Do Campaign Contribution Limits Curb the Influence of Money in Politics?

Saad Gulzar  
Stanford University
Miguel R. Rueda  
Emory University
Nelson A. Ruiz  
University of Oxford

Abstract: Over 40% of countries around the world have adopted limits on campaign contributions to curb the influence of money in politics. Yet, we have limited knowledge of whether and how these limits achieve this goal. Using a regression discontinuity design that exploits institutional rules on contribution limits in Colombian municipalities, we show that looser limits increase the number of public contracts assigned to donors to the elected candidate. This is explained by looser limits increasing the influence of top donors over the elected candidate, rather than reducing electoral competition or changing who is elected to office. We further show that looser limits worsen the quality of public contracts given to the winner’s donors: These contracts are more likely to run over their stipulated costs. Overall, this article links looser campaign contribution limits, donor kickbacks, and worse performance of contracts awarded to donors.

Verification Materials: The data and materials required to verify the computational reproducibility of the results, procedures, and analyses in this erratum are available on the American Journal of Political Science Dataverse within the Harvard Dataverse Network, at: https://doi.org/10.7910/DVN/PXIMVL

Over 40% of countries around the world have adopted laws limiting campaign contributions as a way of curbing the influence of money in politics (IDEA 2014). On the one hand, limits on political donations might prevent policies that favor moneyed interests. On the other hand, contribution limits can be considered as obstacles to the free expression of preferences and to the flow of information voters receive via campaign spending.\(^1\) Despite the widespread use of campaign contribution limits and reasonable arguments in favor and against them, empirical assessments of their impacts, as well as an understanding of the underlying mechanisms behind those effects, remain limited.

We study the effect of campaign contribution limits on donor behavior during the 2011 Colombian mayoral elections, the subsequent assignment of public contracts after the elections, and importantly, the performance of those contracts. By tracing the impact of the regulation all the way to government contract performance, we provide new evidence on how campaign contribution limits could curb the influence of money in politics.

We first establish that a strong bias exists in public spending that favors donors to the winning candidate. Following Boas, Hidalgo, and Richardson (2014), a close elections regression discontinuity (RD) approach shows that the winning candidate’s donors receive, on average,
three more contracts than donors to the runner-up, a 184% increase in the average number of contracts that donors to the top two candidates receive. When we focus on contracts that are assigned under a contractual category that gives mayors more discretion in selecting contract recipients with less oversight, the minimum value category, we find that contracts received by the winner’s donors are 28% larger in value than those assigned to donors to the candidate who barely lost the election.

Next, we ask if campaign limits can curb the benefits received by the winning candidate’s donors. Studying this question empirically is challenging as campaign finance regulations might be influenced by the public perception of corruption and the pressure of private interests on policy makers. Moreover, it is difficult to account for all the historical, cultural, and contextual factors that determine both restrictions on campaign finance and corrupt behavior. We take advantage of the fact that in Colombia, campaign contribution limits in mayoral races vary according to arbitrary thresholds on the number of registered voters. Using an RD design, we find that loosening restrictions on the total amount of contributions to campaigns from 58 million to 110 million pesos (approximately 17,000 to 32,000 U.S. dollars) leads to, on average, three more public contracts of all types and two more minimum value contracts to mayors’ donors.

We proceed to explore the theoretical mechanisms behind why mayors’ donors are favored in municipalities with looser limits. The literature has pointed out that campaign contributions can open the door for undue influence and potential conflicts of interest between candidates and donors (Gilens 2012; Gokcekus, and Sonan 2017; Powell 2012; van Biezen 2010). Based on this idea, we argue that less restrictive limits increase the influence of wealthy individuals on elected officials because those individuals are able to contribute a larger share of total campaign revenue. If a campaign is financed in large part by few donors, elected officials would have more pressure to reward these contributions. Although the potential power of campaign finance regulations to curb this influence is often cited as justification for the existence of such regulations (Gilens 2012; Hummel, Gerring, and Burt 2019; Wiltse, La Raja, and Apollo-nio 2019; van Biezen 2010), empirical studies have not explored how campaign finance restrictions alter the composition of campaign revenues (or other proxies for the clout individual donors have over a candidate) or linked those changes with observed donors’ benefits. Consistent with this argument, we find that donations concentrate among top donors under looser limits. A top donor contributes 9.1 percentage points more of the campaign total revenue under looser limits than what a top donor gives under tighter limits, whereas nontop donors’ donations are unaffected by limit changes.

We also test and rule out three alternative explanations for why the mayors’ donors receive more benefits with looser contribution limits. The first is that looser limits make elections less competitive (Butcher, and Milyo 2020; Hall 2016; Stratmann and Francisco 2006), which reduces the incumbent’s incentives to prioritize the public interest over her donors’ (Gordon, and Huber 2007). We do not find any evidence that electoral competition differs by treatment. The second is that looser limits could attract candidates who are prone to favor private interests (Avis et al. 2017). We show, however, that elected mayors and the pool of candidates in municipalities with higher limits are not systematically different in terms of their previous participation in political campaigns, experience in elected office, or history of sanctions than those in municipalities with lower limits. Finally, we carry out a number of checks that suggest our findings are not driven by more severe under-reporting of donations in municipalities with more limited contributions (La Raja 2014).

The final analysis in the article considers downstream impacts of looser campaign limits on the quality of government functioning as measured by the performance of public contracts that are awarded to donors. This sheds light on the efficiency loss versus information loss debate. On the one hand, favoring certain donors for reasons other than merit can negatively affect contract execution. On the other hand, fewer restrictions could improve the flow of information via donations that helps voters elect those candidates who know how to best allocate public resources (Coate 2004). Challenging the latter view, we show that in a municipality with looser limits, donor-managed contracts are more likely to run over stipulated costs and to require time extensions. Such cost overruns are 214% larger than those of contracts managed by a mayor’s donor under more restrictive limits.

The Colombian case is particularly well suited to study how campaign finance regulations affect donors’ influence over elected officials. In addition to the exogenous variation in limits created by institutional rules that help us address identification challenges, a national ID number allows us to link public contracts to individual donors (Ruiz 2017). This enables us to circumvent challenges faced by roll-call based analyses that are common in the literature. For example, although in our case it is clear who the recipient of a contract is, legislative changes affect a large group of beneficiaries, making it difficult to establish whether a legislator’s support for such changes was aimed at benefiting her donors. Moreover, donors’ influence might manifest at early, but less observable, stages of the legislative process (Powell
and voting on bills on industrial policy, regulation, or taxation at the federal level is more ideologically charged than most municipality government purchases of goods and services (Oliver 2012). This makes it more difficult to gather evidence of quid pro quo exchanges in roll-call analyses as donors and candidates could share policy preferences (Fox, and Rothenberg 2011).

