able to differentiate out all the characteristics related to size that may confound the identification of the causal effect of local electoral rules.

The main idea behind this research design (Angrist and Lavy, 1999; Black, 1999; and Van der Klaauw, 2002) is that municipalities just below the cutoff size (with a single ballot) make good comparisons with those just above the cutoff (where the dual ballot applies). This strategy is

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[8] For a mayoral candidate who is elected in the second round, the 60 per cent bonus is only granted if no other coalition won at least 50 per cent of the votes in the first round. Since there is the option of a disjoint vote, in principle this outcome is possible.

deemed preferable to other non-experimental methods because if the units of the analysis (in our case the Italian municipalities) are unable to manipulate precisely the forcing variable (their size), the variation in treatment (changes in local electoral rules) around the threshold is randomized as as if the municipalities had been randomly drawn just below or just above the threshold (see Lee, 2008).

One implication of the local randomized result is that the empirical validity of the RDD can be tested. If the variation in the treatment near the threshold is approximately randomized, it follows that all "baseline covariates" – those variables determined prior to the realization of the forcing variable – should have about the same distribution just above and just below the cutoff. Section 5.1 presents a test for the absence of discontinuity in baseline characteristics around the threshold that substantiates the empirical strategy. It also shows that beyond the move from single to dual ballot, no other policy variation occurs at the cutoff. Therefore, our results can be attributed to the sole effect of the changes in the local electoral rules documented in Section 2.

The causal effect of the local electoral rules is assessed by allowing the outcome variable to be a function of the size of the city and testing the existence of a discontinuity in the intercept at the threshold. Operationally, we adopt a parametric approach fitting a highly flexible functional form. We will be running regressions of the following type:

$$Y_m = \beta T_m + g(Z_m) + \sum_{t=2003}^{2010} \lambda_t D_t + \varepsilon_m \qquad (1)$$

where Y_m is our measure of political participation in municipality m; $Z_m = POP_m - 15,000$ represents the forcing variable; T_m is a treatment dummy that takes on the value of 1 if $Z_m \geq 0$ and 0 otherwise;[9] g (·) is a higher order polynomial function in the forcing variable; D_t ($t = 2003 - 2010$) are year dummies equal to 1 if in municipality m and in year t a local election took place (see the next section); and ε_m is the random error. The parameter of interest is β that is the average treatment effect of electoral rules on voter turnout and can be interpreted as the jump between the two regression lines at the threshold. In fact, the estimated average treatment effect at the threshold can be represented as:

$$\hat{\beta} = \lim_{Z \to 0^+} \hat{Y} - \lim_{Z \to 0^-} \hat{Y}$$

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[9] Two regions with a special status adopted different thresholds: 5,000 inhabitants for Friuli-Venezia Giulia and 10,000 inhabitants for Sicily: in these cases Z is accordingly defined.

that is, the difference at the limit of the estimated outcome, as the forcing variable approaches the cutoff from the right and the left, respectively. As is well known, RDD estimates can be highly sensitive to the specification of the functional form of $g(\cdot)$. In the empirical section, an extensive robustness analysis will deal with this issue.

4. Data

Our main dependent variable is voter turnout, defined as the percentage of eligible voters who cast a vote in the single round (for the municipalities below the population threshold) or the first round (for those above the threshold, with a dual ballot in place). The statistical units are the Italian municipalities, for most of which turnout data is available for the 2003-2010 period from the Ministry of the Interior.[10] As the dependent variable, we consider the average value because the adoption of the new rules by each municipality was scattered over time according to the expiration date of the administration in office at the time of the approval of the 1993 reform.[11] On average, in this period, 1.8 local elections took place (median = 2, min = 1, max = 4). Therefore, focusing on a more restricted time span would have unduly reduced the number of observations, making the RDD approach unfeasible. Notably, we can calculate the turnout measure more than 10 years after the introduction of the new rule, a time span that we argue is sufficient to generate an effect, if there is one. Turnout at the parliamentary elections refer to 2001 and are also available from the Ministry of the Interior.

The information on the size distribution of the towns is taken from the Census. To substantiate the empirical design (Section 5.1) we make use of data on the activity rates and the share of employees in the non-profit sector. They refer to the last year of data availability before the reform and are taken from the Censuses. To interpret the results on turnout (Section 5.2) we also use a number of additional outcomes: political and fiscal outcomes are taken from the Ministry of the Interior; local development outcomes are taken from the Census (in terms of

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[10] http://elezionistorico.interno.it/index.php. Data for the 340 municipalities located in Trentino-Alto Adige region are provided by the regional electoral office, which we would like to thank here. Data for Valle d'Aosta and Friuli-Venezia Giulia – two other northern Italian regions – are not available. Overall, our sample includes local turnout data for 7,590 of Italy's 8,101 municipalities.

