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STRATEGIC RESTRAINT IN CONTESTS

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STRATEGIC RESTRAINT IN CONTESTS

Abstract

Economic policy is modeled as the outcome of a (political) game between two interest groups. The possible ex-post (realized) outcomes in the game correspond to the proposed policies. In the literature the policies fought for are exogenous. We extend such games by allowing the endogenous determination of the proposed policies. In a first stage the groups decide which policy to lobby for and then, in a second stage, engage in a contest over the proposed policies. Our main result is that competition over endogenously determined policies induces strategic restraint that reduces polarization and, in turn, wasteful lobbying activities.

Keywords: Interest groups, endogenous lobbying targets, voluntary restraint, polarization, voluntary restraint

JEL Classification: E61, E63, F33

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I. Introduction

Economic policy is often the outcome of a (political) game-contest between interest groups. Under the status-quo some policy is implemented. The contest between the interest groups on the approval of their preferred policies involves a struggle between one group that defends the status-quo and other groups that challenge it by fighting for alternative policies. For example, a tax reform may involve a struggle between different industries. Existing pollution standards may be defended by the industry and challenged by an environmentalist interest group. A monopoly can face the opposition of a customers coalition fighting for appropriate regulation. Capital owners and a workers union can be engaged in a contest that determines the minimum wage, and so on. The outcome of the contest depends on the stakes of the contestants and, in turn, on their exerted (fighting, lobbying, rent-seeking) efforts. The realized, ex-post, payoff configuration of the interest groups depends on the policy proposal that actually emerges as the winner of the contest.

In the literature, special cases of the above setting are studied. See, for example, Baik (1998), Ellingsen (1991) and Schmidt (1992) who analyzed the welfare effect of consumer opposition to the existence of monopoly rents. In these studies the policies fought for are exogenous. Furthermore, the status-quo policy and the policy proposed by a single challenger are assumed to coincide with the contestants' optimal policies under certainty conditions where there is no opposition. Although these scholars have recognized that interest groups' awareness to the existence of an opposition may affect their efforts, they disregarded the possible effects of such awareness on their proposed policies. An interest group may prefer a proposal that reduces its (certain) benefit in case of winning the contest, if it anticipates a sufficient increase in the winning probability of that more moderate proposal, thus increasing its expected payoff. In particular, the challenger of the status-quo may be induced to propose a policy which is closer to the status-quo policy and the defender of that policy may prefer to propose a new policy that to some extent compromises with the optimal strategy of the challenger.

The main purpose of this study is to extend the analysis of economic policy determination by allowing the endogenous formation of the proposed policies – the lobbying targets. In our proposed general setting, in a first stage interest groups

decide which policy to lobby for and, then, in a second stage, engage in a contest over the proposed policies. Using as a benchmark a status-quo policy which is the preferred policy of one interest group (the status-quo defender) when there is no opposition, we establish that the status-quo is not an equilibrium strategy of “the defender”. Likewise, the equilibrium proposal of “the challenger” differs from his optimal proposal when he does not face any opposition. Both interest groups choose more moderate positions. Hence, competition over endogenously determined policies reduces polarization and, in turn, wasteful lobbying activities. Such competition cannot result, however, in a (strategic) compromise where the two interest groups share the same equilibrium proposal and so entirely avoid the expenditure of wasteful resources. The extended competition over the endogenously determined proposals can therefore still be inefficient relative to a real compromise.

Our attempt to endogenize the proposed policies and therefore the contestants’ payoffs is related to the literature on optimal contest design. In contrast to that literature, however, where a contest designer (a bureaucrat or an elected politician) is assumed to control the contestants’ rents, Appelbaum and Katz (1987), Kohli and Singh (1999), in our model the contestants themselves determine their rents. Chung (1996) and Gradstein (1993) also analyze the endogenous determination of rents. Their setting is different and somewhat restrictive, first because the payoffs of the contestants are symmetric and, second because the variability of the contested prize is only reached via its dependence on the aggregate efforts of the contestants. See also Ursprung (1990) and Sun and Ng (1999). Finally, our result is also related to the studies of Cairns and Long (1991) and Glazer and McMillan (1992) on voluntary price regulation. Using different settings inspired by Becker’s (1983) pressure model, these authors show that, within a monopoly context, the threat of price regulation due to an effective political opposition by consumers may induce the monopolist to price below the unregulated price.