Our focus on private interests’ influence on local governments in a developing democracy contributes more generally to a literature that, for the most part, has focused on national legislation in industrialized settings (Samuels 2001; Anzia 2019). The Colombian mayoral race context differs significantly from the well-studied federal legislative elections setting in the U.S. As we will show below, donors to Colombian mayoral campaigns are typically local business owners and service providers seeking to gain preferential treatment in public procurement assignment rather than corporations wanting to influence legislation (Bonica 2014) or individuals contributing small amounts to express their political views (Ansolabehere, De Figueiredo, and Snyder 2003). The party system is also highly fragmented and party identification is low. Given that our theoretical insights do not depend on Colombian idiosyncrasies, we believe our findings are relevant to other contexts, but we also contribute to this literature by expanding the study of these issues to geographical settings where existing evidence is particularly thin.

Our article contributes to a large, mostly U.S.-focused, literature that estimates effects of contributions on elected officials’ behavior. In a review of these studies, Ansolabehere, De Figueiredo, and Snyder (2003) find that this work is unable to clearly establish quid pro quo exchanges between politicians and donors. More recent work that addresses some of the methodological challenges in this literature has shown that donors target legislators who are most useful to them in a manner consistent with access-seeking (Powell 2012; Fournaias, and Hall 2014; Barber 2016a; Kalla, and Broockman 2016; Powell, and Grimmer 2016; Li 2018) and to indirectly influence legislative procedure (Fournaias, and Hall 2018). Particularly close to our work, Boas, Hidalgo, and Richardson (2014), find substantial favoritism towards donors to federal deputies in the assignment of government contracts in Brazil. Although our findings are consistent with elected officials rewarding their donors, our main contribution to this literature is to provide evidence of campaign contribution limits curbing the donors’ influence over elected officials.

The literature on campaign finance regulation has shown how restrictions on campaign contributions and spending impact electoral results and competitiveness (Hall 2016; Fournaias 2018; Stratmann and Francisco 2006), polarization (Barber 2016b), party systems (Potter, and Tavits 2015), political efficacy (Primo, and Miyo 2006), future career choices of legislators (Weschle 2019), interest groups’ electioneering activities (Hogan 2005), challenges to incumbents (Hamm, and Hogan 2008), and incumbent reelection (La Raja, and Schaffner 2014). Few papers, however, have explored the relationship between campaign finance regulations and corruption. Baltrunaite (2019) investigates how donors are advantaged in the bidding process for public contracts and estimates the effect of a ban on corporate contributions on contract assignments in Lithuania. Fazekas, and Cingolani (2017) and Hummel, Gerring, and Burt (2019) focus on how campaign finance regulations and campaign state funding are linked to measures of corruption in comparative cross-country analyses. Our RD design and the ability to link donors to contracts allow us to estimate the causal effect of campaign finance regulation on the actual biases favoring donors in contract assignment. Importantly, unlike previous work, we propose and find evidence of a theoretical mechanism that accounts for the greater benefits accruing to donors in municipalities with less stringent campaign finance restrictions. We also assess alternative explanations, and evaluate the effects of such restrictions on the quality of donor-managed contracts.

 Colombian Electoral Context

Mayors in Colombia are powerful figures in their municipalities with discretion over an average of 26% of all local spending. Because they are in charge of executing the municipality budget, they have plenty of opportunities to repay donors. Most public goods and services in a municipality are provided through third parties who contract with the municipal government. There are three types of contracts: open-bid contracts, contracts with nonbid process and waivers, and minimum value contracts that cover those under 10% of the municipality budget. The first category presents the most difficulty for

3Stratmann (2005) finds evidence of the influence of money on legislators’ behavior in a meta-analysis using the same papers but, given methodological challenges faced by the surveyed work, the study does not draw definitive conclusions. Using better research designs, Fowler, Garro, and Spenkuch (2020) do not find evidence of quid pro quos in U.S. Senate races.

4For the period 2004–07.
a mayor who wants to reward a donor. This is because with open-bid contracts there is a call for proposals that is advertised online for 5–10 working days and a committee needs to evaluate the submissions. In the second category, the mayor must provide official justification for waivers and there is only a limited set of economic activities to which the category applies. In contrast, contracts given under the minimum value category only need to be advertised for 1 day and are automatically given to the lowest bidder, which precludes a proposal evaluation by a separate committee.

Mayors have incentives not to renege on agreements made with their donors. Although mayors cannot be re-elected in consecutive terms, most continue their career in politics. Of all mayors in 1988, for example, 62% participated in other elections after their term ended. One reason to favor current donors, therefore, is to maintain a flow of resources in future campaigns. Mayors can also ask for a slice of the contracts, called a mordida (a bite). That is, the recipient of the contract can give back a fraction of the value of the contract to the politician as payment. A famous example among Colombians is the former mayor of Bogotá, Samuel Moreno, who was sentenced to 18 years in prison for receiving 2,790 million pesos—14 times his annual salary—from a recipient of a contract assigned by the local government.

Donors in mayoral races in Colombia generally contribute to only one candidate and are relatively wealthy. In our data, only 138 out of 6,658 donors contribute to more than one candidate and 75.33% of all donors give a contribution that is larger than the average monthly wage in the municipality. This differs from the U.S. case where campaigns rely more on multiple small donations from ordinary citizens (Ansolabehere, De Figueiredo, and Snyder 2003). The fact that the donors do not contribute to mayoral races outside the municipality, and give large donations, is consistent with the general perception that donors to mayoral campaigns are local business owners who could benefit from public contracts.