[11] On average in this period 1.8 local elections per municipality took place (median = 2, min = 1, max = 4).

population growth) and from *Agenzia del territorio* (for real estate price growth).[12] Finally, turnout at the parliamentary elections (Section 5.4) is also available from the Ministry of Interior. Table 1 reports the data sources, the description of the variables and the main descriptive statistics. The average turnout at the local election is 76.8 per cent across the 7,590 Italian municipalities in the sample, with a standard deviation of 8.7 per cent.

5. Results

In this section, we first present the empirical evidence that substantiates the validity of our identification strategy. Then, we provide the estimation results for the effect of local electoral rules on voter turnout. Moreover, we try to interpret the results we obtain on turnout by estimating the impact of electoral rules on a wider set of additional outcomes. Finally, we analyse whether the impact of electoral systems goes beyond that on participation at the municipal elections and overflows on different voting contexts.

5.1. Substantiating the empirical design

The RDD framework relies on the fact that municipalities cannot manipulate their size in order to get a preferred electoral rule applied to them. In our case this requirement is trivially verified. The threshold was decided in 1993 and at that time it was also decided that the reference population was that resulting from the 1991 Census. Moreover, the Census is independently run by the Italian National Institute of Statistics. Finally, even if one accepts that manipulation is feasible, it is not clear what advantage there could be from the municipality's perspective. In any case, we investigate the smoothness of our forcing variable (population size) around the 15,000 threshold. Figure 1 plots the frequency of municipalities whose distance from the cutoff is less than 10,000 inhabitants, using different bin sizes (100, 250, 500 and 1,000 inhabitants). The distribution is positively skewed and a visual inspection reveals a small positive increase in the probability mass after the threshold. At any rate, the hypothesis of non-random sorting around the cutoff is rejected on the basis of the test developed by McCrary (2008).[13]

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[12] *Agenzia del territorio* is a government agency reporting to the Ministry of Economy and Finance and whose mission includes the management of a real estate market observatory.
[13] Results are available from the authors.

Discontinuities in the outcomes at the threshold can be unambiguously attributed to the role of local electoral rules only if no other policy variations occur at the cutoff. This is a reason for concern, as many other regulatory changes for the Italian municipal institutions are implemented as a function of the size of the town.[14] Table 2 shows the changes occurring at various thresholds. They mainly refer to the remuneration of the representatives (mayor, members of the cabinet, members of the council) and the size of the political bodies. Crucially, at the threshold of 15,000 inhabitants no other change occurs beyond that of local electoral rules.

To substantiate the idea that the assignment of the treatment near the cutoff is approximately randomized, we examine whether observed baseline covariates are locally balanced on either side of the cutoff. The regression discontinuity framework provides a natural framework to check whether some confounding factor is driving some spurious correlation. It suffices to run RDD regressions (of the type in equation (1) above) using as dependent variables those factors that the researcher suspects could be driving the results. If no effect is detected then that variable can be considered as controlled for in the RDD exercise. We focus on three characteristics that should capture most of the municipality heterogeneity: the 1991 activity rate (defined as employees and those searching for a job in relation to the population), which measures the degree of socio-economic development; the 1991 share of employees in the non-profit sector, which proxies for pre-treatment local civicness; and a dummy variable equal to one if the municipality is located in one of the special status regions, which have a peculiar institutional set-up that might confound the effects of local electoral rules (regional-level governments also provide generous funding to municipal governments). The results (which are derived from a degree 3 polynomial specification, see Section 5.2) are shown in Table 3: no jump occurs at the threshold as to the activity rate (Column 1) and the share of non-profit employees (Column 2). However, we find weak evidence that the probability of being located in a special status region is not randomized around the threshold (Column 3). As explained by Lee and Lemieux (2009), however, some of the differences in covariates across the threshold might be statistically significant by random chance. To check for this possibility, we combine the multiple tests into a single test statistic that measures whether data are broadly consistent

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[14] They were mostly introduced in the second half of the 1990s.

with the random treatment hypothesis around the cutoff. Table 4 presents the results we obtain by estimating Seemingly Unrelated Regressions (SUR) where each equation represents a different baseline covariate. A χ^2 test for discontinuity gaps in all the equations being zero is strongly supported by data for both samples.

5.2. Baseline findings: the effect of dual ballot on voter turnout

We start by presenting some graphical evidence for the discontinuity of voter turnout at the 15,000 cutoff. Figure 2 we show the mean of the outcome variable for municipalities whose distance from the cutoff is less than 10,000 inhabitants, using different bin sizes (250 and 500 inhabitants). The figure superimposes the fit of a linear regression allowing for a discontinuity at the cutoff and strongly suggests that dual ballot elections induce a larger voter turnout.

