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# Spillovers from Regulating Corporate Campaign Contributions\*

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## Abstract

Populist clamor and recent Supreme Court decisions have renewed calls for increased regulation of corporate money in politics. Few empirical estimates exist, however, on the implications of *existing* rules on firms' political spending. Exploiting within firm-cycle cross-candidate variation and across firm-cycle variation, we demonstrate that the regulation of PAC campaign contributions generates large spillovers into other corporate political expenditures such as lobbying. Using both high dimensional fixed effects and regression discontinuity designs, we demonstrate that firms constrained by campaign contribution limits spend between \$549,000 and \$1.6M more on lobbying per election cycle, an amount that is more than 100 times the campaign contribution limit. This empirical results demonstrate that, similar to regulations in other domains of the economy, constraining specific corporate political activities often yields unintended effects.

**Keywords:** Campaign finance regulation; corporate political activity; election law

**JEL Codes:** D72, D73, K39,

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# 1 Introduction

Corporate money in US politics generates substantial controversy and a series of recent Supreme Court decisions has fueled the widespread perception that the regulations governing corporate political activity are inadequate. Many believe that more needs to be done to control the influence of corporate interests in politics – especially the role of corporate money.<sup>1</sup> Public anxiety over corporate involvement in political campaigns has a long history, however, and the recent decisions are merely the latest in a string of contentious cases. Somewhat surprisingly, there is little empirical analysis of the existing regulations on corporate political involvement.

Attempts to prohibit corporate involvement in politics date back more than a century to the Tillman Act of 1907. The Federal Election Campaign Act of 1971 represents the modern formulation of campaign finance regulation and the Supreme Court’s landmark 1976 decision in *Buckley v. Valeo* reaffirmed the legislated constraints by denying a challenge to the limits on corporate political contributions to candidates. The Court clearly stated the purpose of contribution limits is “the prevention of corruption and *the appearance* of corruption spawned by *the real or imagined* coercive influence of large financial contributions on candidates’ positions and on their actions if elected to office” (*Buckley v. Valeo*, 424 US 1 (1976), p. 25 *emphasis added*). Proponents of electoral reform in the 1970s believed that, by regulating corporate campaign contributions, they would simultaneously limit corporate influence in politics. The Court states in *Buckley* that “contribution ceilings ... prevent attempts to circumvent the [Federal Elections Commission] Act through prearranged or coordinated expenditures amounting to *disguised contributions*” (p. 26, *emphasis added*). However, even the campaign finance regulation of the 1970s did little to quell public dissatisfaction with corporate money in politics.

This paper demonstrates that, similar to other domains of the economy, regulating specific activities such as corporate campaign contributions leads to unintended effects or spillovers. Im-

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<sup>1</sup>For instance, a 2015 New York Times/CBS News poll found that 85% of respondents believe that “fundamental” or “complete” changes are needed to the way political campaigns are financed (Confessore and Thee-Brenan, 2015). A 2012 Reuters poll found that 75% of Americans of both political affiliations felt that there was too much money in politics while 76% thought that corporations should be required to disclose all political spending (Williams, 2012; Yager, 2012). Outside of the US, Australian Shareholders Association equated corporate campaign contributions to bribery and called for their cessation (Baker, 2006).

portantly, the magnitude of these spillovers are large. Our results highlight that firms that are constrained by existing campaign contribution regulations spend an additional \$549,000 to \$1.6M on lobbying per cycle, an amount that is more than 100 times the contribution limit for corporate political action committees (PACs). Likewise, contributions from chief executives also increase when PACs hit a regulatory cap on donations. That these estimates dwarf the prevailing contribution limits suggests that a potential source of the public's longstanding frustration with existing campaign finance regulation is that it is ineffective in practice. In other words, the persistent frustration with corporate political regulations may be that the existing rules do not limit the behavior they are supposed to restrain because firms, seeking to sway the policy-making process, strategically respond to these constraints.

There have been many studies that investigate the underlying economics of corporate political activity. Few however empirically examine corporate political regulation directly, let alone the spillovers that result from strategic corporate behavior. For example, Stratmann (1992) looks at the strategies and effectiveness of PAC contributions, finding that PACs time their contributions to have the largest impact. Blanes i Vidal, Draca and Fons-Rosen (2012), Bertrand, Bombardini and Trebbi (2014) and Cohen and Malloy (2014) demonstrate the importance of personal connections as a channel linking lobbying and voting behavior. Fremeth, Richter and Schaufele (2013) highlight the intra-organizational economic features of political investments. Ovtchinnikov and Pantaleoni (2012) show that contributions flow to politicians who have the greatest discretion over those policies targeted at firms located in specific jurisdictions and Bombardini and Trebbi (2011) relate interest group size to campaign contributions. A theme shared by this research is that corporate political activity has the potential to improve firm outcomes by influencing policy-makers, but none investigate how regulations shape corporate political activity.

The legitimacy of corporate political tactics is frequently questioned, but the reality is the vast majority of these activities are legitimate, conducted in plain sight and constrained by regulation. Lobbying expenditures and CEO contributions, among other activities, follow statutory prescriptions. Despite existing oversight, however, calls for campaign finance reform and improved corporate disclosure of all political activities continue (e.g., Bebchuk and Jackson Jr, 2012).<sup>2</sup> What

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<sup>2</sup>Calls for greater disclosure are not limited to regulatory channels. Between 2007 and 2014, private investors have

is missing in the literature, and what we contribute, is an empirical analysis of the magnitudes of the potential spillover effects from selectively regulating specific corporate political activities. Rather than adopting a strict statutory interpretation on the supply of corporate political money, this paper focuses on how firms actually respond to the prevailing regulation along several observable and complementary margins. Even though companies adhere to the letter of the law, our results demonstrate distinct patterns that support a populist interpretation of corporate political involvement and emphasizes how many of these channels are connected, even as they are treated independently under US regulation.

The papers closest to the present study are Tripathi, Ansolabehere and Snyder (2002) and Lake (2015). Exploiting the introduction of lobbying disclosure act Tripathi, Ansolabehere and Snyder establish that PAC contributions and lobbying expenditures are connected. Tripathi, Ansolabehere and Snyder claim that this link provides support for the “access theory” of corporate political engagement. Lake builds on the Tripathi, Ansolabehere and Snyder data, taking the analysis several steps further. He provides a novel decomposition linking the recorded issues in the lobbying disclosure database to PAC contributions. We extend the analysis in two important directions. First, we concentrate on rules governing corporate political involvement, especially the prospect for unintended consequences. We measure how the rules governing corporate political engagement affect the structure of political activity as measured in dollars. As different agencies regulate the distinct activities, understanding the magnitudes of the prospective spillovers is important. Second, we use larger and more detailed datasets that allows us to concentrate on the contribution constraints (i.e., the neighborhood around the precise per cycle contribution limit). By focusing attention on this neighborhood around contribution thresholds, we are able to avoid many of the debates about the motivations for and theories of corporate contributions and lobbying. Of course, this theory-agnostic approach does have a cost: our results apply to the role of regulations on firm behavior and therefore are not tests of the underlying theories of firm political behavior. While we view this rule focused analysis as a benefit, we recognize that it leaves many questions about what firms are actually “buying” with their money unanswered. While we view the motivations of firms’

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initiated over 350 stockholder proposals in an attempt to obtain improved disclosure of corporate political activities and formal statements of alignment between company values and political contributions (Goodridge and Jantz, 2014; Northstar Asset Management, 2012). These proxy battles have occurred at prominent firms such a Procter & Gamble, General Motors and 3M among many others.

political activities as important, we believe that understanding the implications of the regulations on corporate political activity as equally important.

To evaluate the degree to which these spillovers arise, we exploit the relationship between statutory campaign contribution limits on firms' PACs and alternative modes of political activity. Marrying information on corporate lobbying and campaign contributions, our data includes over 6.8M firm-candidate observations linked across nine election cycles. This enables us to exploit the institutional details of the United States' campaign finance laws, isolate a firm's marginal campaign contribution and employ rich time-varying fixed effects to control for an extensive assortment of unobserved factors. In separate models we apply a regression discontinuity design. Specifically, we measure the response of CEO contributions and lobbying expenditures when a firm's PAC makes the maximum allowable political contribution to a particular candidate relative to other candidates that receive below limit contributions from the same firm. Intuitively, it would appear that there is an obvious omitted variable in this analysis: firm political strategy. The benefit of having a large dataset and a clearly defined regulatory threshold is that we are able to avoid bias due to this omitted variable as long as two assumptions hold. First, in our models examining the relationship between CEO donations and her firm's PAC contributions, we allow both candidate political views and overall firm strategy to vary over time. We assume, however, that firm-by-candidate-by-election cycle factors are orthogonal to CEO contributions. Stated differently, firms cannot strategically target specific election candidates *within an election cycle* in a manner that is positively correlated with CEO contributions. While we believe that this condition is broadly plausible, we take an additional step in our robustness analysis: we embed the firm-cycle and candidate-cycle fixed effects models within a difference-in-difference specification where we examine the relationship between CEO and her PAC's contributions before and after the Bipartisan Campaign Finance Act (BCRA) of 2002. Next, to avoid omitted variable problems for our lobbying models, we assume that in the absence of campaign finance regulation contributions would increase smoothly around the limiting threshold. In other words, without the FEC regulations, we would not expect to observe a large discrete jump in a firm's lobbying expenditures as its PAC transitions from making, say, a \$9900 donation compared with the limiting \$10,000 donation. In the Appendix, this smoothness assumption is tested for alternative variables such as advertising, R&D and dividend expenditures,

appearing to hold. As such, we view this assumption as reasonable. Finally, we probe the sensitivity of our models via several placebo tests. Overall, our main conclusion is that *statutory limits on corporate PACs are effectively non-binding* and that the spillovers can be economically meaningful.

