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# The Optimality of Ignoring Lobbyists

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## Abstract

For situations where interest groups compete in an all-pay auction for a political prize, we derive conditions under which the government optimally balances the costs and the benefits of lobbying by ignoring all lobbying activities and by always assigning the prize to the interest group with the highest ex ante value for it.

*Keywords:* All-pay auction; Lobbying; Social welfare.

*JEL classification:* D44; D72

## 1 Introduction

Lobbying has become an established practice in modern democracies. Its role in society is an intriguing phenomenon, and it has received a lot of attention from economists. Tullock (1980) views lobbying as an all-pay auction, in which interest groups submit “bids” in order to win a political prize. The literature that follows Tullock mainly examines the social costs of lobbying, which are associated with the fact that the resources invested in lobbying cannot be used for other economic activities. Thus, this branch of the literature devotes much attention to how much interest groups invest in lobbying.<sup>1</sup> Another stream of work studies the social benefits of lobbying which arise when interest groups have the opportunity to signal valuable private information choosing bids that are contingent on policy relevant private information.<sup>2</sup>

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<sup>1</sup>See e.g. Baye et al. (1993).

<sup>2</sup>See e.g. Potters and Van Winden (1992).

In this study, we combine the above two views by making a trade-off between social costs and social benefits of lobbying. We do so, assuming that interest groups interact in an all-pay auction and that the government can commit to a “contest success function”, i.e. a function that maps the interest groups’ “bids” into probabilities of winning the prize.

The set-up of this paper is as follows. In section 2, we present our general model and section 3 includes our main results. Section 4 concludes.

## 2 The model

A government owns a political prize, and  $n$  risk neutral interest groups, numbered  $1, \dots, n$ , compete for the prize. Let  $N \equiv \{1, \dots, n\}$  denote the set of all interest groups. Interest groups participate in the all-pay auction, in which they submit bids in order to obtain the prize. We will let  $b_i \in \mathfrak{R}_+$  denote the bid submitted by interest group  $i$ . Let  $\mathbf{b} \equiv (b_1, \dots, b_n)$  be the vector of submitted bids. The government can commit to “contest success functions”  $q_i : \mathfrak{R}_+^n \rightarrow [0, 1]$  for all  $i$  with  $\sum_i q_i(\mathbf{b}) \leq 1$  for all  $\mathbf{b}$ . Each interest group  $i$  pays its bid  $b_i$  and wins with probability  $q_i(\mathbf{b})$ .

Interest groups are expected utility maximizers. Interest group  $i$ ’s utility function is given by

$$u_i(\mathbf{b}) = v_i q_i(\mathbf{b}) - b_i$$

where  $v_i$  is interest group  $i$ ’s value of the prize. For each  $i$ ,  $v_i$  is drawn from a distribution function  $F_i$ , independently from the values of the other bidders.  $F_i$  has support on the interval  $[\underline{v}_i, \bar{v}_i] \subset [0, \infty)$ , and continuous density  $f_i$  with  $f_i(v_i) > 0$ , for every  $v_i \in [\underline{v}_i, \bar{v}_i]$ . Define the sets  $V \equiv \times_{j \in N} [\underline{v}_j, \bar{v}_j]$  and  $V_{-i} \equiv \times_{j \neq i} [\underline{v}_j, \bar{v}_j]$ , with typical elements  $\mathbf{v} \equiv (v_1, \dots, v_n)$ , and  $\mathbf{v}_{-i} \equiv (v_1, \dots, v_{i-1}, v_{i+1}, \dots, v_n)$  respectively. We assume that interest group 1 has the highest ex ante value for the prize, i.e., for all  $i = 2, \dots, n$ ,

$$E\{v_i\} \leq E\{v_1\}.$$

Let

$$H_i(v_i) \equiv \frac{1 - F_i(v_i)}{f_i(v_i)}$$

be the upside-down hazard rate for interest group  $i$ .