In the next section we present the extended two-stage game, establish the main result and illustrate it numerically. In section III the main result is re-established in the context of a more general one-stage game. One special case of this game can be conceived as a reduced form of the two-stage game. Section IV contains a brief summary and concluding remarks on the implications of our result.

II. The Basic Setting

Suppose that a status-quo policy is challenged by one interest group and defended by another group. This policy can be the price of a regulated monopoly, the maximal degree of pollution the government allows or the existing tax structure. The defender of the status-quo policy (hence-for interest group d) prefers the status-quo policy I_s to any alternative policy. The challenger of the status-quo policy (interest group c) prefers the alternative policy I_a . Without any loss of generality, it is assumed that $I_s \neq I_a$ and that the policy I_s (I_a) is the optimal policy proposal of the defender (the challenger), provided that his supported policy gains certain approval. That is, disregarding the possibility that his proposed policy can be rejected, in which case the policy proposed by the rival interest group is assumed to be approved. For example, in the contest over monopoly regulation studied in Baik (1998), Ellingsen (1991) and Schmidt (1992), the monopoly firm defends the status-quo, lobbying for the profit-maximizing monopoly price (against any price regulation), while the consumers challenge the status-quo lobbying for the competitive price (a tight price cap).

The actual implemented policy depends on the contest between the interest groups on the approval of their proposed policies. These proposed policies that are endogenously determined in our extended setting are denoted I_c and I_d . The outcome of the political contest is given in terms of the probabilities Pr_c and Pr_d that the interest groups c and d win the contest. The outcome of the contest depends on the stakes of the contestants and, in turn, on their proposed policies and on their exerted lobbying or rent-seeking efforts. In the current study the government is not introduced as a player in the policy-determination game. However, the important role of the political environment (the form of the government, its motivation and the decision rule it applies) is represented by the commonly used contest success function that specifies the relationship between the outcome of the contest and the proposed policies or the efforts of the interest groups.

We first present the two-stage game where the players first decide which policy to lobby for and then engage in the struggle over the approval of their proposed policies. In this illustrative game we assume a special contest success function. Our results are valid however for a general class of such functions and, in fact, they are valid in a more general class of games as we argue in the next section.

A. The two-stage game

The interest groups make two types of decisions. In the first stage of the game they non-cooperatively select their proposed policies, the lobbying targets, I_c and I_d . In the second stage they engage in a contest over the approval of the proposed policies. The interest groups are assumed to pre-commit on the policies proposed in the first stage.¹ The means of the interest groups to affect the outcome of the contest, viz. their winning probabilities, in the second stage of the game is their lobbying or rent-seeking efforts x_c and x_d . Given the policy proposals I_c and I_d and the utility functions U_c and U_d , the stakes of the interest groups are

$$(1) \quad N_c(I_c, I_d) = U_c(I_c) - U_c(I_d) \quad \text{and} \quad N_d(I_c, I_d) = U_d(I_d) - U_d(I_c)$$

The utility functions U_c and U_d are assumed to be monotonic, continuous and twice differentiable and recall that they are maximized, respectively, at the policies I_a and I_s , $I_s \leq I_a$. Notice that when $I_c = I_d$ both stakes are equal to zero and that $\partial N_c / \partial I_d < 0$ and $\partial N_d / \partial I_c > 0$.

The expected net payoff (surplus) of the risk neutral challenger and defender are, respectively, given by²

$$(2) \quad E(u_c) = U_c(I_d) + \Pr_c N_c(I_c, I_d) - x_c$$

and

$$(3) \quad E(u_d) = U_d(I_c) + \Pr_d N_d(I_c, I_d) - x_d$$

For any given pair of policy proposals we assume that the probabilities \Pr_d and \Pr_c are determined by Tullock's (1980) commonly used contest success function. That is,

¹ For different rent-seeking games with an explicit time structure that allow for such commitment, see Baik and Kim(1997), Baik and Shogren (1992), Baye and Shin (1999), Dixit (1987) and Leininger (1993).