Even as advocates call for stricter regulation of corporate political activity in the aftermath of *Citizen's United* and *McCutcheon* – two Supreme Court decisions that created new opportunities for corporate money in politics – they appear to under-emphasize an important point: many of the political activities in which companies engage are challenging to observe and hence difficult to regulate.<sup>3</sup> Documenting the unintended consequences of existing campaign finance regulation on observable activities, such as lobbying, therefore provides valuable perspective. This is especially true as we demonstrate that the spillovers from imperfect regulation can often be larger than the initial problem that the rules were attempting to remedy. Magnitudes become important especially if corporate political activity is increasingly hidden from view. If the spillover effects are large between lobbying and campaign contribution, they may be equally important along margins that are more difficult to control (i.e., independent expenditures).

The remainder of the paper is laid out as follows. Section 2 presents the conceptual framework that we employ to econometrically identify firms' responses to regulation. Our data are discussed in section 3 and results are in section 4. Section 5 concludes.

## 2 Conceptual Framework

Firms face FEC enforced restrictions on the amount of money that their PAC is permitted to contribute to candidates within a given election cycle. PAC contributions are capped at \$5,000 per candidate per election (primaries) and \$10,000 per candidate per cycle (primaries plus general). These restrictions are unchanged during our window of analysis, 1992 through 2008. Firms can fund the administration of PACs via corporate coffers, but they are barred from making direct contributions to candidates using company money: all contributions to candidates must be from

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<sup>3</sup>A laundry list alternative corporate political activities could be provided – for example, firms may make in-kind contributions to campaigns, make philanthropic contributions to a politician's preferred charity, may threaten to contribute to opponents or may provide monetary contributions to political parties that act as pass-through entities.

the company’s managers, employees or shareholders. While unambiguous limits exist for PAC and individual campaign contributions, firm lobbying expenditures do not have legislated spending caps.

A stylized characterization for why spillovers arise at regulated campaign finance limits is illustrated in Figure 1. Firms make campaign contributions until the marginal cost equals the marginal benefit. An election has  $N$  candidates. Firm,  $j$ , assigns a quality,  $\theta_c$ , to each candidate,  $c$ , which is defined over finite support  $[\theta_l, \theta_h]$ . Define the lowest and highest quality candidates as  $l$  and  $h$ , respectively. Candidates are ranked so that  $\theta_l \leq \theta_c \leq \theta_h$ . The figure’s horizontal axis represents the firm’s rank-ordered distribution of all  $N$  candidates, where moving from left to right represents moving from the lowest to highest quality. The benefit to the firm from contributing to a candidate of given quality is measured along the vertical axis. The solid line depicts the PAC’s revealed contribution behavior, while the thick dashed line represents the firm’s valuation across the full set of candidates.

Three regions are identifiable in Figure 1. First, most firms have no contact with the vast majority of “low quality” political candidates. Based on a firm’s revealed preferences, these individuals provide no value to the firm and are shown to the left of the  $\theta_c$  threshold. Candidates whose marginal value is positive, but for whom the statutory campaign regulations do not bind, are shown between the  $\theta_c$  and  $\theta_{\bar{c}}$  cutoffs. These candidates receive funds from the PAC, implying that they generate some benefit to the firm – in fact, their marginal benefit exactly equals the additional dollar contributed – yet existing regulations do not influence the firms’ decision. Finally, we observe that PACs make identical per candidate contributions to the group of high quality politicians, those individuals ranked to the right of  $\theta_{\bar{c}}$ . Revealed firm behavior demonstrates that the high quality candidates have a marginal value that equals at least one and potentially more. This is shown as the dashed line sits above the solid line and contrasts with candidates ranked to the left of the  $\theta_{\bar{c}}$  threshold where the dashed and solid lines overlap. It is to these individuals that firms have the largest incentive to seek alternative channels through which to influence the political ecosystem, while still following the letter of the law. Our empirical specifications exploit candidate-level variation across this statutory PAC threshold.

It is possible to be slightly more explicit about the role of the  $\theta_{\bar{c}}$  threshold without fully solving

a firm's Lagrangean. Denote the maximum allowable contribution for the PAC by  $\bar{w}$  and let  $b'(w_c)$  represent the marginal benefit from making campaign contribution,  $w$ , to candidate,  $c$ . Assume a firm makes campaign contributions to two candidates, 1 and 2. Let candidate 1 receive a below limit contribution while candidate 2 receives the election limit. If we assume the simplest reasonable objective function – for  $c = 1, 2 : \max_{w_c} b(w_c) - w_c$  – then we obtain the following first order conditions:

$$b'(w_1^*) \leq 1 \tag{1}$$

$$b'(\bar{w}_2^*) = 1 + \lambda_2 \tag{2}$$

where  $\lambda_2$  is a PAC's shadow price of a campaign contribution to at-limit candidate 2. Subtracting equation (1) from (2) then gives the intra-firm cross-candidate variation:

$$b'(\bar{w}_2^*) - b'(w_1^*) \geq 0 \quad \Rightarrow \quad \lambda_2 | \text{PAC Contribution at Limit} \geq 0$$

A positive  $\lambda_2$  reflects a positive shadow price for corporate political activity and, based on revealed contribution behavior, the marginal value of candidate 2 for the firm is greater than one. We regress a series of non-contribution political expenditures on an indicator reflecting whether a candidate,  $c$ , received an at-limit contribution from firm  $j$ 's PAC (in robustness checks we also use alternative non-political dependent variables). Campaign contribution limits enable us to exploit cross-candidate variation across the  $\theta_c$  threshold, whereby candidates receiving at-limit contribution are deemed to be of higher quality *for a given firm* than those receiving below limit contributions.

This framework emphasizes candidate-level variation within firms. Yet, it is worth mentioning that PAC limits are unchanged over our window of analysis. This means that there are no explicit sources of exogenous variation in this variable. Notwithstanding this, the size of our dataset permits very rich and convincing within firm analysis conditional on time-varying firm-specific and candidate-specific fixed effects. Further, the BCRA eliminated soft money contributions in 2002.<sup>4</sup> By sharply changing rules on this major alternative and closely-related channel of corporate political activity, firms may have reallocated at least some share of their resources towards PAC

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<sup>4</sup>Soft money contributions were direct transfers from firms' corporate treasuries to political parties.

contributions making existing limits on them more pertinent. We investigate this legislative change in section 4.3.

### 3 Data and Summary Statistics

To evaluate the scope of spillovers from regulations on corporate campaign contributions, we require information on firms, CEOs, candidates, campaign contributions and lobbying expenditures. All firms that were in the S&P 500 at any point between 1991 and 2008 are included in the sample. Firm characteristics and CEO identities are from COMPUSTAT. Data on candidates and campaign contributions are from FEC filings retrieved from the Center for Responsive Politics' bulk data. All contributions greater than \$200 are recorded by the FEC, but, due to spelling errors, miscoding and partial entries, these data require significant manual processing. Lobbying expenditure data are available from 2000 through 2008 and are retrieved from the Lobbying Disclosure database for all lobbying engagements that are greater than \$10,000. Much of this dataset required manual processing and further documentation is described in the Appendix. Variables are at either the firm-candidate-cycle level yielding a dataset with 6,803,661 observations or, for the regressions using the lobbying data, at the firm-cycle level containing 2,796 observations.

Table 1 summarizes key statistics. The sample includes 950 firms with the mean campaign contribution from these firms' PACs to all candidates equaling \$68. The mean contribution to candidates who received a non-zero contribution is \$2,267, with 14.4% receiving the maximum allowable contribution. CEOs, in comparison, gave an average of \$2 to all candidates, increasing to \$1,324 for those candidates to whom they did contribute.

