Access Fees in Politics

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Abstract

This paper develops a game-theoretic model of lobbying in which a politician sells *access* to interest groups. The politician sets an *access fee*, or the minimum contribution necessary to secure access, and an interest group that pays this fee can share verifiable evidence in favor of its preferred policy. The more the politician knows about interest group evidence, the better able he is to identify and implement the welfare-maximizing policy. In equilibrium, a wealthy interest group must pay more for access than an otherwise similar poor group; and a group involved with an important issue must pay less than an otherwise similar group involved with a less-important issue. The politician sets higher-than-optimal access fees in order to increase contributions. A contribution limit can improve constituent welfare by lowering the price of access, which tends to result in a more-informed politician. However, a limit can also decrease the range of issues for which the politician is willing to sell access, thereby reducing politician information and constituent welfare. Although the optimal limit is binding for some issues, it is never optimal to ban contributions.

Keywords: Lobbying, campaign contributions, contribution limits, political access, hard information, evidence disclosure

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1 Introduction

The economics and political science literatures focus on two motivations behind political contributions. First, one may contribute in the quid pro quo exchange for policy favors. Second, one may contribute to help a politician already in favor of one's cause fund his election. The literature has largely overlooked a third reason for contributing: to secure access to a politician, where those with access can influence the drafting of legislation or the politician's voting record through the provision of information or arguments in support of one's preferred policy, or against a less-preferred option.

Although the first two motivations may help drive contributions, there is substantial evidence that the access motivation also has a significant (if not stronger) influence on interest group contributions.[1] Despite this, few papers attempt to model the contributions-for-access story (I discuss those that do in the Literature Review). This paper presents a simple model of lobbying in which money buys access. I use the model to develop a better understanding of the interaction between politicians and interest groups, and to analyze the impact of a contribution limit on payments and policy outcomes.

A politician must choose a policy, but he is ex ante uncertain about the effects of different choices. An interest group has private evidence in favor of its own preferred policy, which it can verifiably reveal to the politician only if the politician grants the group access. Unlike other models of hard-information disclosure, the politician controls which interest groups receive access. He can therefore require than an interest group provide a political contribution in exchange for the opportunity to disclose its evidence. I refer to this required contribution as the access fee.

In this simple game, the politician sets an access fee, and an interest group decides whether or not to pay the fee. If the group pays the fee, the politician becomes fully informed of its private evidence in favor of its known position. When setting the access fee, the politician also has the option of granting access for free, or not selling access at any price.

The politician cares about choosing the policy that is best for a representative constituent; and the more he knows about the interest group's evidence, the more accurate are his beliefs about this best policy. He also cares about collecting political contributions (which come from access fee payments), and he finds granting access costly. Expected representative constituent welfare

[1] See for example, Herndon (1982), Langbein (1986), Wright (1990), Hall and Wayman (1990), Milyo et al. (2000), Ansolabehere et al. (2002), Clawson et al. (1992), Schram (1995).

is maximized when the politician has full information about the interest group's evidence. This happens when the politician grants access for free, since then the interest group will always present its evidence. If the politician charges a positive access fee, the group only buys access if its evidence is of high-enough quality, otherwise it does not buy access (which happens with positive probability) and the politician remains less than fully informed.

The model yields the following insights. The equilibrium access fee, set by the politician, is strictly increasing in the interest group's wealth and strictly decreasing in the importance of the issue. This means that the politician charges a wealthy interest group a higher price for access than an otherwise similar poor group, and that access is relatively inexpensive for interest groups involved with issues about which the politician (or his constituents) cares intensely. However, for any group, the politician sets an access fee that is higher than the fee that would be preferred by the representative constituent. In equilibrium, the politician trades off constituent welfare in order to increase expected contributions. Interestingly, as interest groups become wealthier, the politician tends to become more informed about policy, which improves expected constituent welfare.

The analysis identifies competing positive and negative effects of a contribution limit. A contribution limit may improve expected constituent welfare by reducing the price of access, which tends to result in more access and a better-informed politician. However, a contribution limit also reduces the politician's financial incentive to grant access. For some issues, a limit may result in the politician no longer finding it worthwhile to grant access. For these issues, the limit causes the politician to refuse access at any (allowed) price, which tends to result in him being less informed and choosing worse policy. When the contribution limit applies to many issues, I show that it is always optimal from the standpoint of constituent welfare to impose a contribution limit that is binding for some issues. Under the optimal limit, the politician will refuse to provide any access for some issues. Banning contributions is never optimal.

2 Literature Review

This paper develops a game theoretic model of lobbying in which interest groups provide political contributions to gain access to a politician. Access allows an interest group to present verifiable or hard evidence in favor of its preferred policy position. To my knowledge, only two other papers share this foundation. Cotton (2008) models political contributions when the politician auctions off access to the highest bidders. Austen-Smith (1998) tells a similar story to the present paper, in which the politician sets implicit prices for access.

Cotton (2008) shows how an interest group with more-persuasive evidence in favor of its preferred policy is willing to pay more to share its evidence with the politician compared to a similar group with less-persuasive evidence. The politician not only learns about the evidence of interest groups that win access; he also makes inferences about interest group evidence by observing the political contributions. In equilibrium, the politician learns about the evidence quality of all interest groups, even when he only gives access to some of the groups. A contribution limit distorts the signaling power of the contributions, which results in a less-informed politician. When the politician sells access to the highest bidder, a contribution limit has a strictly negative impact on expected constituent welfare.

The results in Cotton (2008) depend on the assumption that the politician allocates access through some form of auction mechanism, in which the probability an interest group wins access is strictly increasing in the group's contribution. It is unclear, however, that the politician allocates access in such a way. For example, an interest group that attends a $1000 per plate fundraiser for a politician may expect some minimal amount of access. But the results in Cotton (2008) rely on some uncertainty regarding whether the fundraiser attendee receives access, which may not be the case. As I show in this paper, when the politician commits to access fees before collecting contributions, a contribution limit no longer has a strictly negative impact on representative constituent welfare. Furthermore, the model in Cotton (2008) suggests that total political contributions are decreasing in the number of interest groups the politician provides access. This conclusion is not only counterintuitive, but also not supported by the empirical evidence. For example, Langbein (1986) finds that political contributions are increasing in the time spent by politicians meeting with constituents and interest groups. In the present paper, given any access fee, contributions are increasing in the amount of access.

In Austen-Smith (1998), the politician sets access fees, similar to in this paper. The primary difference between Austen-Smith (1998) and my paper involves the underlying information structure. The earlier paper develops a model in which there are multiple interest groups involved with an issue, and interest groups differ in terms of their ex ante policy preferences relative to those of the politician. The paper considers how access fees depend on whether an interest group has similar policy preferences to the politician. In the current paper, I fix interest group policy positions and assume there is only one interest group per issue. Although these assumptions may result in a less realistic information structure, the resulting model allows for an intuitive analysis with greater focus on interest group wealth differences, issue asymmetries, and the impact of contribution limits. This alternative focus allows me to better address questions central to the current policy debate on campaign finance reform; particularly questions involving contribution limits.

Other "access" models, including Austen-Smith (1995) and Lohmann (1995), assume that information is completely unverifiable. Therefore, the presentation of information by itself can have no impact on the politicians beliefs, and the impact that any piece of information has on the politician depends on who provides it and how much money they attach to the information. This paper, as well as Cotton (2008) and Austen-Smith (1998), make the alternative assumption that evidence can have an impact on the politician's beliefs independent of who provides it, or the size of the contribution attached to it. In other words, interest groups have hard evidence that they can disclose to the politician.

The political-access framework differs from other models of hard information in that the politician has control over which interest groups have access to present information. Typically in the hard information literature, an agent with private information can disclose its information whenever it chooses to do so (e.g., Milgrom and Roberts 1986, Bennedsen and Feldmann 2002, 2006, Bull and Watson 2004, 2007). In the political-access framework, the politician determines which interest groups receive access, and he is able to grant access based on political contributions. Once an interest group receives access, it behaves as if it is in a more traditional game of hard information disclosure, and will always present its evidence. As Milgrom and Roberts (1986) establishes, only an interest group with the worst possible evidence will refuse to present when given access.

3 Game with One Issue

3.1 Model

There are two players: a politician and an interest group. The politician must choose a policy p from a single-dimensional policy space on the real line. The politician prefers to set p as close to the *ideal policy* $\hat{p}$ as possible; however, he is ex ante uncertain about the identity of $\hat{p}$. The interest group prefers strictly higher p.

At the beginning of the game, the interest group draws private, verifiable evidence regarding the identity of $\hat{p}$. Consistent with the information structure developed in Cotton (2008), the interest group's evidence consists of both evidence in favor of a higher policy choice, and evidence in favor of a lower policy choice (or against a higher p). Let e^h denote the strength of the evidence in favor of a high p, and let e^l denote the strength of the evidence in favor of a low p, where both variables are the realization of a random variable $\hat{e}$ uniformly distributed on the unit interval $[0, 1]$. The ideal policy depends on both e^h and e^l, where $\hat{p} \equiv e^h - e^l$.

Before choosing a policy p, the politician can grant the interest group access. If the politician grants the group access, the interest group can send a message to the politician communicating its evidence. Similar to the evidence itself, the message consists of two parts: m^h which communicates evidence in favor of a higher p, and m^l which communicates evidence in favor of a lower p. The interest group can downplay or ignore evidence, but cannot exaggerate it; therefore, $m^h \in [0, e^h]$ and $m^l \in [0, e^l]$. It is straightforward to show that the interest group with access will reveal the maximum amount of evidence in its favor, and the minimum amount of evidence against its position. Thus, $m^h = e^h$ and $m^l = 0$.[2] Therefore, the politician learns about the evidence in favor of a higher p by giving the interest group access. Although the politician does not learn anything about the evidence against a higher p, he is more informed about the ideal policy when he grants the group access than when he does not grant the group access.

Although giving access to the interest group enables the politician to become better informed about the ideal policy, granting access is costly for the politician, imposing on him a utility cost of τ. The politician may require that the interest group pay a political contribution in order to receive access. Let $c \geq 0$ denote the *access fee* set by the politician. The politician commits to give the interest group access if it provides contribution c. If $c = 0$, then the politician grants access to the interest group for sure. If c is higher than the interest group would ever be willing to pay, the politician is said to "not grant access."