Next, we turn to more formal measures of the effect of the electoral rules. Table 5 presents the RDD impact of the change in electoral rules on voter turnout at the threshold. The reported coefficient represents the average treatment effect of the dual ballot rule compared with the single ballot one (standard errors are robust to unknown heteroskedasticity). Column 1 reports the raw mean differences (estimated by fitting a polynomial of order 0) at the cutoff for the voter turnout in the full sample of 7,590 municipalities. There is a statistically significant positive jump of 0.9 percentage points. Then, we present the results from polynomial specifications of increasing order (from Column 2 to Column 4). In all the specifications, we find a positive and significant effect, with a non-negligible economic magnitude of roughly 1 percentage point, which amounts to 1/9 of the standard deviation of the dependent variable.

Table 6 presents a number of robustness checks. Column 1 reports the results we obtain by allowing the degree-3 polynomial of Table 5, Column 4 to have different slopes on the two sides of the cutoff. The results remain undisputed. Column 2 augments the same specification with a number of covariates (we include the variables depicted in Tables 3 and 4 above). As discussed by Lee and Lemieux (2009), because of its local randomized experimental nature it is not necessary to include additional controls in an RDD setting to obtain consistent estimates. However, doing so might reduce the sample variability in the estimator. As a matter of fact, our results show that the inclusion of the additional controls has few consequences, thus validating the identification strategy. Column 3 restricts the estimation sample by about one half of the full sample (we trim the observations outside the bandwidth of ± 12,926 inhabitants around the

cutoff). While remaining highly significant, the point estimate increases to 1.6. Column 4 trims the sample to rule out the very big municipalities, which have additional local elected bodies (*circoscrizioni*) at a finer level of geographic detail. We exclude all towns with a population above 30,000 inhabitants. Results are still confirmed. Finally, we estimate the effect of local electoral rules at fake thresholds. These are placebo experiments, as no treatment takes place at fake thresholds. Following Imbens and Lemieux (2008) in Column 5 we consider the sub-sample with a population of below 15,000 inhabitants and test for a jump at the median of the forcing variable (2,049 inhabitants). Column 6 shows the result of the analogous exercise using the sub-sample to the right of the cutoff point (median = 27,036). In both cases, treatment effects are never significantly different from zero.

5.3 Interpreting the results

The results of the previous section document that one set of electoral rules – the dual ballot – increases the political participation of citizens. This section shows that the boost in participation comes hand in hand with a number of occurrences at the local level. We focus on outcomes linked to politicians' characteristics, public finances and local development. These effects should be interpreted as caused by local electoral rules simultaneously with that on political participation. That is, our evidence can be consistent either with a channel that goes from the higher participation to those outcomes (for instance, greater citizen participation imposes tighter controls on politicians therefore positively affecting the quality of local public services; Giordano and Tommasino, 2011) or a channel that goes the other way around (for instance, better managed municipalities are likely to spur the sense of civic duty of the residents; Barone and Mocetti, 2011).

5.3.1 Representativeness

We start by testing whether differences in local electoral rules cause differences at the political level. Since the source of variation we exploit is one of political nature, it will be unconvincing to attribute effects outside the political sphere if we do not first document that changes indeed occurred in the political arena. One prediction from the political science literature (Section 2) is that single and dual ballot should bear different implications as for the number of parties/lists in the political competition; namely, the dual ballot should be featured by a higher number of political groups and fractions, thus allowing greater representation. Table 7, Panel A shows the results we obtain by using, in a RDD framework as those of Table 5 and Table 6, the number

of different party lists at the local councils. The prediction is nicely confirmed: Column 1 shows that there is an increase of almost 4 parties/lists at the threshold (specification is a degree-3 polynomial). The estimate is confirmed when we take only the regions that were part of the sample of Table 5 and Table 6 (Column 2; municipalities from Valle d'Aosta and Friuli – Venezia Giulia are excluded); allow for varying slopes at both sides of the threshold (Column 3); and introduce the additional controls (Column 4).[15] Our finding on the positive effect of the dual ballot on representativeness is confirmed even if we measure the latter in a different manner. Table 7, Panel B, reports the results of our RDD regressions when the dependent variable is given by the expenditure fragmentation at the municipality-level. It is computed as by 1 minus the Herfindahl – Hirschman index and shares are those relative to self-administration, justice, local police, education, culture, leisure, tourism, roads maintenance, land and environmental management, social services, economic development and business services. Our estimates indicate that the dual ballot entails a non-negligible increase of about 3 per cent in the fragmentation indicator. Overall we conclude that the dual ballot increases representativeness of political preferences.

5.3.2 Quality of local politicians

Another prediction from the political science literature (Section 2) is that the dual ballot should have the effect of stimulating voters to give more weight to the personal qualities of the candidates (and political parties to support high-quality candidates).[16] Clearly, the personal attributes of the politicians in the local executive and the local legislation are mostly unobserved. We do have, however, some observable personal attributes that can used to proxy quality and test theoretical predictions. Table 8, Panel A uses as outcomes the schooling of the major, the members of its cabinet, and the members of the council while Table 8, Panel B, looks at age for the same sample of officials. We find that under dual ballot politicians are featured by a higher schooling (almost one more year) and are more experienced. Anecdotal evidence seems in line with our findings.[17] To corroborate this conclusion we also study the effect of dual ballot on an output-based proxy of politicians' quality. In fact, at the end of the

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[15] To save space, we are not showing the additional robustness checks, analogues to those presented in Table 5 and Table 6, that are generally supportive. Results are available from the authors.

