Proportionality and Turnout: Evidence from French Municipalities

Andrew C. Eggers

London School of Economics

April 2013

Many studies find that voter turnout is higher in countries using PR than in countries using plurality, but because so many factors differ between the two sets of countries it is difficult to know precisely why. I focus on municipal elections in France, where cities above a certain population threshold are required to use PR while those below use plurality; this setting allows me to compare political outcomes across electoral systems while holding fixed a large set of social and political features. I find that PR noticeably increases turnout compared to plurality, and it does so particularly in less competitive contexts. I also find evidence that PR encourages entry and raises the quality of competition. The findings highlight the importance of electoral proportionality in explaining cross-national differences in voter turnout.

I. Introduction: voter turnout and electoral systems

What explains voter turnout? Few questions have attracted more attention, both theoretical and empirical, in political science. Early efforts to explain turnout from a rational choice perspective (Downs 1957, Riker & Ordeshook 1968) treated voters as strategic actors who vote in order to influence election outcomes. More recently, attention has shifted to political parties as the locus of strategic activity: citizens' voting decisions may be driven largely by social norms such as a sense of duty, but strategic elites decide whether to activate those norms based in part on the probability that their mobilization efforts will tip the outcome (Aldrich 1993, Cox 1999). Both approaches imply that turnout should be higher when the marginal voter has a higher probability of casting the pivotal vote, a prediction that has largely been borne out in studies showing higher turnout in smaller electorates and in closer elections.[1]

The idea that turnout depends on pivotality has also been used to explain the consistent finding that turnout is higher in systems using proportional representation (PR) than in systems using plurality or majoritarian formulas.[2] Intuitively, the idea is that voters in a plurality election only stand a chance of affecting the outcome when the race is very nearly a dead heat between the top two candidates, whereas voters in a multi-member PR district can affect which party wins a seat in a variety of possible competitive scenarios.[3] This suggests that the *ex ante* probability of being pivotal may be higher on average under PR, which would tend to boost the incentives for citizens to vote and for parties to mobilize voters.[4]

---

[1]See Blais (2006) and Geys (2006) for references.

[2]For reviews of the evidence linking higher turnout to PR, see Blais (2006) and Geys (2006). Higher turnout in PR is attributed to pivotality most clearly in Cox (1999). Other studies tend to emphasize that PR leads to fewer uncompetitive districts than plurality but do not specify whether this is due to the greater number of chances to be pivotal in a PR election than in a plurality election or another factor such as the (geographically) larger districts typical of PR systems (Powell 1986, Jackman 1987, Blais & Carty 1990).

[3]For example, given two parties x and y in competition in a single-member plurality contest (SMP), a voter can only cast a decisive vote if party x's vote share is $1/2$; with the same two parties competing under the Sainte-Laguë electoral formula and four seats at stake, a voter can be pivotal if party x's vote share is $1/8$, $3/8$, $5/8$, or $7/8$.

[4]The criticism could be made that the probability of casting a pivotal vote is so low under both PR and plurality that we should not expect pivotality to affect strategic behavior: there may be more scenarios in

Although the higher probability of being pivotal under a more proportional electoral formula may well account for higher turnout in PR, prior empirical studies leave considerable doubt that proportionality is in fact an important part of the explanation. The fundamental problem is that proportionality is typically just one of many factors that differs between PR and plurality systems. PR elections typically involve voters choosing among party lists that compete in geographically large districts (sometimes as large as the entire country) within systems with multiple parties and frequent coalition governments; plurality elections, by contrast, typically involve voters choosing among individual candidates who compete in relatively small districts within systems with few parties and less frequent coalition governments. With the two types of elections occurring in settings that differ in these and other ways (including e.g. citizens' attitudes toward the fairness of the electoral system (Banducci et al. 1999)), it is difficult to know which specific factors explain differences in turnout.[5]

More troubling still, there is reason to question the usual causal interpretation of the positive correlation between the use of PR and voter turnout. It is widely appreciated that electoral systems are chosen strategically (Rokkan 1970, Boix 1999, Colomer 2005) and it is reasonable to think that voter turnout may be related to the factors (strategic and otherwise) that affect a given political system's electoral rules. This suggests that PR and plurality systems may differ not just in ways that are either *integral to* the electoral system (e.g. party lists vs. individual candidates, large vs. small districts) or *effects of* the electoral system (e.g. many vs. few parties, frequent vs. infrequent coalition governments, perceptions of fairness) but also in features that are fundamentally *causes of* the electoral system (e.g. the nature of social cleavages, the type of party system, the prevalence of

which a voter could cast a pivotal vote under PR, but given a sizable electorate the probability of any of those scenarios is so small that differences in pivotality would be swamped by other factors in explaining the turnout decision. (As Schwartz (1987, pg. 118) memorably wrote of the argument that the probability of being pivotal is higher in a close election, "Saying that closeness increases the probability of being pivotal . . . is like saying that tall men are more likely than short men to bump their head on the moon.") The fact that turnout and closeness are consistently positively related suggests otherwise; an explanation based on strategic voter mobilization seems to provide a satisfactory explanation.

[5]As Blais (2006) summarizes the literature on electoral systems and turnout, "Most of the literature supports the view that PR fosters turnout, but there is no compelling explanation of how and why, and the pattern is ambiguous when the analysis moves beyond well-established democracies."

norms of inclusion). The fact that it is difficult if not impossible to adequately control for these factors, and that they all could affect turnout, casts doubt on our ability to infer from observational data what would happen to turnout if a given system were to change from plurality to PR, let alone which factor accounts for any effects we find.

In this paper I examine a setting in which I can address many of these problems and thus provide unusually clear answers about how and why PR increases turnout. French electoral law prescribes a PR electoral system for municipal council elections in municipalities of at least 3,500 inhabitants and a plurality system for smaller municipalities. I use a regression discontinuity design to compare turnout in municipalities near this threshold as a way of measuring the effect of the electoral formula while holding other important factors constant. This research design has two clear advantages compared to the usual observational study of turnout and electoral systems. First, because the electoral system employed in each municipality is imposed based on an arbitrary population cutoff, I can credibly estimate the effect of the electoral system on turnout (for cities near the population threshold at least) without worrying about factors that may have led one city to adopt PR while another did not. Second, the plurality and PR systems used in these cities are similar to each other in ways in which plurality and PR systems often differ (notably the arrangement of districts and the prevalence of coalition government), which allows me to focus on a smaller set of possible channels through which the electoral formula could affect turnout.

What I find is that the change from plurality to PR in small French municipalities increases turnout in municipal elections by about one percentage point (from about 69% to 70%), which is small in comparison to cross-national turnout differences but substantial given how many factors are held constant and how recently most of the PR cities changed over from plurality.[6] Adopting PR for municipal elections does not appear to affect turnout in higher-level elections, which is a reassuring sign of the fundamental similarity between these sets of cities. Crucially, I find consistent evidence that PR increases municipal-level turnout only in cities where elections are not very competitive, which is consistent

---

[6]Cities near the 3,500 population are generally growing slowly, such that very few of the cities just above the threshold in the period I examine were using PR before 2001.

with the hypothesis that the proportionality of the electoral formula increases turnout by encouraging mobilization efforts in elections that would be foregone conclusions under plurality. Given the setting, the increase in turnout I find cannot be attributed to e.g. a generalized sense that the PR system is more fair, stronger links between parties and social groups in PR elections, or a difference in the number or arrangement of districts. To be clear, these features may matter in explaining cross-national variation in turnout, but my contribution is to highlight the role of proportionality in a setting where these other features are held more or less fixed.

The proportionality of the electoral formula can affect turnout both directly (by encouraging mobilization) and indirectly (by encouraging entry), and I also find evidence of these indirect effects. I show that, as might be expected based on the lower threshold required to win seats, PR slightly increases the number of lists competing, which is consistent with candidates being more willing to enter competition when the electoral system gives greater rewards to minor lists. More surprisingly, I present some evidence that PR decreases not only the share of the vote won by the top two lists (as would be expected based on Duverger (1954)'s "psychological effect") but also the share of the vote won by the *leading* list, which is consistent with competent candidates being more willing to compete on less dominant lists when the electoral system ensures seats for more than one list. Both of these changes could affect turnout in straightforward ways: the entry of new lists could affect turnout by increasing the total amount of mobilization effort and by appealing to previously unengaged voters; the increase in the quality of challengers could affect turnout by improving the effectiveness of mobilization efforts and making competition closer.

Although the unusual setting I examine allows me to sidestep most of the typical problems of cross-sectional turnout studies, it does pose some idiosyncratic challenges that require special attention. Most importantly, as is often the case in situations where a policy changes at a municipal population threshold (Ade & Freier 2011, Gagliarducci & Nannicini forthcoming), in French municipalities there are other policies that change at the same population threshold at which the electoral system changes: the size of the council

and the mayor's salary both increase slightly at the 3,500 threshold, and (since 2001) a gender parity rule applies only to cities above the threshold as well. I address the first two confounding factors by looking for jumps in turnout at other thresholds where the same policies change, and I address all three confounding factors through subgroup analysis testing predictions about where we might expect to find larger or small effects. I find that the jump in turnout at the 3,500 threshold is *largest* where the effect of the gender parity rule should be *smallest* – namely, those cities where women would be heavily represented even in the absence of the gender parity rule. I find weak evidence of a jump in turnout at other thresholds where the salary increases, but I show that the relationship between the turnout jump and local competitiveness is consistent with the jump being caused by salary at the other population thresholds but not at the 3,500 population threshold.[7] Together, these tests suggest that the jump in turnout I find at 3,500 is in fact due to the change in the electoral formula rather than to other policies that change at the same threshold.

