Crashing the Gate: The Effects of Parliamentary Fragmentation on Democratic Outcomes

Sean Kates
New York University
Department of Politics
https://wp.nyu.edu/seankates/

Abstract

The upsurge in parliamentary representation for electorally marginal parties with extreme or anti-system platforms has generated concern over the effects that such representation can have on party system efficiency and representativeness. In this paper, I use an expansive collection of elections from European parliamentary democracies and a series of regression discontinuity designs to test whether the addition of what I term “gate-crashing” parties undermines parliamentary stability or significantly alters the perceptions and behaviors of voters. I find that such an addition has no discernible causal effect on traditional measures of parliamentary stability, including the size of the governing coalition, the size of the largest party, or even future levels of parliamentary fragmentation. However, the inclusion of a gate-crashing party does lead to a dramatic increase in wasted votes in the following elections. This effect is normatively worrisome, given the strong connection between wasted votes and dissatisfaction with democracy.
Introduction

In the past half decade, a cottage industry has grown up around discussions of democracy’s fragility, particularly in the developed world.\(^1\) Many of these works highlight what seems to be the increasing ungovernability of parliamentary democracies as niche and extreme parties gain representation and upset the traditional balance between center left and center right parties. In this argument, governments that cannot legislate efficiently and effectively are far more prone to collapse, especially under the stress of massive shocks like the global financial crisis or the European refugee crisis. Political fragmentation of this sort becomes a source of policy frustration, and eventually both a cause and a function of democratic dissatisfaction among the populace. These arguments are not exclusively germane to the modern era, with proponents frequently reaching at least as far back as Weimar Germany for historical precedent.

Political scientists have spent a great deal of time exploring the causes of political fragmentation, including the structure of electoral rules (see, e.g. Taagepera and Shugart 1989, Taagepera 1997, Amorim Neto and Cox 1997, Filippov, Ordeshook and Shvetsova 1999, and Flick Witzig and Vatter 2017), country size (Anckar 2000), strategic political considerations on the parts of voters (Golder 2006), ethnic heterogeneity (Birnir and Van Cott 2007 and Lublin 2017) and the information environment (Rozenas and Sadanandan 2018), as well as its possible effects on turnout (see, e.g. Blais and Carty 1990, Blais and Dobrzynska 1998, and Lundell 2011). However, it has been largely taken as fact that when parliaments are diluted with small

\(^1\)The most recent and prominent popular examples include Luce (2017), Levitsky and Ziblatt (2018), Mounk (2018), and Snyder (2018).
parties, particularly single-issue or anti-establishment parties, they become more unstable and difficult to govern. Comparatively little scholarly work has been done to causally identify the effects of increased fragmentation on immediate democratic outcomes, particularly those that may be associated with democratic governance and satisfaction.

In this article, I confront this issue directly, focusing on the implications for a political system when small parties qualify for political representation. This most visible form of political fragmentation sees parties that tend to appeal to small sections of the electorate, and frequently trumpet populist or extreme platforms. In the past three years alone, one could include as examples the qualification of populist Volya in Bulgaria, the rise of decentralization-focused STAN in the Czech Republic, the return to parliament of the nationalist Slovenian National Party, the ill-fated arrival (and then prompt disappearance) of center-right Network in Slovakia, and the introduction of the left-wing anti-Islam Peter Pilz List in Austria.

Using a dataset hand-collected for the project from official electoral offices and archival sources, I apply a series of regression discontinuity analyses centered on party systems where parties either just qualify or fail to qualify for representation to test the direct and indirect effects of adding a small party (which I term “gate-crashing parties”) to a parliament. Specifically, I test whether such an addition (a) increases the number of parties that are brought into the governing coalition, (b) increases the

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2 As we discuss below, there is a great deal of overlap between this group of parties and a more traditional “fringe” party grouping, but it is the level of electoral success - and not the ideological platform - that brings parties into this study.

3 Network won 10 seats in the 2016 Slovakian election, but through party splits and agglomerations now has no members of parliament representing it.
likelihood that early elections are called, (c) decreases the vote share of the largest party in the following election, (d) increases a standard measure of fragmentation in the following election, and (e) increases the number of wasted votes in the following election.\footnote{I use the effective number of parliamentary parties ("ENPP") as the measure of fragmentation.}

I find little evidence of direct impact on the number of coalition partners, largest party vote share, or on future fragmentation. These findings suggest a robustness of parliamentary democracy to this type of threat. However, the introduction of a small party causes a substantial increase in the percentage of wasted votes in the following election, a worrying result for the perception of democratic legitimacy even absent actual deterioration in democratic efficiency. I also find some suggestive evidence that gate-crashing parties actually act as parliament stabilizers, increasing the likelihood that the parliament serves its full legal term. In the next section, I discuss party system fragmentation and its possible effects on democratic governance.

\section*{Party System Fragmentation and Democratic Outcomes}

Party system fragmentation, measured either as an increasing number of parties that receive votes, or as the number of parties that actually enter the legislature, has been on the rise across western democracies for multiple decades. Figure 1 shows the time trend for the effective number of parliamentary parties in each party system in the sample I use in my analysis.\footnote{This sample is described in much greater depth below, but it includes mostly European countries where parliamentary representation is at least partly determined through a system of proportional representation.} While the fitted line shows the general trend
across all party systems, one can observe the same trend mirrored in each of the
countries included. This measure captures the number of parties in a system that
reach parliamentary representation, but accounts for their relative strength using
vote share.

Fragmentation of this kind is not obviously bad for democracy. Heterogeneity of
voter preferences can create demand for alternative parties which focus on narrower
issues or more extreme platforms. Having those voices represented in parliament may,
in certain circumstances, aid democratic legitimacy by giving voice to the dissatisfied,
rather than accruing hostility toward the system outside of its gates.

However, personal voice is only one aspect of democratic satisfaction. Most voters
also expect responsiveness on the part of the government as a whole, particularly in
times of economic or social disruption. The ability of a government to respond in the desired way, which I call “democratic efficiency,” can be conditioned by many things, not the least of which is the number of veto players (in this case, parties) in parliament (Tsebelis 1999). The proper balance between democratic representation and democratic efficiency is never perfectly clear, and is highly likely to be contextual in nature. Thus, it is imperative to capture the effects that fragmentation has on democratic outcomes associated with democratic satisfaction. I focus here on one type of fragmentation, and its effects on both democratic efficiency and representativeness.

Fragmentation can come in different forms, and previous research has not always seen it necessary to disentangle these (but see Best 2013 for an analysis of opposition cohesiveness that does attempt this distinction). It is important to tease these types of fragmentation apart, as they could plausibly generate heterogeneous effects that are ameliorated or amplified by the effects generated by alternative forms. In this paper, I focus on the addition of electorally marginal parties to parliament, perhaps the most accessible form of fragmentation for most voters.⁶

There are good reasons to believe that this type of fragmentation might be the most disruptive, as it can introduce parties that either lack experience in parliamentary procedures, rules, and formalities, or parties whose platforms are either explicitly or implicitly populist, anti-establishment, or ideologically extreme in ways

⁶Fragmentation can also be driven by vote-shifting among existing parliamentary parties, and specifically where large parties lose votes to smaller and medium-sized parties, flattening the relative power structure. Note that this type of fragmentation eventually requires the introduction of new parties to continue fragmentation. Otherwise, there is a ceiling that is reached when vote shares are identical across all current parliamentary parties. The two different forms of fragmentation are thus inextricably connected, and research on either form can elucidate interesting aspects of the other. While I focus on the former form of fragmentation here, I discuss the benefits of research across both types in the Discussion below.
that are likely to be obstructionist more than legislatively productive.\footnote{I describe how parties qualify as gate-crashers in greater depth below, under \textit{Treatment}.} Parliamentary representation grants these parties additional exposure above and beyond what they can command outside of governmental channels of power.