We also see that of the few donors donating to different candidates, 76.1% contribute to candidates from different parties and, of those who donate in the subsequent mayoral election (2015), only 23.7% donate to candidates of the same party. These patterns are in line with low levels of party identification, a reflection of a weak party system born from permissive electoral institutions (Pachón, and Shugart 2010; Shugart, Moreno, and Fajardo 2007). The facts that local politics tends to be less ideological than national politics given the nature of local concerns and institutional constraints on local governments (see, e.g., Oliver 2012), that Colombian parties lack ideological coherence (Botero, and Alvira 2012; Botero, Losada, and Wills-Otero 2016), and more generally, the presence of a weak party system, suggest that partisanship and ideology are not as strong drivers of contributions as they are in the well-studied U.S. federal legislative setting.

Anecdotal evidence suggests that investing in a mayoral campaign can be highly profitable. Take the case of the mayor of Amalfi. One donor contributed 3,000 U.S. dollars to the mayor’s campaign, equivalent to 22% of the campaign’s revenue. Later, during the mayor’s term, the donor signed 86 contracts with the municipality worth more than half a million dollars. Of these contracts, only five were awarded via competitive tender. Such stories find support in the data. The average donor in the sample receives contracts that are 45 times larger than their contribution. Even if we focus on minimum value contracts, their value is, on average, eight times larger than the donor’s contribution. Below, we systematically examine whether mayors’ donors are favored in contract assignment.

Colombian law establishes limits for total campaign contributions that are set equal to a limit on campaign expenses. The National Electoral Commission sets the campaign limits on the basis of the number of registered voters in the municipality. These limits jump discontinuously at arbitrary cutoffs of registered voters. For example, at 25,000 registered voters, the campaign contribution limit increases from 58 to 110 million COP (approximately 15,500 to 29,000 U.S. dollars). In addition, individual donors cannot give more than 10% of the total campaign contribution limit. Limits are announced months before the candidate registration date and violation of these limits can be punished with removal from office, loss of state funding, and dissolution of the political movement. The voter registration

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5There is no limit on the number of times someone can be mayor of a municipality.

6The fact that local politics tends to be less ideological than national politics given the nature of local concerns and institutional constraints on local governments (see, e.g., Oliver 2012), that Colombian parties lack ideological coherence (Botero, and Alvira 2012; Botero, Losada, and Wills-Otero 2016), and more generally, the presence of a weak party system, suggest that partisanship and ideology are not as strong drivers of contributions as they are in the well-studied U.S. federal legislative setting.

7For more on this case, see Bristow (2018).

8See Article 23 of Law 1475 of 2011.

9See National Electoral Commission Norm 78 of 2011.

10See Article 23 of Law 1475 of 2011.
thresholds that determine the contribution limits do not impact other policies, which allows us to avoid the estimation of a compound treatment (Grembi et al. 2018).

### Data

We use electoral data compiled by Pachón, and Sánchez (2014), gathered from the Colombian national electoral authority, the Registraduría Nacional del Estado Civil. These data contain the results for the 2011 mayoral elections for all municipalities. In auxiliary analyses, we also use data from the 2015 mayoral elections.

Data on campaign funding and contracting were compiled by Ruiz (2017) and were taken originally from the National Electoral Commission and Datos Abiertos, an online portal that was created to increase transparency in public procurement. Electronic campaign finance reporting has been mandatory by law since 2009 for every candidate who runs for office. The National Electoral Commission fines candidates or parties that do not comply with the reporting requirements. As a result, compliance is fairly high: Of 4,460 mayoral candidates in 2011, 89% reported campaign finance information. In these data, we observe each donation to a given candidate. The contracting data contain the universe of public procurement data including information on the contractor (and their unique national ID), the contractual category, as well as the contract’s economic sector, value, purpose, and length. We also know whether the contract was completed or went over budgeted costs.

Following Ruiz (2017), we match the unique ID of each donor to the ID of the contractors in the same municipality in which the candidate ran. This creates a direct link between the donor and a beneficiary from government resources. In Colombia, two types of legal entities can contract with the state: individuals and companies. When an individual gives a donation and his/her company receives a contract, we can link them uniquely because the same number is used for the person and their company. The only links that cannot be made are between individuals and public companies or companies with multiple owners: It could be the case that one of the owners gives a donation and then the company, which is identified with a different owner’s ID, receives the contract. Contracts assigned to multiple-owner companies, however, represent only 9.9% of all contracts and are mostly concentrated in large cities that are not included in the sample because they are not close to the threshold used in the RD design.

In terms of politicians’ characteristics, we have access to the entire history of disciplinary sanctions for those who held elected office and whether candidates had illegally registered to vote in the past. The latter can serve as a proxy for nonelected politicians’ proclivity for malefeasance. We also have data on gender, age, and race.

### Estimation Strategy

Our analyses rely on RD designs. There are a number of estimation choices that come with RD models and we adopt the practices advocated in the most recent literature (see, e.g., Gelman, and Imbens 2019; Cattaneo, Idrobo, and Titiunik 2020). First, we estimate treatment effects by calculating the difference between (linear) polynomial approximations of treatment and control outcomes at the cutoff using observations that are near the cutoff. Second, we follow the common practice of using a triangular kernel, which gives more weight to observations near the cutoff. Third, the bandwidth that defines the effective estimation sample in our analysis is the one that minimizes the asymptotic mean squared error (MSE). This accounts for the trade-off between smaller bias and larger variance that shorter bandwidths imply. It is important to note that the MSE can be different for each dependent variable, which implies that, by selecting the bandwidth that minimizes the MSE, the number of observations will change between models. Fourth, we report optimal MSE point estimates, robust confidence intervals, and p-values that account for

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11 Norm 1094 of 2009.
clustering at the municipality level following Calonico, Cattaneo, and Titiunik (2014). This approach avoids the pitfalls of conventional inference that ignore polynomial approximation bias leading to incorrect asymptotic coverage. Finally, we present all our results graphically in SI Appendix E (pp. 13–17).

**The Returns from Donating to a Winning Candidate**

We begin our analysis by documenting that donors who contribute to winning candidates get more contracts. This empirical exercise compares contracts received by donors to the winning candidate to contracts received by the donors to the runner-up. A difficulty in making these comparisons is that winning candidates might differ from losing candidates in ways that make them more likely to assign contracts to their donors. For example, candidates with underlying preferences for malfeasance may be more likely to win through electoral manipulation and to reward their donors. Moreover, donors who are competitive in tendering processes because of their business acumen might also be the best at identifying the most qualified candidate.

