// NO.19-052 | 12/2019

DISCUSSION PAPER

// ULRICH MATTER, PAOLO ROBERTI, AND MICHAELA SLOTWINSKI

Vote Buying in the US Congress

Leibniz Association

ZEW

Vote Buying in the US Congress

Ulrich Matter Paolo Roberti Michaela Slotwinski

September 11, 2019

Abstract

We assess the influence of moneyed interests on legislative decisions. Our theory predicts that the vote outcome distribution and donation flows in a legislature feature a discontinuity at the approval threshold of bills if special interest groups are involved in vote buying. Testing the theoretical predictions based on two decades of roll-call voting in the U.S. House, we identify the link between narrowly passed bills and well-timed campaign contributions. Several pieces of evidence substantiate our main finding, suggesting that moneyed interests exert remarkably effective control over the passage of contested bills.

Keywords: Legislative voting, campaign finance, special interest groups, lobbying, forensic economics

JEL classification: D72, D78

Matter: University of St. Gallen, School of Economics and Political Science, Bodanstrasse 8, 9000 St. Gallen, Switzerland.
Email: ulrich.matter@unisg.ch
Roberti: Free University of Bozen/Bolzano, Faculty of Economics and Management, Universitätsplatz 1 - Piazza Università, 1 I-39100 Bozen-Bolzano Italy. Email: paolo.roberti@unibz.it
Slotwinski: University of Basel, Faculty of Business and Economics, Peter Merian-Weg 6, 4002 Basel, Switzerland. ZEW - Centre for European Economic Research, L7,1, 68161 Mannheim, Germany. Email: michaela.slotwinski@unibas.ch.
We are grateful to Joao Cunha, Patricia Funk, Armando Meier, Georg Nöldeke, Reto Odermatt, Marcus Roller, Mark Schelker, Kurt Schmidheiny, Thomas Stratmann, Sebastian Siegloch, Alois Stutzer, Conny Wunsch, and the many conference participants for helpful remarks. A previous version of this paper was circulated under the title "Precise Control Over Legislative Vote Outcomes: A Forensic Approach to Political Economics" (CESifo WP no. 6007 of July 2016) .

1 Introduction

Popular concerns over the lack of equitableness in the democratic process are often motivated by the role that money–in the form of donations from special interests–supposedly plays in politics (see, e.g., Lessig 2011). Thereby, a prominent question in public discourse as well as in the academic literature is to what extent campaign finance donations affect legislative decisions in the sense that donations in fact buy legislators' votes on specific bills. There is so far no general answer to this question, as it is often unclear whether donations were made because the donor likes the political position of a legislator or whether the legislator takes a certain political position close to the one of the donor *because* of these donations (see, e.g., Fremeth et al., 2013; Bronars and Lott, 1997).

Most empirical studies on legislative voting, lobbying, and the role of money in politics concentrate on legislators' individual voting behavior and, more recently, also address the endogeneity issue, exploiting specific votes and a rather narrow policy setting (see, e.g., Kang 2015). In contrast, we abstract from the individual level and propose a more general approach to the impact of special interest groups and money in politics. Our outcome-focused macro perspective is applicable across policy areas and does not hinge on the resolution of the endogeneity at the individual level. Specifically, we (i) propose a theory that links the activity of special interest groups (from now on SIGs) to abnormalities in the distribution of vote outcomes in a parliament and donation flows from SIGs to legislators; (ii) identify empirically the existence of a systematic SIG impact on legislative vote outcomes on contested bills and thus on legislative decision making in the U.S. House of Representatives, and (iii) present results which suggest a causal link between precisely timed campaign finance donations to Members of Congress and the exertion of influence on these vote outcomes.

The focus of our study is on contested bills decided by a narrow vote margin. While earlier models of lobbying for the sake of simplicity tend to ignore the special case of narrow vote outcomes (see, e.g., Snyder 1991, Breton and Zaporozhets 2009, Dekel et al. 2009 and

Battaglini and Patacchini 2018), we argue that contested votes are of particular interest in gaining a better understanding of the broader relevance and social consequences of special interest politics.[1] When a bill is contested and the corresponding vote outcome is anticipated to be decided by a relatively narrow margin, a SIG with a preference for the proposed policy change must take into account that one legislator's vote might be pivotal in the decision. Hence, right at the 50% threshold necessary for passage, the marginal benefit from persuading one more legislator increases steeply and makes vote buying cost effective. The SIG will buy just enough legislators to get the vote passed. From the point of view of an econometrician, this has the effect of shifting a vote outcome from below the pass threshold to just above it. Moreover, if campaign donations are the means of this lobbying, votes that just pass should be accompanied by a disproportionate amount of spending by SIGs. Similarly, if the SIG pushes for the status quo, we should observe just the opposite. This reasoning suggests that the incentives around this particular threshold can be exploited to test whether special interest groups are indeed buying votes in the US Congress, as SIG impact would leave unique traces in the data (following the idea of forensic economics put forward by Zitzewitz 2012).

We start by setting up a theoretical model of vote buying in a legislature that captures the key features of the reasoning outlined above. Our model predicts that, if there is vote buying by SIGs, (i) the vote outcome distribution (the distribution of Yes-vote shares) and (ii) donation flows to legislators from SIGs feature a discontinuity at the pass margin just above 50% Yes votes. The discontinuous jumps are positive if it is more likely that SIGs push for approvals of bills, and negative otherwise. The theory discusses alternative mechanisms that can cause a discontinuity in the vote outcomes distribution.[2] However, none of the alternative mechanisms can help explain a simultaneous discontinuity in the donation flows

[1] Narrow vote outcomes can be interpreted more broadly as decisions that have potentially far-reaching consequences for large parts of the population, as such decisions coincide by definition with a large minority, rendering them exceptionally relevant in the study of SIG impact.

[2] Among other potential alternative mechanisms, we look at the strategic postponement of bills as well as vote trading.

to legislators.

We test the model's theoretical predictions based on data on all roll-calls in the U.S. House of Representatives between 1990 and 2014. We find an exceptional excess mass in the distribution of vote outcomes right above the pass margin, which reveals that contested votes in the U.S. House are much more likely to be narrowly passed than to be narrowly declined. To assess whether campaign donation flows from SIGs to legislators are systematically related to the excess passed bills, we relate the timing of roll-calls to the timed occurrence of campaign finance contributions. We find that, on average, donations to congressmen in the weeks around the date of the vote on bills that were passed with a very narrow margin are higher than around votes that were defeated by the same narrow margin. This finding suggests that moneyed interests are systematically related to the excess passage of votes. Moreover, we document a specific time pattern of systematic discontinuities in donations around the date at which these particular (excess passed) votes take place. Specifically, donations are discontinuous at the pass margin even in the days before the vote on a proposal. Or to put it differently, donations react already before the (very narrow) vote outcome is established. This result excludes the explanation that SIGs are not involved in the decision making but only react to legislators' voting, and thus suggests that precisely timed donations affect voting on contested bills and not vice versa.

After establishing these relationships, we proceed by testing an additional prediction from our model. Namely, that a higher level of targeted contributions should be accompanied by a stronger discontinuity in the vote outcome distribution. That is, whenever SIGs are better informed about legislators' intensity of preferences for a policy, they are better able to target only the almost indifferent legislators with donations. On the other hand, when SIGs are poorly informed, they have to give donations to random legislators, leading to a lower efficiency of donations and a lower effect on voting outcomes. Our results are consistent with this hypothesis. We observe stronger discontinuities, the higher our measure of targeted donations becomes.

The discussion section of our paper offers additional analyses concerning the mechanism at play and validates further implications of the model. We validate whether what we observe in the data is indeed related to issues SIGs care about. A separate analysis of bills that are likely of interest to SIGs and bills which rather concern the general public reveals that the phenomenon is mainly driven by the former. We provide evidence consistent with the theoretical prediction that marginal legislators are targeted (especially if the vote outcome is expected to be contested). We document that the discontinuity in donations is mainly driven by donations to legislators who vote Yes on a particular day. This is coherent with a positive discontinuity in the distribution and SIGs pushing to pass bills (in line with excess Yes votes).

We perform several robustness checks on our estimation strategy: i) we show that low individual level donations, which are most likely an expression of sympathy rather than an attempt to buy votes, do not show a discontinuity, ii) we check for discontinuities at placebo thresholds without strategic incentives, iii) we check for the sensitivity of our findings with respect to influential observations, iv) we check for the sensitivity of our findings with respect to the bandwidth choice in our non-parametric estimates, and v) we check for the sensitivity of our findings with respect to our SIG-topic categorization. Overall, we find our results to be robust and to be qualitatively unchanged.

Building on the established relationship, we finally present a case study of what happened in the observed discontinuity in the distribution and the donations after limitations on campaign contributions were removed. We show that the documented relationship between precisely timed donations and excess passed bills tends to get stronger after the landmark Supreme Court Decision, Citizens United v. FEC[3] in 2010, which cleared the way for unlimited election-related 'independent expenditures' previously capped in 24 U.S. states.

Our work is related to several strands of literature. First, it builds on the theoretical work

[3] Citizens United v. Federal Election Commission, No. 08-205 (U.S. Jan. 21, 2010).

concerning the influence of pressure groups on legislative politics (see the seminal contributions by Kau et al. 1982, Becker 1983; Snyder 1991; Persson 1998, Grossman and Helpman 1994; see also the more recent papers by Breton and Zaporozhets 2009, Dekel et al. 2009 and Battaglini and Patacchini 2018). Drawing on their prior work on the individual agent level, the theoretical model in this paper aims at aggregating the individual behavior of legislators, incorporating the case of highly contested bills. This allows us to model the properties of vote outcomes in legislative assemblies at the pass margin and to derive testable implications concerning the vote outcome distribution with and without SIG impact. Second, and more specifically, we contribute to the politico-economic literature on money in politics that investigates how campaign contributions from SIGs influence legislators' policy positions and voting behavior (see Ansolabehere et al. 2003, and Stratmann 2019 for a review of the literature). In this, our contribution adds to the work aimed at identifying the causal direction of donations on legislators' voting decisions. So far, causal evidence on this question is scarce as it is challenging to disentangle whether donors simply sympathize with and donate to politicians with political positions close to their own positions (i.e., donations are simply an expression of support), or whether donations actually affect the observed politicians' decisions (i.e., donations actually buy votes). Bronars and Lott (1997) discuss this issue extensively. However, there is some indirect evidence suggesting that contributions matter. For example, Fremeth et al. (2013) show that becoming a S&P 500 CEO implies a sizable increase in individual contributions to politicians, a change in behavior that cannot be explained only by long-standing preferences. Bertrand et al. (2014) provide indirect evidence in support of vote buying, by showing that lobbying firms provide special interests access to politicians (as opposed to only giving issue-specific information to Members of Congress). Related to that, the field experiment in Kalla and Broockman (2016) documents that donations buy access to legislators. Other contributions that provide clues suggesting that lobbies get in touch with politicians to influence vote outcomes are, for example, the works by DellaVigna et al. (2016)[4], and i Vidal et al. (2012) and Luechinger and Moser (2014) who give evidence on the phenomenon of revolving doors in politics and the returns of political connections by firms. A strain of highly relevant contributions aimed at directly identifying the causal effect of donations on legislators' voting decisions so far can be found in the context of individual policy domains (see, e.g., Stratmann 1995, Stratmann 2002, Mian et al. 2010, Dorsch 2011, Kang 2015). While these works and the overall stock of evidence suggest SIGs do affect policy decisions and that donations play a role, a conclusive assessment applicable across policy domains is still missing. Our contribution aims to close this gap by providing an overall picture of the impact of lobbying via campaign contributions on legislative voting which is not plagued by the typical endogeneity issues that studies at the individual level face. Third, our paper is related to theoretical and empirical work on the politico-economic mechanism explaining the narrow passage of roll calls in legislative assemblies (Snyder and Groseclose, 2000; King and Zeckhauser, 2003; Cox and Katz, 2007; Spenkuch et al., 2018). While these contributions mainly concentrate on party bias as one channel that potentially drives the narrow passages of bills, we relate the phenomenon to the impact of SIGs and their campaign finance donations.

The remainder of the paper is structured as follows. In Section 2, we present our model of vote buying in legislatures and how it relates to the shape of the distribution of vote outcomes at the pass margin. Section 3 briefly describes the empirical approach and Section 4 describes the data used in our main analysis. Following on, Section 5 presents the empirical results on our main hypotheses. Section 6 presents evidence on an extension of our model, provides corroborating evidence in support of our interpretation of our main findings, discusses alternative drivers, and validates the robustness of our empirical findings. Finally, Section 7 offers concluding remarks.

[4] The authors show that firms shift spending toward a politician's business in the hope of securing favorable regulation.

2 A Model of Vote-Buying in a Legislature

Our theoretical model is inspired by the literature that analyzes vote buying in legislatures, from the seminal contributions by Snyder (1991) and Groseclose and Snyder (1996) to the more recent works by Breton and Zaporozhets (2009), Dekel et al. (2009) and Battaglini and Patacchini (2018). In contrast to analyzing individual level behavior, our simplified framework aims at deriving the properties of vote outcomes in legislative assemblies from a broader perspective by aggregating the individual level behavior. The basic reasoning is that while this type of 'hidden' behavior, i.e. legislators selling their votes, is not observable at the individual level, it might leave unique characteristic traces in the aggregated outcome (Zitzewitz, 2012). In this vein we study how the distribution of vote outcomes in legislatures, defined as the Yes-vote share, and campaign contributions behave around the pass margin in their 'natural' state (i.e. without lobbying), and how they change with vote-buying by SIGs.[5] We show that the presence of lobbying affects the distribution as well as campaign contributions at the pass margin of 50% in a characteristic manner. This allows us to identify the existence of SIG impact and vote-buying.

To this end, we introduce a simple model of vote buying in a legislature that illustrates the mechanisms relating the activity of special interests and the shape of the distribution of the Yes vote share in a legislature. All proofs can be found in Appendix A.I.

2.1 The model

Let us consider a legislature made up of a continuum of legislators, indexed by $i \in [0, 1]$ with total mass 1, and a special interest group (SIG).[6]

Legislators

[5] Here SIG is a player with preferences for policy, who can get involved in vote buying with legislators.

[6] We consider a unique SIG for simplicity, but the same results apply when there is more than one special interest group. This issue is discussed at the end of this section.

Each legislator i has utility from money m and from policy p: $\gamma m^i + p^i$, where γ measures the relative weight of money with respect to policy in the utility of the legislator.[7] Each legislator simultaneously casts a vote $v^i \in \{\text{Yes}, \text{No}\}$ on the approval or rejection of a bill. As in a probabilistic voting model (see Lindbeck and Weibull 1987), each legislator is subject to random shocks to her utility from policy. These shocks take place before the vote is cast.

In particular, legislator i has utility $p^i = \delta - \sigma^i - r$ from the approval of the bill, where δ is a common shock to the utility of all legislators with continuous probability density function $f(\cdot)$ and cumulative distribution function $F(\cdot)$ with support $[0, 1]$ which is symmetric around $\frac{1}{2}$.[8] σ^i is an idiosyncratic shock to p^i which has probability density function $g(\cdot)$ and cumulative distribution function $G(\cdot)$. The idiosyncratic shock can be exemplified by a personal taste for the issue at stake in the vote. Alternatively, if the legislators are benevolent representatives of their district, σ^i can be some private information on the utility of the constituents that the legislator represents. If instead the legislator is driven by reelection incentives, the idiosyncratic shock can be some new information on how this vote will affect her reelection probability. The common shock can instead be a general popularity shock on the consequences of the bill that is being discussed. It may be helpful to visualize these two shocks as follows. Consider all legislators ordered by the increasing intensity of their utility from the rejection of the bill. The idiosyncratic shocks determine how they are ordered, while the common shock is a common level shifter that determines a cutoff such that only the legislators to the left of the cutoff vote Yes.

For analytic convenience we assume σ^i to be uniformly distributed on $[0, 1]$. r is common to all legislators, and observed by every player in the game. It represents a common known bias of all legislators against the approval of the bill. For simplicity of notation we assume

7 See Roberti (2019). Alternatively, one could define the legislator's utility as follows: $wm + (1 - w)p$. The two models are equivalent, if γ is defined as follows: $\gamma := w/(1 - w)$.

8 A remark on the continuity of f: this assumption is standard in probabilistic voting models, and it is violated if common shocks of a given magnitude are discontinuously more likely than common shocks with a slightly smaller magnitude, which appears to be an unlikely trait of a common shock. The symmetry of f instead simplifies the analysis but it is not a necessary assumption. This issue is discussed below.

$r = 0$, but all results carry through with $r \in [-\frac{1}{2}, \frac{1}{2}]$.[9] The utility from policy given by rejection of the bill is normalized to 0. Without loss of generality we assume that indifferent legislators vote Yes. We assume that if the Yes-vote share is lower than or equal to $\frac{1}{2}$, the bill is not approved. If a share of legislators larger or equal to $\frac{1}{2} + \epsilon$ votes Yes, the bill is approved. For consistency, we assume that if the Yes-vote share falls in-between $\frac{1}{2}$ and $\frac{1}{2} + \epsilon$, the bill is approved with probability $\frac{1}{2}$. In the theoretical analysis, the results are valid for a sufficiently small ϵ.[10] Legislators vote sincerely, that is they vote for the option that gives them the highest utility, without further strategic considerations.

A special interest group

A special interest group tries to influence the political process through monetary contributions to legislators, conditional on voting in its interest. For simplicity's sake we assume that the special interest group has all the bargaining power. The utility of the special interest group from the approval of the bill is φ. From the point of view of the econometrician φ has a generalized Bernoulli distribution that takes values $\varphi \in \{-v, 0, v\}$, $0 < v < \frac{1}{\gamma} \int_0^{\frac{1}{2}+\epsilon} \sigma^i d\sigma^i$, such that $\mathbb{P}(\varphi = -v) = \underline{p}, \mathbb{P}(\varphi = v) = \overline{p}$, $\underline{p} \geq 0$, $\overline{p} \geq 0$, $\underline{p} + \overline{p} \leq 1$.[11] Its utility from the rejection of the bill is normalized to 0. $\varphi = -v$ describes the case where the SIG would like to prevent the approval of the bill, and $\varphi = 0$ refers to a situation in which the SIG is not interested in the vote outcome. If $\varphi = v$, the SIG would like the bill to be approved. The upper bound on v is added for simplicity: as will be clear in the subsequent analysis, the upper bound ensures that for some small positive common shock δ the SIG chooses not to buy votes. We assume that the common shock, the idiosyncratic shocks and φ are independent and that the cost of money to the SIG is linear, with marginal cost equal to 1. In order to

9 The model can be extended to include J groups of legislators (e.g., parties and congressional caucuses) who are heterogeneous with respect to the observed component r^j of their utility from the approval of the bill.

10 This rule is inspired by the approval rule in the U.S. House of Representatives, where a strict majority is required to pass a bill. The presence of ϵ is needed to define a pass threshold above $\frac{1}{2}$ and very close to it. In the empirical analysis it will be defined by half of legislators plus one voting yes.

11 This is an assumption meant to deliver a simplified analysis. In the appendix we investigate the more general case in which the SIG's benefit from the approval of the bill is distributed continuously in $[-1, 1]$.

add realism to the model, we acknowledge that there are motivations for SIG campaign contributions other than vote buying, such as getting legislators reelected in the next legislature (see, for example Felli and Merlo 2007). We do this by assuming that, absent the money meant to influence the legislative vote outcome, the amount of contributions, normalized by $f(\cdot)$, is y. Since these contributions are given for reasons different than vote buying, they are not a function of the vote outcome on a specific bill.[12]

For simplicity we analyze the behavior of legislators and the special interest group with respect to one bill, and we derive the probability distribution of the Yes vote shares by an external observer who does not know the idiosyncratic and common shocks to the legislators' utilities. In the empirical exercise the distribution of the Yes vote share is estimated through a large sample of realized vote outcomes. The two approaches are equivalent, if we assume that, in each realized vote outcome, the idiosyncratic and common shocks are drawn from the pdfs described above.

Absent any influence from the special interest group, i.e. $\underline{p} = \overline{p} = 0$, legislator i votes Yes if $\sigma^i \leq \delta$. Hence all legislators whose idiosyncratic shocks are in $[0, \delta]$ vote Yes. Conditional on a realization of the common shock δ, the share x of Yes votes is δ. The probability density function of the share of Yes votes is therefore $f(x)$, with values $f\left(\frac{1}{2}\right)$ at $x = \frac{1}{2}$ and $f\left(\frac{1}{2} + \epsilon\right)$ at $x = \frac{1}{2} + \epsilon$. If $\epsilon \to 0$ the function is continuous at the approval threshold $x = \frac{1}{2}$. Moreover, as assumed above, the distribution of contributions from special interest groups y is constant and continuous at the approval threshold.

