Should We Tax or Cap Political Contributions? A Lobbying Model With Policy Favors and Access

Christopher Cotton*

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Abstract

This paper develops a model of political contributions in which a politician can either sell policy favors, or sell access. Access allows interest groups to share hard information with the politician in support of their preferred policy. Here selling access maximizes policy utility, while selling policy favors maximizes total contributions. Imposing a binding contribution limit makes it more likely that the politician sells access, which can improve expected constituent welfare. However, a contribution limit distorts the signals associated with the contributions, which tends to result in worse policy. Alternatively, a tax on political contributions can ensure that the politician sells access without distorting his information. Therefore, from the viewpoint of a representative constituent, a tax on contributions is strictly preferred to a contribution limit or no reform. The politician, however, may prefer regulation in the form of a contribution limit, even when a tax is better for the constituent. (*JEL* D72, D44, D82, D78)

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*cotton@miami.edu, Department of Economics, University of Miami, Coral Gables, FL 33146. I greatly appreciate comments and advice from Talia Bar, Kaushik Basu, Dan Benjamin, Jayant Ganguli, Bard Harstad, Ben Ho, Justin Johnson, Antonio Merlo, Ted O'Donoghue, Joe Price, Josh Teitelbaum, two anonymous referees, and especially Steve Coate, as well as comments from participants at various seminars and conferences. Mistakes are my own.

1 Introduction

How might political contributions influence the decisions of politicians? The economics and political science literature highlight two means of influence. First, money may be contributed in a quid pro quo exchange for a policy favor or favorable vote on an issue. Second, money may be contributed to help secure access to a politician, where access allows one to influence policy through the provision of evidence in favor of one policy, or against another.[1] The theoretical literature includes both models in which politicians sell favors (e.g., Grossman and Helpman 1994, Baye et al. 1993, Tullock 1980) and models in which politicians sell access (e.g., Austen-Smith 1998). This paper allows for both of these possibilities, developing a game theoretic model in which a politician *chooses* whether to sell favors or to sell access. It then uses the framework to assess two different campaign finance reforms, including taxing contributions and imposing contribution limits.

This is the first paper in which a politician chooses between *selling* policy favors and *selling* access.[2] If the politician sells favors, he does so using an all-pay auction, rent-seeking mechanism as is common in the lobbying literature (e.g., Gavious et al. 2002, Che and Gale 1998, Baye et al. 1993). Interest groups simultaneously submit contributions to the politician, then the politician votes in favor of the highest contributor. Alternatively, the politician may sell access through a similar process in which groups submit contributions and the high contributor wins access. An interest group with access can present hard evidence to the politician in support of its preferred policy. A politician who learns all evidence can identify and implement his fully-informed policy, which maximizes constituent welfare.

The contributions-for-access model developed here is a tractable framework that is relatively straightforward to incorporate into a similar model of policy favors. Interest groups provide contributions in competition for access, just as they provide contributions in competition for favors in

[1]Interest groups and individuals may also provide contributions to help certain politicians compete for and win (re)election (e.g., Coate 2004b). There is evidence that some interest groups provide political contributions to influence elections, while other groups provide contributions in an effort to influence the votes of sitting legislators (e.g., Herndon 1982, Snyder 1992, Stratmann 2005). How money affects the votes of sitting legislators is open to debate, as the empirical evidence supports both contribution-for-policy favors and contributions-for-access stories. In both cases, higher contributions are correlated with favorable votes; and there is little data available to distinguish between the two stories. By making the choice between selling access and selling favors endogenous, this paper determines when the politician prefers to engage in either activity.

[2]Bennedsen and Feldmann (2006) and Dahm and Porteiro (2008b,a) allow interest groups to influence policy through both the disclosure of hard evidence and the quid pro quo exchange of contributions for policy favors. In these previous models, however, the politician does not control which groups can disclose information, and he is unable to provide access based on contributions.

more traditional lobbying games, including the one used to model the allocation of policy favors in this paper.[3] In the equilibrium of the competition for access game, an interest group with stronger evidence in support of its preferred policy is willing to contribute more in an effort to win access than is an otherwise similar group with weaker evidence. When the politician sells access, he learns about interest group evidence through the revelations of groups with access, *and* through the signaling power of interest group contributions. In equilibrium, selling access allows the politician to become fully informed about the evidence of both interest groups even when he only gives access to one of the groups.

When the politician sells access, contributions allow him to become more informed about the issue, and to choose better policy than he otherwise could. In addition to caring about policy, however, the politician also cares about collecting political contributions. Although selling access results in the politician collecting some contributions, he expects higher total contributions when he sells policy favors instead of access.[4] Therefore, his choice of whether to sell favors or sell access depends on the issue. For important-enough issues—those for which the politician has the most to gain from choosing the best policy—the politician sells access. For less-important issues he sells favors, sacrificing policy utility and constituent welfare in order to collect larger contributions.

A contribution limit (i.e., bid cap) can reduce expected total contributions both when the politician sells policy and when he sells access. The limit tends to have a larger impact on contributions in the policy favor game, making selling policy favors relatively less attractive compared with selling access. A contribution limit can result in the politician selling policy favors for a smaller range of issue. The downside of a limit, however, is that it distorts the signaling power of the contributions when the politician does sell access. This means that, conditional on the politician selling access, he tends to be less informed and chooses worse policy when there is a contribution limit compared to when there is no limit. Although I show that there exists a binding contribution limit that improves expected constituent welfare, this is not necessarily true of all limits. It is never optimal to ban contributions.

Alternatively, society may tax political contributions. Similar to a limit, a tax reduces the

[3]See for example the models by Che and Gale (1998), Gavious et al. (2002), Holt (1979), Holt and Sherman (1982), Baye et al. (1993, 1996), Anderson et al. (1998).

[4]When the politician sells access, he maximizes his expected policy utility, but not total contributions. When the politician sells policy favors, he maximizes expected total contributions, but not policy utility and constituent welfare.

politician's expected revenue both when he sells policy and when he sells access. The impact of the tax is greater in the policy favor game, and it therefore makes selling policy relatively less attractive compared with selling access. A tax decreases the range of issues for which the politician sells policy favors. Unlike a limit, however, a tax does not distort the interest groups' willingness to contribute in competition for either policy favors or access. Therefore, the tax does not distort the signaling power of the contributions in the access game. When the politician sells access, he is able to identify and implement the fully-informed policy even under a high tax rate.

Unlike a limit, a tax unambiguously improves expected constituent welfare. Furthermore, one can always set a tax such that expected constituent welfare is higher than under any limit or no regulation. Here, taxes are strictly better than limits at regulating contributions. Although a tax is better for constituent welfare than a limit, however, the politician may prefer for contributions to be regulated by a limit, as a limit may have less of an impact on total contributions.

The primary contributions of this paper are twofold. First, it develops the first model of political contributions in which a politician chooses whether to sell favors or sell access. By giving the politician this choice, the model should provide a better understanding of the interaction between interest groups and politicians, and the influence that political contributions may have on the decision making process. In this paper, the means by which the politician may sell favors is relatively standard for the literature, building on the work of Hillman and Riley (1989), Baye et al. (1996), Che and Gale (1998), Gavious et al. (2002) and others. The means by which the politician may sell access, however, is relatively novel and represents its own contribution to the lobbying literature. To my knowledge the competition for access model developed here and Austen-Smith (1998) represent the only two theoretical frameworks in which buying access allows an agent (or interest group) to share verifiable evidence with a decision maker.[5] The primary difference between the access model in the present paper and Austen-Smith (1998) is the mechanism through which the politician allocates access: In this paper the politician awards access to the highest contributor; in Austen-Smith (1998) the politician announces prices for access and any interest group that pays the

[5]Cotton (2008) incorporates the evidentiary structure developed in this paper into a model of price setting similar to Austen-Smith (1998). Most other papers that incorporate "access" either do not consider verifiable or hard information, or they do not give the politician control over which groups can disclose evidence. For example, Austen-Smith (1995), Ball (1995), and Lohmann (1995) develop models in which interest groups receive private, unverifiable signals about the impact of a certain policy.

announced price gains access.[6] For the purpose of this paper, the competition for access framework offers the distinct advantage of it being straightforward to incorporate with a standard model of policy favors. Section 8 discusses why the main results of the paper should continue to hold if the politician sells access through a pricing game rather than an auction.

The second primary contribution of this paper is the consideration of contribution limits and taxes. The paper shows that both limits and taxes can cause the politician to switch from selling favors to selling access.[7] A tax, however, is strictly preferred to a limit since it can cause the politician to sell access without distorting the signals associated with the contributions and the politician's information.[8] This result is in contrast to Drazen et al. (2007) which also allows for both a contribution limit and tax. Drazen et al. (2007) considers interest group formation in a variation of the money-for-policy-favor game, and shows that a contribution tax can offset the negative impact of the contribution limit; suggesting that a limit and tax should be used in combination.[9] In the current paper, in which the politician may also sell access and there is no concern about interest group formation, a tax is strictly preferable to a contribution limit, and there is no benefit to using them in combination. Other papers focus on contribution limits alone.[10] Austen-Smith (1998) shows how a limit may result in a more informed politician in an access game where interest groups differ in terms of their evidence reliability. In such a model, a limit can cause the politician to provide access to more-informed interest groups rather than groups with higher willingness to pay for access. This is not the case in the present paper, as there is no reliability issues with the evidentiary structure. Instead, the present paper focuses on differences in issue importance.

[6]How politicians actually do award access is open to debate. Although there is substantial data on political contributions in the U.S., there is little data available how politicians spend their time and with whom they meet. See Stratmann (2005) for an overview of the empirical literature concerning money in politics.

[7]Such an effect is similar to the impact of contribution limits in the policy favor games by Prat (2002a,b) and Coate (2004a), where limits decrease the monetary incentives to provide policy favors and increase the likelihood that a politician chooses the policies preferred by his constituents rather than the policies preferred by an interest group. In these other papers, however, the identity of the ideal policy is known ex ante; there is no role for access, and contributions do not help the political learn about the best policy.