To circumvent these problems, we follow Boas, Hidalgo, and Richardson (2014) and use a close election RD design that compares contracts received by donors to a candidate who barely wins with contracts received by donors to the candidate who barely loses. The unit of analysis is a municipality-candidate and the running variable is the candidate’s vote share minus the vote share of its strongest opponent, which, in the sample with only the top two candidates, implies a victory cutoff of zero.

In order to interpret our estimates as causal effects, we require that candidates who barely win the election are similar in all characteristics that would affect contract assignment to those who barely lose and that donors to bare winner and loser candidates do not differ in characteristics that affect their chances of receiving a public contract. SI Table A1 (p. 2) shows that mayors and runner-up candidates in close elections are similar in their electoral experience, whether they have been elected to office in the past, ideology, campaign size, and notably, in levels of prior malfeasance. Because of this, it is difficult to say that differences in valence can explain why winners would treat their donors differently. Reinforcing this point, we also do not find significant differences in the number of donors or the weight of donations in their campaign revenues. If we were to find such differences, those effects could be driven by differences in characteristics between bare winners and losers observed by donors but unobserved by researchers.

Importantly, in SI Table A2 (p. 3), we also verify that donors to bare winners and losers are similar in a number of observable characteristics. We find no evidence of discontinuities at a zero margin of victory in whether the donor is registered in the chamber of commerce or is registered as a company. Donors to the bare winner are not significantly more likely to be producers of goods (as opposed to service providers or merchants), and, when they are companies, they have similar ages to those donating to the bare loser.

The first model in Table 1 shows that the donors to a winning candidate receive, on average, three more contracts from the elected mayor than those received by the donors to the runner-up. This effect is statistically significant and represents a 184% increase in the average number of contracts that donors to the top two candidates receive. The second column shows the effect on the total value of the contracts received by donors. Although the coefficient on electoral victory is positive, it is not significant. If we focus on minimum value contracts in columns (3) and (4)—the type of contracts that offer more room for the mayor to reward donors and less oversight—we see that the effects of donating to the winner on the number of those contracts and their values are also positive, and in the case of the value of the contracts, it is more precisely estimated with an increase of 28%.

**Effects of Looser Contribution Limits**

The fact that donors to the mayor receive almost three times as many contracts as those they would have received if they had donated to the runner-up is consistent with a biased allocation of public procurement contracts, which is also in line with the greater economic benefits accruing to donors to election winners found in different contexts (see, e.g., Boas, Hidalgo, and Richardson 2014; Stratmann 2005). We now evaluate whether campaign limits are effective in reducing what donors receive from the mayor.

A challenge one faces when studying the effects of campaign contribution restrictions on the benefits received by donors is that some municipality characteristics can be linked to both public contract assignment and campaign regulations. For example, more economically developed municipalities can attract the attention of watchdog anticorruption agencies and the press, which could deter mayors from rewarding their donors. At the same time, these municipalities could have fewer
**Table 1** Effect of Donating to a Winner on Contract Assignment

<table>
<thead>
<tr>
<th></th>
<th># Contracts (1)</th>
<th>ln(Value All) (2)</th>
<th># Min. Value Contracts (3)</th>
<th>ln(Value Min. Value) (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electoral victory</td>
<td>3.045</td>
<td>0.239</td>
<td>1.803</td>
<td>0.281</td>
</tr>
<tr>
<td>Robust p-value</td>
<td>0.028</td>
<td>0.368</td>
<td>0.081</td>
<td>0.063</td>
</tr>
<tr>
<td>CI 95%</td>
<td>0.356, 6.231</td>
<td>[-0.245, 0.663]</td>
<td>[-0.249, 4.268]</td>
<td>[-0.015, 0.583]</td>
</tr>
<tr>
<td>Observations</td>
<td>1,982</td>
<td>1,982</td>
<td>1,982</td>
<td>1,982</td>
</tr>
<tr>
<td>Bandwidth obs.</td>
<td>1,514</td>
<td>1,182</td>
<td>1,420</td>
<td>1,256</td>
</tr>
<tr>
<td>Mean</td>
<td>1.653</td>
<td>0.560</td>
<td>0.800</td>
<td>0.293</td>
</tr>
<tr>
<td>Effect mean (%)</td>
<td>184</td>
<td>43</td>
<td>225</td>
<td>96</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>0.126</td>
<td>0.088</td>
<td>0.115</td>
<td>0.098</td>
</tr>
</tbody>
</table>

*Note:* Local linear estimates of average treatment effects at cutoff estimated with triangular kernel weights and optimal MSE bandwidth. 95% robust confidence intervals and robust p-values with clustering at the municipality level are computed following Calonico, Cattaneo, and Titiunik (2014). Bandwidth obs. denotes number of observations in the optimal MSE bandwidth. Each observation is a candidate-municipality.

restrictions on campaign contributions as they tend to be larger. Without exploiting the fact that regulations are completely determined by the arbitrary threshold of registered voters, a simple selection-on-observables approach estimating the impact of looser limits on donors’ benefits could underestimate the true effect.\(^\text{17}\)

To address these challenges, we employ a quasi-experimental RD design that uses campaign limits set by Colombian institutions. Our main explanatory variable takes the value of 1 if the municipality is at or over the 25,000 registered voters threshold and 0 if it is not. Therefore, moving from control to treatment implies that the municipality has looser campaign contribution limits.\(^\text{18}\)

We explore the effect of looser limits on three sets of outcomes: benefits via contracts that individual donors receive, measures of donors’ influence in a given mayoral campaign, and indicators of how contracts received by donors perform. The unit of analysis for the first and third groups of outcomes is the donor and that of the second is the mayor or mayoral campaign. We note that 94% of municipalities where elections are close (with a margin of victory of 10 percentage points or less) have fewer than 50,000 registered voters and are therefore those for which the contribution limits we examine apply. Moreover, two thirds of the municipalities that are within 5,000 registered voters of the 25,000 registered voters cutoff also have close elections.\(^\text{19}\)

The main identification assumption is that the change in policy toward looser limits is the only change affecting contract assignment and donations that occurs at the threshold of 25,000 registered voters. If there is no manipulation of registered voters around the campaign limit cutoff and if there are no determinants of the outcomes that vary discontinuously at the cutoff other than the limits, the RD design allows us to estimate the causal effect of looser campaign limits in municipalities with 25,000 registered voters.