Let us assume that there is a positive probability of an active special interest group, that knows the idiosyncratic and common shocks occurring to the legislators' utilities. Let us also analyze the case in which the SIG has positive utility from passing the bill $\varphi = v > 0$. Its optimal strategy is as follows. If there are already enough votes to pass the bill, $\delta \geq \frac{1}{2} + \epsilon$,

12 The normalization is due to the fact that, as we show below, the distribution of the Yes-vote share, absent vote buying, is $f(\cdot)$. In the empirical analysis, the distribution of the Yes-vote share is computed as the frequency of votes with a given Yes-vote share, hence y can be interpreted as the average total amount of contributions per bill.

the SIG does not make any monetary transfer. Otherwise, it can make contributions to legislators to convince them to vote yes. The contribution needed to convince a legislator i who would otherwise vote No, hence with idiosyncratic shock $\sigma^i > \delta$, is $(\sigma^i - \delta)/\gamma > 0$. The larger the value γ that legislators attach to money (with respect to policy), the cheaper it is to buy them. The SIG picks only the legislators who are already close to being indifferent between voting No and Yes, which means the ones for which $\sigma^i - \delta > 0$ is lowest. Notice that, if $\frac{1}{2} < \delta < \frac{1}{2} + \epsilon$, the SIG can pay the legislators with $\sigma^i \in \left(\delta, \frac{1}{2} + \epsilon\right)$ and secure the approval of the bill, with respect to the alternative where the bill is approved with probability $\frac{1}{2}$. The cost of convincing these legislators is $\frac{1}{\gamma} \int_{\delta}^{\frac{1}{2}+\epsilon} (\sigma^i - \delta)\, d\sigma^i$. If $\epsilon \to 0$, the cost converges to 0, hence if ϵ is sufficiently small the SIG chooses to pay the needed legislators and approve the bill. If instead $\delta \leq \frac{1}{2}$, it compares the benefit v of passing the bill with the cost of achieving this outcome through monetary contributions. Notice again that, for a sufficiently small ϵ, the SIG, if it chooses to intervene buying votes, does not buy only the votes needed to reach a Yes-vote share in-between $\frac{1}{2}$ and $\frac{1}{2}+\epsilon$, where the vote outcome is approved with probability $\frac{1}{2}$. Instead it buys enough votes to reach the pass threshold $\frac{1}{2} + \epsilon$, because this additional contribution is almost costless. If the common shock δ is such that there are $\frac{1}{2} + \epsilon - \delta$ votes missing to reach the pass threshold, the SIG intervenes if the amount of contributions needed to persuade these legislators is lower than the benefit v of passing the bill:

$$v \geq \frac{1}{\gamma} \int_{\delta}^{\frac{1}{2}+\epsilon} \left(\sigma^i - \delta\right) d\sigma^i. \tag{1}$$

When this inequality is satisfied, the SIG influences the voting outcome, swinging an otherwise negative vote to a positive outcome with slightly more than a 50% Yes vote share. Notice that the right-hand side of inequality (1) decreases with δ. This implies, along with the upper bound on v, that there is a lower bound to $\delta = \underline{\delta}$, such that the inequality is satisfied with equality. If $\delta \in [\underline{\delta}, \frac{1}{2} + \epsilon)$, the SIG intervenes with contributions, pushing the vote share at $\frac{1}{2} + \epsilon$, thus approving the bill.

For the case in which the SIG attaches a negative value to the bill, $\varphi = -v < 0$, a similar argument implies that the SIG intervenes if $\delta \geq \frac{1}{2} + \epsilon$, and the amount of contributions needed to convince $\delta - \frac{1}{2}$ legislators to vote No is lower than the benefit v of not passing the bill:

$$v \geq \frac{1}{\gamma} \int_{\frac{1}{2}}^{\delta} \left(-\sigma^i + \delta\right) d\sigma^i.$$

Hence, whenever $\varphi = -v < 0$, the SIG intervenes for $\delta \in \left(\frac{1}{2}, 1 - \underline{\delta}\right]$, by pushing the vote share exactly at $\frac{1}{2}$. Similarly to the case in which the SIG prefers the passage of the bill, when $\delta \in \left(\frac{1}{2}, \frac{1}{2} + \epsilon\right)$, and ϵ is sufficiently small, the SIG pays the marginal legislators and secures the rejection of the bill.

Thus the distribution of the Yes vote share x, from the point of view of the econometrician who does not know the values of φ, δ and σ^i, shows a peak (excess mass) at $\frac{1}{2} + \epsilon$ with value $\overline{p} \int_{\underline{\delta}}^{\frac{1}{2}+\epsilon} f(\chi)\, d\chi$ and an adjacent peak at $\frac{1}{2}$ with value $\underline{p} \int_{\frac{1}{2}}^{1-\underline{\delta}} f(\chi)\, d\chi$. This distribution shows a discontinuity at the threshold for the approval of the bill, with the peak at $\frac{1}{2} + \epsilon$ being larger than that at $\frac{1}{2}$ if $\overline{p} > \underline{p}$ and ϵ sufficiently small.[13] Moreover, the size of the peaks is positively related to the value γ given by legislators to money, because $\underline{\delta}$ decreases with γ. Hence when money is more effective in buying votes, the size of the jump in the distribution of the Yes vote share is larger, because the SIG is willing to intervene even when the ex-ante vote outcome is farther from $\frac{1}{2}$.

Conditional on the existence of vote-buying by SIGs, this result suggests that, if we observe empirically that the mass at $\frac{1}{2} + \epsilon$ is larger than that at $\frac{1}{2}$, the probability that the SIG is interested in passing the bill is (on average) larger ($\overline{p} > \underline{p}$).[14] The opposite finding would imply that $\overline{p} < \underline{p}$: the probability that the SIG is interested in a rejection outweighs. As we

[13] In this simplified model, where φ takes only three values, there are other two discontinuities, at $x = \underline{\delta}$ and $x = 1 - \underline{\delta}$, because, respectively, below the first threshold and above the second threshold the special interest group does not intervene. This is a feature of the simplified model. Indeed, as shown in the general case, in Appendix A.I, where φ is distributed continuously in $[-1, 1]$, only the discontinuity at the approval threshold is present.

[14] Notice that, if f is not symmetric, and it has a larger mass below the approval threshold than above it, then this result would still hold if $\overline{p}$ is sufficiently larger than $\underline{p}$.

discuss below, there can in principle be other reasons, among others the postponement of marginal bills and vote trading, on why there could be a discontinuity in the distribution of the Yes-vote share. However, as we show in the following analysis, only in the case of vote buying by SIGs, the discontinuity in the distribution of Yes-vote shares is accompanied by a simultaneous discontinuity in contributions from these groups.

If SIGs were indeed involved in vote buying, a second trace left by their activity can be found in the amount of contributions. Given our theoretical considerations, the expected amount of contributions has a peak at $\frac{1}{2}+\epsilon$ with value

$$\frac{\overline{p}}{\gamma}\int_{\underline{\delta}}^{\frac{1}{2}+\epsilon}\int_{\delta}^{\frac{1}{2}+\epsilon}\frac{(\sigma^i-\delta)}{F\left(\frac{1}{2}+\epsilon\right)-F\left(\underline{\delta}\right)}d\sigma^i f(\delta)d\delta+y,$$

and a peak at $\frac{1}{2}$ with value

$$\frac{\underline{p}}{\gamma}\int_{\frac{1}{2}}^{1-\underline{\delta}}\int_{\frac{1}{2}}^{\delta}\frac{(-\sigma^i+\delta)}{F\left(\frac{1}{2}\right)-F\left(\underline{\delta}\right)}d\sigma^i f(\delta)d\delta+y,$$

if SIGs were involved in vote buying.

Hence there is a discontinuity in donations at $\frac{1}{2}$, with the amount of contributions at $\frac{1}{2}+\epsilon$ being larger than that at $\frac{1}{2}$ if it is more likely that the SIG supports approval than rejection of the bill: $\overline{p} > \underline{p}$. Notice that in both cases, the expected amount of contributions is normalized by the mass of votes, respectively at $\frac{1}{2}+\epsilon$ and $\frac{1}{2}$. Therefore, if f was the frequency of vote outcomes, the discontinuity could be interpreted as follows: when $\overline{p} > \underline{p}$, the expected contribution per bill by the SIG is larger when the vote is marginally approved with respect to the case when it is marginally rejected. The effect of γ, the weight given by legislators to money, on the discontinuity in contributions at the approval threshold is ambiguous. A larger γ implies that the SIG lobbies when the vote outcome is farther from $\frac{1}{2}$. However buying votes is cheaper, so the SIG spends less to influence a given vote outcome. As these two mechanisms work against each other, it remains an empirical question whether the discontinuity in donations is larger or smaller with a larger γ, as this depends on which driver is stronger. We can therefore state the following result.

Proposition 1 *The following holds:*

1. *When the special interest group has utility from the approval or rejection of the bill, the* ***distributions of the Yes vote share*** *and the* ***contributions from lobbying*** *exhibit a discontinuity at the approval threshold, with the peak at the approval threshold being larger than the peak just below the approval threshold if a pro-yes SIG is more likely than a status quo SIG.*

2. *The special interest group lobbies legislators who are almost indifferent between rejecting and approving the bill (the marginal legislators).*

3. *When legislators give a higher value to money, the size of the discontinuity in the distribution of the Yes vote share at the approval threshold is larger, while the effect on the size of the discontinuity in contributions is ambiguous.*

For all proofs see Appendix A.I.

In the following, we discuss the robustness of these results to different assumptions and extensions of the model.

Multiple SIGs

The model can be extended to multiple SIGs who compete for influence by giving contributions to legislators. Let us assume that all SIGs have complete information on legislators' utilities. Moreover they are heterogeneous with respect to their marginal cost of money, and they are homogeneous with respect to all other parameters. If the special interest groups pushing for a Yes outcome are more powerful than the ones lobbying for a No, that is, the sum of their marginal costs of money is lower than that of the No lobbies, in every Nash equilibrium they are able to bring the vote outcome to the pass threshold by paying legislators and keeping the No lobbies almost indifferent between giving contributions to influence the vote outcome and not intervening. In general, they spend more than in the model analyzed above, because they need to neutralize the No lobbies, and this leaves a surplus to legislators. However, the main results and comparative statics hold.

No information on the shocks

In the Appendix we show that, if the special interest group does not know at all the utility shocks σ^i and δ occurring to the legislators, it can influence the voting outcome, by shifting the distribution of Yes votes to the right, but there is no discontinuity at the approval threshold. Hence the appearance of a discontinuity is linked with the information that a SIG has on the shocks occurring to legislators, i.e. a discontinuity is evidence that the SIG impacts legislators and has precise information about the shocks of sufficient legislators to exert effective control over vote outcomes.

Finally we devote a larger discussion on the intermediate case in which the SIG has only some information on the shocks occurring to legislators, as this realistic scenario provides us with testable predictions.

2.2 Extension: Imperfect Information on Legislators

In our model we assume that the special interest group knows all the shocks occurring to the legislators' utilities. However, it is reasonable to expect that the SIG knows some legislators better than others.

Let us assume that the SIG, with $\varphi = v > 0$, knows the common shock δ, but only the idiosyncratic shock σ^i of z legislators $\sigma^i \in [0, z]$, where for simplicity we assume that it knows the shocks occurring to the legislators with preferences more likely aligned with its own. The same reasoning applies to $\varphi = -v$. Moreover, to simplify the notation we assume $\epsilon = 0$. The SIG can give *targeted* contributions to known legislators (with $\sigma^i \in [0, z]$) or *untargeted* contributions to unknown legislators ($\sigma^i \in (z, 1]$). By distributing m amount of money to all unknown legislators, conditionally on voting Yes, it is effectively increasing the probability of passing the bill. Consider $z = 0$ and the SIG knows that the bill will not be approved, $\delta \leq \frac{1}{2}$. An unknown legislator votes Yes if $-\sigma^i + \delta + \gamma m \geq 0$. The mass of Yes votes is therefore $\gamma m + \delta$. The SIG can pay $m = \left(\frac{1}{2} - \delta\right)/\gamma$ to all unknown legislators and ensure a positive voting outcome. She does this as long as $v > \left(\frac{1}{2} - \delta\right)/\gamma$. The same happens if $z \leq \delta$, because the SIG knows only legislators who will already vote Yes. If $z > \delta$, the SIG knows legislators who will vote no. She can substitute contributions to unknown legislators for contributions to known legislators. In this case, she spends $\int_\delta^z \left(\sigma^i - \delta\right)/\gamma d\sigma^i$ for targeted contributions and $\left(\frac{1}{2} - \delta\right)(1 - z)/\gamma$ for untargeted contributions. It is easy to show that this saves money, because targeted contributions keep known legislators almost indifferent between voting Yes or No, while untargeted contributions leave a surplus to legislators. This implies that the SIG lobbies even in worse scenarios, i.e. for lower δ, because it has a more efficient use of money. Hence, the following must hold.

Proposition 2 *The amount of targeted contributions is positively correlated with the size of the discontinuity in the density of the Yes vote share at the approval threshold.*

For the proof see Appendix A.I.

2.3 Discussion: alternative mechanisms

Here we discuss some alternative mechanisms that could lead to a discontinuity in the distribution of the Yes-vote share.

(i) *Postponement of bills*: Consider a dynamic version of the model, where the bill is proposed by a legislator in a given period. Proposing bills is costly. Let us assume that, at the beginning of a period, some legislators know all the shocks taking place in that period while all others have the same restricted information as the econometrician. A legislator that would like to propose a bill clearly would not do it if she knows that the bill is going to be rejected. She would postpone the bill until the realized shocks to legislators' utilities bring a majority of them to approve the law. This implies that the econometrician would observe an extra-mass of votes above the pass threshold. This mass would not be necessarily concentrated at the approval threshold, but it could still generate a discontinuity at the approval threshold. In section 6.5, we present empirical evidence that the postponement of bills is unlikely to drive our overall results.

(ii) *Vote trading*: If legislators trade votes with each other, either through a dynamic barter system, i.e. logrolling (Riker and Brams, 1973), or through monetary compensations (Casella et al., 2014), the buyer of votes, which in these models is usually the legislator with stronger preferences for either approval or rejection of the bill, buys just enough votes to get her preferred outcome. If vote trading is spread among legislators, this can in principle generate a discontinuity at the approval threshold.

(iii) *Agency problems with the constituents*: Consider the case in which a legislator has preferences at odds with her constituents on a specific bill. In particular, differently from her constituents, she wants the bill to be approved. In this case, if the legislator knows that there are already enough votes for the bill to pass, she can vote No, keeping her constituents unaware of this mismatch of preferences, and obtaining her preferred vote outcome. If this agency problem is spread among legislator, it can generate an excess mass of bill marginally approved or marginally rejected. Given the voting procedure in the House, where legislators vote almost simultaneously and are not able to observe what their peers vote before making their own decision, this mechanism is unlikely to occur. It could only happen, if legislators were informed about their peers' voting decisions ex ante.

If any of these alternative mechanisms is at play, it can in principle generate a discontinuity in distribution of the Yes-vote share at the approval threshold. However these mechanisms (or others unrelated to vote buying by SIGs) cannot be reconciled with a discontinuity in the contributions from special interest groups at the approval threshold. Indeed, keeping the notation of the model, in any of these alternative mechanisms the amount of contributions for a bill that is marginally approved is y, which is equal to the amount of contributions for a bill that is marginally rejected. Thus, if we observe a discontinuity both in the Yes-vote share and in the contributions from special interest groups, it is strong evidence in favor of vote buying.[15]

3 Empirical Strategy

In this section, we lay out the empirical strategy to test the main predictions of our theoretical model. Following proposition 1.1, we aim to investigate whether there is indeed a discontinuity in the distributions of yes votes at/around the approval threshold. To this end, we apply the empirical likelihood approach to test for discontinuities in densities proposed by Otsu et al. (2013). In order to test whether we also observe a discontinuity in campaign finance donation flows, we draw on the estimation approach for discontinuities at boundary points typically employed in RDD studies by fitting two local linear regressions (LLR) from both sides of the threshold.

3.1 Testing for a discontinuity in the density

Otsu et al. (2013) provide a general framework for inference of discontinuities in densities, proposing a test and confidence sets which are invariant to the formulation of the parameter of interest. Their estimator is well defined even if the alternative local linear binning estimate proposed by, e.g. McCrary (2008) which is often applied in the RDD context, turns out to

[15] The link between a discontinuity in the distribution of the Yes-vote share at the approval threshold and a simultaneous discontinuity in the contributions (as we document it) would also be consistent with some forms of vote trading. The pattern would also emerge if, for example, SIG's organize trades between representatives and then compensate those selling their vote over and beyond what they anyway gain from the trade of votes. We do see such trades via an intermediary as one of several ways in which SIGs can affect vote outcomes with campaign donations and thus consider this explanation consistent with our vote-buying explanation.

be negative.[16] For nonparametric visual evidence on the distribution of Yes vote shares we consistently use local (linear) likelihood density estimation (LLD) (see, e.g., Loader, 1996; Otsu et al., 2013).[17]

In order to estimate the probability density separately from both sides of the threshold, we use local (linear) likelihood density estimation. The point estimates of the density from the left ($\hat{f}_l$) and the right ($\hat{f}_r$) of the threshold result from solving the following two maximization problems:

$$\max_{a_l,b_l}\left\{\frac{1}{n}\sum_{i:x_i<c}K\left(\frac{x_i-c}{h}\right)(a_l+b_l(x_i-c))-\int_{u<c}K\left(\frac{u-c}{h}\right)exp(a_l+b_l(u-c))du\right\};$$
$$\max_{a_r,b_r}\left\{\frac{1}{n}\sum_{i:x_i\geq c}K\left(\frac{x_i-c}{h}\right)(a_r+b_r(x_i-c))-\int_{u\geq c}K\left(\frac{u-c}{h}\right)exp(a_r+b_r(u-c))du\right\}$$

where c is the threshold value in x_i and x in our application is the yes vote share. The threshold, in our case, is the investigated pass margin. $K(\cdot)$ is a symmetric kernel weighting function and h the bandwidth used. The triangular kernel is used throughout the nonparametric estimates, as we are interested in estimates at boundary points and this kernel has advantageous properties at such points (for more details see Hahn et al. 2001 or Fan and Gijbels 1996). The estimators of f_l and f_r are calculated as $\hat{f}_l = exp(\hat{a}_l)$ and $\hat{f}_r = exp(\hat{a}_r)$, and the discontinuity parameter θ is estimated by their difference $\hat{\theta} = \hat{f}_r - \hat{f}_l$. Inference is based on the concentrated log local likelihood ratio function, (profile) empirical likelihood

[16] See the original paper of Otsu et al. (2013) for a discussion of the advantages of their method over the approach of McCrary (2008), which is often used for the discontinuity in density estimation in a RDD context. McCrary (2008) proposes one approach to test for a discontinuity in a density allowing for point estimation and inference. His solution is a local linear regression (LLR) of pre-binned counts. In a similar vein, Otsu et al. (2013) propose an empirical likelihood-based test and confidence sets for the discontinuity. This approach has several advantages over the previously proposed approach by McCrary (2008). First, Otsu et al. (2013)'s suggestion shares the good boundary properties of the local linear estimate while not requiring pre-binning of the data. Second, the estimator is non-negative by construction, while the McCrary (2008) estimator can produce negative density estimates. The latter property is particularly important in our application, because, in theory, the density just below the pass margin could also be zero if manipulation is extreme, under which circumstances the McCrary (2008) test is not well defined (see Otsu et al., 2013).

[17] More precisely for the graphic representation we use the local likelihood implementation (locfit) in the Chronux software package for Matlab (Bokil et al., 2010).

ratio, for the parameter of interest ($\hat{\theta} = \hat{f}_r - \hat{f}_l$) defined as $lr(\theta)$ (see Otsu et al. 2013 for details on its construction).

Under the null hypothesis $H_0 : \theta = \theta_0$ the empirical likelihood function asymptotically follows a chi-square distribution $lr(\theta_0) \xrightarrow{d} \chi^2(1)$. The null hypothesis $H_0 : \theta_0 = \theta$ for some θ can thus be tested by $lr(\theta)$ using $\chi^2(1)$ critical values.

In our context, H_0 states that the distribution of Yes vote shares is continuous at the approval threshold. Thus, we test $f_r - f_l = \theta = 0$ or $f_r/f_l = 1$, respectively.[18]

Note that, while our theoretical concept assuming an infinite amount of legislators leads to a continuous outcome of yes vote shares, our empirical observed distribution is not continuous in the narrow sense. The US House has 435 members, and thus strictly speaking only a restricted set of yes vote shares is possible. However, we still perform density estimates based on the idea that the legislature is still *large enough* to approximate our theoretical concept. We estimate the discontinuity to capture any exceptional excess mass to either side of the threshold value. We are using the term discontinuity and excess mass interchangeably in what follows.

3.2 Testing for a discontinuity in donation flows

The estimation of discontinuities in a bivariate relationship at certain values has recently gained a lot of attention in the RDD literature. We draw on the estimation strategy suggested in this literature, as it is the state-of-the-art procedure for estimating discontinuities at boundary points. The approaches applied here are well described in, e.g., Porter (2003) or Hahn et al. (2001), who provide an introduction to the estimation of discontinuities in local linear regressions (LLRs), and in Fan and Gijbels (1996), who give a general introduction to LLR. To get an estimate of the discontinuity in donation flows at the pass margin, we apply the following estimation equation to every estimation point separately on both sides of the

[18] The empirical likelihood ratio is invariant to the formulation of the null hypothesis.

threshold (c).

$$\min_{\alpha\beta} \sum_{i=1}^{N} (y_i - \alpha - \beta(x_i - x))^2 K_h\left(x_i - x\right)$$

Where y is the total daily donation flows, x_i represents the assignment or running variable - the Yes-vote share, h represents the bandwidth used $h > 0$, $K_h\left(x_i - x\right)$ represents the kernel weighting function at the estimation point x and is defined as $K_h\left(x_i - x\right) = \frac{1}{h} K\left(\frac{x_i - x}{h}\right)$. The discontinuity is then estimated by the difference of the limits of $\hat{y}$, coming from the right $\hat{\alpha}_r$ and coming from the left $\hat{\alpha}_l$, calculated as $\Delta(y) = \hat{\alpha}_r - \hat{\alpha}_l$, where the subscripts indicate the point estimates at the threshold or boundary point (c), either coming from the left l or coming from the right r, respectively. Standard errors for the constructed measures are computed with a nonparametric bootstrap, using the bias corrected percentile method. As before, the triangular kernel is used (for more details see Hahn et al. 2001 or Fan and Gijbels 1996).

It is important to note that, unlike in RDD studies, in our analysis, the discontinuity is the parameter of interest, not because there is local randomization around a certain threshold, but because we expect that there is a strong selection around the pass margin and we want to learn what might drive this 'bunching' of vote outcomes.[19]

4 Data

For the main part of our empirical analysis, we rely on roll-call votes and campaign-finance data for the U.S. House of Representatives, covering the years 1990 to 2014.

Data on roll-call votes is based on the official roll-call records published by the Office of the Clerk of the U.S. House of Representatives (`http://clerk.house.gov`). Additional

[19] In this respect, our approach is related to the work of Caughey and Sekhon (2011), who detect selection in close U.S. House races and try to explain its drivers by discontinuities in the characteristics of candidates narrowly around the threshold.

information on the bills under consideration are based on the official bill data published by the Library of Congress (`www.congress.gov`, previously `www.thomas.gov`) as well as the U.S. Government Publishing Office (GOP).