Let $a \in \{0, 1\}$ denote the interest group's contribution decision, where $a = 1$ if the group pays

[2]This paper's evidentiary structure is consistent with Bull and Watson (2007)'s normality condition, or, equivalently, Lipman and Seppi (1995)'s full-reports condition. As these authors have shown, the interest group has an incentive to reveal the maximum amount of favorable evidence, and the minimum amount of unfavorable evidence.

price c. Let m denote the evidence revealed by the interest group. If the interest group does not pay the access fee, then $m = \emptyset$. If the group does pay the access fee, then it reveals all of the evidence in favor of a higher p, and $m = e^h$. The realization of m given access choice a can be written $m(a)$, where $m(1) = e^h$ and $m(0) = \emptyset$. (If $c = 0$, the politician grants access to the group and learns e^h for sure.)

The social welfare function is $W(p; \hat{p}, \gamma) = -|\hat{p} - p|\gamma$, where the variable γ represents the relative importance of the politician's policy decision. γ may be thought of as how much the representative constituent cares about the issue for which the policy choice is made. γ is the realization of a random variable that is continuously distributed on $\mathbb{R}_{++}$ with distribution G and density g. Let $\mathcal{G}$ denote the set of all continuous distributions on $\mathbb{R}_{++}$, where $G \in \mathcal{G}$. The variable γ is realized at the beginning of the game, before the politician sets a price of access.

Game Order

The game takes place as follows:

1. The politician observes γ. The interest group learns γ, e^h, and e^l. The politician then announces access fee c.

2. The interest group chooses whether to pay c. This decision is denoted by $a \in \{0, 1\}$. If the interest group pays c, then the politician becomes fully informed about e^h.

3. The politician chooses policy p.

States and Beliefs

Although the state of the world is technically given by the realization of e^h, e^l, and γ, the value e^l does not influence play during the game.[3] Therefore, the formal consideration of states and beliefs can ignore e^l, and focus instead on the realization of favorable evidence e^h, and the importance of the issue for social welfare γ.

The interest group knows both e^h and γ with certainty. The politician knows γ, but does not observe the draw of e^h. At the time the politician sets the price for access c, the politician's beliefs about e^h are given by the ex ante distribution of evidence quality. When the politician chooses a

[3] The politician does not observe e^l until the end of the game after the policy is implemented. The interest group, although it observes e^l at the beginning of the game, will never reveal evidence against its preferred position. Therefore, e^l has no impact on the interest group's strategy.

policy, his beliefs about e^h are consistent with Bayes Rule given the ex ante distribution of evidence quality, the interest group's choice of whether to pay for access, and the revelation of evidence if the interest group does receive access. Denote these updated beliefs by $\mu(a, m)$, where $\mu(a, m)$ may be fully represented by an updated density function f_μ. The value $f_\mu(e^h)$ gives the probability that politician puts on the interest group having evidence e^h, given his beliefs e^h.

The politician is a Bayesian. Therefore, if the interest group pays for access (or if $c = 0$), the politician fully learns e^h; so $f_\mu(e^h) = 1$ and $f_\mu(e) = 0$ for all $e \neq e^h$.

Let E denote the ex ante expectations about the state of the world, and let E_μ denote the politician's expectations about the state of the world given beliefs μ.

Payoffs

The politician cares about the welfare of a representative constituent (or citizen), which is maximized when he implements the ideal policy $\hat{p}$, and about collecting political contributions. The variable γ represents how much the representative constituent cares about the issue. Representative citizen welfare, and politician policy payoff is given by $W(p; \hat{p}, \gamma) = -|\hat{p} - p|\gamma$. Letting the parameter ϕ represent how much the politician cares about political contributions, the politician's utility is

$$\begin{aligned} U_P(p, c; \hat{p}, \gamma, a) &= W(p; \hat{p}, \gamma) + (\phi c - \tau)a \\ &= -|\hat{p} - p|\gamma + (\phi c - \tau)a. \end{aligned}$$

The analysis assumes that $\tau < \frac{v}{2}\phi$, which implies that the cost of providing access is less than the maximum possible financial incentive from doing so. As I show in the analysis, $\frac{v}{2}$ is the maximum possible access fee. Any greater fee always results in no interest group buying access.

The interest group strictly prefers a higher policy choice p, and paying a lower contribution. Let the parameter v denote how much the group cares about policy relative to money. Therefore, the interest group's utility is

$$U_{IG}(a; p, c) = vp - ca.$$

3.2 Contribution Equilibrium

The analysis solves for the pure-strategy Perfect Bayesian Equilibrium of the game, which I call the *contribution equilibrium.* A complete description of the equilibrium must include the strategy profiles for the interest group and the politician, as well as the politician's beliefs about the state of the world at the time he chooses policy. The politician's beliefs must be consistent with using Bayes' Rule on the ex ante distribution of evidence quality given the strategies of the interest group. Each player's strategy must be a best response to the strategies of the other players, given their beliefs.

Let the function C^* denote the politician's equilibrium choice of access fee, where $C^*(\gamma, v)$ is the access price when the issue is of γ importance and the interest group has wealth v. Let the function P^* denote the politician's equilibrium policy choice, where $P^*(a, m; \mu)$ describes his choice given a and m. Similarly, let the function A^* define the interest group's equilibrium strategy, where $A^*(c, e^h)$ is the group's choice of whether to pay for access given access fee c and the realized evidence quality e^h.

I solve for the equilibrium of the game using backward induction, first solving for the politician's policy choice, then for the interest group's choice of whether or not to pay the access fee, then finally for the politician's choice of access fee. The equilibrium is described in Proposition 1.

Proposition 1 *In the contribution equilibrium of the access fee game:*

1. *The politician chooses the expected ideal policy given his beliefs μ, where*

$$P^*(a, m; \mu) = \int_0^1 \mu(e^h | a, m, c) e^h de^h - \frac{1}{2}. \tag{1}$$

2. *The interest group buys access iff its favorable evidence is strong enough,*

$$A^*(c, e^h) = \begin{cases} 0 & \textit{when } e^h \leq \frac{2c}{v} \\ 1 & \textit{when } e^h > \frac{2c}{v}. \end{cases} \tag{2}$$

3. *The politician sets a positive access fee,*

$$C^*(\gamma, v) = \frac{-2v^2\phi + v\sqrt{2}\sqrt{v\gamma\phi + 2v^2\phi^2 + 2\gamma\tau}}{2\gamma}. \tag{3}$$

4. *In the contribution equilibrium, the politician's beliefs μ are such that*

(a) if $a = 1$, then

$$f_\mu(e) = \begin{cases} 1 & \textit{for } e = e^h \\ 0 & \textit{for all other } e \neq e^h\textit{; and} \end{cases}$$

(b) if $a = 0$, then

$$f_\mu(e) = \begin{cases} \frac{1}{\bar{e}(c)} & \textit{for } e \in [0, \bar{e}(c)] \\ 0 & \textit{for all other } e \notin [0, \bar{e}(c)]. \end{cases}$$

I will discuss the equilibrium strategies, starting with the policy choice at the end of the game.

Policy Choice

At the time the politician chooses policy, the interest group has already chosen whether to pay the access fee, and all evidence revelation has already taken place. At this point, the politician's choice of policy cannot influence contributions. This means the policy choice can only impact the policy portion of his utility function, and he will choose the policy that maximizes expected constituent welfare given his beliefs. The politician's equilibrium policy choice is therefore $P^*(a, m; \mu) = E_\mu p^o = E_\mu e^h - E_\mu e^l$. Since e^l is uniformly distributed on the unit interval, this simplifies to $P^*(a, m; \mu) = E_\mu e^h - \frac{1}{2}$.

Notice that the equilibrium policy choice depends only on the politician's beliefs about e^h. Therefore, earlier actions only impact policy through their influence on μ.

Interest Group Behavior

The interest group chooses whether to pay access fee c. If it pays fee c, the politician fully learns the value of e^h and will choose policy $P^* = e^h - \frac{1}{2}$. Paying c therefore results in interest group payoff $\left(e^h - \frac{1}{2}\right) v - c$. If the group does not pay c, then the politician relies on his expectations regarding e^h and chooses policy $P^* = E_\mu e^h - \frac{1}{2}$. In this case, the interest group receives payoff $\left(E_\mu e^h - \frac{1}{2}\right) v$. The interest group prefers to pay the fee iff

$$\left(E_\mu e^h - \frac{1}{2}\right) v < \left(e^h - \frac{1}{2}\right) v - c. \tag{4}$$

For any $E_\mu e^h$, if the interest group prefers to pay the fee for some evidence e^h, then it will also prefer to pay the fee for any higher evidence quality $e^{h'} \geq e^h$. Similarly, if the group prefers *not* to pay the fee for some e^h, then it will not pay the fee for any lower evidence quality $e^{h'} \leq e^h$. Since this holds for all $e^h \in [0, 1]$, there must exist some cut-off value $\bar{e}(c)$ such that for all $e^h < \bar{e}(c)$ the interest group does not pay access fee c, and for all $e^h > \bar{e}(c)$ the interest group pays c for access.[4] Given the existence of $\bar{e}$ and the uniform distribution of e^h, it follows that when the group does not buy access $E_\mu e^h = \frac{\bar{e}}{2}$.[5]

When $e^h = \frac{2c}{v}$, the interest group is indifferent between buying access and not buying it at fee c. Therefore, $\bar{e} = \frac{2c}{v}$. When e^h is higher than this, the benefits of disclosing evidence strictly outweigh the cost imposed by the fee. When e^h is lower than this, the interest group prefers the politician to act as if it has evidence quality $\frac{\bar{e}}{2}$ than to pay the fee and disclose its actual evidence quality.

Access Fee

Determining the equilibrium access fee requires solving a straightforward optimization problem, given interest group behavior and policy choice at later stages in the game. The politician's choice of access fee c must maximize his expected payoff

$$\int_0^1 \int_0^1 \Big(- \big|p^o(e^h, e^l) - P^*(A^*(c, e^h), m(A^*(c, e^h)); \mu)\big|\gamma + (c\phi - \tau)A^*(c, e^h)\Big) de^h de^l. \tag{5}$$

As I show in the proof to Proposition 1 in the appendix, after substituting in for P^* and A^* this expression simplifies to

$$EU_P = \left[- \left(\frac{1}{4} + \frac{2}{3}\frac{c^3}{v^3} \right) \gamma \right] + \left[(c\phi - \tau) \left(1 - \frac{2c}{v} \right) \right] \tag{6}$$

when $c \in \left[0, \frac{v}{4} + \frac{\tau}{2\phi}\right]$. (I later show that the politician always chooses c from this range of values.) The term inside the first set of brackets is the politician's expected policy utility (and expected constituent welfare) given access fee c. When $c = 0$, the interest group buys access for sure and policy utility is maximized at $-\frac{\gamma}{4}$. As c increases, policy utility strictly decreases. The term inside the second set of brackets is expected revenue given c. Inside this second term, $(c\phi - \tau)$ denotes contribution utility minus the cost of providing access, and $\left(1 - \frac{2c}{v}\right)$ denotes the probability that the interest group draws high-enough e^h that it buys access at fee c.