[16] The possibility of a disjoint vote (see Section 2) could have enhanced this mechanism.

[17] For instance, De Cecco and Romanelli (1995, p. 185) argue that as a consequence of the dual ballot a new elite of local leaders emerged: "The first elections with the new scheme in some large cities – among the firsts, Milano, Genova, Venezia, Roma, Napoli and Palermo – have, in effect, experienced the raise of personalities outside the political circles, in some cases with a nationwide prestigious."

day, having politicians of higher quality should have repercussions on better policies. In Table 8, Panel C, we use the share of wage and salary expenditures (over total current expenditure) as the outcome for fiscal prudence and good budget management. When this share is large, in fact, it crowds out more productive expenditures and adds rigidity to the budget management. Based on our estimates, savings on personnel costs are statistically significant in all specifications and economically rather relevant: municipalities whose major is elected through a dual ballot scheme show a 1-percentage point saving for personnel expenditure.[18]

5.3.3 Local development outcomes

Better functioning local institutions should positively impact on the development of the area. Good local politicians and a prudent fiscal stance, documented in the previous paragraph, can be an important ingredient. Additional mechanisms, however, might also be at work. For instance, a good local government might spur growth by efficiently providing public goods, such as infrastructures, to firms. It could also facilitate firms' activities by agreeing and implementing pro-development regulations. By the same token, a good local government might enhance the provision of high-quality services to households, and this might spur inwards population flows. Since data on the wide arrays of local services provided and regulations implemented at the local level are not available, we turn to (reduced-form) estimates of the impact of the dual ballot on the overall economic activity of the area.

As underscored by the literature of regional science and urban economics, residential choices as motivated by the benefits accruing to mobile households.[19] Moreover, Roback-type models of spatial equilibrium (Glaeser 2008) underscore that location-specific factors that positively affect both the productivity of the firms and the welfare of the households will result in higher prices for non-tradable factors, such as houses. In Table 9 we test whether the positive effect of the dual ballot translates in higher population (Panel A) and house price (Panel B) growth rates. We find that for both outcomes this is indeed the case. The effect of the dual ballot is that of increasing the attractiveness of the municipality and boosting real-estate evaluations.

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[18] The point that dual ballot cities are characterized by a more careful management of public money has already been made by Chamon et al. (2008) and Bordignon et al. (2010).
[19] The usual assumption is that individuals care about the local labor market conditions and the prices of a bundle of other location-specific amenities, which can include the provision of public goods.

5.4. Beyond local elections

We have showed that the dual ballot causes higher participation at the elections where this system is in place. In this section we document that the effect of local electoral rules on participation goes beyond that that materializes at the municipal elections. The underlying idea is that if electoral rules have an effect on voter turnout through a change in voter's preferences and this change is not transitory, then one should observe a different behaviour in other electoral contexts too.[20] Hence, we focus on turnover at a nationwide context: the Parliamentary elections. Table 10 shows the results we obtain from using as outcome the municipality-level turnout at the elections for the Chamber of Deputies in 2001. We find a positive effect on turnout, which is highly significant and has a magnitude that is roughly in line with that found for municipality elections. Moreover, to the extent that electoral rules have a persistent effect on voters' behaviour, that is an effect that survives in a different voting context, the case for turnout being a measure of the strength of civic engagement is made stronger.

6. Conclusions

By focusing on the Italian case, where single and dual ballot schemes are differently applied to municipalities according to their size, this paper investigates the effect of voting schemes at the local level on the voter turnout of the residents.

The results show that one set of electoral rules – the dual ballot – increases the political participation of citizens. The estimated impact on voter turnout has a magnitude of roughly 1 percentage point. The highlighting of the exact mechanisms through which this effect materializes goes beyond the scope of this paper. However, we argue that a number of channels that political science suggests may be at work. In fact, we document that the positive implications of the dual ballot for political participation is associated with a number of favourable outcomes: wider political representativeness, the emergence of an elite of more

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[20] Moreover, local elections are competitions in which the potential for patronage-driven voting is maximized, given the proximity between voters and elected officials. At the Parliamentary elections the scope for corruption-driven voting is reduced, both because the wider distance between voters and candidates and the abolition since 1993 of preference voting for this electoral context (citizens cannot pick candidates). Therefore, finding an effect of the dual ballot in the nationwide elections also supports the idea that turnout is a good measure of the interest in the common good and it is contaminated by personal patronage benefits issues.

skilled and experienced local politicians, sounder management of local public finance, positive impacts on reduced form proxies for economic development such as population and house-price growth. We also show that the higher political participation triggered by local electoral rules extends to nationwide voting contexts, suggesting that the dual ballot makes the act of voting enter voters' utility function positively. Overall, we believe that our findings have far-reaching consequences on the design of institutions.