Alternatively, exposure could be a double-edged sword. When parties eek into parliament, they are forced to confront the practical limitations of government, including the chastening restrictions of their own minimal position. They face the threat of being associated with the policy ramifications of a parliament, while having little to no influence over them. It may be more difficult to credibly sell the party as a threat to the status quo from inside, rather than outside. If voting for the party does not “fix” things, there may be backlash among its supporters.

The traditional concern with small party entry relies on the unwieldiness of governing amid new or hostile parties. In many countries, however, norms and rules have grown up inside and around parliaments to ensure that, once formed, governments can effectively govern, even in the face of extreme opposition. These norms may blunt the possibly deleterious effects of anti-establishment or extreme parties gaining representation, leaving an open question as to just how harmful small party entry might be to effective governance or democratic representativeness.

In this paper, I try to answer this question causally, using five distinct measures of democratic efficiency and representativeness. Below, I discuss why each of these measures is used, and what effect one might expect from the entry of a gate-crashing party.
Parliamentary Survival

Conventional wisdom suggests that adding an additional gate-crashing party to parliament will increase the likelihood of a discretionary termination of the parliament’s term. The types of parties that just qualify for parliamentary representation are more likely than not to be newer parties, with relatively little parliamentary experience. From the literature on government formation, we know that parties new to parliament are rarely included in the governing coalition (Harmel and Robertson 1985, Bolleyer, Spanje and Wilson 2012), and those with the smallest vote shares are most likely to be excluded (Grotz and Weber 2016). This suggests that party systems with an additional party of only marginal electoral importance are likely simultaneously to see more difficult coalition formations (as the vote share of possible “viable” coalition partners is lower than in the system where seats are distributed only among parties that easily qualified for participation), and likely to contain large formateur parties with an incentive to call new elections if the coalitions in the new government would be less fractious. This can be a recipe for early elections, either due to coalitions too broad or unwieldy to succeed, or large parties with incentives to call them.

From an efficiency standpoint, premature termination of a parliament almost definitionally ends government effectiveness, but even from a longer term perspective early elections are nearly certain to create delays in government policy. Constant electioneering is costly, and more frequent elections court the possibility of habitu-

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8 This includes either a call for snap elections by the government, or a vote of no confidence that triggers new elections.
ating individuals to a form of electoral lethargy. Increased number of elections can also work to decrease the stakes of any one election in the eyes of voters, something that has been shown to decrease turnout (Pacek, Pop-Eleches and Tucker 2009).

**Number of Parties in Government Coalition**

The addition of a gate-crashing party might also be expected to increase the number of parties in the governing party coalition. This follows from the discussion above, but with some small percentage of the seats in parliament occupied by a party unlikely to be included in the coalition, the formateur may be required to add an additional party to a governing coalition to garner the necessary voting support. Mechanically, any seats that go to a small party are denied to a larger party, and as larger parties shrink, the number that are necessary to form a coalition rises.

The number of coalition parties is obviously linked with the survival of the government (Warwick 2007), as well as the ability to pass substantial legislation (Tsebelis 1999) that is responsive to voters’ preferences (Klüver and Spoon 2017). Finally, an increase in the number of parties makes it very difficult for voters to assess accountability accurately (Fisher and Hobolt 2010). An increase in coalition size, then, threatens both democratic efficiency and stability.

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9This is similar to the theory supported in Franklin and Hobolt (2011) for elections to the European Parliament, as well as in traditional arguments against elections with two stages.
Future Levels of Fragmentation

One could also credibly expect that adding an electorally marginal party to parliament will increase future fragmentation. This effect can operate through at least two channels, though I certainly do not rule out others. It may be that a small party generally makes democratic governance more difficult, either because of the reasons discussed above (fractured or over-populated coalitions), because the marginal party is particularly obstructionist, or simply because these parties may be disorganized or poor at carrying out traditional parliamentary responsibilities. To the extent that governance is poor, it is more likely that voters will blame the larger parties (whether government or opposition) than the small. In any case, the former have a much greater vote share to lose than the latter. The end result is a flattening of vote share among large parties, which one observes as future fragmentation.

Even absent a decrease in democratic efficiency, the inclusion of a gate-crashing party can also increase future fragmentation through the way it changes voters’ perceptions. Here, the party that is now part of parliament serves as proof to voters that parties of this type and size can overcome electoral thresholds and other barriers to entry. If some voters that previously adopted a strategic position of voting for medium and larger parties rather than their preferred small parties now find it more acceptable to risk a wasted vote to express themselves more truthfully, this is likely to increase fragmentation.\textsuperscript{10}

These two avenues implicate the two different parts of democratic satisfaction

\textsuperscript{10}In general, any votes that move from medium and large parties to smaller parties are likely to increase the parity between these two groups and increase fragmentation.
discussed in this paper (efficiency and representativeness), and so in addition to testing whether small party entry increases fragmentation in the next elections, I test for two related phenomena.

**Vote Share of Largest Party**

As a natural extension of the arguments above, we should expect that - whether dissatisfied at the democratic performance of the government or simply more open to voting sincerely - voters will move from larger parties to smaller ones. Thus, I expect that the addition of a gate-crashing party to parliament will decrease the vote share of the party that wins the greatest number of votes in the following election. This hypothesis implicates both efficiency, in that governing parties are likely to be smaller and need to compromise more in governing, and representativeness, if the smaller parties now receiving more votes are closer to voters’ ideological position.

In the cases of both future fragmentation and the declining strength of large parties, these outcomes also serve potentially to reinforce the cycle of fragmentation, plausibly leading to greater long-term effects of the type described above. By the logic of this paper, fragmentation in the future may be self-reinforcing. More immediately, governmental fragmentation may itself be associated with dissatisfaction with democracy (Christmann and Torcal 2018), and thus lamentable for the same reasons we discuss below in relation to the number of wasted votes.
Wasted Votes

The inclusion of a gate-crashing party need not be an unalloyed good for the representativeness of a system. If perceptions shift such that voters move away from larger established parties and ultimately cast votes for a party that fails to be included in parliament, representativeness can dramatically decrease. Thus, a slight increase in representativeness for those voters supporting the gate-crashing party in one election is likely to decrease representativeness across the system as a whole in future elections. The final test addresses this exact scenario, and suggests that the inclusion of a gate-crashing party will dramatically increase the number of wasted votes in the following election.

An increase in wasted votes is an indirect harm, though just as serious as the direct harms possible mentioned above. A long line of literature has established the connection between losing an election and decreased feelings of democratic legitimacy and representativeness (see, e.g. Anderson and Guillory 1997, Singh, Karako and Blais 2012, and Blais, Morin-Chass and Singh 2017) and that dissatisfaction of this type may actually be worse in parliamentary systems under proportional representation (Ferland 2015) and when the parties for whom wasted votes are cast are of the type that never or seldom reach parliamentary representation (Delgado 2016). As the perceptions of democratic legitimacy can impact political decisions (including the support of anti-democratic groups) even absent obvious declines in democratic performance, an increase in wasted votes is a worrying sign for democracies.
Table 1 briefly encapsulates the hypotheses attached to each of these outcomes, and the next section details the research design aimed at testing them.

