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# **POLITICAL ECONOMY REASONS FOR GOVERNMENT INERTIA: THE ROLE OF INTEREST GROUPS IN THE CASE OF ACCESS TO MEDICINES**

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**ABSTRACT.** The reluctant reaction of western governments to the AIDS crisis in developing countries is only one example for policy areas where we observe a lack of political action despite a public interest in policy change. The reasons for that lie in the two-stage structure of the political decision-making process: Interest groups influence both the policy choice and the subsequent decision on the level of policy implementation. The lobbies' interest in reform and the issue-specific chance for compromise determine the policy choice. The interest groups' failure to agree on political strategies creates reduced incentives to support policy implementation.

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*“... there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.”* (Niccolò Machiavelli, *Il Principe*, 1513/1514)

## 1. INTRODUCTION

In some policy areas, governments enact less reforms than seem to be desired by the general public. Then, the problem is not so much, which policy is chosen, but rather, why a government does not exert greater effort for *any* option, why a government does too little to change the status quo. In many of these cases, interest groups are particularly influential. One prominent example is the issue of access to medicines in developing countries: For at least the last decade, there has been a pronounced public interest in political action.<sup>1</sup> In spite of this, western governments have been reluctant to take measures to alleviate the crisis. Only recently, we observe political efforts, such as the Barcelona 2002 and Durban 2000 conferences on HIV/AIDS, or the announcement of the Bush administration in January 2003 to increase spending for AIDS relief to 15 billion US\$.

What are the reasons for such a lack of political action? Where are the “bottlenecks” in the political process? This paper argues that the lack of political action is a consequence of the structure of the political decision-making process. This process is composed of two stages: First, in the policy choice stage, a strategy is defined. Then, in the policy implementation stage, the government decides on the expenditures for this policy. When lobbies have political influence in both stages, their failure to agree on a political strategy creates little incentive to support the subsequent policy implementation. Then, the lobbies induce the government to reduce efforts to implement that policy. An example for such a two-stage process are the United States House and Senate: A policy is defined in the Committees concerned with the issue. Then, the Committees on Appropriations decide on the expenditures for the new policy program.

The contribution of this paper is a new focus on the political process. First, in many countries, lobbies are involved in the policy choice from a very early stage on. One reason is that lobbies are

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<sup>1</sup>One example is the publicity that non-governmental initiatives gained when they criticized international patent protection of pharmaceuticals under the Treaty on Intellectual Property Right Protection (TRIPs).

sources of information. Yet, they are also considered as representing groups of citizens whose interests should be reflected in a policy.<sup>2</sup> Thus, a two-stage approach helps to draw a more realistic picture of politics. Second and most importantly, a two-stage model shows *structural* reasons for the failure of governments to implement new policies. In a standard lobbying model, where the lobby's objectives are exogenously given, reforms are delayed if the most influential lobbies prefer the status quo. So far, the structure of political institutions has rarely been related to lobbying. An exception is Persson (1998) who points to the strong link between the outcomes of lobbying games and the political institutions which set the rules for lobbying.

By adding a policy-choice stage where the government invites lobbies to negotiate on a policy compromise, this model endogenously derives the lobby's objectives. The lobby's utility from the status quo then is only one determinant for the lobbying incentives in the policy implementation stage. There are additional effects: The success of reforms depends not only on the influence of its proponents and opponents but also on the chance for a compromise among the lobbies. This is given by the characteristics of the policy issue: The ability of interest groups to compromise depends on the relation of their status-quo bias (their opportunity costs of a policy change) to the contestability of a political issue (the ex-ante maximal value of a compromise). The failure to compromise can have detrimental consequences for policy implementation: The higher the contestability of a policy issue, the lower the value of the policy compromise. This makes a lobby disinterested in political reform, even if its status quo bias is relatively low. The policy choice endogenizes the lobbying interests and provides a structural reason for government inertia. This explains the reluctant government action for access to medicines, which involves highly controversial issues such as patent protection for pharmaceuticals.

There are other explanations for a low level of government effort with respect to policy implementation.<sup>3</sup> Alesina and Drazen (1991) explain delays in budget stabilization measures with a war of attrition among heterogenous groups in the society. In Fernandez and Rodrik (1991), the uncertainty over gains and losses of a policy leads to a status-quo bias. Romer (2003) argues that undesired policy outcomes can be the result of citizens' errors in assessing

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<sup>2</sup>In the German corporatist system, for example, this role of interest groups is explicitly acknowledged.

<sup>3</sup>For a survey over the main ideas, see Alesina (1994).

the value of a policy. The argument closest to this paper is Coate and Morris (1999). In a dynamic setting, they show that policy persistence results from lobbying as the lobbies first adjust to the initial policy and then strive to retain the benefits from that policy.

Few papers analyze the process of policy choice. An exception are Epstein and Nitzan (2002) where the policy choice is a contest between lobbies. Policy compromises are not possible. Epstein and Nitzan (2004) show that lobbies might have the incentive to restrain themselves in their policy suggestions in order to increase the chance that their approval is accepted. In contrast to that, the present model proposes the view that interest groups have the incentive *not* to compromise. This failure to agree then has consequences for the policy implementation choice. Other models endogenize the policy choice by combining a citizen-candidate model with the common agency approach of lobbying: Besley and Coate (2001) find that lobbying does not restrict the equilibrium policy space as citizens may strategically choose candidates to offset the lobby's influence. In contrast, Felli and Merlo (2003) find that when the politician can define the set of lobbies he bargains with, the equilibrium policy space is drawn towards the median.

The second-stage policy implementation choice uses the common agency approach (Bernheim and Whinston (1986a,b), Grossman and Helpman (1994, 2001), and Dixit, Grossman and Helpman (1997)). As common in this literature, the present paper does not model elections. The desire to be reelected is implicit in the government's objective function. Grossman and Helpman (1996) and Prat (2002a) include elections: Interest groups make campaign contributions that the politician uses to influence the opinions of the partly uninformed voters. All these models define the lobbying interests as exogenous to the political game, derived from economic primitives. The policy issue that is the subject of lobbying is assumed exogenously.<sup>4</sup>

Fredriksson and Svensson (2003) endogenize the *effectiveness* of lobbying by adding another stage *after* the standard common agency lobbying game: Under political instability, the government may not stay in power long enough to implement the desired policy. When deciding

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<sup>4</sup>Applications of the common agency framework are by now numerous. See, for example, Persson and Tabellini (1994) for the provision of local public goods, and Rama and Tabellini (1998) for labor market politics. Aidt (1998) analyzes environmental politics, Dixit (1996) and Marceau and Smart (2003) look at taxation issues. Kirchsteiger and Prat (2001) theoretically and experimentally analyze inefficiencies that can arise in such lobbying games. Drazen and Limão (2003) show that it is optimal for the government to commit itself to a cap on transfers to special interests when both the lobbies and the government have some bargaining power.

on their lobbying expenditures, lobbies take this success probability of their political pressure into account. Lobbies may thus exert less pressure in unstable environments. The present paper seeks to endogenize the lobbies' *interest* in lobbying by adding a stage *before* the standard lobbying game: Interest groups have to agree on a political strategy. This compromise endogenously shapes their lobbying interests. It seems plausible that the lobbying interest is influenced by the choice of the political strategy itself.

Most lobbying models exogenously assume that symmetric lobbies lobby by contributions. An exception are Le Breton and Salanie (2003) who show that smaller and heterogenous interest groups are more influential. There, agents with a low stake in a policy change might decide not to lobby and to free ride on the lobbying effort of others. In reality, lobbies also differ in their access to resources and in their organizational form. To allow for variation among lobbies, this paper introduces advertising as an additional lobbying channel. In most of the existing models of political advertising, the government uses the contributions of interest groups to influence voting decisions.<sup>5</sup> Recently, efforts are made to combine the two lobbying channels. In Bennedsen and Feldman (2003), lobbies can provide information and contributions to the government. An information externality arises as unfavorable information makes lobbying by contributions more expensive. Yu (2003) allows for political contributions and lobbying by advertising to the public. Sikkink (1993) shows that civil rights movements can exert substantial pressure on governments by influencing public opinion.<sup>6</sup> The present paper suggests a way to formally model civil rights movements and non-governmental organizations (NGOs): NGOs can use advertising to shape public opinion. The government reacts to the changed voter interests. As in Yu (2003), the effectiveness of advertising depends on the degree of public awareness for an issue.

The theoretical development literature focusses mainly on the recipient countries of foreign aid. It identifies the impacts of foreign aid on growth or democratization.<sup>7</sup> Few authors analyze

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<sup>5</sup>Among those are Austen-Smith (1987), Potters, Sloof, van Winden (1997), Coate (2001), Gersbach and Liessem (2002), and Prat (2002b). Bennedsen and Feldman (2002) analyze informative lobbying to a multi-member legislature. Baron (2003) models interest groups which advertise to the public through the news media.

<sup>6</sup>For the influence of public opinion on foreign policy see also Risse-Kappen (1991).

<sup>7</sup>Svensson (2000a) theoretically analyzes the impact of foreign aid on incentives for rent-seeking in recipient countries. Concerning the impact of foreign aid on growth in Sub-Saharan Africa see Mosley (1996), for an empirical survey see Burnside and Dollar (2000). Much of the literature about development assistance is empirical. For example, Alesina and Dollar (2000) identify reasons why governments grant foreign aid. Noel and Therien (2000) explore the relation between political parties and foreign aid.

the political decision on foreign aid in donor countries: Lahiri and Raimondos-Moeller (2000) trace the allocation of foreign aid to recipient countries back to lobbying by ethnic groups in the donor country. Svensson (2000b) considers commitment problems in donor countries. Mayer and Raimondos-Moeller (2003) show how political support for foreign aid depends on the effects of aid on the terms of trade between a donor and a recipient country. The present paper adds to this literature by applying the two-stage lobbying approach to the political decision-making process on foreign aid for the case of access to medicines.

In the next section, the model is described. The discussion of the results in section 3 highlights the mechanisms at work in a political decision-making process. Section 4 introduces the lobbying channel of advertising and discusses the results for that extension. In section 5, the theory is linked to the case of access to medicines and some policy implications are formulated.

