

Effort and Performance in Public-Policy Contests*

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Abstract

Government intervention often gives rise to contests in which the possible ‘prizes’ are determined by the status-quo and some new public-policy proposal. In this paper we study a general class of such two-player public-policy contests and examine the effect of a change in the proposed policy, a change that may affect the payoffs of the two contestants, on their effort and performance. Our results extend the existing comparative statics studies that focus, in symmetric contests, on the effect of a change in the value of the prize or, in asymmetric contests, on the effect of one contestant’s valuation of the prize. Our results hinge on a fundamental equation that specifies the equilibrium relationship between the strategic own-stake effect and the strategic rival’s-stake effect. This fundamental equation clarifies the role of the three possible types of ability and stake asymmetry in determining the effect of payoff variations on the efforts and performance of the contestants.

Keywords: Public-Policy Contests, Policy Reforms, Lobbying Efforts, Strategic Own-Stake Effect, Strategic Rival’s-Stake (“Substitution”) Effect.

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I. Introduction

Tournaments, conflict, patent races and rent seeking have been modeled as contests in which participants exert efforts to increase their probability of winning a prize. A significant element in such contests is a function that provides each player's probability of winning for any given combination of the efforts made by the contestants, the so called contest success function (CSF). While some literature employs specific CSF's without any particular motivation other than analytical convenience, Skaperdas (1996) provided a rationale for employing a particular CSF by axiomatizing the general class of additive CSF's. A large class of contests has thus been rationalized. In most studies of contests, however, the source of the prize or, more generally, the source of the contestants' prize valuations has been ignored. Despite the fact that in some studies the source of the prize system was based on the existence of monopoly profits (rents) or various forms of protective trade-policies, see, for example, Mueller (2003), the general role of public policy as a determinant of the contest prize system has not been adequately studied. The main objective of this paper is to accomplish this task.

We focus on common situations where the prize system is determined by the government and the contestants are two interest groups. The choice of the government is to either remain with the status quo or supplant it with a proposed new policy. The prizes of the affected interest groups are given by the differences between their payoffs under the existing system and their payoffs under the proposed policy. Whether the proposed policy is implemented depends on the outcome of a political contest in which the two interest groups exert efforts to influence the probabilities of their preferred alternative. We assume that one interest group favors the status quo while the other favors the proposed policy. For example, a tax reform may be supported by one industry and opposed by another. Existing pollution standards may be defended by the industry and challenged by an environmentalist interest group. A monopoly may face the opposition of a consumers' coalition fighting for appropriate regulation.¹ Capital owners and a workers union may be engaged in a contest that

¹ A special case of this setting is studied by Baik (1999) who analyzes the welfare effect of consumer opposition to the existence of monopoly rents.

determines the minimum wage, and so on². The outcome of such contests depends on the contestants' exerted efforts (fighting, lobbying or rent-seeking efforts), that depend, in turn, on the parameters of the contest and, in particular, on the contestants' payoffs in the event that the public-policy proposal is approved or rejected. Some of the above examples are briefly discussed below to illustrate the effect of policy reform on the payoff structure of the contestants.

A major concern in the contest literature has been the issue of how changes in the parameters of the contest (number, valuations and abilities of the contestants and the nature of the information they have) affect the equilibrium efforts of the contestants and the extent of relative prize dissipation, Hillman and Riley (1989), Hurley and Shogren (1998) and Nitzan (1994). In addition, attention has been paid to the effect of changes in these parameters on the contestants' expected payoffs, Baik (1994), Gradstein(1995) and Nti (1997, 1999). The main concern of our paper is the clarification of the effect of changes in public policy on the contestants' efforts and on their probabilities of winning the contest. Earlier studies examined the sensitivity of total efforts to changes either in the value of the prize³ or in the prize valuation of one of the contestants. Our extended comparative statics analysis focuses on the effects of a change in the proposed public policy that generates simultaneous modifications in the prize valuations of all the contestants. Nevertheless, even in those cases that such a change only modifies the prize valuation of a single contestant, we generalize the existing results that dealt with special forms of our general CSF.

We first present the general framework of binary public-policy contests with two possible states of nature (approval and rejection of the proposed policy) allowing the general CSFs axiomatized by Skaperdas (1996). This framework has numerous possible applications such as contests on the approval or rejection of a proposed

² Two recent examples from U.S politics that illustrate the public-policy contest that we study are the congressional reviews of late-term Clinton administration actions on ergonomics and environmental regulations on land use in national forests. Both regulations were reviewed and criticized by the new Congress, and both could have been squelched. But the ergonomics regulations (a decade in the making) were overturned under the Congressional Review Act of 1996, while the environmental regulations were allowed to stand. The explanations for these outcomes can be traced to the strength of the interest groups supporting the regulations (organized labor and the environmental lobby, respectively).

³ In a two-stage contest the prize can be endogenously determined by the contestants. Konrad (2002) examines the role of incumbency advantages for investment that increases the size of the contested prize. Epstein and Nitzan (2004a) focus on the role of strategic restraint in contests.

minimum wage, monopoly regulation, immigration quota, tax reform, protection by tariff or some new environmental policy. The rest of the paper is then devoted to the comparative-statics properties of the public policy contest and, in particular, to the clarification of the role of three types of asymmetry between the contestants on the sensitivity of their effort and performance to the proposed public policy.

In section II we introduce the public-policy contest. In section III we present the function that generates the prize system (the stakes) of the contest and illustrate its applicability. Section IV contains the comparative-statics analysis that focuses on the effect of changes in the proposed public policy on the equilibrium asymmetries between the contestants and, in turn, on the equilibrium effort of the interest groups and on their probability of winning the contest. Section V contains brief concluding remarks.

II. The Public Policy Contest

In our contest the players are two risk-neutral interest groups that are differently affected by the approval and rejection of a proposed policy. In general, one group derives a higher benefit than the other from the realization of its preferred policy. We therefore refer to one player as the Low-Benefit (LB) player and to the other player as the High-Benefit (HB) player⁴. The interest groups engage in a complete-information contest that determines the probabilities of approval and rejection of the proposed policy.⁵

The Rationale for Creating a Contest Between the Interest Groups.