### Table 1: Hypotheses on the Effect of Gate-Crashing Party on Efficiency and Representativeness

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Direction</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) Early Elections</td>
<td>Increase</td>
<td>Instant Parliamentary Term</td>
</tr>
<tr>
<td>2.) Number of Coalition Parties</td>
<td>Increase</td>
<td>Instant Parliamentary Term</td>
</tr>
<tr>
<td>3.) Fragmentation</td>
<td>Increase</td>
<td>Election After Inclusion</td>
</tr>
<tr>
<td>4.) Vote Share of Largest Party</td>
<td>Decrease</td>
<td>Election After Inclusion</td>
</tr>
<tr>
<td>5.) Wasted Votes</td>
<td>Increase</td>
<td>Election After Inclusion</td>
</tr>
</tbody>
</table>

**Research Design**

In the following sections, I describe the data and methodological approach used to test the hypotheses developed above, before moving on to the results.

**Data**

My sample is constructed from developed countries where at least some portion of parliamentary seats are apportioned according to rules of proportional representation. While the effects estimated in this paper may extend to party systems outside of developed countries of this type, or to systems using alternative electoral systems, I argue it makes sense first to isolate the effect in systems that are roughly similar on a host of potential confounders before extending the analysis to systems that differ across them.
I construct the dataset from two different sources. I first use Bormann and Golder’s Democratic Electoral Systems (“DES”) dataset (Bormann and Golder 2013) for certain attributes tied to the political systems in the sample, updating it in the limited instances necessary. The extracted variables from this dataset are generally associated with the level of fragmentation, or system-level covariates that are useful in the estimation procedure.\textsuperscript{11}

I marry this dataset to a second and more expansive set that I created for this paper. This dataset includes outcomes from elections in parliamentary democracies, with particular attention given to the results of parties that either barely earned representation in the legislature, or barely failed to. Thus, for each of the 235 elections, spread across 19 countries (Table 7 in Appendix D lists the countries and periods included in the sample), I use official electoral offices and archival sources to collect measures of how close the last party in (out) of the legislature was to missing (being included) in the parliament. This allows me to separate systems into “treated” and “control” groups, which I discuss in the Methodology section below.

Methodology

In this paper, I attempt to isolate the causal effect of an additional gate-crashing party in parliament on various political outcomes. One approach to this issue might simply regress values of the chosen dependent variables on the number of parliamentary parties selected in a particular country-election. However, this approach (even

\textsuperscript{11}I provide descriptions and summary statistics for all of the variables in Appendix B.
were it to include a large host of appropriate control variables) courts inferential difficulties.

Party systems separated even by only one parliamentary party can differ in fundamental ways that make their comparison for purposes of estimating the desired effect questionable. Consider a sample comparison between a strict two-party system where no third party has ever gained representation and a multi-party democracy with three equal-sized parties that nearly always gain representation in the parliament. Using a naïve regression will effectively measure the difference in the mean values of the dependent variable for each of the two systems; however, the theoretical value of such an estimate is minimal. There is little or no overlap in the sample, so one cannot reasonably extend the measured effect to either system. In general, we probably think that observations where the likelihood of parties qualifying or dropping out of the parliament is quite low are not helpful for estimating the desired effect, which requires the possibility that fragmentation occurs.

My methodological approach addresses this issue directly. I ensure a meaningful sample of comparison cases by adopting a regression-discontinuity ("RD") design. RD designs have become increasingly common in political science as a means of generating plausible causal estimates in situations where experimental manipulation is unlikely or impossible. When the appropriate assumptions are met, the design allows a researcher using observational data to divide the sample at a meaningful threshold and treat observations on either side of the threshold as if they had been randomly assigned there. This allows the researcher to estimate the expected level of any desired outcome on either side of the threshold, and generate a credible causal
estimate for the effect of crossing that threshold by comparing those expected outcomes. The design’s appeal, then, is allowing researchers to treat observational data as if it were generated through an experiment (Imbens and Lemieux 2008, Lee and Lemieux 2010, and Cattaneo, Idrobo and Titiumik 2017).

I employ a continuity-based, local polynomial approach in my design, which has become the standard in empirical analysis.\(^{12}\) This approach relies on the main assumption that the average potential outcomes are continuous functions on either side of the cutoff, and a causal effect of passing a threshold can be estimated by taking the difference of the expected outcomes on either side of the cutoff at this threshold.

I consider as my running variable the measure of closeness to parliamentary representation described below in the Treatment subsection. I call this “margin of representation,” and it is positive for parties that are represented in parliament and negative for those who fail to earn a seat. Note that my observations are at the level of a party system, while the running variable is an attribute of a single party within that system.

Following the most common procedure for RD estimations, I isolate the causal effect of adding an addition parliamentary party by employing a triangular kernel and estimating the weighted local-linear fits to observations within a specific bandwidth on either side of the cutoff. The bandwidth is chosen through an automated, data-

\(^{12}\)However, I also conduct the same analyses using an approach centered on localized randomization, where I assume that there is a small window around the cutoff where an additional party either makes or misses parliamentary qualification on an \textit{as if} random basis. The analysis conducted there follows from the experimental literature. The results of these robustness checks are presented in Appendix C and, as noted in the Results section, track what I find in the main part of the paper.
driven process (to avoid possible researcher manipulation) that attempts to optimize the bias-variance trade-off at the heart of bandwidth selection. Here, I chose the bandwidth that minimizes the mean squared error (“MSE”) given the choice of the triangular kernel and local linear fit. In my primary estimation, I construct a common bandwidth for each side of the threshold, but I show in the Appendices that the results are robust to changes in all of these choices (kernel, polynomial order, and number of bandwidths).

I follow this procedure separately for each dependent variable, as the distribution of the variable around the cutoff will alter the bias-variance trade-off that instructs the bandwidth. The point estimation of each causal effect is a simple comparison of the expected outcome of the local linear fit at the cutoff for the “treatment” group (the systems that saw a party just make the parliament) with the expected outcome of the local linear fit at the cutoff for the “control” group (the systems that saw a party just miss the parliament). To clarify how an observation enters either group, I now discuss the treatment directly.

**Treatment**

This paper attempts to causally identify the effects of adding a gate-crashing party to parliament on a host of dependent variables. As such, it requires a clear and definitive delineation of those parties that serve as gate-crashers, and those that do not. For the purposes of this paper, gate-crashers are to be defined by their level of electoral success, and specifically by whether they qualify for parliamentary representation or not. Thus, parties that gain parliamentary representation may be gate-crashers,
those that do not cannot. Those that do qualify for representation are considered gate-crashers based on the analytic approach, with the likelihood of qualification as a gate-crasher increasing in just how narrowly representation was achieved. Thus, below I describe how I calculate a party’s margin of representation, before moving on to discussing the substantive qualities of the gate-crashers.