## 2. A TWO-STAGE POLITICAL DECISION-MAKING PROCESS

The model describes the two-stage structure of political decision-making processes. A political strategy has to be designed and later implemented. As an illustration, the model uses the decision on foreign aid in donor countries.<sup>8</sup> The model can also be applied to other policy areas where interest groups play an influential role. In the model, there are two interest groups, the “Industry (I)” (pharmaceutical industry) and the “NGOs (N)” (non-governmental organizations). Throughout the model, it is assumed that these two groups have managed to overcome the problem of collective action (see Olson (1965)) and have organized into lobbies. The rest of the population is not organized.<sup>9</sup> For the second stage of the model, this assumption is crucial if lobbying is to create distortions of the policy implementation level. If all groups of the population were represented in interest groups, the lobbying outcome, if restricted to truthful equilibria, would be socially efficient.

The time structure is as follows: In the *first stage* of the model, the lobbies take part in negotiations with the government to define a political strategy. The government sets the framework

<sup>8</sup>Problems with policy implementation in the recipient country are not considered: Many aspects of this complex problem lie in the developing and least developed countries. The issues there range from health-care over the possibility to distribute drugs and ensure their correct use to the lack of financing possibilities.

<sup>9</sup>In the context of trade politics, Mitra (1999) and Magee (2002) endogenously model the formation of interest groups.

for the negotiations and requires the lobbies to find a compromise. Lobbies derive some utility from the compromise. This policy compromise is taken as given in the *second stage*. There, interest groups can influence the level of implementation for the new policy. In addition to their utility from the new policy, lobbies have opportunity costs of the new policy: The “status-quo bias” measures how much lobbies profited from the old policy that is to be replaced. These two elements define the lobbying interest for the policy implementation stage. Players, their strategies and payoffs are introduced in detail below.

**2.1. The policy choice.** In the first stage, both interest groups meet with the government to negotiate on a political strategy. Instead of the standard way to model the lobbies’ objectives as a function of the distance between the equilibrium policy and the lobby’s preferred policy, this model abstracts from policy preferences. The decision variables  $R_k \in [0, 1]$ ,  $k \in \{I, N\}$ , measure the “radicalness” of the lobbies in the negotiations. They do not describe the policy choices of the lobbies but capture their propensity to agree or to disagree on a policy compromise. The larger  $R_k$ , the less willing is the lobby to agree on a compromise. When there is more conflict on an issue, the value of the final compromise is decreased. Taking part in the negotiations does not create any direct costs for the lobbies, regardless of how radical they choose to be.

Incentives to be radical require that the lobbies have differing interests. Thus, all individuals with the same preferences for a policy have to organize in one lobby. To understand the lobbies’ incentives to be radical in the negotiations, consider their internal organization: In the relation to their members, pressure groups communicate their effort by the role they play in the negotiations. The representatives of the interest groups thus have the incentive to take a radical position. Furthermore, supporters or members of an interest group might have extreme preferences. If pressure groups fully compromised their position, members would cease to support them.<sup>10</sup>

The bargaining on a political strategy is modelled by a simple mechanism. The government creates a policy compromise which can be implemented in the second stage of the game. For that, it uses the following rule: The government first designs a “maximal compromise”. This is

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<sup>10</sup>So far, there is no model of such an internal organization of lobbies. Also in this paper, it is not explicitly modelled. A model could be similar to the mechanism of “two-level games” proposed by Putnam (1988).

thought to include all possibly useful measures for a certain political goal. During the negotiations, measures on which the interest groups are unable to agree are left out. The remaining issues constitute the political strategy. This simple structure can be observed in real-world meetings, where the government prepares a strategy-paper designed to incorporate all represented interests. When the interest groups present their diverging views, the strategy-paper is reduced (controversial points are left out) until an agreement can be reached.<sup>11</sup> In such a setting, the government plays no active role. Rather, it serves as an authority to set up rules for determining the compromise. These rules define the interaction between the interest groups, just like the rules of demand and price building on a market define the interaction of competing firms in an oligopoly. The government's role is deliberately kept passive as the model focusses on the interaction between a policy compromise among lobbies and the level of policy implementation. In the policy implementation stage, the government will actively pursue its own objectives.

The interest groups simultaneously choose the radicalness of their policy proposals  $R_k$ . Their utilities from the policy compromise are described by

$$u_k(R_I, R_N) = R_k[\tau - (R_I + R_N)] \quad (1)$$

For the interest groups, the value of a policy compromise is defined by two elements: The first is the ex-post value of compromise, after the controversial issues have been left out. The term in square brackets shows how the value of the compromise decreases with more radical positions of the two lobbies. Policy issues are characterized by different levels of conflict. Whereas agreement is relatively easy in some areas, there are others where a compromise seems almost impossible. The parameter  $\tau \in ]0; 1]$  captures this difference of policy issues. It is given exogenously by the characteristics of the political issue area and is equal for both lobbies.  $\tau$  can be interpreted as the ex-ante value of the maximal compromise the government sets up in its strategy paper. It can also stand for the success probability of a compromise valued with 1. In areas where compromise is relatively easy,  $\tau$  is equal or near one (e.g. concerning more technical questions such as tariffs). On the other hand,  $\tau$  might be near zero when compromise seems very difficult (e.g. concerning the international protection of intellectual property rights).

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<sup>11</sup>For a description of such meetings in the Commission of the European Union, please refer to section 5. Greenwood (1997) analyzes the characteristics of special interest politics in the European Union.

Second, each lobby evaluates the value of the compromise outcome by the effort it has exerted in the negotiations. The more radically a lobby acts in the negotiations, the higher it values the resulting compromise. Put differently, the more effort a lobby exerts in the policy choice stage, the higher is the probability that its own preferences are reflected in the compromise. The strategic decision of the lobbies in the policy choice stage involves a trade-off: Lobbies can increase the chance that the compromise reflects their interests by choosing more extreme  $R_k$ . At the same time, they decrease the ex post value of the compromise. The trade-off for the lobbies is expressed by multiplying the ex-post value of the compromise with the choice of radicalness by each lobby  $R_k$ .<sup>12</sup>

**2.2. The implementation choice.** In the second stage, the interest groups pressure the government to implement the policy at their preferred level of implementation. There are no further negotiations on the policy compromise. The implementation level of a policy describes the amount of money or the effort the government devotes to the policy. It is captured by a variable  $X$ , describing expenditures. The second stage is a two-period game of common agency, as in Dixit, Grossman, and Helpman (1997) and Grossman and Helpman (1994, 2001): In the first period, the lobbies  $k = \{I, N\}$  simultaneously and non-cooperatively choose a contribution schedule  $C_k(X)$  from a set  $\mathcal{C} = [0; \bar{C}]$  of feasible schedules.  $\bar{C}$  is assumed such as to guarantee interior solutions in equilibrium. The contribution schedules are assumed to be continuous and differentiable in  $X$ . They constitute a binding promise of the lobby to pay a certain amount of contributions in exchange for each feasible implementation level.<sup>13</sup> In the second period, the government chooses an implementation level  $X$  from a set  $\mathcal{X} = [0; T]$  of feasible implementation levels, taking into account its own objectives and the contributions of the two lobbies.  $X$  is a part of the total tax revenue  $T$  of the government. The rest of tax revenues  $T - X$  is spent on

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<sup>12</sup>Another way to model the policy choice would be lobbying by information: Interest groups can supply information to the government. However, lobbies have an incentive to overstate their messages. This leads to a credibility problem. In most cases, there is no equilibrium with full information revelation. The more radical an interest group, the more does the government discount its message. In contrast to the present model, opposite biases of the lobbies are beneficial for the government as this allows to extract more information from the lobbies. This requires an active government that seeks information to decide on its own policy preferences. See Grossman and Helpman (2001), Chpt. 5. The present model does not focus on information transmission but on the role of conflict or compromise in negotiations about political strategies.

<sup>13</sup>That lobbies are able to commit to their payment schedule is a common feature of all models of lobbying with common agency. In a dynamic setting, the commitment could be created by reputation effects (Aidt (1998)).

other policies. This section first discusses the strategies of the interest groups. Then, it sets up the objective function of the government and describes the government's strategy.

**2.2.1. *Lobbying by contributions.*** The lobbies influence the government by direct political contributions. These can range from explicit bribery over providing lucrative positions for politicians to donations to the government party. The contributions are of a private nature for the government: They cannot be used to finance policy implementation, to lower taxes, or to be distributed to the citizens. In the second stage, the each lobby  $k$  chooses its optimal contribution schedule  $C_k^*(X)$ . The utility function of lobby  $k$  is given by

$$U_k = -C_k(X) + u_k(R_I, R_N)X + \bar{s}_k(T - X) \quad (2)$$

The trade-off for the lobbies in the policy implementation game is the following: Both lobbies have to incur the costs of lobbying  $C_k$ . The first-stage utility  $u_k(R_I, R_N)$  from the policy compromise lets them desire government effort for the implementation of that policy. On the other hand, this means that the government diverts resources from another policy that has been beneficial to the lobbies. The opportunity costs from a policy change reduce the value of the new policy. The status-quo bias  $\bar{s}_k \in [0; \frac{\tau^2}{4}]$  describes the value of the old policy that is to be replaced by the new compromise.<sup>14</sup> This policy is financed out of the remaining tax revenue  $T - X$ .  $\bar{s}_k$  measures how well the status-quo policy reflects the interest of a lobby: If  $\bar{s}_k$  is high, the lobby receives high gains from the status-quo policy and is not very interested in changing it. Generally, the  $\bar{s}_k$  do not have to be symmetric for both interest groups. For example, a government could have been protecting the industry, so that I's status-quo utility is very high, whereas N's is very low. The marginal utility of contributions for a lobby is given by

$$\frac{\partial U_k}{\partial C_k} = 0 \Leftrightarrow \pi_k \frac{\partial X(C_I, C_N)}{\partial C_k} = 1 \quad (3)$$

$\pi_k = u_k(R_I, R_N) - \bar{s}_k$  denotes the marginal lobbying interest in the implementation of the policy compromise. It captures both the utility from the policy choice in stage one and the status quo bias of the lobby. The left hand side of equation 3 shows the marginal utility for lobby  $k$  of the change in  $X$  induced by a marginal increase in lobbying contributions. The marginal costs

<sup>14</sup>To scale the status-quo bias to the utility function of the lobbies, the upper bound to the exogenous utility parameter is the highest possible first-stage gain  $\frac{\tau^2}{4}$

of contributing are 1. When  $\pi_k > 0$ , the lobby wants more government effort for that policy. When  $\pi_k < 0$ , the status-quo bias of the lobby outweighs the utility from the new policy and the lobby tries to reduce the policy implementation level.