The findings of this study of are of most direct relevance to policymakers in France, where there are periodic proposals to apply the PR system to smaller municipalities;[8] my estimates of the effect of PR on turnout suggest that lowering the population threshold would encourage more people to vote in municipal elections and spur competition as well. More broadly, the findings provide strong evidence that greater proportionality increases turnout even in the absence of changes to the arrangement of districts and the format of the ballot. I return in the conclusion to assessing how relevant these findings are for researchers who are interested in explaining cross-country variation in political participation.

---

[7]To be more specific: as mentioned above, turnout at 3,500 jumps most in the set of cities where one list wins handily; at other thresholds, turnout jumps most in the set of cities where competition is tight, which is more consistent with a story in which mayoral candidates mobilize more aggressively when the office is more valuable.

[8]Since the late-1990s, at least four proposals have surfaced to apply the list-PR system to smaller cities, with proposed thresholds including 2,500, 2,000, 1,500, and 500. See debates in the Senate on 1 March 2000 for proposals to reduce the threshold to either 2000 or 2,500; a proposal "tendant à abaisser le seuil d'application du scrutin proportionnel de liste aux communes de plus de 1 500 habitants" registered in the Senate on 31 July 2012; and a proposal "relative au passage au scrutin proportionnel de liste pour les communes de 500 habitants et plus" registered on 10 October 2012 in the National Assembly.

II. French municipal electoral systems and implications for turnout

The *commune*, or municipality, is the lowest level of French government. Municipalities in France maintain roads and schools, manage local development, and administer cultural programs and some social welfare functions (Loughlin 2007, pp. 90-91). They are responsible for almost a quarter of all public expenditure, amounting to about 6% of GDP (Loughlin 2007, pp. 184-185). Each municipality is governed by a municipal council, ranging in size from 9 in the smallest municipalities to 163 in Paris; the council is in turn led by a mayor, who is a member of the council and ordinarily the leader of the party or list that won the previous election. Municipal elections are held approximately once every six years simultaneously in each of the more than 36,000 municipalities of France.[9]

Since 1946, French electoral law has specified a different system of elections for large and small cities, with the population threshold that separates the two groups of cities varying over time. The current electoral law, enacted in 1982, prescribes a single-district, multi-member plurality system for municipalities with fewer than 3,500 inhabitants and a form of proportional representation for those with 3,500 or more inhabitants. In particular, in the larger cities the council is elected using a list-PR system with a 50% winner's bonus: the list with the most votes is awarded half of the seats on the council, and the remaining seats are distributed proportionally among all of the lists including the winning list.[10] In the smaller cities, candidates appear on lists with as many members as there are seats on the council and voters can vote for a whole list, a subset of the candidates from one list, or candidates from more than one list;[11] seats are awarded to the top individual vote-getters. In both systems the election can take up to two rounds.[12] From the standpoint of the electoral

---

[9]The 2008 election was held seven years after the 2001 elections in order to avoid coinciding with the 2007 presidential elections. In both 2001 and 2008 the municipal elections coincided with cantonal elections.

[10]For example, given a 27-seat council and a narrow margin of victory of one list over a single other list, the winning list should win 21 seats a winner's bonus of 14 plus 7 of the remaining 13 seats. The proportional seats are distributed according to a quota system equivalent to the d'Hondt method.

[11]Given council size m, each voter can vote for only m candidates.

[12]In the PR system, the election ends in the first round if one list wins more than 50% of the vote, and otherwise parties receiving less than 10% of the vote are disqualified and others continue to the second round; in the plurality system, any candidate winning the support of more than 50% of voters in the first round is elected to the council, and if seats remain to be filled a second round is held in which the seats are awarded to the top finishers.

rules, then, what differs between cities above and below the 3,500 population threshold is whether voters are permitted to express candidate-level preferences (yes in smaller cities, no in larger cities) and whether seats are allocated to *candidates* on a *plurality* basis (as is the case in smaller cities) or to *lists* on a *proportional* basis (as is the case in larger cities).

As noted in the introduction, one of the prominent explanations for higher turnout in PR systems is that, at the district level, the probability of a voter casting a decisive vote may be higher under a more proportional electoral formula. One reason for this is simply district magnitude: at the district level, there are typically many seats at stake in a PR election while in a plurality election there is usually only one. The other reason is the electoral formula itself: one can only cast a decisive vote in a plurality election when the two leading candidates are effectively tied, whereas PR formulas ensure that, depending on the district magnitude, a party can win additional seats at various vote share thresholds ranging from, say, 20% to 80%. In the case of French municipal elections in cities near the decisive population threshold, only the second of these arguments really applies, as illustrated by Figure 1. The figure plots the typical relationship between vote shares (x-axis) and seat shares (y-axis) for cities just above and below the 3,500 population threshold that divides plurality and PR cities. (In the figure I assume two lists are competing, which is the modal case.) In plurality cities (blue line), one list typically wins all of the seats if its overall support is at least 60%; because not all voters vote for all of the candidates on a given list, however, it is possible in a very close election between two lists for some members of both lists to win seats. In PR cities (gray line), the allocation of seats depends purely on the formula, with half of the seats being allocated to the plurality winner (indicated by the large jump in the middle) and the rest allocated one at a time at regularly-spaced vote share thresholds. Comparing the two systems in terms of pivotality, then, we see that in the plurality system one has a chance of casting a decisive vote if the contest between lists is quite close but not otherwise; in the PR system there are opportunities to cast a decisive vote in both competitive and uncompetitive contests, but the most valuable opportunity would come in the case of a tie between the leading lists. In terms of turnout,

Figure 1: Proportionality in French municipal electoral systems
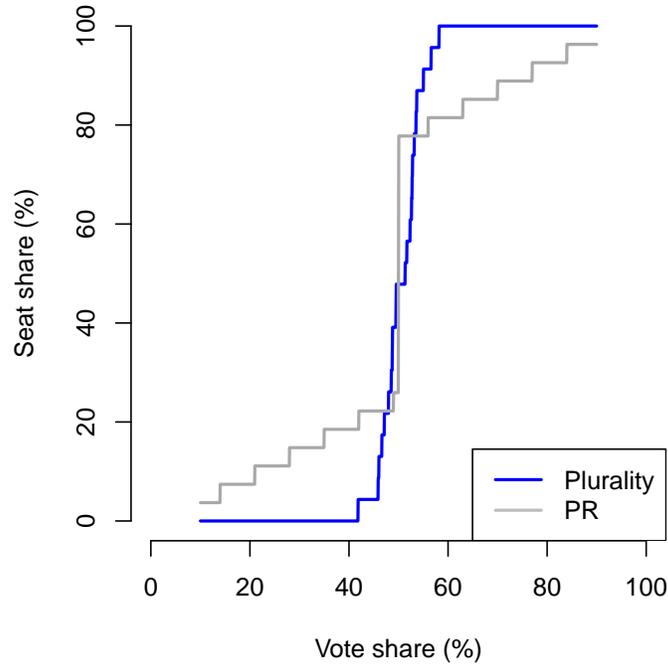
NOTE: The blue line plots the votes-seats relationship in the plurality system given the typical dispersion of vote totals within lists; the gray line plots the votes-seat relationship based on the PR electoral formula employed. I assume two lists and a city population near 3,500.

this suggests that parties would have substantial incentives to mobilize in close elections under both systems, but that in less competitive elections the incentives to mobilize would be considerably higher in the PR system.

One systematic way to think about turnout incentives under different electoral systems is offered by Cox (1999). Cox (1999) sees the incentives of political elites to mobilize voters as a function of the way in which mobilizing effort is converted into political rewards, which depends on (1) the value to the party of winning a seat or a ministerial portfolio, (2) the rate at which mobilization effort translates into votes, (3) the rate at which votes translate into seats, and (4) the rate at which seats translate into portfolios. The differences in proportionality that we just discussed fall under category (3): in a lopsided race, votes translate into seats at a rate of 0 in plurality municipalities and a positive rate at several thresholds in PR races; in a close race, votes translate into seats at a high rate in

both systems. The key advantage of this setting is that, unlike in most comparisons of electoral systems, the other factors identified in Cox (1999)'s framework should not differ much between PR and plurality cases. Controlling for the size of the municipality, factor (1) (the value of winning a seat on the council) would seem to be approximately the same under PR and plurality, as non-executive municipal councilors enjoy the same powers and responsibilities under both systems.[13] There would also seem to be no major difference in factor (2), the translation of mobilization effort into votes in the two systems. According to Cox (1999), mobilization efforts might generally be more effective in PR systems because parties strategically adopt more distinct ideological positions and forge stronger links with social groups (Powell Jr 1980). That argument would seem not to apply in this setting, however, for two main reasons: first, politics in municipalities of this size is primarily personal and competence-based, with a limited scope for ideological appeals;[14] second, the large winner's bonus of the PR system means that lists in both systems have strong incentives to appeal to centrist voters.[15] Campaign regulations that would affect the effectiveness of mobilization efforts are also essentially the same in the two sets of municipalities.[16] Finally, there is no basic difference in factor (4), the way in which seats translate

---

[13]As detailed below, mayors and their deputies are paid about 25% more the PR cities, but it is somewhat unclear whether the value of that "ministerial portfolio" is larger given that councils in PR cities are much more likely to include opposition members who can make life difficult for the mayor: my analysis shows that the proportion of cities in which more than one list has members on the council roughly doubles at 3,500, from 40% to over 80%. Non-executive members of municipal councils are unpaid.