For countries with national constituencies (where the district magnitude is the same as the entire legislature) and thus national electoral thresholds, the calculation for margin of representation is a relatively straightforward task. The parties that barely cross the threshold enter the legislature by the difference between their vote total and the product of the threshold and the total number of valid votes in the national election, all divided by the national vote total. Similarly, the parties that just miss do so by the same difference, which will be negatively signed.¹³

However, when legislative seats are earned at sub-national levels, the process is slightly more complicated. Here, I identify the party that came closest to winning a seat in the parliament without doing so. In most cases, this is a party that competes nationally, but is closest to gaining a seat in one particular legislative district.¹⁴ In some cases, it is a party that is competitive only regionally, but is still not quite strong enough to gain representation. For these parties, I calculate the percentage

¹³Mathematically, the running variable in this instance is equal to:

\[
\frac{\text{Marginal Party Votes} - (\text{Electoral Threshold})(\text{Total Votes Cast})}{\text{Total Votes Cast}}
\]

¹⁴Throughout this paper, I will refer to the division at which a party makes or misses a parliamentary seat a “district.” Depending on the country and electoral system, this can be anything from a small single-member municipality to the entire country.
of votes by which they missed the final seat in the district.\textsuperscript{15} I provide an example of how I calculate this in Appendix A.

Where possible, I also identify the party that only barely qualified for representation in the legislature. Where seats are earned below the national level, I restrict myself to parties that earned a single seat in the legislature or earned all of their seats in the legislature in the same district.\textsuperscript{16} Here, I calculate the percentage of votes by which the party cleared the threshold between representation and no representation.\textsuperscript{17} It should be noted that all election years in the sample have a party that “just missed,” but not all contain parties that “just made” the legislature. Merely having an observed “just missing” party, however, does not mean that the observation enters the analysis, which relies on \textit{how close} the miss actually was.\textsuperscript{18}

The final step in assigning “treatment” lies in paring the full set of observations down to those that will be included in the analysis. As described above, this is done through the bandwidth selection algorithm, removing discretion from the researcher’s

\textsuperscript{15}Mathematically, the running variable in this instance is equal to:

\[ \frac{\text{Marginal Party Votes in District} \ - \ \text{Number of Votes Necessary to Gain Seat}}{\text{Number of Votes in District}} \]

\textsuperscript{16}This is due not only to the difficulty in identifying this party across multiple districts within country-election observations, but also to the strain this conceptually puts on what it means to “just make” the parliament.

\textsuperscript{17}I again demonstrate how this works in Appendix A.

\textsuperscript{18}Note also that I could be faced with a situation where a party system has a party that just missed qualifying for representation, as well as a party that barely qualified for representation. While this is relatively uncommon, for the main analyses, I treat this as a system where a party just qualified, and remove the instance of a system that contained a party that barely missed. I do this because the theory above posits that it is the addition of any party that triggers either the psychological or practical effect I am concerned with, and having a party just left out of the parliament is ancillary to this effect. That is, it does not work as an antidote to the fragmentation that has already occurred. Most importantly, the main results are robust to this choice, and stand even if I include these systems twice (once on either side) of the estimation.
hands. Once the restricted dataset is created, we term the parties that just barely crossed the threshold as gate-crashers, and compare the outcomes associated with their party systems to party systems (within the chosen bandwidth) with a party that just failed to qualify as a gate-crasher.

It is hopefully clear from this distinction that the attribute “gate-crasher,” as attached to a party, is transient and contextual. Parties can move from being a gate-crasher in one election to a non-gate-crasher in the next. In fact, this is the most likely outcome, as parties either fail to qualify for parliament, or develop enough electoral support that they cannot be considered as having “just” made the parliament. In this way, this designation is very much like the “bare winner” and “bare loser” designation that is frequently used when RD designs are applied to estimate incumbency effects in American politics (see, e.g. Lee 2001 and Caughey and Sekhon 2011). There, individual candidates tend to be “bare winners” or “losers” in only one election, before they either win or lose by a greater margin, or fail to compete again.

For the theoretical purposes of the paper, it is important to characterize substantively the parties that qualify as gate-crashers. In general, when we examine the parties ultimately coded as gate-crashers, these parties tend to be younger parties, with more extreme or populist platforms that may make it more difficult to govern effectively. There is substantial overlap between the list of gate-crashing parties and what might traditionally be coded as “fringe” parties - electorally marginal parties whose main focus is not on a traditional left-right economic discussion. Thus, the concerns above about inexperienced and anti-establishment parties are well-founded in the data. However, in the sample as a whole, there are occasionally mainstream
parties or regional parties that do not have these characteristics. For this reason, I repeat the analysis twice, once for the entire sample, and once in a subset where I focus only on parties coded as “new” or “extreme.” I now move to a brief discussion of how I measure the five dependent variables.

**Dependent Variables**

I have five main dependent variables, each attempting to capture a different aspect of democratic efficiency or representativeness. I discuss the intuition behind the inclusion of these variables in the section above, but want to clarify how these are measured in the data.

The *effective number of parliamentary parties* is a weighted measure of the number of parties in a legislature that accounts for the relative strength of the parties. Introduced in Laakso and Taagepera 1979, the effective number of parliamentary parties has become a standard way to judge fragmentation in a legislature. Increasing numbers represent more nodes of influence in the legislature, and thus, more fragmentation. Here, I use the corrected version introduced by Taagepera 1997 that accounts for systems with large groups of very small parties or large disproportionality between the seats allocated and the votes garnered, and use the change in this measure from the previous election. As in many of the dependent variables, I want to test how the addition of a marginal party to parliament changes the party system, based on what the party system looked like before. Thus, it is appropriate to use the change in the dependent variable from the previous election.

The second dependent variable, the *size of the largest party in parliament*, is the
vote share of the party that received the largest number of votes in the election of interest. I use vote share instead of seat share to avoid comparing countries that reward a disproportionate number of seats to election winners through a majority bonus system\textsuperscript{19} with those that do not, and adjust for the vote share won by the largest party in the previous election.

The \textit{percentage of wasted votes} is the third dependent variable. I measure this as the percentage of votes that are cast for a party that does not receive parliamentary representation. When two different types of votes are cast,\textsuperscript{20} I use the percentage of votes cast in the proportional aspect of the election for parties that do not gain seats, regardless of method. Thus, party list votes for parties that gain single-member district seats (but no proportional representation) are not considered wasted. I also adjust this measure for the level of wasted votes in the previous election.

Fourth, I use a dummy variable to capture whether there was a \textit{complete electoral term}. If early elections were called, this variable takes on the value of “0,” if the term was completed and elections called on schedule, it takes value “1.”

Finally, I measure the causal effect of the inclusion of a gate-crashing party on the \textit{number of parties in the governing coalition}. Here, I use the number of parties in the first governing coalition that is formed directly after the election, and adjust it by the number of parties that were in the original government formation of the

\textsuperscript{19}Greece is one example of such a country. Italy also used this system through parts of the last decade.

\textsuperscript{20}As an example, German voters cast one ballot for a proportional party list and another for their single-member constituency.
previous election. Any changes in the makeup or number of parties in the coalition during the respective parliamentary periods are not included.

In the first three cases, I measure the effect of a party just making the parliament on the dependent variable in the following election. For the variables associated with a completed electoral term and the number of coalition parties, however, the effect measured is on the term in which the marginal party is seated in parliament.

**Results**

Figure 2 presents five graphs, each showing a dependent variable mapped above and below the threshold (where a gate-crashing party qualifies for parliamentary representation), with a smoothed locally weighted polynomial fit to the data, surrounded by 95% confidence intervals. While my analysis applies a local linear test in a much smaller bandwidth, these graphs are useful in understanding the distribution in the sample of each dependent variable.

The graphs also suggest that adding a gate-crashing party may only affect two of the dependent variables: the change in wasted votes and the likelihood of completing an electoral term. This expectation is largely borne out when one looks at the detailed estimation results in Table 2.