One concern with this research design is that public officials or donors can artificially try to inflate the number of registered voters to allow some donors to give larger contributions in municipalities below the 25,000 threshold. To test if this concern is important in practice, we carry out a discontinuity in density test proposed by Cattaneo, Jansson, and Ma (2019) and find no evidence of a higher concentration of municipalities with numbers of registered voters right above the cutoff (see SI Appendix C, p. 7).

In addition, we check that predetermined characteristics of municipalities such as population, discretionary revenue, total number of contracts assigned by the mayors, and mayor’s wages, are smooth around the 25,000 voters threshold. If we were to find significant discontinuous jumps in these characteristics at the cutoff, it would be difficult to interpret our estimates as local causal effects. Reassuringly, as SI Table B1 (p. 5) shows, we find

\(^\text{17}\)OLS regressions that control for municipality and mayor characteristics (candidate’s illegal registration of ID, previous sanctions, previous election, political experience, ideology, as well as municipality discretionary revenue, municipality category, mayor’s wage, and council size) but not registered voters give smaller estimates than those presented below. Controlling for registered voters amounts to estimating a parametric RD, which requires much stronger assumptions than our approach (Cattaneo, Idrobo, and Titiunik 2020).

\(^\text{18}\)Analysis of the effects of interest at other cutoffs is made difficult by the fact that there are only 14 municipalities within 5,000 registered voters of the other four cutoffs and that the magnitude of the treatment changes at each of them.

\(^\text{19}\)The 5,000 registered voters and the 10 percentage points are close to the optimal bandwidth found with the RD analysis.
no significant effect of looser limits on these characteristics.

**Result: Looser Limits Increase Benefits to Donors via Public Contracts**

Table 2 shows that a donor contributing to the mayor’s campaign in a municipality with higher limits receives three more contracts of all types (Model 1) and two more of minimum value contracts (Model 3) than one who donated to the mayor in a municipality with more restrictive limits. These are large effects considering that the average number of contracts received by mayors’ donors are 0.28 of all types and 0.21 of minimum value. As shown by Model 4, there is also some evidence that the value of the minimum value contracts received by a donor under looser limits is larger than that of a donor in a municipality with lower limits. This increase is close to 64% in value and the coefficient is significant at the 10% level.

**Mechanism: Looser Limits Increase the Influence of Top Donors**

We have seen that donors to winners of mayoral elections receive more contracts where contribution limits are higher. We now study why this is the case. The influence of money in elections has been identified as a key driver of corruption (Gokcekus, and Sonan 2017) and policies that are biased toward the preferences of the rich (Gilens 2012; Powell 2012; van Biezen 2010). Because of this, campaign finance regulations appear to be an attractive tool to diffuse interests groups’ influence (Gilens 2012; Hummel, Gerring, and Burt 2019; Wiltse, La Raja, and Apollonio 2019; van Biezen 2010). We now lay out the mechanism by which regulation alters donors’ influence over elected officials and test its main implications.

We argue that wealthier donors have more influence over elected officials in higher limit municipalities because they can contribute at a level that cannot be matched by other, more cash-constrained, donors. By raising their contributions, the wealthier donors increase their chances of getting a reward from an elected candidate. This is because a candidate who receives a larger fraction of her campaign revenue from few donors may experience more pressure to reciprocate. Moreover, when a candidate who wants to reciprocate faces a limited budget, she can be forced to prioritize the assignment of rewards to the more generous donors. Although in municipalities with low limits wealthier donors and less wealthy ones donate at more similar levels, with higher limits wealthier donors compete to obtain contracts by giving more and increasing the weight of their contributions in the winner’s campaign revenue. Donors who just want to express their preferences with a small donation are not expected to alter their donation levels with looser limits as much as those who see donations as an investment.

Because we are interested in changes in donors’ influence over mayors induced by changes in contribution limits, the unit of analysis in the results that follow is the mayoral campaign. Model 1 in Table 3 shows that a municipality with higher limits has an average contribution

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**Table 2 Effect of Looser Campaign Contribution Limits on Contracts Assigned to Donors to the Mayor**

<table>
<thead>
<tr>
<th></th>
<th># Contracts (1)</th>
<th>ln(Value All) (2)</th>
<th># Min. Value Contracts (3)</th>
<th>ln(Value Min. Value) (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looser contribution limit</td>
<td>3.091</td>
<td>0.819</td>
<td>2.030</td>
<td>0.638</td>
</tr>
<tr>
<td>Robust p-value</td>
<td>0.012</td>
<td>0.234</td>
<td>0.023</td>
<td>0.061</td>
</tr>
<tr>
<td>CI 95%</td>
<td>[0.735, 5.994]</td>
<td>[−0.513, 2.098]</td>
<td>[0.306, 4.200]</td>
<td>[−0.030, 1.364]</td>
</tr>
<tr>
<td>Observations</td>
<td>2,049</td>
<td>2,049</td>
<td>2,049</td>
<td>2,049</td>
</tr>
<tr>
<td>Bandwidth obs.</td>
<td>457</td>
<td>366</td>
<td>366</td>
<td>341</td>
</tr>
<tr>
<td>Mean</td>
<td>0.280</td>
<td>0.205</td>
<td>0.210</td>
<td>0.101</td>
</tr>
<tr>
<td>Effect mean (%)</td>
<td>1,104</td>
<td>400</td>
<td>967</td>
<td>632</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>6,980</td>
<td>5,312</td>
<td>5,292</td>
<td>5,190</td>
</tr>
</tbody>
</table>

*Note: Local linear estimates of average treatment effects at cutoff estimated with triangular kernel weights and optimal MSE bandwidth; 95% robust confidence intervals and robust p-values with clustering at the municipality level are computed following Calonico, Cattaneo, and Titiunik (2014). Bandwidth obs. denotes number of observations in the optimal MSE bandwidth for each dependent variable. Each observation is a donor.*
Table 3  Effect of Looser Campaign Contribution Limits on Campaign Revenues (Top and Nontop Donors)