A major caveat is in order. Our identification strategy delivers a highly credible identification of the effect of local electoral rules for the sub-population of municipalities close to the threshold. Away from the threshold, the RDD results may be much less informative. The limited external validity of the RDD is indeed well-known. Needless to say, extrapolating our results to other contexts (say, for different levels of government or other countries) should only be attempted with care.

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Tables and figures

Table 1. Descriptive statistics

Variable	Source	Definition and units of measurement	# Obs	Mean	Std. Dev.	Min.	Max.
Voter turnout at local elections	Ministry of the Interior (1)	Percentage of eligible voters who casted a ballot (first ballot) in municipality elections (average 2003–2010)	7,590	0.768	0.087	0.039	0.992
Population in 1991	National Statistical Institute- 1991 Census of population and housing	Units	8,100	7,009.633	42,450.26	31	2,775,250
Population in 2001	National Statistical Institute- 2001 Census of population and housing	Units	8,101	7,035.643	39,326.61	33	2,546,804
Activity rate	National Statistical Institute- 1991 Census of population and housing	Active population as a percentage of the total population in 1991	8,100	0.413	0.048	0.161	0.637
Share of employees in the non-profit sector	National Statistical Institute- 1991 Census of industry and services	Percentage – 1991	8,115	0.014	0.009	0.000	0.087
Special status region	Italian laws	Dummy variable equal to 1 if the municipality belongs to a special status region and 0 otherwise	8,117	0.173	0.378	0	1
Number of parties/lists	Ministry of the Interior – database of local elected representatives and staff serving in local authorities	# parties in local councils – units, average 1994–2008	8,108	2.539	1.873	1	13.857
Schooling of local politicians	Ministry of the Interior – database of local elected representatives and staff serving in local authorities	# years of schooling for the major, the members of its cabinet, and the members of the council at the municipality level – average 1994–2008	8,108	12.076	1.430	6.567	15.801
Age of local politicians	Ministry of the Interior – database of local elected representatives and staff serving in local authorities	Age of the major, the members of its cabinet, and the members of the council at the municipality level– average 1994–2008	8,108	51.057	3.187	40.595	66.721
Wage and salary expenditures	Ministry of the Interior – database on municipalities' balance sheets	Wage and salary expenditure as a percentage of total current expenditure – average 2001–2005	8,097	0.336	0.082	0.166	0.554
Expenditure fragmentation	Ministry of the Interior – database on municipalities' balance sheets	1 - Herfindahl-Hirschman computed on the basis of the shares of various current expenditure items – average 2001-2005	8,022	0.731	0.076	0.000	0.862
Population growth	National Statistical Institute	Average compounded growth rate in the 1994–2005 period	8,098	0.002	0.020	-0.071	0.121
House price growth	Agenzia del territorio	Average compounded growth rate in the 2002–2007 period	6,345	0.054	0.044	-0.298	0.275
Voter turnout at the Parliament elections	Ministry of Interior	Percentage of eligible voters who casted a ballot at the 2001 elections for the Chamber of Deputies	8,068	0.798	0.107	0.049	1.000

(1) except for Trentino Alto-Adige whose data were provided by the Region.

Table 2. Changes in local institutions as functions of the size of the municipality

Size	Changes
1,000	Mayor's and cabinet members' wages
3,000	Mayor's and cabinet members' wages / size of the council
5,000	Mayor's and cabinet members' wages / inclusion in the Domestic Stability Pact
10,000	Mayor's, cabinet members' and council members' wages / size of the council / size of the cabinet
15,000	Local electoral rules
30,000	Mayor's, cabinet members' and council members' wages / within-city neighborhood councils allowed
50,000	Mayor's and cabinet members' wages
100,000	Mayor's and cabinet members' wages / size of the council / size of the cabinet / within-city neighbourhood councils compulsory
250,000	Mayor's and cabinet members' wages / size of the council / size of the cabinet
500,000	Mayor's and cabinet members' wages / size of the council / size of the cabinet

Source: http://www.camera.it/parlam/leggi/deleghe/testi/00267dl.htm;

Table 3. Balancing properties for the baseline covariates: single equation estimates

	(1) Activity rate	(2) Share of employees in the non-profit sector	(3) Special status region
Treatment	0.003	0.026	0.043+
	(0.002)	(0.037)	(0.024)
Constant	0.414**	1.441**	0.182**
	(0.001)	(0.012)	(0.008)
Observations	8,100	8,100	8,100
R-squared	0.00	0.00	0.01

Notes. The dependent variable in columns (1) – (3) is the Activity rate in 1991, the Share of employees in the non-profit sector in 1991 and a dummy variable for municipalities located in special status regions, respectively. Results are from the specifications as (1) in the text (without year dummies) and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 4. Balancing properties for the baseline covariates: SUR estimates