[8]In Wittman (2002) and Coate (2004b), limits decrease the amount of advertising, which results in a less-informed electorate. In a game with access, a limit may also result in a less-informed politician.

[9]In Drazen et al. (2007) politicians and lobbyists bargain over a policy choice. There, a binding contribution limit can increase the bargaining power of lobbyists, increasing the expected returns from lobbying. When this is the case, a limit can result in the formation of more lobbying groups, and therefore worse policy from the perspective of the politician's constituents. A contribution tax can offset the negative impact of the contribution limit.

[10]For example, Dahm and Porteiro (2008b) show how contribution limits may deter informational lobbying in a game in which interest groups have free access to a politician. In Riezman and Wilson (1997), a politician may choose to sell additional policy favors in order to make up for a decrease in contributions that result from a limit. Both Che and Gale (1998) and Gavious et al. (2002) consider the effects of contribution limits on total revenue.

Incorporating reliability issues will likely weaken, but not eliminate this paper's results.

The model is described in Section 2 and solved in Section 3. Sections 4 and 5 consider the impact on equilibrium behavior and policy outcomes of a contribution limit and a tax, respectively. The welfare effect of a limit and a tax are compared in Section 6. Section 7 incorporates interest group asymmetries into the model. Allowing for wealth or valuation differences does not change the results. Section 8 discusses alternative assumptions about the underlying mechanisms for awarding policy and access. It also discusses the cases of noisy interest group evidence, and costly evidence production. Section 9 concludes the paper.

2 Model

A politician must choose a policy from a continuous, single-dimensional policy space $[-1, 1]$. Denote his choice of policy by p. There are two interest groups associated with the issue; group L strictly prefers lower (leftward) p and group R prefers higher (rightward) p all else equal. The politician experiences policy utility $W(p)$ from his policy choice, where

$$W(p) = \left[\alpha_R p + \alpha_L(-p) - \frac{p^2}{2}\right]\gamma.$$

The analysis assumes that the politician's policy utility is equivalent to the welfare function for his representative constituent (a non player in the game). The politician is ex ante uncertain about the values α_R and α_L which represent the benefits and costs of marginal changes in policy. The value $-\frac{p^2}{2}$ incorporates into $W(p)$ a tendency for the representative constituent to prefer moderate policy. The value $\gamma > 0$ represents issue importance, and is the realization of a random variable continuously distributed on R_{++} according to distribution G and density g.[11]

Let $\hat{p}$ denote the policy the politician prefers when he is *fully informed*. Therefore, $\hat{p} \equiv \arg\max_p W(p) = \alpha_R - \alpha_L$. If the politician chooses $p = \hat{p}$, he maximizes both his own policy utility and the welfare of the representative constituent.[12]

[11] Campaign finance reforms may be implemented before the realization of γ. By modeling γ as the realization of a continuously distributed random variable, the analysis is able to capture the reality that campaign finance reforms apply across many, different issues.

[12] The specified equation for W simplifies the analysis. Assuming $W(p) = -(\alpha_R - \alpha_L - p)^2$ would not change the results. Alternative functions may also be used. For example, one may incorporate bias into the policy utility function by setting $W(p) = \left[\alpha_R p + \alpha_L(-p) - \frac{-(|p-Bias|)^2}{2}\right]\gamma$, where $\hat{p}$ then equals $\alpha_R - \alpha_L + Bias$. Such $Bias$ represents

Each interest group $j \in \{L, R\}$ observes its own α_j, but not that of the other group. Each group's α_j is the independent realization of a random variable uniformly distributed on $[0.1]$.[13] The distribution of α is common knowledge. Each interest group has private, verifiable evidence about its own α_j. Formally, the evidentiary structure meets the requirements of Lipman and Seppi (1995)'s full reports condition and Bull and Watson (2007)'s evidentiary normality condition, which require that higher-type agents (i.e., agents with higher α_j) can always provide evidence not available to lower-type agents. An agent can underrepresent but not exaggerate its evidence. If group $j \in \{L, R\}$ has access to the politician, it can costlessly present any evidence amount $e_j \in [0, \alpha_j]$, or he can refuse to present any evidence setting $e_j = \emptyset$.[14]

The politician controls which interest groups receives access. Due to time constraints, I assume the politician can only grant access to one of the groups; however, this assumption may be relaxed.[15] If he grants a group access, that group is able to present evidence e_j.

In this framework, the politician is able to sell policy favors and access to interest groups. Let $c_j \geq 0$ denote the political contribution that group j pays the politician.

Payoffs–The politician prefers to set policy as close to the fully-informed policy as possible. He also benefits from collecting political contributions. His payoff is given

$$U_P = W(p) + c_L + c_R.$$

Interest groups prefer more extreme policies, and they find providing political contributions

the political leanings of the politician or his constituent. In another example, the politician may be responsible for choosing a trade tariff $p \in (0, 1)$, for which $W(p) = [\alpha_R \ln p + \alpha_L \ln(1-p)]\,\gamma$, and where $\hat{p}$ equals $\frac{\alpha_R}{\alpha_R + \alpha_L}$. For the full-information result to hold, without other modifications to the model, W must be such that $\partial\hat{p}/\partial\alpha_R = -\partial\hat{p}/\partial\alpha_L$. However, as long as $\partial\hat{p}/\partial\alpha_R > 0$ and $\partial\hat{p}/\partial\alpha_L < 0$, the politician can still become fully informed by selling access, so long as he grants access to the group that signals the highest α. See for example the discussion concerning interest group asymmetries in section 7.

[13] Assuming that draws of α are uniformly distributed and uncorrelated simplifies the analysis, but is not necessary. The α's may be (negatively) correlated and drawn from less-straightforward distributions.

[14] One may think of an interest group's evidence as a collection of verifiable documents. For a detailed discussion, see Bull and Watson (2004, 2007).

[15] The time constraint is reasonable if one thinks of the game being repeated across many issues and many different interest groups. Alternatively, the politician could find granting access costly, in which case he prefers to give access to one group rather than both groups. So long as the cost of access is small enough, the results of the analysis continue to hold.

costly. Given implemented policy p, groups L and R earn respective payoff

$$U_L = -p\frac{v}{2} - c_L, \text{ and}$$
$$U_R = p\frac{v}{2} - c_R.$$

The value $\frac{v}{2} > 0$ represents how much interest groups care about policy relative to money. For now, interest groups differ in terms of their evidence, and not in terms of their valuation. They share a common v, which is common knowledge. Section 7 allows for group asymmetries.

Game Order–The politician can sell access or a policy favor. If he sells access, the group that receives access can present evidence to the politician. If he sells a policy favor, the group that receives the favor gets to choose the policy that is implemented.

The game takes place as follows:

1. The politician chooses whether to sell access or a policy favor at the beginning of the game. Denote this choice by a, where $a = 1$ if the politician sells access and $a = 0$ if he sells a policy favor.

2. Whether the politician sells access or a policy favor, interest groups compete for the "prize" in the same way. Both interest groups simultaneously contribute to the politician, and the group that provides the highest contribution wins the prize.

3. If the politician sells a policy favor, then the winner of the prize competition chooses a policy. If the politician sells access, then the winner of the prize competition chooses evidence to reveal to the politician; then, after updating his beliefs about the evidence quality of both interest groups, the politician chooses a policy.

Let $w \in \{L, R\}$ denote the identity of the prize winner.

Player Strategies and Equilibrium Concept–In both the access and policy-favor subgames, interest groups must choose how much to contribute to the politician. In the access subgame, groups must also choose the evidence $e_j \in [0, \alpha_j]$ or $\emptyset$ to reveal. A complete description of an interest group's strategy must describe its choice of c_j and e_j for each possible (γ, α_j, a) triple.

The politician must choose whether to sell access or policy, and if he sells access he must also choose a policy at the end of the game. A complete description of his strategy must give his choice of a for each possible γ, as well as his choice of p for each possible (γ, c_L, c_R, e_w) vector.

Let μ represent the politician's beliefs about the state of the world at the time he chooses policy in the access subgame. E_μ denotes expectations given beliefs μ, and E (without the subscript) denotes ex ante expectations before the start of the game.

The analysis solves for the symmetric Perfect Bayesian Equilibrium of the game, which I label the *contribution equilibrium.* A complete description of the equilibrium must include the strategy profiles for the interest groups and the politician, as well as the politician's beliefs about the state of the world at the time he chooses policy in the access subgame. The politician's beliefs must be consistent with Bayes' Rule on the ex ante distribution of α given the strategies of the interest groups. Each player's strategy must be a best response to the strategies of the other players, given the player's beliefs.

3 Contribution Equilibrium

The paper first determines interest group behavior and policy choice in the access and policy-favor subgames, then it considers the politician's choice of whether to sell access or sell policy.

3.1 Selling Policy Favors

When the politician chooses to sell a policy favor, the interest groups compete in a traditional all-pay auction, rent-seeking game (e.g., Hillman and Riley 1989, Baye et al. 1996). The interest group that wins the contest will choose to implement the most extreme p in its preferred direction. Group L prefers to implement policy $p_L \equiv -1$, and group R prefers prefers policy $p_R \equiv 1$. The winning group earns policy payoff of $\frac{v}{2}$, and the other group receives policy payoff equal to $-\frac{v}{2}$. Therefore, holding contributions constant, an interest group values winning the contest at v.

If group w wins, it sets $p = p_w$. The winning group earns payoff $U_w = \frac{v}{2} - c_w$. The non-winning group (denoted $-w$) earns payoff $U_{-w} = -\frac{v}{2} - c_{-w}$. There is no pure strategy equilibrium in the all-pay auction game with complete information about player valuations. The mixed strategy Nash equilibrium of the policy favor subgame involves each interest group contributing c according to distribution H, where $H(c) = \frac{c}{v}$. Since both interest groups share a common valuation for the prize, no one is willing to bid (on average) more than the other group in an effort to secure the prize. In equilibrium, the politician is equally likely to award the policy favor to interest group R as he is to award the favor to interest group L.