The government aims to maximize social welfare among the interest groups by committing to a contest success function for each interest group, which defines a mechanism  $\mu$ . Define  $B(\mu)$  as the set of Bayesian Nash equilibria of  $\mu$ . Let  $b \equiv (b_1, \dots, b_n)$  be a typical element of  $B(\mu)$ , where  $b_i : [\underline{v}_i, \bar{v}_i] \rightarrow \mathfrak{R}_+$  denotes the equilibrium strategy for bidder  $i \in N$ . We let  $\tilde{\mu}$  denote the mechanism that always assigns the prize to interest group 1. Note that in the Bayesian Nash equilibrium of  $\tilde{\mu}$ , all bids are zero.

Let  $sw(\mu, b)$  denote social welfare of mechanism  $\mu$  given that equilibrium  $b \in B(\mu)$  is played. We assume that social welfare is the sum of the interest groups' utilities in equilibrium, i.e.,

$$sw(\mu, b) = \sum_{i \in N} E_{\mathbf{v}} \{u_i(b_1(v_1), \dots, b_n(v_n))\}.$$

Let  $M$  be the set of all mechanisms. We say that mechanism  $\mu^* \in M$  is *socially optimal* if there is a  $b^* \in B(\mu^*)$  such that  $sw(\mu^*, b^*) \geq sw(\mu, b)$  for all  $\mu \in M$  and  $b \in B(\mu)$ .

### 3 The socially optimal mechanism

By the revelation principle (Myerson, 1981), we may assume, without loss of generality, that the government only considers incentive compatible and individually rational direct revelation mechanisms. Let  $(p, x)$  be such a mechanism, with

$$p : V \rightarrow [0, 1]^n$$

having

$$\sum_{j \in N} p_j(\mathbf{v}) \leq 1,$$

and

$$x : V \rightarrow \mathfrak{R}_+^n.$$

We interpret  $p_i(v)$  as the probability that interest group  $i$  wins, and  $x_i(v)$  as the expected payments by  $i$ , when  $v$  is announced. Note that payments are non-negative, because we assume that bids are non-negative.

We define  $X_i(v_i) \equiv E_{\mathbf{v}_{-i}} \{x_i(v_i, v_{-i})\}$  and  $Q_i(v_i) \equiv E_{\mathbf{v}_{-i}} \{p_i(v_i, v_{-i})\}$  respectively as interest group  $i$ 's expected payment and its conditional probability that it wins given its type  $v_i$ . Let

$$U_i(v_i) \equiv Q_i(v_i)v_i - X_i(v_i) \tag{1}$$

be interest group  $i$ 's interim utility from a feasible direct revelation mechanism  $(p, x)$ .

**Lemma 1** *Individual rationality and incentive compatibility are equivalent to*

$$\text{if } v_i \leq w_i \text{ then } Q_i(v_i) \leq Q_i(w_i), \forall v_i, w_i, i, \quad (2)$$

$$U_i(v_i) = U_i(\underline{v}_i) + \int_{\underline{v}_i}^{v_i} Q_i(y_i) dy_i, \forall v_i, i, \text{ and} \quad (3)$$

$$U_i(\underline{v}_i) \geq 0, \forall i.$$

**Proof.** See Myerson (1981). ■

Obviously,  $\tilde{\mu}$  is optimal in the case of (1) a pure common value ( $\underline{v}_i = \bar{v}_i = \bar{v}$  for all  $i$  and some  $\bar{v} > 0$ ) and (2) interest group 1 always having a higher value than other interest groups ( $\underline{v}_1 \geq \bar{v}_i$  for all  $i > 1$ ). Proposition 1 generalizes these observations to less obvious settings.