The main variable of interest based on the roll-call data is the share of Yes-votes (in percent), which we compute for all roll-call votes in our data set. Given the focus of our empirical strategy, vote outcomes right at the approval margin of 50% are of particular relevance for testing our theory. The upper panel in Figure A17 presented in the Data Appendix illustrates how often narrow vote outcomes (results with a share of Yes votes between 48% and 52%) occur in our main sample over time. The figure shows that there is no clear seasonal variation and that less than 10% of all votes were decided by a very narrow margin during most years in our observation period. However, during some congresses, a substantial portion of the votes were decided by a narrow margin.

The raw data on campaign contributions are provided by the Center for Responsive Politics (CRP) and is compiled by the Sunlight Foundation's Influence Explorer database.[20] Each record refers to an individual donation and contains the exact date the donation was made, as well as the type of donation and information on the contributor.[21]

While it is not possible to tell which donations have been earmarked for a particular bill, it is possible to assign donations to bills by their timely occurrence. For our main analysis concerning the role of donation flows, we therefore compute the total daily campaign contributions donated to representatives over an interval of 4 weeks (28 days) before and after each day that a roll-call vote took place. As a consequence, we assign 57 data points[22],

[20] For large scale replication purposes, we recommend using the bulk download of the full raw data set (around 10 GB) provided by the Sunlight Foundation under `https://sunlightlabs.github.io/datacommons/bulk_data.html`.

[21] The lower panel in Figure A17 (shown in the Data Appendix) shows the natural logarithm of the monthly aggregate flow of money to representatives for the whole observation period in our study. The figure illustrates that overall campaign finance contributions have risen over the last decades. Contributions follow the seasonal pattern of the Congress, with peaks shortly before elections (i.e., November of even calendar years, indicated with red dashed vertical lines) and relatively few donations during the first months of a new congress.

[22] These are composed of 28 days before the vote, 28 days after the vote, and the day of the vote itself. The

each representing the donation total for one day, to each roll-call outcome which we observe, whereby the voting date serves as the assignment indicator.[23]

5 Results

The main results of our empirical analysis are presented in three steps. We first test for the continuity in the distribution of vote outcomes in the U.S. House before we proceed by testing for the continuity of donation flows around the approval threshold. We then test whether there is any systematic pattern in the timing of donations that might drive the discontinuity.

5.1 Testing for continuity of the vote outcome distribution

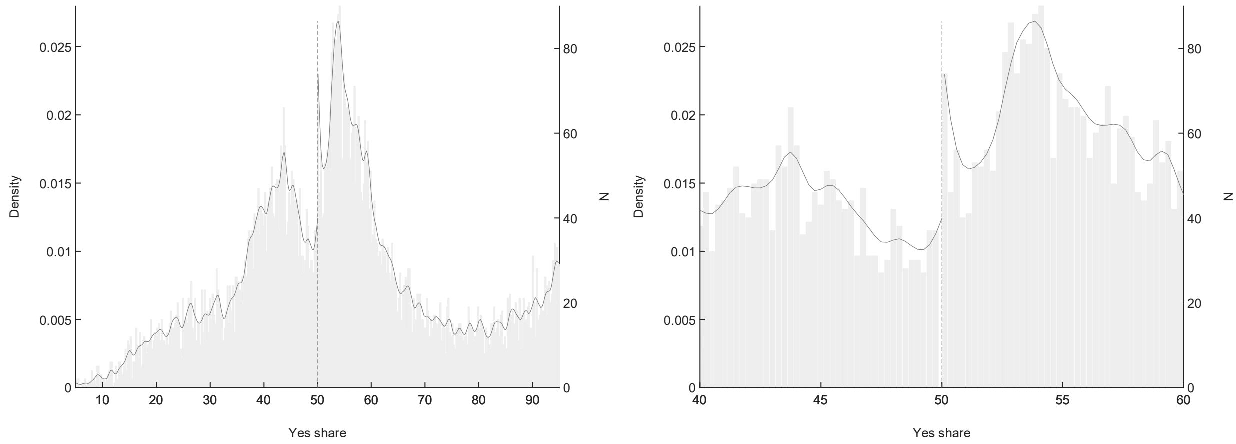
We start by testing the first part of our null hypothesis, i.e., that the distribution of vote outcomes is continuous at the pass margin employed in the U.S. House (with 435 voting members), i.e., a simple majority of over 50%, in order to determine whether there is evidence for SIG impact on representatives' votes. Thus, the vote threshold in the following analysis is the first possible Yes vote share above 50%. A Yes vote share of 50.1149%.

We first illustrate the overall vote outcome distribution in Figure 1 (a). The vertical line indicates the respective vote threshold. Evidently, votes with a Yes vote share that is narrowly above the threshold seem to be disproportionally frequent, as we see a distinct spike just above the threshold. Figure 1 (b) visualizes a more zoomed in version of the distribution around the threshold. To see whether the distribution features a discontinuity, we estimate an LLD separately from both sides of the threshold, using a bandwidth of $h = 1$.[24]

advantage of this procedure is that each vote receives the same weight in the estimation, irrespective of whether there were many or few single donation flows.

[23] See the Data Appendix (A.III) for a complete list of which donation types/recipient types (in accordance with CRP's categories) are considered in each of three main categories (individual, corporate/organization, and party).

[24] The chosen bandwidth rather undersmooths the data, as the optimal bandwidth suggested for the



(a) Overall (b) Zoomed in

Figure 1: The left figure shows the overall LLD vote distribution. The solid line represents the LLD fit on both sides of the threshold (binwidth 1 percentage point), the shaded area represents the histogram of the underlying data using a binwidth of 0.25 percentage points. The figure on the right presents the same figure in a more zoomed in version. The corresponding density discontinuity estimates can be found in row I of Table 1.

The resulting smooth is also visualized in Figure 1. The distribution features excess mass above the pass margin which opens up a positive discontinuity. Votes appear to bunch above the threshold.[25] The distribution further features a very peculiar shape in that it is bimodal. A possible explanation, which goes beyond the scope of the theory, is that SIGs observe the ex-ante vote outcome as being very close to the threshold and get in touch with more legislators than necessary to convince them to change their voting decision, in order to insure against last-minute betrayals. This would lead to an overshooting of the effect of lobbying with excess masses of votes being present slightly farther from the pass threshold. Importantly, our prediction that the distribution is continuous in the absence of SIG impact

approach in McCrary (2008) would be around 10.71 with a binsize of 0.47. However, we expect that the selection of bills is stronger the closer they are to the pass margin (this idea is also suggested in Caughey and Sekhon (2011) for close electoral races). In our estimation approach, we thus accept a higher variance of the estimate in exchange for a reduction in the bias of the nonparametric estimate.

25 McCrary (2008) hints at this empirical regularity; however, it is only used as a working example of the methodological approach to test the basic assumption of a regression discontinuity design and is not further considered. We obtain a qualitatively similar picture when applying the method used in McCrary (2008) to estimate discontinuities in densities by smoothing binned counts. The equivalent plot for Figure 1 is presented in Figure A11 in the Appendix.

Table 1: Density discontinuity estimates

	c	h	$\hat{f}_l$	$\hat{f}_r$	$\hat{\theta}$	$\hat{l}r$	$\hat{f}_r/\hat{f}_l$	p-value	N
Overall									
I.	50.1149	1	0.012 4	0.023 0	0.010 6	5.946 6	1.849 6	0.014 7	12,404
Election year									
II.	50.1149	1	0.008 9	0.027 7	0.018 7	8.575 5	3.105 3	0.003 4	5,651
Non-election year									
III.	50.1149	1	0.015 5	0.019 3	0.003 8	0.423 2	1.244 6	0.515 3	6,753

Notes: Local likelihood ratio results for the discontinuity in the vote distribution. c refers to the threshold used, h refers to the bandwidth, $\hat{f}_l$ reports the fit of the density coming from the left and $\hat{f}_r$ coming from the right, $\hat{\theta}$ is the estimate of the discontinuity, $\hat{l}r$ is the value of the local likelihood ratio statistic under the null, and $\hat{f}_l/\hat{f}_r$ measures the relative size of the discontinuity. N stands for the number of observations with regard to the observations available for estimating the whole density in the sample.

carries over to this case.

In order to assess whether the observed excess mass is systematically different from zero, we estimate the discontinuity in the density, based on the empirical likelihood approach described above. Results are reported in Table 1, where the corresponding discontinuity estimate for Figure 1 is presented in row I. We find that, overall, the discontinuity in the probability density of vote outcomes at the threshold is positive and significantly different from zero. Thus, we reject the null hypothesis of continuity of the distribution. In line with our theoretical reasoning, this is a first piece of evidence suggesting that vote-buying affects the outcome of narrow legislative decisions. The finding of a positive discontinuity suggests that, on average, the likelihood that SIGs lobby to pass bills outweighs the probability that they lobby to reject bills. Thus, when pressure from groups favoring a passage outweighs pressure from opposing groups, our estimates can be understood as a lower bound of the actual impact. Looking at the relative measure of the discontinuity $\hat{f}_r/\hat{f}_l$, the point estimate of the density just above the threshold is about two times higher than the point estimate of the distribution just below the threshold or, to put it differently, the mass increases by about 80 percent.

Our theoretical model would further predict that any discontinuity at the pass margin is stronger if the value of money for legislators γ is higher (point 3 of Proposition (1)). One important determinant of the value of money is likely electoral campaigns. A clear empirical approximation of the value of money is, of course, hard to find. However, it is conceivable that the value of money and the scope of action for legislators might well differ depending on the intensity of electoral competition. On the one hand, interest groups have easier access to legislators during election years, as they meet more often (e.g., during fund raising events) and might thus more easily press their interests (in exchange for, e.g., financial campaign support). In particular, during election years, legislators are in need of donations to finance their campaigns. This could make them more prone to the influence of SIGs by increasing the value of money. On the other hand, the discretionary leeway for legislators might be higher in years without elections, as there is less public attention and media coverage. Pressure to maintain their reputation might thus force legislators to make a trade-off between direct electoral support and indirect electoral support through SIGs (in the form of, e.g., campaign finance contributions). This would speak for SIGs having more influence on legislators' voting behavior in years without elections. However, we would expect that the trade-off between SIGs and voters is the strongest for higher-level politicians, such as candidates for presidency or senators, and that the need of money outweighs it for U.S. Representatives. Consequently, we would expect that the value of money γ is higher during election years.

To see whether this prediction fits the data, we repeat the estimates for the subsample of votes in election and non-election years.[26] The results can be found in Table 1, rows II and III, and are visualized in Figure A2. While both distributions seem to have a rather similar shape overall, the distribution remains systematically discontinuous in the election year case, while the discontinuity is small and not significantly different from zero in the non-election year sample. The relative measure $\hat{f}_r/\hat{f}_l$ in election years is about 3 (an increase of the mass

[26] House elections take place in even years. Thus, in our sample period, these are 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, and 2014. Here, all seats in the House and one third of the seats in the Senate are up for election.

of about 200 percent), while it is only about 1.2 (an increase of the mass of only about 20 percent) in years without elections. This result is in line with our theoretical prediction and suggests that the impact of SIGs is stronger in election years.

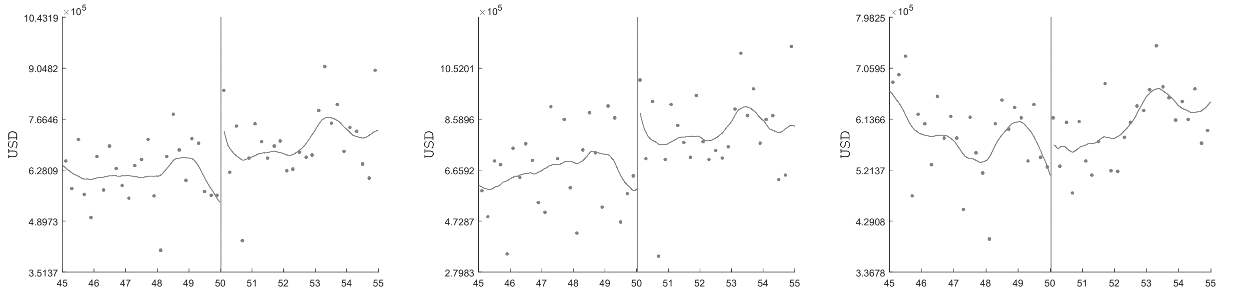
Summing up, we find that the vote outcome distribution in the House features a clear and systematic discontinuity at the passage margin. This means that the number of narrowly passed votes in the House is systematically higher than the number of votes rejected with the same narrow margin. This finding leads to the rejection of the hypothesis of a continuous distribution, and according to our theoretical reasoning, it is a first piece of evidence suggesting the existence of SIG impact on representatives' voting behavior and contested policy decisions. We further find that the impact is primarily present in election years, when legislators are arguably in need of money to finance their campaigns.

5.2 Testing for continuity in campaign finance donations

As we theorize above, if there is SIG impact that is mediated by vote buying we would expect a simultaneous discontinuity in donation flows to legislators around the approval threshold. The central dependent variable for testing this hypothesis (y) is $Money$, i.e., total daily campaign finance contributions around the vote date. If we find donations to be discontinuous, resembling the behavior of the vote distribution, this would be first evidence for a systematic link between the documented impact on the vote distribution and campaign money, jointly suggesting vote buying by SIGS.

As described above, we test for a discontinuity by fitting a local linear regression to the total daily donation flows (for each bill) over the vote share separately on both sides of the threshold. We use a bandwidth of $h = 1$.[27] We define our dependent variable as the total

[27] As before, the chosen bandwidth clearly undersmooths the data, as the optimal bandwidth suggested by, e.g., Calonico et al. (2016) for the estimation of a discontinuity in two LLR smooths would be arround 6.7. However, we expect that the selection of bills is stronger very narrowly around the threshold (as suggested in Caughey and Sekhon (2011)). We thus accept a higher variance for a reduction in the bias of the non-parametric estimate, and therefore report rather conservative estimates. We validate the



(a) Total donations (b) Donations Elec. (c) Donations N.Elec.

Figure 2: The solid line visualizes the local linear smooth of total daily donation flows within a time span of ± 4 weeks around the vote using all votes in the sample, or votes in election and non-election years, respectively. The gray dots represent raw means of the dependent variable within bins of 0.2 percentage points.

daily donations to representatives between 4 weeks before and 4 weeks after the vote, in order to capture donations in the time around the vote date. As mentioned above, we link votes to donations at each day in the defined time range, thus around the date on which the respective vote took place, and then calculate the daily total of these donations for each vote.[28]

Figure 2 shows the local linear fit of the daily total donations within a time span of 4 weeks around the vote date for the whole sample of votes. Visually, the donation flows feature a wing-like pattern around the threshold, and a positive discontinuity at the approval threshold. Strikingly, we observe that, on average, total daily donation flows drop sharply for narrowly rejected bills and rise sharply for narrowly passed bills. It suggests that, on average, donation flows around bills that were narrowly passed are higher than around bills that were narrowly defeated.

In a next step, we test whether these visual discontinuities are systematic by estimating the discontinuity in total daily campaign donation flows at the threshold value and report

robustness to wider bandwidths in the Robustness section, but we prefer the estimates very narrowly around the pass margin as we think that they are most likely to capture the selection best.

28 The advantage of this procedure is that each vote receives the same weight in the estimation, irrespective of whether there were many or few single donation flows.

Table 2: Discontinuity in total daily donations

	I	II	III
Sample			
	Total donations Overall	Total donations Election years	Total donations Non-Election years
$\Delta(Money)$	193,638.84	284,856.84	54,092.21
$lower99\%$	123,038.81	160,052.71	−29,210.03
$upper99\%$	267,299.69	417,371.14	158,709.01
h	1	1	1
N	707,028	322,107	384,921
$Nboot$	1,000	1,000	1,000

Notes: Local linear discontinuity estimates including 99% bootstrap confidence intervals. $Money$ stands for total daily donations within a range of 4 weeks around each vote.

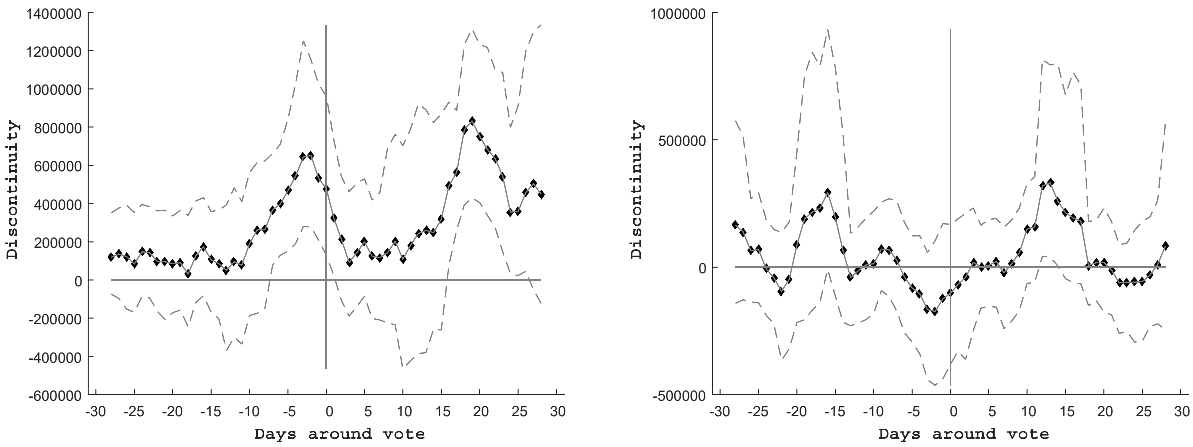
the results in Table 2 in columns I to III. Overall, the discontinuity in total daily donation flows within 4 weeks before and after the vote is systematic and positive at the threshold. On average, total daily donation flows jump by about USD 190,000. This finding is in line with the prediction from our model, suggesting that if there are excess passed bills which are driven by money, campaign donation flows should as well show a discontinuity. This matches the first prediction of Proposition (1) from the model: whenever SIGs change the vote outcome with donations to legislators, we should expect a simultaneous discontinuity at the approval threshold in the distribution of vote outcomes and donation flows.

Above, we found that the discontinuity in the density is primarily driven by election years as our model suggests, under the assumption that the value of money for legislators is higher in these years. The prediction about how the discontinuity in donations could evolve is ambiguous. On the one hand it might be larger, as SIGs might lobby even if the vote outcome without vote buying were to end up far below the pass threshold. In this case they would need to lobby more legislators. On the other hand, it might be smaller, as lobbying each legislator might become cheaper. Thus, it is an empirically open question as to which force outweighs the other. We test for discontinuities in donations on the subsample of votes in election and non-election years. The resulting patterns are presented in Figures 2b and 2c and the estimates are presented in row II and III of Table 2. Donation flows in the 4 weeks before and after votes that were narrowly passed are on average about USD 280,000 higher than those around votes that narrowly lost in election years. The point estimates are not significantly different from zero in non-election years. Thus, just as in the case of the density, the discontinuity seems to be driven by election years and it is positive, suggesting that, even though lobbying each legislator becomes cheaper, SIGs spend more because they intervene even when the vote outcome is far below the pass threshold, lobbying more legislators.

Overall, these results show that there are, on average, systematically higher total daily donation flows to representatives around votes that were narrowly passed compared to those which were narrowly defeated. This is especially true for election years. This nicely meets the predictions form our model, suggesting a discontinuity in donations if SIGs are involved and money is their preferred way to convince legislators. These results are further in line with our observations in the vote distribution, where we found that the vote outcome distribution is discontinuous in election years, but not in non-election years, suggesting that the impact of SIGs is especially present during election years. The results for the total daily donation flows show a similar behavior and suggest that donation flows are related to the passage of contested bills. These findings are also in line with the argument and findings in Gordon (2001). The author argues that donations by special interest should be particularly important in narrow ('critical') votes and documents that the relationship between received donations and legislators' voting behavior (in the California Senate Committee on Governmental Organization; 1987-1988) is especially strong in such narrow votes.

Time structure of discontinuities in donation flows

We would not expect any specific temporal structure in the donations that drive the documented discontinuity if donations were not related to the vote outcome. Consequently, in a next step, we investigate whether there is a specific time pattern in the discontinuities in donation flows within the 4 weeks before and after the votes that drives the overall observed



(a) Elec. year (b) Non-Elec. year

Figure 3: Rolling discontinuity estimates in total donations for election and non-election years within a 6-day band. The dots represent the discontinuity estimates, and the dashed lines represent the 99% confidence bands.

phenomenon in donation flows. To this end, we repeat the discontinuity estimates in a rolling manner, always including daily donations within a 6-day time band. Results for the sample of votes in election years are presented in Figure 3a and for non-election years in Figure 3b. Each dot represents a discontinuity estimate (using a bandwidth of 1% as before). The x-axis represents the $\pm$ 28 days around the vote, centered on the vote date. The estimates include the daily donations on the date they are assigned to on the x-axis and the 5 following days, such that, for example, the estimate at $x = 0$ includes donations on the day of the vote itself and on the 5 following days.

We find that the donation flows show systematic discontinuities in the period about 10 days before the vote until the day after the vote, and also in the period of 15 to 24 days after the vote in the election years. This could be interpreted to mean that money is a motivating device just before the vote takes place, and that representatives who stick to the agreement are rewarded after the vote has been passed. The corresponding time pattern for non-election years features few significant point estimates and does not reveal any clear pattern.

The finding of this clear temporal structure around the dates of votes again suggests a systematic relationship between donation flows to representatives and their voting decisions on contested bills. Importantly, this analysis reveals discontinuities in donations even before the vote on the narrowly passed bills takes place. This, however, cannot be explained by the observed future voting behavior if the voting decision of representatives is not already known in advance with certainty. This discontinuity in donation flows just before the vote means that contested bills, around which we observe more donation flows, are much more likely to narrowly pass than contested bills around which there are lower donation flows. Thus, some donors, who, in principle, should not be able to predict the vote outcome precisely, donate systematically more in the days just before the vote on bills which we then observe to lie just above the pass margin. This observation thus suggests a causal link running from donation flows to representatives' voting behavior in contested votes.

The joint occurrence of excess mass above the pass margin of the vote distribution and a positive discontinuity in average donation flows executed just before those very same passage votes goes beyond a simple correlation between money and the passage of contested bills. An alternative interpretation to the one that moneyed interests are systematically linked to the vote outcomes of contested votes needs to account not only for the discontinuity in the vote outcome distribution *but also* for the very timely occurring excess donations. In particular, SIGs simply spending more money to persuade legislators if a bill is expected to be highly contested *cannot* explain the pattern depicted in the data.