Table 1 also shows that average lobbying expenditures for all firms and firms who lobby total \$1,101,868 and \$2,898,788, respectively. As is evident, firms' outlays on lobbying significantly exceed the the dollar values of their campaign contributions as there are no statutory limits on lobbying expenditures. Further, disclosure requirements only mandate the reporting of total expenditures, the names of firm-linked lobbyists and the set of issues for which the lobbying was undertaken (de Figueiredo and Richter, 2014). While the contribution data is disaggregated to

firm-candidate pairs, lobbying expenditures are aggregated across all activities on a per cycle basis for each firm. The lobbying data also start in 2000 so are available for a shorter time frame. Despite these limitations, we perform revealing robustness checks that demonstrate how FEC contribution limits influence firms' lobbying allocations. The purpose in this paper is to be completely agnostic with respect to the interpretation of this spillover beyond linking it to the conventional unintended consequences of regulation. However, alternative readings are available. Following Hall and Deardorff (2006) and Ellis and Groll (2014), it is possible to interpret some share of these lobbying expenditures as comprising a form of "legislative subsidy" – a "matching grant of costly policy information, political intelligence, and labor to the enterprises of strategically selected legislators" (Hall and Deardorff, 2006, pg. 69). *Inter alia*, the outputs from lobbying engagements include research reports and polling data, information which is valuable to politicians. Lobbying, from this perspective, becomes an additional channel through which firms circumvent statutory contribution limits.

## 4 Quantifying the Spillover Effects of Limits on PAC Contributions

We first examine the effect of Corporate PAC regulations on CEO contributions followed by our most striking results: the effect of campaign contribution regulations on lobbying expenditures. Robustness checks including placebo models and a regression discontinuity specification are presented alongside the main lobbying regressions. Then, using a difference-in-differences specification, the implications of BCRA are evaluated vis-à-vis these two activities.

### 4.1 CEO Contributions to Candidates

Before examining lobbying expenditures, the domain where the bulk of corporate political money is allocated, we examine the relationship between CEO contributions and PAC contributions at regulated limits. Our first specification is:

$$\begin{aligned}
\text{CEO Contribution}_{ijct} &= \beta_1 \text{PAC Contribution}_{jct} \\
&+ \beta_2 \text{PAC Contribution at Limit}_{jct} \\
&+ \psi_{jt} + \gamma_{ct} + \varepsilon_{ijct}
\end{aligned} \tag{3}$$

where the dependent variable, CEO Contribution<sub>ijct</sub>, is the amount of money that CEO *i*, associated with firm *j* in election cycle *t* contributed to candidate *c*. PAC Contribution<sub>jct</sub> and PAC Contribution at Limit<sub>jct</sub> are binary variables which take a value of 1 if firm *j*'s PAC contributed and contributed at the statutory limit, respectively, to candidate *c* in cycle *t*. The equation also includes firm-by-cycle,  $\psi_{jt}$ , and candidate-by-cycle,  $\gamma_{ct}$ , fixed effects. Firm-specific characteristics such as its political strategy, operating performance and regulatory status likely vary over time; firm-by-cycle fixed effects control for these unobservable factors that may influence a CEO's political behaviour. Similarly, political candidates' policy preferences may evolve over time. Candidate-by-cycle fixed effects control for a candidate's policy position within a given cycle. The combination of firm-by-cycle and candidate-by-cycle fixed effects permits a time-varying firm-to-policy match for each election cycle in our data. As a result, identifying variation is within firm-cycle cross-candidate – i.e., we exploit within firm-cycle differences in candidates across the  $\theta_{\bar{c}}$  threshold from Figure 1 after removing candidate-year confounding effects. The final variable in equation (3) is  $\varepsilon_{ijct}$ , the error term which encompasses all remaining CEO-specific factors that may influence her contribution behavior.

The coefficient of interest in equation (3) is  $\beta_2$ . This represents a response to the threshold,  $\theta_{\bar{c}}$ , and is interpreted as the amount by which the CEO supplements the PAC's contribution to a given candidate once the PAC is not able to contribute further. CEO contributions represent another margin through which the firm can make political investments – i.e., they represent the spillover from the regulation. In fact, when constrained it is especially likely that a PAC director would urge all senior executives to contribute to important candidates, so by focusing exclusively on the CEO's behavior, we underestimate this channel.<sup>5</sup>

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<sup>5</sup>One concern for identification is that the CEO may coincidentally contribute to the same politicians as the PAC. There are persuasive reasons to believe that this is unlikely. First, Fremeth, Richter and Schaufele (2013) demonstrate that, compared with other phases of their career, CEOs' campaign contribution behavior changes dramatically once they ascend to the chief executives' office. This suggests that CEO political contribution behavior is not driven by

Table 2 demonstrates that statutory limits on PAC political contributions lead CEOs to make supplementary donations to candidates who are important to the firm. Two columns of results are presented. Column 1 is a linear probability model where the dependent variable is binary, taking a value of one if a CEO made a contribution to a particular candidate. This model shows that CEOs are 7.7% more likely to make a contribution to candidates if the PAC has contributed to that individual at its statutory limit. Column 2 repeats the analysis but uses the dollar-valued contributions from CEOs as the dependent variable. For candidates that have received the maximum PAC contribution, CEOs give an additional \$123. All estimates are statistically significant and suggest that firm-linked political contributions extend beyond PACs to executives affiliated with the firm – i.e., CEOs supplement PAC contributions.

Figure 2 extends the results of Table 2 by decomposing the PAC contributed variable into a series of dummy variables representing discrete contribution intervals. The estimated coefficients for this plot are in the Appendix’s Table 7. The y-axis represents CEOs’ contribution to a specific candidate in response to their PACs’ contribution. A gentle upward sloping relationship is evident until the PAC reaches their statutory limit for a given counter-party. At that point, CEO contributions *to the same candidates* spike upward.<sup>6</sup> The PAC’s shadow price in the \$4,500-4,999 interval equals zero (i.e.,  $\lambda^* = 0$ ); at the limit, it is positive (i.e.,  $\lambda^* \geq 0$ ). The difference across these two bins is the within firm-cycle threshold we are exploiting in Table 2. The dramatic “hockey stick” shape appears because, at the margin, the firm does not sufficiently value candidates receiving sub-limit contributions to induce adjustment to other domains. We interpret Figure 2 as persuasive evidence that firms are operating within prescribed campaign finance rules, but are behaving in a manner that contravenes the spirit of the law.

Several additional comments are warranted. First, as we exclusively focus on CEO contributions, our coefficients should be considered a lower bound on the magnitude of constraint avoidance as other managers could similarly contribute. Second, we emphasize the voluntariness of these contributions. It is illegal to “coerce” any firm employee, including high-ranking executives, into personal preferences and is responsive to their firms’ requirements.

<sup>6</sup>F-tests reject the null hypothesis that the marginal CEO response to a PAC at the limit is equal to a non-limit contribution. Specifically, in Table 2 we test:  $H_0 : \text{PAC contributed} = \text{PAC contributed at limit}$  and reject the null ( $p\text{-value} = 0.00$ ). In Figure 2 we test:  $H_0 : \text{PAC gave between } \$4,500\text{-}4,999 = \text{PAC at limit}$  and similarly reject the null ( $p\text{-value} = 0.00$ ).

contributing to any political candidate, let alone one directly linked to the firm. Likewise, firms cannot increase employee salaries to encourage “contribution flow-through”. Case studies emphasize that most firms actually do adhere to the strictures of these regulations (Sabato, 1985); nonetheless, these results demonstrate that coordination of contributions between PACs and executives occurs at S&P 500 firms. Third, limits on campaign contributions should be considered soft constraints at best. This analysis provides rigorous empirical results which illustrate the ease in sidestepping these rules. Fourth, reverse causality is a lingering concern for these specifications, yet several features of the analysis imply that it is unlikely to be a big deal. To start, CEOs very rarely hit the individual campaign contribution limits when the PAC does. This means that CEOs are exercising discretion in their contribution behavior. Next, PACs must be governed by a formal board, often led by someone other than the CEO. These boards are responsible for stewarding the contributions from shareholders and firm employees. Finally, it worth pondering the magnitude of these estimates. A \$123 response seems small and not something of great concern. Yet, while the dollar values are small, the pattern matches what we observe with respect to other types of expenditures and highlights that alternative unobserved spending (e.g., independent expenditures) follows similar patterns. Indeed, as is shown next, these magnitudes increase dramatically once we focus on activities with no regulated cap such as lobbying expenditures.