² Notice that: $E(u_j) = \Pr_i U_j(I_i) + \Pr_j U_j(I_j) - x_j$, Thus

$E(u_j) = U_j(I_i) + \Pr_j N_j(I_j, I_i) - x_j$ for $i \neq j$ and $i, j = c, d$.

$$(4) \quad \Pr_i = \Pr_i(x_i, x_j) = \frac{x_i}{x_i + x_j}, \quad \forall i \neq j, (i, j = c, d) \text{ for } x_c, x_d > 0$$

In our two-stage game with full information a sub-game perfect equilibrium can be calculated by using the following backward induction procedure. The equilibrium effort levels determined at the second stage are interior (x_c and x_d are positive). Such equilibria are characterized by the following conditions:³

$$(5) \quad \frac{\partial E(u_c)}{\partial x_c} = \frac{x_d}{(x_d + x_c)^2} N_c - 1 = 0 \quad \text{and} \quad \frac{\partial E(u_d)}{\partial x_d} = \frac{x_c}{(x_c + x_d)^2} N_d - 1 = 0$$

The equilibrium expenditures and winning probabilities of the two players are given by

$$(6) \quad x_c^* = \frac{N_c^2 N_d}{(N_c + N_d)^2}, \quad x_d^* = \frac{N_c N_d^2}{(N_c + N_d)^2}$$

and

$$(7) \quad \Pr_c^* = \frac{N_c(I_c, I_d)}{N_c(I_c, I_d) + N_d(I_c, I_d)}, \quad \Pr_d^* = \frac{N_d(I_c, I_d)}{N_d(I_c, I_d) + N_c(I_c, I_d)}$$

The equilibrium expected net payoff (surplus) of the challenger and the defender are, respectively, given by

$$(8) \quad E(u_c^*) = U_c(I_d) + \frac{(N_c(I_c, I_d))^3}{(N_c(I_c, I_d) + N_d(I_c, I_d))^2}$$

and

$$(9) \quad E(u_d^*) = U_d(I_c) + \frac{(N_d(I_c, I_d))^3}{(N_c(I_c, I_d) + N_d(I_c, I_d))^2} +$$

³ The sufficient second order conditions of such equilibria are assumed to be satisfied.

Anticipating these equilibrium net payoffs, the interior equilibrium policy proposals of the two interest groups are characterized by

$$(10) \quad \frac{\partial E(u_c)}{\partial I_c} = 0 \quad \text{and} \quad \frac{\partial E(u_d)}{\partial I_d} = 0.$$

Notice that since I_a maximizes U_c , it also maximizes $N_c(I_c, I_d)$, for any given I_d that differs from I_a . Similarly, I_s maximizes $N_d(I_c, I_d)$, for any given I_c that differs from I_s . By assumption then, $\frac{\partial N_c(I_c, I_d)}{\partial I_c} = 0$, if $I_c = I_a$ and $\frac{\partial N_d(I_c, I_d)}{\partial I_d} = 0$, if $I_d = I_s$, provided that $I_c \neq I_s$. Hence,

$$(11) \quad \left. \frac{\partial E(u_c^*)}{\partial I_c} \right|_{I_c=I_a} = \frac{-2(N_c(I_c, I_d))^3 \frac{\partial N_d(I_c, I_d)}{\partial I_c}}{(N_c(I_c, I_d) + N_d(I_c, I_d))^3} < 0$$

and

$$(12) \quad \left. \frac{\partial E(u_d^*)}{\partial I_d} \right|_{I_d=I_s} = \frac{-2(N_d(I_c, I_d))^3 \frac{\partial N_c(I_c, I_d)}{\partial I_d}}{(N_c(I_c, I_d) + N_d(I_c, I_d))^3} > 0$$

The above inequalities directly imply that, as long as the two interest groups engage in a viable contest in the second stage of the game, in equilibrium the two interest groups are induced to voluntarily moderate their proposals relative to their best policies when there is no opposition. Specifically, the equilibrium policies I_c^* and I_d^* satisfy: $I_c^* < I_a$ and $I_d^* > I_s$. That is

Proposition 1: *Competition over endogenously determined policy proposals reduces polarization.*

The intuition for this result is as follows: If there is no opposition the challenger chooses the policy I_a . In the presence of an opposition, the challenger realizes that lowering his proposal below I_a leads to a decrease of his payoff from winning the contest. But the more restrained proposal yields an increase in the payoff of the

opponent and, in turn, a reduction in his stake that induces him to become less aggressive. The resulting decline in the defender's probability of winning the contest clearly benefits the challenger. Since the latter favourable effect dominates the former unfavourable effect, the challenger prefers to restrain his lobbying target, i.e., propose a policy below I_d . A similar intuition explains the readiness of the defender of the status-quo to moderate his position by proposing a policy that exceeds I_s .