[14]A sizable proportion of politicians and lists eschew partisan affiliations completely; in 2008, for example, only 35% of mayors in cities between 3,000 and 4,000 in population were listed by the Ministry of the Interior as UMP, Socialist, or Communist compared to 80% in cities above 20,000 in population; over 50% of the mayors in the smaller cities were listed without a distinct party affiliation ("*divers gauche*" or "*divers droite*") compared to 12.5% in the larger cities. Typical list names in cities around 3,500 in population are completely un-ideological, e.g. "All together for [commune name]" or "List of [name of head of the list]", whereas in larger cities list names like "Union of the Left for [commune name]" are common.

[15]A more plausible way in which Cox (1999)'s factor (2) might be affected by the electoral system in this setting is that, as indicated by Figure 1, the PR electoral formula allows much less popular lists to win seats, which may lead to more and better lists entering and thus increase turnout through more and better mobilization efforts.

[16]As in higher-level elections in France, there are strict limits on the production and display of posters and the distribution of mailings in municipal campaigns: posters can only be hung in certain designated places, for example, and mailings (limited to one per voter) must use a specified size, shape, and type of paper. One exception is that the cost of printing posters, mailings, and ballot papers is reimbursable in municipalities above the threshold, but in a city of around 3,500 inhabitants the cost of printing the maximum allowable set of materials is small (conservatively, about 20 euros per list member).

9

into "portfolios", i.e. the positions of mayor and deputy mayor. Given the winner's bonus in the PR system and the essentially winner-take-all nature of the multimember plurality elections, coalition government in small municipalities is basically unknown. The list that wins the plurality of votes is assured of producing the mayor and deputy mayors under the PR system and almost assured of doing so under the plurality system.

Given these similarities between the two systems, a comparison of PR and plurality cities near the 3,500 population threshold offers an unusually clear test of the hypothesis that PR boosts turnout, and in particular that it does so in part by increasing elites' incentives to mobilize voters in less evenly-balanced contests. There are of course some differences other than proportionality that are integral to the two systems and might affect turnout: voters may value the opportunity to vote for individuals under the plurality system as opposed to voting only for lists under PR, for example; candidates may also exert more mobilizing effort when they receive an individual vote total in the plurality system than when results are tabulated at the list level under PR.[17] These differences would tend to depress turnout under PR, making it more difficult to find an effect of the electoral formula in the average municipality. There is little reason to expect these factors to depress turnout differentially in competitive and uncompetitive places, however, suggesting that we may be able to measure the effect of proportionality *per se* by measuring how turnout depends on the electoral formula in more and less competitive environments.

III. Turnout and the 3,500 population threshold

In order to measure the effect of the electoral system on voter turnout in small French cities, I apply a regression discontinuity design or RDD (Thistlethwaite & Campbell 1960, Hahn et al. 2001, Lee 2008), taking advantage of the fact that the electoral system is determined at a population cutoff.[18] Before presenting results, I describe my implementation of RDD

---

[17]A candidate's efforts to mobilize support under PR *only* benefit the marginal member of her list whereas in the plurality system those efforts boost her own vote total and thus improve her chances of winning a seat, as well as her status among those who pay attention to the voting results.

[18]For other examples of the use of population thresholds in regression discontinuity designs, see Egger & Koethenbuerger (2010), Pettersson-Lidbom (2012), Fujiwara (2011), Gagliarducci & Nannicini (forthcoming), Brollo et al. (forthcoming).

and provide evidence that it will produce credible estimates in this setting.

A. Preliminaries

My implementation of the regression discontinuity design is standard and simple. I use local linear regression to estimate the conditional expectation of the outcome at each point; in order to estimate the discontinuity at the 3,500 threshold, I define a sample of cities close to the threshold and regress the dependent variable on the log of population[19] (recentered at the population threshold) interacted with an indicator for whether the city is above the threshold (Imbens & Lemieux 2008). In some specifications I include as covariates the municipality's turnout in a previous presidential election (1995 or 2002) as well as a set of socioeconomic factors (proportion retired, proportion unemployed, proportion possessing a baccalaureate degree, proportion employed in agriculture, population in the previous census), the area of the municipality, and the region; given that cities just above or below the 3,500 threshold should be similar on average in these and other dimensions, the purpose of including covariates is primarily to increase precision rather than to control for confounding factors.

One key choice parameter is the window within which one conducts the local linear regression. In principle the RDD should depend exclusively on cities very close to the threshold, such that whether a given city holds its elections under PR or plurality might be decided by arbitrary factors such as whether a new house is built before the census is taken or whether the census enumerators count a family's grown son as living in the village or in Paris. In practice, using a wider window may improve estimates of the conditional expectation at the threshold. One widely-used method for choosing a window is a cross-validation procedure described by Imbens & Lemieux (2008) that searches for a window that minimizes mean squared error in the vicinity of the threshold. Using this procedure on my main outcomes I obtain surprisingly wide optimal windows, the majority of which are above 50% of population (i.e. a window of 1,750 to 5,250 for a threshold of 3,500). The

---

[19]My analysis indicates that the turnout rate decreases roughly linearly in log population. Geys (2006) recommends using log population for turnout studies and provides examples.

reason why the optimal bandwidths are so large appears to be that most of the outcomes I examine are quite linear in log population, such that the bias resulting from using a larger bandwidth is minimal. As explained below, I present my results in a variety of ways in order to show how my results depend on the bandwidth chosen.

The validity of the RDD could be called into question if mayors of cities near the population threshold could manipulate their official population numbers (for example by allowing or disallowing housing permits) and thus effectively choose their electoral system; if that were the case, then cities on either side of the threshold may differ not just in their electoral system but also in other (possibly unobservable) features such as their preferences for one system or another. One standard way of checking the validity of the RDD, due to McCrary (2008), involves testing for a jump in the density of the forcing variable at the threshold; in this case, McCrary (2008)'s test fails to find a jump in (log) population at the threshold where the electoral system changes (p = .127). Another standard validity check is to carry out RDD analysis in which pre-treatment covariates serve as outcome variables. Table 7 in the appendix reports RD effect estimates at varying population windows (25%, 50%, and 75%), showing that there is (as one would expect) no "effect" of crossing the 3,500 population threshold on the vast majority of placebo outcomes. These tests suggest that cities just above and below the population threshold are indeed comparable in not just observed but also unobservable features (e.g. local political culture). For robustness, in the analysis that follows I show results both with and without covariates.

B. Results

Table 1 reports the first set of RD results, focusing on the 2008 municipal elections and restricting attention to municipalities with a population within 50% of 3,500. Column (1) reports a linear regression in which the running variable (log municipal population, recentered around the threshold of 3,500) is interacted with "Treat", an indicator for the population being at least 3,500. The coefficient on "Treat" indicates that turnout in cities just above the 3,500 population threshold is about 1 percentage point higher than that in cities just below the 3,500 threshold. (Coefficients on the running variable and its

Table 1: RD analysis: Municipal turnout in 2008

Coefficient	(1)	(2)	(3)	(4)
Treat	$0.928^{\dagger}$	1.122^{**}	-0.211	0.147
	(0.523)	(0.418)	(0.812)	(0.65)
Treat × Less competitive			1.784	1.299
			(1.196)	(0.987)
Treat × Least competitive			1.778	$1.746^{\dagger}$
			(1.182)	(0.997)
Less competitive			-3.194^{***}	-0.95
			(0.701)	(0.631)
Least competitive			-7.035^{***}	-2.518^{***}
			(0.748)	(0.716)
Constant	68.598^{***}	-13.061	71.998^{***}	-9.137
	(0.325)	(10.167)	(0.469)	(10.426)
RV-Treat interactions?	✓	✓	✓	✓
RV-Treat-Comp. interactions?			✓	✓
Covariates?		✓		✓
Population window	50%	50%	50%	50%
Obs.	3171	3171	3171	3171

NOTE: Regression coefficients shown; dependent variable is municipality-level turnout 2008, in %. "Treat" is an indicator for cities with populations of 3,500 or more; "RV" indicates the running variable (log population, recentered around 3,500); "Less competitive" and "Least competitive" are the middle and bottom terciles of predicted competitiveness, constructed as described in footnote 20. Robust standard errors are shown in parentheses. "Covariates" refers to the first 6 covariates in Table 7 plus region dummies and turnout in the 2002 presidential election. Guide to significance codes: *** indicates $p < .001$; ** indicates $.001 < p < .01$; * indicates $.01 < p < .05$; and † indicates $.05 < p < .1$.

interaction with "Treat" are included in the regression but not shown.) Column (2) reports the same regression with the addition of covariates (the first 6 covariates in Table 7 plus region dummies and turnout in the 2002 presidential election). The inclusion of covariates only slightly affects the magnitude of the coefficient on "Treat" but it increases precision such that we can reject the null hypothesis of no jump at 3,500 at the .01 level.