Expected total contributions from selling the policy favor equal v. The politician is able to extract all of the expected rent from the interest groups. The resulting policy choice, however, is at the extreme end of the policy space. The politician's expected policy utility from selling a favor for issue γ equals $E(W|a=0) = -\frac{\gamma}{2}$. Therefore, $E(U_P|a=0) = -\frac{\gamma}{2} + v$.

3.2 Selling Access

Policy Choice–When the politician sells access, he retains the right to choose policy. Since the policy decision is made at the end of the game, it cannot affect contributions. Therefore, the politician chooses p to maximize $E_\mu W(p)$. He sets p equal to his expectation regarding $\hat{p}$ or $p = E_\mu \alpha_R - E_\mu \alpha_L$. Only when the politician is fully informed about α_L and α_R is he able to identify and implement the fully-informed policy $\hat{p}$.

Evidence Revelation–Any interest group with access reveals *all* of its evidence, $e_j = \alpha_j$. This is a standard result in the hard evidence literature (e.g., Milgrom and Roberts 1986, Bull and Watson 2004). If a group with access revealed $e_j < \alpha_j$, then the group could costlessly represent higher α by revealing $e_j = \alpha_j$ instead. Only when each type of agent reveals $e_j = \alpha_j$ do no groups have an incentive to deviate. Similarly, no agent with $\alpha_j > 0$ will ever refuse to reveal evidence. If $e_j = \emptyset$, the principal updates his beliefs putting probability 1 on $\alpha_j = 0$.[16]

In equilibrium, any group j with access reveals $e_j = \alpha_j$. Therefore, when group j reveals evidence e_i to the politician, the politician's beliefs μ must put probability 1 on $\alpha_j = e_j$ and probability 0 on any state in which $\alpha_j \neq e_j$. This means that if the politician gives access to group j, then he fully learns its type and $E_\mu \alpha_j = \alpha_j$.

Interest Group Contributions–In equilibrium, all interest groups contribute according to the contribution function C. It is straightforward to show that C is strictly increasing in α_j.[17]

[16] If instead the politician's beliefs are such that $E_\mu \alpha_j > 0$ when $e_j = \emptyset$, then all groups with $\alpha_j \leq E_\mu \alpha_j$ (and no groups with $\alpha_j > E_\mu \alpha_j$) have an incentive to announce $e_j = \emptyset$. The politician recognizes this and his beliefs therefore must account for the types of agents that do announce $e_j = \emptyset$, which requires him to lower $E_\mu \alpha_j$. Again however, only groups with actual qualifications lower than the updated expected qualifications have an incentive to refuse to reveal their evidence. The reasoning repeats, and the required $E_\mu(\alpha_j \mid e_j = \emptyset) \to 0$; only then do no groups have an incentive to deviate. See Milgrom and Roberts (1986) for a formal proof.

[17] To show this, solve for the equilibrium under the assumptions that C is strictly decreasing in α, or that C is not strictly monotonic. Either alternative assumption results in a contradiction when solving for the equilibrium contribution function.

Since C is strictly increasing, it is invertible, where $\alpha^*(c) = C^{-1}(\alpha)$, and there exists a one-to-one mapping between a group's contribution and its evidence quality. It immediately follows that a rational agent can determine an interest group's α if he observes its contribution.

To solve for the equilibrium contribution function, the analysis solves for the contribution decision of interest group j assuming that interest group $-j$ contributes according to the equilibrium function. Because group $-j$ contributes according to C, the politician can correctly infer α_{-j} from c_{-j}. Interest group j chooses contribution c_j to maximize its expected utility

$$\frac{v}{2}\int_0^{\alpha^*(c_j)} [\alpha_j - \alpha_{-j}]\, d\alpha_{-j} + \frac{v}{2}\int_{\alpha^*(c_j)}^{1} [\alpha^*(c_j) - \alpha_{-j}]\, d\alpha_{-j} - c_j. \tag{1}$$

Interest group j wins access so long as $c_{-j} < c_j$, which happens whenever $C(\alpha_{-j}) < c_j$ or $\alpha_{-j} < \alpha^*(c_j)$. The first integral in the expression represents the group's payoff when it wins access, in which case the group reveals its evidence and α_j to the politician and the politician chooses $p = \alpha_j - \alpha_{-j}$. Even though the politician does not give group $-j$ access, his expectations regarding α_{-j} are correct because group $-j$ contributes according to the strictly increasing equilibrium contribution function. The second integral in the expression represents the group's payoff when it does not win access, and the politician relies on its contribution when updating his expectations regarding α_j. In which case, the politician chooses $p = \alpha^*(c) - \alpha_{-j}$.

The first order conditions of the interest group's expected utility maximization problem are

$$\frac{v}{2}\frac{\partial \alpha^*(c_j)}{\partial c_j}[\alpha_j - \alpha^*(c_j)] + \frac{v}{2}\int_{\alpha^*(c_j)}^{1} \frac{\partial \alpha^*(c_j)}{\partial c_j} d\alpha_{-j} - 1 = 0.$$

In equilibrium, $\alpha^*(c_j) = \alpha_j$, and strict monotonicity implies that $[\partial\alpha^*(c_j)/\partial c_j]^{-1} = C'(\alpha_j)$. Therefore, the first order conditions simplify to

$$C'(\alpha_j) = (1 - \alpha_j)\frac{v}{2}. \tag{2}$$

It is straightforward to show that the initial requirement that $C'(\alpha_j) > 0$ holds. Integrating with respect to α_j gives the equilibrium contribution function[18]

$$C(\alpha_j) = (1 - \frac{\alpha_j}{2})\alpha_j \frac{v}{2}. \tag{3}$$

Information Revelation and the Role of Access–Because the contribution function is strictly increasing in α_j, there exists a one-to-one mapping between each group's contribution and its evidence quality. A group with the highest-possible α contributes $C(1) = \frac{v}{4}$, and a group with the lowest-possible α contributes $C(0) = 0$. For all values $\alpha \in [0, 1]$, a higher α means a larger contribution. The politician recognizes this and in equilibrium he correctly infers the evidence quality of both interest groups, even though he only gives access to one of them. In equilibrium, $E_\mu \alpha_j = \alpha_j$ for both interest groups, and the politician chooses $p = \hat{p}$.

If interest group j contributes more than $C(\alpha_j)$, then the politician will overestimate α_j when the group does not receive access. In order for no interest group to have an incentive to deviate from the equilibrium contribution function, the expected policy benefit from marginally increasing one's contribution in order to signal higher evidence must be completely offset by the monetary costs of submitting a higher contribution. This is the condition given by Eq. 2. Figure 1 shows an example contribution function. At low α, an interest group is relatively unlikely to win access; therefore the benefit of marginally increasing its contribution is relatively large. Over such values of α the slope of the contribution function must be relatively steep to offset the incentive to increase one's contribution. Alternatively, an interest group with a high α is relatively likely to submit the high contribution and win access. Therefore, the politician is likely to learn its true α even if it over contributes in order to signal higher evidence. Over such α the benefit of signaling a higher α is relatively small; therefore, the slope of the contribution function does not need to be as steep to offset these benefits.

In equilibrium, the politician becomes fully informed about the evidence quality of both groups by observing their contributions alone. This does not imply that the politician becomes fully informed even when he provides *no* access. If the politician does not provide access to either group,

[18]The interest group's expected payoff is strictly increasing in c_j up to $c_j = C(\alpha_j)$, and strictly decreasing in c_j for all higher values. If the group provides no contribution, the politician expects that the group has $\alpha_j = \alpha(0) = 0$. Thus, interest groups do not prefer to provide any other contribution than $C(\alpha_j)$. Any off-equilibrium contribution $c_j > C(1)$ is interpreted by the politician as representing some feasible $\alpha \in [0, 1]$ (rather than some larger $\alpha > 1$).

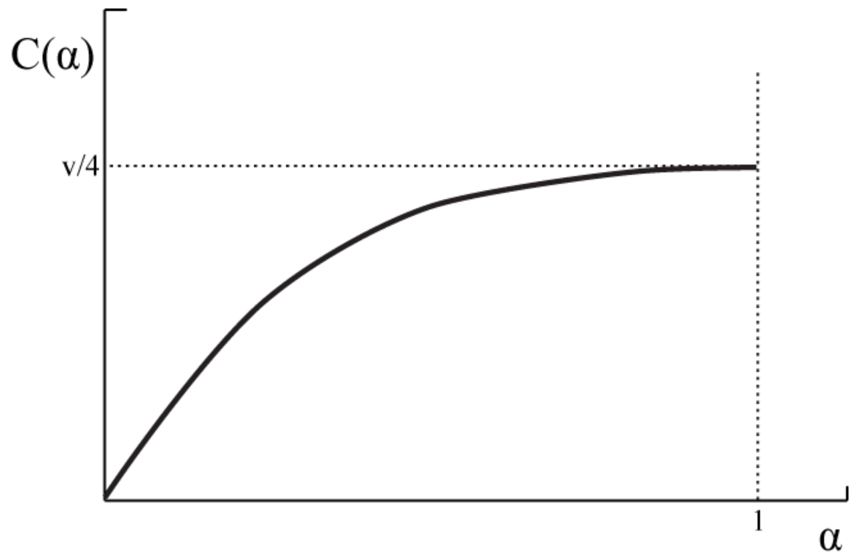

Figure 1: Example contribution function

then the contributions become uninformative.[19]

Politician Payoffs–In equilibrium, the politician set $p = \hat{p}$, maximizing his policy payoff and constituent welfare at $W(\hat{p}) = \frac{(\alpha_R - \alpha_L)^2}{2}\gamma$. The politician's ex ante expected policy utility when he sells access is $E(W|a=1) = \int_0^1 \int_0^1 W(\hat{p}) d\alpha_L d\alpha_R = \frac{\gamma}{12}$. Total ex ante expected contributions equal $E(c_L + c_R|a=1) = 2\int_0^1 C(\alpha)d\alpha = \frac{v}{3}$. The politician's expected utility when he sells access is $E(U_P|a=1) = \frac{\gamma}{12} + \frac{v}{3}$.