Taken together, our results show that donation flows are systematically related to the behavior of the vote distribution. This suggests that campaign donation flows are one of the drivers of the impact on representatives' votes and that the discontinuity in the vote distribution is, at least in part, driven by SIGs' financial campaign support to congressmen. Moreover, we find that donations that drive the discontinuous behavior mainly occur just the week before the vote and about two weeks after the vote has taken place, suggesting that representatives are first motivated and later rewarded for catering to the interests of SIGs. This is an important finding with respect to a pending question in the literature on money in politics.

Our result can be seen as first macro evidence in line with the hypothesis that donations actually buy votes. The timing of donations would be irrelevant with respect to the timing of votes if it were the case that donors only support their friends in politics, and donations did not work as incentives to affect voting decisions, in particular roll call votes. However, if it were the case that donations are, at least in part, aimed at convincing representatives to pass specific bills, we would expect the timing of donations to be systematically close to votes that pass with a very narrow margin (for a similar argument see Stratmann, 1998). One way to think about these findings is that SIGs can exert remarkably *precise control* over contested vote outcomes in the US House.

In the remainder of the paper we substantiate and validate the main empirical findings with a series of additional tests.

6 Corroborating Evidence and Validation

In this section, we provide additional evidence on the mechanisms behind the phenomenon documented and discuss the relevance of potential alternative drivers. First, we perform a test of the additional predictions of our extended model. Then, we validate whether the overall pattern is likely to be driven by bills SIGs are interested in and test the assumption that SIGs lobby legislators who are marginal. Further, we validate whether donations to Yes voters drive the pattern in donation flows, which would be consistent with finding that SIGs are more likely to lobby to pass bills. We check whether the postponement of bills is a potential alternative driver of the observed phenomenon, before we validate the robustness of our main findings.

6.1 Testing the predictions of the extended theory

The extension of our basic model discussed in Section 2.2 proposes that more targeted contributions are positively correlated with the size of the discontinuity in the density of the Yes vote share at the approval threshold. Thus, we would expect to see a stronger excess mass the more targeted contributions are.

In order to test whether our results are consistent with this reasoning we need a measure approximating in which cases SIG contributions are more targeted. One such measure is the concentration of all contributions made around a particular roll-call. If the sum of donations is concentrated on only few legislators, the donations are probably more targeted than when donations are equally distributed among all representatives. Drawing on our data on campaign finance contributions, we compute the Gini coefficient as a measure for contribution inequality. That is, for the population of US Representatives and the time-frame around a particular roll-call, we define the total amount of contributions received by all representatives together as the 'total income' and compute the Gini coefficient based on how much of this 'total income' goes to how many representatives. The resulting Gini coefficient of contribution inequality takes a value of 0 if contributions are equally distributed among representatives, and a value of 100 if one representative receives all contributions. Proposition 2 would thus translate into the hypothesis that the discontinuity in the distribution of the Yes vote share is larger, the higher the Gini coefficient.

Figure 4 visualizes the result of our empirical test of this hypothesis. It shows the resulting relative size of the discontinuity ($\frac{\hat{f}_r}{\hat{f}_l}$) in the density when including only votes with an increasing Gini coefficient. For example, the estimate assigned to 32 is the relative size of the discontinuity estimate including only votes with a Gini coefficient above 32. We proceed by excluding more and more votes with lower values of the Gini coefficient, and thus only use votes around which the campaign contributions become more and more unequal. The sample median of the Gini is about 43. As shown in Figure 4, the discontinuity estimates increase with increasing index values (higher concentration of contributions). They strongly increase once we include only votes with a Gini above 50. The result of this test is consistent with our hypothesis suggested by the extended model and again stresses the systematic relationship between the excess passed bills and campaign donation flows.

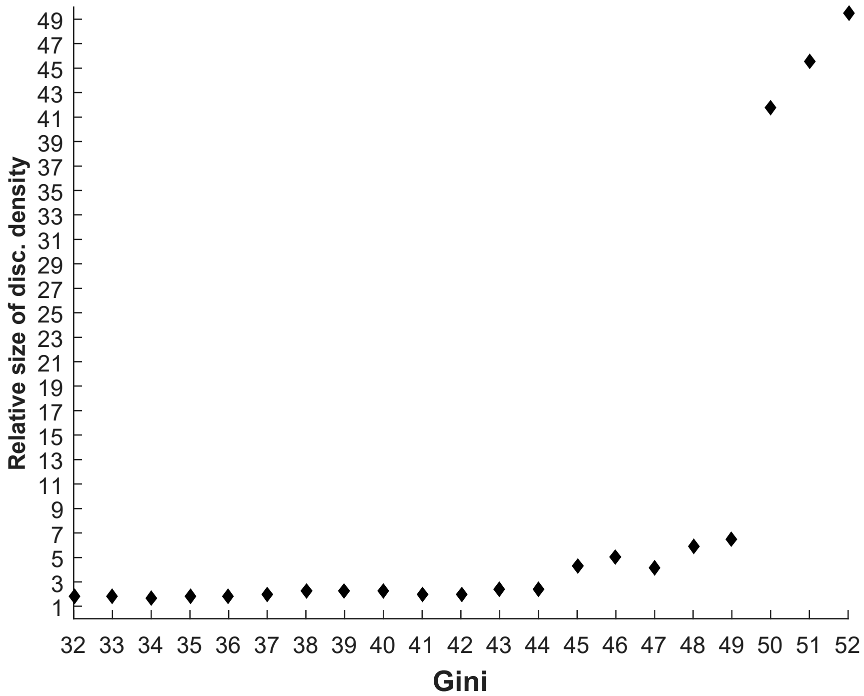


Figure 4: This figure visualizes the discontinuity in density estimates with an increasing value of Gini coefficient of donations. Estimates that are significant at least at the 5% level are marked as filled dots.

6.2 SIGs' interests in specific bills

First, if SIGs are indeed the main driving force, we would expect that the overall pattern documented above is mainly driven by voting decisions on bills that are of particular interest to well-organized (rather small) SIGs. In order to gain a clearer picture of SIGs' role in the evidence observed, we categorize bills as either being of interest to small, well-organized SIGs or, rather, to larger, less well-organized groups (e.g., taxpayers) or the general public. To do

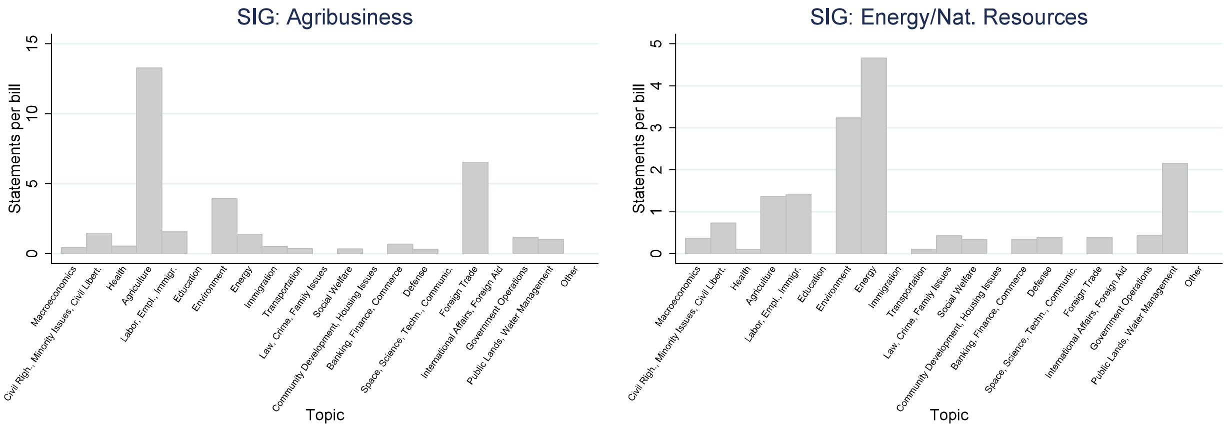


Figure 5: These two graphs visualise the average number of statements for SIGs in the MapLight data by bill topics for special interest groups related to Agriculture and Energy.

so, we draw on the Policy Agenda Project's (PAP) data which offers categories of bill issues and their main topics for a large proportion of the votes under consideration.[29] Based on the PAP categories and subcategories, we code the votes as either being of particular interest for rather specific, comparatively small, and well-organized SIGs (such as votes concerning agriculture and energy/natural resources) or as being of interest for larger/broader SIGs or the general public (i.e., taxpayers) that are arguably difficult to organize (such as votes concerning civil rights, family issues, and social welfare).

According to the nomenclature in the Topics Codebook of the PAP 2014, we assign the following major codes to well- and less well-organised interests. SIG topics: Macroeconomics; Health; Agriculture; Labor, Employment, and Immigration; Environment; Energy; Transportation; Banking, Finance and Domestic Commerce; Defense; Space, Science, Technology and Communications; Foreign Trade; Public Lands and Water Management. Non-SIG topics: Civil Rights, Minority Issues, and Civil Liberties; Education; Immigration; Law, Crime, and Family Issues; Social Welfare; Community Development and Housing Issues; International Affairs and Foreign Aid; Government Operations.

In order to validate our categorization, we compare it to a data set of SIGs' public statements

[29] See `http://www.comparativeagendas.net/us` for details.

in favor of or against specific bills.[30] If our categorization discriminates well between the bills that well-organized SIGs are interested in and those they are not interested in, we would expect to see these groups (or their members) actively and publicly supporting or opposing such bills more than other bills.

To compare the frequency with which SIGs publicly oppose or support specific bills with our bill categorization, we group SIGs according to their associated sector and industry.[31] This leaves us with 13 interest group types which correspond closely with the topic coding of bills following the PAP categories. We then calculate the average number of statements per bill, topic and interest group.

We find that there are more than twice as many SIG statements for SIG-related bills than for non-SIG bills (9663 to 3734 statements). If our categorization indeed captures votes of interest for the respective group, we would expect that this group is on average more active with respect to SIG bills than with respect to others. For example, we would expect agribusiness interest groups to predominantly make statements in favor or against bills on topics related to agriculture (in comparison to other bill topics). Figure 5 summarizes the average number of statements on bill topics for two exemplary interest groups, namely ‘Agribusiness’ and ‘Energy/Natural Resources’. As expected, we find that groups related to agribusiness exhibit a high level of activity on agricultural topics per bill. At the same time, groups related to the energy sector are particularly active on energy topics. Table A1 in the Appendix shows the average number of statements per topic for all interest groups and topics in our data. Overall, interest groups are most active on topics that are related to their sector. In contrast, larger groups with broader interests such as ideological groups and ‘others’ are likely to be comparatively active on any topic without exhibiting a specific

[30] We draw on the data provided by MapLight (http://maplight.org). MapLight records which interests groups were active and took a stance on which bill for a selection of relevant bills. As this source does not cover the entire time-span investigated in our main analysis, the additional results presented here are only for the years 2005-2014.

[31] Our categorization of SIGs using MapLight category codes can be found in Table A9 in the Data Appendix.

pattern.

In addition, as Maplight aims to track bills that are of particular interest for specific SIGs, we would expect that SIG bills are more likely to be included in this data. The overall inclusion probability is about 74 %. Bills on topics that we assign to well-organized special interests are included with a probability of 79%, while those we do not assign to well-organized special interest groups are only included with a 65% probability.

We employ our categorization of bills in order to investigate whether the pattern associated with the SIG impact is more prevalent in votes related to special interests. We repeat our estimates of the discontinuity in density and the discontinuity in total daily donation flows for both subsamples of SIG and non-SIG topic votes in election years.

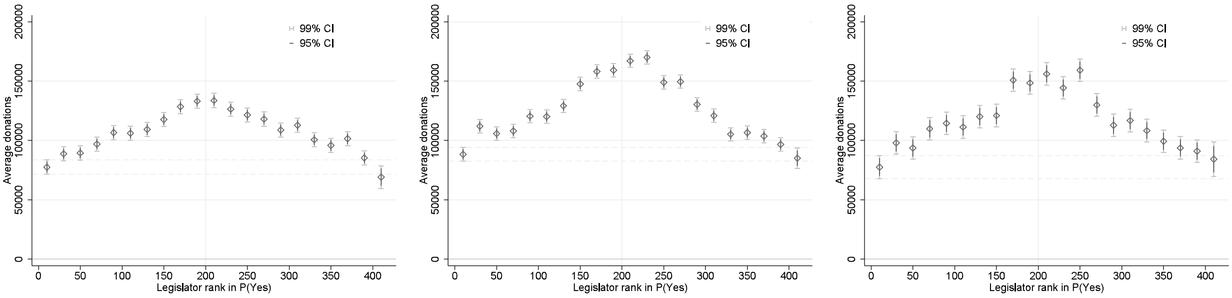
The main results regarding the discontinuity in total daily donation flows are visually summarized in Figure A7 and A8 in the Appendix. The respective point estimates are reported in Tables A2 and A3 in the Appendix.

In line with our main findings, there are systematic discontinuities at the pass margin in the distribution and in the donation flows for bills on topics which we assign to SIGs. At the same time, there are no systematic discontinuities in votes on issues not assigned to SIGs.

6.3 Donations to marginal representatives

Our theoretical model predicts that SIGs primarily target representatives who are marginal, and thus close to indifferent about the passage or rejection of a bill (Proposition (1.2)). In this section we try to validate whether this prediction is consistent with our data.

Assume the SIG only knows how likely a legislator is to vote Yes on a particular bill based on their policy positions (reflected in their aggregated past voting records). Under this assumption we can recover for each roll-call who the marginal representatives were in the eyes of the SIG. We do so by sorting representatives according to their propensity to vote



(a) Yes share 20-40 (b) Yes share 40-60 (c) Yes share 60-80

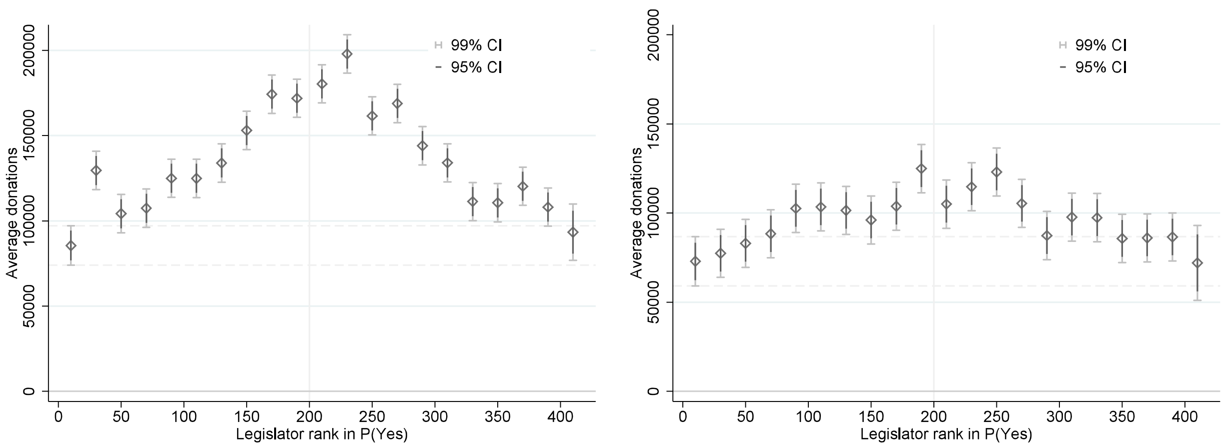
Figure 6: These figures visualize average donations to Legislators grouped by their rank in the probability to vote Yes on the particular bill.

Yes in each of the roll calls, given their DW-Nominate scores (1st and 2nd dimensions).[32] We thus order representatives according to their propensity to vote Yes on a particular bill, such that a rank of 1 marks the highest probability to vote Yes on this bill, and the higher the rank the lower this probability is. Representatives with a rank somewhere around 200 should in this case be the marginal ones, as the U.S. House has 435 voting representatives. If our assumption holds, the SIG should give more to the marginal representatives compared to those whose estimated voting intention is quite clear. In a second step, we therefore calculate average donation flows to the representatives in groups covering 20 rank points.[33] We do this for 3 ranges of vote outcomes: (*i*) Yes vote shares between 20 and 40 percent and (*ii*) Yes vote shares between 60 and 80 percent (those for which the result was quite clear and SIGs should have been less likely to intervene), and (*iii*) a Yes vote share between 40 and 60 percent (those for which the result was less clear).

Figure 6 visualizes the results. Overall, average donations tend to be higher for representatives with a rank around the center, which is in line with the idea that marginal repre-

[32] Specifically, we estimate for each roll-call in our data set the propensity of each representative to vote Yes, given their first and second dimension DW-Nominate score values of the respective congress. DW-Nominate scores (Poole and Rosenthal, 1985) are a broadly applied measure of a representative's policy position in a multi-dimensional policy space that are computed based on roll-call records (see, e.g., Voeten 2000, Desposato Desposato, Shor and McCarty 2011). It is widely acknowledged that DW-Nominate scores are strong predictors of representatives' voting behavior. Data on DW-Nominate scores is provided by voteview.com.

[33] We only use information on bills for which we can recover the propensities and in which at least 400 representatives voted during election years.



(a) Predicted to narrowly fail (but still pass) (b) Predicted to clearly pass (and pass)

Figure 7: These figures visualize average donations to legislators grouped by their rank in the probability to vote Yes on a particular bill and for two types of votes. First, for bills that were expected to narrowly fail (with a predicted Yes-vote share between 45 and 50) which in the end narrowly passed (with a realized Yes vote share between 50 and 55). Secondly, for bills that were predicted to clearly pass (with a predicted Yes vote share between 65 and 80) which in the end were clearly passed (with a realized Yes-vote share of 65 and 80).

sentatives are more likely to be targeted. Furthermore, we observe that the peak of average donations for the predicted marginal representatives is especially pronounced for votes with a less clear vote outcome - those with a resulting Yes vote share between 40 and 60.

In a next step, we use the propensity to vote Yes to predict the expected vote outcome, counting representatives with a propensity of over 55 percent to vote Yes in a given roll-call as an expected Yes vote. We repeat the exercise above for two types of bills. Firstly, bills for which the predicted vote outcome would have been between a Yes vote share of 45 and 50, i.e., which were expected to be narrowly declined, which however in the end were narrowly passed with a Yes vote share between just above 50 and 55 percent. Secondly, we use bills which were expected to pass with a clear majority (a Yes-vote share between 65 and 80), which in the end were indeed passed by such a clear majority. If our reasoning holds and SIGs pay marginal representatives, the pattern observed before should be even more distinct for the former group of bills, while it should be less distinct for the latter. Figure 7 presents the results. Indeed we observe that marginal representatives around bills that were expected to narrowly fail but were in the end narrowly passed receive higher donations than do the already decided representatives. This pattern is much less distinct for bills that were expected to pass and were clearly passed in the end. This provides us with descriptive evidence that SIGs contribute to marginal representatives and that this seems to be more pronounced for bills which are expected to be contested.

6.4 Are donations related to the support of bills?

If SIG impact indeed works through monetary contributions, the discontinuity of donation flows to representatives who voted Yes should be larger than for those who voted No. This is because our evidence suggests that lobbying to pass bills outweighs lobbying in the other direction.

To see whether representatives who voted Yes really received more donations, we estimate the discontinuity in total daily donation flows within $\pm$ 4 weeks of the vote, once over all donations made to representatives who voted Yes and once over all donations to representatives who voted No. More specifically, we calculate the total of daily donations to Representatives who approved one bill on a specific day and those who did not approve a bill on that day. This is of course an approximation, as we can only assign donation flows to days and not directly to bills. However, if there is a systematic relationship between Yes-voters and the discontinuity, this should nevertheless be captured in this approximation. Results for estimating the discontinuities in daily total donation flows to Yes and No voters are summarized in Table 3. We find that only total donation flows to representatives who voted Yes in election years feature a positive significant discontinuity, and that there is no systematic discontinuity for representatives who voted No. The result suggests that donors systematically target those representatives who are willing to vote for the bill (if paid). The graphical representation of the pattern in donation flows to Yes and No voters around the threshold can be found in the Appendix (Figure A3 presents results for election years, and Figure A4

Table 3: Discontinuity in total donations to representatives who vote Yes or No

	I	II	III	IV	V	VI
Sample						
Years	*Overall*	*Elec.*	*NonElec.*	*Overall*	*Elec.*	*NonElec.*
Voted (Yes/No)	Yes	Yes	Yes	No	No	No
$\Delta(Money)$	1,569,347.53	3,414,589.71	−597,052.38	29,604.97	4,131.03	−487,445.43
*lower*99%	826,844.42	2,219,621.63	−1,369,124.79	−571,390.64	−954,338.32	−1,075,303.53
*upper*99%	2,391,758.63	4,724,345.18	−10,272.40	516,403.02	872,973.61	33,516.41
h	1	1	1	1	1	1
N	707,028	322,107	384,921	707,028	322,107	384,921
Nboot	1,000	1,000	1,000	1,000	1,000	1,000

Notes: Local linear discontinuity estimates including 99% bootstrap confidence intervals. *Money* stands for total donations that were made to representatives who voted, Yes or No, on the respective day of the vote within a range of 4 weeks before or after the vote date.

for non-election years).[34]

6.5 Alternative mechanism: postponed bills

Finally, we attempt to check the competing hypothesis that the excess passed bills emerge due to a well-informed Speaker of the House who uses her agenda-setting power to postpone votes on bills until the necessary number of representatives has been convinced and the bill will be passed with certainty. While this explanation would still imply the impact of a specific interest on legislators' decision making and information about the a priori outcome, it would suggest a different channel for producing the discontinuity at the pass margin and would be hard to align with the coinciding discontinuity in donations as well as the fact that it seems to be driven by bills of particular interest for SIGs.

[34] In election years, donations to Yes voters feature a distinct positive jump and the expected wing-like behavior around the threshold, while donations to those who voted against a bill peak around the threshold but feature no distinct discontinuity. The time pattern of donations shows the similar systematic behavior to that found before, in election years (Figure A5 in the Appendix). We see that the observed pattern of donation flows in non-election years, despite featuring a significantly negative drop at the threshold (see Table 3 overall), does not look systematic at all (Figure A4). There is no distinct pattern around the margin. This is also confirmed by the rolling estimates in Figure A6 in the Appendix. If we take a smaller subset of donations, the statistical significance in non-election years for donations to Yes and No voters disappears, while donations to Yes voters in election years robustly show the same time pattern as the overall donations investigated previously.