## 4.2 Lobbying Expenditures

Lobbying expenditures by firms far exceed their monetary campaign contributions (de Figueiredo and Cameron, 2009; Milyo, Primo and Groseclose, 2000). During the 2008 election cycle for example, average aggregate campaign contributions by S&P firms with PACs (conditional) equaled \$543,548. The mean lobbying expenditures for all S&P 500 firms during the same cycle was \$2,728,642 (unconditional). Contributions and lobbying are two components of firms’ integrated political strategies. As with campaign contributions, we want to quantify the extent to which a constraint on contributions spills-over into lobbying when firms reach statutory campaign contribution

constraints.<sup>7</sup> We estimate:

$$\begin{aligned} \text{Lobbying Expenditures}_{jkt} = & \alpha_1 \text{PAC Contributed}_{jt} \\ & + \alpha_2 \text{PAC Contributed at Limit}_{jt} \\ & + \delta_j + \eta_{kt} + \nu_{jt} \end{aligned} \tag{4}$$

Several features distinguish this model from equation (3). First, Lobbying Expenditures<sub>jkt</sub> represent the aggregate outlays on lobbying by firm  $j$  in industry  $k$  in cycle  $t$ . Unlike CEO contributions which vary by CEO-candidate-cycle, due to reporting requirements, variation in equation (4) is reduced to firm-cycle. As a consequence, there is a mismatch between the definition of PAC Contributed and PAC Contributed at Limit indicators in equation (3) and equation (4). In the CEO contribution models, these variables are coded as candidate-specific – a firm reached its statutory contribution limit for a given candidate-cycle – whereas for equation (4) they are cycle-specific. This means that if a firm’s PAC reached its statutory limit *for any candidate, c*, in cycle,  $t$ , PAC at Limit takes a value of one. A similar rule applies to sub-limit contributions and the PAC Contributed variable. This redefinition implies a coarsening of our variable of interest, one which relies on a distinct source of variation.<sup>8</sup> The obvious limitation of these coarser data is a diminution of the identifying variation.

In addition to the distinct source of dependent variable variation, our regression equation, (4) (in contrast to equation (3)), employs a different resolution of controls:  $\delta_j$  are firm-specific parameters which capture time-invariant factors such as headquarters location, while  $\eta_{kt}$  are industry-cycle fixed effects.<sup>9</sup> We therefore complete two additional series of robustness checks: using alternative, non-political dependent variables as placebos and specifying a regression discontinuity formulation. These coefficients remove time-varying attributes that are common to all firms within an industry. The most important factor being the regulatory burden of specific industries which may change over time.

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<sup>7</sup>This underlying relationship also buttresses the view that campaign contributions are either an explicit or implicit “cost of access” to lawmakers (Kalla and Broockman, 2015).

<sup>8</sup>We elaborate on this in Appendix A.

<sup>9</sup>We define industries according to the Fama-French 49 set of portfolios. Code available on the authors’ websites includes a concordance between four digit SIC codes from COMPUSTAT and the Fama-French portfolios.

Our coefficient of interest in equation (4) is  $\alpha_2$ , the effect of hitting the statutory campaign contribution limit for any candidate on lobbying expenditures. A residual concern is that our PAC Contributed at Limit coefficient may be biased if the estimate captures some unobserved factor such as a “big firms do more” effect (i.e., larger firms more broadly engage in a range of political activities spanning lobbying and campaign contributions). Similarly, lobbying expenditures and PAC contributions *at statutory limits* may be jointly determined. Firm-specific and industry-cycle fixed effects alleviate much of the trepidation regarding bias and we undertake several empirical exercises which demonstrate that any bias due to unobserved factors in  $\alpha_2$  is likely small. Still, we do not exploit any exogenous variation in FEC limits and our results should be interpreted as partial correlations. The robustness and stability of our estimates, nonetheless, suggest that campaign contribution regulations lead to spillovers into lobbying expenditures.

Table 3 demonstrates this link, illustrating that statutory FEC contribution regulations influence firm lobbying expenditures. Column 1 is our main specification where the coefficient on the PAC Contributed at Limit variable is a statistically and economically significant \$549,000. When an S&P 500 firm reaches its statutory campaign contribution limit for any candidate in a cycle, it allocates over \$500,000 more to lobbying than otherwise. Of course, this coefficient may be upwardly biased due to an unobserved factor (e.g., a systematic factor related to firm size). We do two things to assuage these concerns. First, we calculate Altonji, Elder and Taber’s (2005) selection on unobservables to selection on observables ratio. For the model in column 1, omitted unobservable factors would need to explain 7.7 more variation in the dependent variable than the included observables (i.e., our fixed effects and PAC Contributed variable) in order to fully explain our effect size. This ratio is well in excess of Altonji, Elder and Taber (2005) rule of thumb for a robust estimate of 1.0. Next, in column 2 we re-run the regression from column 1; instead of including the PAC Contributed at Limit variable however, we substitute a “PAC had Large Expenditures” indicator. This variable takes a value of one if a firm’s PAC made aggregate contributions in excess of \$100,000 per cycle, a value that is approximately at the 90th percentile of distribution. Neither the PAC Contributed nor the PAC had Large Expenditures variables are statistically significant. More importantly, the coefficient on PAC had Large Expenditures is approximately \$250,000 less than the PAC Contributed at the Limit coefficient from column 1, hinting that there is something

inherent to the limits that is driving firm lobbying expenditures. The model in column 3 puts all three variables together and corroborates this conclusion. The coefficient on the PAC Contributed at the Limit variable is still statistically and economically significant and robust to the inclusion of the PAC had Large Expenditures indicator. When a firm's PAC reaches its FEC enforced limit for any candidate in a given cycle, it allocates over \$500,000 more to lobbying expenditures.

Columns 4, 5 and 6 repeat the analysis of columns 1, 2 and 3, but restricts the sample to firms who lobbied. The pattern of coefficients is consistent validating the analysis. The estimate for statutory limits in column 6 states that when a firm that has positive lobbying expenditures also reaches its campaign contribution limit for any candidate in a given cycle, it spends \$662,000 more to lobbying. A positive shadow price on campaign contributions appears to have large spillovers into other corporate political activities.

#### Non-Political Dependent Variables: Placebo Analysis

A range of additional tests were performed on the models to rule out potentially spurious correlations with firms reaching PAC contribution limits. While these placebo models that use alternative, non-political dependent variables cannot provide a direct falsification test of the spillovers from political regulations, it is reassuring that we do not find meaningful results where we do not expect to find them.

Table 4 repeats the analysis of Tables 3 replacing lobbying expenditures with four of alternative firm-specific dependent variables: R&D expenditures, advertising expenditures, dividend payouts and value of acquisitions. These variables are less "politically discretionary" compared with CEO contributions or lobbying. Four columns of results are presented, one for each of the alternative variables. As is clear, we find no statistically or economically meaningful relationship between PAC contributions at statutory limits and any of these dependent variables. For each, the confidence intervals are wide and include zero.

## Regression Discontinuity Analysis

Given the nature of the activity we investigate, it is challenging to rule out omitted variables. To add further robustness to our results, we complete a “one-sided” regression discontinuity analysis. Typically, regression discontinuity models have a forcing variable that spans both sides of an exogenous cut-off, however, one-sided analysis, where the forcing variable stops at the cut-off, is a valid design (Hahn, Todd and Van der Klaauw, 2001; Lee and Lemieux, 2010). In this context, we treat PAC contributions as the forcing variable and the regulated contribution limit as a threshold. We then interpret any jump in lobbying expenditures, the outcome variable, at that threshold as a spillover. Regression discontinuity assumes a counterfactual where lobbying would vary smoothly with PAC contributions in the absence of regulations, an assumption we see as plausible.

We present results in two formats. Figure 3 illustrates the jump in lobbying expenditures at the PAC contribution limit. The dots in the figure represent the average per firm lobbying expenditures for each firm whose maximum per candidate PAC contribution is within the bin. For example, the average amount spent on lobbying per cycle for firms whose maximum contribution was between \$8,000-8,999 was slightly less than \$1M. The trend line then is a locally weighted, lowest fit to these bin means. The salient feature of this graph is the obvious discontinuity that exists as firms move from the \$9,000-9,999 bin to the \$10,000 limit. (Appendix B presents placebo regression discontinuity figures for the alternative dependent variables used in the previous subsection. None of these figures exhibit comparable jumps at the PAC limit.) It is the distinct jump at the threshold that we interpret as the spillover effect from corporate campaign finance regulation.

While the simple visual representation is compelling, it is possible to control for additional factors and be more precise about the magnitudes. Table 5 presents the results corresponding to this specification:

$$\begin{aligned} \text{Lobbying Expenditures}_{jkt} = & \rho_0 + g(\text{PAC Contributions}_{jt}) \\ & + \lambda c_{jt} + \delta_j + \eta_{kt} + \mu_{jt} \end{aligned} \tag{5}$$

where  $c_{jt}$  is an indicator that takes a value of one when firm  $j$ 's PAC hits its limit in cycle  $t$ . The main difference between this specification and (4) is that the dollar value of PAC contributions enter continuously as a polynomial,  $g(\cdot)$ , rather than as a dummy variable. Table 5 presents results

where the polynomial contains linear and quadratic terms (Gelman and Imbens, 2017). The fixed effects in (5) are identical to those in (4).

Table 5 contains four columns. Column (1) is the most parsimonious model, containing a linear trend in contributions and omitting the industry-year fixed effects. Regulations on corporate political contributions in this formulation lead to more than \$3,000,000 additional dollars spilling over into lobbying expenditures. Column (2) includes a quadratic term in the forcing variable and attenuates this estimate to \$2,400,000. Industry-year fixed effects are added to columns (3) and (4) to control for any time-varying, industry-specific factors – such as other regulations or policies – that may drive firms’ lobbying efforts. Corporate PAC regulations in these specifications still yield large spillover effects, equaling \$2,300,000 and \$1,600,000, respectively.