3.3 Selling Policy v. Selling Access

By selling policy the politician maximizes his expected total contributions, but does so at the cost of implementing a less-than-ideal policy. By selling access, the politician maximizes his policy utility, but collects lower contributions.

Lemma 1 *In the contribution equilibrium*

- *selling policy favors results in the highest possible expected contribution revenue, but does not maximize policy utility;*

[19] Without access, all interest groups face the same incentives when choosing their contributions; a group with a high α is no longer willing to provide a larger contribution than a group with a lower α. The politician recognizes this and does not take the size of the contributions into account when updating his beliefs. This means that $E_\mu \alpha_j = E\alpha_j$ for both $j \in \{L, R\}$, and the access selling politician chooses $p = 0$.

- *selling access results in the highest possible policy utility, but does not maximize expected contribution revenue.*

It is straightforward to determine when he prefers each course of action.[20] The politician prefers to sell access when $E(U_P|a=1) \geq E(U_P|a=0)$, or $\frac{\gamma}{12} + \frac{v}{3} \geq -\frac{\gamma}{2} + v$. This result is restated in the following proposition.

Proposition 1 *In the contribution equilibrium:*

1. *For important-enough issues (i.e., $\gamma \geq \frac{8}{7}v$), the politician sells access and $p = \hat{p}$.*

2. *For less-important issues (i.e., $\gamma < \frac{8}{7}v$), the politician sells policy favors and $p \neq \hat{p}$ with probability* 1*.*

The variable γ represents how much the politician cares about policy relative to how much he cares about political contributions. This means that the politician prefers to sell access rather than policy favors if the issue is important enough–if he cares enough about the policy outcome relative to contributions. For less important issues, he chooses to sell policy favors which results in higher revenue and lower policy utility.

Throughout the paper, $\bar{\gamma}$ denotes the cutoff value at which the politician is indifferent between selling access and selling policy favors. Let $\bar{\gamma}(\emptyset) = \frac{8}{7}v$ denote this value for the case without campaign finance reform (i.e., no contribution limit or tax). The following sections derive the cutoff values when there is a limit and a tax, $\bar{\gamma}(\bar{c})$ and $\bar{\gamma}(\tau)$ respectively.

4 Contribution Limit

This section considers the impact of a contribution limit on equilibrium behavior and policy outcomes. An interest group cannot contribute more than the limit, denoted $\bar{c} \in [0, v)$. If $\bar{c} = 0$, there is a *contribution ban.* The limit is assumed less than v since without the limit no interest group will ever contribute more than v.

[20] I assume that the indifferent politician sells access.

4.1 Policy Favor Game with Limit

Equilibrium contributions depend on the size of the limit. For the case when $\bar{c} \leq \frac{v}{2}$, each interest group contributes $\bar{c}$, and each wins the prize with equal probability. Total revenue equals $2\bar{c}$ which is strictly less than the no-limit expected revenue of v.

For the case when $\bar{c} > \frac{v}{2}$, groups contribute according to a mixed strategy. Their contributions are made according to distribution $H_{\bar{c}}$, where

$$H_{\bar{c}}(c) = \begin{cases} \frac{c}{v} & \text{for } c \in (0, 2\bar{c} - v] \\ \frac{2\bar{c}-v}{v} & \text{for } c \in (2\bar{c} - v, \bar{c}) \\ 1 & \text{for } c = \bar{c}. \end{cases}$$

Each group wins the prize with equal probability, and has an expected contribution of $\frac{v}{2}$. Just as in the case without a contribution limit, a high enough limit (i.e., $\bar{c} > \frac{v}{2}$) results in the interest groups competing away all of their expected rent. The politician continues to collect v in expected contributions.

Only a strict enough contribution limit affects politician utility in the policy favor subgame. To impact the politician's expected payoffs from selling policy, it must be that $\bar{c} < \frac{v}{2}$. Otherwise, the politician's expected payoff from selling policy is unchanged.[21] Independent of $\bar{c}$, the politician's expected policy utility equals $-\frac{\gamma}{2}$ whenever he sells policy favors.

4.2 Access Game with Limit

Under a limit, the politician will still choose the policy he expects maximizes $W(p)$ given his beliefs; although the limit might influence the policy choice be influencing the politician's information and his beliefs about $\hat{p}$. Furthermore, regardless of the limit, an interest group with access will always fully reveal its evidence. The limit can affect the interest groups' equilibrium contribution strategy.

Without a limit, the maximum interest group contribution in the access game is $\frac{v}{4}$. Therefore, any $\bar{c} \geq \frac{v}{4}$ has no impact on behavior in the access game. For $\bar{c} < \frac{v}{4}$, interest groups contribute

[21] Che and Gale (1998) assume that interest groups differ in terms of their valuations. In that case, they show that a limit can actually increase expected total contributions. Allowing for such differences in this paper would mean an ever stricter contribution limit is required in order to decrease the politician's expected utility from selling policy favors.

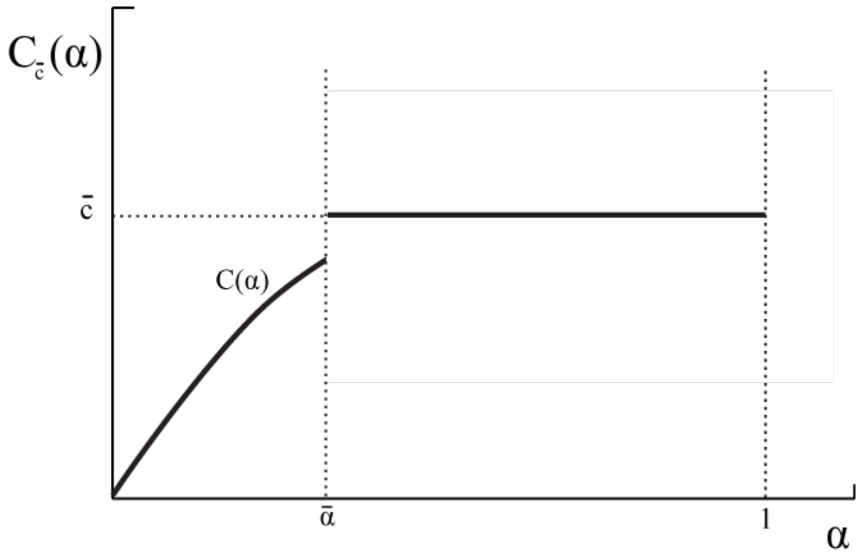

Figure 2: Example contribution function with limit $\bar{c}$

according to function $C_{\bar{c}}$, where

$$C_{\bar{c}}(\alpha) = \begin{cases} \left(1 - \frac{\alpha}{2}\right)\frac{\alpha v}{2} & \text{for } \alpha < \bar{\alpha}(\bar{c}) \\ \bar{c} & \text{for } \alpha \geq \bar{\alpha}(\bar{c}) \end{cases} \tag{4}$$

where

$$\bar{\alpha}(\bar{c}) = \max\left\{0, 1 - \sqrt{2 - \frac{8\bar{c}}{v}}\right\}. \tag{5}$$

Appendix section 10.1 provides details about the derivation of $C_{\bar{c}}$.[22] Figure 2 provides an example contribution function. An interest group with α equal to the cutoff value $\bar{\alpha}(\bar{c})$ is indifferent between contributing according the the increasing contribution function and contributing the maximum amount $\bar{c}$. The cutoff value $\bar{\alpha}$ takes on values between 0 and 1 as $\bar{c}$ increases from $\frac{v}{8}$ to $\frac{v}{4}$. If $\bar{c} \leq \frac{v}{8}$, then $\bar{\alpha} = 0$ and all interest groups contribute the limit independent of their evidence quality.

Any contribution limit $\bar{c} < \frac{v}{4}$ results in a pooling equilibrium in which any interest group with $\alpha_j \in [\bar{\alpha}(\bar{c}), 1]$ contributes $\bar{c}$. A politician who observes $c_j = \bar{c}$ can no longer infer α_j from observing the contribution alone. Without granting the group access, the politician only learns that $\alpha_j \in [\bar{\alpha}(\bar{c}), 1]$. The potential for pooling results in a less-than-fully informed politician whenever

[22]The analysis in this section is most closely related to Gavious et al. (2002), which incorporates bid caps into an all pay auction game with agents who are privately informed about their valuations. In the current model, however, agents are privately informed about their evidence, not their valuations.

both interest groups contribute $\bar{c}$; in which case the politician randomly awards access to one of the groups and remains less than fully informed about the other group's evidence. If neither or only one of the groups contributes $\bar{c}$, the politician remains fully informed as he gives access to the high contributor and can fully infer the low contributor's evidence from its contribution.

With probability $(1-\bar{\alpha}(\bar{c}))^2$ both groups contribute $\bar{c}$ in which case he remains less than fully informed about one group's α. When he chooses policy, he relies on his expectation of α, where $E(\alpha|\alpha \in [\bar{\alpha}, 1]) = \frac{\bar{\alpha}+1}{2}$. The politician's ex ante expected utility equals

$$E(U_P|\bar{c}, a=1) = \left[\frac{\gamma}{12} - (1-\bar{\alpha}(\bar{c}))^4 \frac{\gamma}{24}\right] + 2\left[(1-\bar{\alpha}(\bar{c}))\bar{c} + \frac{v}{2}\left(\frac{\bar{\alpha}(\bar{c})^2}{2} - \frac{\bar{\alpha}(\bar{c})^3}{6}\right)\right]. \tag{6}$$

The term in the first set of brackets denotes the politician's expected policy utility $E(W|\bar{c}, a=1)$, where $-(1-\bar{\alpha}(\bar{c}))^4 \frac{\gamma}{24}$ is the loss in expected utility from potentially being less informed compared to the case without a limit. The term in the second set of brackets denotes the expected contribution from each group. It is straightforward to show that both expected policy utility and expected revenue are lower in the access game under a limit than when there is no limit (or when $\bar{c} \geq \frac{v}{4}$ which means the limit is not binding). For any $\bar{c} < \frac{v}{4}$ expected contribution revenue is strictly increasing in $\bar{c}$; the stricter the limit, the lower the revenue. Similarly policy utility is strictly decreasing in $\bar{c}$, for $\bar{c} \in \left[\frac{v}{8}, \frac{v}{4}\right]$. For any $\bar{c} > \frac{v}{4}$, the limit does not change the access game, and for any $\bar{c} < \frac{v}{8}$ both groups always contribute the limit and further decreasing $\bar{c}$ has no impact on policy utility.