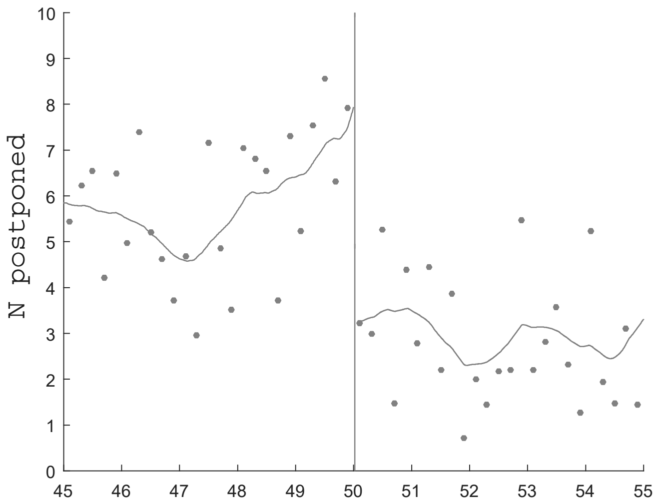


Figure 8: Local linear smooth of the total number of postponements by bill. The gray dots represent raw means of the dependent variable within bins of 0.2 percentage points.

In order to assess whether the postponement of bills might be one potential driver of the excess passed bills, we leverage the fact that we can reconstruct the history of actions taken on each bill. In order to do so, we collect data on all legislative actions taken on each of the bills going to the floor in the US House during the observation period of our main analysis.[35] We then annotate the histories of each of these bills, keeping track of which action was taken in which chamber at which point in time. The resulting dataset of bill histories enables us to count the number of times a proceeding on a bill was postponed before it was voted on.[36] Further, we assign to each bill the number of postponements before the last vote we observe on a particular bill. If postponements could explain our observation of excess passed bills, we should also observe that narrowly passed bills were on average postponed more often.

Figure 8 shows the resulting pattern in the number of postponements around the pass margin. The number of postponements tends to be higher for bills that are narrowly declined compared to those narrowly passed. On average, bills that were narrowly declined had 4.67

[35] This data was collected from the Library of Congress.

[36] We code a proceeding as postponed if the description text of a specific action contains the terms "postpone", "Postpone", "postponed", "or Postponed".

more postponements than those that were narrowly passed. The discontinuity in the number of postponements is, however, not significant on conventional levels. This finding shows that, if anything, the postponement of proceedings on bills works against the proposed alternative mechanism.

6.6 Robustness of main findings

In order to validate the robustness of our evidence, we perform several validation checks on the sample of votes in election years that drive our main findings.

Placebo test with non-strategic donations

If the discontinuity in donation flows is really due to strategic donating in order to influence representatives' voting behavior, we would expect that very low individual donation flows do not drive our effect.[37] These low donations are normally sympathy statements from private persons that are arguably not intended to impact representatives' voting. This is exactly what we find when repeating the discontinuity in total donation estimates for a subsample of 'low' individual donation flows below USD 30, 40, 50, and 100. They do not feature systematic discontinuities at the pass margin. The detailed results are presented in Table A4 in the Appendix.

Placebo thresholds In order to validate that our evidence is indeed driven by the incentives around the pass margin, we repeat our analysis of the density at several placebo thresholds without incentives for strategic influence. We do not observe any systematic discontinuities in the density at these placebo thresholds (see Figure A12 in the Appendix). These estimates are not only insignificant, but are also much smaller than those at the investigated vote

[37] High campaign finance donations by individuals might still capture some special interests as shareholders, CEOs, and board members of specific companies might intend to specifically influence Representatives through donations in the context of legislation that is particularly relevant for their industry. Recent revelations by Estes and Novak (2016) suggest that firms might even systematically organize and refund donations which are made by their executive employees. In contrast, very low donations by a broad range of individual donors are less likely to be the result of coordinated SIG efforts.

threshold. They suggest that the striking excess mass is specific to the strategic threshold above 50 percent. This also holds for estimates of the discontinuity in total daily donation flows at the alternative thresholds presented in Figure A13 in the Appendix. The fact that we do not find any response at thresholds without systematic incentives supports the systematic interpretation of our findings and defuses concerns that our findings are driven by the estimation techniques used.[38]

Influential observations

We check whether our results could be driven by single influential observations or years. In Figure A14, we present the discontinuity in density estimates in which we drop one year at a time. The estimates are rather stable and remain significantly different from zero at the 5% level. We also repeat this strategy for the discontinuity in donation estimates, using the time range between two days prior to and three days after the vote in election years (driving our results). Again, the results do not seem to be driven by single observations or years, as the estimates remain rather stable (as shown in Figure A15 in the Appendix). Moreover, our results are robust to the exclusion of the years 2001 and 2002, when seats in the House were divided equally between Democrats and Republicans. Thus, our results are not driven by a strict party alignment either. Further, our results are also robust to the exclusion of votes in November of the election years, where donations peak. This is also true when excluding, for example, votes between October and December.[39]

Sensitivity with respect to the bandwidth choice

We repeat our main estimates for a range of bandwidths, and do not find a particular sensitivity. Results of this analysis for the discontinuity in density estimates can be found in Table A5 in the Appendix. The check for bandwidth choice sensitivity for the discontinuity

[38] In addition, this finding alleviates the concern that the estimated discontinuity is driven by the nature of our empirical data, which is not continuous in a strict way. If our finding would be driven by discontinuities due to the nature of our data, we would also expect to estimates systematic discontinuities at other points of the distribution.

[39] The results of these additional analyzes are available upon request.

in donation flow estimates, using the time range between two days prior to and three days after the vote in election years, is presented in Figure A16 in the Appendix.[40]

Sensitivity with respect to SIG-topic categorization

We validate the sensitivity of our estimates with respect to our SIG and non-SIG categorization with regard to single topics. To do this, we repeat the estimates on the subsamples of topics, leaving out one topic category each time. The results of this exercise are reported in Tables A6 and A7 in the Appendix. We do not find that the results change qualitatively, either for the density, or for the donation flow estimates. Therefore, no topic category seems to drive our overall conclusion that there is evidence for impact of donation flows in SIG votes, while there is no such evidence in non-SIG votes.

6.7 More money more impact? Citizens United v. FEC

The evidence documented above suggests that moneyed interests have a rather remarkable impact on contested roll-call votes in the House.

Concerns that campaign finance contributions could affect political decisions in such a direct way has been controversially discussed both in the public discourse and the academic literature in the USA and abroad for many years (see, e.g., Lessig 2011). While this has led in some cases to more restrictive rules at the state-level (see, e.g., the 2009 campaign finance law reform in New Mexico –2009 N.M. Laws, Chap. 68), policy changes at the federal level have, rather, removed limits to moneyed interests' potential impact on the political process in the USA. Most prominently, the Supreme Court's decision in *Citizens United v. FEC*.[41] ruled state-level campaign finance regulations limiting or banning election-related 'independent expenditures' by corporations and unions unconstitutional and hence opened doors for unlimited election-related 'independent expenditures' through so-called super PACs.

[40] As our evidence is due to a local phenomenon around the threshold the size of the estimates naturally decreases if we include wider and wider windows around the threshold.

[41] Citizens United v. Federal Election Commission, No. 08-205 (U.S. Jan. 21, 2010).

While there is no concise consensus with regard to what exactly the net consequences of the landmark decision are, there is rather wide agreement that, if anything, the influence of organized interests (particularly of well-financed interests) on politics was strengthened. In fact, the sentiment that the court's decision might substantially extend corporate interests' influence on politics in the United States, was already quite clearly expressed by Justice Stevens in the dissent to the decision: "The financial resources, legal structure, and instrumental orientation of corporations raise legitimate concerns about their role in the electoral process. Our lawmakers have a compelling constitutional basis, if not also a democratic duty, to take measures designed to guard against the potentially deleterious effects of corporate spending in local and national races."[42]

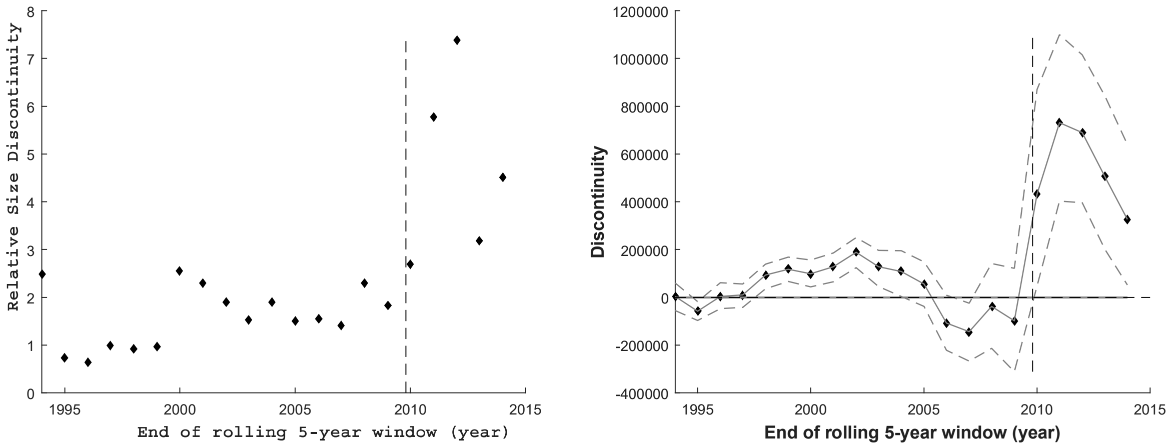
If SIGs exert control over narrowly decided vote outcomes by means of campaign contributions, we might expect SIGs to have larger influence on vote outcomes under a regime allowing unlimited election-related 'independent expenditures' by SIGs ('post Citizens United', i.e. during the time after the Supreme Court's decision), than under a regime that bans or limits such expenditures. In order to investigate whether the impact of moneyed interests on vote outcomes in contested roll-calls has indeed increased post Citizens United, we re-estimate the discontinuities documented above for rolling windows of 5 years (covering the time before and after Citizens United). The results, presented in Figure 9, display the last year of each window (i.e., the year the estimate is assigned to) on the horizontal axis. For example, the estimate at 1994 is the estimate including the years 1990 to 1994 and the last estimate at 2014 includes the years from 2010 to 2014, and thus the period after the Supreme Court's decision. In order to make the estimated discontinuities in the vote outcomes distribution better comparable over the years, we present them in relative terms (f_r/f_l). Figure 9a shows the results for the vote outcomes.[43]

Evidently, the relative size of the discontinuity in the density is strongly amplified in the post

---

[42] Citizens United v. Federal Election Commission, No. 08-205 (U.S. Jan. 21, 2010) (Stevens, J., dissenting).

[43] The absolute values are presented in Figure A10 in the Online Appendix.



(a) Relative size of Discontinuity (f_r/f_l) (b) Discontinuity in total daily donation flows

Figure 9: Rolling 5-year window estimates for the discontinuity in the distribution of vote outcomes (displayed as the relative size of the discontinuity estimates, f_r/f_l) (left) and rolling 5-year window estimates for the discontinuity in total daily donation flows around the pass margin (right). The dots in (b) represent the discontinuity estimates and the dashed lines represent the 99% confidence bands. The dashed vertical line in both panels indicates the estimate which first includes one year of the post Citizens United period.

Citizens United period. While the point estimate just above the pass margin is about two to three times higher than the point estimate just below the pass margin in the pre-period it is around four to eight times higher in the post Citizens United period.[44] Consequently, the number of narrowly passed bills, compared to the number of narrowly rejected bills is much higher in the post-period. This would be consistent with the hypothesis that the impact of SIGs is stronger under the new scenario.

This impression is also confirmed when the corresponding result of the rolling estimates of the discontinuity in the donation flows around the pass margin presented in Figure 9b is considered. While we still see systematic positive discontinuities in the years before the decision, the estimates including the years 2010 and after are larger by an order of magnitude.[45]

While these results should not be overinterpreted, as they are simply based on a before/after

[44] The most concurrent statistically significant estimates are also observed in the estimates that include the post-decision period (years since 2010; see Figure A10 in the Online Appendix).

[45] This result also holds if only considering the donation flows between the day of the vote and the 10 days before the vote. The results of this additional analysis are available upon request.

comparison, the emerging picture is consistent with the hypothesis that moneyed interests have a larger impact on voting decisions in highly contested bills in the House after the Supreme Court's decision.[46]

Moreover, these results are consistent with the predictions of the model: if legislators are cheaper to buy (in this case because there are lower legal limitations on vote buying), we expect to observe a larger excess mass in the distribution of the Yes-vote share at the approval threshold.

7 Concluding Remarks

Contested bills in the U.S. House are systematically more likely to pass with a very narrow margin than they are to fail with such a margin. According to our theoretical reasoning, the documented statistical regularity of a discontinuity in the distribution of vote outcomes at the pass margin, coinciding with a discontinuity in the daily donation flows right around these narrowly passed bills, is evidence for a remarkably effective impact of moneyed interests on contested legislative decisions. The positive discontinuity in donation flows is mainly driven by donations to representatives who were willing to pass the bill, is present even before the vote outcome can be observed (in the days before the vote takes place), and is driven by votes on bills that are of particular interest to SIGs. Taken as a whole, our results suggest that moneyed interests systematically affect representatives' decisions on contested bills and, thus, have a substantial impact on policy decisions on controversial issues.

The results presented can be seen as first macro evidence for a vote-buying scheme vis-à-vis a scheme in which SIGs simply channel financial support to representatives with policy positions close to their own. This is an important result, as it is generally difficult to empirically determine in specific cases whether the causal direction runs from representatives'

[46] Importantly, our basic findings presented in the prior sections are not purely driven by the period after 2010. Taking only the years before, we still find the equivalent systematic patterns, but they are less pronounced in magnitude compared to the period after the decision.

policy positions to campaign support from SIGs, or vice versa. It is reasonable to assume that in practice both mechanisms are at play: SIGs support legislators whose past voting behavior is aligned with the SIG's policy preferences and legislators adjust their voting behavior due to donations received from specific SIGs (vote-buying). Our results show that the latter leaves a remarkable imprint on legislative outcomes in the U.S. House of Representatives.

References

Ansolabehere, S., J. de Figueiredo, and J. M. Snyder (2003). Why is there so little money in U.S. politics? *Journal of Economic Perspectives 17*(1), 105–130.

Battaglini, M. and E. Patacchini (2018). Influencing connected legislators. *Journal of Political Economy 126*(6), 2277–2322.

Becker, G. S. (1983). A theory of competition among pressure groups for political influence. *Quarterly Journal of Economics 98*(3), 371–400.

Bertrand, M., M. Bombardini, and F. Trebbi (2014). Is it whom you know or what you know? an empirical assessment of the lobbying process. *American Economic Review 104*(12), 3885–3920.

Bokil, H., P. Andrews, J. Kulkarni, S. Mehta, and P. P. Mitra (2010). Chronux: A platform for analyzing neural signals. *Journal of Neuroscience Methods 192*(1), 146–151.

Breton, M. L. and V. Zaporozhets (2009). Sequential legislative lobbying under political certainty. *Economic Journal 120*(543), 281–312.

Bronars, S. G. and J. R. J. Lott (1997). Do campaign donations alter how a politician votes? Or, do donors support candidates who value the same things that they do? *Journal of Law and Economics 40*(2), 317–350.

Calonico, S., M. D. Cattaneo, M. H. Farrell, and R. Titiunik (2016). "rdrobust": Software for regression discontinuity designs. *Working Paper, University of Michigan.*

Casella, A., T. Palfrey, and S. Turban (2014). Vote trading with and without party leaders. *Journal of Public Economics 112*, 115–128.

Caughey, D. and J. S. Sekhon (2011). Elections and the regression discontinuity design: Lessons from close US House races, 1942–2008. *Political Analysis 19*(4), 385–408.

Cox, G. W. and J. N. Katz (2007). Gerrymandering roll calls in Congress, 1879–2000. *American Journal of Political Science 51*(1), 108–119.

Dekel, E., M. O. Jackson, and A. Wolinsky (2009). Vote buying: Legislatures and lobbying. *Quarterly Journal of Political Science 4*(2), 103–128.

DellaVigna, S., R. Durante, B. Knight, and E. La Ferrara (2016). Market-based lobbying: Evidence from advertising spending in italy. *American Economic Journal: Applied Economics 8*(1), 224–56.

Desposato, S. W. Parties for rent? Ambition, ideology, and party switching in Brazil's Chamber of Deputies. *American Journal of Political Science 50*(1), 62–80.

Dorsch, M. (2011). Bailout for sale? The vote to save Wall Street. *Public Choice 155*(3), 211–228.

Estes, A. and V. Novak (2016). Millions in political donations fueled by matching bonuses at Boston law firm. Published online: https://www.opensecrets.org/news/2016/10/millions-in-political-donations-fueled-by-matching-bonuses-at-boston-law-firm [last checked: 4/08/2019].

Fan, J. and I. Gijbels (1996). *Local Polynomial Modelling and its Applications*, Volume 66 of *Monographs on Statistics and Applied Probability*. London: Chapman and Hall.

Felli, L. and A. Merlo (2007). If you cannot get your friends elected, lobby your enemies. *Journal of the European Economic Association 5*(2-3), 624–635.

Fremeth, A., B. K. Richter, and B. Schaufele (2013). Campaign contributions over CEOs' careers. *American Economic Journal: Applied Economics 5*(3), 170–88.

Gordon, S. B. (2001). All votes are not created equal: Campaign contributions and critical votes. *Journal of Politics 63*(1), 249–269.

Groseclose, T. and J. M. Snyder (1996). Buying supermajorities. *American Political Science Review 90*(2), 303–315.

Grossman, G. M. and E. Helpman (1994). Protection for sale. *American Economic Review 84*(4), 833–850.

Hahn, J., P. Todd, and W. van der Klaauw (2001). Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica 69*(1), 201–209.

i Vidal, J. B., M. Draca, and C. Fons-Rosen (2012). Revolving door lobbyists. *American Economic Review 102*(7), 3731.

Kalla, J. L. and D. E. Broockman (2016). Campaign contributions facilitate access to congressional officials: A randomized field experiment. *American Journal of Political Science 60*(3), 545–558.

Kang, K. (2015, 07). Policy influence and private returns from lobbying in the energy sector. *Review of Economic Studies 83*(1), 269–305.

Kau, J. B., D. Keenan, and P. H. Rubin (1982). A general equilibrium model of congressional voting. *Quarterly Journal of Economics 97*(2), 271–293.

King, D. and R. Zeckhauser (2003). Congressional vote options. *Legislative Studies Quarterly 28*(3), 387–411.

Lessig, L. (2011). *Republic, Lost: How Money Corrupts Congress - And a Plan to Stop It.* New York: Twelve.

Lindbeck, A. and J. W. Weibull (1987). Balanced-budget redistribution as the outcome of political competition. *Public Choice 52*(3), 273–297.

Loader, C. R. (1996). Local likelihood density estimation. *Annals of Statistics 24*(4), 1602–1618.

Luechinger, S. and C. Moser (2014). The value of the revolving door: Political appointees and the stock market. *Journal of Public Economics 119*, 93–107.

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

Mian, A., A. Sufi, and F. Trebbi (2010). The political economy of the US mortgage default crisis. *American Economic Review 100*(5), 1967–1998.

Otsu, T., K.-l. Xu, and Y. Matsushita (2013). Estimation and inference of discontinuity in density. *Journal of Business & Economic Statistics 31*(4), 507–524.

Persson, T. (1998). Economic policy and special interest politics. *Economic Journal 108*(447), 310–327.

Poole, K. T. and H. Rosenthal (1985). A spatial model for legislative roll call analysis. *American Journal of Political Science 29*(2), 357–384.

Porter, J. (2003). Estimation in the Regression Discontinuity Model. *Mimeo, Department of Economics, Harvard University*.

Riker, W. H. and S. J. Brams (1973). The paradox of vote trading. *American Political Science Review 67*(4), 1235–1247.

Roberti, P. (2019). Citizens or lobbies: Who controls policy? *Games and Economic Behavior 113*, 497 – 514.

Shor, B. and N. McCarty (2011). The ideological mapping of american legislatures. *American Political Science Review 105*(3), 530–551.

Snyder, J. M. (1991). On buying legislatures. *Economics & Politics 3*(2), 93–109.

Snyder, J. M. and T. Groseclose (2000). Estimating party influence in congressional roll-call voting. *American Journal of Political Science*, 193–211.

Spenkuch, J., P. Montagnes, and D. Magleby (2018). Induction in the wild? Evidence from sequential voting in the U.S. Senate. *American Economic Review 108*(7), 1971–2013.

Stratmann, T. (1995). Campaign contributions and congressional voting: Does the timing of contributions matter? *Review of Economics and Statistics 77*(1), 127–136.

Stratmann, T. (1998). The market for congressional votes: Is timing of contributions everything? *Journal of Law and Economics 41*(1), 85–114.

Stratmann, T. (2002). Can special interests buy congressional votes? Evidence from financial services legislation. *Journal of Law and Economics 45*(2), 345–373.

Stratmann, T. (2019). Campaign finance. In R. D. Congleton, B. N. Grofman, and S. Voigt (Eds.), *Oxford Handbook of Public Choice*, Volume 1, pp. 415–432. New York, NY: Oxford University Press.

Voeten, E. (2000). Clashes in the assembly. *International Organization 54*(2), 185–215.

Zitzewitz, E. (2012). Forensic economics. *Journal of Economic Literature 50*(3), 731–769.