The estimates in Table 5 are larger than those in Table 3. Still, our preferred models remain the fixed effects specifications in Table 3. This is for two reasons. First, the results in Table 3 explicitly control for main alternative explanation: the big firms do more effect – i.e., a systematic unobservable related to firm size. Despite this control, the results maintain. This adds credibility to the interpretation that it is, in fact, campaign regulation regulations that drive the lobbying spillovers. Second, the current setting is not ideal for a regression discontinuity research design. To unambiguously interpret regression discontinuity models, the treated units, firms allocating lobbying dollars in this context, *should not* be able to fully manipulate the running variable. Lee and Lemieux (2010) describe how it is reasonable to make causal inferences when agents have an *imperfect* ability to manipulate the forcing variable. In most cases, it is reasonable to expect that firms do in fact have complete control over their PAC contributions. As such, our setting requires that we assume that firms experience “optimization frictions” or internal miscommunication to meet this condition. Firms must occasionally make mistakes, so that there is randomization around the threshold – i.e., they must contribute too much or too little to particular candidates in a given cycle. These frictions or hiccups need not occur in every case; simply, a positive probability of error must entail that firms do not have *perfect* control over PAC funds. This assumption is strong and limits how much should be inferred from the regression discontinuity analysis. Still, notwithstanding this requirement, we believe that these regression discontinuity results serve as a meaningful robustness check for our preferred specifications.

### 4.3 Bipartisan Campaign Finance Reform Bill

While we believe that using within firm plus within industry-cycle variation is compelling, a limitation of these results is that we do not observe any change in regulated PAC contribution limits. During our period of analysis, however, BCRA was enacted. This legislation provides exogenous variation in the policy environment and changed key provisions of campaign finance regulation. Most notably it prohibited soft money campaign contributions to political parties, forbidding corporations from using corporate treasury funds to make political campaign contributions for party building activities. Neither corporate PAC contributions, whose money originates from employees, managers and shareholders of the firm, nor lobbying expenditures were affected by this bill. Nonetheless, BCRA stopped one prospective channel of corporate political activity and hence generates a greater incentive to employ alternative means to game campaign finance regulation. We explore this policy variation by examining potential changes in CEO contributions and lobbying expenditures across the pre- and post-BCRA eras.

Table 6 presents two models that capture the effect of BCRA. Column 1 has CEO contributions as its dependent variable, whereas column 2 uses lobbying expenditures. We introduce an indicator variable that equals one for election cycles that come after 2003. Results show an uptick in both CEO contributions and lobbying expenditures post-BCRA. When PACs reach their statutory contribution limit, CEOs contribute an additional 16% in the post-BCRA period. This coefficient however is not statistically significant. Its magnitude is also small, echoing the previous CEO results. In contrast, lobbying expenditures, a political activity funded from corporate treasuries like soft money contributions, has a statistically significant 145% increase in the post-BCRA era. To reemphasize, BCRA increased the regulatory stringency on a firm's overall corporate political activity, but did not directly affect the amount that a PAC could contribute or the level of a firm's lobbying. This estimate therefore supports the argument that firms use alternative avenues to respond to these regulations. We caution against over-interpreting these results as there is only a single pre-BCRA cycle of lobbying data. Still, these results support the conclusion that firms actively respond to rules by substituting to complementary activities *and* that the magnitude of these spillovers is large.

## 5 Conclusion

Regulation of corporate political activity continues to attract controversy as it strikes at the fundamental tension of money in politics: there is trade-off between protecting free speech and maintaining democratic integrity. Empirically, we demonstrate that regulating one type of corporate political activity leads to spillovers into other activities. Executives provide small supplementary contributions, while there are large increase in firm lobbying expenditures as PACs reach their regulated campaign contribution limits. While each distinct corporate political activity is legal and closely monitored by regulatory agencies, the relationship and magnitude of the spillovers between lobbying expenditures and campaign contributions suggests that a more comprehensive interpretation of campaign finance regulation is warranted in practice. If the purpose of corporate campaign contribution limits is indeed the prevention of real or imagined corruption due to the supply of money in politics, the current suite of regulations appears too narrow.

Our econometric models illustrate that it is reasonable to believe that some share of existing corporate lobbying outlays are in fact large spillovers from early attempts to regulate specific corporate actions. But the political channels that we explore represent the tip of the iceberg (Chamon and Kaplan, 2013). Many corporate political activities are difficult to observe and hence challenging to regulate. For instance, we have deliberately avoided discussing contributions from so-called Super PACs. These groups can allocate unlimited sums to independent issue advocacy. The creation of this new category of political activity falls outside our empirical window, but is emblematic of the wide-array of options available to firms seeking to influence decision-makers. Firms are creative and are able to discover many routes to influence politicians.

It is important to re-emphasize that our estimates do not provide a counterfactual for “optimal regulation”. Indeed spillovers may be advantageous or costly from a social welfare perspective. Corporate philanthropy, for example, may be socially sub-optimal. Firms, in pursuit of their political interests, may make charitable contributions in support of a politician’s preferred social cause (or senior managers may persuade employees to donate to the company’s philanthropic foundation). If charitable donations increase, social outcomes may improve. The point is that campaign finance externalities may be positive or negative and charity is one domain that may be construed

as socially productive.

As a final point, we note that our focus is large firms' involvement in federal politics. Participation in state politics is often equally important and state politicians may be subject to spillovers from federal regulations. States vary in the stringency of their campaign finance regulation with some mimicking the federal policy while others have no statutory restrictions on corporate donations. There is growing evidence that firms are becoming active in the election of State Supreme Court Justices, individuals who can receive campaign contribution in twenty states (see, Kang and Shepherd, 2011). Like the connection between federal campaign contributions and lobbying, these vertical regulatory externalities may be equally large and difficult to measure.

This analysis demonstrates that firms respond to political limits in a similar manner to their reactions to rules in other domains. Regulations, especially if they are incomplete or imperfect, produce unintended consequences and, populist sentiment notwithstanding, it is important to understand that these spillovers can be large before embarking on new rule-making endeavors.

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## 6 Figures

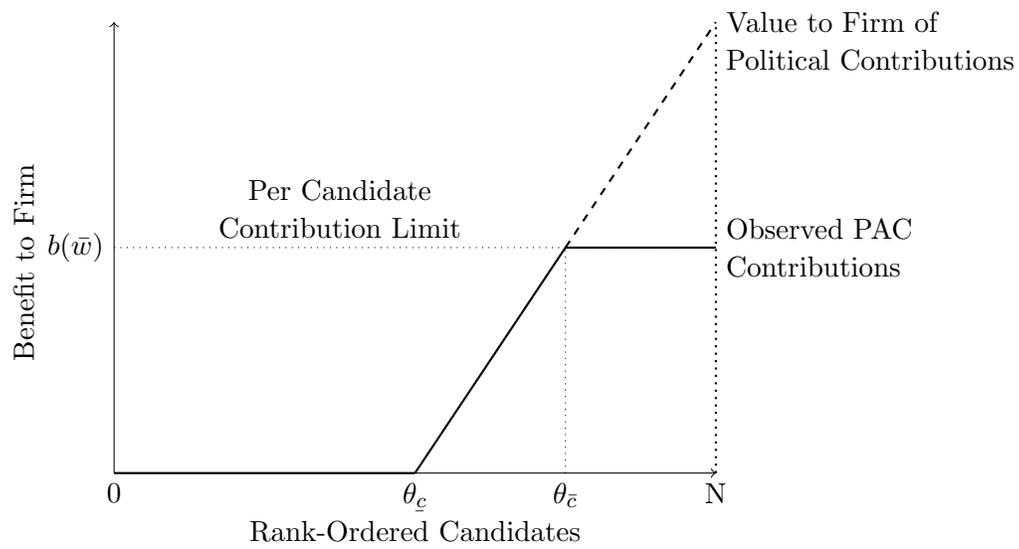


Figure 1: Firms' Observed Political Contributions versus their Underlying Valuation of Political Connections