**Proposition 1** *If  $H_i$  is a decreasing function for all  $i$ ,  $\tilde{\mu}$  is socially optimal.*

**Proof.** Define  $SW(p, x)$  as the expected social welfare from direct revelation mechanism  $(p, x)$  given that all interest groups play the equilibrium strategy of announcing their type truthfully. Then,

$$\begin{aligned} SW(p, x) &= \sum_{i \in N} \left( U_i(\underline{v}_i) + E_{v_i} \left\{ \int_{\underline{v}_i}^{v_i} Q_i(y_i) dy_i \right\} \right) \\ &= \sum_{i \in N} (U_i(\underline{v}_i) + E_{v_i} \{ H_i(v_i) Q_i(v_i) \}) \\ &\leq \sum_{i \in N} (U_i(\underline{v}_i) + E_{v_i} \{ H_i(v_i) \} E_{v_i} \{ Q_i(v_i) \}) \\ &= \sum_{i \in N} (U_i(\underline{v}_i) + (E\{v_i\} - \underline{v}_i) E_{v_i} \{ Q_i(v_i) \}) \\ &\leq \sum_{i \in N} (U_i(\underline{v}_i) + (E\{v_1\} - \underline{v}_i) E_{v_i} \{ Q_i(v_i) \}) \\ &\leq E\{v_1\} \sum_{i \in N} E_{v_i} \{ Q_i(v_i) \} \\ &\leq E\{v_1\}. \end{aligned} \quad (4)$$

The first equality in the above chain follows with (3), and we get the second and third equality using integration by parts. The first inequality follows because the expectation

of a product of a decreasing and an increasing function is less or equal than the product of the expectations. In this case,  $H_i(v_i)$  is decreasing in  $v_i$  (by assumption), and  $Q_i$  is increasing in  $v_i$  (by (2)). Moreover, (1) and (2) imply

$$U_i(\underline{v}_i) \leq \underline{v}_i Q_i(\underline{v}_i) \leq \underline{v}_i E_{v_i} \{Q_i(v_i)\}$$

from which the third inequality follows. The other manipulations are straightforward. Because expected social welfare from  $\tilde{\mu}$  equals  $E\{v_1\}$ , it immediately follows that  $\tilde{\mu}$  is socially optimal. ■

The following proposition shows that relaxing the assumption that  $H_i$  is strictly decreasing for each interest group  $i$  may completely reverse the above finding. This result is analogous to McAfee and McMillan's (1992) finding that colluding bidders optimally bid noncooperatively in the first-price sealed-bid auction if side-payments are not feasible and the upside-down hazard rate is increasing.

**Proposition 2** *Suppose all bidders draw their value from the same value distribution function,  $H_i$  is strictly increasing, and  $\underline{v}_i = 0$  for all  $i$ . Then the government optimally implements a perfectly discriminatory contest success function, i.e., the prize always ends up in the hands of the interest group that submits the highest bid.*

**Proof.** In the case of perfectly discriminatory contest success function, the interest group with the highest value always wins the prize in equilibrium (Krishna, 2002). From (4), it follows that social welfare is maximized under this allocation rule. ■

## 4 Concluding remarks

We have shown that under fairly general assumptions, the government maximizes expected social welfare by assigning the political prize to the interest groups with the highest *ex ante* value for it. Note that if the government ignores lobbyists, the prize may be unlikely to end up in the hands of the interest group with the highest *ex post* value. Our findings imply that the government can optimally base its decision on the allocation of the political prize on very limited information, namely the identity of the interest group which has the highest *ex ante* value for the prize. Unrestricted lobbying is optimal in the case of (1)

symmetric interest groups, (2) an increasing upside-down hazard rate, and (3) the lowest possible value is zero for all interest groups.

Our results not only apply to lobbying, but to many situations where agents forgo valuable resources while competing for a prize. Examples include contests for research grants, political campaigns, and advertising. In an advertising contest, for instance, our results imply that when total demand does not depend on the amount of advertising, firms optimally collude by not spending money on advertising.<sup>3</sup>

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<sup>3</sup>Huck et al. (2002) derive a similar result in a model with complete information.