Appendix: For Online Publication

A.I Theory: extensions and proofs

Continuous distribution of SIG benefit from the voting outcome

Let us consider a variation of the model in which φ has distribution $w(\varphi)$ on $[-1, 1]$ and cumulative distribution $W(\cdot)$. Considering the previous analysis, whenever $\delta \leq \frac{1}{2}$, the SIG contributes with probability

$$1 - W\left(\frac{1}{\gamma}\int_{\delta}^{\frac{1}{2}} \left(\sigma^i - \delta\right) d\sigma^i\right),$$

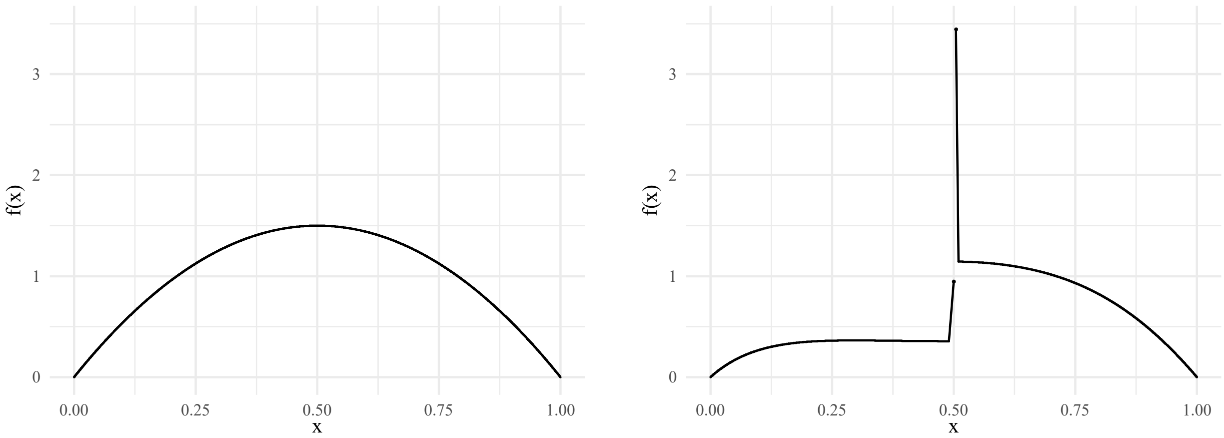
conditional on δ. Similarly, whenever $\delta > \frac{1}{2}$, the SIG contributes with probability

$$W\left(\frac{1}{\gamma}\int_{\frac{1}{2}}^{\delta} \left(\sigma^i - \delta\right) d\sigma^i\right).$$

Hence the distribution of Yes-vote share is

$$\begin{aligned} & W\left(\frac{1}{\gamma}\int_{x}^{\frac{1}{2}} \left(\sigma^i - x\right) d\sigma^i\right) f\left(x\right) && \text{if} \quad x < \frac{1}{2}, \\ \int_{\frac{1}{2}}^{1} & W\left(\frac{1}{\gamma}\int_{\frac{1}{2}}^{\chi} \left(\sigma^i - \chi\right) d\sigma^i\right) f\left(\chi\right) d\chi && \text{if} \quad x = \frac{1}{2}, \\ \int_{0}^{\frac{1}{2}} & \left[1 - W\left(\frac{1}{\gamma}\int_{\chi}^{\frac{1}{2}} \left(\sigma^i - \chi\right) d\sigma^i\right)\right] f\left(\chi\right) d\chi && \text{if} \quad x = \frac{1}{2} + \epsilon, \\ & \left[1 - W\left(\frac{1}{\gamma}\int_{\frac{1}{2}}^{x} \left(\sigma^i - x\right) d\sigma^i\right)\right] f\left(x\right) && \text{if} \quad x > \frac{1}{2} + \epsilon. \end{aligned} \tag{3}$$

The distribution of Yes-vote share shows one discontinuity at the approval threshold.



(a) Without SIG (b) With active SIG

Figure A1: The two figures show the result of numerically computing the distribution of yes vote shares, following the distribution's definition outlined above with parameter values $\epsilon = 0.1$, f is a symmetric Beta distribution with shape parameters set to $\alpha = 2$ and $\beta = 2$, and w a Beta distribution with shape parameters set to $\alpha = 5$ and $\beta = 1$, shifted and rescaled to have support $[-1, 1]$. The parameter values of w ensure that the mean of w is on the right of 0: it is more likely that the SIG supports the bill than the status quo. The integrals are computed by means of an adaptive quadrature of the corresponding integrand over the intervals indicated in (3). The left figure shows the numerically approximated distribution without the influence of SIGs for the same parameter values (only $f(\cdot)$), while the right figure shows the numerically approximated distribution under the influence of SIGs (equations (3)).

No information on the shocks to representatives' utilities

Let us consider the case in which the special interest group does not know the utility shock on any legislator. In this situation, what is its optimal strategy? By distributing m amount of money to all representatives, it is effectively increasing the probability of the bill being passed. Each legislator receives the transfer m, conditional on voting Yes. She votes Yes if $-\sigma^i + \delta + \gamma m \geq 0$. The mass of Yes votes is therefore $\delta + \gamma m$.

The probability density function of the share x of Yes votes is therefore

$$f\left(x - \gamma m\right),$$

which is a continuous function at any value x, in particular at the approval threshold $x = \frac{1}{2}$. The benefit the SIG receives from donating m to the representatives is given by v multiplied by the probability of having the bill passed $\int_{\frac{1}{2}}^{1} f(x-\gamma m)\,dx$. The cost is computed by multiplying m for the interval x of representatives who receive the contribution, i.e. the representatives who vote Yes, and the probability $f(x-\gamma m)$ that this event realizes, integrated in $[0,1]$. Hence, the utility of the SIG is

$$v\int_{\frac{1}{2}}^{1} f(x-\gamma m)\,dx - \int_{0}^{1} mxf(x-\gamma m)dx,$$

which it maximizes with respect to m, conditional on its utility being positive. If v is sufficiently large there is an internal solution $m^* > 0$ to this problem. Hence the distribution of the share x of Yes votes is shifted to the right by γm^*.

Proof of Proposition 1

The discontinuities in the distribution of the Yes vote share and in the contributions from lobbying are described in the main body of the paper. However, in the simplified case analyzed in the main body of the paper, where φ takes only three values, there are two other discontinuities at $x = \underline{\delta}$ and $x = 1-\underline{\delta}$, because the special interest group does not intervene below the first threshold and above the second threshold. This is a feature of the simplified model. Indeed, as shown in the general case where φ is distributed continuously in $[-1,1]$, only the discontinuity at the approval threshold is present.

Now let us show that the peaks in the distributions of Yes-vote share and contributions from lobbying at $\frac{1}{2}+\epsilon$ are larger than those at $\frac{1}{2}$ when $\overline{p} > \underline{p}$. In the equations that follow, for ease of exposition, we impose $\epsilon = 0$. First of all, $\underline{\delta}$ and $1-\underline{\delta}$ are symmetric around $\frac{1}{2}$. Hence, when $\overline{p} = \underline{p}$ and given the symmetry of f, it is easy to show that $\overline{p}\int_{\underline{\delta}}^{\frac{1}{2}} f(\chi)\,d\chi = \underline{p}\int_{\frac{1}{2}}^{1-\underline{\delta}} f(\chi)\,d\chi$: the two peaks are equal. When $\overline{p} > \underline{p}$, the peak in the distribution of the Yes-vote share at $\frac{1}{2}+\epsilon$ is larger than the one at $\frac{1}{2}$. Similarly, when $\overline{p} = \underline{p}$ and given the symmetry of f, we can show that

$$\overline{p}/\gamma\int_{\underline{\delta}}^{\frac{1}{2}}\int_{\delta}^{\frac{1}{2}}\left(\sigma^i-\delta\right)d\sigma^i f(\delta)d\delta + y = \underline{p}/\gamma\int_{\frac{1}{2}}^{1-\underline{\delta}}\int_{\frac{1}{2}}^{\delta}\left(-\sigma^i+\delta\right)d\sigma^i f(\delta)d\delta + y.$$

Indeed, by making a change of variables in the lhs integral, by substituting $\eta = \delta - \frac{1}{2}$ and making another change of variables in the rhs integral, by substituting $\nu = -\delta + \frac{1}{2}$ and $\zeta = 1 - \sigma$, the previous equation becomes

$$\int_{\underline{\delta}-\frac{1}{2}}^{0} \int_{\frac{1}{2}+\eta}^{\frac{1}{2}} \left(\sigma^i - \eta - \frac{1}{2}\right) d\sigma^i f\left(\eta + \frac{1}{2}\right) d\eta = \int_{\underline{\delta}-\frac{1}{2}}^{0} \int_{\frac{1}{2}+\nu}^{\frac{1}{2}} \left(\zeta^i - \nu - \frac{1}{2}\right) d\zeta^i f\left(\frac{1}{2} - \nu\right) d\nu.$$

The latter equation is satisfied because f is symmetric around $\frac{1}{2}$. Hence, when $\overline{p} > \underline{p}$, the peak in the contributions at $\frac{1}{2} + \epsilon$ is larger than the one at $\frac{1}{2}$.

Next we prove that the size of the discontinuity in the distribution of the Yes vote share at the approval threshold increases with γ. Indeed, let us compute the following derivative:

$$\frac{\partial \underline{\delta}}{\partial \gamma} = -\frac{\frac{1}{\gamma^2} \int_{\underline{\delta}}^{\frac{1}{2}} \left(\sigma^i - \underline{\delta}\right) d\sigma^i}{\frac{1}{\gamma}\left(\frac{1}{2} - \underline{\delta}\right)} = -\frac{\frac{1}{\gamma} \int_{\underline{\delta}}^{\frac{1}{2}} \left(\sigma^i - \underline{\delta}\right) d\sigma^i}{\left(\frac{1}{2} - \underline{\delta}\right)} < 0.$$

The minimum ex-ante Yes vote share for which the SIG still decides to lobby ($\underline{\delta}$) decreases in γ. Hence the SIG lobbies even for a lower δ, which implies that the discontinuity at the approval threshold increases.

Instead, the effect of γ on the discontinuity in the amount of contributions at the approval threshold is ambiguous, as the following derivative shows:

$$\frac{\partial}{\partial \gamma} \frac{1}{\gamma} \int_{\underline{\delta}}^{\frac{1}{2}} \int_{\delta}^{\frac{1}{2}} \left(\sigma^i - \delta\right) d\sigma^i f(\delta) d\delta = -\frac{1}{\gamma^2} \int_{\underline{\delta}}^{\frac{1}{2}} \int_{\delta}^{\frac{1}{2}} \left(\sigma^i - \delta\right) d\sigma^i f(\delta) d\delta +$$

$$\left[\int_{\underline{\delta}}^{\frac{1}{2}} \frac{\left(\sigma^i - \underline{\delta}\right)}{F\left(\frac{1}{2}\right) - F\left(\underline{\delta}\right)} d\sigma^i f(\underline{\delta}) + \int_{\underline{\delta}}^{\frac{1}{2}} \int_{\delta}^{\frac{1}{2}} \left(\sigma^i - \delta\right) d\sigma^i f(\delta) d\delta \frac{f\left(\underline{\delta}\right)}{\left(F\left(\frac{1}{2}\right) - F\left(\underline{\delta}\right)\right)^2}\right] \frac{\frac{1}{\gamma^2} \int_{\underline{\delta}}^{\frac{1}{2}} \left(\sigma^i - \underline{\delta}\right) d\sigma^i}{\left(\frac{1}{2} - \underline{\delta}\right)}.$$

The first addendum is negative, while the second one is positive. An equivalent result holds for the amount of contributions at $x = \frac{1}{2}$.

Proof of Proposition 2

First we prove that, as z increases, and for a given δ, the cost for the special interest group of achieving a Yes outcome decreases. First of all notice that when the SIG knows $z > \frac{1}{2}$ representatives, it does not give money to representatives with $\sigma^i > \frac{1}{2}$, because it can already win the vote by lobbying the representatives with $\sigma^i \leq \frac{1}{2}$. In this case all results for the full information case carry over, as the SIG knows sufficient representatives to pass the bill. Hence we can consider only the case in which $z \leq \frac{1}{2}$. In this situation, the cost of having the bill passed is given by $\frac{\partial}{\partial z} \int_{\delta}^{z} (\sigma^i - \delta) d\sigma^i$ for targeted contributions and $\left(\frac{1}{2} - \delta\right)(1 - z)$ for untargeted contributions, as explained in the main body of the paper. The effect of an increase in the interval of known representatives on the total amount of contributions is computed through the following derivative:

$$\frac{\partial}{\partial z} \left\{ \int_{\delta}^{z} (\sigma^i - \delta) d\sigma^i + \left(\frac{1}{2} - \delta\right)(1 - z) \right\} =$$
$$(z - \delta) - \left(\frac{1}{2} - \delta\right),$$

which is negative, because $z < \frac{1}{2}$, which implies that the SIG spends less money as z increases. The minimum ex-ante vote share $\underline{\delta}$ such that the SIG chooses to lobby representatives is defined by equating the benefit of lobbying to pass the bill v with its cost:

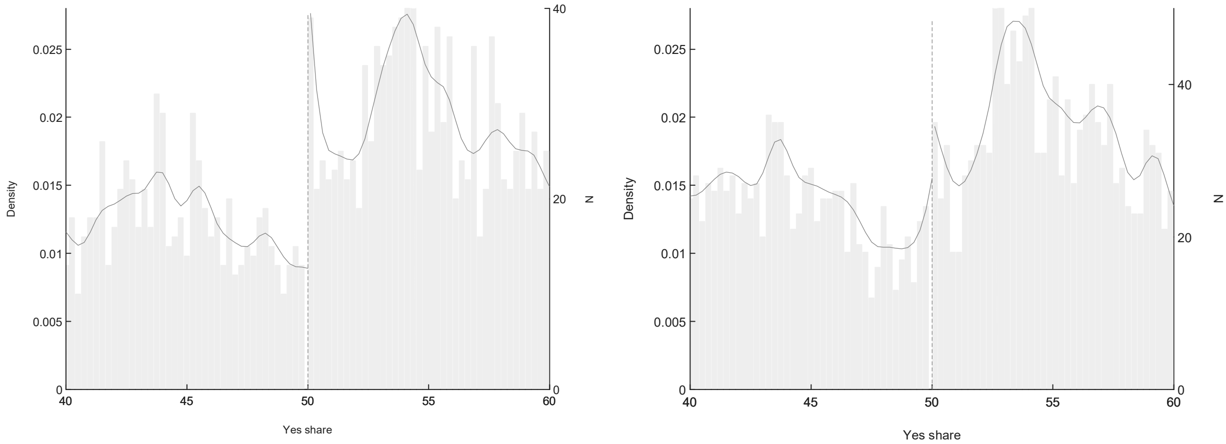
$$\gamma v = \int_{\underline{\delta}}^{z} (\sigma^i - \underline{\delta}) d\sigma^i + \left(\frac{1}{2} - \delta\right)(1 - z).$$

We now show that $\underline{\delta}$ decreases with z:

$$\frac{\partial \underline{\delta}}{\partial z} = \frac{(z - \delta) - \left(\frac{1}{2} - \delta\right)}{(z - \underline{\delta})} < 0,$$

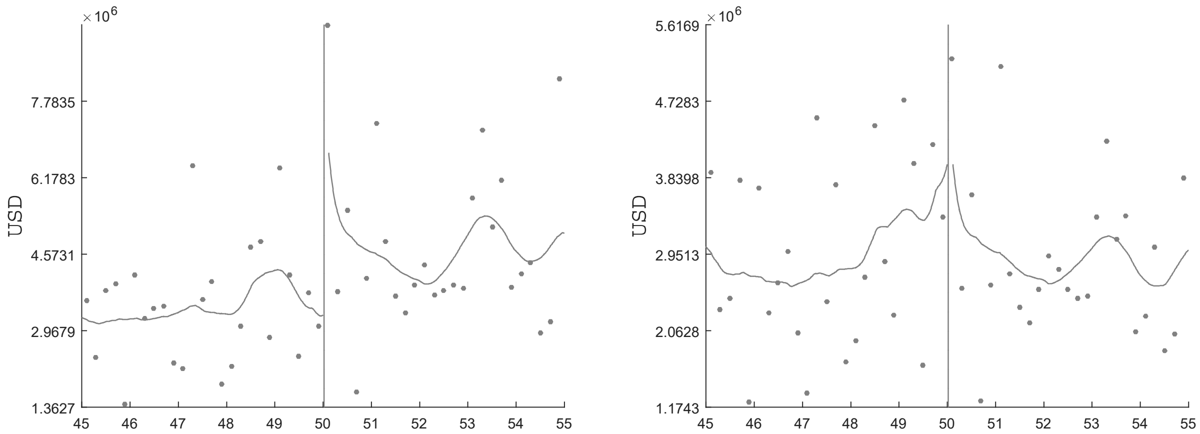
which proves the Proposition.

A.II Additional Materials



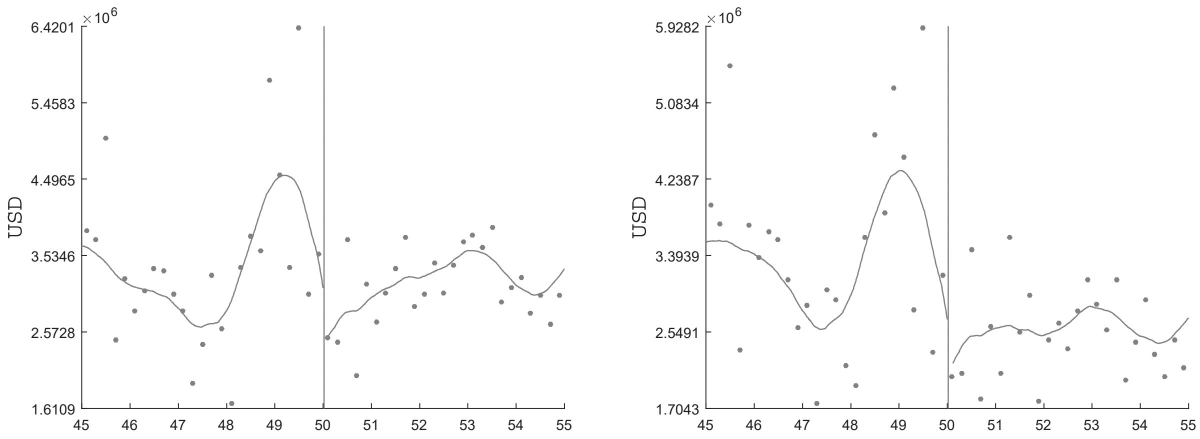
(a) Election years (b) Non-election years

Figure A2: Vote distributions in election and non-election years. The solid line represents the LLD fit on both sides of the threshold, the shaded area represents the histogram of the underlying data using a binwidth of 0.25 separately on both sides of the threshold. The corresponding density discontinuity estimates can be found in row II and III of Table 1.



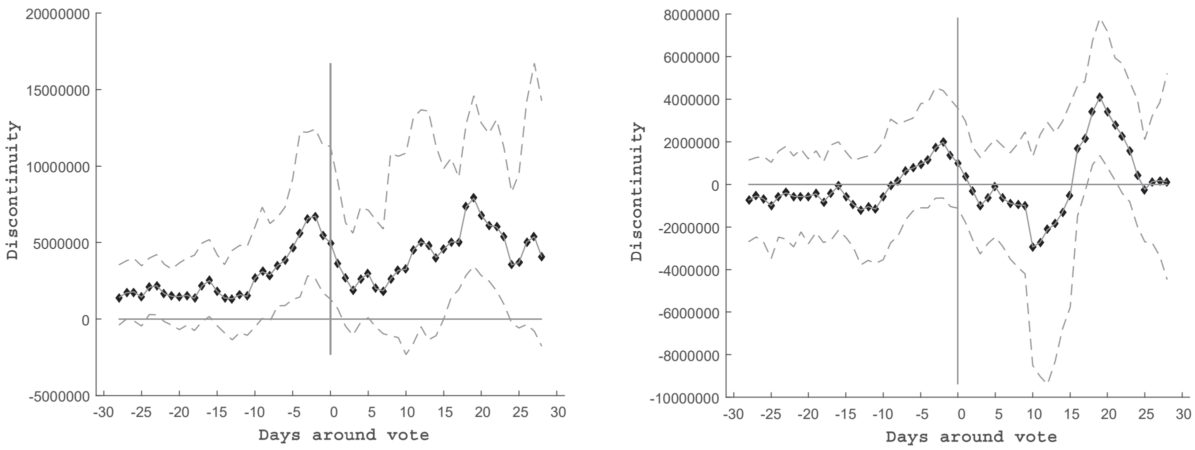
(a) Yes (b) No

Figure A3: The solid line visualizes the local linear smooth of total daily donation flows within a time span of ± 4 weeks around the vote, using all votes in election years, and total daily donations to Yes or No voters, respectively. The gray dots represent raw means of the dependent variable within bins of 0.2 percentage points.



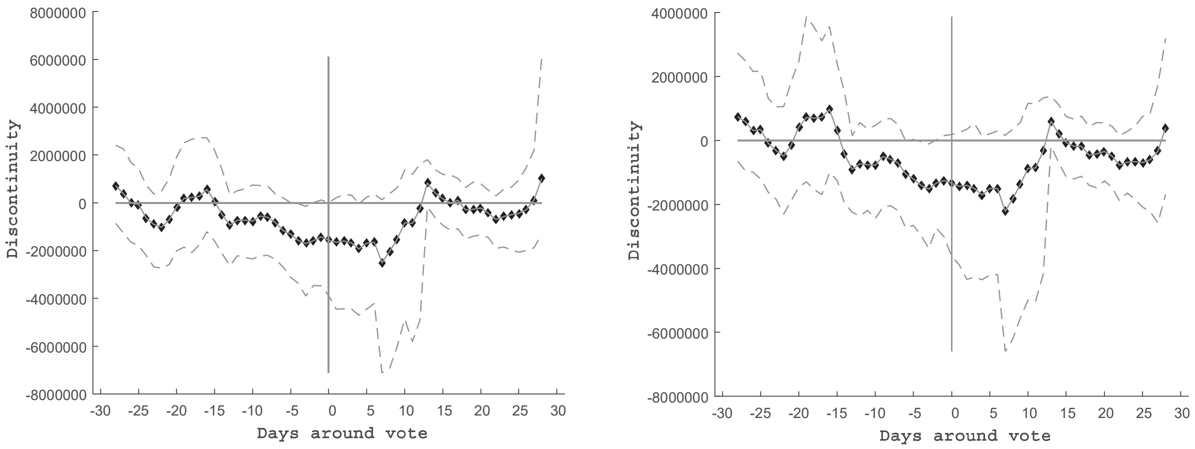
(a) Yes (b) No

Figure A4: The solid line visualizes the local linear smooth of total daily donation flows within a time span of ± 4 weeks around the vote, using all votes in non-election years, and total daily donations to Yes or No voters, respectively. The gray dots represent raw means of the dependent variable within bins of 0.2 percentage points.