The ruling politicians/government could decide to select the policy that generates the highest benefit to one of the interest groups. An alternative option for the government is to choose randomly between the two different policies that it faces. Clearly, if the utility the government derives from the selection of a policy is positively related to the aggregate net payoffs (stakes) of the interest groups, then it would never randomize, that is, it would select the policy that generates the higher stake. The probabilities of realization of the two policies in the complete-information public-policy contest are given by the CSF. This function specifies the relationship between the interest groups'

⁴ See Epstein and Nitzan (2002a).

⁵ Modeling the contestants as single agents presumes that they have already solved the collective action problem. The model thus applies to already formed interest groups.

investment in the so called influence, lobbying or rent-seeking activities and the probability of realization of the two policies. The expected payoff of interest group i is denoted by $E(w_i)$ and the effort invested by each interest group is denoted by x_i . (later on we examine the relationship between the CSF, $E(w_i)$ and x_i).

Suppose that the government's objective function $G(E(w_L); E(w_H); (x_H + x_L))$ depends on the expected payoffs $E(w_i)$ and on the interest groups' lobbying efforts $x_L + x_H = X$. If the government decides not to generate a contest and choose an optimal certain policy, then the value of the government's objective function is equal to $G(N_H)$. N_H denotes the value to the government if it decides to select the policy that generates the highest benefit to one of the interest groups.⁶ It is therefore sensible for the government to create a contest if and only if the expected value of its objective function is increased by the existence of a contest. That is, $G(E(w_L); E(w_H); (x_H + x_L)) > G(N_H)$.

For example, as commonly assumed in the recent political economy literature, see Grossman and Helpman (2001), Persson and Tabellini (2000), let the government's objective function be a weighted average of the expected social welfare and the lobbying efforts: $G(.) = \alpha(E(w_L) + E(w_H)) + (1 - \alpha)(x_L + x_H)$. The parameters α and $(1 - \alpha)$ are the weights assigned to the expected social welfare and the contestants' lobbying outlays. If the government decides not to generate a contest and choose the policy that results in the higher stake, then the value of the government's objective function is equal to αN_H . In this case it is therefore sensible for the government to create a contest if and only if: $\alpha(E(w_L) + E(w_H)) + (1 - \alpha)(x_L + x_H) > \alpha N_H$.

In Epstein and Nitzan (2002b) it is shown that, if the weight assigned to the lobbying outlays is greater than the weight assigned to the expected stakes, a contest based on CFSs, such as the commonly assumed all-pay auction or Tullock's lottery logit functions, is preferable to no contest. In such cases then random government behavior is rational.

⁶ In terms of the notation what will be developed below, $N_H = u_H + v_L$.

The contest

Player i 's preferred policy is approved in probability Pr_i . The present discounted value of this policy to this player is equal to u_i and its value to his opponent, player j , is equal to v_j . By assumption then, for each player, approval of his preferred policy is associated with a positive payoff, that is, $u_i > v_i$. Note that, in general, the four values u_L, v_L, u_H and v_H , viz., the players' payoffs corresponding to the approval and rejection of the policy I proposed by the government (a ruling politician or a bureaucrat) depend on I .

As defined above, x_i denotes the effort of the risk-neutral player i . The expected net payoff of i is equal to:

$$(1) \quad E(w_i) = Pr_i u_i(I) + Pr_j v_i(I) - x_i, i \neq j$$

Given the contestants' efforts, the probabilities of approval and rejection of the proposed policy, Pr_L and Pr_H , are obtained by the CSF. As in Skaperdas (1992), it is assumed that $\frac{\partial Pr_i(x_i, x_j)}{\partial x_i} > 0$, $\frac{\partial Pr_i(x_i, x_j)}{\partial x_j} < 0$ and given x_j , there exists \underline{x}_i such that, for $x_i \geq \underline{x}_i$, $\frac{\partial^2 Pr_i(x_i, x_j)}{\partial x_i^2} < 0$ ^{7 8}(the latter inequality ensures that the second order conditions are satisfied). Since $Pr_i(x_i, x_j) + Pr_j(x_j, x_i) = 1, i \neq j$, it holds that

⁷ As already noted, the function $Pr_i(x_i, x_j)$ is usually referred to as a contest success function (CSF). The functional forms of the CSF's commonly assumed in the literature, see Nitzan (1994) and Skaperdas (1996), satisfy these assumptions.

⁸ To ensure that the equilibrium is a pure strategy Nash equilibrium and that it is unique,, in addition to the assumed properties of the CSF, we have to add the following requirement (see Skaperdas, 1992):

$$Pr_i(x_i, x_j)(1 - Pr_i(x_i, x_j)) \frac{\partial^2 Pr_i(x_i, x_j)}{\partial x_i \partial x_j} + (2 Pr_i(x_i, x_j) - 1) \frac{\partial Pr_i(x_i, x_j)}{\partial x_i} \frac{\partial Pr_i(x_i, x_j)}{\partial x_j} = 0$$

This condition is satisfied if $\frac{\partial^2 Pr_i(x_i, x_j)}{\partial x_i \partial x_j} > 0$ iff $Pr_i(x_i, x_j) = 0.5$. This plausible assumption means that player i has an advantage in terms of ability, if a change in j 's effort positively affects his marginal winning probability. In other words, a positive (negative) sign of the cross

second-order partial derivative of $Pr_i(x_i, x_j)$, $\frac{\partial^2 Pr_i}{\partial x_j \partial x_i}$, implies that i has an advantage

(disadvantage) when j 's effort changes. Note that this assumption is satisfied by many CSFs that have been studied in the literature (see Skaperds, 1992).

$$(2) \quad \frac{\partial^2 \Pr_i(x_i, x_j)}{\partial x_i \partial x_j} = - \frac{\partial^2 \Pr_j(x_j, x_i)}{\partial x_i \partial x_j}.$$

The ability of a contestant j to convert effort into probability of winning the contest can be represented by the marginal effect of a change in his effort on his winning probability. By assumption, this marginal effect is declining with his own effort. A change in his effort also affects, however, the marginal winning probability of his opponent i . The opponent i has an advantage in terms of ability if a change in j 's effort positively affects his marginal winning probability. In other words, a positive (negative) sign of the cross second-order partial derivative of $\Pr_i(x_i, x_j)$, $\frac{\partial^2 \Pr_i}{\partial x_j \partial x_i}$,

implies that i has an advantage (disadvantage) when j 's effort changes. At some given combination of efforts (x_i, x_j) , the ratio between the effect of a change in j 's effort on the marginal winning probability of i and the effect of a change in j 's effort on his own ability, $\frac{\partial^2 \Pr_i}{\partial x_i \partial x_j} / \left(\frac{\partial^2 \Pr_j}{\partial x_j^2} \right)$, is therefore a local measure of the asymmetry

between the abilities of i and j . This asymmetry together with two types of stake-asymmetry that are presented below play a crucial rule in determining the comparative statics effects on which this study focuses.