As discussed in the previous section, the votes-to-seats relationship under the two electoral systems used in French municipalities suggests that PR should especially increase

turnout in less closely-contested elections. In columns (3) and (4) of Table 1, I test that prediction by dividing municipalities into terciles based on predicted competitiveness[20] and fully interacting the treatment effect with these competitiveness terciles.[21] The coefficients on "Less competitive" and "Least competitive" indicate that turnout is higher in more competitive contexts, which is not surprising. More importantly, the interactions between "Treat" and the competitiveness terciles suggest that crossing the population threshold has a larger effect in less competitive contexts, which is consistent with the idea that PR increases turnout in this setting by increasing the incentive to mobilize voters in elections that would be foregone conclusions under plurality. The interaction term for "Least competitive" cities is statistically significant at the .1 level once covariates are included in the regression.

To give a sense of the robustness of these findings, Figure 2 depicts the regression discontinuity plot (left) and the relationship between the effect estimate and the bandwidth (right) separately for the most competitive (panel A, top) and least competitive (panel B, bottom) terciles of municipalities. In the left plot of both panels, the black dots portray average turnout for cities within a given population bin.[22] A blue line depicts the local linear regression separately on each side of the threshold, using a bandwidth of 50% of population (the same bandwidth as the one used for Table 1); the dotted line shows the robust .95 point-wise confidence interval. These plots visually confirm the findings reported in Table 1: there is a clear level shift in turnout at 3,500 in less competitive municipalities (bottom left) but not in the more competitive municipalities (top left). The right plot in

---

[20]In particular, I compute the average vote share of winning candidates in cities below the 3,500 threshold in 2008 and regress that on socioeconomic indicators plus (categories of) the share of voters supporting Sarkozy in the 2007 presidential election. The predictions from this model are then used to generate a measure of competitiveness for cities on both sides of the 3,500 population threshold, where the lowest predicted competitiveness is found in cities where the predicted support for winning candidates is highest. The measure is thus not based on municipal voting outcomes and, like the predictors on which it is based, is continuous across the 3,500 threshold. Substantively similar results are obtained when I define competitiveness based on actual rather than predicted support for the winning list/candidates.

[21]Covariates are not interacted with the competitiveness terciles, but all other terms in the regression are: the treatment indicator, the running variable, and the interaction of the two.

[22]The bins here are .06 in log population; for example, the first two bins to either side of the threshold encompass cities from 3,296 to 3,500 and 3,500 to 3,716.

each panel shows how the estimated effect depends on the population window within which the local linear regression is conducted. As shown in the top panel in Figure 2, the effect of crossing the 3,500 threshold in competitive cities is about zero for most bandwidths and it does not approach significance at any bandwidth. In the bottom panel we see that in the least competitive cities the estimated effect is at or above 1 percentage point for all bandwidths, with an effect that is at least borderline statistically significant (even without covariates) for all bandwidths above 40%. In each of the plots on the right, the vertical gray line indicates the optimal population window according to the cross-validation procedure suggested by Imbens & Lemieux (2008). (See Table 8 in the appendix for the RD estimates at the optimal bandwidths for this and all other analysis in the paper.)

As a further test of the effect of the electoral formula on turnout in this setting, Table 2 looks at the average effect of crossing the 3,500 threshold on turnout in the 2001 and 2008 municipal municipal elections as well as in higher-level elections between 2002 and 2007. Because the only electoral rule that changes at the 3,500 population threshold is the municipal electoral rule, we would expect turnout to increase in the municipal elections but not in higher level elections. This is in fact what we find. Each entry in Table 2 reports the estimate from an RD regression at a given bandwidth (25%, 50%, and 75%) either with or without covariates.[23] The top three rows show estimates for municipal elections; the average effects in 2001 appear even stronger than those in 2008, and unsurprisingly the pooled estimates are strong and substantial as well. The bottom three rows show estimates for higher-level elections. In the presidential elections of 2002 and 2007 and the regional elections of 2004, we do not see higher turnout in cities just above the 3,500 population threshold; when covariates are included none of the effects is significant.

The absence of a positive effect on turnout in higher-level elections is particularly noteworthy in light of Ladner & Milner (1999), whose main finding is that turnout in municipal elections is higher in Swiss municipalities that adopt PR than in those that use plurality methods. Remarkably, Ladner & Milner (1999) also find that PR cities have higher turnout

---

[23]The entries in this and subsequent tables thus each report the coefficient on "Treat" in a regression like that in Table 1.

Figure 2: The effect of crossing the 3,500 population threshold on 2008 municipal turnout for most and least competitive municipalities

A. Most competitive municipalities

B. Least competitive municipalities
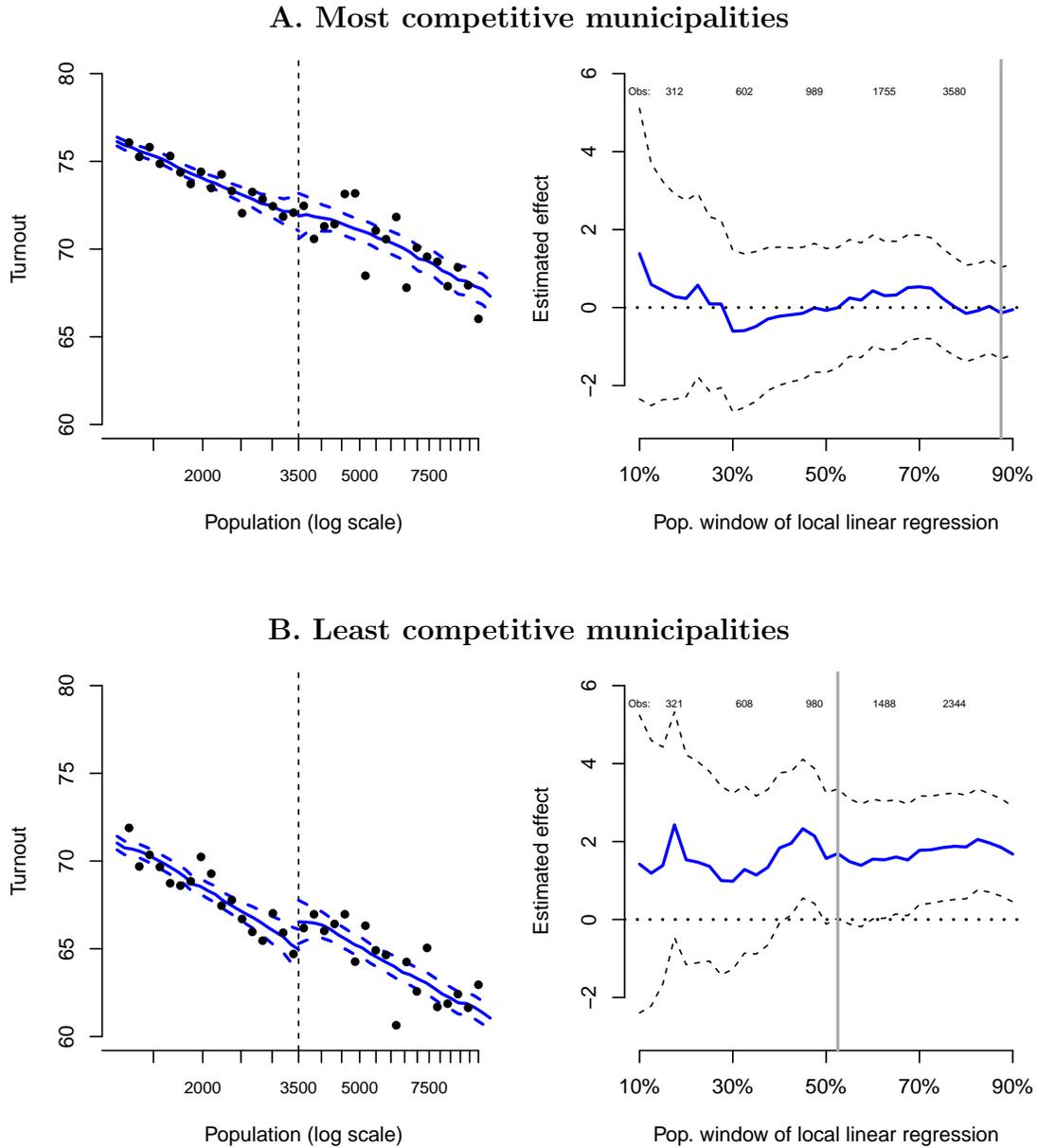
NOTE: In each panel, the left plot shows turnout (y-axis) and population (x-axis, log scale) in municipal elections. Each black dot reports the mean turnout within a population bin; the blue line is the local regression line using a population window of 50%. The right plot in each panel shows the RD estimate as a function of the bandwidth chosen; numbers along the top indicate the sample size at each bandwidth and the vertical line indicates the bandwidth chosen by Imbens & Lemieux (2008)'s cross-validation procedure (in a range of 10% to 90%). In both plots, dotted lines indicate robust point-wise .95 confidence intervals. The construction of the competitiveness terciles is described in footnote 20.