[4]The value $\bar{e}$ is not restricted to be positive. If $\bar{e} < 0$, then the politician will always buy access independent of the realized e^h. Similarly, if $\bar{e} > 1$, then the politician will never buy access independent of the realized e^h.

[5]When the group does buy access, the politician learns e^h with certainty; therefore, $E_\mu e^h = e^h$.

The derivative of expression 6 with respect to c simplifies to

$$\left[-\gamma\frac{2c^2}{v^3}\right] + \left[\phi + (\tau - 2\phi c)\frac{2}{v}\right]. \tag{7}$$

The term inside the first set of brackets represents the impact that increasing the access fee has on the politician's expected policy utility (and constituent welfare). Notice that this term is strictly negative for all positive c. The term inside the second set of brackets represents the impact that increasing the access fee has on expected revenue. When $c = \frac{v}{4} + \frac{\tau}{2\phi}$, this second term is maximized, and for any access fee, moving the fee closer to this amount strictly increases expected revenue. The politician will never prefer c greater than $\frac{v}{4} + \frac{\tau}{2\phi}$ since increasing c above this value results in both lower policy utility and lower revenue.

Setting the expression 7 equal to 0 gives the first order conditions for the politician's maximization problem. Solving for c provides a closed-form solution for the equilibrium access fee C^*. The solution is given in Proposition 1 by equation 12. Section 3.2.1 considers the characteristics of C^* in more detail.

3.2.1 Characteristics of Equilibrium Access Fee

Proposition 2 describes the notable characteristics of the equilibrium access fee function C^*.

Proposition 2 *The equilibrium access fee C^* is*

1. *strictly increasing in the cost of providing access* $\left(\frac{\partial C^*}{\partial \tau} > 0\right)$,
2. *strictly increasing in interest group wealth* $\left(\frac{\partial C^*}{\partial v} > 0\right)$,
3. *strictly decreasing in issue importance* $\left(\frac{\partial C^*}{\partial \gamma} < 0 \text{ for all } \gamma > 0\right)$, *where* $C^* \to 0$ *as* $\gamma \to \infty$, *and* $C^* \to \left(\frac{v}{4} + \frac{\tau}{2\phi}\right)$ *as* $\gamma \to 0$, *and*
4. *strictly positive* $\left(C^* > 0 \text{ for all } \gamma\right)$.

These results make intuitive sense. As the politician's cost of providing access τ increases, he increases the access fee to help offset this increase. The parameter v represents how much the interest group cares about the policy choice relative to money. All else equal, as the interest group becomes more wealthy, or as it becomes more concerned about the policy choice, the value

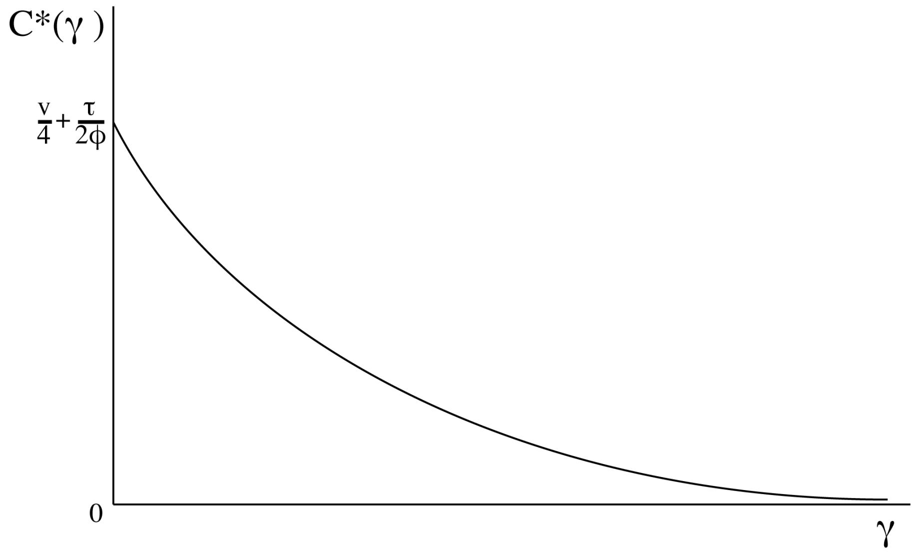

Figure 1: Equilibrium access fee as a function of issue importance

v increases. As the proposition shows, in equilibrium the politician charges a higher price of access to relatively wealthy interest groups compared with less wealthy groups.

The variable γ represents how important the policy choice is to the representative constituent. The proposition says that the politician charges a lower price for access to an interest group that is involved with an issue that he considers important. As the importance of the issue increases, the access fee falls, with the fee approaching (but never reaching) 0 in the limit. Conversely, for issues not considered important by the constituents, the politician charges a relatively high price for access. As the importance of the issue approaches 0, the access fee approaches $\frac{v}{4} + \frac{\tau}{2\phi}$, which is the access fee that maximizes the politician's expected payment from the interest group minus the cost of providing access.[6] An illustration of C^* as a function of γ is provided by Figure 1.

Although the politician's policy utility (and constituent welfare) is maximized if he sets an access fee equal to 0, he will always set a positive access fee. This is because the politician cares about collecting contributions as well as choosing the best policy. At a low-enough c, the marginal benefit to contributions (the right-hand portion of expression 7) will exceed the marginal cost to the policy choice (the left-hand portion of expression 7). Compared to the case of $c = 0$, a marginally positive

[6]This is the access fee the politician would choose if his utility function did not incorporate constituent welfare, and only included contribution utility (so, $U_P = (c\phi - \tau)\, a$). When the politician cares–even just a little–about constituent welfare, he trades off at least some contribution revenue in order to increase social welfare. Notice that $\frac{v}{4} + \frac{\tau}{2\phi} < 1$ is assured by the assumption that the cost of providing access is less than the benefit from the maximum possible access fee, or $\tau < \frac{\phi v}{2}$.

fee has essentially no effect on the policy choice. A marginally positive access fee means that only a group with the lowest possible evidence quality will not buy access. When the politician sees that a group does not buy access, he correctly infers that the group must have the lowest possible e^h, and therefore essentially remains fully informed about e^h. Therefore, compared to $c = 0$, a marginally positive access fee has strictly positive effect on expected politician payoffs since it has a positive influence on expected contributions, and essentially no effect on the policy utility.[7]

3.3 Constituent Welfare

When the politician chooses an access fee, he is concerned with constituent welfare and political contributions. His expected utility was given by equation 6. The term within the first set of brackets of this expression represents expected constituent welfare given access fee c. Given access fee function c, expected welfare for an issue of γ importance is

$$EW = -\left(\frac{1}{4} + \frac{2}{3}\frac{c^3}{v^3}\right)\gamma. \tag{8}$$

In equilibrium, this becomes,

$$EW(\gamma) = -\left(\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma))^3}{v^3}\right)\gamma. \tag{9}$$

For any γ, expected constituent welfare is decreasing in the distance between the implemented policy p^* and the ideal policy $\hat{p}$. The expected distance between p^* and $\hat{p}$ equals $\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma))^3}{v^3}$, and may be denoted $E|\hat{p} - p^*|$. A lower value $E|\hat{p} - p^*|$ corresponds to a more-informed policy decision.

4 Affect of a Contribution Limit in One-Issue Game

Up until now, I assume there are no limits to the maximum size of the interest group's payment to the politician. This section considers how the analysis changes if political contributions are constrained. In particular, I am interested in the impact that a contribution limit has on social

[7]This does not imply that the optimal limit is 0. Furthermore, this same argument does not hold starting from an already positive access fee. At a higher access fee, there is a range of e^h for which the interest group does not buy access. Therefore, the politician is less than certain about the evidence quality of a group that does not buy access, and a marginal increase in the access fee has a negative effect on the accuracy of the politician's beliefs about e^h.

welfare.

The analysis first determines the equilibrium access fee given any limit $\bar{c}$. I then describe the impact a limit has on politician information and expected constituent welfare. Depending on issue importance γ, the limit may have a positive or negative effect on politician information. The potential positive effect results because the limit decreases the equilibrium access fee for a range of γ. A lower fee means that the interest group is more likely to buy access and share its information with the politician. The potential negative effect results because the politician may not find it worth his time to provide access when he can only charge a fee up to the limit. When the politician does not offer access at any allowed price, he remains uninformed with probability 1. I show that there exists a limit that improves constituent welfare, compared to the case when contributions are unlimited. However, too strict of a limit decreases welfare.

Denote the contribution limit by $\bar{c} \geq 0$. Under the contribution limit, the politician still chooses the policy he believes is best at the final period of the game. Furthermore, the limit does not influence the interest group's willingness to pay for access. The limit only influences the politician's ability to set the access fee. Any limit greater than the maximum equilibrium contribution has no impact on behavior; therefore, I limit the analysis to the case when $\bar{c} \in \left[0, \frac{v}{4} + \frac{\tau}{2\phi}\right)$. A *contribution ban* implies that $\bar{c} = 0$. Throughout this section, C^*, A^*, and P^* refer to the equilibrium strategies for the game without a contribution limit, and $C^*_{\bar{c}}$, $A^*_{\bar{c}}$, and $P^*_{\bar{c}}$ refer to the strategies under limit $\bar{c}$.

4.1 Equilibrium Under the Limit

The equilibrium access fee for the game with contribution limit $\bar{c}$ is described by the following proposition. The proposition also says that the interest group's access strategy and the politician's policy strategy are unchanged by the imposition of a limit.

Proposition 3 *In the contribution equilibrium of the game with contribution limit* $\bar{c} \in \left[0, \frac{v}{4} + \frac{\tau}{2\phi}\right)$,

1. *the politician sets access fee*

$$C^*_{\bar{c}} = \begin{cases} C^*(\gamma, v) & \text{if } \gamma \geq \gamma^*(\bar{c}; v) \\ \bar{c} & \text{if } \gamma \in [\bar{\gamma}(\bar{c}; v), \gamma^*(\bar{c}; v)] \\ \emptyset \text{ (no access)} & \text{if } \gamma < \bar{\gamma}(\bar{c}; v) \end{cases}$$

where $\gamma^*(c;v) = \frac{(2\tau - 4c\phi + v\phi)v^2}{2c^2}$ *and* $\bar{\gamma}(c;v) = \frac{12v^2(\tau - c\phi)}{4c^2+2cv+v^2}$, *and*

2. $A^*_{\bar{c}} = A^*$, $P^*_{\bar{c}} = P^*$, *and* $\mu_{\bar{c}} = \mu$.