Denote by $n_i = (u_i - v_i)$ the stake of player i (his real benefit from winning the contest), (see Baik, 1999, Epstein and Nitzan, 2002a and Nti, 1999). A player's stake is secured when he wins the contest, that is, when his preferred policy is the outcome of the contest. Recall that for one player the desirable outcome is associated with the approval of the proposed policy while for the other player the desirable outcome is realized when the proposed policy is rejected. The expected net payoff of interest group i can be rewritten as follows:

$$(3) \quad E(w_i) = v_i(I) + \Pr_i n_i(I) - x_i$$

In general, the stakes of the contestants are different, that is, one of them has an advantage over the other in terms of his benefit from winning the contest. With no

loss of generality, we assume that $n_L \leq n_H$. The ratio n_L/n_H is a measure of the asymmetry between the stakes of the contestants⁹.

By our assumptions, both players participate in the contest¹⁰ (x_L and x_H are positive). We therefore focus on the unique interior Nash equilibria of the contest.

Solving the first order conditions $\left(\frac{\partial E(w_L)}{\partial x_L} = 0 \text{ and } \frac{\partial E(w_H)}{\partial x_H} = 0 \right)$ we obtain:

$$(4) \quad \Delta_i = \frac{\partial \Pr_i(x_i, x_j)}{\partial x_i} n_i(I) - 1 = 0 \quad \forall i \neq j \text{ and } i, j = L, H$$

Thus, the first order conditions require¹¹ that:

$$(5) \quad \frac{\partial \Pr_i}{\partial x_i} = \frac{1}{n_i(I)}, \quad i = L, H$$

By the expressions in (5) that determine the equilibrium efforts of the players and their probabilities of winning the contest and by the assumed properties of the CSF, we directly obtain that under a symmetric CSF¹² ($\forall x_i, x_j, \Pr_i(x_i, x_j) = \Pr_j(x_j, x_i)$), the player with the higher stake makes a larger effort and has a higher probability of winning the contest. The probability of the socially more efficient outcome of the

⁹ Suppose that the policy I determines the total prize of the contest $V(I)$ and the contestants' shares $\alpha_j(I)$ and $\alpha_i(I)$ in $V(I)$. Contestant's i 's stake is now equal to $n_i(I) = \alpha_i(I)V(I)$ where $0 < \alpha_i(I) < 1$ and $\alpha_j(I) + \alpha_i(I) = 1$. This alternative formulation enables a convenient look at the three factors affected by the policy I, namely, the value of the contest V , the derivative V' and the shares $\alpha_j(I)$ and $\alpha_i(I)$. Notice that the sign of V'/V determines whether public policy is more or less restrictive and α_i/α_j represents the asymmetry in the contestants' stakes.

¹⁰ It is assumed that both players participate in the contest, i.e.,

$$\left. \frac{\partial \Pr_i(x_i, x_j)}{\partial x_i} \right|_{x_i=0} > \frac{1}{n_i(I)} \quad \forall x_j \text{ and } i \neq j.$$

¹¹ It can be easily verified that the second order conditions hold.

¹² Such symmetry implies that the two players share an equal ability to convert effort into probability of winning the contest.

contest is thus higher than the probability of the less efficient outcome. For a similar result see Baik (1994) and Nti (1999).

III. Public Policy and the Prize System (The Contestants' Stakes)

A change in the policy instrument I affects the stakes of the players and thus their efforts and their probability of winning the contest¹³. In this section we examine how a change in the proposed policy affects the prize system, that is, the contestants' stakes, assuming that the functions $n_i(I)$ ($i = L, H$) are continuous and twice differentiable in I . A policy reform may affect the stake of one of the contestants or the stakes of both of them. Denoting the effect of a change in I on n_i by n'_i ,

$n'_i = \frac{\partial n_i}{\partial I}$, our subsequent analysis relates to all of the following five possible types of public-policy effects on the stakes of the interest groups:

Table 1: The Possible Types of a Policy Reform

Type	n'_i	n'_j
(i)	>0	<0
(ii)	>0	$=0$
(iii)	$=0$	<0
(iv)	>0	>0
(v)	<0	<0

In reforms of type (ii) and (iii), a change in I only affects the stake of one interest group. The incidence of the proposed policy reform in these cases is therefore partial. A change in I can be interpreted as a more (less) restrained government intervention if it reduces (increases) the affected stake. Clearly, such a change also affects the stake-asymmetry between the contestants. For example, in type (ii) reform where $i=H$, an increase in I represents a less restrained intervention that increases the asymmetry between the stakes of the contestants.

¹³ Note that the domain of the policy instrument I , the closed interval $I \in [\underline{I}, \bar{I}]$, may reflect economic feasibility or political feasibility.

In the remaining types the incidence of the proposed reform is complete because a change in I affects the stakes of the two contestants. In reforms of type (i) a change in the policy instrument I has opposite effects on the stakes of the two players. If $i=H$, such a change positively affects the asymmetry between the stakes of the contestants. If $i=L$, the asymmetry between the stakes is inversely related to a change in I . In both cases a change in the proposed policy can be considered as a more restrained government intervention if it reduces the sum of the stakes $n_L + n_H$.

In reforms of type (iv) and (v) a change in I has a similar positive or negative effect on the stakes of the players. In both of these cases, therefore, such a change can be unambiguously interpreted as a more restrained or a less restrained government intervention. In these cases the effect of a change in I on the stake-asymmetry depends on the relationship between the elasticities of the stakes with respect to I . Specifically, the effect of a change in I on n_L/n_H depends on whether $\frac{\eta_L}{\eta_H}$ is greater

or smaller than 1, where $\eta_j = \frac{\partial n_j}{\partial I} \frac{I}{n_j}$, $j = L, H$. In a type (iv) reform the asymmetry

in the stakes is positively related to a change in I if $\frac{\eta_L}{\eta_H} < 1$. In a type (v) reform the

asymmetry in the stakes is positively related to a change in I if $\frac{\eta_L}{\eta_H} > 1$.