The table presents two different results for each dependent variable. The top line in each set represents the naïve, conventional RD result, where the estimate is equal to the difference between the expected outcome at the threshold using the linear fit for treated cases and the expected outcome at the threshold using the fit for non-
Figure 2: Smoothed Local Polynomial Fits, with Confidence Intervals

(a) Likelihood of Completing Electoral Term
(b) Change in Number of Coalition Parties
(c) Change in ENPP
(d) Change in Lead Party Vote Share
(e) Change in Wasted Votes

...treated cases, and the variance is calculated as in a traditional weighted least squares estimation. However, this result fails to account for the fact that the linear model is knowingly and purposefully misspecified in the optimal bandwidth.\textsuperscript{21}

Thus, the second line in each set of results presents a modified error and test.

\textsuperscript{21}More can be found on this in Cattaneo, Idrobo and Titunik (2017), section 4.3.
Table 2: Effects of Gate-Crashing Party on Efficiency and Representativeness

| Dependent Variable          | Eff, N | Method               | Estimate | Std. Err. | z      | P > |z|  | 95% CI               |
|-----------------------------|--------|----------------------|----------|-----------|--------|------|---|----------------------|
| 1.) Likelihood of Completing Term | 129    | Conventional         | 0.371    | 0.200     | 1.851  | 0.064|   | [-0.022, 0.764]     |
|                             |        | Robust Bias-Corrected | 0.235    | 1.691     | 1.091  | 0.063|   | [0.063, 0.857]       |
| 2.) Number of Coalition Parties | 149    | Conventional         | -0.042   | 0.140     | -0.301 | 0.764|   | [-0.317, 0.233]     |
|                             |        | Robust Bias-Corrected | 0.160    | -0.432    | 0.666  | 0.091|   | [-0.383, 0.245]     |
| 3.) Change in ENPP          | 103    | Conventional         | -0.066   | 0.092     | -0.717 | 0.474|   | [-0.245, 0.114]     |
|                             |        | Robust Bias-Corrected | 0.103    | -0.344    | 0.731  | 0.666|   | [-0.238, 0.167]     |
| 4.) Change in Largest Vote Share | 98     | Conventional         | -0.085   | 0.107     | -0.797 | 0.426|   | [-0.295, 0.124]     |
|                             |        | Robust Bias-Corrected | 0.119    | -1.047    | 0.295  | 0.358|   | [-0.358, 0.109]     |
| 5.) Change in Wasted Votes  | 135    | Conventional         | 0.513    | 0.204     | 2.516  | 0.012|   | [0.113, 0.913]      |
|                             |        | Robust Bias-Corrected | 0.230    | 2.288     | 0.022  | 0.075|   | [0.075, 0.976]      |

The results in the table largely confirm what the visualizations suggested. First, there is a statistically and substantively significant effect of including a gate-crashing party on wasted votes in the election following that party’s inclusion. The estimate reflects that the growth in wasted votes is over 50% larger in systems that add a gate-crasher, with an expected increase in wasted votes of approximately 41% in these systems, and an expected reduction of 10% in systems where a party just...

\[^{22}\text{That being said, it is trivial to derive from the confidence intervals provided.}\]
missed parliamentary representation. Given that both groups experience roughly identical levels of wasted votes in the election I analyze (4.40% median for the control group, 4.25% for the treatment), an effect of this size equates to an expectation of approximately 4% of votes being wasted in the following election for systems where parties just miss, and roughly 6% of the votes wasted in systems where parties just qualify for representation. This is a substantively large percentage of voters that may perceive themselves as voiceless within their democratic system.

It should be noted that this is a pooled result across systems where the marginal party added can represent either a small or large proportion of the number of parties in parliament. As such, one might be concerned that the overall effect is driven by only a subsample of the parliamentary systems under study (Cattaneo et al. 2016). I address this concern in Appendix F, where I break down the sample into discrete subsamples where elections yield either $x$ or $x+1$ parties, and run the same analysis covered above on each subsample separately. I now move on to the remaining dependent variables.

While only reaching statistical significance at the $\alpha = 0.10$ level, the result concerning the likelihood of completing the electoral term is suggestive and substantively very interesting. First, the effect is large, if imprecisely measured. The estimate suggests that adding an additional small party to parliament can increase the probability of completing the electoral term from approximately 43% to just over 80%. Second,

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23I complete an additional series of robustness checks in the Appendices. In Appendix C, I approach the issue through an entirely different RD framework, that of local randomization rather than continuity. In Appendix E, I report results from specifications of the continuity-based framework that vary over selections of kernel, polynomial order, and the number of bandwidths. As I discuss in each Appendix, the effect of the inclusion of a gate-crashing party on wasted votes is robust to these changes.
this effect is in the opposite direction of that predicted, with the specific type of fragmentation analyzed here actually aiding in democratic stability.\textsuperscript{24}

In hindsight, of course, this is perhaps not so shocking. Parties that just cross the electoral threshold have very little incentive to support calls for early elections (either by the government or via a vote of no confidence), as they are at risk of falling just on the other side of the cutoff and missing out on representation in the next parliamentary session. Unless there is reason to believe that they will profit incredibly from new elections, they are likely to serve as stabilizing forces out of their own self-interest.

Similarly, one might imagine that an additional party in parliament could simultaneously affect the way governmental coalitions are formed and maintained, while also fracturing the opposition. In the former case, the existence of a gate-crashing party in parliament could allow the leading party to form a cabinet more to its liking (and alleviating one of the reasons for a future call for snap elections) by enlarging the pool of potential coalition partners.\textsuperscript{25} In the latter, there is no assurance that a gate-crashing party that qualifies will have the same concerns as larger parties in the opposition, nor join them in coordinated efforts to undermine the governing coalition.\textsuperscript{26} In any event, this result deserves greater research in the future.

\textsuperscript{24}In Appendix G, I break down the analysis by number of parliamentary parties as I did for wasted votes in Figure 4 in Appendix F. I find the effects are still positive for nearly all sizes of parliamentary party contingents, except at very high levels of party numbers. Again, though, these effects are even more imprecisely measured than those attached to the wasted vote analysis.

\textsuperscript{25}Consider, for instance, the 2016 Slovakian elections, and the aforementioned Network party. By barely qualifying for parliamentary representation, Network increased the number of possible coalition parties that lead party Smer-SD could join in talks and negotiations. This was particularly important as Smer-SD had already ruled out cooperating with the far-right Kotleba People’s Party Our Slovakia, who won over 8\% of the votes and 9\% of seats.

\textsuperscript{26}Consider here the Bulgarian Volya, who barely won entry into the Bulgarian parliament in 2017
In each of the other three analyses (those concerned with the largest party’s vote share, the number of parties in a coalition, and the future level of parliamentary fragmentation), I find no evidence for my hypothesized effects. The estimates not only fail to reach traditional levels of statistical significance, but are also substantively small.\textsuperscript{27} Thus, even were one to argue that the effects are merely imprecisely measured, they are of such a small magnitude that one would not consider them substantively important. In Appendix H, I conduct equivalence tests on these three outcomes, showing that we can safely reject effect sizes that would be normatively worrisome.

These null findings suggest that the introduction of a gate-crashing party to the parliament does not affect these direct measures of democratic efficiency. As discussed above, the sample of parties to just earn parliamentary representation includes mainstream and regional parties that may be more amenable to forming coalitions and operating within the standard norms and rules of parliamentary behavior. Potentially, these parties could be the reason we find null effects, hiding disruptive and destructive effects attached to extreme or new parliamentary parties. Thus, I repeat the analyses above, this time sub-setting the analysis to only compare situations where the parties that earn representation are “extreme” or new to parliament.