The function γ^* denotes the inverse function of C^* (i.e., $\gamma^*(c) \equiv C^{*-1}(\gamma)$); therefore, $\gamma^*(\bar{c};v)$ is the value of γ that solves $C^*(\gamma, v) = \bar{c}$. To deal with the case of contribution bans, note that $\gamma^*(0, v) = \infty$ for any v. When the realized value of γ is greater than $\gamma^*(\bar{c};v)$, the politician prefers to charge an access fee less than the maximum contribution, and the limit has no effect on the access fee.[8]

The value $\bar{\gamma}(\bar{c};v)$ is the value of γ at which the politician is indifferent between selling access at price $\bar{c}$, and not granting any access. For $\gamma < \bar{\gamma}(\bar{c};v)$, the politician does not find it worth his time to grant the interest group access when he can only charge an access fee up to $\bar{c}$. For this range of γ, the politician does not sell any access and remains fully uninformed about interest group evidence.

For γ between $\bar{\gamma}$ and γ^*, the politician is willing to provide access at a price equal to the contribution limit; although he would prefer to set the fee above the limit. For this range of issue importance, the politician sets the fee at $\bar{c}$.

The value $\bar{\gamma}(\bar{c};v)$ is strictly decreasing in $\bar{c}$, and for large enough $\bar{c}$ it will be the case that $\bar{\gamma}(\bar{c};v) \leq 0$.[9] When this is the case, the cost to the politician of providing access is sufficiently low such that, independent of how important the issue is, he still finds it worthwhile to sell access at price $\bar{c}$.

An illustration of the access fee is provided by Figure 2 for the case when $\bar{\gamma}(\bar{c};v) > 0$. For $\gamma < \bar{\gamma}(\bar{c};v)$, the politician does not sell access; therefore, the access fee function does not exist over that range of values.

4.2 Welfare Effects of Limit for One Issue

In this section, I consider the effects that a limit has on politician information and welfare for a single issue. I then identify the socially optimal limit, which maximizes expected constituent

[8] In the case of a contribution ban, there is no γ for which this condition holds. Therefore, a ban influences behavior for all potential issues.

[9] This will always be the case as $\bar{c}$ approaches $\frac{v}{4} + \frac{\tau}{2\phi}$, the highest possible equilibrium access fee without the limit. This is because, by assumption, the cost of providing access is sufficiently low such that for some feasible access fee the politician finds granting access to the interest group worthwhile, even as the importance of the issue approaches 0.

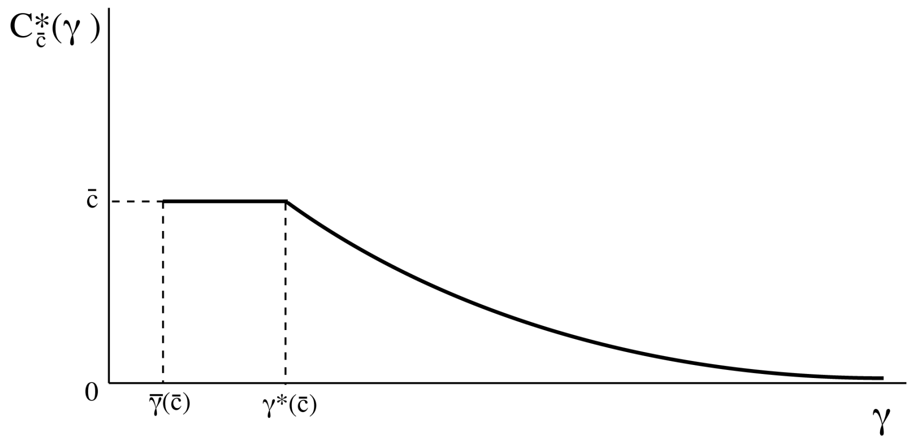

Figure 2: Equilibrium access fee under limit $\bar{c}$

welfare. Throughout this section, I assume that the limit only applies to a single issue with known γ. The more realistic case, when a limit applies across multiple issues, is addressed in Section **??**.

Expected constituent welfare under limit $\bar{c}$ depends on how important the issue is, and the access fee the politician charges given the limit. Proposition 3 describes the equilibrium contribution function. When the politician charges an access fee c, expected welfare is given by expression 8. When he does not sell any access, expected welfare is simply $-\frac{\gamma}{3}$, which is expected welfare when the politician is completely uninformed about interest group evidence.

Lemma 1 *For any issue γ, expected constituent welfare given contribution limit $\bar{c}$ is*

$$EW_{\bar{c}}(\gamma) = \begin{cases} -\left(\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma,v))^3}{v^3}\right)\gamma & \text{if} \quad \gamma \geq \gamma^*(\bar{c};v) \\ -\left(\frac{1}{4} + \frac{2}{3}\frac{\bar{c}^3}{v^3}\right)\gamma & \text{if} \quad \gamma \in [\bar{\gamma}(\bar{c};v), \gamma^*(\bar{c};v)] \\ -\frac{\gamma}{3} & \text{if} \quad \gamma < \bar{\gamma}(\bar{c};v). \end{cases}$$

The following proposition comes from comparing equilibrium expected constituent welfare under the limit (lemma 1) with equilibrium expected constituent welfare when there is no limit (equation 9).

Proposition 4 *For any issue γ, compared to the case of no limit, contribution limit $\bar{c}$ has*

- *no effect on politician information and expected constituent welfare if $\gamma \geq \gamma^*(\bar{c};v)$,*

- *a positive effect on politician information and expected constituent welfare if* $\gamma \in (\bar{\gamma}(\bar{c};v), \gamma^*(\bar{c};v))$, *and*

- *a negative effect on politician information and expected constituent welfare if* $\gamma \leq \bar{\gamma}(\bar{c};v)$.

Below, I provide intuition for these three possible effects: *no effect*, *positive effect*, and *negative effect*.

No Effect – When the realized value of γ is sufficiently high (i.e., greater than $\gamma^*(\bar{c};v)$), the politician prefers to set an access fee below the contribution limit. For issue γ, imposing such a contribution limit therefore does not affect his ability to set his desired access fee. Under the limit, the politician sets fee $C^*(\gamma, v)$; just as he would if there was no limit. The limit has no effect on politician information, his policy choice, or expected constituent welfare.

Positive Effect – For moderate realizations of γ (i.e., when γ is between $\bar{\gamma}(\bar{c};v)$ and $\gamma^*(\bar{c};v)$), the politician prefers to charge an access fee greater than the contribution limit $\bar{c}$; however, he is willing to grant access even if he can only charge a fee equal to the contribution limit. For these issues, the contribution limit causes the politician to set a lower price for access than he otherwise would. The lower access fee means a higher probability that the interest group buys access, as well as more accurate beliefs about e^h when the group does not buy access.[10] This tends to result in a more-informed politician, who is better able to identify and implement the ideal policy, and higher expected constituent welfare.

Negative Effect – When the realized value of γ is sufficiently low (i.e., less than $\bar{\gamma}(\bar{c};v)$), the politician prefers to charge an access fee above the limit, and he is *not* willing to sell access at a fee equal to the limit. Although the politician would be willing to offer access at a high-enough fee, the contribution limit prevents him from being able to charge a sufficiently high amount.[11] The politician therefore does not grant any access, he learns nothing about the interest group's evidence quality, and with probability 1 he remains fully uninformed about the ideal policy. This is in contrast to when there is no contribution limit, and the politician becomes fully informed with positive probability.[12] This tends to result in a less-informed politician, who is less able to identify

[10]The more accurate beliefs in this case result from there being a smaller range of e^h for which the group chooses not to buy access.

[11]For these values of γ, the costs of providing access τ outweigh the expected informational and monetary benefits when the fee cannot exceed $\bar{c}$.

[12]Also note that when the politician grants no access, he is also less informed about the interest group's evidence

and implement the ideal policy, and lower expected constituent welfare.

The ranges of γ for which a contribution limit has positive, negative, or no effects depends on how strict the limit is. Remember that $\bar{\gamma}$ and γ^* are both decreasing in $\bar{c}$. Increasing the limit decreases the range of γ for which there is a negative impact on politician information, and increases the range of γ for which there is no impact on information. A high enough limit results in $\bar{\gamma} < 0$, which means that any limit will have an unambiguously non-negative effect on expected constituent welfare. At the opposite extreme, a contribution ban means that $\gamma^*(0) = \infty$, which means that the limit will always have either a positive or negative effect on welfare. Furthermore, a contribution ban results in the largest range of issues for which there is a negative effect.

4.3 Optimal Limit for One Issue

This section is concerned with the contribution limit that maximizes expected constituent welfare. The *optimal limit for issue* (γ, v) is denoted $\bar{c}_o(\gamma, v)$. Given the realization of γ and v, the limit $\bar{c}_o(\gamma, v)$ maximizes expected constituent welfare. If a contribution ban is optimal, then $\bar{c}_o(\gamma, v) = 0$. If it is optimal to impose no limit, then $\bar{c}_o(\gamma, v) = \emptyset$.

An overly-strict limit results in the politician not selling any access. A limit that is not strict enough results in the interest group being willing to buy access for a smaller range of evidence quality than might otherwise be possible. The optimal limit is defined by the following proposition.

Proposition 5 *Let $\bar{c}'$ solve $\bar{\gamma}(\bar{c}'; v) = \gamma$. Then $\bar{c}_o(\gamma) = \max\{0, \bar{c}'\}$.*

The optimal limit for the issue $\bar{c}_o(\gamma, v)$ equals either the lowest possible limit at which the politician is willing to sell access or 0, whichever is greater. The lowest limit at which the politician is willing to sell access results in the politician being indifferent between selling access at a fee equal to $\bar{c}_o$, and not selling any access. Any lower limit means that $\bar{\gamma}(\bar{c}; v) > \gamma$, and the politician chooses not to sell access. In this case, the politician will remain completely uninformed about interest group evidence, and increasing the limit to $\bar{c}_o(\gamma, v)$ tends to result in a more fully informed politician. Any limit higher than $\bar{c}_o(\gamma, v)$ results in $\bar{\gamma}(\bar{c}; v) < \gamma$; for which case the politician charges a higher access fee than he needs to cover the costs of providing access. If the limit is reduced to

quality compared to the situation when there is no limit and the group does not buy access. When the group does not buy access in the no-limit case, the politician can still infer that the group has sufficiently-low evidence quality such that buying access was not worthwhile.