Usually, a change in public policy affects the stakes of the two contestants. The applicability of the corresponding reforms of type (i), (iv) and (v) is illustrated by the following examples.

Monopoly price regulation: Several authors (e.g., Baik (1999), Ellingsen (1991), Epstein and Nitzan (2003), Fabella (1995)) have pointed out that consumers oppose government protection of a monopoly in attempting to defend their surplus. In this example the firm is the LB player and the consumers' are the HB player. When the monopoly price ranges between the competitive price and the profit-maximizing monopoly price, a change in the proposed price positively affects the stakes of both players (the reform is of type (iv)).

Public-Good Provision: The government considers building a park on the border of a residential neighborhood. In order to finance the project, a general tax is levied on all residents of the country who may benefit from the provision of the proposed park.

However, the local residents, the individuals who reside close to the park, are subjected to another “tax”: the negative externalities (increased congestion, noise, etc.) associated with living close to a public park. If the collected taxes are allocated to the building of the park, an increase in the lump-sum tax or in the tax rate implies an increase in the size of the park. Such a reform can be of type (iv). Now assume that beyond a certain point, an increase in the size of the park does not increase the benefit of the general public. In such a case, an increase in taxes and, in turn, in the size of the park may reduce the benefit associated with the approval of the proposed change in the tax for the non-local residents. Such a reform can be of type (i) or type (ii). Finally suppose that the collected taxes are used to finance the park as well as to compensate the local residents for the negative externalities. In such a case it is possible that an increase in the proposed tax results in a decrease in the benefit associated with the rejection of the proposed tax change for the local residents (the reform is of type (v)).

Protection by Tariff: The study of trade policy determination has often applied rent seeking or contest models, see Hillman (1989) and Mueller (2003). The producer is the *LB* player and the representative of the consumers is the *HB* player. An increase in the proposed tariff increases the benefit of the consumers from disapproval of the proposed tariff change and increases the benefit of the local producers from approval of the proposed tariff.¹⁴

Clearly, numerous other applications come to mind. In fact, any setting where public policy affects the payoffs of two agents (interest groups), such that one agent is interested in the approval of the proposed policy and the other agent supports the rejection of that proposal can serve as an illustration to our model. One can easily construct other examples assuming, for example, that the policy instrument is the quality of a public good provided by the government, the degree of privatization of a particular publicly-owned company or income transfer from one agent (interest group) to another.

¹⁴ If the policy instrument is a protective general tariff - which is imposed on all imported products including the imported inputs, the representatives of the local producers and the consumers are, respectively, the *LB* and *HB* players. In such a case, rejection of a proposed increase in the tariff increases the net benefit of the local consumers. Approval of such a proposed increase in the protective tariff may increase or decrease the benefit (the rent) of the local producers. The latter possibility occurs when production costs become sufficiently high due to the increased tariff on the imported inputs. Under this latter possibility, the proposed reform is of type (i). Otherwise we are back to a type (iv) reform.

IV. Public Policy, Efforts and Winning Probabilities

The effort exerted in the public-policy contest deserves attention because, if it is conceived as wasteful resources, it can be interpreted as social costs and, therefore, serve as a measure of inefficiency (note that the misallocation of resources is the true social cost while the effort may be a transfer). Understanding how public policy affects this effort, which is often referred to as rent dissipation, is the main goal of the proposed theory of public-policy contests.

By differentiation of the first order conditions (see (4)), we get that the Nash equilibrium efforts satisfy the following conditions:

$$(6) \quad \frac{\partial x_i^*}{\partial I} = \frac{\frac{\partial \Delta_i}{\partial x_j} \frac{\partial \Delta_j}{\partial I} - \frac{\partial \Delta_j}{\partial x_i} \frac{\partial \Delta_i}{\partial I}}{\frac{\partial \Delta_i}{\partial x_i} \frac{\partial \Delta_j}{\partial x_j} - \frac{\partial \Delta_j}{\partial x_i} \frac{\partial \Delta_i}{\partial x_j}}, \quad i \neq j, \quad i, j = L, H$$

We thus obtain that:

$$(7) \quad \frac{\partial x_i^*}{\partial I} = \frac{n_i \frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \frac{\partial \text{Pr}_j}{\partial x_j} \frac{\partial n_j}{\partial I} - n_j \frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \frac{\partial \text{Pr}_i}{\partial x_i} \frac{\partial n_i}{\partial I}}{n_i n_j \left(\frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \frac{\partial^2 \text{Pr}_i}{\partial x_i^2} - \frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \frac{\partial^2 \text{Pr}_j}{\partial x_i \partial x_j} \right)}, \quad i \neq j, \quad i, j = L, H$$

Rewriting (7) together with (5), we obtain the fundamental equation that generates all the comparative statics results:

$$(8) \quad \frac{\partial x_i^*}{\partial I} = \frac{1}{B} \frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \eta_j n_i - \frac{1}{B} \frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \eta_i n_j, \quad i \neq j, \quad i, j = L, H$$

where $B = I n_i n_j \left(\frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \frac{\partial^2 \text{Pr}_i}{\partial x_i^2} - \frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \frac{\partial^2 \text{Pr}_j}{\partial x_i \partial x_j} \right)$ and all second-order partial

derivatives are computed at the Nash equilibrium (x_H^*, x_L^*) . The first term in (8)

represents the strategic rival's-stake ("substitution") effect. The sign of this term is equal to the sign of $\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \eta_j$. The second term represents the own-stake ("income")

effect. The sign of this term is equal to the sign of η_i . By assumption,

$$\frac{\partial^2 \text{Pr}_i(x_i, x_j)}{\partial x_i^2} < 0 \text{ and, by (2), } \frac{\partial^2 \text{Pr}_i(x_i, x_j)}{\partial x_i \partial x_j} \frac{\partial^2 \text{Pr}_j(x_j, x_i)}{\partial x_i \partial x_j} < 0. \text{ Hence, } B > 0.^{15}$$