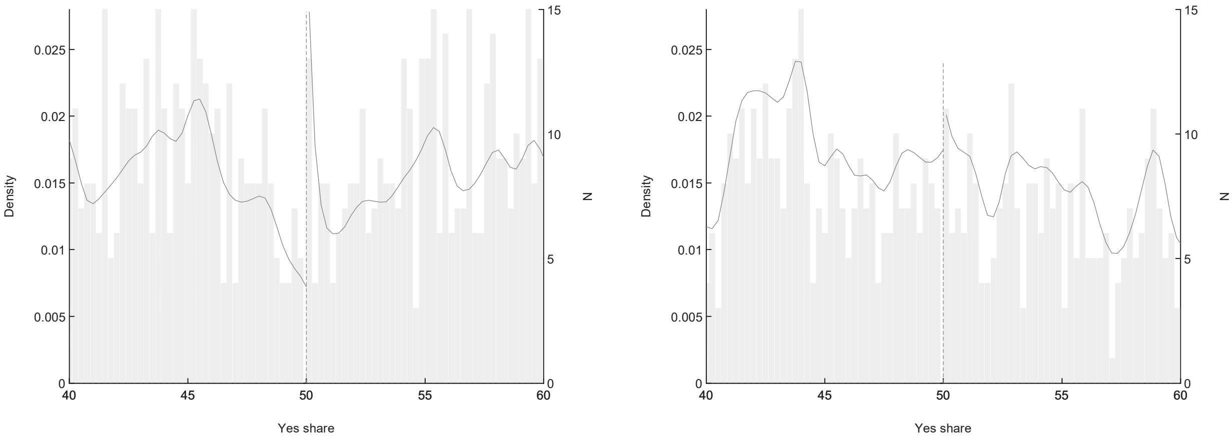
(a) Yes (b) No

Figure A5: Rolling discontinuity estimates in total donations to Yes and No voters within a 6-day band in election years. The dots represent the discontinuity estimates, and the dashed lines represent the 99% confidence bands.



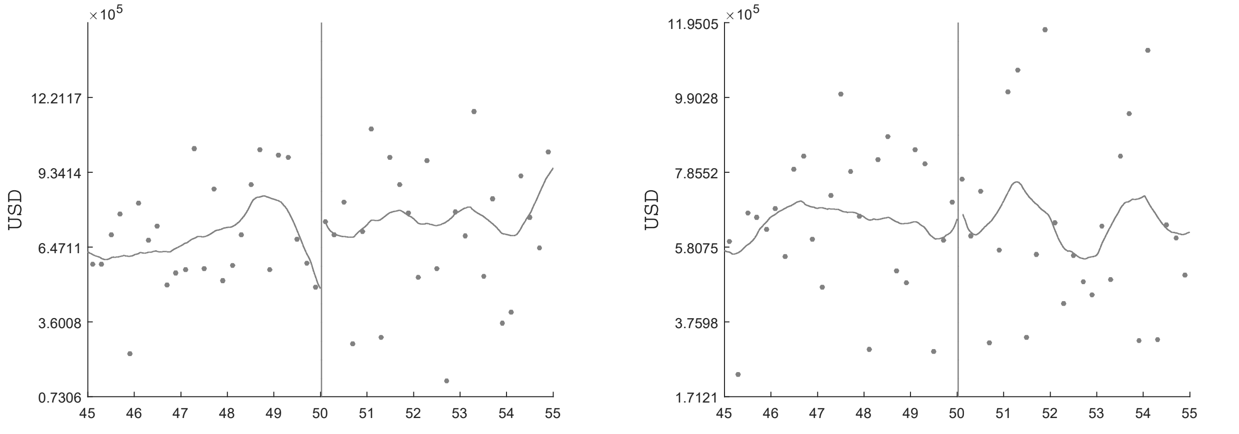
(a) Yes (b) No

Figure A6: Rolling discontinuity estimates in total donations to Yes and No voters within a 6-day band in non-election years. The dots represent the discontinuity estimates, and the dashed lines represent the 99% confidence bands.



(a) Density: SIG-related bills (b) Density: Non-SIG bills

Figure A7: Density estimates in election years for votes on bills related to special interest topics (a) and votes on bills related to non-special interest topics (b). The underlying histogram is presented in bins of 0.2 percentage points.



(a) Total donations: SIG-related bills (b) Total donations: Non-SIG bills

Figure A8: Local linear smooths of total daily donations in election years for votes on bills related to special interest topics (a) and votes on bills related to non-special interest topics (b). Both panels present the local linear fit of donation flows in the ± 4 weeks around the vote date. The gray dots represent raw means of the dependent variable within bins of 0.2 percentage points.

Table A1: SIG: Average number statements on topic by bill

SIG:	Agribusiness	Education	Health	Transportation	Energy Nat Resource	Finance/Insur. /RealEst	Misc. Business	Labor	Communication Electronics	Defense	Construction	Ideology Single-Issue	Other
Macroeconomics	0.42	0.21	0.48	0.36	0.39	1.30	1.27	1.85	0.39	0.09	0.36	2.79	0.45
Civil Righ., Minority Issues, Civil Libert.	1.45	0.18	1.36	0.64	0.73	2.91	4.73	2.36	0.45	0.00	2.64	6.18	0.73
Health	0.53	0.20	2.97	0.20	0.10	1.37	2.43	1.57	0.13	0.00	0.80	3.70	0.93
Agriculture	12.82	0.09	0.45	0.18	1.36	1.91	0.91	0.45	0.00	0.00	0.09	4.64	1.18
Labor, Empl., Immigr.	1.65	0.25	0.70	1.50	1.40	3.05	3.40	2.40	1.05	0.15	2.30	2.05	0.35
Education	0.00	1.84	0.32	0.00	0.00	0.47	0.32	1.37	0.16	0.00	0.11	2.74	0.74
Environment	4.12	0.12	0.62	0.77	3.12	2.08	1.69	0.77	0.12	0.00	2.27	4.23	0.77
Energy	1.32	0.13	0.45	0.58	4.79	3.21	1.92	1.05	0.84	0.08	1.61	3.92	0.24
Immigration	0.50	0.50	0.25	0.50	0.00	2.25	1.25	2.25	2.50	0.00	0.50	1.50	0.50
Transportation	0.37	0.00	0.21	2.16	0.11	0.63	0.68	2.11	0.11	0.00	1.37	2.05	0.95
Law, Crime, Family Issues	0.00	0.50	0.50	0.07	0.36	0.79	1.00	1.00	1.64	0.14	0.00	3.71	0.50
Social Welfare	0.33	0.22	1.22	0.22	0.33	0.56	1.00	0.56	0.33	0.00	0.11	4.67	1.78
Community Development, Housing Issues	0.00	0.00	0.00	0.00	0.00	2.62	0.31	0.23	0.00	0.00	0.54	3.23	0.85
Banking, Finance, Commerce	0.70	0.15	0.51	0.60	0.32	4.25	2.36	0.89	1.02	0.08	0.66	2.28	0.28
Defense	0.31	0.03	0.36	0.10	0.38	0.59	0.38	2.15	0.38	0.00	0.10	2.21	0.46
Space, Science, Technology, Communications	0.00	0.38	0.00	0.00	0.00	0.25	0.00	0.13	1.88	0.00	0.25	1.00	0.25
Foreign Trade	6.54	0.08	0.69	1.62	0.38	7.08	4.69	2.62	1.46	0.15	0.54	2.00	0.77
International Affairs, Foreign Aid	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	5.40	0.60
Government Operations	1.21	0.97	0.71	1.39	0.47	1.73	1.69	1.97	0.61	0.06	1.18	3.97	0.79
Public Lands, Water Management	0.96	0.02	0.00	0.30	2.45	0.34	0.83	0.13	0.19	0.00	0.32	3.45	0.64
Other	0.00	0.00	0.00	0.50	0.00	5.00	0.50	0.00	0.00	0.00	0.50	1.50	1.00
Mean	1.35	0.31	0.62	0.64	1.09	1.95	1.59	1.34	0.57	0.04	0.86	3.22	0.62

Notes: Average number of statements per bill and topic.

Table A2: Density discontinuity estimates for SIG and non-SIG topics

	c	h	$\hat{f}_l$	$\hat{f}_r$	$\hat{\theta}$	$\hat{l}r$	$\hat{f}_r/\hat{f}_l$	p-value	N
SIG									
I.	50.1149	1.0000	0.007 2	0.027 8	0.020 6	4.615 8	3.858 5	0.031 7	2,356
Non-SIG									
II.	50.1149	1.0000	0.017 5	0.020 1	0.002 6	0.055 0	1.150 2	0.814 5	1,784

Notes: Local likelihood ratio results for the discontinuity in the vote distribution for votes in election years and separately for votes considered as SIG and non-SIG topics. N stands for the number of observations with regard to the observations available for estimating the whole density in the sample.

Table A3: Discontinuity in total donations to representatives for SIG and non-SIG topics

Sample		
Votes	SIG	Non-SIG
$\Delta(money)$	251,162.53	13,712.19
$lower99\%$	134,398.23	−137,934.72
$upper99\%$	380,841.44	180,242.42
h	1	1
N	134,292	101,688
$Nboot$	1,000	1,000

Notes: Local linear discontinuity estimates including 99% bootstrap confidence intervals. *Money* stands for total daily donations within a range of 4 weeks around each vote. The sample is restricted to votes in election years and we present separate estimates for votes considered as SIG and non-SIG topics.

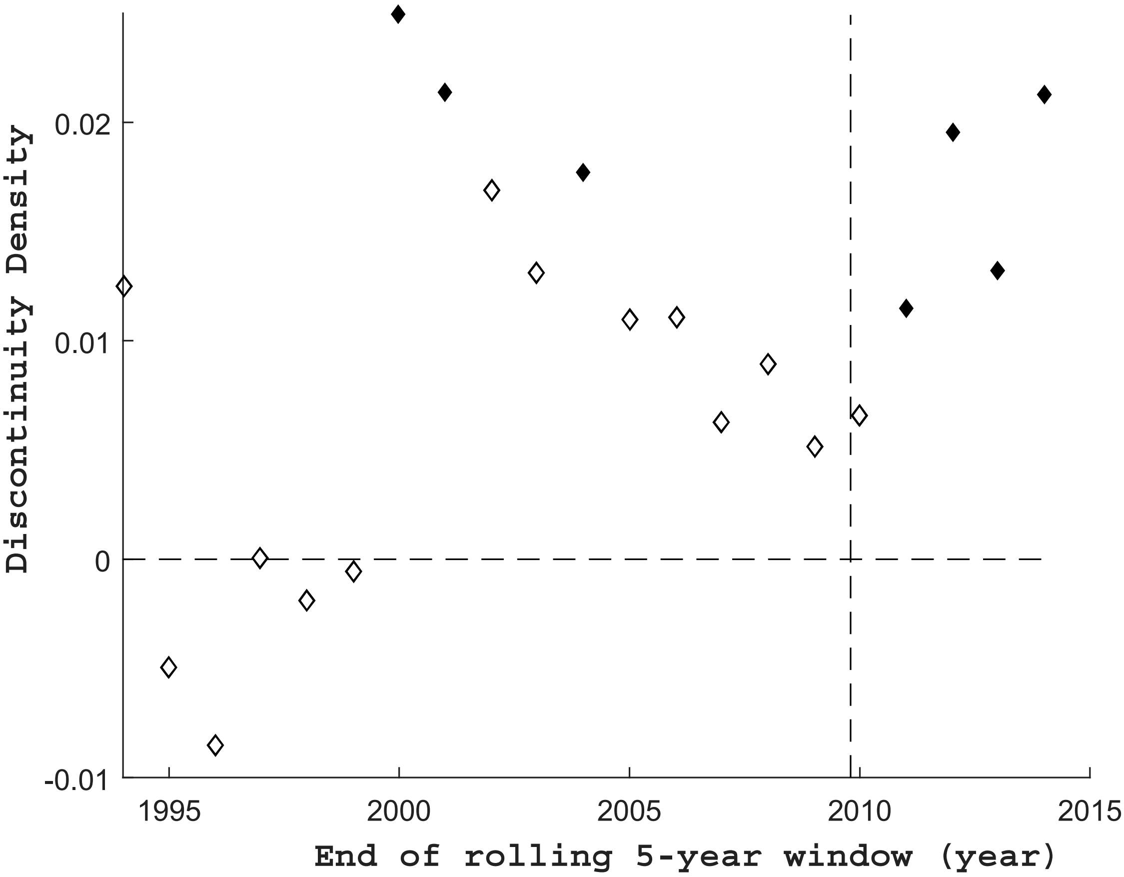


Figure A9: Discontinuity in the density

Figure A10: Rolling 5-year window estimates for the discontinuity in the distribution of vote outcomes. The figure displays the absolute discontinuity estimates, using a bandwidth of 1. Estimates that are significantly different from zero at the 10 percent level are marked with filled points. The dashed vertical line indicates the estimate that first includes one year of the post Citizens United period.

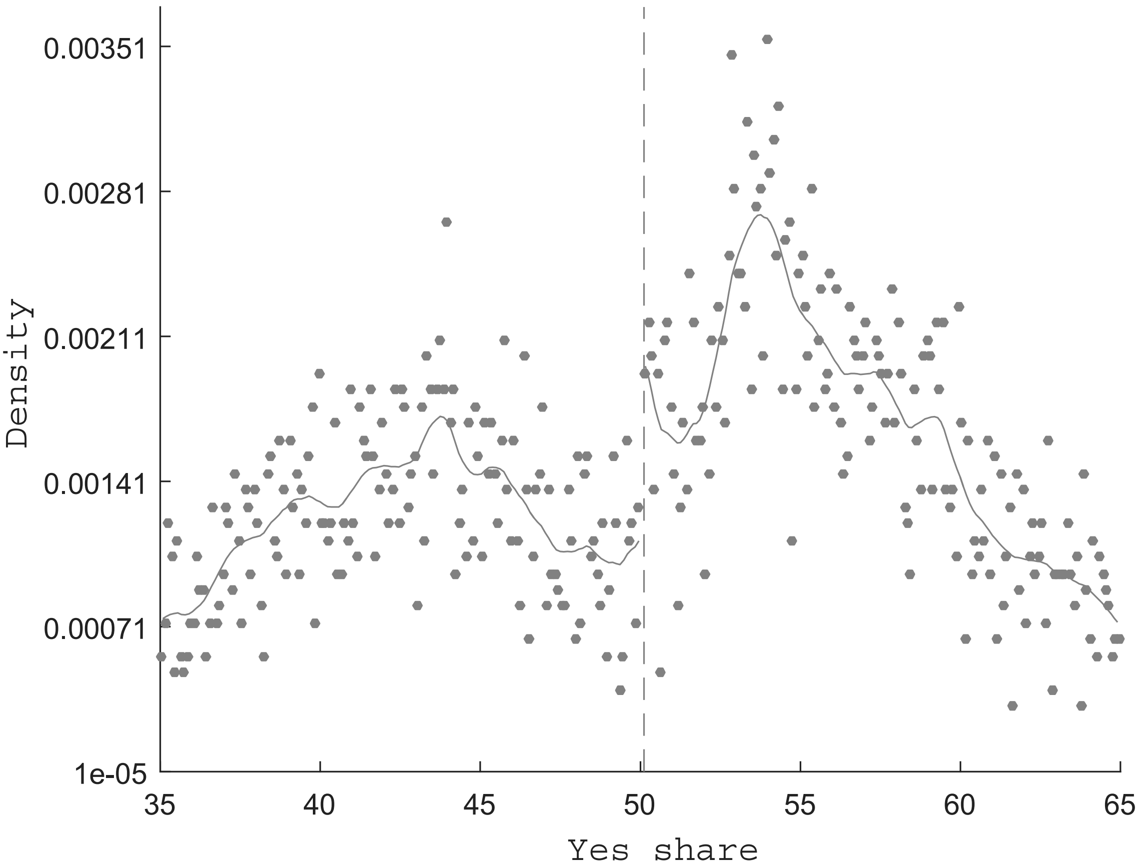


Figure A11: Vote distributions estimate using smoothed binned counts as in McCrary (2008). The smooth is a local linear smooth using a triangular kernel and the bandwidth of 1%. The bin size is 0.1%. The automated procedure in McCrary (2008) proposes a binsize of 0.47 and a bandwidth of 10.74. It renders a point estimate of log difference in height of 0.73 with a p-value of 0.075.

Table A4: Discontinuity in total 'low' individual donations

	I	II	III	IV
Sample				
Donations	Don<30	Don<40	Don<50	Don<100
Years	Elec.	Elec.	Elec.	Elec.
$\Delta(Money)$	−0.06	0.36	0.31	1.63
$lower99\%$	−0.82	−0.58	−0.54	−13.66
$upper99\%$	0.44	1.13	1.14	12.70
h	1	1	1	1
N	322,107	322,107	322,107	322,107
$Nboot$	1,000	1,000	1,000	1,000

Notes: Local linear discontinuity estimates, including 99% bootstrap confidence intervals. $Money$ stands for total daily individual donations within a range of 4 weeks around each vote, including only 'low' donation flows for below USD 30, 40, 50, and 100, respectively, in election years.

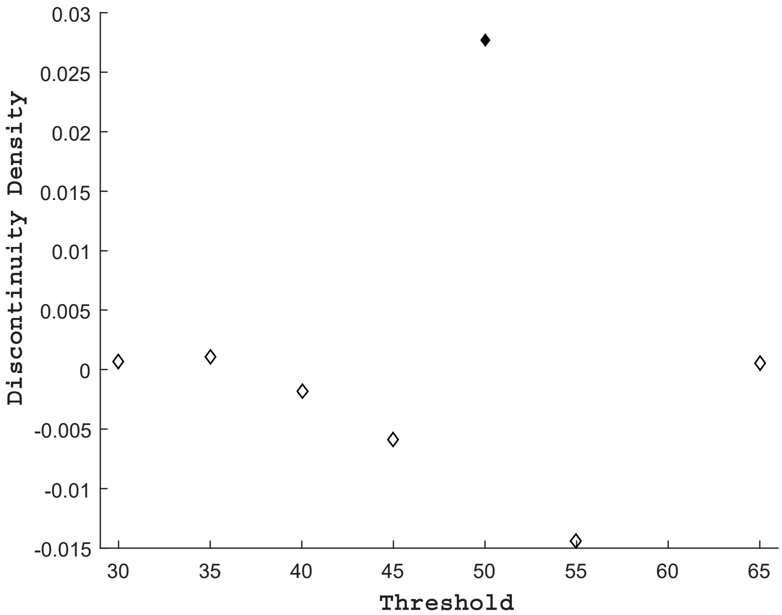


Figure A12: Discontinuity in density estimates for votes in election years at several thresholds. Estimates that are significantly different from zero at the 5 percent level are marked with filled points.

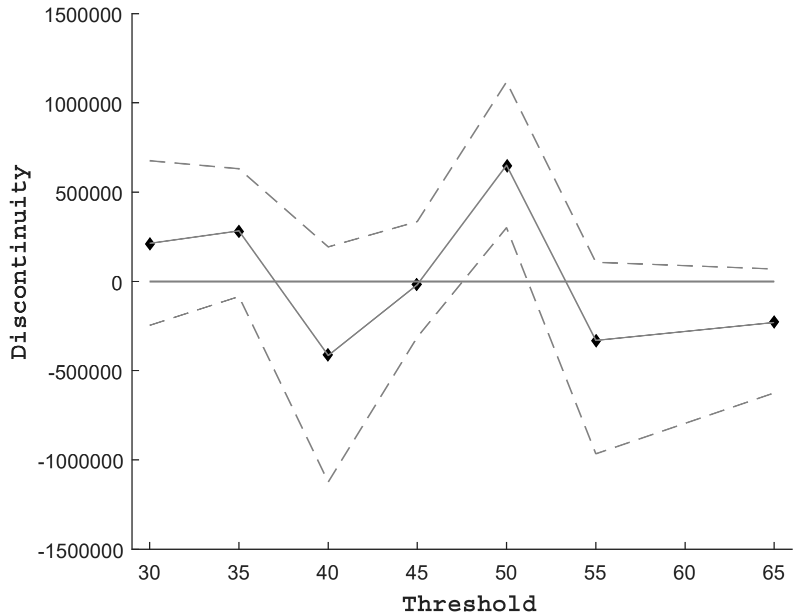


Figure A13: Discontinuity in total daily donations around votes in election years between the two days before the vote and up to three days after the vote, for several thresholds. The dots represent the discontinuity estimates, and the dashed lines the 99% confidence bands.

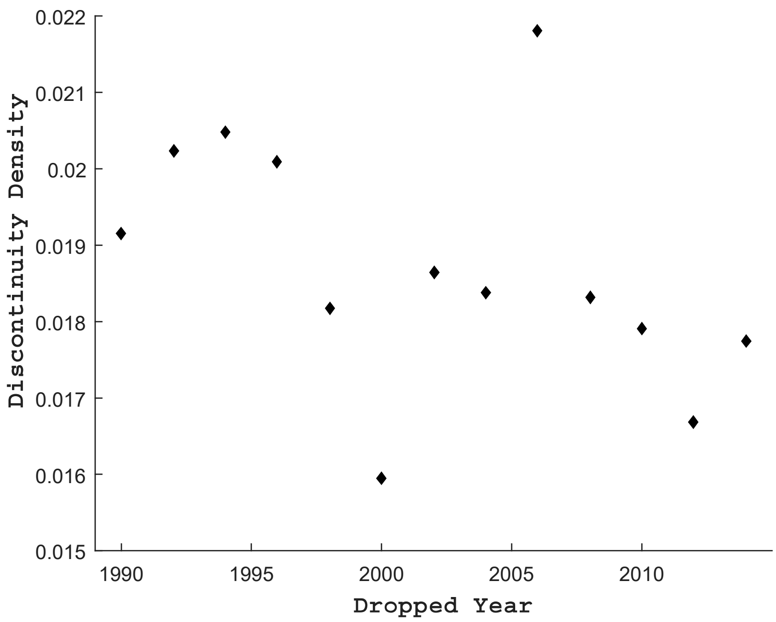


Figure A14: Discontinuity in density estimates for votes in election years dropping one year at a time. Estimates that are significantly different from zero at the 5 percent level are marked with filled points.