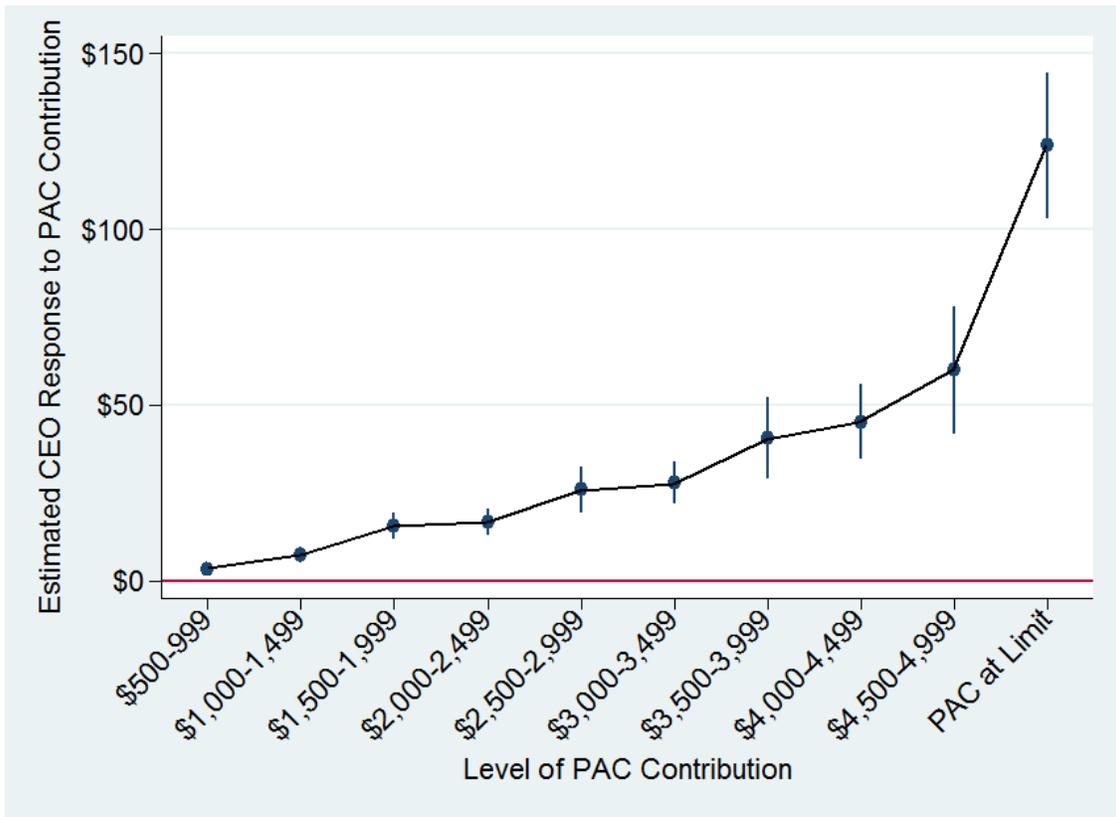


Figure 2: Response of CEO Contributions to PAC contributions

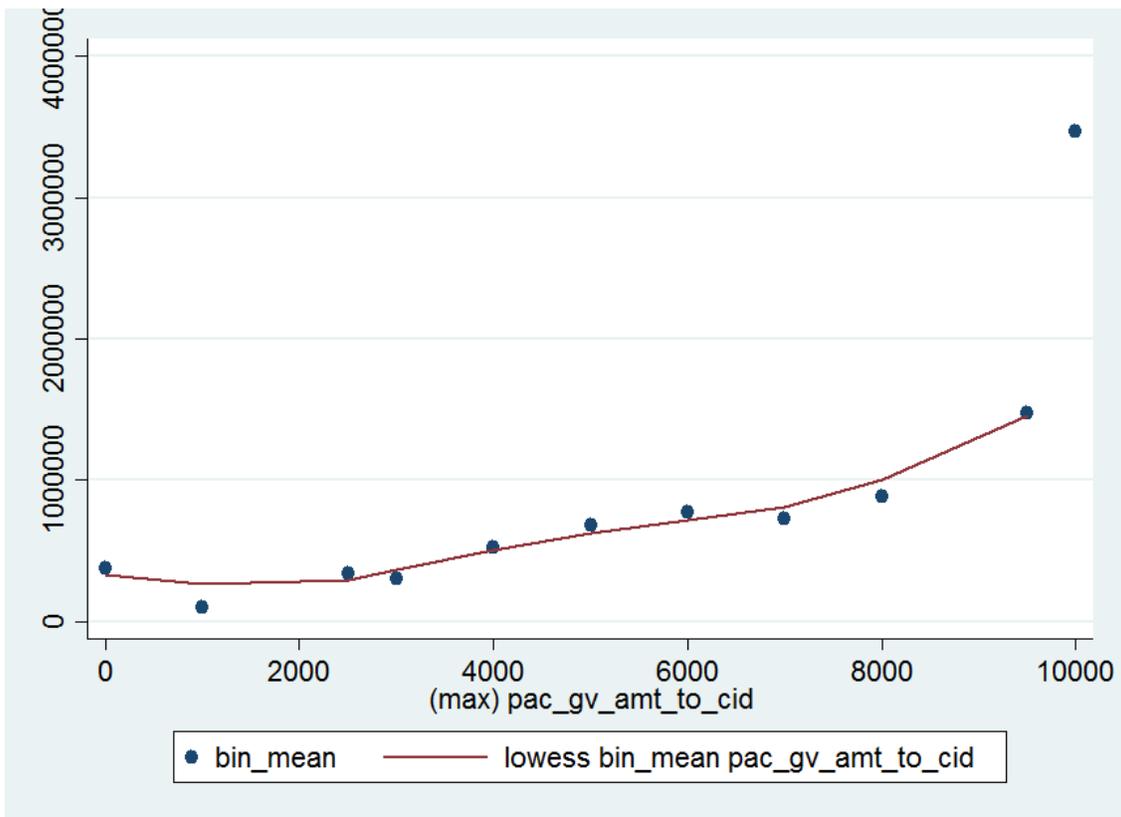


Figure 3: Regression Discontinuity Analysis of PAC Contributions Limits

## 7 Tables

Table 1: Summary Statistics for PAC and CEO Campaign Contributions, Lobbying Expenditures and Philanthropic Donations

<i>Contributions to candidates</i>	<i>All Candidates</i>		<i>Candidates Receiving a Contribution</i>	
	Mean	Standard Deviation	Mean	Standard Deviation
<i>Political Action Committees:</i>				
Contributions to candidates (\$)	68.48	553.79	2,266.53	2,273.41
<i>Chief Executive Officers:</i>				
Contributions to candidates (\$)	2.00	61.68	1,323.98	873.41
<i>Lobbying expenditures</i>	<i>All Firms</i>		<i>Firms that Lobby</i>	
	Mean	Standard Deviation	Mean	Standard Deviation
Aggregate per cycle lobbying expenditures (\$)	1,101,868	3,680,732	2,898,788	5,516,570

This table provide summary statistics on firms and CEO political contributions and firm lobbying expenditures. PAC and CEO contributions are from 1992-2008. Lobbying data are from 2000-2008.

Table 2: Effect of PAC Statutory Limits on CEO Campaign Contributions

	(1)	(2)
PAC contributed	0.011*** (0.001)	13.09*** (1.07)
PAC contributed at limit	0.066*** (0.006)	109.92*** (10.05)
Firm-cycle fixed effects	Yes	Yes
Candidate-cycle fixed effects	Yes	Yes
Number of firms	950	950
Observations	6,803,661	6,803,661

\*\*\* - significant at 1%; \*\* - significant at 5%. Values in parentheses are standard errors clustered by firms.

This table demonstrates that firms circumvent campaign finance regulations by having executives supplement PAC contributions to candidates. Model (1) is a linear probability model where the dependent variable takes a value of one when a firm's CEO contributes to a specific candidate. (2) uses the dollar values of CEO contributions as the dependent variable. PAC contributed and PAC contributed at limit are binary variables taking a value of one if a firm's PAC contributed to a particular candidate and contributed the maximum permitted amount to that candidate, respectively.

Table 3: Effect of PAC Statutory Limits on Firm Lobbying Expenditures

	(1)	(2)	(3)	(4)	(5)	(6)
PAC contributed	274,011.1 (326,853.4)	333,053.3 (325,288.3)	263,734.9 (325,406.7)	27,528.2 (388,999.3)	146,361.6 (394,279.1)	64,468.8 (398,745.4)
PAC contributed at limit	549,166.0*** (225,013.4)		524,387.8** (254,197.8)	586,727.7** (266,997.6)		662,590.0** (305,066.2)
PAC had large expenditures		306,066.2 (208,005.7)	88,054.8 (244,241.9)		-41,373.7 (259,139.3)	-294,999.6 (314,676.3)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-cycle fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	787	787	787	579	579	579
Observations	2,783	2,783	2,783	1,908	1,908	1,908

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%. Values in parentheses are standard errors clustered by firms.

This table demonstrates that statutory campaign contribution limits influence firms' lobbying expenditures. The dependent variable in (1), (2) and (3) is aggregate per cycle lobbying expenditures of all S&P 500 firms. (4), (5) and (6) are restricted to firms that lobbied, but use the same dependent variable. PAC contributed and PAC contributed at limit are binary variables taking a value of one if a firm's PAC contributed to any candidate and contributed the maximum permitted amount to any candidate, respectively. PAC had a large expenditures is a binary variable that takes a value of one if the firm's PAC contributed more than \$100,000 to candidates during the cycle. While varying across cycles, the \$100,000 threshold is approximately the 90th percentile of PAC expenditures.