16

Table 2: Effect of crossing 3,500 population threshold on turnout in municipal and higher-level elections

Outcome	Mean turnout	Effect estimates					
		(1)	(2)	(3)	(4)	(5)	(6)
Municipal, 2001	70.73	0.989 (0.778)	1.537** (0.538)	1.525*** (0.433)	1.075† (0.598)	1.685*** (0.413)	1.525*** (0.33)
Municipal, 2008	69.14	0.763 (0.765)	0.929† (0.523)	1.476*** (0.423)	0.71 (0.582)	1.128** (0.414)	1.504*** (0.338)
Municipal, 2001 & 2008	69.96	0.878 (0.71)	1.242** (0.481)	1.502*** (0.385)	0.946† (0.528)	1.346*** (0.359)	1.518*** (0.285)
Presidential, 2002	74.95	-0.04 (0.413)	-0.189 (0.29)	-0.038 (0.241)	0.1 (0.288)	-0.139 (0.2)	0.055 (0.166)
Regional, 2004	63.38	-0.448 (0.583)	-0.7† (0.414)	-0.241 (0.341)	-0.384 (0.398)	-0.401 (0.288)	-0.177 (0.239)
Presidential, 2007	86.33	-0.248 (0.326)	-0.439† (0.224)	-0.253 (0.185)	-0.099 (0.18)	-0.13 (0.124)	-0.095 (0.103)
Window:	25%	25%	50%	75%	25%	50%	75%
Covariates?					✓	✓	✓

NOTE: RD estimates are shown for the effect of crossing the 3,500 population threshold on turnout in two municipal election-years (2001 and 2008, separately and pooled) and three higher-level elections. Robust standard errors are shown in parentheses; for the pooled regression standard errors are clustered at the municipality level. For significance codes see Table 1.

17

in higher-level elections (even though all cities use the same system for these higher-level elections), which they interpret as evidence that PR is adopted in municipalities that are "culturally predisposed toward higher political participation" (pg. 248).[24] The absence of a higher-level "effect" of the electoral system in the French context makes sense given that, unlike in the Swiss case, these cities do not choose their electoral system.

IV. Addressing Multiple Treatments

So far I have provided evidence that average municipal election turnout in cities just above the 3,500 population threshold is slightly higher than that in cities just below the threshold. Because the electoral system changes from plurality to PR at that threshold and because the effect appears strongest in less competitive municipalities (as theory predicts), it seems reasonable to attribute the jump in turnout at the 3,500 threshold to the electoral system. There is, however, a complication. As in many cases in which policies depend on population thresholds (Ade & Freier 2011), other features of municipal government change at the 3,500 population threshold: a gender parity rule is imposed on electoral lists, the number of councillors increases from 23 to 27, and the mayor's salary increases by about 25%. In this section I consider whether these other treatments may also have contributed to the jump in turnout I observe at the 3,500 threshold.

First, consider the gender parity rule that, since 2001, has applied to cities of 3,500 or more inhabitants. The rule aims to achieve gender parity on municipal councils by requiring that each list include an equal number of men and women, with gender alternating down the list. The fact that the electoral system and the gender parity rule go into effect at the same population threshold is not an accident; the assumption among policymakers seems to be that parity would be much less effective under plurality rule because voters could disproportionately cast votes for male candidates even if lists are gender-balanced.[25]

---

[24]As the authors suggest, it could also be that the habit of participating in municipality elections spills over into higher-level elections.

[25]Given how commonly entire lists are elected currently in smaller cities, this assumption may be unwarranted. An article in the original gender parity proposal involved reducing the electoral rule threshold from 3,500 to 2,000 explicitly in order to bring more cities under the parity rule; this article was removed following opposition in the Senate. See debate of 1 March 2000, accessible at

In principle, the increase in average turnout at the 3,500 threshold could be explained by the gender parity rule: perhaps the newly-included women are able to mobilize a new set of voters, or perhaps their presence in politics spurs turnout by increasing the perceived legitimacy of municipal politics.[26] One can even think of a logic by which the effect of the parity rule on turnout might be larger in less competitive elections: perhaps the set of voters who would be mobilized by the parity rule in less competitive contests are already mobilized in competitive contests. To test whether the parity rule might be responsible for the increase in turnout I find at 3,500, I carry out subgroup analysis based on the idea that, if the parity rule were in fact responsible, the jump in turnout would be largest in places where the parity rule had the largest effect – cities where women would be most under-represented in the absence of the parity rule. I use the observed level of female representation in 2008 in cities below the 3,500 threshold to predict the level of female representation for cities on both sides of the threshold (based on socioeconomic covariates and voting outcomes in the 2007 presidential election). I then use the predicted level of representation to divide cities into terciles based on the size of the predicted effect of the parity rule (where the largest effect is predicted for those cities with the lowest predicted level of female representation). After confirming that the actual effect of the gender parity rule (estimated via RD) is in fact strongly related to the predicted effect, I estimate the effect of crossing the 3,500 population threshold separately for the three groups of cities. The results are reported in Table 3 and plotted in Figure 3. It does not appear to be the case that the jump in turnout at 3,500 is largest where the gender parity law would have the largest effect. If anything, turnout jumps more in places where the effect of the gender parity rule would *smaller*, which suggests that the parity law is not responsible for the turnout jump at the 3,500 threshold.

Two other important policies also change at the 3,500 threshold: the salary of the mayor (from 1600 euros per month to 2058 euros per month[27]) and the size of the council

---

Table 3: Effect of crossing 3,500 population threshold on 2008 turnout, as a function of effect of gender parity law

Subgroup: Effect of parity law	Mean turnout	Effect estimates					
		(1)	(2)	(3)	(4)	(5)	(6)
High	69.82	-0.503 (1.242)	0.166 (0.867)	0.14 (0.683)	0.334 (0.996)	0.837 (0.697)	0.975† (0.556)
Medium	69.33	1.029 (1.313)	1.984* (0.924)	2.385** (0.753)	0.575 (0.928)	1.934** (0.695)	2.035*** (0.566)
Low	68.25	1.561 (1.431)	0.573 (0.918)	1.859* (0.761)	0.992 (1.118)	1.037 (0.751)	1.555* (0.623)
Window:	25%	25%	50%	75%	25%	50%	75%
Covariates?					✓	✓	✓

NOTE: As described in the text, cities are divided into terciles ("High", "Medium" and "Low") according to the size of the predicted effect of the gender parity law; the effect of crossing the 3,500 population threshold is separately estimated for each group. See Table 2 for details of the table presentation.

Figure 3: Effect of crossing 3,500 threshold on 2008 turnout according to predicted effect of gender parity law
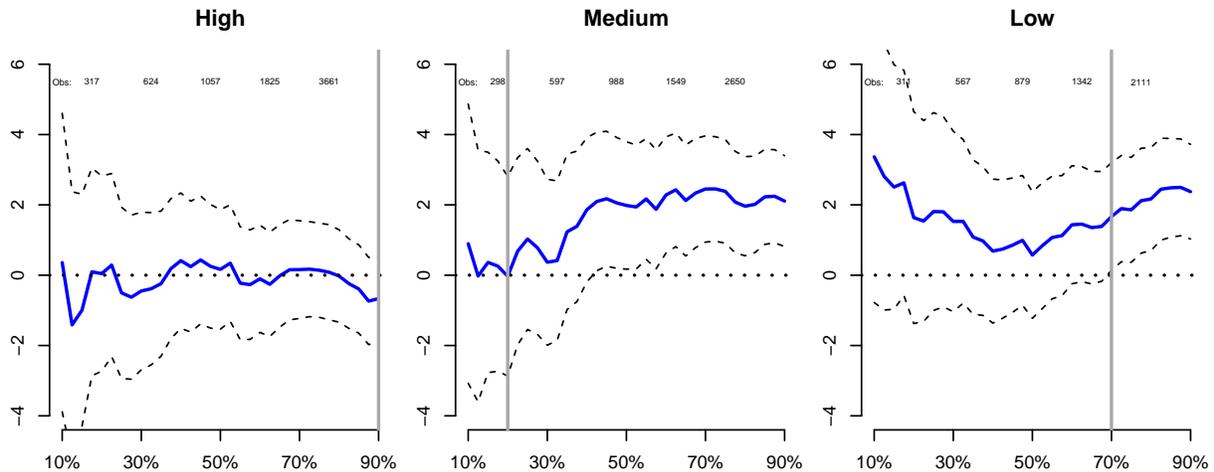
NOTE: Each plot shows the predicted effect of crossing the 3,500 threshold on turnout (y-axis) as a function of the window of the local linear regression (x-axis) for one group of cities defined by the size of the predicted effect of the gender parity law.

(from 23 to 27). In both cases one can imagine a mechanism by which the policy change would increase turnout: a higher salary makes it more valuable to win office and should thus induce greater mobilization efforts; a larger council means longer lists and thus more people with direct involvement in the elections. I attempt to determine whether either or both of these treatments could be responsible in two ways. First, I take advantage of the fact that both the salary and the council size increase at other population thresholds (500 and 1000, for salary; 500 and 1500, for council size) where we can conduct RDD analysis.[28] Under the assumption that the effect would be roughly similar at other thresholds where the same policy changes, we can evaluate whether the change at 3,500 could be attributable to one or both of these policies. In Table 4 I report RDD results for the effect of crossing the 500, 1000, and 1500 population thresholds on turnout in 2001 and 2008 (pooled); I also show the effect at three placebo thresholds (750, 2150, and 4520) where no policy change takes place.