4.3 Selling Access v. Selling Policy with Limit

As in the case without a contribution limit, the politician sells access whenever his expected utility in the access subgame is at least as large as his expected utility in the policy favor subgame. It is straightforward to calculate $\bar{\gamma}(\bar{c})$, the issue importance for which the politician is indifferent between selling access and selling policy in equilibrium. The cutoff value depends on the contribution limit.

For $\bar{c} \geq \frac{v}{2}$, the limit does not affect politician payoffs in either the policy favor game or the access game. Therefore, such a limit cannot affect the politician's choice of whether to sell access or sell policy favors, and the cutoff value equals $\bar{\gamma}(\emptyset)$.

For $\bar{c} \in \left[\frac{v}{4}, \frac{v}{2}\right)$, the limit affects expected payoffs in the policy favor subgame, but not in the access subgame. In this case, the politician chooses to sell access if $\frac{\gamma}{12} + \frac{v}{3} \geq 2\bar{c} - \frac{\gamma}{2}$. Rearranging this gives the condition that the politician sells access if $\gamma \geq \frac{24}{7}\bar{c} - \frac{4}{7}v$, otherwise he sells policy.

For $\bar{c} \in \left(\frac{v}{8}, \frac{v}{4}\right]$, the limit impacts expected payoffs in both the policy favor and access subgames. In this case, the politician sells access if his expected payoff from doing so (given by Eq. 6) is at least as great as his expected utility from selling favors (i.e., $2\bar{c} - \frac{\gamma}{2}$). He therefore sells access whenever $\gamma \geq \left[2v\bar{\alpha}(\bar{c})\left(3 - \bar{\alpha}(\bar{c})^2\right)\right] / \left[13 + 4\bar{\alpha}(\bar{c}) - 6\bar{\alpha}(\bar{c})^2 + 4\bar{\alpha}(\bar{c})^3 - \bar{\alpha}(\bar{c})^4\right]$, where $\bar{\alpha}(\bar{c})$ is given by Eq. 5.

For $\bar{c} \in \left[0, \frac{v}{8}\right]$, both interest groups always contribute the limit in both the access and policy favor games, independent of their evidence qualities. Therefore, both games result in the same revenue (i.e., $2\bar{c}$) for the politician. The access game, however, results in strictly higher expected policy utility, as the politician learns one of the group's evidence before selecting policy. He therefore strictly prefers to sell access rather than sell policy under such a limit for all $\gamma > 0$.

In summary,

$$\bar{\gamma}(\bar{c}) = \begin{cases} \frac{8}{7}v & \text{for } \bar{c} \geq \frac{v}{2} \\ \frac{24}{7}\bar{c} - \frac{4}{7}v & \text{for } \bar{c} \in \left[\frac{v}{4}, \frac{v}{2}\right) \\ \frac{2v\bar{\alpha}(\bar{c})\left(3-\bar{\alpha}(\bar{c})^2\right)}{13+4\bar{\alpha}(\bar{c})-6\bar{\alpha}(\bar{c})^2+4\bar{\alpha}(\bar{c})^3-\bar{\alpha}(\bar{c})^4} & \text{for } \bar{c} \in \left(\frac{v}{8}, \frac{v}{4}\right] \\ 0 & \text{for } \bar{c} \in \left[0, \frac{v}{8}\right]. \end{cases} \tag{7}$$

For any $\bar{c} < \frac{v}{2}$, the politician sells access for a larger range of γ than he does without a limit. However, any limit $\bar{c} < \frac{v}{4}$ influences contributions in the access subgame, limiting the amount of information that the politician can infer from each group's contribution.

Lemma 2

1. *For any $\bar{c} < \frac{v}{2}$, $\bar{\gamma}(\bar{c}) < \bar{\gamma}(\emptyset)$. The limit results in the politician selling access for a larger range of issues, and selling policy for a smaller range of issues.*

2. *For any $\bar{c} < \frac{v}{4}$, the limit decreases the probability the politician is fully informed about both α_R and α_L when he sells access.*

4.4 Effect of Limit on Constituent Welfare

A contribution limit causes the politician to sell access (rather than policy favors) for a larger range of γ. This effect tends to improve constituent welfare, as the politician more often chooses the policy he believes is best, rather than choosing an interest group preferred policy.[23] When the politician *does* sell access, however, a limit also decreases the politician's ability to learn about evidence by observing contributions. This effect decreases expected constituent welfare, as the politician tends to have less accurate beliefs about $\hat{p}$ and is less likely to choose the welfare maximizing policy in the access game.[24]

The optimal limit, from the standpoint of constituent welfare, depends on the distribution of γ. Even without additional assumptions regarding the distribution of γ, it follows that the optimal limit (1) will result in a pooling equilibrium in the access game, which tends to decrease the accuracy of the politician's beliefs about $\hat{p}$, and (2) will always be positive. Banning contributions is never optimal.

Let $EW(\bar{c})$ denote ex ante expected constituent welfare under limit $\bar{c}$, and let $EW(\emptyset)$ denote expected welfare when contributions are not limited.

Proposition 2 *There exists some $\bar{c}^* \in \left(\frac{v}{8}, \frac{v}{4}\right)$ such that*

1. $EW(\bar{c}^*) \geq EW(\bar{c})$ *for all* $\bar{c} \geq 0$, *and*

2. $EW(\bar{c}^*) > EW(\emptyset)$.

Let *binding limit* refer to any limit below the maximum equilibrium contribution in the access game; therefore, a binding limit is any $\bar{c} < \frac{v}{4}$. Proposition 2 shows that there exists a binding limit that results in higher expected constituent welfare compared to no limit or any other limit, and that banning contributions is never optimal. In fact, it is never optimal to impose a limit resulting in all interest groups contributing $\bar{c}$ independent of their type. To see why a limit of $\frac{v}{4}$ is not optimal, consider implementing a marginally lower limit. This decrease in the limit causes the politician to sell access for more issues–a good thing. It also decreases politician information when he does sell access, but only by a very small amount.[25] Similar reasoning rules out a limit of $\frac{v}{8}$ or below.

[23]Selling policy always results in lower expected constituent welfare than selling access. This is because selling policy results in an outcome that is independent of the fully-informed policy $\hat{p}$. If the politician retains the right to choose policy–as when he sells access–then he chooses the policy he believes is best. Even when he is less-than fully informed about the evidence, his policy choice tends to be closer to the ideal policy than when an interest group chooses policy.

[24]This negative affect is only true of a limit that is strict enough to influence behavior in the access game (i.e., $\bar{c} < v/4$).

[25]A limit just below $\frac{v}{4}$ means a small positive probability that both groups contribute $\bar{c}$, and since the politician can only give access to one group he remains less than fully informed about the other group's evidence. However,

5 Taxing Contributions

This section considers the impact of a contribution tax. I show that a proportional tax can have similar benefits as a contribution limit, but without the information loss.

Consider a tax rate $\tau \in [0, 1]$. Any political contribution c is taxed at rate τ such that the politician receives payment $(1-\tau)c$. The remainder of the tax may go towards some public good which I do not model.[26] I assume that neither the politician nor his constituents benefit from the tax revenue. If the constituents benefited from the tax, then taxing contributions would be even more attractive.

Unlike a limit, a tax does not distort the interest groups' incentives to contribute whether they are competing for access or policy favors. It does, however, influence the politician's incentives to sell policy rather than access.

5.1 Policy Favor Game with Tax

A tax does not change interest group behavior in the policy favor game, and equilibrium contribution strategies are identical to those in the original game without a tax or a limit. The equilibrium is in mixed strategies, with each interest group randomly drawing a bid from a uniform $(0, v]$ distribution. Each group wins with an equal ex ante probability, and $Ec_j = \frac{v}{2}$ for both j. Total expected after-tax revenue for the politician is $(1-\tau)v$. Expected politician utility from selling a policy favor is $E(U_P|\tau, a = 0) = -\frac{\gamma}{2} + (1-\tau)v$.

5.2 Access Game with Tax

Interest groups have the same incentives to contribute as in the original game, and the equilibrium contribution function is unchanged. Both groups submit contributions according to the original function C defined in Eq. 3. Total expected contributions equal $\frac{v}{3}$, and expected politician revenue is $(1-\tau)\frac{v}{3}$. C is strictly increasing for all $\alpha \in [0, 1]$. Therefore, unlike in the case of a contribution limit, in equilibrium the politician can always correctly infer an interest group's α from its contribution. The politician remains fully-informed about interest group evidence. He is able to

because this other group contributed the limit, the politician correctly infers that the group had high enough evidence quality to make such a contribution. In this case, the range of α for which an interest group is willing to contribute the limit is very small; therefore, the politician remains almost-fully informed about the group's evidence.

[26] One possibility is that the taxes fund the bureaucratic system necessary to enforce and collect the taxes.

implement $\hat{p}$, which results in the maximum policy utility. His expected utility from selling access is $E(U_P|\tau, a=1) = \frac{\gamma}{12} + (1-\tau)\frac{v}{3}$.

5.3 Selling Policy v. Selling Access with Tax

When contributions are taxed at rate τ, the politician prefers to sell access if $\frac{\gamma}{12} + (1-\tau)\frac{v}{3} \geq -\frac{\gamma}{2} + (1-\tau)v$. Rearranging this expression gives the condition $\gamma \geq (1-\tau)\frac{8}{7}v$. Therefore, for any $\tau \in [0,1]$, $\bar{\gamma}(\tau) = (1-\tau)\frac{8}{7}v$, and $\frac{\partial \bar{\gamma}}{\partial \tau} < 0$. The cutoff value $\bar{\gamma}$ is strictly decreasing in the tax rate, where $\bar{\gamma}(1) = 0$.