A. Partial incidence: Policy reforms affecting a single stake

When a change in I only affects the stake of one of the contestants, as in reforms type (ii) and (iii), η_i or η_j is equal to zero and (8) reduces to

¹⁵ Under the alternative formulation suggested in footnote 6, where $n_i(I) = \alpha_i(I)V(I)$ the fundamental equation becomes:

$$(8') \quad \frac{\partial x_i^*}{\partial I} = D \left\{ \frac{V'}{V} \left(\frac{\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j}}{\frac{\partial^2 \text{Pr}_j}{\partial x_j^2}} - \frac{\alpha_j}{\alpha_i} \right) + \frac{\alpha_j'}{\alpha_j} \left(\frac{\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j}}{\frac{\partial^2 \text{Pr}_j}{\partial x_j^2}} + \left(\frac{\alpha_j}{\alpha_i} \right)^2 \right) \right\} \quad \forall i \neq j, \quad i, j = L, H$$

where

$$V' = \left(\frac{\partial V}{\partial I} \right), \quad \alpha_i' = \left(\frac{\partial \alpha_i}{\partial I} \right) \text{ and } D = \left(V \alpha_j \frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \left(\frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \frac{\partial^2 \text{Pr}_i}{\partial x_i^2} - \frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \frac{\partial^2 \text{Pr}_j}{\partial x_i \partial x_j} \right)^{-1} \right) < 0.$$

Here one can clearly distinguish between the separate effects on i 's effort of a change in the relative extent of government intervention V'/V and of a change in the relative share of j 's stake α_j'/α_j . Notice that the former effect is weaker and that there are just four different types of public-policy reforms corresponding to the four possible sign combinations of $\frac{\partial V}{\partial I}$ and $\frac{\partial \alpha_i}{\partial I}$ (a less (more)

"restrictive" policy reform, $\frac{\partial V}{\partial I} > 0$ $\left(\frac{\partial V}{\partial I} < 0 \right)$, that redistributes benefits in favor of player i

(player j), $\frac{\partial \alpha_j}{\partial I} < 0$ $\left(\frac{\partial \alpha_j}{\partial I} > 0 \right)$).

(8'')

$$\frac{\partial x_i^*}{\partial I} = \frac{1}{B} \left(\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \eta_j n_i \right) \quad \text{or} \quad \frac{\partial x_i^*}{\partial I} = \frac{1}{B} \left(-\frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \eta_i n_j \right) \quad \forall i \neq j, \quad i, j = L, H$$

In such a case the change in player i 's effort corresponding to the change in n_j is equal to the strategic rival's-stake ("substitution") effect, when $i \neq j$, or to the strategic own-stake ("income") effect, when $i=j$. The former effect is ambiguous, depending on the sign of the cross-partial derivative of the CSF. The latter effect is clear-cut, due to our assumption that the marginal winning probability of a contestant is declining in his own effort.

In case (ii) with $i=H$ and case (iii) with $i=L$,

$$\frac{\partial x_H^*}{\partial I} = \frac{1}{B} \left(-\frac{\partial^2 \text{Pr}_L}{\partial x_L^2} \eta_H n_L \right) \quad \text{and} \quad \frac{\partial x_L^*}{\partial I} = \frac{1}{B} \left(\frac{\partial^2 \text{Pr}_L}{\partial x_L \partial x_H} \eta_H n_L \right).$$

In cases (iii) with $i=H$ and case (ii) with $i=L$,

$$\frac{\partial x_H^*}{\partial I} = \frac{1}{B} \left(\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} \eta_L n_H \right) \quad \text{and} \quad \frac{\partial x_L^*}{\partial I} = \frac{1}{B} \left(-\frac{\partial^2 \text{Pr}_H}{\partial x_H^2} \eta_L n_H \right).$$

We therefore obtain

Proposition 1:

In case (ii) with $i=H$ and case (iii) with $i=L$,

$$\text{Sign} \left(\frac{\partial x_H^*}{\partial I} \right) = \text{Sign} (\eta_H) \quad \text{and} \quad \text{Sign} \left(\frac{\partial x_L^*}{\partial I} \right) = \text{Sign} \left(\frac{\partial^2 \text{Pr}_L}{\partial x_L \partial x_H} \eta_H \right).$$

In cases (iii) with $i=H$ and case (ii) with $i=L$,

$$\text{Sign} \left(\frac{\partial x_L^*}{\partial I} \right) = \text{Sign} (\eta_L) \quad \text{and} \quad \text{Sign} \left(\frac{\partial x_H^*}{\partial I} \right) = \text{Sign} \left(\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} \eta_L \right).$$

Proposition 1 directly yields the following general comparative-statics result that focuses on the sensitivity of a contestant's effort to a change in his or his rival's stake:

Corollary 1.1 In cases (ii) and (iii), $\frac{\partial x^*_H}{\partial n_H} > 0$, $\frac{\partial x^*_L}{\partial n_L} > 0$,

$$\text{Sign} \left(\frac{\partial x^*_H}{\partial n_L} \right) = \text{Sign} \left(\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} \right) \quad \text{and} \quad \text{Sign} \left(\frac{\partial x^*_L}{\partial n_H} \right) = \text{Sign} \left(\frac{\partial^2 \text{Pr}_L}{\partial x_L \partial x_H} \right).$$

By this first corollary, under our general CSF, the effort exerted by a contestant is positively related to his stake. That is, the strategic own-stake (“income”) effect is always positive (effort of every player is a “normal good”). In contrast, the effort exerted by a player can be positively or negatively related to the stake of his rival. It can also be independent of the rival’s stake. When the equilibrium marginal winning probability of a contestant is positively (negatively) related to his rival’s effort, his strategic substitution effect is positive (negative). Following Bulow, Geanakoplos and Klemperer (1985), in such a case we say that a contestant’s effort is a strategic complement (substitute) to his rival’s effort. When the cross-partial derivative of the CSF is equal to zero the contestants’ efforts are independent. Note that, by (2), in our setting the strategic substitution effects are asymmetric; if a player’s effort is a strategic complement to his opponent’s effort, then his opponent’s effort is a strategic substitute to his effort.