2.2.2. *The government.* In the policy implementation stage, the government chooses the expenditures or effort  $X$  for the implementation of the new policy. The government's objectives are driven by the desire to be reelected. Elections are not explicitly modelled. Instead, it is assumed that the government maximizes the utility of a representative voter. This could be the median voter or the aggregate of all, in this case identical, voters. The implicit assumption is that the challenger will also try to win elections by promising as much utility as possible to the voters.

Note that the model differs from the set-up in Dixit, Grossman and Helpman (1997) and most of the subsequent applications because the utilities of the lobbies do not enter the objective function of the government. In this model, the government is not benevolent but maximizes a reduced form of voters' welfare. There are two reasons for this setup: First, model assesses how the influence of lobbies distorts the policy implementation level away from the one desired by the general public. The inclusion of the lobbies' utility would distract from this point. Second and most importantly, the model derives the lobbying interests for the implementation stage endogenously from the negotiations on the policy choice. Thus, in a situation without lobbying, it is unclear where the lobbies' preferences should come from. When ex-ante preferences of the interest groups have to be assumed, one important feature of the model is lost.

The general publics' opinion is captured by the voters' utility function:

$$V(X) = (Y - T) + U(T - X) + a_0\alpha X \quad (4)$$

with  $U(0) = 0$ ,  $U_X < 0$  in  $X$ , and  $U_{XX} < 0$ , continuous and twice differentiable. To ensure internal and unique solutions for  $X$ , the following Inada conditions are imposed:  $\lim_{X \rightarrow 0} U_X = 0$  and  $\lim_{X \rightarrow T} U_X = -\infty$ . The first part of the citizens' aggregate utility is their private consumption  $Y - T$ , where  $Y$  denotes total aggregate income.  $T$  is the total tax revenues of the government and marks the upper bound for the expenditures for the new policy. All taxes

that are not spent for the new policy are used for the status quo project. The utility from the status-quo policies is denoted by  $U(T - X)$ .<sup>15</sup>

The utility that voters get from an allocation of tax revenues to the new policy is given by  $a_0\alpha X$  with  $a_0 \in [0; 1]$  and  $\alpha \in ]0; 1[$ .<sup>16</sup> The expenditures (in the context of access to medicines, foreign aid) for the new policy are discounted with  $\alpha$ , the “altruism parameter”. Citizens value these expenditures less than their private consumption. Welfare in the recipient country is not part of this model. Typically, the altruism parameter will take a value well below 1. Surveys suggest that citizens in industrialized countries would be willing to give at most 5% of their income to foreign aid (Olsen, 2000). To apply this model to issues other than foreign aid, such as environmental politics or consumer protection, the altruism parameter can be increased if citizens are more directly affected by the policy. The parameter  $a_0$  describes the degree of information on the need for the new policy. For now, it is given exogenously and remains unchanged. In section 4,  $a_0$  is endogenized by giving the lobbies the possibility to advertise.

When there is no lobbying in stage two, the government decides on a level of implementation called the no-lobby implementation level. It is useful to state the following preliminary result:

**Lemma 1.** *When there is no lobbying, the government’s maximization problem has a unique global maximum  $X_{nl}^*$ .*

$$X_{nl}^* = \operatorname{argmax} V(X) = \operatorname{argmax} [(Y - T) + U(T - X) + a_0\alpha X] \quad (5)$$

*Proof.* See appendix. □

When there is lobbying, the government cares about the political contributions from the lobbies and about the utility of voters. With lobbying, the government maximizes

$$G(\{C_I, C_N\}, X) = \sum_{k=I, N} C_k(X) + V(X) \quad (6)$$

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<sup>15</sup>The model focusses on the shift of tax revenues from the status-quo to a new policy. Situations where the government lowers or increases taxes are left out of the model. The model abstracts from voting or elections and the mass of citizens does not lobby. Therefore, it is plausible to leave out decisions on the tax level, which would directly affect private consumption and would therefore most likely influence the citizens’ voting behavior.

<sup>16</sup>More general functions for the utility from private consumption and government expenditures for the new policy would be possible without changing the qualitative results. Then, however, a uniqueness of the results would no longer hold for all cases. Therefore, the modelling choice is that of a linear specification of these parts of the utility function.

### 3. LOBBYING BY CONTRIBUTIONS: RESULTS

The equilibrium concept is a subgame-perfect Nash equilibrium. It encompasses the two stages policy choice and policy implementation. The model is solved by backward induction.

**3.1. Stage two.** The implementation decision of stage two is solved by the equilibrium of the corresponding common agency game. As common in the literature, attention is restricted to “truthful” or “globally compensating” contribution schedules. A schedule  $C_k(X)$  is truthful, if there exists a fixed utility level  $\bar{U}_k$  such that  $C_k^*(X) = \max\{U_k(X^*, C_k^*) - \bar{U}_k, 0\}$ . The lobby optimally chooses a target utility level  $\bar{U}_k$ . The willingness to pay for a level of policy implementation then is the lobby’s utility from the equilibrium implementation level net of this target utility.<sup>17</sup> A truthful equilibrium of the policy implementation game is defined by a pair of feasible optimal and truthful lobbying contribution schedules  $\{C_k^*(X)\}$ ,  $k = \{I, N\}$ , and of the optimal implementation level  $X^*$  such that  $X^*$  is the government’s best response to  $\{C_k^*(X)\}$  and, for each lobby  $k$ , the lobbying contribution  $C_k^*(X)$  and the resulting implementation choice by the government  $X^*$  are a best response to the contribution schedule of the other lobby.

**Proposition 1.** *For each  $a_0$  and  $\alpha$  and each combination of  $\{\pi_k\}$ ,  $k = \{I, N\}$ , of the lobbies’ interests in policy implementation, there exists an equilibrium  $[X^*; \{C_k^*(X^*, \bar{U}_k)\}]$  with a unique policy outcome  $X^*$  and a set of truthful contribution schedules if and only if:*

$$X^* = \operatorname{argmax} G = \operatorname{argmax} \left[ \sum_{k=I, N} C_k^* + (Y - T) + U(T - X) + a_0 \alpha X \right] \quad (7)$$

such that  $U_k(X^*, C_k^*) = \bar{U}_k$  where  $\bar{U}_k$  is defined by

$$G(X^*; \{C_k^*(X^*, \bar{U}_k)\}) \geq \max_{X \in \mathcal{X}} G(X; (C_l^*(X^*, \bar{U}_k); 0)); l \neq k \quad (8)$$

*Proof.* See appendix. □

<sup>17</sup>As shown by Bernheim and Whinston (1986), the restriction to truthful equilibria is especially attractive because they are efficient in the sense that the outcome of such an equilibrium maximizes the sum of payoffs of the players and because they are coalition-proof. Furthermore, Bernheim and Whinston have shown that each lobby’s best-response correspondence to any strategies of the opponents contains a truthful strategy. This can justify the restriction to truthful equilibria. Most models of special interest politics have used this concept of truthful equilibria. Grossman and Helpman (2001) use the new term of “compensating contribution schedules”. They distinguish between locally compensating contribution schedules which define only equilibrium behavior and (globally) compensating contribution schedules which prescribe the same rule also for all out-of-equilibrium contributions.

When the lobbies have similar interests, the policy implementation level has some characteristics of a public good: It then enters the utility function of both lobbies with the same sign and there is no rivalry in consumption (the policy does not entail redistribution among the lobbies). These mutual gains from policy implementation could induce the lobbies to free-ride on each other's lobbying contributions. In reality, this will not happen when each lobby has additional benefits from lobbying such as reputation vis-a-vis the government and their members.<sup>18</sup> In the model, by restricting the strategy space to truthful contribution schedules, the possibility of free-riding is excluded. Compensating contribution schedules reflect the lobby's willingness to pay for a policy change for all positive lobbying contributions. Formally,  $\frac{\partial C_k}{\partial X} = -\frac{\frac{\partial U_k}{\partial X}}{\frac{\partial U_k}{\partial C_k}} \forall X$  where  $C_k(X) > 0$  given that the lobby reaches a fixed utility level  $\bar{U}_k$  and  $C_k(X) = 0$  otherwise. To induce the lobby to participate in the lobbying game,  $\bar{U}_k$  has to be higher than the lobby could achieve without participating.<sup>19</sup>

**3.2. Stage one.** In stage one, the political strategy is defined. The policy compromise is given by the Nash equilibrium of the non-cooperative game where both lobbies simultaneously choose their radicalness  $R_k$ . It is a pair of feasible mutually optimal choices  $(R_I^e, R_N^e)$ .

**Proposition 2.** *For given  $\tau$  and  $\bar{s}_k$  there is a unique policy equilibrium  $(R_I^e, R_N^e)$  if and only if:*

$$R_k^e = \text{argmax}[-C_k^*(X^*) + R_k[\tau - (R_I + R_N)]X^*(C_I, C_N) + \bar{s}_k(T - X^*)] \quad (9)$$

*Proof.* See appendix. □

The equilibrium is symmetric:  $\tau$  is a characteristic of the policy and is equal for both lobbies. The resulting policy is a weak compromise. The two lobbies are not able to internalize the external effects their choice has on the utility of their competitor. From the policy choice, each

<sup>18</sup>Some readers may wonder whether a situation where lobbies have the same interests is of any relevance. The issue of free riding might arise when lobbies see that others lobby for the same cause. In the models of common agency, this is excluded by the focus on truthful equilibria. Empirically, Gawande (1997) shows that the interaction between similar lobbies is the most important factor in determining lobbying expenditures.

<sup>19</sup>For example, for lobby  $I$  with  $\pi_I > 0$ , this means that  $C_I(X) = \pi_I(X - X_N^*) \forall X > X_N^*$  and 0 otherwise.  $X_N^*$  denotes the equilibrium policy choice when only the NGOs are lobbying. The industry's utility level would then by  $\bar{U}_I(X) = -\pi_I(X - X_N^*) + \pi_I X = \pi X_N^*$  and the industry would exactly be indifferent between lobbying and staying out of the lobbying game. For  $\bar{U}_I(X) = \pi X_N^* + \epsilon$  with  $\epsilon > 0$ , the industry would strictly prefer to lobby. In contrast to that standard result, Le Breton and Salanie (2003) show that free-riding can occur under asymmetric information over the politician's sensitivity to political contributions.

lobby gets the utility  $u_k^e(\frac{\tau}{3}, \frac{\tau}{3}) = \frac{\tau^2}{9}$ . The chance to represent own interests in the policy choice makes each lobby act radically in the negotiations. This reduces the value of the compromise.