Baik (1999), Ellingsen (1991) and Schmidt (1992) study the welfare effect of consumer opposition to the existence of monopoly rents sharing the assumption that the contested alternatives are the standard textbook profit-maximizing price and the competitive consumer-surplus-maximizing price. Proposition 1 implies that, as long as the alternative prices are endogenously selected by the monopoly firm and by its customer coalition, the firm would voluntarily support some price regulation and the consumers would not lobby for a tight price cap.⁴ Our result has a broad applicability as the framework we are suggesting naturally fits numerous contexts where economic policy is the outcome of interest group pressures that may take the form of lobbying, rent-seeking, bribes or campaign contributions.

Although polarization is reduced, it is not eliminated. That is, an equilibrium with completely converging proposed policies is impossible. To prove this claim, suppose, to the contrary, that (I^*, I^*) is such an equilibrium. Then, by the definition of Nash equilibrium, for every I_c , $U_c(I^*)$ exceeds $E(U_c(I_c, I^*))$. Recall that $E(U_c(I_c, I^*)) = U_c(I^*) + (Pr_c(I_c, I^*) N_c(I_c, I^*) - x^*(I_c, I^*)) = U_c(I^*) + A(I_c, I^*)$. Since $A(I_c, I^*)$ is positive when I_c is associated with a positive stake and I^* differs from such I_c , $E(U_c(I_c, I^*))$ exceeds $U_c(I^*)$. The obtained contradiction implies that (I^*, I^*) cannot be an equilibrium, which proves our claim. Namely,

Proposition 2: *The equilibrium policy proposals of the interest groups cannot coincide.*

⁴ For related results in the special context of monopoly regulation, see Cairns and Long (1991) and Glazer and McMillan (1992). Using the different setting of Becker's (1983) pressure model, these authors show that the monopolist is induced to price below the unregulated profit-maximizing price. The former authors argue that the monopolist takes into account the effect of his price on the probability that regulation is imposed by the legislator. Self regulation is his way to permit government regulation. The latter authors argue that lack of knowledge by the monopolist of just how much can be extracted from consumers before they will be induced to mount an effective political opposition induces him to accept a lower price.

The intuition behind this result is as follows: for both interest groups, a deviation from any agreed upon compromise results in a first order increase in the expected payoff, $Pr_i(I_i, I^*) - N_i(I_i, I_j)$, and a second order reduction in the expected payoff, $-x_i$. Consequently, both interest groups are induced to deviate from any agreed upon proposal and conflict is a necessary outcome of the interaction in our game.⁵ Since there always remain effective incentives for the interest groups to engage in a viable contest, wasteful resources are expended in the second stage of the game. Note that the interest groups could, of course, increase their expected payoffs by agreeing to cut down their lobbying efforts by the same proportion. This implies that the equilibrium of the policy – determination game is inefficient. The example in the next section illustrates the possibility that both interest groups can become better off if they share the same proposal.

B. A numerical example

Let $U_c(I) = I(1 - I)$ and $U_d(I) = I(1 - 10I)$. By (1),

$$N_c(I_c, I_d) = I_c(1 - I_c) - I_d(1 - I_d) \quad \text{and} \quad N_d(I_c, I_d) = I_d(1 - 10I_d) - I_c(1 - 10I_c)$$