Lemma 3 *For any $\tau \in (0,1]$:*

1. *$\bar{\gamma}(\tau) < \frac{v}{2}$. The tax results in the politician selling access for a larger range of issues, and selling policy for a smaller range of issues.*

2. *The politician remains fully informed about α_R and α_L when he sells access.*

5.4 Effect of Tax on Constituent Welfare

For any τ, if the politician sells access then he becomes fully informed about interest group evidence in equilibrium, and he is able to identify and implement his fully-informed policy $\hat{p}$. Therefore, selling access results in the maximum possible constituent welfare. Furthermore, given any issue γ, it is possible to set τ such that the politician chooses to sell access.

Lemma 4 *For each γ, there exists a $\tau' \in [0,1)$ such that for any $\tau \geq \tau'$ the politician sells access and $p = \hat{p}$.*

Before the realization of γ, it is optimal from the standpoint of the constituents to set $\tau = 1$. When $\tau = 1$, the politician, who cares about identifying his fully-informed policy, chooses to sell access to the group who submits the highest (fully-taxed) contribution. He does this for all γ, and he remains fully informed in the process.

Proposition 3 *A tax $\tau^* = 1$ achieves the maximum possible constituent welfare with probability 1.*

A tax rate of 1 results in the politician selling access for *all* possible issues. He therefore becomes fully informed independent of γ and implements $p = \hat{p}$ with probability 1. This represents the first-best optimal outcome for constituents, which is not achieved in the unregulated game or under a limit.

The model assumes that politician revenue does not directly benefit constituents. Contributions may, however, provide some social benefit if they are used to run advertisements during campaigns. Coate (2004b), for example, develops a model in which contributions fund ads that help inform voters about politician quality. If contributions are used for such purposes, fully taxing contributions may not be optimal. Although it is feasible that a high tax combined with some system to public campaign financing may be optimal for constituent welfare. This issue is not further addressed in the present paper.

6 Tax Versus Limit

Both a tax and a limit can cause the politician to switch from selling policy favors to selling access, which results in better policy choices and improves constituent welfare. However, a limit decreases the politician's available information in the access game. This is not the case with a tax; the politician remains fully-informed when he sells access.

The optimal tax rate $\tau^* = 1$ results in expected constituent welfare of $EW(\tau^*) = 0$, which is strictly greater than the expected constituent welfare under any possible limit. If constituents receive additional benefits from the collected taxes, then the advantage of taxing, rather than limiting contributions is further increased. The tax rate need not be at τ^* in order for taxing contributions to result in higher expected constituent welfare than a contribution limit.

Proposition 4 *There exists a tax rate $\hat{\tau} < 1$ such that for all $\tau \geq \hat{\tau}$,*

- $EW(\tau) > EW(\bar{c}^*)$, *and*
- $EW(\tau) > EW(\emptyset)$.

A tax is clearly better than a limit when it comes to achieving the best policy and highest constituent welfare. A tax rate of $\tau = 1$ achieves the maximum possible expected constituent welfare in the policy favor and access game.[27]

This does not however imply that the politician prefers a tax. First note that the politician prefers no regulation to a contribution tax, as a tax simply limits the revenue associated with any action. Suppose, however, there is outside pressure for campaign finance reform. To model this, assume that the politician can select either a limit or a tax to achieve some minimum required cutoff value $\bar{\gamma}'$. Does the politician prefer to achieve $\bar{\gamma}'$ through the use of a limit or a tax? Remember that $\bar{\gamma} = \frac{8}{7}v$ without either a limit or a tax; therefore, only $\bar{\gamma}' < \frac{8}{7}v$ are of interest.

Proposition 5 *To achieve any $\bar{\gamma}' < \frac{8}{7}v$, the politician prefers the use of a limit rather than a tax so long as v is sufficiently large.*

Proposition 5 shows that the politician may support the use of a limit rather than a tax, even when a tax results in higher constituent welfare. This will be true whenever interest groups are sufficiently wealthy. Consider an extreme case where $\bar{\gamma}' = 0$. The politician can achieve $\bar{\gamma}'$ through a tax rate of $\tau = 1$, which maximizes policy utility but results in the politician collecting no contribution revenue. Alternatively, the politician can achieve the required cutoff by setting a limit $\bar{c} = \frac{v}{8}$, which results in the politician collecting $2\bar{c}$ in revenue, but being fully uninformed about one of the interest group's α in equilibrium.[28] In this case, total expected politician policy utility equals $\frac{\gamma}{24}$. The politician prefers to achieve $\bar{\gamma}'$ through a limit $\bar{c} = \frac{v}{8}$ rather than a tax $\tau = 1$ so long as $\frac{\gamma}{12} < 2\frac{v}{8} + \frac{\gamma}{24}$ or equivalently $v > \frac{\gamma}{6}$. Such a v cutoff exists for any $\bar{\gamma}' < \frac{8}{7}v$. This result may help explain why contribution limits are popular policy instruments, but contribution taxes are uncommon.

7 Interest Group Asymmetries

There are various ways to incorporate interest group asymmetries into the model. I do so by allowing interest groups to differ in terms of their valuation parameter v. Without loss of generality, assume

[27] Such a tax is distinctly different from a contribution ban, even through both regulations result in the politician collecting no revenue. Under a high tax, the interest groups still make payments that are observed by the politician and used to determine which group receives access. This is equivalent to "burning money." A ban could potentially also lead to such an outcome if interest groups donate money to the politician's favorite charity or community organization in place of providing a campaign contribution. The politician will remain fully informed in such a situation, so long as he observes the charitable donations of all groups and grants access to the group that provides the largest donation.

[28] When $\bar{c} = \frac{v}{8}$, both groups contribute $\bar{c}$ independent of their α, and the politician randomly awards access to one of the groups.

that group R is more wealthy than group L; therefore, $v_R > v_L$. This may also be interpreted as group R caring more about the issue than group L. Both interpretations are reasonable, and justify consideration of this extension. The values v_L and v_R are common knowledge.

In the policy favor game, the model takes the form of the all-pay auction analyzed by Hillman and Riley (1989) and Baye et al. (1996). Because the interest groups differ in terms of their valuations, they no longer follow the same mixed strategies. Instead, group R is more likely to submit a higher contribution compared to group L, and is more likely to win the policy favor. Group R wins with probability $1 - \frac{v_L}{2v_R} > \frac{1}{2}$. Total expected contributions collected by the politician equal $\frac{v_L(v_R+v_L)}{2v_R} < v_L$, and expected politician utility equals $EU_P = -\frac{\gamma}{2} + \frac{v_L(v_R+v_L)}{2v_R}$.

In the access game, I assume that the politician gives access to the interest group that *signals* the highest quality evidence, rather than the group that provides the largest contribution.[29] In this case, interest group contribution functions are unchanged from the earlier analysis, except they now depend on a group's v as well as its α. Therefore, $C_j(\alpha) = \left(1 - \frac{\alpha}{2}\right) \frac{\alpha v_j}{2}$. Because a group's contribution function is strictly increasing in its α, the politician continues to be able to correctly infer a group's α from its contribution. He remains fully informed and implements $\hat{p}$. Allowing interest groups to differ in terms of v therefore does not change the policy outcome of the access game. It does, however, change the expected total contributions. Now, expected politician revenue equals $\frac{v_R+v_L}{6}$.

The politician sells access whenever $\frac{\gamma}{12} + \frac{v_R+v_L}{6} \geq -\frac{\gamma}{2} + \frac{v_L(v_R+v_L)}{2v_R}$. Rearranging gives

$$\gamma \geq \frac{2}{7}\left(\frac{v_R + v_L}{v_R}\right)(3v_L - v_R).$$

When interest groups have the same v, selling policy favors always results in higher expected revenue than selling access. However, when groups differ in terms of v, this is not necessarily the case. When $v_L < \frac{v_R}{3}$, selling access results in higher expected contributions, and higher policy utility; for this range of values the politician prefers to sell access for all realizations of γ. For larger v_L, the politician prefers to sell access only for important enough issues–those issues with

[29] Such an assumption simplifies the analysis, and is reasonable given the accounts of politicians and interest groups (see for example, Schram (1995), Makinson (2003)). Smaller, local organization often need to contribute less to achieve access than larger, more wealthy organization. Without this assumption, there is pooling amongst the highest α rich groups. However, the politician will remain fully informed, as a rich group with such high α will win access, as the pooling contribution amount is greater than the contribution from any type of poor group.

high enough γ.

Just as in the game without interest group asymmetries, introducing either a contribution limit and a tax can cause the politician to switch from selling policy to selling access. Selling access is always better for constituents than selling policy favors. While a limit may have averse affects on politician information when he does sell access, however, a tax does not have such affects. Therefore, introducing a tax can assure that the politician sells access, and that he continues to be able to identify and implement his fully informed policy.

8 Discussion

This paper combines a stylized model of policy favors with a stylized model of access to help gain a better understanding of the role of political contributions and the effects of campaign finance reforms. The mechanisms through which this paper assumes the politician awards favors or access are not the only means by which a politician may trade policy choices or access for contributions. Allowing the politician to award policy or access through alternative means should not change the main results, so long as the politician continues to choose "better" policy in the money-for-access subgame than in the money-for-policy subgame.

In this paper, the politician gives access to the interest group that provides the highest contribution (or in the case of interest group asymmetries, to the group that signals the highest α). Alternatively, the politician may set a price for access, and any group that pays the set price receives access (e.g., Austen-Smith 1998). Cotton (2008) considers such a mechanism while assuming an underlying evidentiary structure similar to the one developed in this paper. Under such an alternative mechanism for awarding access, the politician becomes fully informed about the evidence of any group with access, and he becomes partially informed about the evidence of any group that does not pay for access. This is because only groups with high-enough α are willing to pay the set access fee, and the politician can correctly infer that any group who does not pay the fee has a lower α. Selling access through access fees still results in a more informed policy decision than selling policy favors. Therefore, the main results of the paper should continue to hold: the representative constituent tends to be better off when the politician sells access rather than favors, both a limit and a tax can make selling access more likely, and a tax does so without further distorting the politician's information.