The utilities from the policy compromise depend on the contestability of a political issue  $\tau$ . This is common knowledge. The easier a compromise, the larger  $\tau$ , the higher are the gains from such a compromise for the lobbies, even though they then also choose to be even more radical. Note that a decrease in  $\tau$  also leads the lobbies to act less radically as they anticipate the lower possibility of compromise. There may be situations where a change in the political or public environment increases or reduces the value of  $\tau$  for a given policy issue. For example,  $\tau$  might increase when a controversial issue is publicly discussed (see section 5). The gains from compromise decrease with lower  $\tau$ :

**Lemma 2.** *The lower the chance for a compromise  $\tau$ , the more often does the status-quo bias outweigh the first-stage utility from a policy compromise and the more often is  $\pi_k < 0$ .*

*Proof.* The equilibrium policy proposals  $R_k^e = \frac{\tau}{3}$  are increasing with  $\tau$ . The gains from a new policy compromise  $\pi_k$  are increasing with higher  $R_k^e$ . For lower  $\tau$ ,  $u_k(R_I, R_N)$  is decreasing. Thus, the smaller is the range of  $\bar{s}_k \geq 0$  for which  $\pi_k$  are positive.  $\square$

Is there a chance to have a stronger policy compromise? The pressure groups could improve their gains from the first stage by agreeing on advance on more compromising policy suggestions  $R_k^c$ . This “collusion” would lead them to maximize:

$$\max_{R_I; R_N} [(R_I + R_N)[\tau - (R_I + R_N)]] \quad (10)$$

If they succeed in the collusion, they both act less radically:  $R_I^c = R_N^c = \frac{\tau}{4}$ . This gives them a utility of  $u_k^c(\frac{\tau}{4}, \frac{\tau}{4}) = \frac{\tau^2}{8}$  which is larger than the equilibrium gains. However, this outcome, although favorable for both, is not implementable:

**Lemma 3.** *The “collusion” policy proposals  $R_k^c$  are not sustainable. Ceteris paribus, there always is an incentive to deviate in the policy choice game.*

*Proof.* This follows directly from the reaction functions in the policy choice game.  $\square$

The overall marginal interest in government action for the new policy compromise is determined not only by the first-stage utilities but also by the status-quo biases of the lobbies. By relating the status-quo biases of the lobbies to the first-stage utilities which are defined by the possibility of compromise  $\tau$ , different categories of policy issues can be defined:

**Lemma 4.** *The status-quo bias of the lobbies determines the marginal interest in government action for the new policy:*

- In Case 1, when  $\bar{s}_k \geq \frac{\tau^2}{8}$ ,  $\pi_k^j \leq 0$ ,  $j \in \{c, e\}$
- In Case 2, when  $\frac{\tau^2}{9} < \bar{s}_k < \frac{\tau^2}{8}$ ,  $\pi_k^e < 0$  while  $\pi_k^c > 0$
- In Case 3,  $\bar{s}_k \leq \frac{\tau^2}{9}$ ,  $\pi_k^j \geq 0$ ,  $j \in \{c, e\}$ .

*Proof.* This follows directly from the utility functions of the lobby groups.  $\square$

The gains from a policy compromise do not have to be symmetric: Depending on the respective values of  $\bar{s}_I$  and  $\bar{s}_N$ , one lobby might benefit from a new policy whereas the other suffers. Note that the lobbies will in equilibrium not stay away from the policy choice game, even if  $\pi_k < 0$ . Staying away ( $R_k = 0$ ) leaves them with  $u_k(0) = 0$ . As there are no costs, participating in the first stage policy negotiations can only increase the lobbies' utilities.

**3.3. Results of the two-stage game.** It is now possible to combine the two stages to the subgame-perfect Nash equilibrium solving the political decision-making game.

**Proposition 3.** *For each parameter constellation, there exists an equilibrium of the political decision-making game with a unique pair of negotiation effort choices  $(R_I^e, R_N^e)$ , a unique policy implementation level  $X^*$ , and a set of truthful lobbying contribution schedules  $\{C_k^*(X^*, \bar{U}_k)\}$ ,  $k = \{I, N\}$  fulfilling the conditions of propositions 2 and 1.*

*Proof.* The proof follows from Propositions 1 and 2.  $\square$

The outcome shows that the quality of a policy compromise and the utilities lobbies derive from this compromise directly affect the level of implementation of a policy. The main purpose of this model is to point to this link between the two stages of a political decision-making process. Both stages have their own determinants of strategic action by the agents. The process

of negotiating a political strategy on the one hand and the decision on a level of policy implementation have so far been treated separately. Nonetheless, there is an important connection between the two: When the interest groups decide on their effort level in the second stage, they are guided by the utilities they expect from the policy compromise reached in stage one. In addition, the status-quo bias of the lobbies plays an important role. In particular for weak policy compromises it may outweigh the positive interests in government action for a new policy. Once the link between the two stages is defined, a look at the consequences of different outcomes of the policy choice game helps to answer the questions posed in the beginning: Why are there policy areas where a low level of government action is observed? In particular, why have governments so far shown only limited action in the issue of access to medicines? For a wide range of policy characteristics, the inclusion of lobbies in the political process leads to a reduced level of policy implementation. For notation, let  $X_e^*$  be the implementation level following from the equilibrium policy proposals  $R_k^e$  and gains  $\pi_k^e$  and  $X_c^*$  the implementation level following from the first-stage collusion proposals  $R_k^c$  and gains  $\pi_k^c$ .

**Proposition 4.** *The inclusion of lobbies in the political process leads to reduced levels of policy implementation if and only if  $\sum_{k=I,N} \pi_k < 0$ . This depends on the category of the policy issue:*

- *Case 1: If  $\sum_k \bar{s}_k \geq \frac{\tau^2}{4}$ ,  $X_e^* < X_c^* < X_{nl}^*$*
- *Case 2: If  $\frac{2\tau^2}{9} < \sum_k \bar{s}_k < \frac{\tau^2}{4}$ ,  $X_e^* < X_{nl}^* < X_c^*$*
- *Case 3: If  $\sum_k \bar{s}_k \leq \frac{2\tau^2}{9}$ ,  $X_{nl}^* < X_e^* < X_c^*$*

*Proof.* See appendix. □

In the first stage, lobbies act more radically than if they could agree on a compromise in advance. This reduces their interest in lobbying in the policy implementation stage. In turn, this induces the government to devote less effort to the implementation of such a policy than would be possible under a more encompassing compromise. Thus, it is always true that  $X_e^* < X_c^*$ .

How does the outcome differ from the situation where the government alone decides on the level of implementation? Whether the implementation level  $X_e^*$  is larger or smaller than the no-lobby level  $X_{nl}^*$ , depends on the relation of the status-quo biases  $\bar{s}_k$  and the potential of compromise  $\tau$  for a policy issue (see lemma 4 and 2). The higher  $\bar{s}_k$ , the lower are a lobby's

marginal interests  $\pi_k$  in the new policy. When their sum is negative, lobbying leads to a reduced level of implementation of the new policy. This is in line with the observation that policies which reduce advantages for certain groups encounter more difficulties in implementation. Depending on the policy issue, the inclusion of lobbies in the first stage of the political process can increase or decrease government action for the new policy compromise. If lobbying interests differ,  $sgn[\pi_I] \neq sgn[\pi_N]$ , the difference of their absolute values ( $|\pi_I| - |\pi_N|$ ) determines whether the implementation level is increased or decreased (see proof of proposition 4).

The model points to the relation of the status-quo bias to the possibility of reaching substantial agreements on a political strategy: Especially when the policy compromise is weak, a large weight is given to the status-quo biases of the lobbies. Then, it is more likely that they will lobby for lower government action for the new policy. Lemma 2 shows that a lower  $\tau$  translates directly into the equilibrium implementation levels: When an encompassing compromise is impossible  $\tau$ , the cases 1 and 2 are more frequent. Lobbies then oppose the implementation of the new policy, even when they have relatively low opportunity costs. In the other extreme, for high values of  $\tau$ , even high status-quo utility levels - showing a low interest in policy change - are sufficient to induce lobbies to promote the implementation of a new policy.

#### 4. LOBBYING BY ADVERTISING

**4.1. Asymmetric lobbying channels.** So far, both lobbies were equally effective in influencing the policy outcome. This assumption is now relaxed as an additional lobbying channel, lobbying by advertising, is introduced. This can capture the difference between “classical” lobbies and NGOs. The latter might not have the financial resources to exert direct lobbying pressure. Also, their civil rights’ origin creates some ideological barriers to lobbying (see section 5). NGOs thus use the lobbying expenditures  $C_N(X)$  to directly influence public opinion.<sup>20</sup>

In the model, voters have some interest in the implementation of the policy compromise. However, they may be unaware of the need for this policy. Only a fraction  $a_0$  of the population is informed ex-ante and is aware of the need for government action for the new policy. The lobby can advertise to increase the proportion of informed citizens. The lobbies do not have

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<sup>20</sup>Grossman and Helpman (1999) give a rational for advertising directly to the public: Citizens may lack important information and the costs of gathering information may be prohibitively high.

the possibility to convince ex-ante informed voters that they do not derive utility from the new policy. It is impossible to reduce information among the citizens.<sup>21</sup> While in reality, there might be some scope for persuasion, it is plausible that advertising contrary to the truth at least is more costly for a lobby. A lot of effort is required to make the advertising messages convincing when they are not backed by facts.