Table 4: Effect of PAC Statutory Limits on Non-Political Dependent Variables

Dependent Variable	R&D	Advertising	Dividends	Acquisition Value
	(1)	(2)	(3)	(4)
PAC contributed	72.34 (97.56)	-75.39 (53.57)	-48.70 (85.93)	236.86 (156.06)
PAC contributed at limit	63.07 (68.56)	4.71 (34.74)	-23.02 (66.93)	5.32 (103.31)
Firm fixed effects	Yes	Yes	Yes	Yes
Cycle fixed effects	Yes	Yes	Yes	Yes
Number of firms	943	943	943	943
Observations	4,821	4,821	4,821	4,821

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%. Values in parentheses are standard errors clustered by firms.

This table demonstrates that statutory campaign contribution limits have little influence firms' non-political decision-making. The dependent variable in (1) is R&D expenditures. In (2) it is advertising expenditure. It is dividend payouts in (3) and acquisition value in (4).

Table 5: Regression Discontinuity Analysis of PAC Regulations on Lobbying Expenditures

	(1)	(2)	(3)	(4)
PAC limit	3,001,984*** (532,382)	2,427,612*** (662,269)	2,250,564*** (490,039)	1,630,744*** (615,759)
Industry-cycle fixed effects	No	No	Yes	Yes
Cycle fixed effects	Yes	Yes	Yes	Yes
Quadratic in PAC contributions	No	Yes	No	Yes
Number of firms	700	700	693	693
Observations	2200	2200	2191	2191

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%. Values in parentheses are standard errors clustered by firms.

Lobbying data post-2000

Table 6: Effect of BCRA on CEO Campaign Contributions and Lobbying Expenditures

	<i>CEO Contributions</i>	<i>Lobbying Expenditures</i>
PAC contributed	10.97*** (0.98)	-84,974.1 (340,482.9)
PAC contributed at limit	99.32*** (9.75)	372,978.8 (228,145.1)
PAC contributed*post-BCRA	6.99*** (1.90)	528,711.0*** (203,895.9)
PAC Contributed at Limit*post-BCRA	16.54 (11.77)	539,008.1*** (220,949.6)
Firm-cycle fixed effects	Yes	
Candidate-cycle fixed effects	Yes	
Firm fixed effects		Yes
Industry-cycle fixed effects		Yes
Number of firms	950	787
Observations	6,803,661	2,783

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%. Values in parentheses are standard errors clustered by firms.

This table interacts the PAC contributed and PAC contributed at limit variables with an indicator representing the post-Bipartisan Campaign Finance Reform Act for CEO contributions and lobbying expenditures, respectively. This legislation eliminated soft money contributions but left PAC limits intact.

## APPENDIX – FOR ONLINE PUBLICATION

### A Notes on Dataset Construction

#### A.1 CEO Data

The data on the individual contributions made by CEOs of S&P 500 firms are collected by the Federal Election Commission (FEC). Campaigns are obligated to report to the FEC every campaign contribution equal to or greater than \$200. Many campaigns disclose all contributions, even those below this threshold. These data are then processed and made available by the Center for Responsive Politics, which provides a bulk dataset. Data identifying the CEOs (amongst other executives) were sourced from the Execucomp package from COMPUSTAT. Our transaction level dataset was constructed by establishing firm-candidate pairs for every S&P 500 firm and every general election candidate for the 9 federal election cycles. CEO contributions were identified and linked by hand on a per candidate basis to this firm-candidate pair unit of analysis. Fremeth, Richter and Schaufele (2013) outline a small number of anomalies in the raw contribution data – several negative and over limit contributions are recorded. As in that previous research, we recode all contributions to ensure that all donations are greater than or equal to zero and less than or equal to the FEC cycle limit.

#### A.2 PAC Data

The political contributions of firm-linked PACs are also collected by the FEC and available from the Center for Responsive Politics Bulk Data. According to statutory requirements these PACs are limited to receive and allocate funds provided by employees, directors, and shareholders of the firm. The PAC to firm identifier mappings were provided by Myers (2005), which we further manipulated in the cases where S&P500 firms had multiple PACs. In such cases, we collapsed the multiple PAC listings into a single observation. In addition, over the period of study firms enter and exit the S&P 500 but at no time did a firm in the S&P 500 originate a new PAC (however, some PACs would be left dormant with little to no political activity). A transaction level dataset was created to mirror that of the CEO data.

#### A.3 Lobbying Data

Data on the lobbying intensity of S&P 500 firms are from the disclosed transaction reports that as mandated by the Lobbying Disclosure Act of 1995. These are administered by the Secretary of the Senate's Office of Public Records (SOPR). Lobbying firms are required to provide a good-faith estimate rounded to the nearest \$10,000 of all lobbying-related income from their clients in each quarter. A lobbying firm does not have to file for clients that do not spend at least \$3,000 during

a quarter. Organizations that use in-house lobbyists must provide good-faith estimates rounded to the nearest \$10,000 of all lobbying-related expenditures in a quarter. These data are processed and linked to firms by the Center for Responsive Politics. Unlike the contribution data however, the statutory filing requirements do not identify specific political counterparties so firm-candidate pairs cannot be established.

#### A.4 Matching Variation in Lobbying to Contribution Data

Formalizing the method used to go from candidate-level variation for campaign contributions to firm-level variation for lobbying expenditures requires us to approximate the marginal value of lobbying which depends on the incremental expenditure allocated to the most important politician,  $c$ . The empirical challenge is that we are unable to observe individual-level lobbying expenditures; we only observe (i) aggregate lobbying expenditures and (ii) PAC contributions to individual candidates. Write the sum of lobbying expenditures for firm  $j$  in cycle  $t$  as:

$$\text{Lobbying Expenditures}_{jt} = \sum_c g(w_{jtc})$$

where  $g(w_{jtc})$  is a function that maps individual-level campaign contributions to aggregate lobbying expenditures. Assume that a given firm has an identical ranking of candidates for lobbying and PAC contributions and approximate  $g(\cdot)$  with a stepwise function where we calculate the average value of lobbying in a set of bins defined by PACs campaign contribution patterns (Deryugina and Hsiang, 2014). Index the bins with  $m$ . Denote the lower bound of the  $m^{\text{th}}$  bin with  $\underline{\Delta}^m$  and the upper bound with  $\overline{\Delta}^m$ . The average value of  $g(\cdot)$  over bin  $\Delta^m$  equals (suppressing the  $j$  and  $t$  subscripts):

$$\overline{g(\Delta^m)} = \frac{1}{\overline{\Delta}^m - \underline{\Delta}^m} \int_{\underline{\Delta}^m}^{\overline{\Delta}^m} g(w_c) dw_c$$

which can be approximated over the full set of bins:

$$\sum_c g(w_c) \approx \sum_m \overline{g(\Delta^m)} \cdot 1[w_c \in \Delta^m]$$

Let  $T^m$  be an indicator variable that equals 1 for all bins,  $m$ , except the one containing the maximum campaign contribution. Let  $\tilde{T}^m$  be a dummy that takes a value of one if a PAC's maximum contribution  $w$  to any  $c$  is in that bin – i.e.,

$$\tilde{T}^m = \begin{cases} 1 & \text{if } \sup_m (g(\Delta^m)) \\ 0 & \text{otherwise.} \end{cases}$$

Then:

$$\begin{aligned} \text{Lobbying Expenditures} &= \sum_m \overline{g(\Delta^m)} \cdot 1[w_c \in \Delta^m] \\ &= \sum_{m < \tilde{T}} \alpha_m T^m + \tilde{\alpha} \cdot \tilde{T}^m \end{aligned}$$

where  $\tilde{\alpha}$  reflects the marginal increase in lobbying expenditures allocated to the most important candidate. Our empirical strategy then examines firm-cycle variation in  $\tilde{\alpha} \cdot \tilde{T}^m$  above and below the campaign contribution limit.

## B ADDITIONAL RESULTS AND ROBUSTNESS CHECKS

### Additional Tables

Table 7 displays the coefficients illustrated in Figure 2.

Table 7: Estimated Coefficients for Figure 2

PAC Contribution Interval	
\$500-999	3.17*** (0.47)
\$1,000-1,499	7.48*** (1.08)
\$1,500-1,999	15.52*** (1.93)
\$2,000-2,499	16.70*** (1.89)
\$2,500-2,999	25.99*** (3.37)
\$3,000-3,499	27.93*** (3.08)
\$3,500-3,999	40.61*** (5.93)
\$4,000-4,499	45.23*** (5.46)
\$4,500-4,999	59.91*** (9.18)
At Limit	123.88*** (10.55)
Firm-cycle fixed effects	Yes
Candidate-cycle fixed effects	Yes
Number of firms	950
Observations	6,803,661

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%. Values in parentheses are standard errors clustered by firms.

This Table illustrates the coefficients in Figure 2.