It can be readily verified that the optimal policies of the challenger and the defender are equal, respectively, to $I_a = 0.5$ and $I_s = 0.05$. The solution of (10) and (11) yields the non-converging equilibrium policies $I_c^* = 1/6$ and $I_d^* = 1/12$. The challenger voluntarily reduces his proposal from $1/2$ to $1/6$ and the defender of the status-quo moderates his position and increases the proposal from 0.05 to $1/12$. The reduced polarization is reflected by a reduction in the contestants' stakes relative to the benchmark case: the challenger's stake is reduced from $N_c(0.5, 0.05) = 0.2025$ to $N_c(1/6, 1/12) = 0.0625$ and the defender's stake is reduced from $N_d(0.5, 0.05) = 2.025$ to $N_d(1/6, 1/12) = 0.125$. By (8) and (9), in equilibrium the expected payoffs are given by

$$E(U_c^*) = U_c(1/12) + 0.00694 = (1/12)(11/12) + 0.00694 = 0.083$$

and

$$E(U_d^*) = U_d(1/6) + 0.055 = (1/6)(-4/6) + 0.055 = -0.056$$

⁵ A different result can be obtained if the interest groups are allowed to be risk averse or in a different one-time interaction setting, see Skaperdas (1992).

Notice that, since $E(U_c^*) > U_c(1/12)$ and $E(U_d^*) > U_d(1/6)$, the challenger and the defender prefer to moderate their positions, but still engage in the equilibrium contest and **not** share their opponent's proposal.

The interest groups are induced to voluntarily restrain their proposals, nevertheless, they still have an effective incentive to engage in a wasteful contest. The equilibrium outcome can therefore be inefficient. Indeed this is the case in the example as there exist pairs of policy proposals (I_c, I_d) that yield increased expected – payoffs to both interest groups. In particular, there are $(I_c, I_d) = (I, I)$ that satisfy the following inequalities:

$$U_c(I) = I(1-I) > 0.083 \text{ and } U_d(I) = I(1-10I) > -0.056.$$

The solution of this system of inequalities is given by I that satisfy $0.091 < I < 0.13$. Agreement on such proposals could have made both interest groups better off. Such an agreement is efficient. However, it is not an equilibrium outcome.

III. The One-Stage Game: A Generalization

The analysis of endogenous policy proposals can be carried out using a one-stage game where the outcome of the contest is determined by the policy proposals of the interest groups. Despite its simpler form, this game may fit more general settings as it does not require that interest groups are able to affect the approval probability of the proposed policies through investment in lobbying or rent-seeking activities. Nevertheless, the one stage framework captures that possibility because it can be conceived as a reduced form of the two-stage game of the previous section as well as of other two-stage games. The advantage of this simpler reduced form is that we no longer need to make particular assumptions regarding the behaviour of the interest groups in terms of their lobbying efforts or regarding the particular form of the contest success function. The latter function can be of Tullock's form or of alternative forms, e.g., the frequently used logit or probit forms. We present below the more general setting and then clarify how is it related to the two-stage game studied so far.

Suppose that the approval probability of the policy proposed by the challenger (the defender) is Pr_c ($Pr_c = 1 - Pr_d$). This probability $Pr_c(I_c, I_d)$ now directly depends on the two proposals: I_c and I_d . It is assumed that, for any given policy of the

defender, I_d , $I_d < I_a$, as the challenger's *becomes more extreme* and raises I_a , the approval probability of his proposal declines. On the other hand, as the defender moderates his position and raises I_d , the approval probability of his proposal increases. That is,

$$(14) \quad \frac{\partial \Pr_c(I_c, I_d)}{\partial I_c} < 0 \quad \text{and} \quad \frac{\partial \Pr_d(I_c, I_d)}{\partial I_d} > 0$$

The assumption implies that the political process that generates the approval probabilities always rewards unilateral restraint by both interest groups. Put differently, the chances of an interest group to see its supported position implemented become higher if that position is moderated. This basic characteristics of the political environment is the main driving force of our result. ⁶

Denote by $n_c(I_c, I_d)$ and $n_d(I_c, I_d)$ the stakes of the challenger and the defender of the status-quo. Notice that under the one stage setting these stakes can be different from the stakes presented in the previous section ($N_c(I_c, I_d)$ and $N_d(I_c, I_d)$).