To keep the model simple, it is assumed that citizens believe the messages from the lobbies as long as they state that there is a need of government action for the new policy. In contrast, when a lobby tries to persuade the voters that there is no or less need for the new policy, the messages are ignored. Such a behavior would result from Bayesian updating by the voters in the presence of uncertainty over the true state of the world.<sup>22</sup> Here, this process is substituted by a simple influence function: It is assumed that citizens can be either fully informed or fully uninformed. Informed citizens are aware of the need of government effort  $X$  for the compromise policy. For the uninformed part of the population, an expenditure of  $X$  just means that their utility from the status-quo policies  $U(T - X)$  is reduced. The lobby changes the proportion of informed citizens by using its lobbying contributions  $C_k(X)$  to advertise. The fraction of informed citizens is

$$a(C_k(X)) = a_0 + a_1 C_k(X); \quad a(C_k(X)) \in [0; 1] \quad (11)$$

where  $a_0 \in ]0, 1]$  is the fraction of citizens who are informed ex-ante and  $a_1 \in ]0, 1]$  is the effectiveness of advertising effort. The co-domain of  $a(C_k(X))$  is:  $a(0) = a_0$  and  $a(\bar{C}_k(X)) = 1$ .

When  $\pi_k > 0$ , an interest groups uses advertising in order to increase the proportion of informed citizens. It then has a positive interest in policy implementation. When  $\pi_k < 0$ , the lobby would like to see less government effort for that policy. Then, it cannot use advertising as it is impossible to decrease the number of citizens that are aware of the need for the new policy.

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<sup>21</sup>In most of the political advertising models, lobbies can only partially manipulate information. They act as advocates of their cause, that is, they reveal only information favorable to them and withhold unfavorable information (see Dewatripont and Tirole (1999)). Baron (2003) and Bennedsen and Feldman (2003) use a similar restriction. In contrast, some models, e.g. Bloch and Manceau (1999), of persuasive advertising have that firms can change the consumers' preference rankings over several products. In the political advertising literature, Yu (2003) is the only one to use influence functions that allow for persuasion without constraints. There, however, influence functions are assumed exogenously.

<sup>22</sup>For such a setup, see Grossman and Helpman (2001), Chpt. 6: Lobbies use messages to “educate voters”. The voters are able to assess the credibility of the messages and update their beliefs accordingly.

Two other scenarios are then possible: Either the lobby resorts to direct contributions. Then, we are back to the analysis of section 3. If the NGOs, due to external constraints, are not able to use direct contributions, they stay out of the lobbying game whenever  $\pi_N < 0$ . Then, the policy outcome  $X_I^*$  is determined by the lobbying game between the government and the industry.<sup>23</sup> The NGOs' utility from the policy implementation stage is then  $U_N = \pi_N X_I^*$ . In the following, it is assumed that the NGOs advertise whenever  $\pi_N > 0$  and refrain from lobbying otherwise. In the asymmetric case where the NGOs lobby by advertising and the industry lobbies by direct contributions, the contributions of the NGOs directly influence the utility of the voters. The government's objective function can then be written as

$$G(\{C_k\}, X) = C_I(X) + V_N(X, C_N(X)) = C_I(X) + (Y - T) + U(T - X) + a(C_N(X))\alpha X \quad (12)$$

where  $V_N(X)$  describes the utility of the voters after the NGOs have advertised. To see how exactly advertising changes the utility of voters, consider the slope of  $V_N(X)$  for  $\pi_N > 0$ :

$$\frac{\partial V_N(X, C_N(X))}{\partial X} = \frac{\partial U(T - X)}{\partial X} + a_0\alpha + a_1\alpha C_N^*(X) + a_1\alpha \frac{\partial C_N^*(X)}{\partial X}X \quad (13)$$

In addition to the marginal utility from the status-quo policy  $\frac{\partial U(T - X)}{\partial X}$  and the marginal utility increase of the ex-ante informed voters  $a_0\alpha$ , lobbying by advertising has two effects: First, the fraction of informed voters is increased from  $a_0$  to  $a_0 + a_1 C_N^*(X)$ . These voters receive the marginal utility  $\alpha$  from an increase in  $X$ . The second effect,  $a_1\alpha \frac{\partial C_N^*(X)}{\partial X}X$  shows the absolute change of the voters' utility due to a marginal increase in the number of informed voters. For these newly informed citizens  $a_1 \frac{\partial C_N^*(X)}{\partial X}$ , the utility component  $\alpha X$  newly appears after advertising.

The slope of the new utility function of the voters  $V_N(X, C_N(X))$  depends on the NGOs' equilibrium contributions  $C_N^*(X)$ . Thus, the NGOs cannot design a contribution schedule that gives no extra utility to the government. Again, the concept of truthful contribution schedules is used. For all positive contributions, the marginal change in contributions has to reflect the NGOs' willingness to pay for the policy change:  $\frac{\partial C_N(X)}{\partial X} = \pi_N$  for all  $X$  where  $C_N(X) > 0$ , given a target utility  $\bar{U}_N$ . The minimal utility level they have to get to be exactly indifferent between advertising and not advertising is  $U_N(X) \geq \bar{U}_N = \pi_N X_I^*$ . In general,  $\bar{U}_N \geq \pi_N X_I^*$ . Thus, the

<sup>23</sup>Given  $\pi_I$  and assuming that  $I$  is restricted to truthful contribution schedules  $C_I^*(X) = \max\{\pi_N X - \bar{U}_I; 0\}$ ,  $X_I^*$  is derived a condition similar to proposition 1:  $\frac{\partial G(X, C_I(X))}{\partial X} = \frac{\partial U(T - X)}{\partial X} + a_0\alpha + \pi_I$ . As  $I$  is the only lobby,  $\bar{U}_I$  is now defined by  $G(X^*; \{C_I^*(X^*, \bar{U}_I)\}) \geq \max_{X \in \mathcal{X}} G(X; 0)$ .

compensating contribution schedule of the NGOs is  $C_N^*(X) = \max\{\pi_N X - \bar{U}_N; 0\}$ . When the NGOs are the only lobby  $X_I^*$  is substituted by  $X_{nl}^*$ . It is useful to state:

**Lemma 5.** *The voters' utility function  $V_N(X)$  when the NGOs lobby by advertising and are restricted to truthful contribution schedules has a unique global maximum.*

*Proof.* See appendix. □

For the second stage of the political process, the policy implementation equilibrium becomes:

**Corollary 1.** *For each  $\pi_I$  and each  $\pi_N > 0$ ,  $a_0, a_1$  and  $\alpha$ , there exists a unique equilibrium  $[X^*; \{C_k^*(X^*, \bar{U}_k)\}]$  if and only if:*

$$X^* = \arg\max G = \arg\max [C_I^*(X^*, \bar{U}_I) + (Y - T) + U(T - X) + (a_0 + a_1 C_N^*(X^*, \bar{U}_N))\alpha X] \quad (14)$$

such that  $U_k(X, C_k) \geq \bar{U}_k$  and with  $C_I^* \in \mathcal{C}$  fulfilling

$$G(X^*; \{C_k^*(X^*, \bar{U}_k)\}) \geq \max_{X \in \mathcal{X}} V_N(X; (C_N^*(X^*, \bar{U}_k); 0)) \quad (15)$$

*Proof.* See appendix. □

The main results, namely that a failure to compromise in the policy choice stage yields low implementation results also holds for asymmetric lobbying. Yet, for this case, it is no longer true that  $\sum_k \pi_k$  determines the equilibrium outcome of the implementation level. Therefore, it is useful to state the results for the case with similar lobbying interests:

**Corollary 2.** *For all  $\pi_k$  which satisfy  $\text{sgn}[\pi_I^j] = \text{sgn}[\pi_N^j]$ ,  $j \in \{e, c\}$ , and with  $\bar{s}_k \geq 0$ , and  $\tau \in ]0; 1]$ , it is always true that  $\pi_k^e < \pi_k^c$  and  $X_e^* < X_c^*$ .*

*Compared to the no-lobby implementation level  $X_{nl}^*$  (see equation 5), and assuming  $\pi_k^e, \pi_k^c \neq 0$ , the outcome depends on the category of the policy issue:*

- *Case 1: If  $\bar{s}_k \geq \frac{\tau^2}{8}$ ,  $X_e^* < X_c^* < X_{nl}^*$  where only I lobbies and  $\pi_I^j < 0$*
- *Case 2: If  $\frac{\tau^2}{9} < \bar{s}_k < \frac{\tau^2}{8}$ ,  $X_e^* < X_{nl}^* < X_c^*$  where only I lobbies in equilibrium as  $\pi_k^e < 0$  and both lobbies are active under collusion as  $\pi_k^c > 0$*
- *Case 3: If  $\bar{s}_k \leq \frac{\tau^2}{9}$ ,  $X_{nl}^* < X_e^* < X_c^*$  where both lobbies are active and  $\pi_I^j > 0$*

*Proof.* See appendix. □

Also when the NGOs lobby by advertising, low implementation results from a failure to compromise in the policy choice stage. However, now the low policy outcomes do not lie in the responsibility of the NGOs: As they are restricted to use informative advertising, they become the advocates of public opinion. The implementation level is only lowered by the lobbying effort of the industry. This result is discussed from the normative point of view in section 4.2.

With an asymmetry in lobbying channels, it is interesting to ask when one lobbying channel is more effective than the other. This is especially relevant for a situation where the interest groups can strategically choose which lobbying channel they want to use. (The possibility that both channels can be used simultaneously is excluded in this model.) For a better view on the relative effectiveness of the two lobbying methods, consider the following special case where lobbies have opposite directions of their lobbying interests:

**Proposition 5.** *Let  $|\pi_I| = |\pi_N|$  and  $\pi_I < 0$  and  $\pi_N > 0$ . Let lobby  $N$  use advertising.*

*Advertising is more effective than direct contributions if and only if*

$$\frac{1}{a_1\alpha} + \frac{\bar{U}_N}{\pi_N} < 2X \quad (16)$$

*Proof.* See appendix. □

When more citizens can be reached by an advertising campaign (higher  $a_1$ ) as well as when voters are more altruistic (higher  $\alpha$ ), lobbying by advertising is more effective. When  $\alpha$  is higher, citizens respond more to the information about the new policy issue. The awareness in the population of the need for political action is then higher. This means that for issues which directly concern the citizens, such as environmental politics or consumer protection, advertising will have more impact than in the case of foreign aid.<sup>24</sup> Naturally, advertising is also more effective, the lower the target utility level  $\bar{U}_N$ , as the NGOs then have more resources free for advertising. When the lobbying interest  $\pi_N$ , increases, this increases the effort or expenditures  $C_N = \pi_N X - \bar{U}_N$  for advertising. Note that the effectiveness of advertising also depends on the implementation level  $X$ : The higher the implementation level, the more effective is advertising. The reason for that is the double effect of advertising. It not only marginally changes the welfare function, but adds a new component to it for all marginally new informed citizens. The higher

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<sup>24</sup>This result is similar to the one in Yu (2003).

the level of  $X$ , the more weight is given to these additions to the welfare function. In which area of  $X \in [0; T]$  the advertising takes place, depends on the exact form of the voters' utility function  $V(X)$ : The NGOs only advertise for  $\bar{U}_N \geq \pi_N X_I^*$ . Condition 16 thus is valid only for  $X \geq X_I^*$ . The higher  $X_I^*$ , the higher will be the  $X$  and the more effective is advertising.

