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The Political Economy of Interest Groups: Pressure and Information*

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Abstract

We examine the incentives of an interest group to provide a political decision-maker with policy-relevant information and to exert pressure on her. Both activities are costly but may induce the lobby's preferred policy. Our paper provides an integrated analysis of both lobbying activities and leads to interesting insights into the behavior of the interest group. Moreover, we show how conclusions of models that take into account only one of these activities may change. Our main results say that the relationship between the pressure exerted and the amount of information transmitted is not monotonic, and that an increase in the amount of information that the lobby transmits may be socially harmful. This analysis has immediate implications for the current discussions in the United States and Europe concerning the reform of their respective rules of party and candidate financing.
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1 Introduction

In the last few years the existing rules governing how interest groups can give money to political parties and politicians have been increasingly questioned in many countries of the world. Many of them, like the United States, are reforming their systems.[1] In Germany, Japan and Ireland the need for reform is recognized.[2] In some countries (like Spain, Germany or France) illegal payments have been discovered and it is not clear to which extend political decisions have been influenced by this money.[3] The resulting discussion on how to reform the system is augmenting. This paper proposes a simple model of the interaction between an interest group and a politician that allows – among other things – to derive some guidelines concerning these reforms.

The standard literature on interest groups is important to understand two types of activities of lobbies in the political process. On one hand, interest groups typically posses information that legislators do not and such information is relevant to legislators when it concerns the consequences of policies. Given that the interests of lobbies do not necessarily coincide with those of legislators, questions like to which extend a lobby is able to persuade a legislator or concerning the incentives of lobbies to acquire costly information arise naturally (see Calvert (1985), Austen-Smith and Wright (1992), Austen-Smith (1995), Ball (1995), Lohmann (1995 and 1998) or recently Bennedsen and Feldmann (2002)).

On the other hand, interest groups exert pressure on legislators "directly" e.g. via campaign contributions (see e.g. Becker (1983 and 1985), Sny-

[1] See the Bipartisan Campaign Reform Act which President Bush signed into law on 27 March 2002 – seen by some authors as the first major realignment of the campaign finance system since the 1970s. The bill's core is a ban on "soft money" (unlimited campaign contributions to political parties) and the prevention of so-called "issue" ads by special interest groups that mention a candidate (see e.g. The New York Times, 14 February/21 March 2002). Note that reform is an issue in many parts of the world, see e.g. the Campaign finance reform bills in the Philippines (The Philippine Star, 18 February 2002) or Puerto Rico (Caribbean Insight, 16 June 2000).

[2] See the "Herzog-Commission" in Germany, which was appointed to develop a new finance system for the Christian Democrats (CDU) after their finance scandal (Süddeutsche Zeitung (Germany), 18/19 March 2000). Or the first policy speech on 7 May 2001, of the newly elected Japanese Prime Minister Junichiro Koizumi (New York Times, 25 April 2001). For Ireland see the intention of Prime Minister Bertie Ahern to amend to the Electoral Act (Irish Independent, 23 January 2001).

[3] For Germany one may think of the fund scandal around former Chancellor Helmut Kohl mentioned above (The Financial Times, 19 July 2001) or the loan scandal of the speaker of Berlin's city council (Financial Times, 7 May 2001). For Spain see for instance the resignation of Spain's labour minister Manuel Pimentel (Financial Times, 21 February 2000). Concerning France see e.g. the Elf-scandal (Daily Telegraph, 19 May 2001).

der (1991), Groseclose and Snyder (1996) or Prat (2002)). Considerable progress has been made in understanding both issues separately.[4]

However, this literature falls short of integrating both activities and explaining the choice of interest groups between transmitting information and exerting pressure. Few papers combine both activities. Sloof and van Winden (2000) analyze the decision of a lobby between persuasion through the use of "words" or "actions" in a repeated signaling game. Driving force is the reputation of the lobby that determines if a threat is enough to persuade or must be carried out. Therefore its focus lies in what we consider to be "pressure". In Austen-Smith (1995) interest groups provide campaign contributions and information but payments serve to gain access to the politician rather than to implement the desired outcome (as it will be the case in our paper). Lohmann (1995) also considers monetary contributions to gain access and information provision to a policy-maker.

To our best knowledge, only in Bennedsen and Feldmann (2001) the lobby has simultaneously access to the two means "pressure" and "information" of affecting the policy choice. Despite their work is close in spirit to ours, the model, as well as the particular questions they address widely differ. Bennedsen and Feldmann focus on the lobby's choice of whether to combine both activities (information and contributions) or to give up one in favor of the other. They find that the information provision activity will be, in many circumstances, non-optimal for the lobby due to a negative externality it generates for her. In our model, this negative effect is also present, but we study how it alters the nature of the information transmission. Moreover, the analysis we perform allows us to study how the interaction of informational lobbying and pressure affects the amount of information and of pressure conveyed in equilibrium. It also provides us with a basis to deal with welfare considerations. These aspects are not treated in Bennedsen and Feldmann whose model, in exchange, deals with the issue of multiple lobbies.