At none of the thresholds in Table 4 do I find an effect on turnout that is either as large or as consistent as the effect of crossing the 3,500 threshold. There is some evidence, however, of a jump in turnout at 500 and 1000, the two population thresholds where the mayor's salary increases. This suggests that mayor salary could play a role in the jump at 3,500. A careful consideration of the way in which a higher mayor salary would affect mobilization incentives suggests otherwise, however. If a higher salary increases turnout by inducing greater mobilization effort by mayoral hopefuls, it would be most likely to do so when it is most unclear which list will prevail – i.e. in elections expected to be close. In Section III, however, it was seen that crossing the 3,500 threshold increased turnout the most in the *least* competitive races. Table 5 reports the same subgroup analysis at the 500 and 1,000 population thresholds.[29] The results depend on the specification but indicate a different pattern from the one I find at 3,500: across the two thresholds, the evidence of a

---

[28]Council size also changes at 2,500, but at that threshold there is also a change in the rules about fielding incomplete candidate lists, which further complicates matters.

[29]Competitiveness terciles are constructed in the same was as described in footnote 20, but based on a model using municipalities with population between 250 and 1,250. The results using actual competitiveness rather than predicted competitiveness even more starkly show a jump in turnout in the most the competitive municipalities.

Table 4: Effect of crossing other population thresholds on turnout in 2001 and 2008 municipal elections

Pop.	Policy changes	Mean turnout	Effect estimates					
			(1)	(2)	(3)	(4)	(5)	(6)
500	S,C	78.95	0.735* (0.323)	0.359 (0.228)	0.299 (0.184)	0.705** (0.263)	0.419* (0.186)	0.392** (0.144)
750		77.21	-0.179 (0.356)	-0.383 (0.252)	-0.226 (0.206)	0.071 (0.289)	-0.332 (0.204)	-0.303† (0.163)
1000	S	75.99	0.916* (0.398)	0.82** (0.275)	0.446* (0.224)	0.7* (0.311)	0.586** (0.219)	0.075 (0.179)
1500	C	74.08	0.426 (0.463)	-0.275 (0.335)	-0.07 (0.273)	0.274 (0.369)	-0.185 (0.266)	-0.101 (0.218)
2150		72.06	0.19 (0.569)	-0.191 (0.404)	-0.825* (0.328)	0.399 (0.44)	-0.095 (0.31)	-0.578* (0.253)
4520		69.33	-0.451 (0.796)	-0.192 (0.537)	0.448 (0.426)	-0.358 (0.57)	-0.064 (0.391)	0.744* (0.318)
Window:		25%	25%	50%	75%	25%	50%	75%
Covariates?						✓	✓	✓

NOTE: RD estimates are shown for the effect on turnout of crossing the population thresholds indicated in the left-most column on turnout in 2001 and 2008. The second column from the left indicates the policies that change at each threshold; "S" indicates an increase in the salary of the mayor and "C" indicates an increase in the size of the municipal council. See Table 2 for other notes.

turnout jump seems to be strongest in the highest competitiveness tercile. Together with the analysis reported in Section III, this analysis suggests that very little of the effect of crossing the 3,500 threshold on turnout can be attributed to the change in salary: analysis of other thresholds at which salary changes shows evidence of turnout increasing in the competitive places where salary should matter the most, while other analysis shows that the jump at 3,500 occurs where the mayor's salary should have the *smallest* effect and the electoral rule should have the *largest* effect.

Table 5: Effect of crossing population thresholds on 2008 turnout, as a function of competitiveness

Pop.	Subgroup: Competitiveness	Mean turnout	Effect estimates					
			(1)	(2)	(3)	(4)	(5)	(6)
500	High	79.81	1.777** (0.625)	1.246** (0.432)	0.517 (0.341)	1.402** (0.529)	0.947* (0.372)	0.494† (0.296)
500	Medium	78.31	0.27 (0.637)	-0.281 (0.446)	0.052 (0.36)	0.526 (0.563)	-0.207 (0.399)	-0.008 (0.328)
500	Low	76.26	0.515 (0.662)	0.572 (0.476)	0.834* (0.387)	0.609 (0.601)	0.78† (0.434)	0.885* (0.354)
1000	High	77.81	1.944** (0.707)	1.458** (0.501)	1.396*** (0.406)	1.878** (0.598)	1.061* (0.426)	0.827* (0.354)
1000	Medium	75.13	0.221 (0.761)	0.021 (0.525)	-0.234 (0.435)	-0.258 (0.666)	-0.239 (0.469)	-0.539 (0.387)
1000	Low	72.9	1.238 (0.822)	1.364* (0.554)	0.906* (0.452)	1.46* (0.703)	1.373** (0.488)	0.75† (0.4)
	Window:	25%	25%	50%	75%	25%	50%	75%
	Covariates?					✓	✓	✓

NOTE: RD estimates are shown for the effect on turnout of crossing the population threshold indicated in the left-most column, separately by tercile of predicted competitiveness. See Table 2 for presentation notes. See text for construction of competitiveness terciles.

23

V. Indirect channels: number and quality of lists

The evidence presented to this point is consistent with the hypothesis that PR increases turnout in French municipalities because, under the more proportional electoral formula, candidates mobilize voters in relatively uncompetitive situations in which they would not bother to do so under plurality. This is the direct effect of proportionality on mobilization. Proportionality may also indirectly affect turnout by increasing the number and quality of lists in competition; I assess that possibility in this section.

The idea that proportional representation favors the entry of more parties (compared to plurality systems) has a long history; it is notably a component of the "psychological effect" described by Duverger (1954). Given that lists can win seats with far less support under the PR system (as indicated by Figure 1), we should expect more lists to enter in cities just above the 3,500 population threshold. The top row of Table 6 and the top panel of Figure 4 report RDD analysis of the effect of crossing the 3,500 threshold on the number of lists in competition in the 2001 and 2008 elections. (Analysis here is restricted to northwest France, because list-level results for sub-3,500 cities are not available elsewhere.) The results suggest that the number of lists jumps by about 0.2 on average, from just below 2 to just above 2. (Note however in Figure 4 that at the optimal window we cannot reject the null of no effect.) The second row of Table 6 and the bottom panel of Figure 4 reports the effect of crossing 3,500 on the share of the vote (in %) won by the top two lists. Consistent with the increase in the number of lists, the average share of support for the top two lists drops by about 3% on average, from around 98% to around 95%. Both findings suggest that the PR system may have increased turnout in part by encouraging the entry of new lists that increase aggregate mobilization effort and appeal to previously unengaged parts of the electorate.[30]

An additional reason why the support for the top two lists may decline at the 3,500

---

[30]Note that, at the cross-national level, the number of parties in competition does not seem to be positively related to turnout (Blais 2006). Jackman (1987) attributes this to the fact that multipartyism makes elections less decisive, a consideration that does not enter in my context because there are no coalition governments. Grofman & Selb (2011) notes that two of the standard explanations for why more parties should increase turnout do not withstand scrutiny, as a larger number of parties does not necessarily imply more proportional results or more competition at the district level.

Figure 4: Effect of crossing 3,500 population threshold on number of lists and support for top two lists
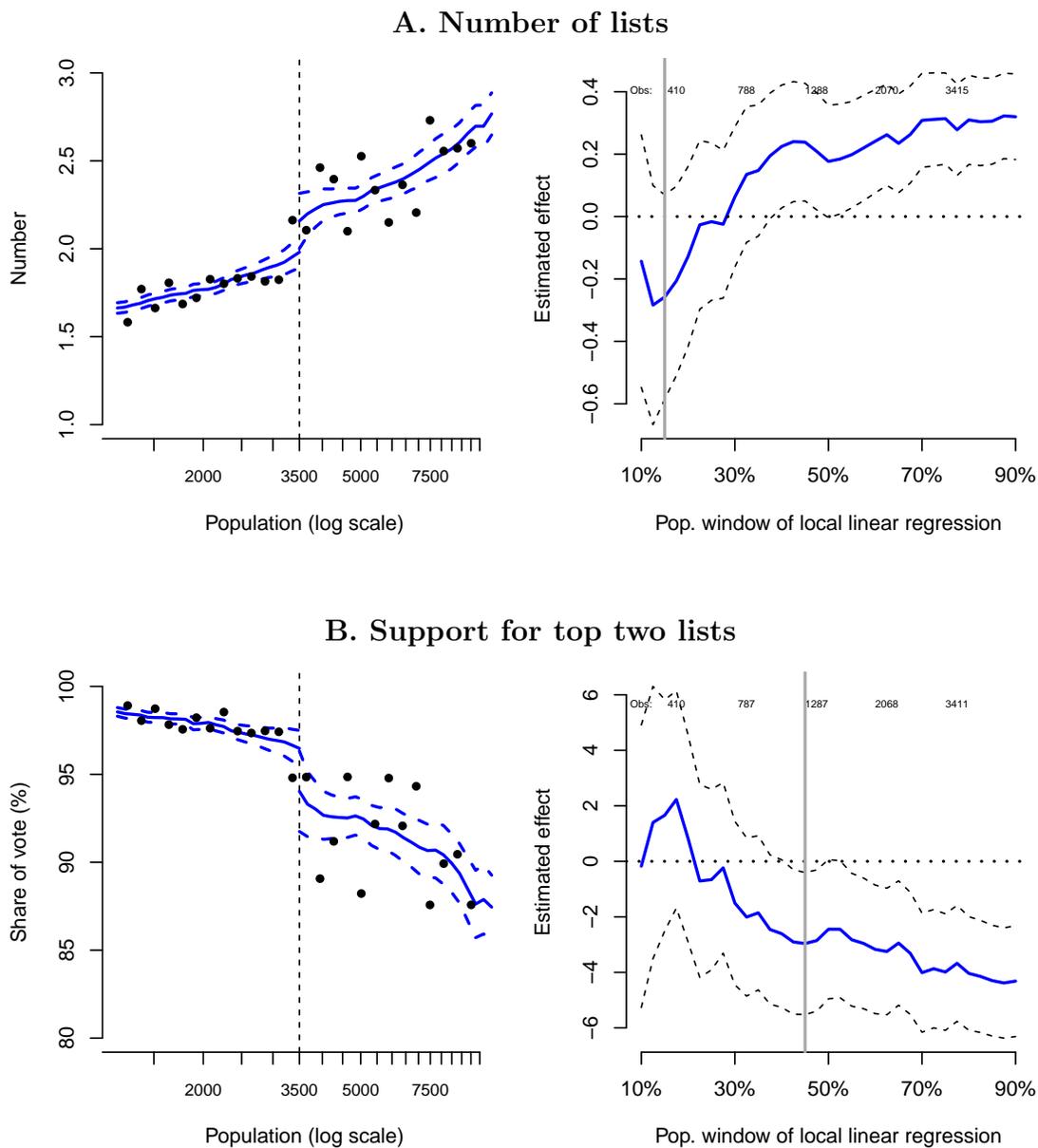
A. Number of lists