In the model, the industry could choose to use advertising if this channel proved to be more effective. On the other hand, the NGOs are excluded from lobbying by direct contributions. This means that an asymmetry of lobbying can result even if  $\pi_N > 0$ . When advertising is the less effective lobbying channel or whenever  $\pi_N < 0$ , the NGOs have a disadvantage from not using direct political contributions. Yet, casual evidence seems to suggest that especially civil rights groups prefer advertising or even restrict themselves not to use political contributions. One reason could be their lack of resources. Yet, if there are no fixed costs for lobbying by contributions, this is no valid explanation. If empirical evidence proves that some groups commit to lobby only by advertising, a closer analysis for the reasons of this choice would be worthwhile.

**4.2. Lobbying and the voters' utility.** So far, the model has not made any normative assessments. In particular with asymmetric lobbying, however, it would be interesting to see the implications of different lobbying channels for the utility of the general public. This can yield some policy implications as to which lobbying channels should be supported or controlled more than others. To evaluate the political process, the equilibrium outcome has to be compared to some benchmark. For the purpose of describing democratic political processes, the adequate benchmark seems to be the utility of the voters. Note that the model does not yield explicit welfare results: Instead of welfare, it considers the utility of the representative voter. Nevertheless, this can capture how lobbying distorts the policy implementation level with respect to the level desired by the public. How does the implementation outcome  $X_e^*$  from the political process compare to the implementation outcome which maximizes the utility of the citizens? The benchmark  $X_{opt}^*$  is defined by taking into account that citizens get some utility from the policy compromise, even though they may not be aware of that ( $a_0$  is set equal to 1):

$$X_{opt}^* = \text{argmax}[(Y - T) + \alpha X + U(T - X)] \quad (17)$$

Then, the outcome from the political process compares to the optimum as follows:

**Proposition 6.** *Whenever  $\pi_k < 0$  for at least one  $k$ ,  $X_e^* < X_{opt}^*$ .*

*When  $\pi_k > 0 \forall k$ , direct political contributions can lead to too little or too much implementation.*

*In the limit, lobbying by advertising yields the benchmark case.*

*Proof.* See appendix. □

In connection with advertising, welfare considerations, even in this reduced form, are problematic. The preferences of the citizens are influenced by advertising. In this model, the NGOs advertise by information. Advertising messages cannot convince the voters that there is no need for the new policy. Still, in most cases, a fraction of the population remains uninformed and thus unaware of their utility from an implementation of the new policy. Is it then possible to judge whether the utility function after advertising reflects the “true” utility? In modern democracies, where the population is the sovereign, the decision of which policies are desirable for the society is left to the citizens. Who would then be in the position to judge whether the citizens are informed enough to know their true preferences?

Considering this, instead of the benchmark that considers the altruism of the citizens even when they themselves are unaware of it, a less idealistic point of reference could be the utility function of the citizens *after* the advertising campaign. This would give lobbying by advertising a welfare-neutral role: All implementation outcomes without direct lobbying contributions, that is, without distortions to the welfare considerations of the government, are then ex-post welfare-maximizing. Policy implications are discussed in the next section.

## 5. POLICY IMPLICATIONS

The involvement of lobbies in the political process can lead to lower government action than is desired by the voters. Therefore, there is room for improvements of the political process.

**5.1. Design of the political process.** When interest groups are involved in the political decision-making process, both at the policy choice and the policy implementation stage, they have a very high influence on the overall policy outcome. Their failure to agree on political strategies then leads to an overall low level of government action. Even when all groups of society are represented in interest groups, this result would not change: As proved by Bernheim

and Whinston (1986), the policy implementation outcome would then be socially efficient *given* the lobbying incentives defined in the policy choice stage. Because of the failure to compromise in the first stage, however, these lobbying incentives would be inefficiently low.

It could therefore be beneficial to exclude the lobbies from the first stage of the decision-making process. This partial ban on corporatism would mean that the government chooses the political strategy free from the pressure of lobbies. The resulting policy could be more encompassing. The dynamics of the policy choice which lead to very weak policy compromises would be circumvented. On the other hand, an official ban on corporatism may lead to less transparency, as the lobbies resort to direct political contributions to shape the compromise according to their interests. In the implementation stage, this can move the outcome away from the outcome that is desired by the general public. An institutionalized corporatism should be based on public pressure. This can only be achieved by officially acknowledging interest groups as important political agents.

**5.2. Ex-ante compromise.** One result of the model is that the “collusive” policy compromise leads to higher policy implementation level than in equilibrium. Yet, in the policy choice game, this alone does not help to support collusion. Interest groups have an incentive to deviate from the collusive strategy. That overall gains are reduced by this behavior does not change the commitment problem. In the implementation stage, there is no punishment for a deviation from collusion. Quite to the contrary, the deviator shapes the outcome of stage two and gets an additional surplus. The government could implement a different set of rules for the decision-making process. Collusion can be sustained only if interest groups are punished for deviating. Repeated interaction could be one solution to this problem. The government could also give incentives for the interest groups to co-ordinate in advance. This model does not develop such a solution. With respect to possible improvements of political decision-making processes, further investigation of this question would be worthwhile.

**5.3. The case of access to medicines.** Why have western governments not reacted more actively to the health crisis in developing countries? Surveys (Olsen(2000)) show that in most industrialized countries there is a significant public interest in foreign aid. In most countries,

there exist both political institutions concerned with development assistance and several non-governmental organizations (NGOs) that promote the case of access for medicines. This shows that there is the expertise to draft effective strategies and to implement such policies. International organizations, interest groups, and scientists have proposed possible solutions. An example is the DEFEND proposal (Ganslandt, Maskus, Wong (2001)). The authors propose a fund to compensate the pharmaceutical industry for R&D and low-price sales of medicines.<sup>25</sup>

In the ongoing political debates, such as the “Civil Society” meetings of the EU Commission, one can identify several characteristics.<sup>26</sup> These meetings were attended by associations of the research-based as well as the generic pharmaceutical industry and some of the most active NGOs (Participants there include MSF, OXFAM, AIM and others). Generally, all interest groups, the pharmaceutical industry as well as the NGOs involved, and the EU Commission, agreed on the need for immediate action.

Concerning the political strategy, the proposals had very different potentials for compromise. For example, short-term donations of limited amounts of drugs, and trade measures, such as lower tariffs or agreements for a transfer of technology were rather low-conflict points. Fundamental conflict developed concerning the protection of intellectual property rights, where NGOs frequently blamed the industry of profiting from excessively strong patent rights. Also differential pricing and parallel import of drugs (importing copy-drugs into a country with patent protection) were among the controversial issues. Ethical and human rights’ questions which are relevant for the issue of health further complicated the situation. The NGOs accused the industry of neglecting these aspects. They perceived the chance of compromise to be very low.<sup>27</sup> Conflict over access to medicines thus has evolved on several levels: On the one hand, there is an ideological level. The NGOs generally refuse to support measures where the industry is compensated because they blame it to be responsible for the crisis. This leads to conflicts on

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<sup>25</sup>Suggestions can also be found in the working paper series of the WHO Commission on Macroeconomics and Health: Kremer (2001) gives an overview over possible policies.

<sup>26</sup>Agendas and reports for these meetings can be found at <http://europa.eu.int/comm/trade/csc/issuegr.htm>.

<sup>27</sup>An illustration for the tense atmosphere in those meetings can be found in a quote from one of the discussion reports: “Dialogue between the industry and certain NGOs was not always easy.”, see <http://europa.eu.int/comm/trade/csc/rephealth05a.htm>, version 14/03/2002.

other levels, where technical problems have to be solved. For example, the interest groups were not able to agree on the use of the WHO-list of the most essential drugs for developing countries.

These meetings can be evaluated in terms of the political decision-making model. The level of conflict seems to be sufficiently high to give the lobbies negative equilibrium gains from the policy compromise. This can be the reason why they lobby against the implementation of the new strategy. This leads to a lower than status-quo level of government action.

**5.4. Changing the lobbies' attitude.** Recently, governments have started policy projects to alleviate the health crisis in developing countries. This policy change coincides with an intensified discussion of the issue which has also found a large echo in the media. In the model, one way to achieve a higher level of government action is to increase the perception of the *ex ante* probability of compromise. This gives the lobbies a higher interest in the actual policy implementation. Public discussions as well as the dissemination of objective information about an issue, for example by publications by independent experts, could achieve this change in perception. Here, the independent media play an important role (see Baron (2003)).

A big problem are the lobbies' status-quo biases: Especially when the former policy has been very advantageous for them, they will not be in favor of the implementation of a new policy compromise. When the government is dependent on the lobbies' support for the implementation of a new policy, it could therefore try to reduce their stakes in the old policy by creating disadvantages for companies which are opposed to change. A way to achieve this is public pressure. A good example are the recent campaigns which put moral pressure on pharmaceutical companies, arguing that they would protect their patents by sacrificing human lives. This led several companies to offer a large amount of AIDS medicines for free.<sup>28</sup>

**5.5. Advertising.** In many political issue areas, interest groups are not symmetric. One side, usually the industry, has capital and can offer other advantages, such as attractive positions. Most interest groups opposing the industry have a civil society origin. They are citizen initiatives, created in order to bring policy outcomes closer to the needs of the citizens. These groups usually do not have the resources or the structure to use the classical lobbying channel of

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<sup>28</sup>An overview of industry initiatives is given by the European Federation of Pharmaceutical Industries and Associations, <http://www.efpia.org/4pos/access/Inventory%20May2002.doc>, version 12/09/2002

direct contributions. A second reason for NGOs not to use direct political contributions is ideological: Often, those movements are created out of a general discontent with the current political process. Their ideology prescribes certain channels by which political influence can be used without destroying democratic values. As direct political contributions, even when they do not involve illegal bribes, are characterized by a lack of transparency, NGOs refrain from using them even if they had the resources to do so.