As we see in Table 3 below, this does not drastically change our main results. While our estimates are far noisier due to loss of power, those attached to the direct

\textsuperscript{27}In fact, in two of the three cases, the estimates are in the opposite direction of the predictions, though the confidence intervals around them suggest that any effect could just as well run in the same direction.\textsuperscript{27}

and has campaigned on sweeping away the political corruption it sees as rampant not only in government parties, but in the opposition as well. This is a common difficulty when the gate-crashing party has run on a populist anti-elite platform.
measure of democratic efficiency (future fragmentation, number of coalition parties, and size of the largest party) remain substantively small. Even when we talk only of the effect of extreme or new parties entering parliament, the effect remains contained to wasted votes and parliamentary survival, with the estimated effect of extreme or new party entry on wasted votes particularly high.

Thus, throughout the paper, I find little evidence that small-party entry, even that of extreme parties or parties new to parliament, has a substantial effect on several key indicators of government efficiency. Rather, this type of entry seems only to adjust the manner in which voters think about parties and their strategic choice to vote. I discuss further implications of these findings below.

Discussion

In this paper, I showed that, contra expectations, the addition of a small party to parliament does not seem to affect certain key measures of democratic efficiency or future fragmentation. However, adding a gate-crasher does greatly increase the
percentage of wasted votes in the following election. In addition, there is suggestive evidence that these parties can be system stabilizers, increasing the likelihood that the parliament runs its full term.

Despite worries that the introduction of gate-crashing parties can upset the stability of the parliament, I find no evidence that this addition has such a direct effect. There is no increase in the number of parties needed to form a governing coalition, and the vote share of the largest party in the following election (and thus, their relative strength in forming coalitions) is not affected. On a more systemic level, fragmentation of this type has no effect on future fragmentation of any type. Systems that add gate-crashing parties in one election are no more likely to see their effective number of parliamentary parties increase than systems that see a party just miss out. This dampens concerns about a self-reinforcing spiral where the introduction of electorally marginal parties acts as a catalyst to ever-increasing fragmentation.

On the other hand, I find strong evidence that the inclusion of a gate-crashing party greatly increases the percentage of wasted votes in future elections. As discussed above, there are deep theoretical and empirical literatures on the relationship between individuals casting votes for parties that fail to gain representation in the parliament and feelings among those same individuals of being voiceless and dissatisfied with democratic outcomes. The finding that gate crashers do not seem to negatively affect the measures of democratic efficiency arguably amounts to a second order concern if there is still a marked increase in dissatisfaction among the electorate. In other words, it might not matter if democracy is resilient to small levels of fragmentation in practice if a large enough percentage of the populace believes
otherwise. Thus, the findings surrounding the increase in wasted votes call for far more research.

The possible mechanisms behind the increase in wasted votes are important to tease apart. While I hypothesized that voters may perceive the representation of gate-crashing party in parliament as a type of “proof of concept” for other niche parties and be more willing to forgo strategic voting, I cannot establish this as the definitive mechanism with the analysis conducted here. One might alternatively believe that the parties that qualify for parliament attract the attention of larger parties, who move to co-opt the smaller party’s major points of attraction (similar to arguments made in Meguid 2005 and Meguid 2010). In this case, one might very well see some portion of the votes gained by the small party transferred to a larger party, while the party’s remaining supporters lose their voice in parliament, increasing the percentage of wasted votes. Additional work is required to adjudicate between these possible mechanisms, or others.

Similarly, the results surrounding parliamentary term completion demand additional research. While scholars have noted the relationships between government survival and the ideological diversity of the parties involved, the distribution of votes, and the returnability of parties (but see Chiba, Martin and Stevenson 2015 for a discussion about concerns with selection bias that may weaken these results), there has been relatively scant work on how the constitution of the parliament itself may work to stabilize or destabilize the government ultimately chosen. In particular, the case I describe here (where a gate-crashing party may have competing concerns of both strong opposition and the compelling desire to remain in parliament) deserves
deeper consideration, especially as party systems may be becoming more volatile or open to new entry parties.

Finally, it should be noted that this paper has only analyzed the causal effects of a particular type of parliamentary fragmentation. It may well be that other types are far worse for democratic efficiency and serve to exacerbate the effects I find here. Most pressing from a research standpoint, then, is identifying the different avenues through which party systems fragment, the degree to which these avenues are interrelated, and how this interaction manifests itself in democratic outcomes.
References


Appendix A: Sample Running Variable Calculation

In this Appendix, I provide an example of how I calculate the running variable when legislative seats are distributed at the sub-national level. Consider a country where legislative seats are distributed in multi-member districts using a D’Hondt method. In Table 4, I display the voting results from a district that allocates 8 seats, and has 4 parties competing and earning the votes as displayed in the second column.28

<table>
<thead>
<tr>
<th>Denominator</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Seats Won</th>
</tr>
</thead>
<tbody>
<tr>
<td>Party A</td>
<td>200,000*</td>
<td>100,000*</td>
<td>66,666*</td>
<td>50,000*</td>
<td>40,000</td>
<td>4</td>
</tr>
<tr>
<td>Party B</td>
<td>160,000*</td>
<td>80,000*</td>
<td>53,333*</td>
<td>40,000</td>
<td>32,000</td>
<td>3</td>
</tr>
<tr>
<td>Party C</td>
<td>60,000*</td>
<td>30,000</td>
<td>20,000</td>
<td>15,000</td>
<td>12,000</td>
<td>1</td>
</tr>
<tr>
<td>Party D</td>
<td>40,000</td>
<td>20,000</td>
<td>13,333</td>
<td>10,000</td>
<td>8,000</td>
<td>0</td>
</tr>
</tbody>
</table>

Asterisks denote a seat allocation.

There are 460,000 total votes, and the final seat in the district is allocated to Party A. Party D misses a seat by 10001 votes29 out of 460,000 votes, or approximately 2.17%. Note that I do not assume that the votes come from any of the parties currently allocated seats, but rather could be shifted from the votes for losing parties. This is not a particularly strong assumption, as there are almost always parties that receive fewer votes than the marginal party, but whose votes - when summed across all such parties - total more than the margin between representation and no seat.30

28The numbers and setup of this example are constructed from the following website: http://www.moonwise.co.uk/dhondt.php.
29I assume throughout that tiebreaker procedures would cut against the party in question, so they needed to gain one more vote than earned the final seat.
30More to the point, while I recognize the possibility of a distribution of votes that does not satisfy this assumption, in actuality such a distribution never appears in the data. There are always more than enough votes of this type to cover the margin.
In order to demonstrate how I calculate the running variable for those parties that just qualify for the legislature, consider the case where Party C’s lone seat in the legislature was garnered in this district. I would say that Party C made the legislature by 20,000 votes, or 4.35%. Had the party received 20,000 fewer votes, they would not be represented in the legislature.

\[31\text{Here, I assume these votes are distributed in a way that does not change the allocation of seats.}\]
Appendix B: Summary Statistics