Table A5: Density discontinuity - Sensitivity Bandwidth Choice

	c	h	$\hat{f}_l$	$\hat{f}_r$	$\hat{\theta}$	$\hat{l}r$	$\hat{f}_r/\hat{f}_l$	p-value	N
Election years									
I.	50.1149	0.5000	0.0110	0.0387	0.0277	4.7561	3.5085	0.0292	5,651
II.	50.1149	0.7500	0.0094	0.0328	0.0234	7.6494	3.4975	0.0057	5,651
III.	50.1149	1.0000	0.0089	0.0277	0.0187	8.5755	3.1053	0.0034	5,651
IV.	50.1149	1.2500	0.0094	0.0253	0.0159	8.5918	2.7007	0.0034	5,651
V.	50.1149	1.5000	0.0090	0.0235	0.0145	9.6469	2.6176	0.0019	5,651
VI.	50.1149	1.7500	0.0086	0.0225	0.0138	11.0875	2.6034	0.0009	5,651
VII.	50.1149	2.0000	0.0083	0.0219	0.0136	12.9333	2.6264	0.0003	5,651
VIII.	50.1149	2.2500	0.0083	0.0216	0.0133	14.4692	2.6021	0.0001	5,651
IX.	50.1149	2.5000	0.0083	0.0211	0.0127	15.2205	2.5232	0.0001	5,651
X.	50.1149	2.7500	0.0085	0.0205	0.0120	15.2951	2.4091	0.0001	5,651
XI.	50.1149	3.0000	0.0087	0.0199	0.0113	15.0817	2.2962	0.0001	5,651
XII.	50.1149	3.2500	0.0088	0.0193	0.0105	14.6498	2.1931	0.0001	5,651
XIII.	50.1149	3.5000	0.0088	0.0187	0.0098	14.3839	2.1143	0.0001	5,651
XIV.	50.1149	3.7500	0.0089	0.0182	0.0093	13.9875	2.0371	0.0002	5,651

Notes: Local likelihood ratio results for the discontinuity in the vote distribution for votes in election years and for diverse bandwidths. N stands for the number of observations with regard to the observations available for estimating the whole density in the sample.

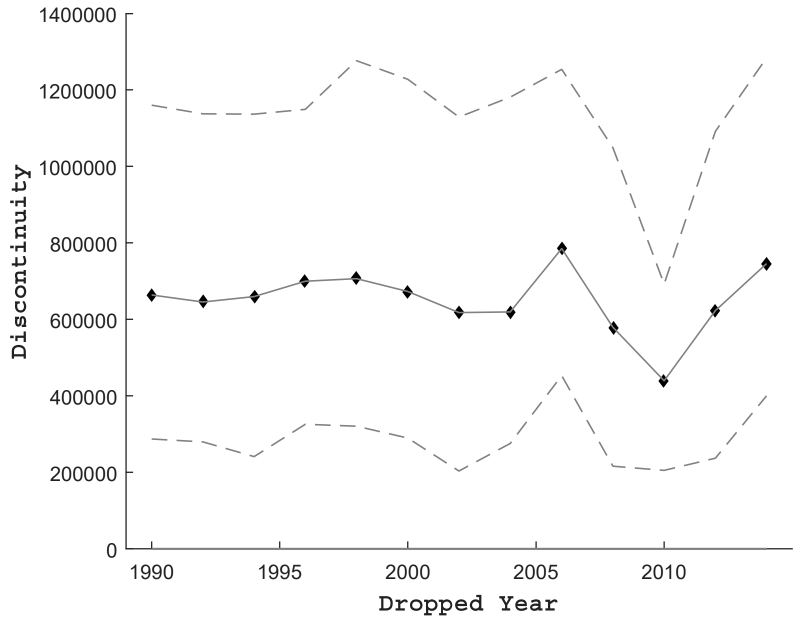


Figure A15: Discontinuity in total daily donations around votes in election years between the two days before the vote and up to three days after the vote, dropping one year at a time. The dots represent the discontinuity estimates, and the dashed lines the 99% confidence bands.

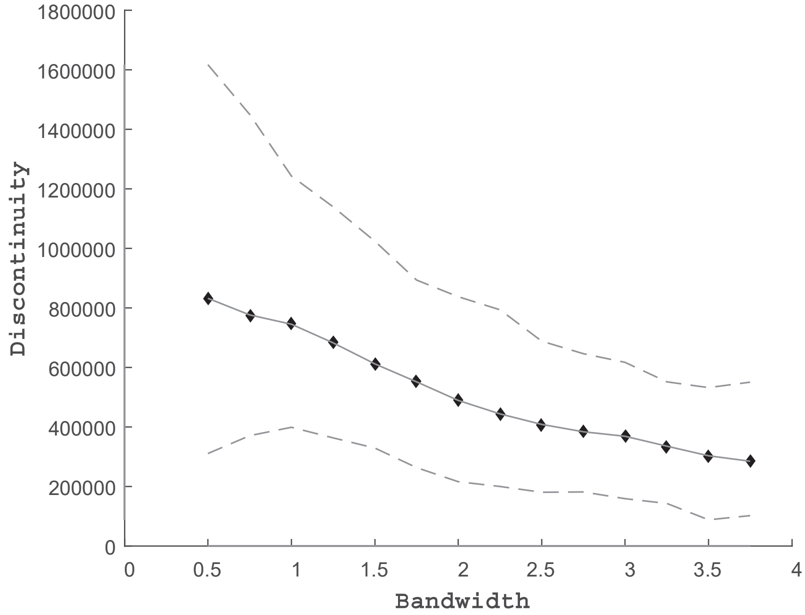


Figure A16: Discontinuity in total daily donations around votes in election years between the two days before the vote and up to three days after the vote, for diverse bandwidths. The dots represent the discontinuity estimates, and the dashed lines the 99% confidence bands.

Table A6: Density discontinuity - Sensitivity with regard to single topic categories

Category	c	h	$\hat{f}_l$	$\hat{f}_r$	$\hat{\theta}$	$\hat{l}r$	$\hat{f}_r/\hat{f}_l$	p-value	N
SIG topics									
Total	50.1149	1.0000	0.0072	0.0278	0.0206	4.6158	3.8585	0.0317	2,356
Macroecon.	50.1149	1.0000	0.0077	0.0268	0.0191	3.7342	3.4746	0.0533	2,201
Health	50.1149	1.0000	0.0078	0.0301	0.0224	4.4189	3.8785	0.0355	2,220
Agriculture	50.1149	1.0000	0.0062	0.0294	0.0233	5.1608	4.7696	0.0231	2,253
Labor, Empl., Immigr.	50.1149	1.0000	0.0075	0.0266	0.0191	3.9576	3.5629	0.0467	2,279
Environment	50.1149	1.0000	0.0076	0.0304	0.0227	4.8388	3.9814	0.0278	2,228
Energy	50.1149	1.0000	0.0078	0.0262	0.0184	3.6580	3.3642	0.0558	2,181
Transportation	50.1149	1.0000	0.0077	0.0295	0.0219	6.0053	3.8585	0.0143	2,218
Banking, Finance, Commerce	50.1149	1.0000	0.0081	0.0276	0.0195	3.6494	3.3960	0.0561	2,129
Defense	50.1149	1.0000	0.0084	0.0284	0.0200	2.9406	3.3800	0.0864	1,831
Space, Science, Techn., Communic.	50.1149	1.0000	0.0075	0.0289	0.0214	4.6158	3.8585	0.0317	2,267
Foreign Trade	50.1149	1.0000	0.0075	0.0279	0.0203	4.1886	3.6981	0.0407	2,255
Public Lands, Water Management	50.1149	1.0000	0.0029	0.0214	0.0184	7.0116	7.3214	0.0081	1,854
Non-SIG topics									
Total	50.1149	1.0000	0.0175	0.0201	0.0026	0.0550	1.1502	0.8145	1,784
CivilRigh., Minority Issues, Civil Libert.	50.1149	1.0000	0.0170	0.0209	0.0039	0.1140	1.2304	0.7356	1,712
Education	50.1149	1.0000	0.0187	0.0218	0.0031	0.0623	1.1639	0.8029	1,643
Immigration	50.1149	1.0000	0.0179	0.0193	0.0013	0.0175	1.0734	0.8948	1,737
Law, Crime, FamilyIssues	50.1149	1.0000	0.0144	0.0206	0.0062	0.3148	1.4292	0.5748	1,549
Social Welfare	50.1149	1.0000	0.0184	0.0207	0.0022	0.0367	1.1210	0.8481	1,734
Community Development, Housing Issues	50.1149	1.0000	0.0183	0.0215	0.0032	0.0720	1.1739	0.7885	1,704
International Affairs, ForeignAid	50.1149	1.0000	0.0186	0.0214	0.0028	0.0550	1.1502	0.8145	1,677
Government Operations	50.1149	1.0000	0.0148	0.0080	−0.0068	0.2565	0.5381	0.6125	732

Notes: Local likelihood ratio results for the discontinuity in the vote distribution for votes in election years and separately for votes considered as SIG and non-SIG topics. The table presents estimates for both groups, once for the overall grouping (*Total*) and once dropping one topic category at a time. N stands for the number of observations with regard to the observations available for estimating the whole density in the sample.

Table A7: Discontinuity in total donations to representatives - Sensitivity with regard to single topic categories

SIG							
Topic	*Total*	*Macroecon.*	*Health*	*Agriculture*	*Labor, Empl., Immigr.*	*Environment*	*Energy*
$\Delta(money)$	251,162.53	251,181.96	262,459.61	223,962.75	263,482.57	257,128.62	158,601.86
*lower*99%	123,663.23	126,748.63	137,662.46	88,217.53	139,805.86	132,885.97	33,463.28
*upper*99%	375,131.65	382,011.03	389,135.12	345,934.88	387,899.60	382,358.54	273,805.75
h	1	1	1	1	1	1	1
N	134,292	125,457	126,540	128,421	129,903	126,996	124,317
Nboot	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Topic	*Transport.*	*Bank., Fin. Commerce*	*Defense*	*Space. Science Techn. etc.*	*Foreign Trade*	*Public Lands Water Manag.*	
$\Delta(money)$	251,162.53	302,833.83	192,267.03	251,162.53	258,406.62	388,710.85	
*lower*99%	122,531.25	168,868.11	64,999.76	120,347.48	118,655.77	125,704.68	
*upper*99%	370,870.80	427,878.82	311,443.08	383,647.03	382,698.99	661,493.76	
h	1	1	1	1	1	1	
N	126,426	121,353	104,367	129,219	128,535	105,678	
Nboot	1,000	1,000	1,000	1,000	1,000	1,000	
Non-SIG							
Topic	*Total*	*Civil Rights etc.*	*Education*	*Immigration*	*Law, Crime, FamilyIssues*	*Social Welfare*	*Commun. Dev., Housing Issues*
$\Delta(money)$	13,712.19	−18,613.24	14,700.02	22,381.05	399.70	3,253.16	8,936.41
*lower*99%	−157,636.00	−164,468.61	−143,311.57	−130,827.33	−171,847.79	−169,964.10	−143,790.67
*upper*99%	185,131.48	149,870.50	178,150.74	197,645.85	195,597.86	163,456.56	173,938.68
h	1	1	1	1	1	1	1
N	101,688	97,584	93,651	99,009	88,293	98,838	97,128
Nboot	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Topic	*Intern. Affairs, Foreign Aid*	*Government Operations*					
$\Delta(money)$	13,712.19	49,420.34					
*lower*99%	−141,509.83	−86,144.49					
*upper*99%	156,877.72	184,690.39					
h	1	1					
N	95,589	41,724					
Nboot	1,000	1,000					

Notes: Local linear discontinuity estimates including 99% bootstrap confidence intervals. *Money* stands for total daily donations within a range of 4 weeks around each vote. The sample is restricted to votes in election years and we present separate estimates for votes considered as SIG and non-SIG topics. The table further presents estimates for both groups, once for the overall grouping (*Total*) and once dropping one topic category at a time.

A.III Data Appendix

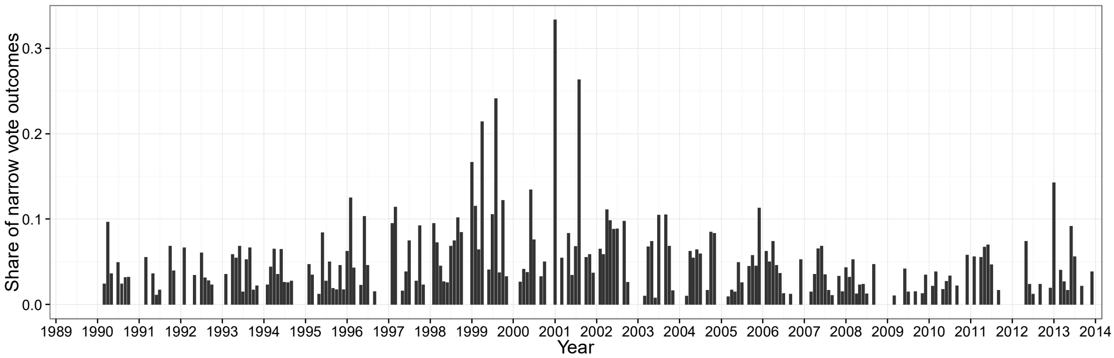
Our data set on campaign finance contributions consists of all campaign finance donations to U.S. representatives registered by the Federal Election Commission (FEC) between 1 January 1989 and 31 January 2015. The raw data is prepared by the Center for Responsive Politics (CRP) and provided by the Sunlight Foundation's Influence Explorer database (`https://sunlightlabs.github.io/datacommons/bulk_data.html`). Each row in the raw data set consists of one registered donation, mentioning the amount (in USD), the exact donation date, as well as additional information describing both the recipient and the contributor. Two additional variables are particularly relevant for our empirical analyses:

The samples we use in our analyses of donation flows are constructed as follows. For all samples, we filter out contributor-categories that either contain rare special cases of donations, or contain contributors that are not reasonable with respect to the hypotheses we want to test (i.e., self-contributions), or remainders that could not have been properly categorized. Table A8 lists the contributor-categories that are generally excluded.

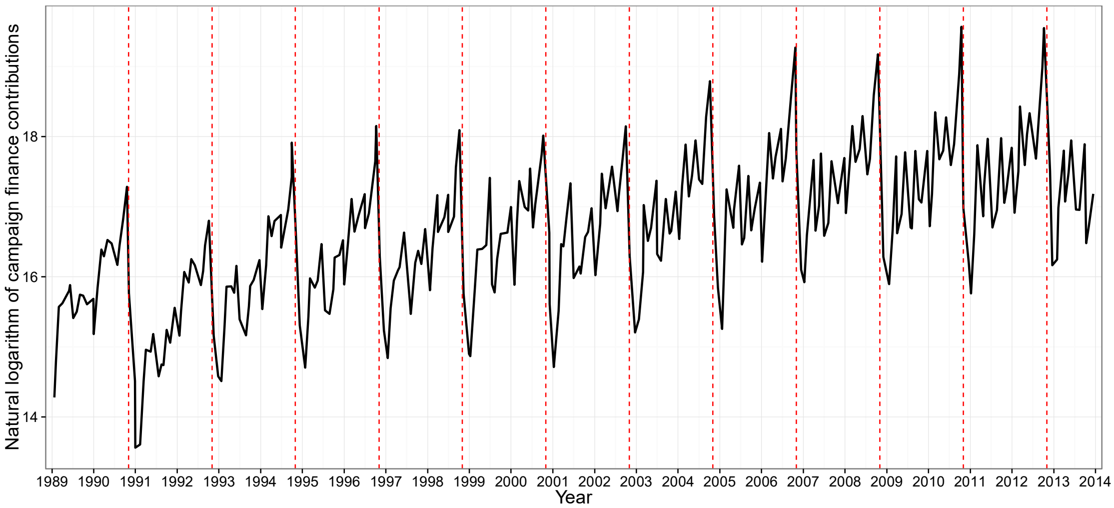
Table A8: Generally excluded campaign finance contribution categories

Code	Category	Description
Z7777	non-contribution	office use only
Z8888	non-contribution	catcode error
Z9000	candidate self-finance	candidate contribution to his/her own campaign
Z9010	candidate self-finance	Republican candidate contributions to own campaign
Z9020	candidate self-finance	Democratic candidate contributions to own campaign
Z9030	candidate self-finance	third-party candidate contributions to own campaign
Z9040	candidate self-finance	nonpartisan candidate contributions to own campaign
Z9100	party committee transfer	transfer between national party committees
Z9500	non-contribution	transfer from intermediary (type 24i or 24t)
Z9600	non-contribution	non-contribution, miscellaneous
Z9700	non-contribution	unitemized (small) contributions
Z9800	public subsidy	campaign funding from public sources
Z9999	non-contribution	internal transfer and other non-contributions

Notes: CRP campaign finance categories (and respective codes) of campaign finance transactions that are generally excluded from our analyzes.



(a) Narrow roll-call votes in the U.S. House



(b) Monthly campaign finance contributions to U.S. Representatives

Figure A17: Panel (a) shows the share of narrow vote outcomes per month. Panel (b) shows the natural logarithm of total campaign finance contributions per month. Campaign finance contributions are aggregated as the monthly sum of all donations (individual, party, and corporate/organization) to all respective U.S. representatives (and respective candidates). The vertical dashed red lines indicate election months.
Data sources: Campaign finance data: CRP and Sunlight Foundation; Roll-call votes: GovTrack (primary sources: `www.house.gov`, Library of the Congress/THOMAS.gov, GOP).

Table A9: Grouping MapLight catcodes to SIGs

Agribusiness															
A0000	A1000	A1100	A1200	A1300	A1400	A1500	A1600	A2000	A2300	A3000	A3100	A3200	A3300	A3500	A4000
A4100	A4200	A4300	A4500	A5000	A5200	A6000	A6500	A8000	G2000	G2100	G2300	G2400	G2500		
Education															
H5000	H5100	H5150	H5170	H5200	H5300										
Health															
H0000	H1000	H1100	H1110	H1120	H1130	H1400	H1500	H1700	H1710	H1750	H2000	H2100	H2200	H2300	H3000
H100	H3200	H3300	H3400	H3500	H3700	H3800	H3900	H4000	H4100	H4200	H4300	H4400	H4500	H4600	H4700
Transportation															
T0000	T1000	T1100	T1200	T1300	T1400	T1500	T1600	T1700	T2000	T2100	T2200	T2300	T2310	T2400	T2500
T3000	T3100	T3200	T4000	T4100	T4200	T5000	T5100	T5200	T5300	T6000	T6100	T6200	T6250	T7000	T7100
T7200	T8000	T8100	T8200	T8300	T8400										
Energy/ Nat Resource															
E0000	E1000	E1100	E1110	E1120	E1140	E1150	E1160	E1170	E1180	E1190	E1200	E1210	E1220	E1230	E1240
E1300	ME1320	E1500	E1600	E1610	E1620	E1630	E1700	E2000	E3000	E4000	E4100	E4200	E5000		
Finance/Insur./RealEst															
F0000	F1000	F1100	F1200	F1300	F1400	F1410	F1420	F2000	F2100	F2110	F2200	F2300	F2400	F2500	F2600
F2700	F3000	F3100	F3200	F3300	F3400	F4000	F4100	F4200	F4300	F4400	F4500	F4600	F4700	F5000	F5100
F5200	F5300	F5500	F7000												
Misc. Business															
G0000	G1000	G1100	G1200	G1300	G1310	G1400	G2110	G2200	G2350	G2600	G2700	G2800	G2810	G2820	G2840
G2850	G2860	G2900	G2910	G3000	G3500	G4000	G4100	G4200	G4300	G4400	G4500	G4600	G4700	G4800	G4850
G4900	G5000	G5100	G5200	G5210	G5220	G5230	G5240	G5250	G5260	G5270	G5280	G5290	G5300	G5400	G5500
G5600	G5700	G5800	G6000	G6100	G6400	G6500	G6550	G6700	G6800	G7000	M0000	M1000	M1100	M1300	M1400
M1500	M1600	M1700	M2000	M2100	M2200	M2250	M2300	M2400	M3000	M3100	M3200	M3300	M3400	M3500	M3600
M4000	M4100	M4200	M4300	M5000	M5100	M5200	M5300	M6000	M7000	M7100	M7200	M7300	M8000	M9000	M9100
M9200	M9300	T9000	T9100	T9300	T9400										
Labor															
L0000	L1000	L1100	1200	L1300	L1400	L1500	L5000	LA100	LB100	LC100	LC150	LD100	LE100	LE200	LG000
LG100	LG200	LG300	LG400	LG500	LH100	LM100	LM150	LT000	LT100	LT300	LT400	LT500	LT600		
Communication/Electronics															
C0000	C1000	C1100	C1300	C1400	C2000	C2100	C2200	C2300	C2400	C2600	C2700	C2800	C2900	C4000	C4100
C4200	C4300	C4400	C4500	C4600	5000	C5100	C5110	C5120	C5130	C5200	C5300	C5400	C6000	C6100	C6200
C6300	C6400	C6500													
Defense															
D0000	D2000	D3000	D4000	D5000	D6000	D8000	D9000								
Construction															
B0000	B0500	B1000	B1200	B1500	B2000	B2400	B3000	B3200	B3400	B3600	B4000	B4200	B4300	B4400	B5000
B5100	B5200	B5300	B5400	B5500	B6000										
Ideology/Single Issue															
J0000	J1000	J1100	J1110	J1200	J1300	J2000	J2100	J2200	J2300	J2400	J2500	J3000	J4000	J5000	J5100
J5200	J5300	J5400	J6100	J6200	J6500	J7000	J7120	J7150	J7200	J7210	J7300	J7400	J7500	J7510	J7600
J700	J8000	J9000	J9100	JD100	JD200	JE300	JH100	JW100							
Other															
H6000	X0000	X1200	X3000	X3100	X3200	X3300	X3500	X3700	X4000	X4100	X4110	X4200	X5000	X7000	X8000
X9000	Y0000	Y1000	Y2000	Y3000	Y4000										

Notes: Grouping of MapLight catcodes to special interest groups according to sector and industry.

//
IMPRINT

ZEW – Leibniz-Zentrum für Europäische Wirtschaftsforschung GmbH Mannheim

ZEW – Leibniz Centre for European Economic Research

L 7,1 · 68161 Mannheim · Germany
Phone +49 621 1235-01
info@zew.de · zew.de