## Regression Discontinuity Analysis of Using Alternative Dependent Variables

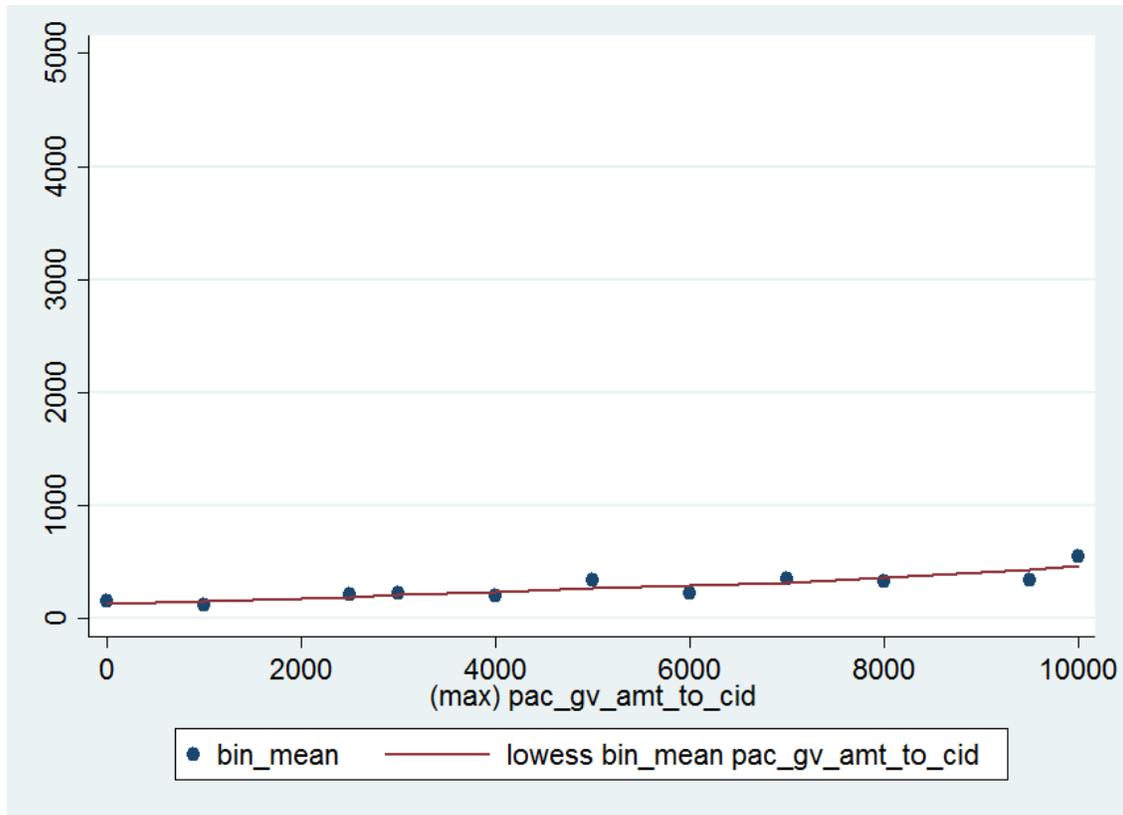


Figure 4: Response of Advertising Expenditures to PAC contributions

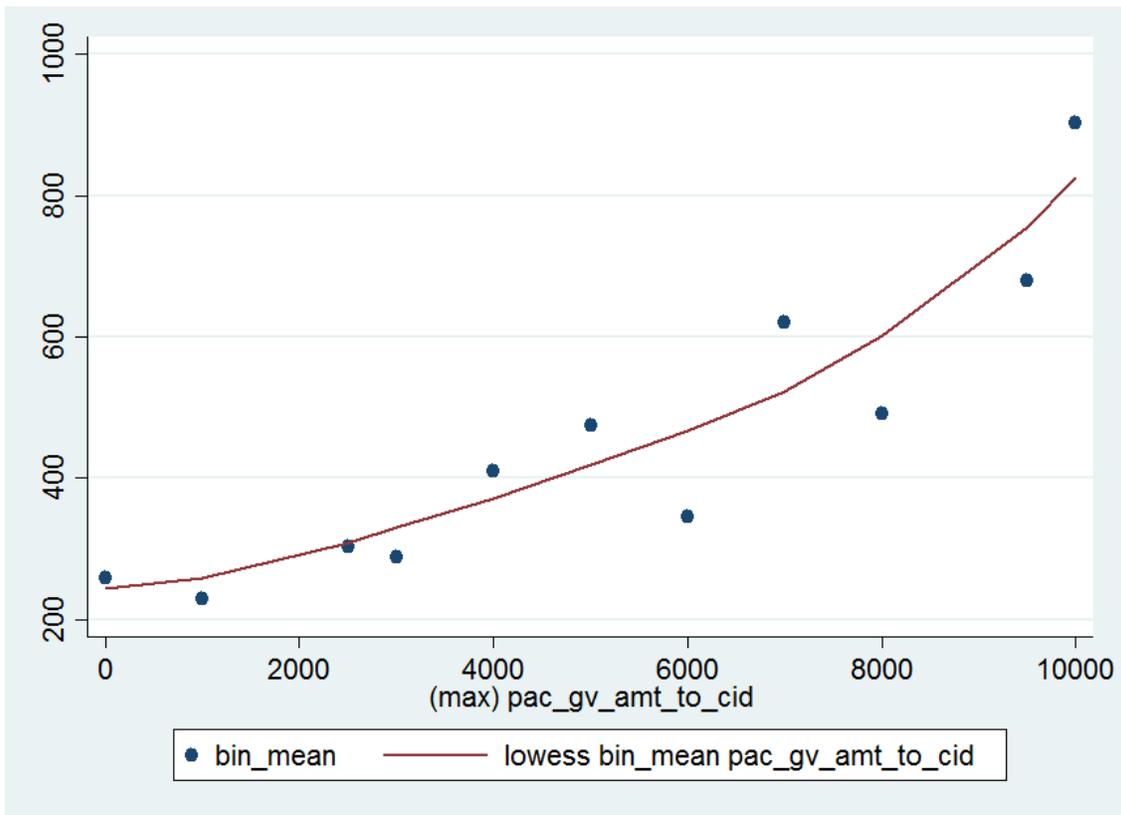


Figure 5: Response of R&D Expenditures to PAC contributions

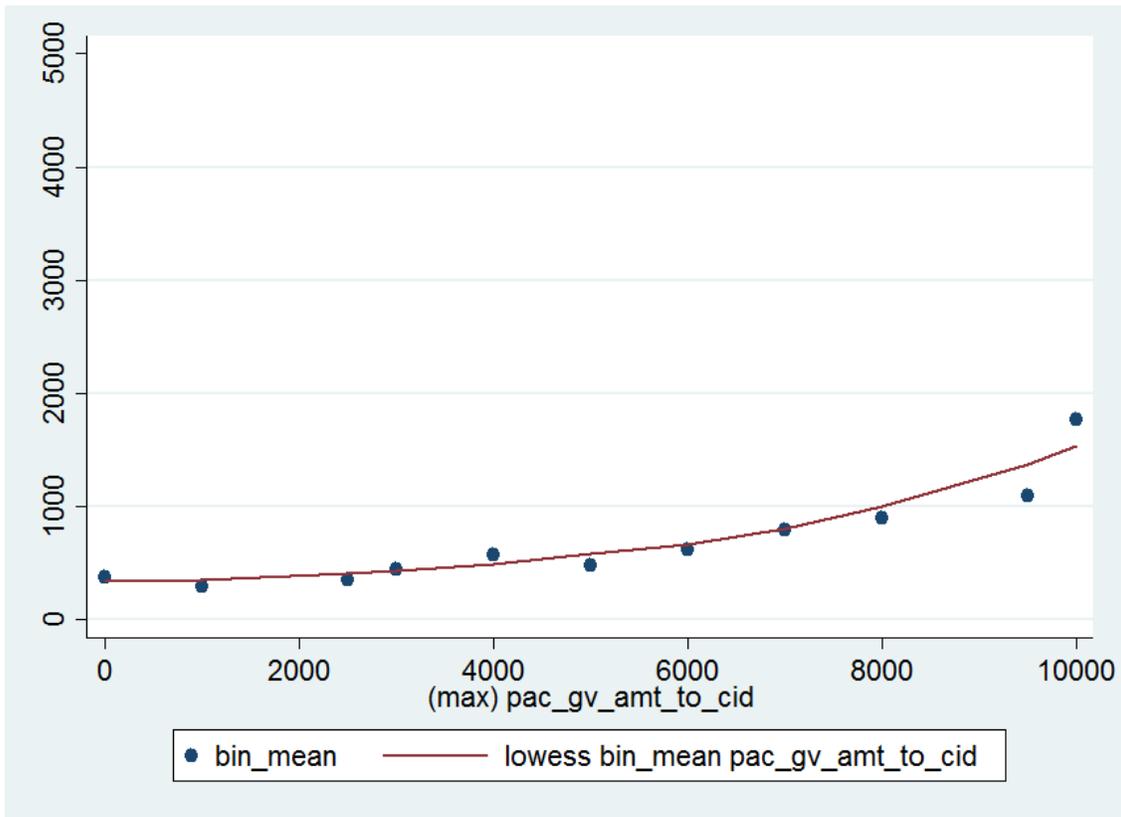


Figure 6: Response of Tax Expenditures to PAC contributions