Table 5: Descriptive Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Legislative Parties</td>
<td>387</td>
<td>7.501</td>
<td>2.925</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Completion of Electoral Term</td>
<td>362</td>
<td>0.740</td>
<td>0.439</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Largest Party Vote Share</td>
<td>389</td>
<td>0.345</td>
<td>0.079</td>
<td>0.152</td>
<td>0.523</td>
</tr>
<tr>
<td>Percent Change in Largest Party Vote Share</td>
<td>355</td>
<td>0.007</td>
<td>0.200</td>
<td>−0.571</td>
<td>0.658</td>
</tr>
<tr>
<td>Effective Number of Parliamentary Parties</td>
<td>389</td>
<td>4.070</td>
<td>1.315</td>
<td>2.090</td>
<td>8.690</td>
</tr>
<tr>
<td>Percent Change in ENPP</td>
<td>355</td>
<td>0.040</td>
<td>0.229</td>
<td>−0.423</td>
<td>0.970</td>
</tr>
<tr>
<td>Wasted Votes</td>
<td>389</td>
<td>0.060</td>
<td>0.056</td>
<td>0.002</td>
<td>0.351</td>
</tr>
<tr>
<td>Percent Change in Wasted Votes</td>
<td>355</td>
<td>0.293</td>
<td>1.080</td>
<td>−1.000</td>
<td>5.044</td>
</tr>
<tr>
<td>Number of Coalition Parties</td>
<td>385</td>
<td>2.831</td>
<td>1.638</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Percent Change in Coalition Parties</td>
<td>357</td>
<td>0.142</td>
<td>0.663</td>
<td>−1.000</td>
<td>3.000</td>
</tr>
<tr>
<td>Rate of Complete Electoral Terms</td>
<td>389</td>
<td>0.762</td>
<td>0.233</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Age of Democracy</td>
<td>389</td>
<td>42.211</td>
<td>33.664</td>
<td>0</td>
<td>123</td>
</tr>
<tr>
<td>Historic Variability in ENPP</td>
<td>389</td>
<td>0.553</td>
<td>0.377</td>
<td>0.000</td>
<td>1.496</td>
</tr>
</tbody>
</table>
Appendix C: Local Randomization Design

Instead of a continuity-based approach to the RD design, one might employ a design based on local randomization. This approach relies on the assumption that, in a tight window around the cut-off, whether an observation qualifies as in the control or treatment group (that is, whether the observation occurs to the left or right of the cutoff) is essentially random. To the extent that this assumption is plausible, one can then use statistical techniques generally used in experimental setups to analyze the effect of crossing the threshold itself. This approach can present a stiffer test, as the window is generally smaller than the bandwidth associated with the continuity-based test, shrinking the number of appropriate observations and decreasing the power of one’s tests. In this Appendix, I employ this design as a form of robustness test for the continuity-based results. I describe it in depth below, before presenting the results.

I construct a window around the cut-off (where the margin of representation is equal to 0) in a data-driven and systematic way that restricts the degrees of researcher freedom available to us and lends itself to replicability of the results. Specifically, I select a group of predetermined\textsuperscript{32} covariates that may be associated with the running variable everywhere except inside a small window around the cutoff. These covariates should also be plausibly related to the dependent variable.

Once I select this group of covariates and the way in which I test their balance within a particular window,\textsuperscript{33} I start the window-selection procedure with a window

\textsuperscript{32}Here, I simply mean the values taken by the covariates are known before the treatment occurs.

\textsuperscript{33}This includes whether the test will be based on a difference in means across treated and untreated groups or some alternative, the randomization mechanism on which the test will be based, the minimum of observations in a window, and the statistical threshold at which I test the balance.
that includes the minimum number of observations and iteratively extend it outwards until balance is no longer achieved in the test.\footnote{Annotated code for the window-selection process and all other results is available on the author’s website, as well as upon request.}

In this project, I believe three covariates in particular are important to consider in the construction of the window. The first is the system’s historical variability, which I measure here as the standard deviation in the effective number of parliamentary parties in all of the elections prior to the election of interest. The second is the percentage of previous parliaments that completed their term.\footnote{Conversely, this an be thought of as: \((1 - \text{the percentage of previous parliaments that ended in calls for an early election})\).} The final covariate I believe is importantly related to the dependent variables is the age of the parliamentary democracy.

In each of these cases, these variables are likely to have an independent effect on the dependent variable. Countries with high levels of historic variability in their number of parliamentary parties should be expected to continue that trend, which could have an adverse effect on the estimation of the causal effect of a marginal party, especially when I discuss the change in parliamentary parties between elections. Similarly, countries that are more (or less) prone to calling early elections should be balanced across the control and treatment cases, particularly when estimating the effect of a marginal party on completion of term.

I also include the age of the democracy given the widely-held belief that older, more-established democracies tend to be more stable and experienced with small perturbations to their legislatures. In this case, I want to balance the sample across
treatment and control because it recognizes that both parties and individual voters may be less likely to respond to the feeling of greater fractionalization and chaos.

Within the window selected, I use a simple difference-in-means test statistic that is evaluated in two ways. First, I conduct a randomization-based test of the Fisherian sharp null hypothesis that the effect is zero via simulation methods, which yields an exact associated p-value in a finite sample. Second, I calculate the p-value associated with a test of the Neyman null hypothesis that the average treatment effect is zero. These Neyman inferences are based on the large sample approximate behavior of the statistic, and the p-value itself is also not exact. The former test is focused testing the specific sharp null (which in all of the cases will be at zero), while the latter is more focused on point estimation of the effect size. With the Fisherian test, I also calculate a range of values for the treatment effect for which I would fail to reject the null, were the null to be assigned at that effect size, and tested at the traditional $\alpha = .05$ levels.

Results

The results from this approach mirror those in the main paper. I continue to find little evidence of direct effects of marginal parties on the various democratic outcomes, but continue to find a statistically and substantively significant effect on the amount of wasted votes in the following election. I first discuss the window in which I conduct each of the analyses.

As discussed directly above, the choice of window is data-driven, based on the largest area around the cutoff where the chosen predetermined covariates are bal-
anced (and thus, unlikely to bias the results). The covariates are balanced in the symmetric window $[-0.0042,0.0042]$. This suggests that I can reasonably compare systems where parties just made or just missed qualifying for parliamentary representation by 0.42% points in the decisive election. In Figure 3, I show the traditional RD plots visualizing the balance across these variables inside the window. By construction, none of these differences are statistically significant at the $\alpha = .15$ level.

**Figure 3:** RD Plots of Predetermined Covariates

(a) Historic Variability  (b) Ratio of Completed Terms  (c) Age of Democracy

In the window of local randomization, I have 120 observations when the dependent variable is measured in the following election (that is, the change in the size of the largest party, the change in the effective number of parliamentary parties, and the increase in wasted votes) and 121 observations when the dependent variable is measured in the election of interest (the completion of an electoral term and the increase in the number of coalition parties).

I present the results of the pooled analysis for five tests in Table 6 below.

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36I use a Kolmogorov-Smirnov test statistic with $\alpha$ set at 0.15, such that any differences in the covariates across treatment and control more “significant” than this violates the balance.
Table 6: Results, Pooled RD tests

| Dependent Variable | N   | Diff. Means | Finite-Sample P>|T| | Large Sample P>|T| | Fisherian 95% CI |
|--------------------|-----|-------------|----------------|----------------|----------------|-----------------|
| Change in Wasted Votes | 120 | 0.508 | 0.003 | 0.013 | [0.14, 0.87] |
| Change in Effective Number of Parliamentary Parties | 120 | -0.049 | 0.26 | 0.257 | [-0.13, 0.04] |
| Change in Largest Party Vote Share | 120 | 0.005 | 0.667 | 0.665 | [-0.026, 0.017] |
| Likelihood of Completing Term | 121 | 0.121 | 0.135 | 0.112 | [-0.03, 0.28] |
| Increase in Coalition Parties | 121 | -0.094 | 0.43 | 0.386 | [-0.3, 0.13] |

Interpretation of the results is fairly straightforward and follows very much in line with the main results. The estimated effect of adding a small parliamentary party is a nearly 51% increase in wasted votes in the following elections, spread between a 42% increase in systems that add the party and a 8.8% decrease in systems where a party just misses qualifying for representation.