$\bar{c}_o(\gamma, v)$, the politician continues to sell access, but at a lower price. This tends for him to be more informed, since the interest group is more likely to buy access.

When the optimal limit is imposed, the politician charges an access fee equal to the limit, which is less than the fee he would charge is there was no limit. If the limit is too high, then the positive effect of the limit is not as high as it otherwise could be. If the limit is too low, then the negative effect of the limit is present, and the negative effect can be decreased by increasing the limit.

5 Game with Many Issues

Section 3 developed a model of access fees in which the politician chooses policy for a single issue. The analysis found the equilibrium of such a model, and Section 4 determined the impact that a contribution limit has on equilibrium behavior and expected constituent welfare.

It should be noted, however, that a contribution limit or ban typically applies to all contributions, not only the contributions of one interest group that is concerned with a specific issue. In this section, I address this concern by expanding the one-issue model to incorporate many different issues that may differ in terms of issue importance, interest group wealth, and ideal policy.

The politician must choose policy for each of many independent issues. Formally, there is a continuum of issues, of total weight 1. There is one interest group per issue, that only cares about its own issue's policy. For each issue, the game remains unchanged from the one-issue model.

Denote an arbitrary issue from this continuum by j. I use subscript j to denote a variable or parameter specific to issue j, including politician policy choice p_j, ideal policy $\hat{p}_j$, access fee c_j, access decision a_j, message m_j, evidence (e_j^l, e_j^h), interest group wealth v_j, and issue importance γ_j. The parameters ϕ and τ are common across all issues.

The realized state of the world assigns values γ_j, v_j, and (e_j^l, e_j^h) to each issue. For each issue, the issue importance γ_j is the independent realization of a continuously random variable with distribution G and density g such that $g(\gamma) > 0$ iff $\gamma > 0$. A higher realization of γ_j means that the politician cares more about issue j relative to other issues. The interest group preference parameter $v_j > 0$ is the independent realization of a random variable distributed according to H and density h. A higher realization of v_j means that interest group j is either more wealthy or cares more intensely about the issue-j policy outcome. For each issue, the politician observes both γ_j and v_j

at the start of the game. Just as in the one-issue game, however, he is initially uninformed about the realized values of e_j^l and e_j^h which are the independent realizations of a random variable uniformly distributed on the unit interval. Interest groups face the same incentives as in the one-issue game; therefore, an interest group with access will always fully reveal e_j^h and reveal nothing about e_j^l.

Each interest group cares only about its own issue. Therefore, interest group j has utility function

$$u_j^{IG}(a_j; p_j, c_j, v_j) = v_j p_j - c_j a_j.$$

The politician's utility function for issue j is

$$u_j^P(p_j, c_j; \hat{p}_j, \gamma_j, a_j) = -|\hat{p}_j - p_j|\gamma_j + (\phi c_j - \tau)a_j.$$

Across all issues, total politician utility is

$$U^P(p, c; \hat{p}, \gamma, a) = \int_j (-|\hat{p}_j - p_j|\gamma_j + (\phi c_j - \tau)a_j)\, dj.$$

Assuming that politician utility is linear in the portion of interest groups to receive access simplifies the analysis, and ensures a closed-form solution for the equilibrium contribution function. Let λ denote the portion of all interest groups that receive access to the politician.

Before the beginning of the game, the politician observes γ_j and v_j for each issue, and each interest group observes the γ_j, v_j, and (e_j^l, e_j^h) associated with its own issue. The game takes place in the following order.

1. For each issue, the politician sets an access fee c_j.

2. Each interest group observes the access fee associated with its issue, and decides whether to pay the fee. This decision is denoted by a_j. Groups that pay the fee choose messages to send the politician m_j.

3. The politician observes interest group behavior, then for each issue he chooses a policy p_j.

5.1 Equilibrium with No Limit

The analysis of the many-issue framework considers the Perfect Bayesian Equilibrium of the game, which I label the *contribution equilibrium with many issues.* The equilibrium is described in Proposition 6. It establishes that for any given issue, interest group and politician strategies are independent of other issues. The equilibrium of any issue subgame is the same as the equilibrium of the one-issue game with the same issue characteristics.

Proposition 6 *In the contribution equilibrium with many issues, for each j:*

1. *The politician chooses the expected socially optimal policy given his beliefs μ, where*

$$P_j^*(a_j, m_j; \mu) = \int_0^1 \mu(e^h | a_j, m_j, c_j) e^h de^h - \frac{1}{2}. \tag{10}$$

2. *The interest group buys access iff its favorable evidence is strong enough,*

$$A_j^*(c_j, e_j^h) = \begin{cases} 0 & \textit{when } e_j^h \leq \frac{2c_j}{v_j} \\ 1 & \textit{when } e_j^h > \frac{2c_j}{v_j}. \end{cases} \tag{11}$$

3. *The politician sets a positive access fee,*

$$C_j^*(\gamma_j) = \frac{-2v_j^2\phi + v_j\sqrt{2}\sqrt{v_j\gamma_j\phi + 2v_j^2\phi^2 + 2\gamma_j\tau}}{2\gamma_j}. \tag{12}$$

4. *In the contribution equilibrium, the politician's beliefs μ are such that*

   (a) if $a_j = 1$, then

$$f_\mu(e_j) = \begin{cases} 1 & \textit{for } e_j = e_j^h \\ 0 & \textit{for all other } e_j \neq e_j^h\textit{; and} \end{cases}$$

   (b) if $a_j = 0$, then

$$f_\mu(e_j) = \begin{cases} \frac{v_j}{2c_j} & \textit{for } e_j \in [0, \frac{2c_j}{v_j}] \\ 0 & \textit{for all other } e_j \notin [0, \frac{2c_j}{v_j}]. \end{cases}$$

The intuition behind this equilibrium is the same as in the one-issue game. I therefore do not go through each strategy again, but rather refer the reader to the discussion in Section 3.2.

Furthermore, the results established by Proposition 2 hold regarding the characteristics of the equilibrium access fee for any given issue. The politician assigns a relatively high access fee to issues with relatively rich interest groups, and those for which he cares relatively little about the policy outcome.

5.2 Equilibrium with Limit

A contribution limit $\bar{c}$ affects each issue as it would have in the one-issue game. For certain issues, it causes the politician to lower the access fee to the limit. For other issues, it causes the politician to not sell any access.

Proposition 7 *When there is a contribution limit $\bar{c}$, the contribution equilibrium with many issues is such that, for each issue j,*

1. *the politician sets access fee*

$$C^*_{\bar{c},j} = \begin{cases} C^*_j(\gamma) & \text{if } \gamma_j \geq \gamma^*(\bar{c}; v_j) \\ \bar{c} & \text{if } \gamma_j \in [\bar{\gamma}(\bar{c}; v_j), \gamma^*(\bar{c}; v_j)] \\ \emptyset \text{ (no access)} & \text{if } \gamma_j < \bar{\gamma}(\bar{c}; v_j) \end{cases}$$

   where $\gamma^*(c; v) = \frac{(2\tau - 4c\phi + v\phi)v^2}{2c^2}$ and $\bar{\gamma}(c; v) = \frac{12v^2(\tau - c\phi)}{4c^2+2cv+v^2}$, and

2. *interest groups play strategy A^*_j, the politician chooses policy according to P^*_j, and $\mu_{\bar{c}} = \mu$.*

5.3 Expected Constituent Welfare

For any γ and v, equation 8 gives expected constituent welfare when there is no contribution limit. When there are many issues that differ in terms of γ and v, expected constituent welfare is

$$EW_{\text{no limit}} = -\int_0^{v^{max}} h(v) \int_0^{\infty} g(\gamma) \left(\frac{1}{4} + \frac{2}{3} \frac{(C^*(\gamma, v))^3}{v^3} \right) \gamma d\gamma dv. \tag{13}$$

Under limit $\bar{c}$, expected constituent welfare across all issues is

$$\begin{aligned} EW_{\bar{c}} \;=\; & \int_0^{v^{max}} h(v) \Big[-\int_0^{\bar{\gamma}(\bar{c};v)} g(\gamma)\tfrac{\gamma}{3} d\gamma - \int_{\bar{\gamma}(\bar{c};v)}^{\gamma^*(\bar{c};v)} g(\gamma) \left(\tfrac{1}{4} + \tfrac{2}{3}\tfrac{\bar{c}^3}{v^3}\right) \gamma d\gamma \\ & - \int_{\gamma^*(\bar{c};v)}^{\infty} g(\gamma) \left(\tfrac{1}{4} + \tfrac{2}{3}\tfrac{(C^*(\gamma,v))^3}{v^3}\right) \gamma d\gamma \Big] dv. \end{aligned} \tag{14}$$

For important enough issues (i.e., when γ is greater than $\bar{\gamma}(\bar{c}; v)$), the politician prefers to charge an access fee below the limit, and the limit does not influence the equilibrium access fee. For this range of γ, the limit has neither a positive nor a negative effect on politician information, and expected constituent welfare is the same as it was without a limit (8). For any positive limit, there exists a range of γ for which this is the case.[13]

When issue importance is sufficiently low (i.e., when γ is less than $\bar{\gamma}(\bar{c}; v)$), the politician is unwilling to sell access for a fee that cannot exceed the limit (although he would offer to sell access if he could set a high-enough fee). For these issues the politician remains fully uninformed about interest group evidence. The limit has a negative effect on politician information, decreasing welfare to $-\frac{\gamma}{3}$. This range of γ has positive weight so long as $\bar{\gamma}(\bar{c}; v)$ is positive.[14]

For γ between $\bar{\gamma}(\bar{c}; v)$ and $\gamma^*(\bar{c}; v)$ the politician is willing to sell access at a fee equal to the contribution limit, although he would prefer to set the access fee above the limit. For these issues, the limit causes the politician to set a lower access fee than he otherwise would have. By decreasing the price of access, the limit has a positive effect on politician information, thereby improving expected constituent welfare.[15] It is always the case that $\gamma^*(\bar{c}; v) > \bar{\gamma}(\bar{c}; v)$ and $\gamma^*(\bar{c}; v) > 0$; therefore, there always exists a range of γ for which the positive effect exists.

Depending on the model parameters including the distribution of γ, a contribution limit $\bar{c}$ may either increase or decrease ex ante expected constituent welfare. Compared to the case of no limit, imposing limit $\bar{c}$ increases expected constituent welfare when γ is between $\bar{\gamma}(\bar{c}; v)$ and $\gamma^*(\bar{c}; v)$, and the limit decreases expected constituent welfare when γ is less than $\bar{\gamma}(\bar{c}; v)$. Whether the limit increases or decreases ex ante expected constituent welfare depend on the distribution of γ, G.