B. Support for top two lists

NOTE: See notes to Figure 2. Analysis here is based on results in northwest France in 2001 and 2008.

Table 6: Effect of crossing 3,500 population threshold on number of lists and support for lists

| Dependent variable	Mean	Effect estimates					
		(1)	(2)	(3)	(4)	(5)	(6)
Number of lists	2.02	-0.016 (0.074)	0.177*** (0.053)	0.315*** (0.04)	-0.007 (0.063)	0.162*** (0.048)	0.299*** (0.037)
Vote share (%) for top two lists	95.42	-0.659 (0.911)	-2.456*** (0.706)	-3.996*** (0.56)	-0.994 (0.786)	-2.25*** (0.654)	-3.872*** (0.532)
Vote share (%) for winning list	66.06	-1.812 (1.765)	-4.474*** (1.267)	-8.423*** (0.979)	-1.732 (1.577)	-4.344*** (1.174)	-8.155*** (0.893)
Window:	25%	25%	50%	75%	25%	50%	75%
Covariates?					✓	✓	✓

NOTE: Analysis is based on cities in northwest France in the 2001 and 2008 elections. See Table 2 for details of the table presentation.

population threshold has to do with the quality of minor lists: holding constant the number of lists, we might expect minor lists to be populated by higher quality candidates under PR because under that system candidates on minor lists have a chance of winning a seat. The same consideration extends even to second-place lists, which generally do not win seats under plurality but win seats as a rule under the PR system (as indicated by Figure 1). Given the difference in electoral rewards, high-quality candidates may choose to challenge the locally dominant coalition under the PR system rather than join it as they might be inclined to do under the plurality system.[31] As a way of testing this possibility, I measure the effect of crossing the 3,500 threshold on support for the winning list; the results are reported in the bottom row of Table 6 and plotted in Figure 5. Although the size of the effect is sensitive to the window chosen (and is not significant at the optimal window), for windows above about 40% I find a significant drop in support for the winning list at the 3,500 threshold – a drop that is large enough that it could not simply be explained by the

---

[31]On the other hand, if competent politicians' preference ordering is "serve as mayor" > "not serve on council" > "lead opposition on council", then the plurality system would provide greater incentives for competent challengers to enter.

increase in support for lists finishing third or lower. This is consistent with the hypothesis that the PR system increases the quality of competition by encouraging more competent politicians to challenge, rather than join, dominant lists.[32] This increase in competition may in turn have contributed to the increase in turnout both by augmenting mobilization efforts and by giving voters a more intriguing choice.

Figure 5: Effect of crossing 3,500 population threshold on support for winning list
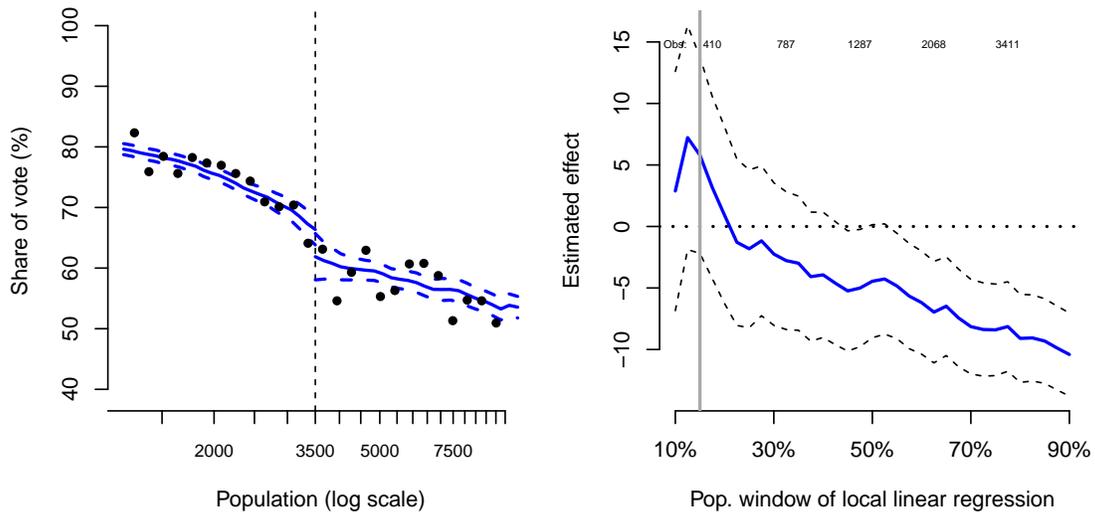
NOTE: See notes to Figure 2. Analysis here is based on results in northwest France in 2001 and 2008.

VI. CONCLUSION

There are two primary empirical approaches to the question of how electoral systems affect turnout, each corresponding to a broader style of research in comparative politics. One starts from the variation in political participation that we hope to explain – usually cross-country variation in turnout in legislative elections – and attempts to relate it to variation in electoral systems, controlling when possible for other aspects of the political environment

---

[32]An alternative possible explanation for the shift in support away from the dominant list is that voters prefer not to vote for unsuccessful candidates and lists and are more willing to vote for less dominant lists under PR, where those lists will at least win a few seats. For physiological research on voters' preference for winners, see Stanton et al. (2009).

that may vary across countries. The other approach starts from the possible explanations of turnout and looks for settings in which the effect of one of those explanations may be advantageously measured. The two approaches are complementary. The first approach directly addresses the phenomena we find interesting, but it usually leaves us with concerns about omitted variables and reverse causation; the second approach provides convincing accounts of how a particular "treatment" affected turnout in a particular setting, but it usually leaves us with questions about how well these accounts apply to other settings of more general interest. In other words, the first approach is subject to criticisms about internal validity while the second approach is subject to criticisms about external validity.

This study is decidedly of the second type. Although the results are of direct interest to ongoing policy debates about local election systems in France, the primary goal of the study is to complement cross-national studies seeking to understand how electoral formulas affect political participation. Taking advantage of an unusual natural experiment in small French cities, it documents an effect of the electoral formula on turnout, showing that (as predicted by existing accounts of how mobilization incentives depend on electoral rules) PR increases turnout most in less evenly-fought elections. Because many other features that usually differ between PR and plurality systems are held constant here (notably the arrangement of districts and the frequency of coalition government), the results provide confirmation that turnout depends on the proportionality of the electoral formula. Of course, it is difficult to know to what extent these results explain cross-national differences in turnout: municipal council elections in small French cities differ from national legislative elections in numerous ways, including such major factors as the nature of the electoral systems in use and the role of political parties. Still, I argue that the effects of proportionality that I document in this setting also operate at the national level where, for a variety of reasons, these effects are much more difficult to measure.

<center>REFERENCES</center>

Ade, F. & Freier, R. (2011), 'When can we trust population thresholds in regression discontinuity designs?'.

Aldrich, J. H. (1993), 'Rational choice and turnout', *American Journal of Political Science* pp. 246–278.

Banducci, S. A., Donovan, T. & Karp, J. A. (1999), 'Proportional representation and attitudes about politics: results from new zealand', *Electoral Studies* **18**(4), 533–555.

Blais, A. (2006), 'What affects voter turnout?', *Annu. Rev. Polit. Sci.* **9**, 111–125.

Blais, A. & Carty, R. K. (1990), 'Does proportional representation foster voter turnout?', *European Journal of Political Research* **18**(2), 167–181.

Boix, C. (1999), 'Setting the rules of the game: the choice of electoral systems in advanced democracies', *American Political Science Review* pp. 609–624.