There are also alternative means through which the politician may sell policy. For example, the politician may sell policy through a menu auction in which each interest group provides a contribution schedule that assigns a payment to each possible policy choice (e.g., Grossman and Helpman 1994, Bernheim and Whinston 1986). Such a mechanism may result in a moderate equilibrium policy choice (e.g., $p = 0$); however the policy choice is still made by a less informed politician and does not result in as good of policy as in the access subgame in which the politician is more-fully informed. Again, the main results of the paper should continue to hold.

Another means of generalizing the model is to allow for noisy information in the access game. For example, interest groups may not know exactly how the politician will interpret their evidence. One way to model this is for each interest group to observe a signal correlated with its α_j. In this case, the contribution function is increasing in a group's signal rather than its α, which the groups do not observe. If a group wins access, the politician still becomes fully informed about α_j. Otherwise, the politician remains less than fully-informed about the groups α_j, although he can infer the group's signal from its contribution. To the extent that a group's signal is correlated with its true type, contributions still enable the politician to become better informed about a group's type. Here, the politician continues to be better informed and choose better policy when he sells access rather than favors.

The access framework in this paper also assumes that interest groups are endowed with evidence about their respective issues, but politicians are ex ante uncertain about the evidence. This assumption is supported by the idea that interest groups are actively involved with their issues, but politicians must make decisions regarding many issues, some of which they likely know little or nothing about.[30] It would also be reasonable, however, to assume that the acquisition or presentation of evidence is costly for the interest groups. So long as the costs to an interest group are low enough, such an assumption should weaken, but not significantly change the results. For example, if the presentation of evidence is costly, only groups with high-enough evidence quality pay to present it if they gain access. This would likely create pooling amongst the groups with low

[30] In this way, this paper's model probably does not apply to an issue like abortion, for which politicians are already well informed or likely to publicly commit to a position, and for which constituents likely have strong beliefs. Instead, such a model is likely a better fit for an issue such as steel tariffs in which the domestic automobile producers have arguments against a tariff, the domestic steel industry has arguments in favor of a tariff, and most politicians are not well informed about the optimal level of tariff for their constituents.

quality evidence, who will not find it worthwhile to pay the presentation costs. If the costs are small enough, most groups will continue to behave according to the original model. The same should be true if the politician can pay to conduct his own research, so long as his costs are sufficiently large compared to the research costs of the interest groups.

9 Conclusion

This paper makes two primary contributions. First, it develops a new model of lobbying and money in politics. The framework combines a traditional money-for-policy model with an informational lobbying and money-for-access game. The model shows that for some issues, the politician provides policy favors in exchange for contributions. For other issues (those of great enough importance), the politician provides access in exchange for contributions, where information revealed through access allows him to make better policy decisions.

Second, the paper compares two types of campaign finance reform: imposing contribution limits, and taxing contributions. The analysis shows that both a contribution limit and a tax may result in better policy outcomes. This is because either reform may cause the politician to sell more access and fewer policy favors. When the analysis compares the effects of a contribution limit and a contribution tax, however, a tax is clearly the better type of campaign finance reform for the representative constituent. A limit makes selling access more likely, but at the same time reduces the politician's ability to identify and implement his fully-informed policy. A tax, on the other hand, makes selling access more likely without reducing politician information.

Future work may further improve this framework by considering repeated interactions between a politician and interest groups, analyzing legislative decision making, or formally modeling how politicians use contributions to fund elections in the presence of both policy favors and access.

10 Appendix

10.1 Access Game Equilibrium Contribution Function with Limit

The contribution limit constrains the possible contributions, but does not directly influence the interest groups' willingness to contribute. Interest groups with high enough evidence quality prefer to contribute more than the limit, but are unable to do so. Groups with low enough evidence quality are happy contributing less than the limit. Let $\bar{\alpha}(\bar{c})$ denote the α cutoff associated with limit $\bar{c}$ such that groups with $\alpha > \bar{\alpha}$ contribute the limit, and those with $\alpha \leq \bar{\alpha}$ contribute less than the limit. If both groups contribute $\bar{c}$, each wins access with equal probability. If a group receives access, the politician observes its evidence directly. If a group contributes $\bar{c}$ and does not receive access, the politician acts as if the politician has α equal to $E_{\mu}(\alpha) = \frac{\bar{\alpha}+1}{2}$.

A group with $\alpha \leq \bar{\alpha}$ has the same incentives to contribute as without a limit; therefore, $C_{\bar{c}}(\alpha) = C(\alpha)$ for $\alpha \leq \bar{\alpha}$. If group j contributes $c < \bar{c}$, then it receives expected payoff equal to Eq. 1. For α in this range, a group's expected payoff is maximized when it contributes according to the contribution function C derived in the previous section; doing so results in expected payoffs

$$\frac{v}{2}\int_0^1 [\alpha_j - \alpha_{-j}]d\alpha_{-j} - (1 - \frac{\alpha_j}{2})\alpha_j \frac{v}{2}. \tag{8}$$

If group j contributes $c_j = \bar{c}$, it receives payoff

$$\frac{v}{2}\int_0^{\bar{\alpha}} [\alpha_j - \alpha_{-j}]d\alpha_{-j} + \frac{v}{2}\int_{\bar{\alpha}}^1 \left(\frac{1}{2}[\alpha_j - \frac{\bar{\alpha}+1}{2}] + \frac{1}{2}[\frac{\bar{\alpha}+1}{2} - \alpha_{-j}]\right) d\alpha_{-j} - \bar{c}. \tag{9}$$

If the other group contributes less than the limit (which it does when $\alpha_L < \bar{\alpha}$), group j receives access and the politician also correctly learns group $-j$'s evidence through its contribution. If $-j$ also contributes the limit, each group receives access with equal probability, and the politician only learns the evidence quality of the group that receives access.

For any $\alpha < \bar{\alpha}(\bar{c})$, the benefit of contributing the limit (i.e., Eq. 9 minus Eq. 8) is strictly increasing in the group's α. The higher α_j, the more attractive j finds contributing the limit, rather than any value less than the limit. The cutoff value $\bar{\alpha}(\bar{c})$ is the evidence value at which the interest group is indifferent between contributing $\bar{c}$ and contributing $C(\bar{\alpha})$ (i.e., $\bar{\alpha}$ solves for α_j the equality Eq. 9 = Eq. 8). Solving for $\bar{\alpha}$ gives $\bar{\alpha} = 1 - \sqrt{2 - \frac{8\bar{c}}{v}}$. When $\bar{\alpha} \leq 0$, the interest group contributes the limit for all α. This happens whenever $\bar{c} \leq \frac{v}{8}$.

10.2 Proofs

Formal proofs of Proposition 1 and Lemmas 2 and 3 are omitted. They follow directly from the analysis in the body of the paper and appendix section 10.1.

Proof of Lemma 1. Consider first the maximum equilibrium contribution revenue. The worse-possible policy utility for an interest group equals $-\frac{v}{2}$, which happens when the politician implements the *other* group's policy. For any p, group R receives policy payoff $p\frac{v}{2}$ and group L receives policy payoff $-p\frac{v}{2}$. Suppose interest group i contributes according to an equilibrium strategy s_i, and that $F(\cdot|s_L, s_R)$ is the equilibrium distribution of policy choice p given the equilibrium strategies. The expected policy benefit to interest group R of participating is $\int_{-1}^{1} f(p|s_L, s_R)\left(p\frac{v}{2} - (-\frac{v}{2})\right) dp$. Independent of how policy is chosen (i.e., through the sale of access, the sale of policy favors, or in some other way), an interest group's equilibrium contribution will not exceed the expected benefit from making the contribution. Therefore, $Ec_R(s_R, s_L) \leq \int_{-1}^{1} f(p|s_L, s_R)\left(p\frac{v}{2} - (-\frac{v}{2})\right) dp$, and similarly for Ec_L. Together, this means $Ec_R + Ec_L \leq \int_{-1}^{1} f(p|s_L, s_R)\left(v + p\frac{v}{2} - p\frac{v}{2}\right) dp = v$. Therefore, total expected revenue cannot exceed v. Selling policy favors achieves v; while selling access results in total expected contributions of $\frac{v}{3} < v$.

Next, consider the maximum equilibrium politician policy utility. By definition $\hat{p} \equiv \arg\max_p W(p)$. In the access subgame, $p = \hat{p}$ with probability 1; thus maximizing policy utility and constituent welfare. In the policy favor subgame, $p \neq \hat{p}$ with probability 1, thus achieving lower expected policy utility. ■

Proof of Proposition 2. Expected constituent welfare as a function of the contribution limit is given by

$$EW(\bar{c}) = \begin{cases} \int_0^{\bar{\gamma}(\bar{c})} g(\gamma)\left[-\frac{\gamma}{2}\right] d\gamma + \int_{\bar{\gamma}(\bar{c})}^{\infty} g(\gamma)\left[\frac{\gamma}{12}\right] d\gamma & \text{for } \bar{c} = \emptyset \text{ or } \bar{c} \geq \frac{v}{4} \\ \int_0^{\bar{\gamma}(\bar{c})} g(\gamma)\left[-\frac{\gamma}{2}\right] d\gamma + \int_{\bar{\gamma}(\bar{c})}^{\infty} g(\gamma)\left[\frac{\gamma}{12} - (1-\bar{\alpha}(\bar{c}))^4 \frac{\gamma}{24}\right] d\gamma & \text{for } \bar{c} \in \left[\frac{v}{8}, \frac{v}{4}\right] \\ \int_0^{\infty} g(\gamma)\frac{\gamma}{24} d\gamma & \text{for } \bar{c} \in \left[0, \frac{v}{8}\right], \end{cases}$$

where $\bar{\gamma}(\bar{c})$ is defined by Eq. 7. First, it should be clear from $EW(\bar{c})$ above that a limit of $\bar{c} = \frac{v}{4}$ is strictly better (for constituent welfare) than any higher limit, or no limit at all. This follows because $\frac{\partial \bar{\gamma}}{\partial \bar{c}} \geq 0$ for all $\bar{c} \geq \frac{v}{4}$ and $\frac{\partial \bar{\gamma}}{\partial \bar{c}} > 0$ for all $\bar{c} \in \left[\frac{v}{4}, \frac{v}{2}\right)$. Remember $g(\gamma) > 0$ for all $\gamma > 0$.