	(1)
Activity rate	-0.000
	(0.003)
Share of employees in the non-profit sector	0.055
	(0.047)
Special status region	-0.002
	(0.021)
Observations	8,091
χ^2	1.68
p-value	0.641

Notes. The dependent variables are the Activity rate in 1991, the Share of employees in the non-profit sector in 1991 and a dummy variable for municipalities located in special status regions. Results are from the specifications as (1) in the text (without year dummies) and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). All regressions are simultaneously estimated with the SUR estimation method. Standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 5. The effect of the dual ballot on voter turnout at the local elections: baseline results

	(1)	(2)	(3)	(4)
	Degree 0	Degree 1	Degree 2	Degree 3
t01==1	0.009**	0.011**	0.012**	0.009**
	(0.002)	(0.002)	(0.003)	(0.003)
Constant	0.743**	0.742**	0.742**	0.743**
	(0.008)	(0.008)	(0.008)	(0.008)
Observations	7,590	7,585	7,585	7,585
R-squared	0.04	0.04	0.04	0.04

Notes. The dependent variable is voter turnout (average 2003-2010) at local elections. Results are from the specifications as (1) in the text. The polynomial in the forcing variable is of zero, first, second, third degree in columns 1, 2, 3, 4, respectively (corresponding parameters are not reported). All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 6. The effect of the dual ballot on voter turnout at the local elections: robustness

	(1) Varying slopes	(2) Controls included	(3) Restricted sample	(4) Upper trimmed sample	(5) Lower fake threshold	(6) Upper fake threshold
Treatment	0.009+	0.009**	0.016*	0.012+	-0.002	0.000
	(0.005)	(0.003)	(0.007)	(0.006)	(0.005)	(0.005)
Constant	0.746**	0.646**	0.744**	0.748**	0.747**	0.739**
	(0.009)	(0.015)	(0.010)	(0.009)	(0.010)	(0.010)
Observations	7,585	7,575	3,765	7,313	6,945	640
R-squared	0.05	0.15	0.08	0.05	0.05	0.16

Notes. The dependent variable is voter turnout (average 2003-2010) at local elections. Results are from the specifications as (1) in the text and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). In column 1 varying slopes are allowed. In column 2 the specification is augmented with the following controls: activity rate in 1991, share of employees in the non-profit sector, a dummy equal to 1 for municipalities located in the special status regions and 0 otherwise and a dummy equal to 1 for municipalities located in the South. In column 3 the sample is restricted by one half by trimming the observations outside the bandwidth of ± 12,926 inhabitants around the cutoff. In column 4 the sub-sample with a population of less than 15,000 inhabitants is considered. In columns 5 the sub-sample with a population of less than 15,000 inhabitants is considered and the cutoff is at 2,049. In columns 6 the sub-sample with a population of more than 15,000 inhabitants is considered and the cutoff is at 27,036 inhabitants. All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 7. The effect of the dual ballot on representativeness

	(1) Baseline	(2) Same regions	(3) Variable slopes	(4) Controls included
Panel A. Outcome: number of parties/lists in local councils				
Treatment	3.867**	4.098**	3.697**	3.841**
	(0.127)	(0.127)	(0.132)	(0.121)
Constant	2.535**	2.533**	2.936**	1.728**
	(0.047)	(0.048)	(0.102)	(0.131)
Observations	8,096	7,803	8,096	8,096
R-squared	0.68	0.69	0.71	0.69
Panel B. Outcome: expenditure fragmentation				
Treatment	0.030**	0.027**	0.089**	0.028**
	(0.004)	(0.005)	(0.005)	(0.004)
Constant	0.738**	0.740**	0.698**	0.572**
	(0.002)	(0.002)	(0.005)	(0.010)
Observations	8,010	7,790	8,010	8,010
R-squared	0.08	0.08	0.30	0.14

Notes. The dependent variable in Panel A, B is the number of parties in local councils and expenditure fragmentation, respectively. Results are from the specifications as (1) in the text (without year dummies) and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). In column 2 municipalities located in Friuli–Venezia Giulia and Valle d'Aosta are excluded from the sample. In column 3 varying slopes are allowed. In column 4 the specification is augmented with the following controls: activity rate in 1991, share of employees in the non-profit sector, a dummy equal to 1 for municipalities located in the special status regions and 0 otherwise and a dummy equal to 1 for municipalities located in the South. All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 8. The effect of the dual ballot on the quality of local politicians