In the symmetric case where, $\forall x_H$ and x_L , $\text{Pr}_H(x_L, x_H) = 1 - \text{Pr}_H(x_H, x_L)$, there exists a pure strategy Nash equilibrium, such that $x^*_H > x^*_L$ and, in equilibrium, $\text{Sign} \left(\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} \right) = \text{Sign} (x^*_H - x^*_L) > 0$, which implies that $\frac{\partial^2 \text{Pr}_L}{\partial x_L \partial x_H} < 0$. Hence, by Corollary 1.1,

Corollary 1.2: In cases (ii) and (iii), if, $\forall x_H$ and x_L ,

$$\text{Pr}_H(x_L, x_H) = 1 - \text{Pr}_H(x_H, x_L), \quad \text{then} \quad \frac{\partial x^*_H}{\partial n_H} > 0, \quad \frac{\partial x^*_L}{\partial n_L} > 0, \quad \frac{\partial x^*_H}{\partial n_L} > 0 \quad \text{and}$$

$$\frac{\partial x^*_L}{\partial n_H} < 0.$$

This second corollary generalizes the result obtained by Nti (1999) where Pr_i is assumed to take the particular symmetric logit form, as in Tullock (1980),

$Pr_i(x_i, x_j) = \frac{x_i^r}{x_i^r + x_j^r}$, $i = L, H$. In this special case of symmetric lobbying abilities

of the contestants, the *HB* player can be referred to as the favored player and the *LB* player can be referred to as the underdog, see Dixit (1987). Corollary 1.2 establishes that effort of the favored player increases with both his own stake (valuation of the contested prize) and with the stake (prize valuation) of the underdog. Effort of the underdog increases with his stake (prize valuation), but decreases with the stake (prize valuation) of the favored player.

Another more general asymmetric form of the logit CSF is:

$Pr_H = \frac{\sigma h(x_H)}{\sigma h(x_H) + h(x_L)}$, where $\sigma > 0$, $h(0) \geq 0$ and $h(x_i)$ is increasing in x_i ¹⁶, see

Baik (1994). Here the parameter σ represents the asymmetry between the lobbying abilities of the two players. Note that when $\sigma < 1$, the *HB* player has an ability disadvantage relative to the *LB* player. It can be shown that under this particular CSF,

$\text{Sign} \left(\frac{\partial^2 Pr_L}{\partial x_L \partial x_H} \right) = \text{Sign} (Pr_L - Pr_H)$ and, therefore, for some $\sigma^* < 1$, $Pr_L = Pr_H = 1/2$

and $\frac{\partial^2 Pr_L}{\partial x_L \partial x_H} = \frac{\partial^2 Pr_H}{\partial x_H \partial x_L} = 0$. By Corollary 1.1 we get

Corollary 1.3: In cases (ii) and (iii), if $Pr_H = \frac{\sigma h(x_H)}{\sigma h(x_H) + h(x_L)}$, where $\sigma > 0$, $h(0) \geq 0$

and $h(x_i)$ is increasing in x_i , then

$$\frac{\partial x_H^*}{\partial n_H} > 0, \quad \frac{\partial x_L^*}{\partial n_L} > 0 \quad \text{and} \quad \frac{\partial x_L^*}{\partial n_H} \geq 0 \Leftrightarrow \frac{\partial x_H^*}{\partial n_L} \leq 0 \Leftrightarrow Pr_H \leq 1/2.$$

This third corollary generalizes Proposition 1 in Baik (1994).

B. Complete incidence: Policy reforms affecting both stakes

When a change in I affects the stakes of the two contestants, as in reforms type (i), (iv) and (v), η_L and η_H are positive or negative. By the fundamental equation (8),

¹⁶ In this special case we keep the assumption that a contestant's marginal winning probability is declining in his effort. This requires additional assumptions on the first and second derivatives of the function $h(x_i)$.

when the contestants' efforts are independent, the sensitivity of every contestant's effort with respect to a proposed policy reform is always unequivocal. When the contestants' efforts are not independent, the sensitivity of the effort of one contestant with respect to a proposed policy reform is always unequivocal because the sign of his strategic rival's-stake ("substitution") effect is equal to the sign of his strategic own-stake ("income") effect. The sensitivity of his opponent's effort with respect to the proposed policy reform is ambiguous, depending on whether his strategic own-stake ("income") effect is larger than, equal to or smaller than his strategic rival's-stake ("substitution") effect. Using (8) we thus get

Proposition 2: In cases (i), (iv) and (v),

(a) If $\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} = 0$, then $\text{Sign} \left(\frac{\partial x^*_i}{\partial I} \right) = \text{Sign} (\eta_i)$.

(b) If $\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \neq 0$, then (1) $\text{Sign} \left(\frac{\partial x^*_i}{\partial I} \right) = \text{Sign} (\eta_i) \Leftrightarrow \text{Sign} \left(\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \eta_j \right) = \text{Sign} (\eta_i)$

$$\text{and (2) } \frac{\partial x_j}{\partial I} > 0 \Leftrightarrow -\frac{\partial^2 \text{Pr}_i}{\partial x_i^2} \eta_j n_i > -\frac{\partial^2 \text{Pr}_j}{\partial x_j \partial x_i} \eta_i n_j$$

By Proposition 2 (a), if the contestants are symmetric in terms of their equilibrium abilities, then the strategic rival's-stake ("substitution") effects vanish (efforts are independent) and the positive strategic own-stake ("income") effect solely determines the direct effect of a change in I on a contestant's effort. In the perfectly symmetric case where, $\forall x_H$ and x_L , $\text{Pr}_H(x_L, x_H) = 1 - \text{Pr}_H(x_H, x_L)$ and $n_H = n_L = n$, there exists a symmetric pure strategy Nash equilibrium, $x^*_H = x^*_L$, and $\frac{\partial^2 \text{Pr}_L}{\partial x_L \partial x_H} =$

$$\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} = 0, \text{ see Dixit (1987). Hence, by Proposition 2 (a),}$$

Corollary 2.1: In cases (i), (iv) and (v), if, $\forall x_H$ and x_L ,

$$\text{Pr}_H(x_L, x_H) = 1 - \text{Pr}_H(x_H, x_L) \text{ and } n_H = n_L = n, \text{ then } \frac{\partial x^*_H}{\partial n} = \frac{\partial x^*_L}{\partial n} > 0.$$

This corollary generalizes a similar result established by Nti (1999), assuming a

particular CSF of the logit form.