[13] When contributions are banned (i.e., $\bar{c} = 0$), all issues are affected. The politician always sets a positive access fee when he is able to do so; therefore banning contributions affects his behavior on all issues. Formally, this is because $\gamma^*(\bar{c}; v) \to \infty$ when $\bar{c} \to 0$.

[14] If $\bar{\gamma}(\bar{c}; v) \leq 0$, then the politician is willing to sell access for any issue at a fee equal to the contribution limit. In this case, there will not exist any $\gamma < \bar{\gamma}(\bar{c}; v)$.

[15] Since $\bar{c} < C^*(\gamma, v)$ when $\gamma \in [\bar{\gamma}(\bar{c}; v), \gamma^*(\bar{c}; v)]$, it follows that $-\left(\frac{1}{4} + \frac{2}{3}\left(\frac{\bar{c}}{v}\right)^3\right)\gamma > -\left(\frac{1}{4} + \frac{2}{3}\frac{\left(C^*(\gamma, v)\right)^3}{v^3}\right)\gamma$ for this range of γ.

5.4 Optimal Limit

The optimal limit maximizes $EW_{\bar{c}}$, which was given by equation 14. The derivative of $EW_{\bar{c}}$ with respect to $\bar{c}$ simplifies to

$$\frac{\partial EW_{\bar{c}}}{\partial \bar{c}} = \int_0^{v^{max}} h(v) \left[-g(\bar{\gamma}(\bar{c};v)) \left[\frac{1}{12} - \frac{2}{3}\frac{\bar{c}^3}{v^3} \right] \bar{\gamma}(\bar{c};v) \frac{\partial \bar{\gamma}(\bar{c};v)}{\partial \bar{c}} - \int_{\bar{\gamma}(\bar{c};v)}^{\gamma^*(\bar{c};v)} g(\gamma) \frac{2\bar{c}^2}{v^3} \gamma d\gamma \right] dv. \quad (15)$$

To make the discussion more intuitive, I rewrite expression 15 to give the marginal effect of a *decrease* in $\bar{c}$. As the limit becomes stricter, expected constituent welfare changes according to

$$-\frac{\partial EW_{\bar{c}}}{\partial \bar{c}} = \int_0^{v^{max}} h(v) \left(Z1 + Z2 \right) dv. \quad (16)$$

where $Z1 \equiv g(\bar{\gamma}(\bar{c};v)) \left[\frac{1}{12} - \frac{2}{3}\frac{\bar{c}^3}{v^3} \right] \bar{\gamma}(\bar{c};v) \frac{\partial \bar{\gamma}(\bar{c};v)}{\partial \bar{c}}$ and $Z2 \equiv \int_{\bar{\gamma}(\bar{c};v)}^{\gamma^*(\bar{c};v)} g(\gamma) \frac{2\bar{c}^2}{v^3} \gamma d\gamma$.

Given any interest group wealth parameter v, imposing a stricter limit increases the range of γ for which the politician does not sell any access, and for which the limit has a negative effect on information. This effect is represented by $Z1$, which is strictly negative.[16]

At the same time, a stricter limit also reduces the average access fee on issues for which the politician does sell access. This means that the interest group is more likely to buy access and the politician become informed. $Z2$ represents this positive effect of a stricter limit on information and welfare that is present for some range of γ. $Z2$ is strictly positive.

Without making assumptions regarding the distribution of γ, one cannot find a closed-form solution for the optimal contribution limit $\bar{c}_o$. One can, however, conclude the following.

Proposition 8 *There exists some* $\bar{c}_o \in \left(0, \frac{\tau}{\phi}\right)$ *such that*

1. $EW_{\bar{c}_o} > EW_{no\ limit}$, *and*

2. $EW_{\bar{c}_o} \geq EW_{\bar{c}}$ *for all other* $\bar{c} \geq 0$.

Not only does Proposition 8 establish that an optimal limit exists, it also provides a range of values within which the optimal limit is located. Corollary 1 follows from this range.

Corollary 1

[16]Since $\frac{\partial \bar{\gamma}}{\partial \bar{c}} < 0$, $Z1 < 0$.

1. *It is never optimal (for expected constituent welfare) to ban contributions.*

2. *It is always optimal (for expected constituent welfare) to set a contribution limit. Under the optimal limit, the politician sells access for some, but not all, issues.*

If contributions are banned, the politician only grants access for issues where the expected policy benefit of learning the interest group's evidence exceeds the time costs of granting access. For any issue that the politician does grant access, the politician learns e^h for sure. Now, consider the impact of a marginally positive limit compared to a contribution ban. $\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}$ is strictly positive at $\bar{c} = 0$, which means that increasing the limit above 0 improves constituent welfare. The intuition for this follows. A positive limit increases the range of γ for which the politician chooses to sell policy–a welfare benefit. A positive limit also decreases the probability that the interest group buys access, which tends to decrease welfare since a politician is less likely to fully learn e^h. This negative impact on welfare is minimized when considering a marginally positive fee. This is because when the politician sets a marginally positive access fee, only an interest group with the lowest possible evidence quality does not buy access. When the group does not pay for access, the politician correctly infers that the interest group has the lowest-possible e^h, and the politician remains fully informed about e^h. A marginally positive limit causes the politician to grant access for a larger range of issues (a benefit) and does not result in him being less informed regarding any of the issues. Therefore, a marginally positive limit is strictly better for expected constituent welfare than a contribution ban.

If $\bar{c} = \frac{\tau}{\phi}$, then $\bar{\gamma}(\bar{c}; v) = 0$ and the politician sells access at some fee for all issues. Any higher contribution limit results in a higher access fee for some issues, but does not increase the range of issues for which the politician does sell access (since he is already offering to sell access for all issues). Therefore, setting the limit equal to $\frac{\tau}{\phi}$ is better than setting a higher limit, or no limit at all. Now, consider the impact of a limit that is marginally less than $\frac{\tau}{\phi}$ compared to one equal to $\frac{\tau}{\phi}$. Evaluated at $\bar{c} = \frac{\tau}{\phi}$, $-\frac{\partial EW_{\bar{c}}}{\partial \bar{c}} > 0$; therefore, a stricter limit improves constituent welfare. The intuition is as follows. Imposing a stricter limit reduces the access fee associated with some issues, which tends to have a positive impact on welfare. A stricter limit also means that for low-enough γ the politician will not sell any access, which tends to decrease expected welfare. For a limit just below $\frac{\tau}{\phi}$, the politician sells access for all issues except the least-important ones (those with the smallest possible γ). Such a limit causes the politician to become less informed about the least important issues, and to become more informed about relatively important ones. The net effect of such a limit on welfare is positive compared to a limit equal to $\frac{\tau}{\phi}$.

Under the optimal limit, the politician sells access for some, but not all issues. That he does not sell access for every issue follows from $\bar{c}_o < \frac{\tau}{\phi}$ which means $\bar{\gamma}(\bar{c}_o; v) > 0$. That the politician always gives access for some issues follows because he prefers to grant access to interest groups concerned with issues for which he cares passionately (those with high-enough γ), even when he does not have a monetary incentive to do so.

6 Conclusion

I develop a simple model of access fees in politics, and use it to analyze the impact of contribution limits on policy choice and constituent welfare. The model, adapted from the evidence model in Cotton (2008), has some significant advantages. By fixing the policy preferences of the interest group, and using a relatively simple evidence structure, I am able to consider in detail the impact of interest group wealth, the politician's cost of providing access, and the importance of the issue for which the politician must choose a policy. This is in contrast to the earlier work by Austen-Smith (1998) in which there is a more-complex evidence structure and interest groups differ in how similar their preferences are to the politician. The focus of Austen-Smith (1998) is on how extreme or moderate the interest groups that buy access are, and the paper says relatively little about the relationship between access fees and interest group wealth or issue importance, or about the impact of contribution limits (although there is a brief discussion).

This paper predicts that politicians charge higher access fees to more wealthy interest groups relative to poor groups, and lower access fees to groups involved with relatively important issues. Both predictions have strong intuitive appeal, and supporting empirical evidence. Furthermore, I show that the politician tends to become more informed about interest group evidence and make better policy decisions when the issue is more important. Interestingly, increasing interest group wealth can improve expected constituent welfare.

The analysis identifies positive and negative effects of a contribution limit. A limit has a positive effect because it decreases the average access fee, which increases the probability that an interest group buys access. A limit has a negative effect because it may decrease the number of issues for which the politician is willing to sell any access. When the politician cannot charge more than the limit for access, he may not find selling access for certain issues worth his time. (Although he will always find it worth his time to sell access for issues about which he cares passionately enough.)

The paper shows that, when the limit applies across many issues, it is always optimal to set a contribution limit that results in the politician refusing to sell any access for some issues. I also show that a contribution ban is *never* optimal. This result is in contrast to Cotton (2008) in which limits have a strictly negative impact on politician information and constituent welfare. It is also in contrast to the number of models in which the politician knows the ideal policy ex ante, and allowing contributions enables the politician to trade policy favors that decrease constituent welfare for contributions. Clearly the mechanism by which the politician allocates access has a significant impact on the welfare implications of a contribution limit. Future empirical work should attempt to better understand the process by which politician's award access.

7 Appendix

Proof. (Prop. 1) Most of the proof for Proposition 1 is provided in the body of the paper in Section 3.2. Here, I provide the analysis that is not included in the body of the paper. The body of the paper fully describes the derivation of P^*. A^* is fully derived, except for explicitly stating that $\bar{e} = \frac{2c}{v}$ is the value of e^h that solves expression 4 with equality. When $e^h = \frac{2c}{v}$, the interest group is indifferent between buying access at fee c and not buying access.

The derivation of C^* requires the simplification of the politician's expected utility function, given P^* and A^*. Expression 5 states the interest groups expected utility, given his uncertainty regarding e^l and e^h. To simplify this expression, first note that since $A^* = 1$ iff $e^h \leq \frac{2c}{v}$,

$$\int_0^1 \int_0^1 (c\phi - \tau) A^*(c, e^h) de^h de^l = (c\phi - \tau)(1 - \bar{e}). \tag{17}$$

The policy utility part of the expression 5 can be rewritten

$$-\gamma \int_0^1 \int_0^1 |p^o - P^*| de^h de^l = -\gamma \int_0^1 \int_0^{\bar{e}} |p^o - P^*| de^h de^l - \gamma \int_0^1 \int_{\bar{e}}^1 |p^o - P^*| de^h de^l. \tag{18}$$

When $e^h > \bar{e}$, the group buys access and the politician becomes fully informed about e^h, and chooses $P^* = e^h - \frac{1}{2}$. When $e^h \leq \bar{e}$, the group does not buy access and the politician chooses policy$E_\mu e^h - \frac{1}{2} = \frac{\bar{e}}{2} - \frac{1}{2}$.