The expected payoff (surplus) of the challenger and the defender are, respectively, given by:

$$(15) \quad E(u_c) = U_c(I_d) + n_c(I_c, I_d) \Pr_c(I_c, I_d)$$

and

$$(16) \quad E(u_d) = U_d(I_c) + n_d(I_c, I_d) \Pr_d(I_c, I_d)$$

In this simpler one-stage setting the ability of the interest groups to affect the probabilistic outcome of the political game by investing in lobbying activities is not ruled out, however, it is not introduced explicitly. If, for example,

$$n_i(I_i, I_j) = \frac{(N_i(I_i, I_j))^2}{(N_i(I_i, I_j) + N_j(I_i, I_j))} \quad \text{and} \quad \Pr_i(I_i, I_j) = \frac{N_i(I_i, I_j)}{(N_i(I_i, I_j) + N_j(I_i, I_j))} \quad (i, j =$$

a, d), then the problem described in the two-stage game setting is equivalent to the one-stage game; The equilibrium policy proposals in the two games are identical as

the strategy sets and the expected payoffs of the players are the same ((8) and (9) are identical to (15) and (16)). The stakes in the one-stage game can now be interpreted as the reduced stakes of the two-stage game. In other words, the stakes in the one-stage game already take into account, although only implicitly, the Nash equilibrium expenditures of the interest groups that do try by lobbying, rent seeking, campaign contributions etc. to affect the probability of approval of their proposed policies.

In the one stage game the stakes satisfy the following conditions:

$$(17) \quad \left. \frac{\partial n_c(I_c, I_d)}{\partial I_c} \right|_{I_c=I_a} \leq 0 \quad \text{and} \quad \left. \frac{\partial n_d(I_c, I_d)}{\partial I_d} \right|_{I_d=I_s} \geq 0$$

Notice that if the interest groups cannot affect their winning probabilities by lobbying efforts, then we can let $n_i(I_i, I_j) = N_i(I_i, I_j)$ ($i, j = c, d$). In such a case,

$$\left. \frac{\partial n_c(I_c, I_d)}{\partial I_c} \right|_{I_c=I_a} = \left. \frac{\partial n_d(I_c, I_d)}{\partial I_d} \right|_{I_d=I_s} = 0. \quad \text{If, however, the one stage-game is}$$

conceived as a reduced form of a more complex two-stage game that allows for influence activities, as in Becker (1983), then (17) may hold with equalities or inequalities. Adding more costs (for example, costs due to increased political uncertainty, as in Glazer and McMillan (1992)), can only moderate the optimal policy proposals of the interest groups. Since adding influence costs can never increase the optimal policy proposals beyond the ones obtained under certainty conditions, the sign of the derivatives in (17) cannot be reversed. In a reduced-form game then I_a and I_s need not maximize the reduced stakes. Whether they maximize these stakes depends on whether the reduced form takes into account the possible relationship between lobbying efforts of the interest groups and the approval probabilities of their proposals. Once again we obtain that,

$$(18) \quad \left. \frac{\partial E(u_c)}{\partial I_c} \right|_{I_c=I_a} < 0 \quad \text{and} \quad \left. \frac{\partial E(u_d)}{\partial I_d} \right|_{I_d=I_s} > 0$$

⁶ A similar assumption is made in Glazer and McMillan (1992) in the context of a monopoly that takes into account the probability that regulation is imposed.

and consequently we get that $I_c^* < I_a$ and $I_d^* > I_s$. Hence, competition between interest groups induces restraint, i.e., decreases the polarization between the proposed policies, both in the two-stage game of the previous section and in the one-stage game which is amenable to broader interpretations.

IV. Concluding Remarks

Competition over endogenously determined policy proposals reduces the polarization between the positions of interest groups. In particular, each group restrains its proposal relative to its optimal proposal under certainty. This result is valid in the illustrative stylized two-stage game and in the more general one-stage game. Although the interest groups voluntarily restrain their proposals, they are nevertheless induced to engage in a wasteful contest as complete agreement is not an equilibrium outcome.

Our result has broad applications. It rationalizes the self-restraint of interest groups such as firms investing in pollution control or voluntarily adopting cleaner production processes or such as environmentalists who do not maintain a zero pollution target. It explains why monopolists are induced to self regulate their price and why their customer coalitions do not insist on a tight price cap. It also implies that an interest group's support of a welfare program or of any policy that has redistribution effects need not reflect its altruistic preferences, but rather its egoistic strategic restraint

The robustness of our result needs to be examined with respect to an increase in the number of interest groups that propose policy proposals.. Another possible worthwhile extension is the endogenization of the contest success function by adding the government (the elected politicians, the bureaucrats or both) as an active player in the policy-determination game.

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