Proposition 2(b) can be used to determine the sensitivity of the contestants' efforts in all possible situations corresponding to the three types of policy reforms affecting both stakes and $\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \neq 0$. Consider for example a type (i) policy reform

and suppose that $\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} < 0$, that is, the effort of the HB player is a strategic

substitute of the effort of the LB player. By Proposition 2 (b), in such a case,

$$\frac{\partial x_H^*}{\partial I} > 0 \quad \text{and} \quad \frac{\partial x_L}{\partial I} \begin{matrix} > \\ < \end{matrix} 0 \Leftrightarrow -\frac{\partial^2 \text{Pr}_H}{\partial x_H^2} \eta_L n_H \begin{matrix} > \\ < \end{matrix} -\frac{\partial^2 \text{Pr}_L}{\partial x_L \partial x_H} \eta_H n_L.$$

Notice that by Proposition 2(b), the conditions resolving the ambiguity regarding the sensitivity of j 's effort to a proposed policy reform involve the three elements of asymmetry between the contestants introduced in sections II and III:

$$A^1_j = \frac{\partial^2 \text{Pr}_j}{\partial x_j \partial x_i} \bigg/ \left(\frac{\partial^2 \text{Pr}_i}{\partial x_i^2} \right), \quad A^2_j = \frac{n_j}{n_i} \quad \text{and} \quad A^3_j = \frac{\eta_j}{\eta_i}.$$

In fact, the comparison between the strategic rival's-stake ("substitution") effect and the strategic own-stake ("income") effect depends on the relationship between the ability-asymmetry represented by A^1_j and the normalized stake-asymmetry represented by

$$\frac{A^3_j}{A^2_j} = \frac{\eta_j / n_i}{\eta_i / n_i}.$$

Specifically, by Proposition 2, it can be easily verified that

Corollary 2.2: $\frac{\partial x_i^*}{\partial I} < 0 \Rightarrow \frac{\partial x_j^*}{\partial I} \begin{matrix} > \\ < \end{matrix} 0 \Leftrightarrow A^1_j \begin{matrix} > \\ < \end{matrix} \frac{A^3_j}{A^2_j}$

$$\frac{\partial x_i^*}{\partial I} > 0 \Rightarrow \frac{\partial x_j^*}{\partial I} \begin{matrix} > \\ < \end{matrix} 0 \Leftrightarrow A^1_j \begin{matrix} < \\ > \end{matrix} \frac{A^3_j}{A^2_j}$$

To illustrate the economic interpretation of this corollary, suppose, for example, that the *HB* player has a disadvantage in terms of his equilibrium ability (marginal winning probability), that is, $\frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} < 0$. By Proposition 2, when the proposed

reform is of type (iv), an increase in I induces the *LB* player to increase his effort. In

this case the *HB* player's effort is a strategic substitute to the *LB* player's effort, so the strategic substitution effect induces the *HB* player to reduce his effort. However, his effort is a "normal" good, so the increase in his stake induces him to increase his effort. The latter effect is dominant and the *HB* player also increases his effort, if his advantage in terms of stakes, which is represented by the stake-asymmetry measure

$$\frac{A^3_H}{A^2_H} = \frac{\eta_H/n_H}{\eta_L/n_L}$$

is larger than his ability disadvantage, which is represented by the

ability-asymmetry measure $A^1_H = \frac{\partial^2 \text{Pr}_H}{\partial x_H \partial x_L} / \left(\frac{\partial^2 \text{Pr}_L}{\partial x_L^2} \right)$. Similar economic

interpretations can be given to the conditions in Corollary 2.2 in all other possible situations corresponding to the three types of reforms affecting the two players, given that the *HB* player is advantaged or disadvantaged in terms of his equilibrium ability.

In our setting, the response of one contestant to a change in the proposed policy is ambiguous. A change in I may differently affect therefore the aggregate efforts of the contestants. This implies that when $\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} \neq 0$, under any type of a

proposed reform the effect of a change in I on the aggregate effort $X^* = x^*_H + x^*_L$ is ambiguous. Since $\frac{\partial X^*}{\partial I} = \frac{\partial x^*_H}{\partial I} + \frac{\partial x^*_L}{\partial I}$, by (8') and Corollary 1.1 we get:

Proposition 3:

$$\frac{\partial^2 \text{Pr}_i}{\partial x_i \partial x_j} > 0 \Rightarrow \frac{\partial X^*}{\partial n_j} > 0 \text{ and } \frac{\partial X^*}{\partial n_i} > 0 \Leftrightarrow -\frac{\partial^2 \text{Pr}_j}{\partial x_j^2} \eta_i n_j > \frac{\partial^2 \text{Pr}_j}{\partial x_j \partial x_i} \eta_i n_j .$$

That is, if i 's effort is a strategic complement to j 's effort, then aggregate effort increases with an increase in j 's stake. Aggregate effort also increases with i 's stake, if the positive strategic own-stake ("income") effect of player i is larger than the negative strategic rival's-stake ("substitution") effect of player j .

Let us finally consider how a change in the proposed policy affects the performance of the contestants; namely, their probabilities of winning the contest:

$$(9) \quad \frac{d \Pr^*_L}{d I} = \frac{\partial \Pr_L}{\partial x^*_L} \frac{\partial x^*_L}{\partial I} + \frac{\partial \Pr_L}{\partial x^*_H} \frac{\partial x^*_H}{\partial I}$$

Note that $\frac{\partial \Pr_L}{\partial x^*_H} = -\frac{\partial \Pr_H}{\partial x^*_H}$, $\frac{\partial^2 \Pr_L}{\partial x^*_H \partial x^*_L} = -\frac{\partial^2 \Pr_H}{\partial x^*_H \partial x^*_L}$ and $\frac{\partial \Pr_i}{\partial x_i} = \frac{1}{n_i(I)}$. Thus we

may rewrite (9) as:

$$(10) \quad \frac{d \Pr^*_L}{d I} = \frac{1}{B n_L n_H} \left(n_L n_H \frac{\partial^2 \Pr_H}{\partial x_L \partial x_H} (\eta_H + \eta_L) - \left(\frac{\partial^2 \Pr_H}{\partial x^2_H} \eta_L n^2_H - \frac{\partial^2 \Pr_L}{\partial x^2_L} \eta_H n^2_L \right) \right)$$