The optimal policy is defined as $\hat{p} \equiv e^h - e^l$. Expression 18 can therefore be written

$$-\gamma \int_0^1 \int_0^{\bar{e}} |(e^h - e^l) - \left(\frac{\bar{e}}{2} - \frac{1}{2}\right)| de^h de^l - \gamma \int_0^1 \int_{\bar{e}}^1 |(e^h - e^l) - \left(e^h - \frac{1}{2}\right)| de^h de^l. \tag{19}$$

Given the uniform distribution of e, the second part of this expression simplifies to

$$\begin{aligned} -\gamma \int_0^1 \int_{\bar{e}}^1 |(e^h - e^l) - \left(e^h - \tfrac{1}{2}\right)| de^h de^l &= -\gamma \int_0^1 \int_{\bar{e}}^1 |\tfrac{1}{2} - e^l| de^h de^l \\ &= -(1-\bar{e})\tfrac{\gamma}{4}. \end{aligned} \tag{20}$$

Now consider the first part of expression 19. Let H denote the distribution of $\hat{p}$ given that $e^l \in [0,1]$ and $e^h \in [0,\bar{e}]$. The density of H is denoted by h, where $h(\hat{p}) = 1 - \frac{\hat{p}}{\bar{e}}$ or $\hat{p} \in [0,\bar{e}]$; $h(\hat{p}) = 1$ or $\hat{p} \in [\bar{e}-1, 0]$; $h(\hat{p}) = \frac{1}{\bar{e}} - \frac{\hat{p}}{\bar{e}}$ or $\hat{p} \in [-1, \bar{e}-1]$; and $h(\hat{p}) = 0$ otherwise. The function $h(\cdot)$ is symmetric around $(\bar{e}-1)/2$ (which is the implemented policy P^* when the group does not buy access). One can therefore rewrite the first part of expression 19,

$$\begin{aligned} -\gamma \int_0^1 \int_0^{\bar{e}} |e^h - e^l - \tfrac{\bar{e}-1}{2}| de^h de^l &= -2\bar{e}\gamma \left[\int_{\frac{\bar{e}-1}{2}}^0 \left(\hat{p} - \tfrac{\bar{e}-1}{2}\right) d\hat{p} + \int_0^{\bar{e}} \tfrac{1+\hat{p}}{\bar{e}} \left(\hat{p} - \tfrac{\bar{e}-1}{2}\right) d\hat{p} \right] \\ &= -\left(\tfrac{1}{4} + \tfrac{\bar{e}^2}{12}\right) \gamma\bar{e}. \end{aligned} \tag{21}$$

Taken together, expressions 17, 20, and 21 imply

$$\begin{aligned} EU_P(P^*, c; \hat{p}, \gamma, A^*) &= -\left(\tfrac{1}{4} + \tfrac{\bar{e}^2}{12}\right)\gamma\bar{e} - (1-\bar{e})\tfrac{\gamma}{4} + (c\phi - \tau)(1-\bar{e}) \\ &= \left[-\left(\tfrac{1}{4} + \tfrac{2}{3}\tfrac{c^3}{v^3}\right)\gamma \right] + \left[(c\phi - \tau)\left(1 - \tfrac{2c}{v}\right) \right]. \end{aligned}$$

After this is established, the body of the paper describes the rest of the process to derive C^*.

The derivation of equilibrium also requires the derivation of politician beliefs, μ. Beliefs must be consistent with Bayes' Rule given equilibrium strategies. If the interest group pays the access fee, the politician becomes fully informed about e^h, and his beliefs must be such that $f_\mu(e^h) = 1$. If the group does not buy access, the politician can infer that $e^h \leq \bar{e}$. Given the ex ante uniform distribution of e, it is equally likely that the interest group has any $e^h \in [0, e^h]$. Therefore, $f_\mu(e) = \frac{1}{\bar{e}}$ for all $e \in [0, e^h]$, and $f_\mu(e) = 0$ for e not in this range. ■

Proof. (Prop. 2) Straightforward. ■

Proof. (Prop. 3) Imposing a contribution limit $\bar{c}$ constrains the politician's choice of access fee, but does not influence the politician's or interest group's preferences. Given any μ, the politician prefers to choose the policy he believes is best for his constituents, $P^*_{\bar{c}} = E_\mu e^h - \frac{1}{2}$. Thus, $P^*_{\bar{c}} = P^*$. Given any fee, the interest group prefers to buy access whenever $e^h > \frac{2c}{v}$. Thus $A^*_{\bar{c}} = A^*$. Given that the interest group's access decision does not change for any given fee c, the politician's beliefs about the interest group's evidence quality also will not change. Thus, $\mu_{\bar{c}} = \mu$.

Similarly, for any γ the politician prefers to choose the same access fee as he did in the game without a limit. Function C^*, defined in Section 3.2, gives the politician's preferred access fee for any issue, γ. When $C^*(\gamma) \leq \bar{c}$, the politician chooses access fee. Since C^* is strictly decreasing in γ, this will be true for all $\gamma \geq \gamma^*(\bar{c}; v)$, where $\gamma^*(c) \equiv {C^*}^{-1}(\gamma)$. It is straightforward to solve for

$$\gamma^*(c) = \frac{(2\tau - 4c\phi + v\phi)\, v^2}{2c^2}$$

.

When $C^*(\gamma) > \bar{c}$ (or equivalently $\gamma < \gamma^*(\bar{c}; v)$), the politician is unable to set his preferred access fee. When this is the case, he can choose to set the access fee at some value less than $\bar{c}$, set the fee equal to $\bar{c}$, or not grant any access.

First, I establish that for $\gamma < \gamma^*(\bar{c}; v)$, the politician sets either $c = \bar{c}$, or $c = \emptyset$. To establish this, it is sufficient to show that EU_P is strictly increasing in c for all $c \leq \bar{c}$; which means that$c = \bar{c}$ results in higher EU_P than any $c < \bar{c}$, and which rules out any fee less than the limit. Expression 6 gives the equation for EU_P, which is concave in c. The derivative of EU_P with respect to c is given by expression 7, the second derivative equals $\frac{\partial^2 EU_P}{\partial^2 c} = -\gamma \frac{4c}{v^3} - \frac{4\phi}{v}$, which is clearly negative. Access fee $c = C^*(\gamma)$ solves $\frac{\partial EU_P}{\partial c} = 0$. Given the concavity of EU_P, for any $c < C^*$, EU_P is increasing in c. Since $\bar{c} < C^*$ and EU_P is increasing in c for $c < C^*$, EU_P is also increasing in c for all $c \leq \bar{c}$. Therefore, for $\gamma < \gamma^*(\bar{c}; v)$, the politician prefers to set $c = \bar{c}$ than any lower fee.

For $\gamma < \gamma^*(\bar{c}; v)$, the politician sets $c = \bar{c}$ or chooses not to sell access. Setting $c = \bar{c}$ results in

$$EU_P(\bar{c}) = -\left(\frac{1}{4} + \frac{2}{3}\frac{\bar{c}^3}{v^3}\right)\gamma + \left(1 - \frac{2\bar{c}}{v}\right)(\bar{c}\rho - \tau)\,.$$

Not selling access (i.e., $c = \emptyset$) results in $EU_P(\emptyset) = -\frac{\gamma}{3}$. Let $\bar{\gamma}$ denote the issue importance for which the politician is indifferent between selling access at price $\bar{c}$ and not selling access. $\bar{\gamma}$ solves

$$-\frac{\bar{\gamma}}{3} = -\left(\frac{1}{4} + \frac{2}{3}\frac{\bar{c}^3}{v^3}\right)\bar{\gamma} + \left(1 - \frac{2\bar{c}}{v}\right)(\bar{c}\rho - \tau)\,.$$

Solving this expression for $\bar{\gamma}$ gives

$$\bar{\gamma} = \frac{12v^2(\tau - c\phi)}{4c^2 + 2cv + v^2}.$$

Note that $gam\bar{m}a < \gamma^*(\bar{c}; v)$. As I've already established, for $\gamma \geq \gamma^*(\bar{c}; v)$, the politician sets access fee equal to $C^*(\gamma)$, which is less than $\bar{c}$ for this range of γ. For $\gamma \in [\bar{\gamma}(\bar{c}; v), \gamma^*(\bar{c}; v)]$, $EU_P(\emptyset) < EU_P(\bar{c})$ and the politician will choose to sell access at $c = \bar{c}$ rather than not sell access. For $\gamma < \bar{\gamma}$, $EU_P(\bar{c}) < EU_P(\emptyset)$ and the politician will choose to not sell any access than to sell access at fee $c = \bar{c}$. ■

Proof. (Lemma 1) Expected constituent welfare given any access fee c equals

$$-\left(\frac{1}{4} + \frac{1}{12}(\bar{e}(c))^3\right)\gamma, \tag{22}$$

where $\bar{e}(c)$ is the cutoff evidence quality associated with fee c, such the interest group buys access iff $e^h > \bar{e}(c)$. When the politician sets access fee c, I've already established that $\bar{e}(c) = \frac{2c}{v}$. Therefore, expected welfare given access fee c is

$$-\left(\frac{1}{4} + \frac{2}{3}\frac{c^3}{v^3}\right)\gamma \tag{23}$$

When $\gamma \geq \gamma^*(\bar{c}; v)$, the politician sells access at fee $C^*(\gamma)$. When $\gamma \in [\bar{\gamma}(\bar{c}; v), \gamma^*(\bar{c}; v)]$, the politician sells access at fee $\bar{c}$. In both of these cases, it is straightforward to calculate $EW_{\bar{c}}$ given expression 23. When $\gamma < \bar{\gamma}(\bar{c}; v)$ the politician does not sell access, no interest group buys access, which is represented by $\bar{e}(\emptyset) = 1$. For this case, it is straightforward to calculate $EW_{\bar{c}}$ given expression 22. ■

Proof. (Prop. 4) The lower is $\bar{e}$, the more informed is the politician. As I have already established, $\bar{e} = \frac{2c}{v}$ when the politician sells access at fee c, and $\bar{e} = 1$ when the politician does not sell access ($\bar{e} = 1$ means no interest group buys access). Lemma 1 gives $EW_{\bar{c}}$ for each γ. Also, it has already been established that when there is no contribution limit, $EW(\gamma) = -\left(\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma))^3}{v^*}\right)\gamma$. Since $C^*(\gamma) \in \left(0, \frac{v}{4} + \frac{\tau}{2\phi}\right)$, $EW(\gamma) \in \left(-\frac{\gamma}{3}, -\frac{\gamma}{4}\right)$.