Consider now $\bar{c} \in \left[\frac{v}{8}, \frac{v}{4}\right]$. For this range of limit,

$$\begin{aligned}\frac{\partial EW(\bar{c})}{\partial \bar{c}} = \;& g(\bar{\gamma}(\bar{c}))\left[-\frac{\bar{\gamma}(\bar{c})}{2}\right]\bar{\gamma}'(\bar{c}) - g(\bar{\gamma}(\bar{c}))\bar{\gamma}'(\bar{c})\left[\frac{\bar{\gamma}(\bar{c})}{12} - (1-\bar{\alpha}(\bar{c}))^4\frac{\bar{\gamma}(\bar{c})}{24}\right] \\ & + 4(1-\bar{\alpha}(\bar{c}))^3\bar{\alpha}'(\bar{c})\int_{\bar{\gamma}(\bar{c})}^{\infty} g(\gamma)\frac{\gamma}{24}d\gamma.\end{aligned}$$

The derivative evaluated at the upper bound of this range, $\bar{c} = \frac{v}{4}$, is

$$\frac{\partial EW(\frac{v}{4})}{\partial \bar{c}} = -\frac{v}{6}g(2v/7)\bar{\gamma}'(v/4).$$

The derivative of the cutoff value with respect to the limit, $\frac{\partial \bar{\gamma}(\bar{c})}{\partial \bar{c}}$, is strictly positive for all $\bar{c} \in [\frac{v}{8}, \frac{v}{4}]$. Therefore, $\frac{\partial EW(\frac{v}{4})}{\partial \bar{c}} < 0$. Given an initial $\bar{c} = \frac{v}{4}$, marginally decreasing $\bar{c}$ strictly increases expected constituent welfare. Thus, $\bar{c}^* < \frac{v}{4}$.

Similarly, the derivative evaluated at the lower bound of this range, $\bar{c} = \frac{v}{8}$, is

$$\frac{\partial EW(\frac{v}{8})}{\partial \bar{c}} = \frac{2}{3v}\int_0^{\infty} g(\gamma)\gamma d\gamma > 0.$$

Given an initial $\bar{c} = \frac{v}{8}$, marginally increasing $\bar{c}$ strictly increases expected constituent welfare. Thus, $\bar{c}^* > \frac{v}{8}$. Taken together these conditions imply $\frac{v}{8} < \bar{c}^* < \frac{v}{4}$. ■

Proof of Lemma 4. Define $\tau' \equiv \max\left\{0, 1 - \frac{7}{8}\frac{\gamma}{v}\right\}$. Given some tax rate τ, the politician sells access if $\gamma \geq \bar{\gamma}(\tau) = (1-\tau)\frac{8}{7}v$. Rearranging, the politician sells access if $\tau \geq 1 - \frac{7}{8}\frac{\gamma}{v}$. Since $\tau \geq 0$, it follows that the politician sells access iff $\tau \geq \tau'$. From the analysis in the body of the paper, it follows that whenever the politician sells access in the game with a contribution tax, the politician becomes fully informed in equilibrium. A fully-informed politician chooses his fully-informed policy, setting $p = \hat{p}$. ■

Proof of Proposition 3. For any tax rate $\tau \in [0, 1]$, ex ante expected constituent welfare is

$$EW(\tau) = \int_0^{(1-\tau)\frac{8}{7}v} g(\gamma)\left[-\frac{\gamma}{2}\right]d\gamma + \int_{(1-\tau)\frac{8}{7}v}^{\infty} g(\gamma)\left[\frac{\gamma}{12}\right]d\gamma, \tag{10}$$

which is strictly increasing in $\tau \in [0, 1]$. Therefore, $EW(\tau)$ is maximized at the maximum tax rate, $\tau = 1$. Therefore, $EW(\tau = 1) = \int_0^{\infty} g(\gamma)\left[\frac{\gamma}{12}\right]d\gamma$ ■

Proof of Proposition 4. From the proof to Proposition 3, it is clear that $EW(\tau)$ is strictly increasing in τ, and ranges from $\int_0^\infty g(\gamma)\left[\frac{\gamma}{12}\right]d\gamma$ when $\tau = 1$ to $\int_0^{\frac{8}{7}v} g(\gamma)\left[-\frac{\gamma}{2}\right]d\gamma + \int_{\frac{8}{7}v}^{\infty} g(\gamma)\left[\frac{\gamma}{12}\right]d\gamma$ when $\tau = 0$.

From the proof to Proposition 2, it is clear that for any $\bar{c} \geq 0$, $EW(\bar{c}) < \int_0^\infty g(\gamma)\left[\frac{\gamma}{12}\right]d\gamma$. Therefore, $EW(\bar{c}) < EW(\tau = 1)$. Let $EW(\bar{c}^*)$ denote the maximum possible ex ante expected welfare under a limit. Let τ' solve $EW(\tau) = EW(\bar{c}^*)$ for τ, where $EW\tau$ is given by Eq. 10. Given that $EW(\tau)$ is strictly increasing in τ and that $EW(\bar{c}) < EW(\tau = 1)$ for all $\bar{c}$, it follows that $\tau' < 1$. Given that $EW(\tau)$ is strictly increasing in τ, it follows that for any $\tau > \tau'$, $EW(\tau) > EW(\bar{c})$. ■

Proof of Proposition 5. First consider the case when $\bar{\gamma}' \in \left[\frac{2}{7}v, \frac{8}{7}v\right)$. The required limit to achieve $\bar{\gamma} = \bar{\gamma}'$ solves $2\bar{c} - \frac{\bar{\gamma}'}{2} = \frac{\bar{\gamma}'}{12} + \frac{v}{3}$; therefore, $\bar{c} = \frac{1}{24}(4v + 7\bar{\gamma}')$. The politician's expected utility in the game with such a limit equals

$$\int_0^{\bar{\gamma}'} g(\gamma)\left(2\bar{c} - \frac{\gamma}{2}\right)d\gamma + \int_{\bar{\gamma}'}^{\infty} g(\gamma)\left(\frac{\gamma}{12} + \frac{v}{3}\right)d\gamma. \tag{11}$$

To achieve $\bar{\gamma}'$ through a tax, the required τ solves $\frac{\bar{\gamma}'}{12} + (1-\tau)\frac{2}{3}v = -\frac{\bar{\gamma}'}{2} + (1-\tau)v$; therefore, $\tau = \frac{8v - 7\bar{\gamma}'}{8v}$. This is true for any $\bar{\gamma}' < \frac{8}{7}v$. The politician's expected utility in the game with such a tax equals

$$\int_0^{\bar{\gamma}'} g(\gamma)\left(-\frac{\gamma}{2} + (1-\tau)v\right)d\gamma + \int_{\bar{\gamma}'}^{\frac{8}{7}v} g(\gamma)\left(\frac{\gamma}{12} + (1-\tau)\frac{v}{3}\right)d\gamma + \int_{\frac{8}{7}v}^{\infty} g(\gamma)\left(\frac{\gamma}{12} + \frac{v}{3}\right)d\gamma. \tag{12}$$

The politician prefers the limit whenever Eq. 11 is greater than Eq. 12. This condition simplifies to whenever $\int_0^{\frac{8}{7}v} g(\gamma)(8v - 7\bar{\gamma}')\frac{1}{24}d\gamma > 0$, which holds for all v, given that $\bar{\gamma}' < \frac{8}{7}v$.

Next consider the case when $\bar{\gamma}' \in \left[0, \frac{2}{7}v\right]$. For values in this range, the required limit to achieve $\bar{\gamma}'$ solves Eq. 7 as an equality. The required tax is the same as in the first case. To prove that there exists a v large enough such that the politician prefers regulation through a limit, it is sufficient to show that there exists a v large enough such that the politician prefers the limit to the tax for each possible realization of γ, with strict preference for some potential realizations.

For $\gamma < \bar{\gamma}'$, the politician sells favors and the politician's realized utility is independent of the type of regulation. Here the politician is indifferent between both types of regulation. For $\gamma \in \left[\bar{\gamma}', \frac{2}{7}v\right]$, the politician earns expected payoff $\frac{\gamma}{12} - (1-\bar{\alpha}(\bar{c}))^4\frac{\gamma}{24} + 2(1-\bar{\alpha}(\bar{c}))\bar{c} + v\left(\frac{\bar{\alpha}(\bar{c})^2}{2} + \frac{\bar{\alpha}(\bar{c})^3}{6}\right)$ under required limit $\bar{c}$, and the politician earns expected payoff $\frac{\gamma}{12} + \frac{7\bar{\gamma}'}{24}$ under the required tax. For this range of γ, the expected payoff under the tax is independent of v, while the expected payoff under the limit is strictly approaches ∞ as $v \to \infty$. Thus, the politician will strictly prefer the limit for large enough v. For $\gamma \in \left(\frac{2}{7}v, \frac{8}{7}v\right]$, the politician earns expected payoff $\frac{\gamma}{12} + \frac{v}{3}$ under a limit. Under the required tax, the politician earns the same expected payoff as in the case when $\gamma \in \left[\bar{\gamma}', \frac{2}{7}v\right]$. The politician's expected payoff is strictly increasing in v under the limit, with $EU_P \to \infty$ as $v \to \infty$, and the politician's expected payoff is again independent of v under the tax, given γ. Again, the politician will strictly prefer the limit for large enough v. Finally, for $\gamma \geq \frac{8}{7}v$, the politician earns the same expected payoff $\frac{\gamma}{12} + \frac{v}{3}$ under either regulation and is therefore indifference.

For large enough v, the politician strictly prefers the limit for some potential realizations of γ, and is indifferent between the tax and the limit for all other realizations of γ. Therefore, if v is large enough, the politician earns a strictly higher ex ante expected utility under the limit, and thus strictly prefers the limit to the tax. ■

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