	(1) Baseline	(2) Same regions	(3) Variable slopes	(4) Controls included
Panel A. Outcome: schooling of local politicians				
Treatment	0.806**	0.774**	1.428**	0.759**
	(0.101)	(0.112)	(0.089)	(0.095)
Constant	12.268**	12.299**	12.037**	10.490**
	(0.044)	(0.047)	(0.080)	(0.170)
Observations	8,096	7,803	8,096	8,096
R-squared	0.17	0.17	0.40	0.28
Panel B. Outcome: age of local politicians				
Treatment	0.649**	0.644**	0.408[+]	0.849**
	(0.127)	(0.135)	(0.220)	(0.130)
Constant	51.152**	51.180**	51.361**	55.131**
	(0.046)	(0.048)	(0.193)	(0.402)
Observations	8,096	7,803	8,096	8,096
R-squared	0.02	0.02	0.02	0.12
Panel A. Outcome: wage and salary expenditures				
Treatment	-0.010**	-0.008*	-0.017**	-0.013**
	(0.003)	(0.004)	(0.006)	(0.003)
Constant	0.335**	0.336**	0.342**	0.438**
	(0.001)	(0.001)	(0.005)	(0.009)
Observations	8,083	7,790	8,083	8,083
R-squared	0.00	0.00	0.00	0.22

Notes. The dependent variable in Panel A, B and C is the years of schooling, the age of local politicians and the wage and salary expenditure as a percentage of total current expenditure, respectively. Results are from the specifications as (1) in the text (without year dummies) and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). In column 2 municipalities located in Friuli–Venezia Giulia and Valle d'Aosta are excluded from the sample. In column 3 varying slopes are allowed. In column 4 the specification is augmented with the following controls: activity rate in 1991, share of employees in the non-profit sector, a dummy equal to 1 for municipalities located in the special status regions and 0 otherwise and a dummy equal to 1 for municipalities located in the South. All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 9. The effect of the dual ballot on local development outcomes

	(1) Baseline	(2) Same regions	(3) Variable slopes	(4) Controls included
Panel A. Outcome: population growth				
Treatment	0.001*	0.001	0.005**	0.001*
	(0.000)	(0.000)	(0.001)	(0.000)
Constant	0.002**	0.002**	-0.001	-0.037**
	(0.000)	(0.000)	(0.001)	(0.002)
Observations	8,091	7,798	8,091	8,091
R-squared	0.00	0.00	0.01	0.09
Panel B. Outcome: house price growth				
Treatment	0.018**	0.021**	0.016**	0.020**
	(0.003)	(0.003)	(0.004)	(0.003)
Constant	0.053**	0.053**	0.055**	0.094**
	(0.001)	(0.001)	(0.003)	(0.006)
Observations	6,342	6,049	6,342	6,342
R-squared	0.02	0.02	0.02	0.05

Notes. The dependent variable in Panel A, B is the wage and salary expenditure as a percentage of total current expenditure and expenditure fragmentation, respectively. Results are from the specifications as (1) in the text (without year dummies) and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). In column 2 municipalities located in Friuli–Venezia Giulia and Valle d'Aosta are excluded from the sample. In column 3 varying slopes are allowed. In column 4 the specification is augmented with the following controls: activity rate in 1991, share of employees in the non-profit sector, a dummy equal to 1 for municipalities located in the special status regions and 0 otherwise and a dummy equal to 1 for municipalities located in the South. All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

Table 10. The effect of the dual ballot on turnout at the Parliamentary election

	(1) Baseline	(2) Same regions	(3) Variable slopes	(4) Controls included
Treatment	0.014**	0.010*	0.056**	0.019**
	(0.005)	(0.005)	(0.009)	(0.004)
Constant	0.799**	0.803**	0.759**	0.541**
	(0.002)	(0.002)	(0.009)	(0.012)
Observations	8,062	7,783	8,062	8,062
R-squared	0.00	0.00	0.01	0.40