Proposition 6 shows that a political process that relies on advertising as a lobbying channel can be expected to lead to an outcome closer to the benchmark than with direct lobbying contributions. Nevertheless, in most cases, government action will be too low. If the weaker benchmark of the voters' utility after advertising is taken, all implementation outcomes where only advertising is used are optimal, even when they are lower than the status-quo level. In these cases, only direct political contributions distort the outcome. Naturally, lobbying by influencing public opinion is less distorting when the benchmark considers the utility of the general public. Such a benchmark seems to be apt for modern western democracies where no party or decision maker can claim to know the "true" best policy. (This might be different for other political regimes.) Lobbies that use advertising act as advocates of the citizens: By aiming at the public opinion, they can give more decision-making power to the constituents. The policy choice then is closer to the preferences of the general public. This is a role most NGOs are claiming for themselves. In many cases, their civil rights' origin gives this claim some legitimacy. When interest groups shape public opinion, they constitute an essential part of democracy. In Germany, for example, the duty to inform and create public opinion is explicitly assigned to political parties. Interest groups can be an important supplement and corrective in this respect.

The results imply that influencing public opinion should be made a more effective lobbying channel than direct political contributions. This could be achieved by creating more transparency in political institutions. Increased publicity of a subject could trigger the orientation towards more information-oriented lobbying. After access to medicines has increasingly been covered in the media, the recent strategy of some pharmaceutical companies to donate medicines against HIV/AIDS accompanied by a big public-relations campaign is a move in this direction. In countries with a transparent government, where direct political contributions are difficult and

less effective, the utility of the population is more readily taken into account even when policies are shaped by lobbies. This is true even when not all citizens are organized. The model thus provides an argument for increased democratization and for the demands for transparency in current democratic governments.

## 6. CONCLUSION

The paper describes the process of the definition and implementation of a political strategy. When interest groups are involved in both stages of a political decision-making process, they have significant influence on the policy implementation outcome. Policies are classified in several categories, depending on the ex-ante perception for the chance of a compromise and the lobbies' status-quo biases. If a policy question is perceived as very controversial, the influence of lobbies reduces policy implementation even if they did not benefit a lot from the status-quo policy. Policy implications include a change in the perception of controversial policy issues and the reduction of the status-quo biases of the lobbies. Furthermore, governments should not integrate interest groups too early in the decision-making process. More transparency in political institutions can give stronger incentives to interest groups to lobby by shaping public opinion.

## 7. APPENDIX

### 7.1. Proof of Lemma 1.

*Proof.* The utility function of the voters is defined by

$$V(X) = (Y - T) + U(T - X) + a_0\alpha X$$

with  $U(0) = 0$ ,  $U_X < 0$ , and  $U_{XX} < 0$ , continuous and twice differentiable. Also,  $\lim_{X \rightarrow 0} U_X = 0$  and  $\lim_{X \rightarrow T} U_X = -\infty$ . The first-order condition for a maximum is

$$\frac{\partial V}{\partial X} = \frac{\partial U(T - X)}{\partial(T - X)} \frac{\partial(T - X)}{\partial X} + a_0\alpha = 0$$

With  $\frac{\partial(T - X)}{\partial X} = -1$  and the assumptions on  $U(X)$ , we get that

$$\frac{\partial U(T - X)}{\partial(T - X)} = -\frac{\partial U(T - X)}{\partial X} = a_0\alpha$$

is fulfilled by a unique  $X^*$  for each parameter constellation. For a global maximum, the second order condition is

$$\frac{\partial^2 V}{\partial X^2} = \frac{\partial^2 U(T - X)}{\partial X^2} < 0$$

This is fulfilled by the assumption  $U_{XX} < 0 \forall X$ . □

### 7.2. Proof of Proposition 1.

*Proof.* The proof for existence and uniqueness of the second-stage equilibrium  $[X^*; \{C_k^*(X^*, U_k^*)\}]$ , follows the standard proof in the literature (e.g., Grossman and Helpman 2001, Chpt. 7). First, consider the lobbies' problem: When the lobbies are constrained to use truthful contribution schedules, the marginal change of their contribution  $C_k(X)$  with respect to a change in  $X$  has to reflect their marginal change in utility:

$$\frac{\partial C_k}{\partial X} = -\frac{\frac{\partial U_k}{\partial X}}{\frac{\partial U_k}{\partial C_k}} = -\frac{\pi_k}{-1} = \pi_k$$

For  $\pi_k > 0$ , contributions grow with a higher level of policy implementation. When  $\pi_k < 0$ , the lobby would like to see less policy implementation. Contributions increase with a lower  $X$ .

Using these truthful contribution schedules, it can be shown that the government objective function  $G(\{C_k(X)\}, X)$  has a global maximum for each parameter constellation and marginal

lobbying interests  $\pi_k$ . The first-order condition for the government is given by

$$\frac{\partial G}{\partial X} = \frac{\partial C_I}{\partial X} + \frac{\partial C_N}{\partial X} + \frac{\partial U(T - X)}{\partial X} + a_0\alpha = 0.$$

The marginal lobbying contributions can now be substituted into the first-order condition for the government:

$$\frac{\partial U(T - X)}{\partial X} + a_0\alpha = -(\pi_I + \pi_N) \Leftrightarrow \frac{\partial V(X)}{\partial X} = -(\pi_I + \pi_N)$$

With Lemma 1,  $V(X)$  has a unique global maximum when there is no lobbying. Call that equilibrium  $X_{nl}^*$  (no lobby).  $V(X)$  is increasing for all  $X < X_{nl}^*$  and decreasing for all  $X > X_{nl}^*$ . With lobbying contributions, the first-order condition for the government is changed: For  $(\pi_I + \pi_N) > 0$ ,  $\frac{\partial V}{\partial X}$  has to be negative in equilibrium.  $\frac{\partial V}{\partial X}$  is monotonously decreasing in  $X$  (see Lemma 1). Therefore, it must hold that the new equilibrium is unique and that  $X^* > X_{nl}^*$ . A similar argumentation holds for  $(\pi_I + \pi_N) < 0$ .

The set of equilibrium lobbying contributions is constrained by the requirement of truthful equilibria where each lobby has to get the utility level  $\bar{U}_k$  defined by condition 8: In order to induce the government to follow its interests, each lobby has to make the government at least as well off as it would be if only the other lobby was contributing.  $\square$

### 7.3. Proof of Proposition 2.

*Proof.* The first order conditions of this problem lead to linear reaction functions of the form:

$$R_I = \frac{\tau - R_N}{2}; R_N = \frac{\tau R_0 - R_I}{2}$$

For  $\tau > 0$  this leads to a unique, positive, internal solution:  $|R_I^e| = R_N^e = \frac{\tau}{3}$ . Second order conditions are fulfilled. The government can apply this mechanism without further restrictions, as  $\tau \geq (R_I + R_N)$  always holds.  $\square$

### 7.4. Proof of Proposition 4.

*Proof.* Take the first-order condition of Proposition 1. By comparing the first derivatives of the government objective function, the implementation levels  $X_e^*$ ,  $X_c^*$  and  $X_{nl}^*$  can be ranked.

Equilibrium and collusion implementation levels  $X$  can be found using the following first derivative of the government objective function, substituting  $\{\pi^j\}$  with  $j \in \{e, c\}$ :

$$\frac{\partial G}{\partial X} = \pi_I^j + \pi_N^j + \frac{\partial U(T - X)}{\partial X} + a_0\alpha$$

From Lemma 3 it follows that  $\pi_k^e < \pi_k^c$  for both negative and positive values of  $\pi_k$ . So  $\pi_k^c$  can be expressed by  $\pi_k^e + \epsilon$ . Look at the first-order conditions for the maximization problem of the government for  $\pi^e$  and  $\pi^c$  respectively:

$$\frac{\partial G(X_e)}{\partial X} = 0 \Leftrightarrow a_0\alpha + \frac{\partial U(T - X)}{\partial X} = -(\pi_I^e + \pi_N^e)$$

and

$$\frac{\partial G(X_c)}{\partial X} = 0 \Leftrightarrow a_0\alpha + \frac{\partial U(T - X)}{\partial X} = -(\pi_I^e + \epsilon + \pi_N^c + \epsilon)$$

With Lemma 1 and Proposition 1,  $G$  is a continuous function with a unique maximum  $X^*$  for each parameter constellation. With  $\epsilon > 0$ , and  $U_{XX} < 0 \forall X$ , it must be that  $X_e^*$  and  $X_c^*$  exist and are unique. Furthermore,  $-(\pi_I^e + \pi_N^e) > -(\pi_I^c + \pi_N^c)$  as  $0 > -2\epsilon$  and therefore  $X_c^* > X_e^*$ .

With respect to  $X_{nl}^*$ , a similar argument can be used. The first-order condition for the status quo level of policy implementation  $X_{nl}^*$  is given by condition 5 as

$$\frac{\partial G(X_{nl})}{\partial X} = 0 \Leftrightarrow a_0\alpha + \frac{\partial U(T - X)}{\partial X} = 0$$

With respect to the conditions above, the only difference is the sum of marginal contributions  $(\pi_I^j + \pi_N^j)$ .  $G$  is a continuous function with a unique maximum  $X^*$  for each parameter constellation. With  $U_{XX} < 0 \forall X$ , the slope of  $G$  is monotonously decreasing with  $X$ . Thus,

$$X_j^* \begin{cases} < X_{nl}^* & \text{if and only if } (\pi_I^j + \pi_N^j) < 0, \\ > X_{nl}^* & \text{otherwise.} \end{cases}$$

For the rest of the proof, use the results of lemma 4: If and only if  $\pi_k^e$  and  $\pi_k^c$  are positive,  $X_{nl}^* < X_e^* < X_c^*$  (case 1). If and only if  $\pi_k^c > 0$  and  $\pi_k^e < 0$ ,  $X_e^* < X_{nl}^* < X_c^*$  (case 2). If and only if  $\pi_k^j < 0$ ,  $X_e^* < X_c^* < X_{nl}^*$  (case 3).