<table>
<thead>
<tr>
<th></th>
<th>In (Avg. Donation)</th>
<th>Share Top</th>
<th>Share Nontop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looser contribution limit</td>
<td>1.134</td>
<td>0.091</td>
<td>0.001</td>
</tr>
<tr>
<td>Robust p-value</td>
<td>0.002</td>
<td>0.016</td>
<td>0.911</td>
</tr>
<tr>
<td>CI 95%</td>
<td>[0.416, 1.918]</td>
<td>[0.019, 0.176]</td>
<td>[−0.019, 0.017]</td>
</tr>
<tr>
<td>Observations</td>
<td>999</td>
<td>999</td>
<td>999</td>
</tr>
<tr>
<td>Bandwidth obs.</td>
<td>78</td>
<td>239</td>
<td>65</td>
</tr>
<tr>
<td>Mean</td>
<td>0.716</td>
<td>0.068</td>
<td>0.009</td>
</tr>
<tr>
<td>Effect mean (%)</td>
<td>158</td>
<td>134</td>
<td>11</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>4,570</td>
<td>10,880</td>
<td>3,943</td>
</tr>
</tbody>
</table>

Note: Local linear estimates of average treatment effects at cutoff estimated with triangular kernel weights and optimal MSE bandwidth; 95% robust confidence intervals and robust p-values are computed following Calonico, Cattaneo, and Titiunik (2014). Bandwidth obs. denotes number of observations in the optimal MSE bandwidth for each dependent variable. Each observation is a mayoral campaign.

to the mayor’s campaign that is 113.4% larger than one with tighter contribution restrictions. This is consistent with the regulation affecting donors’ behavior. The fact that there are larger donations with looser limits, however, does not imply that the individual influence of some of the donors over the mayor is increased, as all donors could raise their contributions in such a way that the relative share of each individual’s contribution to the campaign revenue is not significantly altered.

If higher contribution limits increase the influence of the most generous donors, we should see a larger difference between what the top and nontop donors contribute to the mayor’s campaign in municipalities with looser limits. Figure 1 shows that this is indeed the case. In municipalities with looser limits, the average individual contribution among the top two donors as a fraction of total campaign resources is 10 percentage points larger than the average contribution of a nontop donor. In low contribution limit municipalities, on the other hand, this difference is less than half at 4 percentage points. Here and in the analysis that follows, we have focused on the top two donors as the reference group as they contribute to the campaigns significantly more than the rest (see SI Appendix D, p. 11).

Table 3 presents consistent evidence using the RD estimation framework. Models 2 and 3 show that the effect

21 For these figures, we have taken municipalities that are within 5,000 registered voters of the 25,000 registered voters cutoff.

22 Similar patterns emerge when we define top donors as the top three or just the most generous donor (see SI Appendix D, p. 8).

Figure 1 Contributions per Donor around Campaign Contributions Limits Cutoff

Note: Total contributions per donor are averaged across donors in each group (top two or nontop two) and then across municipalities; 95% confidence intervals.
of a higher contribution limit on the average contributions of a top donor (as a fraction of campaign revenue) is 9.1 percentage points, whereas the effect of higher limits on the contribution of a nontop donor is very close to zero and statistically insignificant.

To further examine our proposed theoretical mechanism, we estimate heterogeneous effects of higher limits on contracts received by top and nontop donors. If higher limits increase the influence of top donors over the mayors, the effects of higher limits on the contracts they receive should be stronger for them than for less generous donors. Importantly, there could be self-selection into being a top donor with top donors having characteristics that make them more likely to receive contracts and, because of this, the interaction term between a top donor indicator and the higher limit treatment might be endogenous at the cutoff. To account for this source of bias, we take a selection-on-observables approach proposed by Gerardino, Litschig, and Pomeranz (2017), in which we use propensity scores to give more weight in the RD estimation to observations where top donors and nontop donors are similar in terms of observed characteristics. Given the two-step nature of this methodology, we compute standard errors via bootstrap. We find that the effect of higher limits on the value of all contracts for top donors is positive and significantly larger than the effect of higher limits on these variables for nontop donors’ contracts (see SI Appendix D, p. 9).

There are alternative explanations for the increased rewards to donors under less restrictive limits that rely on changes in the nature of the electoral competition (Butcher, and Milyo 2020; Fouirmaïes 2018; Hall 2016; Stratmann and Francisco 2006). The possibility of raising more money might attract different types of candidates who could be more willing to reward their donors. It could also be that higher limits amplify the advantages of incumbents, decreasing electoral competition, and diminishing accountability pressures on the elected candidate (Gordon, and Huber 2007). To assess whether these explanations account for the observed patterns, we estimate the effects of higher limits on characteristics of the pool of candidates, the winning candidate, and measures of electoral competition.

We find that elected mayors in higher limit municipalities are no different than those in lower limit municipalities in terms of age, gender, ideology, experience in elected office, history of participation in elections, or record of sanctions than those in lower limit municipalities. The one difference we find is that they are less likely to have an indigenous background. This evidence is inconsistent with lower quality candidates being elected with more donor money (see SI Appendix D, p. 9).

Additionally, we find that electoral competition in treatment and control municipalities is similar (see SI Appendix D, p. 10). We see this pattern in terms of the margin of victory, the number of candidates, the demographic composition of the candidates, the share of candidates who participated in previous elections, and those who have previously been elected. The effect of higher limits on the vote share of the winner is, if anything, negative. This is inconsistent with the idea that larger donors’ rewards are the result of reduced electoral competition. It could also be argued that, given that higher limits appear to decrease the winner’s vote share, candidates in a more competitive environment might have to compete for the wealthier donors by offering them greater future rewards. We examine this by studying the impact of higher limits on the concentration of large donors among candidates, finding no significant differences on either side of the cutoff.

Result: The Quality of Contracts Worsens and Other Implications

So far we have established that looser campaign limits concentrate donor power among top donors while also increasing the kickbacks donors receive in terms of government contracts. In this section we explore other implications of looser restrictions of campaign contributions.

We first address the question of whether there are negative consequences in terms of the performance of public contracts received by donors. It could be the case that looser limits increase contract efficiency, as greater campaign spending allows voters to select the candidates who seeks to achieve the desired outcome of most voters (Coate 2004). The results in Table 4 do not support this idea. Model 1 shows that the probability that a donor of the mayor has a contract with costs running over budgeted amounts increases by 14 percentage points in looser limit municipalities. Moreover, the increase in the value of such cost overruns is 214% (Model 4). Model

23 We use the type of economic activities in which they engage, whether they are business owners, and the age of their business operations that are available for donors registered with the chamber of commerce. The Stata module used is rddsda (Carril et al. 2017).