This gives

Proposition 4:

$$\frac{d \Pr^*_L}{d I} > 0 \quad \text{if} \quad \frac{\partial^2 \Pr_L}{\partial x_L \partial x_H} (\eta_H + \eta_L) \geq \left(\frac{\partial^2 \Pr_H}{\partial x^2_H} \eta_L \frac{n_H}{n_L} - \frac{\partial^2 \Pr_L}{\partial x^2_L} \eta_H \frac{n_L}{n_H} \right)$$

By this proposition we get:

Corollary 4.1:

$$(a) \quad \text{Under a type-(i) reform with } i=H, \quad \frac{d \Pr^*_L}{d I} < 0 \quad \text{if} \quad \frac{\partial^2 \Pr_L}{\partial x_L \partial x_H} \leq 0;$$

$$(b) \quad \text{Under a type-(iv) reform with } i=L, \quad \frac{d \Pr^*_L}{d I} > 0 \quad \text{if} \quad \frac{\partial^2 \Pr_L}{\partial x_L \partial x_H} \geq 0;$$

(c) Under a type-(iv) reform,

$$\frac{d \Pr^*_L}{d I} > 0 \quad \text{if} \quad \frac{\partial^2 \Pr_H}{\partial x^2_H} \left/ \left(\frac{\partial^2 \Pr_L}{\partial x^2_L} \right) \right. > \frac{\eta_H n_L^2}{\eta_L n_H^2} \quad \text{and} \quad \frac{\partial^2 \Pr_L}{\partial x_L \partial x_H} \geq 0;$$

(d) Under a type-(v) reform,

$$\frac{d \Pr^*_L}{d I} > 0 \quad \text{if} \quad \frac{\partial^2 \Pr_H}{\partial x^2_H} \left/ \left(\frac{\partial^2 \Pr_L}{\partial x^2_L} \right) \right. < \frac{\eta_H n_L^2}{\eta_L n_H^2} \quad \text{and} \quad \frac{\partial^2 \Pr_L}{\partial x_H \partial x_L} \geq 0.$$

Under a type (i) reform with $i=H$, an increase in the proposed policy increases the stake-asymmetry between the contestants. In other words, such a reform tends to increase the disadvantage of the *LB* player in terms of stakes. If he is also disadvantaged in terms of ability (marginal contest winning probability), then, by Corollary 4.1 (a), the proposed increase in I reduces both his effort (see Proposition 2) and his probability of winning the contest. Notice that this is the case, despite the possible decline in the effort exerted by the *HB* player. Under a type-(i) reform with $i=L$, an increase in the proposed policy reduces the stake-asymmetry between the contestants. That is, the *LB* player becomes less disadvantaged in terms of the contest stakes. If he also has a disadvantage in terms of ability (marginal contest winning probability), then, by Corollary 4.1 (b), the proposed increase in I increases his probability of winning the contest, despite the fact that his effort need not rise (see Proposition 2).

V. Conclusion

Government intervention often gives rise to contests in which the possible prizes are determined by the status-quo and some new public-policy proposal. Since a proposed policy reform has different implications for different interest groups, these groups make efforts to affect in their favor the probability of approval of the proposed public policy. A change in the proposed policy modifies the stakes of the interest groups who take part in the contest on the approval or rejection of the proposed policy. Such a change has two effects on the nature of the public-policy contest. It affects the degree of competition by increasing or decreasing the sum of the potential prizes (stakes) and by increasing or decreasing the asymmetry between the contestants' stakes (prize valuations). What determines the contestants' effort response to the proposed policy reform and, in turn, the change in their probability of winning the contest, are three asymmetry factors: The existing stake-asymmetry; the asymmetry in the effect of a proposed reform on the existing stakes; and the ability-asymmetry: the asymmetry in the effect of a change in a contestant's effort on his own and on his opponent's marginal probability of winning the contest.

We studied a general class of two-player public-policy contests and examined the effect of a change in the proposed policy, a change that may affect the payoffs of one or both contestants, on their effort and performance. Proposition 1 and its corollaries generalize the comparative statics results of Baik (1994) and Nti (1999)

that focus on the effect of changes either in the value of a contest prize in symmetric contests or in one of the contestants' valuation of the prize in asymmetric contests, assuming special forms of our general CSF. Propositions 2 – 4 present the comparative statics results in the extended setting where the proposed public policy determines the prize system: the stakes of the two interest groups. All the results hinge on a fundamental equation that stresses the significance of the relationship between the strategic own-stake (“income”) effects and the strategic rival’s-stake (“substitution”) effects corresponding to any change in the proposed public policy. This fundamental equation clarifies the role of the three types of asymmetry between the contestants in determining the effect of a change in the contestants' payoffs on their effort and performance.

In the political economy literature substantial attention has been paid to the endogenous determination of policy proposals by two competing political parties. An important issue is how policy proposals map into policy outcomes. Typically, the answer to this question is provided on the basis of a representative-democracy model where the equilibrium proposals hinge on the party ideologies, the mapping of proposals into policy outcomes, the information that politicians and the voters have on this mapping and on the voters' preferences. For example, Cukierman and Tommasi (1998) develop a framework where the politician in office has better information than the voters about the way in which policy maps into outcomes, identifying circumstances under which policies are proposed and implemented by “unlikely” political parties rather than by parties whose ideology favors such policies. In our setting, the status quo and the proposed challenging policy are two competing policies that are considered to be parameters and not endogenous variables. The proposed policy in our study can be determined endogenously by a third player; a bureaucrat or an incumbent politician, in an extended contest. In such a case, see Epstein and Nitzan (2002a), (2003), the proposed policy is not the result of political competition between two parties, but rather is determined by a bureaucrat who takes into account the contest between the interest groups and, in particular, their expected lobbying efforts and benefits. Epstein and Nitzan (2004b) show that in such an extended model it is possible that the bureaucrat proposes an atypical extreme policy that is not a compromise between the most preferred policies of the interest groups. But such situations are not due to asymmetric information about the mapping of policy instruments into policy outcomes, as in Cukierman and Tommasi (1998), because in

our setting, by assumption, a proposed policy is always implemented, provided that it is approved by the ruling politician, and this is common knowledge for the interest groups. Rather, in the extended setting an extreme policy can be proposed because of the special significance the bureaucrat assigns to the anticipated lobbying outlays directed by the contestants to the government.

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