To relate the requirement of  $(\pi_I^j + \pi_N^j) < 0$  to the parameters  $\tau$  and  $\bar{s}_k$ , use lemma 4:

- Case 1:  $(\pi_I^j + \pi_N^j) < 0$  if  $\sum_k \bar{s}_k > \sum_k u_k = 2\frac{\tau^2}{8} = \frac{\tau^2}{4}$
- Case 2:  $(\pi_I^e + \pi_N^e) < 0 < (\pi_I^c + \pi_N^c)$  if  $\frac{2\tau^2}{9} < \sum_k \bar{s}_k < \frac{\tau^2}{4}$
- Case 3:  $(\pi_I^j + \pi_N^j) > 0$  If  $\sum_k \bar{s}_k < \sum_k u_k = 2\frac{\tau^2}{9}$

□

### 7.5. Proof of Lemma 5.

*Proof.* For this proof,  $\pi_N > 0$  is assumed. Let  $X_{nl}^*$  be the unique equilibrium policy choice of the government without lobbying (see lemma 1). When the NGOs are the only lobby and are constrained to truthful contribution schedules, we get as the first-order condition for the government's maximization problem

$$\frac{\partial V_N(X, C_N(X))}{\partial X} = \frac{\partial U(T - X)}{\partial X} + a_0\alpha + a_1\alpha(2\pi_N X - \bar{U}_N) = 0$$

where  $C_N^*(X) = \max\{\pi_N X - \bar{U}_N, 0\}$ , and  $\bar{U}_N \geq \pi_N X_{nl}^*$ . When we assume  $\pi_N > 0$ , we expect the NGOs to increase the policy choice of the government, otherwise, it would fare better if it were not lobbying. Therefore,  $V_N(X) = V(X)$  when  $X < \frac{\bar{U}_N}{\pi_N}$ .

Note that  $U(0) = 0$ ,  $U_X < 0$ , and  $U_{XX} < 0$ , continuous and twice differentiable and  $\lim_{X \rightarrow 0} U_X = 0$  and  $\lim_{X \rightarrow T} U_X = -\infty$ . With the other terms constant or linearly increasing in  $X$  and bounded by the requirement that  $X \leq T$ , there must be a unique  $X_N^*$  that fulfills this first-order condition.

It now remains to be shown that  $V_N(X^*)$  is the maximum of  $V_N(X, C_N(X))$ . This is the case when  $\frac{\partial V_N(X, C_N(X))}{\partial X} > 0$  for  $X < X^*$  and  $\frac{\partial V_N(X, C_N(X))}{\partial X} < 0$  for  $X > X^*$ . With the monotonicity assumption on  $U_X(T - X)$ ,  $U_{XX} < 0$ , this follows directly.

Furthermore, for advertising to be effective, it must hold that  $X_N^* > X_{nl}^*$ . By comparing the first-order condition of the government's maximization problem to the condition in lemma 1, we see that this is the case if  $a_1\alpha(2\pi_N X - \bar{U}_N) > 0$ . The lower bound for  $X$  is given by  $X \geq \frac{\bar{U}_N}{\pi_N}$ . Plugging that in, we get  $a_1\alpha(2\bar{U}_N - \bar{U}_N) > 0$ . This is always fulfilled. Thus,  $X_N^* > X_{nl}^*$  holds.  $\square$

### 7.6. Proof of Corollary 1.

*Proof.* The proof is similar to the proof of proposition 1. The only difference is the changed maximization problem of the government, as the lobbying contributions of the NGOs directly enter the utility function of the voters. Note that throughout,  $\pi_N > 0$  is assumed. For  $\pi_N < 0$ , we are back to proposition 1. When we assume that the NGOs stay out of the lobbying game, the policy choice is shaped only by the lobbying activity of the industry. The policy choice that

results when only the industry is lobbying is given by  $X_I^* = \text{argmax}[C_I(X) + V(X)]$ .  $X_I^*$  is existing and unique, see proposition 1.

With the requirement of truthful equilibria, we again get the condition for the marginal lobbying contributions of both lobbies  $\frac{\partial C_k}{\partial X} = \pi_k$ . In lemma 5, it has been shown that the maximization problem of the government has a unique maximum when only the NGOs are lobbying. It remains to be shown that the same holds true when the industry is included in the lobbying game. In order to make the NGOs at least indifferent between lobbying and staying out of the lobbying game, the lobby has to be given a minimal utility level:  $U_N(X) \geq \bar{U}_N = \pi_N X_I^*$ . The compensating contribution schedule of the NGOs is again  $C_N^*(X) = \max\{\pi_N X - \bar{U}_N, 0\}$   $\forall X \geq \frac{\bar{U}_N}{\pi_N}$  and 0 otherwise.

The first-order condition for a global maximum of  $G(X)$  is given by

$$\frac{\partial G}{\partial X} = 0 \Leftrightarrow \frac{\partial V_N(X, C_N(X))}{\partial X} = -\frac{\partial C_I}{\partial X} = -\pi_I$$

or

$$\frac{\partial U(T - X)}{\partial X} + a_0\alpha + a_1\alpha(2\pi_N X - \bar{U}_N) = -\pi_I$$

With lemma 5 and  $\pi_I$  constant, there must be a unique  $X^*$  that fulfills this condition. The equilibrium lobbying contribution for the NGOs then is  $C_N^*(X^*) = \pi_N X^* - \bar{U}_N$ . For the industry, the equilibrium lobbying contributions have to fulfill condition 15. The industry's target utility level  $\bar{U}_I$  is defined by the requirement that it leaves the government indifferent between maximizing  $V_N(X)$  or accepting the contribution and choosing the implementation level preferred by the industry.  $\square$

### 7.7. Proof of Corollary 2.

*Proof.* In lemma 5, it has been shown that the maximization problem of the government has a unique maximum for each parameter constellation. It is straightforward that a change in  $\pi_I$  has the same effects on  $X^*$  as in the case with symmetric lobbying: Whenever  $\pi_N < 0$ , the industry is the only lobby and the proof of proposition 4 applies. For the case where  $\pi_N > 0$ , lemma 5 shows that  $V_N(X)$  has a similar behavior to  $V(X)$ : Thus, it is not possible that lobbying by advertising reverts the impact of  $\pi_N$  or  $\pi_I$  with respect to the results in proposition 4. Consider

again the first-order condition for the maximization problem of the government when  $\pi_N > 0$ :

$$\frac{\partial U(T - X)}{\partial X} + a_0\alpha + a_1\alpha(2\pi_N X - \bar{U}_N) = -\pi_I$$

When  $\pi_N$  increases, the left hand side of the first-order condition increases for all  $X$ . Remember that  $U_{XX} < 0$ . The equilibrium value  $X^*$  thus has to increase with  $\pi_N$ . When  $\pi_I > 0$ , this further increases  $X^*$ . For  $\pi_I < 0$ ,  $X^*$  is decreased. The mechanism is equal to the one proved in proposition 4. To see the categorization of policy issues, take  $\pi_k = u_k - \bar{s}_k$  where  $\pi_k^e = \frac{\tau^2}{9} - \bar{s}_k$  and  $\pi_k^c = \frac{\tau^2}{8} - \bar{s}_k$ :

- Case 1: If  $\bar{s}_k \geq \frac{\tau^2}{8}$ ,  $\pi_I^j < 0$
- Case 2: If  $\frac{\tau^2}{9} < \bar{s}_k < \frac{\tau^2}{8}$ ,  $\pi_k^e < 0$  and  $\pi_k^c > 0$
- Case 3: If  $\bar{s}_k \leq \frac{\tau^2}{9}$ ,  $\pi_I^j > 0$

□

### 7.8. Proof of Proposition 5.

*Proof.* The proof focusses only on the implementation level  $X^*$ . It considers only condition 14 and omits all other equilibrium conditions concerning the optimal lobbying contributions  $C_k^*$ . Given  $|\pi_I| = |\pi_N|$  and  $sgn[\pi_k] \neq sgn[\pi_l]$ , let  $\pi_I < 0$  and  $\pi_N > 0$ . Consider the first-order condition for the problem of the government and substitute  $|\pi_I|$  with  $\pi_N$ :

$$a_0\alpha + \frac{\partial U(T - X)}{\partial X} = -a_1\alpha(2\pi_N X - \bar{U}_N) + \pi_N$$

When the right hand side is negative, advertising has a higher impact on the equilibrium policy implementation level than direct contributions as then  $X^* > X_{nl}^*$ . The condition for that is

$$\pi_N < a_1\alpha(2\pi_N X - \bar{U}_N) \Leftrightarrow \frac{1}{a_1\alpha} + \frac{\bar{U}_N}{\pi_N} < 2X$$

This is the condition for the relative effectiveness of the different lobbying channels. □

### 7.9. Proof of Proposition 6.

*Proof.* In proposition 4 it is shown that the equilibrium policy implementation level decreases with respect to  $X_{nl}^*$  whenever  $\pi_k^e < 0$ ,  $k = \{I, N\}$ . The first order condition for  $X_{opt}^*$  is given by

$$\alpha + \frac{\partial U(T - X)}{\partial X} = 0$$

as  $a_0 < 1$ , it must be that  $X_{opt}^* > X_{nl}^*$  (see lemma 1). This proves the first part of proposition 6.

Next, it is shown that for  $\pi_k > 0$ , advertising can in the limit yield the equilibrium outcome  $X^* = X_{opt}^*$ . Consider again the first-order condition for the maximization problem of the government with  $\pi_k > 0$ :

$$a_0\alpha + \frac{\partial U(T - X)}{\partial X} + a_1\alpha(2\pi_N X - \bar{U}_N) = -\pi_I$$

Lobbying by direct political contributions could lead to too much implementation, as the contributions outweigh the government's concern for the utility of the voters: A large  $\pi_I$  increases the resulting policy implementation level. If in the extreme both interest groups used direct political contributions for lobbying and only a very small part of the population was informed, the government would decide the implementation level almost exclusively considering the contributions of the lobbies. This follows directly from proposition 1. The resulting implementation choice could then well be  $X^* > X_{opt}^*$ .

In contrast to that, lobbying by advertising can never lead to results where  $X^* > X_{opt}^*$ : In the limit,  $a(\bar{C}_N(X)) = 1$ . Then, we are back to the condition for  $X_{opt}^*$ . As  $a(C_N(X))$  is monotonously increasing with  $C_N(X)$ , the limit case is also the case where the government puts the highest weight on the citizens' utility from the implementation of the new policy  $\alpha a(C_N(X))X$ . Lower  $a(C_N(X))$  must thus always yield  $X^* < X_{opt}^*$ .  $\square$

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