24 This concentration is captured by the Herfindahl of big donors computed with the shares of large donors per candidate. Big donors are those whose donations are above the median in the municipality, but results are robust to using the 75th percentile as the cutoff.
Table 4 Effect of Looser Campaign Contribution Limits on Quality of Contracts

<table>
<thead>
<tr>
<th>Panel A: All contracts</th>
<th>Cost overruns</th>
<th>Extension</th>
<th>ln(Added days)</th>
<th>ln(Cost overruns val.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looser contribution limit</td>
<td>0.141</td>
<td>0.079</td>
<td>0.206</td>
<td>2.141</td>
</tr>
<tr>
<td>Robust p-value</td>
<td>0.028</td>
<td>0.083</td>
<td>0.163</td>
<td>0.042</td>
</tr>
<tr>
<td>CI 95%</td>
<td>[0.016, 0.285]</td>
<td>[−0.011, 0.173]</td>
<td>[−0.092, 0.544]</td>
<td>[0.082, 4.316]</td>
</tr>
<tr>
<td>Observations</td>
<td>2,049</td>
<td>2,049</td>
<td>2,049</td>
<td>2,049</td>
</tr>
<tr>
<td>Bandwidth obs.</td>
<td>291</td>
<td>282</td>
<td>341</td>
<td>301</td>
</tr>
<tr>
<td>Mean</td>
<td>0.008</td>
<td>0.007</td>
<td>0.017</td>
<td>0.123</td>
</tr>
<tr>
<td>Effect mean (%)</td>
<td>1,763</td>
<td>1,129</td>
<td>1,212</td>
<td>1,741</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>4,686</td>
<td>4,526</td>
<td>5,172</td>
<td>4,803</td>
</tr>
</tbody>
</table>

Panel B: Minimum value contracts

<table>
<thead>
<tr>
<th></th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looser contribution limit</td>
<td>0.079</td>
<td>0.008</td>
<td>0.040</td>
<td>1.136</td>
</tr>
<tr>
<td>Robust p-value</td>
<td>0.072</td>
<td>0.945</td>
<td>0.637</td>
<td>0.109</td>
</tr>
<tr>
<td>CI 95%</td>
<td>[−0.007, 0.167]</td>
<td>[−0.068, 0.073]</td>
<td>[−0.112, 0.183]</td>
<td>[−0.244, 2.446]</td>
</tr>
<tr>
<td>Observations</td>
<td>2,049</td>
<td>2,049</td>
<td>2,049</td>
<td>2,049</td>
</tr>
<tr>
<td>Bandwidth obs.</td>
<td>291</td>
<td>385</td>
<td>250</td>
<td>301</td>
</tr>
<tr>
<td>Mean</td>
<td>0.004</td>
<td>0.003</td>
<td>0.007</td>
<td>0.059</td>
</tr>
<tr>
<td>Effect mean (%)</td>
<td>1,975</td>
<td>267</td>
<td>571</td>
<td>1,925</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>4,603</td>
<td>6,236</td>
<td>3,917</td>
<td>4,822</td>
</tr>
</tbody>
</table>

Note: Local linear estimates of average treatment effects at cutoff estimated with triangular kernel weights and optimal MSE bandwidth; 95% robust confidence intervals and robust p-values with clustering at the municipality level are computed following Calonico, Cattaneo, and Titiunik (2014). Bandwidth obs. denotes number of observations in the optimal MSE bandwidth for each dependent variable. Each observation is a donor.

2 shows evidence consistent with an increase of 8 percentage points in the likelihood contracts managed by a mayor’s donor require extensions, but the effect is not as precisely estimated.25 We do not find significant effects of looser limits on the probability of having cost overruns, extensions, the value of cost overruns, or additional days past the deadline for contract completion when we focus on minimum value contracts. These results suggest that, although it is easier for mayors to give contracts to donors via minimum value contracts, the lower quality of execution linked to cost overruns and extensions appears to be concentrated in large contracts. This is intuitive, as it is more difficult to justify extensions or cost overruns with smaller, less complex contracts.

We also explore whether looser limits yield net benefits for the donors themselves. Although we have shown that donors benefited via more numerous and larger contracts with looser limits, we have also shown that the price they pay for such benefits (their donations) increases. SI Table G1 (p. 22) presents the effect of looser limits on the ratio of the value of all contracts that a donor receives to the value of her contribution—the profitability ratio. We find that looser limits increase the profitability ratio of minimum value contracts by 79.2%. The point estimate is even larger (implying a 145% increase) when we count all types of contracts.26

An alternative channel by which changes in campaign contribution limits can affect the public is through their impact on electoral malpractice. If candidates are restricted on the resources they can receive and spend legally, does this push them toward engaging in illegal activities to win elections? This question is relevant in contexts where electoral manipulation and violence are common. In Colombia in particular, right-wing paramilitaries tried to influence the outcomes of local and national elections around this period (Acemoglu, Robinson, and Santos 2013). We show that there are no significant differences in vote buying and turnout.

In fact, unlike municipalities with looser restrictions, in those with tight limits that are within the optimal bandwidth, there are no donors whose contracts had cost overruns or required extensions (see SI Figures E4, E5, and discussion in SI Appendix E on pp. 12–17).

25SI Table G2 (p. 23) shows that the effects are driven by the top donors in the sample for which we have information on donor characteristics.
suppression reports, armed group attacks, or paramilitaries’ attacks on either side of the cutoff. We also find no strong evidence in favor of more campaign contributions financing vote buying (see SI Appendix G, p. 24).

Robustness: Underreporting and Extended Sample

A concern with some of our findings is that campaigns might underreport their contributions in municipalities with more restrictive regulations (La Raja 2014). This would bias our results in favor of finding a positive effect of looser limits on donations and overstate the additional benefits going to donors in municipalities with looser limits. We first note that online campaign finance reporting became mandatory in 2009 and that the first elections to fully implement the measure were those of 2011. The reporting system was designed by Transparency International and the electoral commission to increase transparency in campaign reporting and fines for violators of the law were introduced. This could have increased expectations of higher scrutiny in the documents presented by campaigns in 2011.

Nevertheless, we conduct a number of checks to assess whether measurement error is affecting our estimates. We first examine the patterns of lack of reporting by candidates in the donation data. If candidates not only underreport contributions but also decide not to report at all when there are lower limits, we should see more campaign finance reporting to the right of the cutoff. SI Table H1 (p. 25) shows a negative and insignificant coefficient on looser limits with reporting as the outcome. To account for the fact that no winning campaign has missing reports, we additionally estimate a model where we restrict the sample to include only campaigns of second place candidates in close elections, which, as we saw above, are similar to those of the election winner. This test does not change our conclusions.