For $\gamma \geq \gamma^*(\bar{c}; v)$, the politician sets fee $c = C^*(\gamma)$. This is the same access fee he sets when there is not contribution limit. Therefore, $\bar{e}(C^*_{\bar{c}}(\gamma)) = \bar{e}(C^*(\gamma))$ (i.e., the politician receives the same information), and $EW(\gamma) = EW_{\bar{c}}(\gamma)$ (i.e., expected constituent welfare is unchanged). For $\gamma \in [\bar{\gamma}(\bar{c}; v), \gamma^*(\bar{c}; v)]$, the politician sets fee $c = \bar{c}$, where $\bar{c} < C^*(\gamma)$. Given that $\bar{c} < C^*(\gamma)$, it is straightforward to show that $\bar{e}(\bar{c}) < \bar{e}(C^*(\gamma))$ (i.e., the politician is better informed), and $EW(\gamma) < EW_{\bar{c}}(\gamma)$ (i.e., expected constituent welfare increases). For $\gamma < \bar{\gamma}(\bar{c}; v)$, the politician does not sell access. Therefore, $\bar{e}(\emptyset) > \bar{e}(C^*(\gamma))$ (i.e., the politician is less informed), and $EW(\gamma) > EW_{\bar{c}}(\gamma)$ (i.e., expected constituent welfare decreases). ■

Proof. (Prop. 5) Let $\bar{c}'$ solve $\bar{\gamma}(\bar{c}') = \gamma$. Prop. 3 establishes that at $\bar{c}'$ the politician sets access fee equal to $\bar{c}'$. Also, $\bar{e}(\bar{c}') \in (0, 1)$.

First, I establish that $\bar{c}'$ results in higher $EW_{\bar{c}}$ compared to any lower $\bar{c}$. For all $\bar{c} < \bar{c}'$, $\bar{\gamma}(\bar{c}; v) > \gamma$; therefore, the politician does not grant access and $EW_{\bar{c}} = -\frac{\gamma}{3}$. At $\bar{c}'$, $\bar{e} \in (0, 1)$; therefore, $EW_{\bar{c}'} \in \left(-\frac{\gamma}{3}, -\frac{\gamma}{4}\right)$ (see the proof to Prop. 4), and $EW_{\bar{c}}(\gamma) < EW_{\bar{c}'}(\gamma)$ for all $\bar{c} < \bar{c}'$.

Second, I establish that $\bar{c}'$ results in higher $EW_{\bar{c}}$ compared to any higher $\bar{c}$. Note that since $\gamma < \gamma^*(\bar{c}')$, $\bar{c}' < C^*(\gamma)$. If the new $\bar{c} \in (\bar{c}', C^*(\gamma)]$, then the politician sets the fee equal to $\bar{c}$. If the new $\bar{c} \geq C^*(\gamma)$, then the politician sets access fee equal to $C^*(\gamma)$, which is strictly greater than $\bar{c}'$. Either way, increasing the contribution limit above $\bar{c}'$ results in a strictly higher access fee. As I've already established, a strictly higher access fee increases $\bar{e}$, and decreases expected constituent welfare. $EW_{\bar{c}}(\gamma) < EW_{\bar{c}'}(\gamma)$ for all $\bar{c} > \bar{c}'$.

Third, I establish that $\bar{c}'$ results in higher expected constituent welfare compared to setting no limit. If there is no limit, the politician sets access fee equal to $C^*(\gamma)$, which I've shown is strictly higher than $\bar{c}'$. As I've already established, a strictly higher access fee increases $\bar{e}$, and decreases expected constituent welfare. $EW(\gamma) < EW_{\bar{c}'}(\gamma)$. ■

Proof. (Prop. 8) First, I establish that $\bar{c} = \frac{\tau}{\phi}$ results in higher expected constituent welfare than no limit or any $\bar{c} > \frac{\tau}{\phi}$. Note that $\bar{\gamma}(\tau/\phi) = 0$. Therefore,

$$EW_{(\tau/\phi)} = -\int_0^{\gamma^*(\tau/\phi)} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(\tau/\phi)^3}{v^3}\right)\gamma d\gamma - \int_{\gamma^*(\tau/\phi)}^{\infty} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma))^3}{v^3}\right)\gamma d\gamma.$$

For any $\bar{c} > \frac{\tau}{\phi}$, $\bar{\gamma}(\bar{c};v) < 0$. Therefore,

$$EW_{\bar{c}\,>(\tau/\phi)} = -\int_0^{\gamma^*(\bar{c};v)} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{\bar{c}^3}{v^3}\right)\gamma d\gamma - \int_{\gamma^*(\bar{c};v)}^{\infty} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma))^3}{v^3}\right)\gamma d\gamma.$$

Note that $EW_{(\tau/\phi)} > EW_{\bar{c}\,>(\tau/\phi)}$ iff $EW_{(\tau/\phi)} - EW_{\bar{c}\,>(\tau/\phi)} > 0$. For any $\bar{c} > \tau/\phi$,

$$EW_{(\tau/\phi)} - EW_{\bar{c}\,>(\tau/\phi)} = -\int_0^{\gamma^*(\bar{c};v)} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(\tau/\phi)^3 - \bar{c}^3}{v^3}\right)\gamma d\gamma - \int_{\gamma^*(\bar{c};v)}^{\gamma^*(\tau/\phi)} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(\tau/\phi)^3 - (C^*(\gamma))^3}{v^3}\right)\gamma d\gamma$$

Since $\frac{\tau}{\phi} < \bar{c}$ and $\frac{\tau}{\phi} < C^*(\gamma)$ for $\gamma \in (\gamma^*(\bar{c};v), \gamma^*(\tau/\phi))$, it follows that $EW_{(\tau/\phi)} - EW_{\bar{c}\,>(\tau/\phi)} > 0$. Thus, a contribution limit equal to $\frac{\tau}{\phi}$ results in higher expected constituent welfare than any higher limit.

Setting no limit results in

$$EW_{\text{no limit}} = -\int_0^{\infty} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(C^*(\gamma))^3}{v^3}\right)\gamma d\gamma.$$

Note that $EW_{(\tau/\phi)} > EW_{\text{no limit}}$ iff $EW_{(\tau/\phi)} - EW_{\text{no limit}} > 0$.

$$EW_{(\tau/\phi)} - EW_{\text{no limit}} = -\int_0^{\gamma^*(\tau/\phi)} g(\gamma)\left(\frac{1}{4} + \frac{2}{3}\frac{(\tau/\phi)^3 - (C^*(\gamma))^3}{v^3}\right)\gamma d\gamma$$

Since $\frac{\tau}{\phi} < C^*(\gamma)$ for $\gamma \in (0, \gamma^*(\tau/\phi))$, it follows that $EW_{(\tau/\phi)} - EW_{\text{no limit}} > 0$. Thus, a contribution limit equal to $\frac{\tau}{\phi}$ results in higher expected constituent welfare than imposing no limit. Therefore, the optimal limit $\bar{c}_o \in [0, \tau/\phi]$.

I will now show that $\bar{c}_o \neq \frac{\tau}{\phi}$ and $\bar{c}_o \neq 0$. To do so, it is sufficient to show that $\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}\Big|_{\bar{c}=0} > 0$, and

$\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}\Big|_{\bar{c}=(\tau/\phi)} < 0$. That $EW_{\bar{c}}$ is a continuous, smooth function between 0 and τ/ϕ assures that the function achieves a maximum on this interval.

The derivative of expected constituent welfare with respect to $\bar{c}$ is given by equation 15. It follows from this expression that

$$\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}\Bigg|_{\bar{c}=0} = -g(\bar{\gamma}(0))\left[\frac{1}{12}\right]\bar{\gamma}(0)\bar{\gamma}'(0).$$

Note that $\bar{\gamma}(0) = 12\tau > 0$; $g(\gamma) > 0$ for all positive γ including $\gamma = 12\tau$; and $\bar{\gamma}'(0) < 0$. Therefore, $\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}\Big|_{\bar{c}=0} > 0$. This means that a marginally positive contribution limit results in higher expected constituent welfare than banning contributions.

Similarly,

$$\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}\Bigg|_{\bar{c}=(\tau/\phi)} = -g(\bar{\gamma}(\tau/\phi))\left[\frac{1}{12} - \frac{2}{3}\frac{(\tau/\phi)^3}{v^3}\right]\bar{\gamma}(\tau/\phi)\bar{\gamma}'(\tau/\phi) - \int_{\bar{\gamma}(\tau/\phi)}^{\gamma^*(\tau/\phi)} g(\gamma)\frac{2(\tau/\phi)^2}{v^3}\gamma d\gamma.$$

Since $\bar{\gamma}(\tau/\phi) = 0$, this simplifies to Similarly,

$$\frac{\partial EW_{\bar{c}}}{\partial \bar{c}}\Bigg|_{\bar{c}=(\tau/\phi)} = -\int_{0}^{\gamma^*(\tau/\phi)} g(\gamma)\frac{2(\tau/\phi)^2}{v^3}\gamma d\gamma,$$

which is strictly negative. Therefore, setting a contribution limit just below $\frac{\tau}{\phi}$ results in strictly higher expected constituent welfare than setting a contribution limit equal to $\frac{\tau}{\phi}$. Thus, $\bar{c}_o \neq \frac{\tau}{\phi}$ and $\bar{c}_o \neq 0$. Together, these results establish that $\bar{c}_o \in (0, \tau/\phi)$. ■

Proof. (Cor. 1) Proposition 8 directly established that a contribution ban was never optimal, and that it was always optimal to impose a contribution limit $\bar{c}_0 \in (0, \tau/\phi)$. It remains to be shown that any limit $\bar{c} \in (0, \tau/\phi)$ results in the politician giving access for some, but not all, issues. To establish this, it is sufficient to show that $\bar{\gamma}\bar{c} > 0$ for all $\bar{c}$ in this range. Since $\bar{\gamma}'(\bar{c}) < 0$ for all possible limits, it is sufficient to show that $\bar{\gamma}(0) > 0$ which implies that for any $\bar{c} > 0$, $\bar{\gamma}(\bar{c}; v)$ will also be positive. $\bar{\gamma}(0) = 12\tau > 0$, thus $\bar{\gamma}(\bar{c}; v) > 12\tau$ for all $\bar{c} > 0$. ■

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