Notes. The dependent variable is the voter turnout at Parliamentary elections in 2001. Results are from the specifications as (1) in the text (without year dummies) and the polynomial in the forcing variable is of third degree (corresponding parameters are not reported). In column 2 municipalities located in Friuli–Venezia Giulia and Valle d'Aosta are excluded from the sample. In column 3 varying slopes are allowed. In column 4 the specification is augmented with the following controls: activity rate in 1991, share of employees in the non-profit sector, a dummy equal to 1 for municipalities located in the special status regions and 0 otherwise and a dummy equal to 1 for municipalities located in the South. All regressions use the OLS estimation method. Robust standard errors in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.
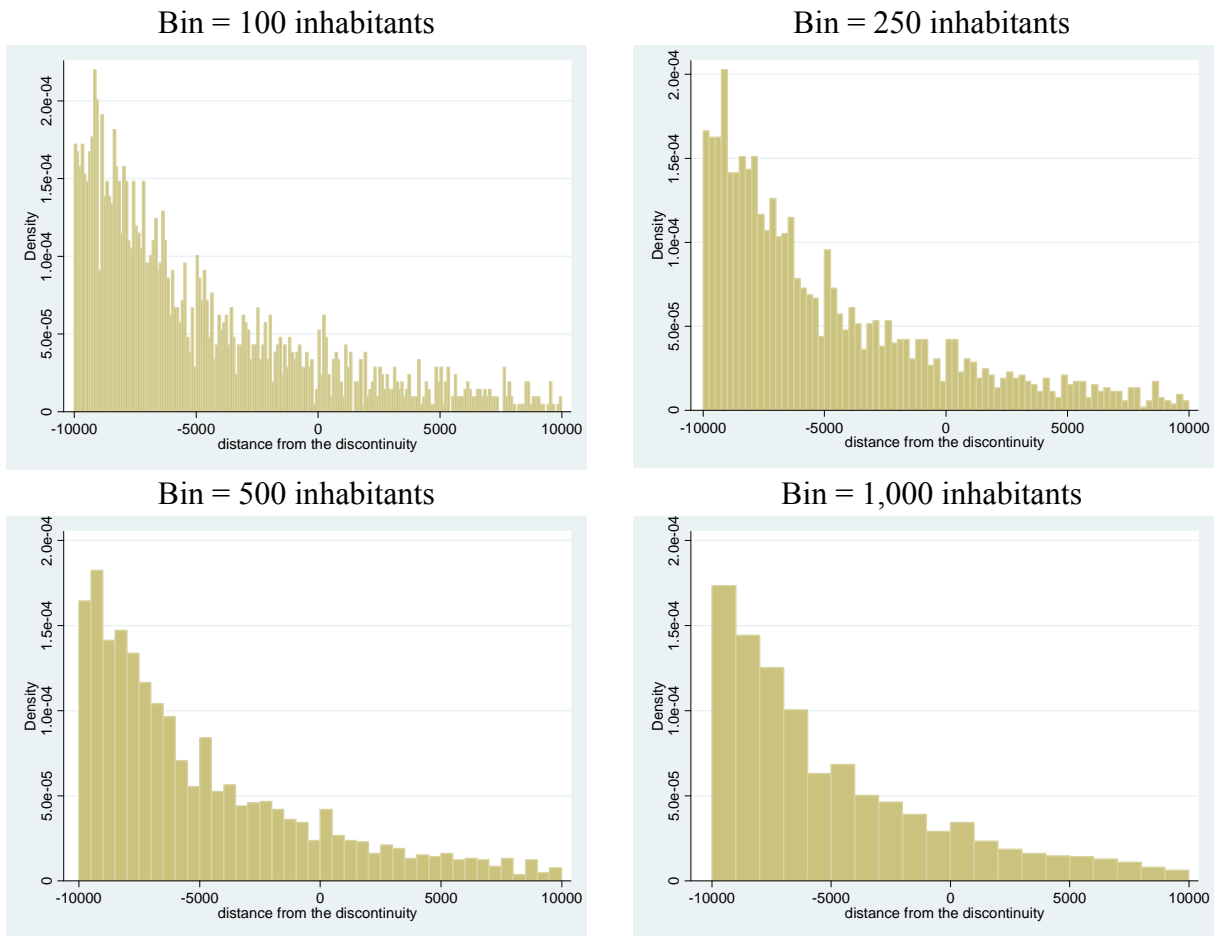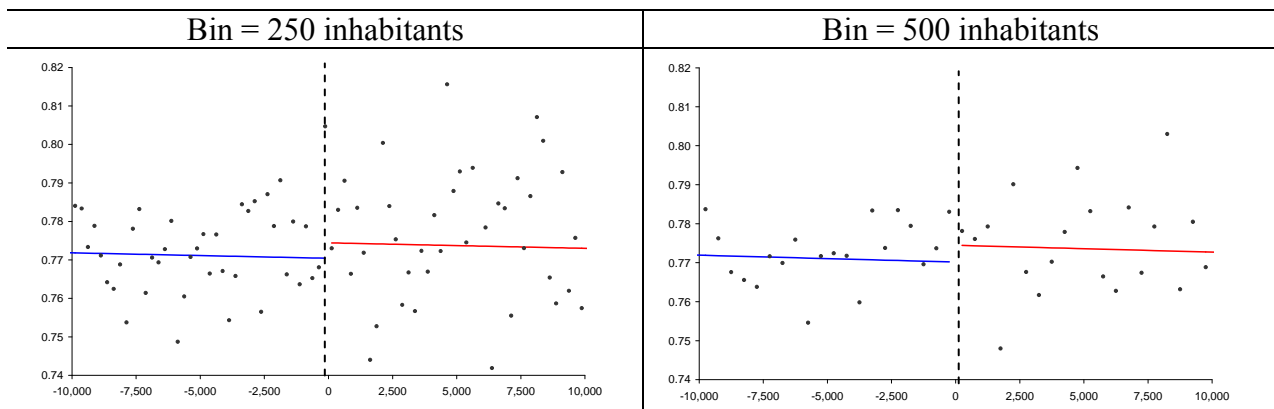
Figure 1. Population density around the threshold

Bin = 100 inhabitants

Bin = 250 inhabitants

Bin = 500 inhabitants

Bin = 1,000 inhabitants

Figure 2. The effect of local electoral rules on voter turnout

Bin = 250 inhabitants

Bin = 500 inhabitants

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