We also estimate the effect of looser limits on the number of donors to the winning candidate. If we observe a significant increase in the number of donors in higher limit municipalities, this could be partially explained by campaigns not reporting some of their donors in lower limit municipalities. The results of this test, however, show that there are no significant differences in the number of donors linked to changes in contribution limits (see SI Appendix D, p. 9). This finding is also inconsistent with the idea that top donors circumvent the limits by donating through third parties whose individual donations are below the legal limits when restricted, which would imply a negative coefficient in this model.

In a third test to examine potential underreporting, we estimate the effect of looser limits on the share of all contracts (given to donors and nondonors) in economic sectors and under contractual categories that increase the mayor’s discretion in recipient selection and that are typically used to reward donors. In our data, 32% of the contracts given to donors are linked to purchases of construction machinery and office supplies, indicating a preference of mayors to reward donors with this type of a contract. In addition, when they are given under the minimum value category, mayors have more discretion to chose the contracts’ recipient. Given the above, if off-the-book donations are affecting our findings and there is no real difference in the benefits that donors (reported and not reported) receive with tight and looser limits, we should not see an effect of looser limits on the share of the types of contracts that mayors prefer to repay their contributors. This is because similar municipalities would demand the same amounts and the same types of contracts. Moreover, looser limits would just induce a different allocation of the same number of contracts from nonreported donors to reported donors. Table H2 (p. 25) shows, however, that the share of total minimum value contracts associated with office supplies and purchases of construction materials tends to be higher in looser limit municipalities.

We also address concerns related to our ability to make correct inferences in some models where the number of effective observations is small. As a separate robustness test, we checked that the patterns in contributions and contracting we observe around the 2011 election hold in an extended sample that also includes the 2015 elections for which the rule that alters contribution limits at 25,000 registered voters also applies. Although not all variables used in the 2011 analysis are available for 2015 (such as characteristics of donors or quality of contract execution for the 2015 incumbency period), we are able to replicate all results for which data are available on the extended sample. With the larger sample, we confirm that donors to the election winner receive more contracts than donors to the runner-up, that the number of contracts assigned to the mayor’s donors increase in municipalities with looser limits, and that the influence

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27 We take municipalities for which the margin of victory was less than 10 percentage points.

28 This is a stringent test given that looser limits could actually increase the true number of donors and not just the reporting.

29 The incumbency period starts in 2015 and ends in 2019, which means information on whether the contracts overrun in costs or required extensions for those contracts signed toward the end of the period is presently unavailable.
of top donors is also larger in these same municipalities (see SI Appendix J, pp. 35–37). Some differences with the previous results are worth noting: We find significant, positive, and large effects of donating to the election winner and of looser contribution limits on the value of donors’ contracts. Even though we now find that candidates running in municipalities with looser limits are less experienced, the experience of the elected mayor—who assigns the contracts—is not different under looser limits (see SI Appendix J, pp. 38 and 39). Moreover, inconsistent with the idea that “bad types” of candidates are drawn to municipalities with looser limits, we find that elected candidates in such municipalities are, if anything, less likely to have previous sanctions for violating the code of conduct of public officials.\(^30\)

**Conclusion**

We examine whether campaign contribution limits curb quid pro quo benefits for donors through the assignment of public contracts in Colombia. We document a bias in public procurement assignment in favor of mayors’ donors. We also find that these donors receive a greater number of public contracts in municipalities with looser campaign contribution limits. The evidence suggests that larger benefits given to donors in higher limit municipalities are explained by top donors having a greater influence over the mayor and not by candidate selection effects or changes in the competitiveness of the election. The contracts given to donors in higher limit municipalities also tend to perform worse, yielding large cost overruns. Overall, in the absence of tight contribution limits, society pays more for the completion of public projects, whereas top campaign donors are more than compensated for the donations they make through the contracts they receive.

Although we have focused our empirical analysis on Colombian mayoral elections, our main theoretical mechanism could still be relevant for other settings. As restrictions on campaign finance are loosened, the risk of a campaign being financed (and captured) by a few individuals could increase. It is important to examine whether in other contexts where campaigns rely more on small donations from more voters expressing their preferences, rich individuals still achieve the level of influence over elected officials under looser campaign finance restrictions that we see in Colombia. A separate consideration when studying the effects of campaign finance in other contexts is the fact that candidates can reward donations through legislation and regulations (over which the municipality mayors we study have less power). A particular challenge when studying donors’ benefits measured in that way is that donors choose an ideologically close candidate who will favor her preferred legislation or regulation. In our case, giving local contracts to specific donors suffers less from this concern.

This article has concentrated on one potential benefit of reducing the influence of donors over elected officials: reducing the biased allocation of public resources. More work should also be done on whether campaign contribution limits impose costs on society by altering the flow of information available to voters during the campaign. The fact that we do not find strong evidence of higher quality candidates running and being elected in municipalities with looser contribution limits, however, is inconsistent with important informational gains via additional campaign spending.\(^31\) Equally important to formulate recommendations on appropriate campaign finance regulations is to acknowledge that corrupt agents adapt to regulatory changes and that the positive effects of regulations we see might change over time (La Raja 2014). As long as governments offer contracts that generate higher profits than those of the private sector—as is common with local government contracts—private interests will have strong incentives to continue to influence elected officials after the elections. More research is needed to study how campaign finance reforms alter other channels of influence in a post-election setting like lobbying.

**References**


\(^30\)More details about the analysis and findings are in SI Appendix J on pp. 31–39.

\(^31\)Campaign misinformation financed with donations could also potentially distort public choices toward less ideal candidates.


Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix A: Electoral Victory and Predetermined Covariates

Appendix B: Looser Campaign Contribution Limits and Predetermined Covariates

Appendix C: Sorting Tests

Appendix D: Mechanisms

Appendix E: Estimates Figures (RD Plots)

Appendix F: Bandwidth Sensitivity Figures

Appendix G: Other Implications

Appendix H: Measurement Error

Appendix I: Polynomial Order

Appendix J: Extended Sample (2011 and 2015 Elections)