The remaining four dependent variables still have estimated effects that fail to meet traditional levels of statistical significance, but the imprecisely measured effect attached to the likelihood of completing the term is substantively large and theoretically interesting.
## Appendix D: Elections Used in Dataset

**Table 7:** Elections Currently in Sample

<table>
<thead>
<tr>
<th>Country</th>
<th>Years in Sample</th>
<th>Number of Elections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1923-2017</td>
<td>25</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1991-2017</td>
<td>9</td>
</tr>
<tr>
<td>Croatia</td>
<td>2003-2016</td>
<td>5</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1992-2017</td>
<td>8</td>
</tr>
<tr>
<td>Denmark</td>
<td>1990-2015</td>
<td>8</td>
</tr>
<tr>
<td>Estonia</td>
<td>1995-2019</td>
<td>7</td>
</tr>
<tr>
<td>Germany (West Germany)</td>
<td>1949-2017</td>
<td>19</td>
</tr>
<tr>
<td>Greece</td>
<td>1993-2019</td>
<td>11</td>
</tr>
<tr>
<td>Israel</td>
<td>1949-2019</td>
<td>21</td>
</tr>
<tr>
<td>Italy</td>
<td>1948-2013</td>
<td>17</td>
</tr>
<tr>
<td>Latvia</td>
<td>1993-2018</td>
<td>9</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>1999-2013</td>
<td>4</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1946-2017</td>
<td>22</td>
</tr>
<tr>
<td>Norway</td>
<td>1945-2017</td>
<td>19</td>
</tr>
<tr>
<td>Poland</td>
<td>1993-2015</td>
<td>7</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1990-2016</td>
<td>9</td>
</tr>
<tr>
<td>Slovenia</td>
<td>1992-2018</td>
<td>8</td>
</tr>
<tr>
<td>Spain</td>
<td>1979-2016</td>
<td>12</td>
</tr>
<tr>
<td>Sweden</td>
<td>1970-2018</td>
<td>15</td>
</tr>
</tbody>
</table>
Appendix E: Robustness of Continuity-Based Design

In this appendix, I test the robustness of the results surrounding the increase in wasted votes. In general, the main analysis follows the best practices of continuity-based RD design, but in this section, I vary the selections of kernal, polynomial order, and the number of bandwidths in order to confirm that the results are robust to alternative approaches. I first describe the possible alternatives, and then display all results in Table 8.

Kernal

To derive the main results, I used a triangular kernal and a local-linear estimation. However, one might prefer a uniform kernal that weights all observations within the bandwidth equally, rather than by their proximity to the cutoff. Thus, I re-estimate the effect of adding a small parliamentary party on the increase in wasted votes using a uniform kernal.

Polynomial Order

Following best practices, I estimated the main effects using a local linear estimator that provides a balance between the accuracy of the estimation and variability of the estimate. In the tests presented below, I increase the order of the polynomial (allowing for a second and third order fit to the data on either side of the cutoff), which increases both the accuracy and variability of the estimate.
**Bandwidth Selection**

I employed a bandwidth selection process focused on optimizing the mean-squared error in the original estimation, while also constructing the confidence intervals using a bandwidth that minimizes the asymptotic coverage error rate. In both cases, however, I constrained the bandwidths on both sides of the cutoff to be identical. In practice, this is not necessary, and so below I report tests that loosen this restriction. Here, different bandwidths are used for estimation on the left and right sides of the threshold, optimizing the MSE for each respective estimation.

**Results**

Table 8 presents the results of the alternative specifications. Only a change in the polynomial order affects the statistical significance of the results, though even there it is the increased variability forced on the fit and the widening of the bandwidth that causes this change. The estimates are still substantively large, and similar to the main result presented in the paper.

| Specification          | Kernal   | Order | Bandwidth (L) | Bandwidth (R) | Estimate | Std. Err. | z     | P>|z| | 95% Conf. Int. |
|------------------------|----------|-------|----------------|----------------|----------|-----------|-------|------|----------------|
| Baseline               | Triangular | 1     | 0.010          | 0.010          | 0.514    | 0.204     | 2.520 | 0.012 | [0.114, 0.914] |
| Change in Kernal       | Uniform  | 1     | .008           | .008           | 0.501    | 0.223     | 2.251 | 0.024 | [0.065, 0.937] |
| Polynomial Order - 2   | Triangular | 2     | .013           | .013           | 0.444    | 0.257     | 1.728 | 0.084 | [-0.060, 0.948] |
| Polynomial Order - 3   | Triangular | 3     | .015           | .015           | 0.398    | 0.312     | 1.273 | 0.203 | [-0.215, 1.010] |
| Unequal Bandwidths     | Triangular | 1     | .008           | .024           | 0.685    | 0.208     | 3.285 | 0.001 | [0.276, 1.093] |

Table 8: Robustness Results - Wasted Votes
Appendix F: Subsample Analysis for Wasted Votes

In this Appendix, I show that the pooled result for the increase in wasted votes is not driven by a particular set of observations, or party systems. In order to assess this concern, I break down the sample into discrete subsamples where elections yield either $x$ or $x + 1$ parties, and run the same analysis covered above on each subsample separately. Thus, I measure the effect in each subsample of moving from $x$ to $x + 1$ parties, using the identical RD framework. The results are displayed in Figure 4.

I immediately note that, reassuringly, all estimates are positive, if imprecisely measured due to the sample disaggregation. There may be some deterioration in the effect as the number of parliamentary parties increases, though I do not have enough data to test this robustly. The estimates in the subsamples where I have the greatest support (systems having anywhere from 5 to 8 parliamentary parties, represented in the Table by the 3rd-5th results) all see similar effect sizes and a combined effect that also nearly replicates the overall pooled effect. These results all tend to suggest a robustness to the main result.
Figure 4: RD Effects at Different Levels of Parliamentary Parties

Estimates are calculated in the same manner as in the main analysis, and 95% confidence intervals are constructed using robust bias-corrected standard errors. The dashed blue line represents the pooled effect.
Appendix G: Subsample Analysis for Likelihood of Completing Electoral Term

In Figure 5 below, I analyze each subsample of possible parliamentary party numbers as described in the main text surrounding the increase in wasted votes. Here, however, the dependent variable is the likelihood of completing a full electoral term.

**Figure 5:** RD Effects at Different Levels of Parliamentary Parties, Full Term Completion

Estimates are calculated in the same manner as in the main analysis, and 95% confidence intervals are constructed using robust bias-corrected standard errors. The dashed blue line represents the pooled effect.
As discussed in the body of the paper, most of the results are positive and approach the pooled result (here, 0.371). However, all results are very imprecisely measured due both the reduced sample size and the noisiness inherent in a binary outcome (survival vs. early elections). This figure invites additional research into how different types of fragmentation may have mixed effects on government survival.