Brollo, F., Perotti, R., Tabellini, G. & Nannicini, T. (forthcoming), 'The political resource curse', *American Economic Review* .

Colomer, J. M. (2005), 'It's parties that choose electoral systems (or, Duverger's laws upside down)', *Political Studies* **53**(1), 1–21.

Cox, G. (1999), 'Electoral rules and the calculus of mobilization', *Legislative Studies Quarterly* pp. 387–419.

Downs, A. (1957), 'An economic theory of democracy'.

Duverger, M. (1954), *Political Parties: Their Organization and Activity in the Modern State*, Wiley.

Egger, P. & Koethenbuerger, M. (2010), 'Government spending and legislative organization: Quasi-experimental evidence from germany', *American Economic Journal: Applied Economics* **2**(4), 200–212.

Fujiwara, T. (2011), 'A regression discontinuity test of strategic voting and duvergers law', *Quarterly Journal of Political Science* **6**(3-4), 197–233.

Gagliarducci, S. & Nannicini, T. (forthcoming), 'Do better paid politicians perform better? disentangling incentives from selection', *Journal of the European Economic Association* .

Geys, B. (2006), 'Explaining voter turnout: A review of aggregate-level research', *Electoral Studies* **25**(4), 637–663.

Grofman, B. & Selb, P. (2011), 'Turnout and the (effective) number of parties at the national and district levels: A puzzle-solving approach', *Party Politics* **17**(1), 93–117.

<center>29</center>

Hahn, J., Todd, P. & Van der Klaauw, W. (2001), 'Identification and estimation of treatment effects with a regression-discontinuity design', *Econometrica* pp. 201–209.

Imbens, G. & Lemieux, T. (2008), 'Regression discontinuity designs: A guide to practice', *Journal of Econometrics* **142**(2), 615–635.

Jackman, R. (1987), 'Political institutions and voter turnout in the industrial democracies', *The American Political Science Review* pp. 405–423.

Ladner, A. & Milner, H. (1999), 'Do voters turn out more under proportional than majoritarian systems? the evidence from swiss communal elections', *Electoral Studies* **18**(2), 235–250.

Lee, D. (2008), 'Randomized experiments from non-random selection in US House elections', *Journal of Econometrics* **142**(2), 675–697.

Loughlin, J. (2007), *Subnational Government: The French Experience*, Palgrave McMillan.

McCrary, J. (2008), 'Manipulation of the running variable in the regression discontinuity design: A density test', *Journal of Econometrics* **142**(2), 698–714.

Pettersson-Lidbom, P. (2012), 'Does the size of the legislature affect the size of government? evidence from two natural experiments', *Journal of Public Economics* **96**(3), 269–278.

Powell Jr, G. B. (1980), 'Voting turnout in thirty democracies: Partisan, legal, and socioeconomic influences', *Electoral Participation: A Comparative Analysis* **534**.

Powell, Jr, G. B. (1986), 'American voter turnout in comparative perspective', *The American Political Science Review* pp. 17–43.

Riker, W. H. & Ordeshook, P. C. (1968), 'A theory of the calculus of voting', *American Political Science Review* **62**(01), 25–42.

Rokkan, S. (1970), *Citizens, Elections, Parties: Approaches to the Comparative Study of the Process of Development*, Universitetsforlaget.

Schwartz, T. (1987), 'Your vote counts on account of the way it is counted: An institutional solution to the paradox of not voting', *Public Choice* **54**(2), 101–121.

Stanton, S. J., Beehner, J. C., Saini, E. K., Kuhn, C. M. & LaBar, K. S. (2009), 'Dominance, politics, and physiology: voters' testosterone changes on the night of the 2008 United States presidential election', *PLoS One* **4**(10), e7543.

Thistlethwaite, D. & Campbell, D. (1960), 'Regression-discontinuity analysis: An alternative to the ex post facto experiment', *Journal of Educational Psychology* **51**, 309–317.

Table 7: RD analysis: The effect of crossing the 3,500 population threshold on placebo (pre-treatment) outcomes

Outcome	Mean	Effect estimates		
		(1)	(2)	(3)
Pct. retired, 1999	19.07	0.711 (0.667)	0.313 (0.455)	0.24 (0.361)
Pct. working in agriculture, 1999	5.34	-0.023 (0.638)	-0.068 (0.461)	0.775* (0.38)
Pct. with 'bac' degree, 1999	36.45	-0.713 (0.985)	-0.758 (0.718)	-0.187 (0.585)
Pct. unemployed, 2001	12.33	-0.764 (0.762)	-0.456 (0.542)	0.064 (0.441)
Log pop., 1990	8.03	$0.025^{\dagger}$ (0.013)	0.013 (0.009)	0.011 (0.007)
Area (sq. km.)	21.37	-3.087 (2.021)	-1.883 (1.406)	-1.803 (1.123)
Local tax revenue, 2000 (in thous. euros)	1142.57	172.027 (106.377)	125.215 (75.952)	109.848 (66.66)
FCTVA, 2000 (in thous. euros)	101.36	5.422 (8.829)	4.661 (6.544)	6.406 (5.628)
Turnout, 1995 pres. elections	81.87	-0.157 (0.341)	-0.057 (0.236)	-0.109 (0.192)
Pct. for Chirac, 1995 pres. elections	51.87	0.633 (0.927)	0.772 (0.674)	0.585 (0.541)
Region: Center	0.08	-0.033 (0.028)	-0.006 (0.019)	-0.005 (0.016)
Region: West	0.22	-0.005 (0.044)	-0.076* (0.031)	-0.084*** (0.025)
Region: South	0.22	0.018 (0.045)	0.042 (0.032)	$0.052^{\dagger}$ (0.026)
Region: East	0.13	0.046 (0.037)	0.044 (0.027)	0.013 (0.022)
Region: North	0.16	-0.019 (0.039)	0.004 (0.028)	0.018 (0.023)
Region: SW	0.13	0.013 (0.037)	0.003 (0.026)	0.015 (0.021)
Region: Paris	0.06	-0.021 (0.026)	-0.01 (0.019)	-0.01 (0.015)
Window:	25%	25%	50%	75%

Table 8: Estimated effects at optimal bandwidths chosen by cross-validation

Reference	Outcome	Mean	Window	Effect	Std. Err.	N
Figure 2.A	Turnout, 2008; high competition	72.257	87.5%	-0.14	(0.653)	7046
	Turnout, 2008; medium competition	69.181	90%	1.841**	(0.686)	4351
Figure 2.B	Turnout, 2008; low competition	66.041	52.5%	1.691†	(0.909)	1132
Table 2, row 1	Turnout, 2001	70.727	67.5%	1.416**	(0.454)	5997
Table 2, row 2	Turnout, 2008	69.141	52.5%	1.071*	(0.539)	3419
Table 2, row 3	Turnout, 2001 & 2008	69.962	67.5%	1.235***	(0.317)	11600
Table 2, row 4	Turnout, 2002 presidential	74.949	67.5%	-0.126	(0.257)	5997
Table 2, row 5	Turnout, 2004 regional	63.384	55%	-0.588	(0.416)	3963
Table 2, row 6	Turnout, 2007 presidential	86.326	60%	-0.246	(0.2)	4658
Table 3, row 1	Turnout, 2008; high parity effect	69.818	90%	-0.667	(0.662)	8761
Table 3, row 2	Turnout, 2008; medium parity effect	69.327	20%	-0.03	(1.478)	339
Table 3, row 3	Turnout, 2008; low parity effect	68.248	70%	1.668*	(0.809)	1684
Table 4, row 1	Turnout, 2001 & 2008 at 500	78.948	60%	0.45**	(0.167)	30281
Table 4, row 2	Turnout, 2001 & 2008 at 750	77.212	77.5%	-0.309†	(0.162)	41269
Table 4, row 3	Turnout, 2001 & 2008 at 1000	75.992	42.5%	0.862***	(0.243)	14350
Table 4, row 4	Turnout, 2001 & 2008 at 1500	74.079	87.5%	-0.065	(0.2)	45314
Table 4, row 5	Turnout, 2001 & 2008 at 2150	72.056	27.5%	0.093	(0.434)	4444
Table 4, row 6	Turnout, 2001 & 2008 at 4520	69.569	42.5%	-0.196	(0.477)	4262
Table 5, row 1	Turnout in 2001 at 500; high comp.	79.249	90%	0.736*	(0.365)	6935
Table 5, row 2	Turnout in 2001 at 500; medium comp.	76.744	90%	0.003	(0.341)	7261
Table 5, row 3	Turnout in 2001 at 500; low comp.	75.462	42.5%	1.119*	(0.467)	3313
Table 5, row 4	Turnout in 2001 at 1000; high comp.	77.084	67.5%	0.926†	(0.492)	4755
Table 5, row 5	Turnout in 2001 at 1000; medium comp.	74.12	90%	0.119	(0.405)	8528
Table 5, row 6	Turnout in 2001 at 1000; low comp.	72.065	80%	1.503***	(0.411)	6801
Table 6, row 1	Number of lists	2.017	15%	-0.258†	(0.151)	330
Table 6, row 2	Vote share for top two lists	95.416	45%	-2.961**	(1.082)	1180
Table 6, row 3	Vote share for winning list	66.06	15%	5.793	(4.066)	330