We propose a simple politico-economic model of one interest group and one legislator in which both lobbying activities exerting pressure and providing information are costly but may induce the lobby's preferred policy. We model the effect of the lobby's pressure in the spirit of Ben-Zion and Eytan (1974) in that the payoff function of the politician depends on the pressure exerted and the policy chosen. For the strategic transmission of

[4] The interested reader is referred to the survey of Austen-Smith (1997) or the monograph of Grossmann and Helpman (2001) and the literature therein. We provide a detailed comparison of our results and the existing literature in Section 5.2. Throughout this paper we use the words "political decision-maker", "politician" and "legislator", on one hand and on the other "interest group", "group" and "lobby" interchangeably. Also, we employ the words "to lobby" and "to influence" when referring to both activities of a lobby.

information we extend the set-up of Laffont (1999) introduced to the literature on informational lobbying by Bennedsen and Feldmann (2002).[5] A key feature of the transmission of information is the following. Sometimes the lobby will be successful in advancing their issues and exerting pressure becomes obsolete. However, sometimes the group will be unsuccessful and it will be more difficult to exert the necessary pressure afterwards.[6]

Our main result is to show that both lobbying activities are not independent, since the amount of policy-relevant information revealed by the lobby heavily depends on the profitability of exerting pressure. Concerning this relationship one may expect to find that both activities are substitutes (a lobby exerting a lower level of pressure opts for a higher level of information) but we show that this is not always the case. We characterize a relevant region of the parameters, determined by the cost of exerting pressure, where the information acquisition activity is complementary to the use of pressure. For this region holds that any reform that tries to reduce the capacity of the lobby to "pressure" the politician would, therefore, generate as a by-product a decrease in the amount of information transmitted by the interest group.

The reason for the complementarity is that for intermediate costs of pressure, the interest group wants to exert pressure when the informational activity was unsuccessful. The lobby wants to correct the outcome of the informational activity. Hence, an increase in the costs of pressure has two effects. On one hand, the relative price of the information activity decreases, but on the other hand, correcting an unsuccessful informational activity becomes more expensive. We show that there are parameter values for which the second effect prevails over the first.

Another consequence of this mechanism is our second main result. When a lobby has access to both lobbying activities, the relationship between "information" and "welfare" is a complex one. More information transmitted may result in a higher probability of an erroneous decision. The reason is again that for intermediate costs of pressure the interest group wants to correct the outcome of the informational activity. We carry out a welfare analysis and determine exactly when a legislator will on average make "better" decisions with lobbying than without. There is also a parameter range for which the lobbying activity – although pressure is exerted – is socially desirable.

Other contributions of this paper are to lead to interesting insights into (i) the optimal allocation of resources of the interest group on both activ-

[5] Concerning the information transmission see also Aghion and Tirole (1997), Kessler (1998) and specially Chapter 11 in Laffont and Tirole (1993).

[6] This latter effect is called by Bennedsen and Feldmann (2001) the negative externality of information or the indirect cost of information.

ities, (ii) the institutions of the information transmission process, (iii) the interest group's choice between "penalizing" or "rewarding" the legislator when exerting pressure on her and (iv) how insights generated from models considering only one lobbying activity may change in an integrated analysis of both activities. We consider these results to be important for the above mentioned reform activities.

This paper is organized as follows. Section 2 presents the model whose decision stages are analyzed in the following Section. Section 4 discusses the key assumptions of the basic model and presents a detailed pressure game. Section 5 elaborates on the relevance of the integrated approach by carrying out (in Subsection 5.1) a welfare analysis comparing a world with lobbying to one without, by comparing (in Subsection 5.2) our results to the literature and by deriving (in Subsection 5.3) from our model some basic insights concerning rules for interest group payments to parties and politicians. The last Section offers some concluding remarks concerning future research.

2 A Simple Model

We consider a fixed agenda $D \in \{A, B\}$ and focus on a given political decision-maker P, assumed to be pivotal in the vote between A and B. There is no abstention. The optimal decision of P depends on subsequent reelection chances, which in turn depend on whether the decision D taken was correct or not. There are two states of the world $\omega \in \{a, b\}$. The probability of state a is $Pr[\omega = a] = q$ and $q \geq \frac{1}{2}$ is observed by P. We suppose that the correct decision in state a is A and in state b is B.

Given this, we can define the benefits of the politician (measuring, in some way reelection chances), as contingent both, on the policy chosen, and the true state of the world:

$$B_D^w \in \left\{B_A^a, B_A^b, B_B^a, B_B^b\right\}.$$

The only restriction imposed is that having made the right choice is better for the politician, i.e.,

$$B_A^a \geq B_A^b, \text{ and } B_B^b \geq B_B^a.$$

With this, we can define the expected benefits of the decision-maker from choosing either policy:

$$\begin{aligned} EB\left(D = A\right) &= qB_A^a + \left(1 - q\right)B_A^b \\ EB\left(D = B\right) &= qB_B^a + \left(1 - q\right)B_B^b. \end{aligned}$$

The politician will choose policy B if and only if $EB\,(D = B) \geq EB\,(D = A)$, that is:

$$q \leq \frac{\Gamma_b}{\Gamma_a + \Gamma_b},$$

with $\Gamma_a \equiv B_A^a - B_B^a$, and $\Gamma_b \equiv B_B^b - B_A^b$, measuring, the premium given by the electorate when choosing the right policy in states a and b, respectively.[7]

We suppose there exists an interest group L, concerned with the outcome of the political decision. The lobby is assumed to prefer strictly policy B, whatever the state of the world. Thus total utility of L is given by $\Pi_L(B) = V_B$ and $\Pi_L(A) = V_A$, with $V_B - V_A \equiv \Delta > 0$. We assume that the interest group does not observe q but knows that q is uniformly distributed on the line segment $[\frac{1}{2}, 1]$.

The idea here is straightforward. If there were no interest group, the politician would always choose decision A. Since the lobby prefers B, she always wants to influence the politician. The uncertainty of L over the exact value of q and the fact that payoffs are common knowledge imply that L does not exactly know how much "influence" is necessary to persuade the legislator. This can be interpreted in terms of the interest group not being sure how convinced the politician is that A is the correct decision. The lobby can take two actions in order to influence the politician:

(1) The interest group may acquire costly policy-relevant information and decide whether to transmit it.[8] When the agenda is announced, L is supposed to have no more information than P. However, at a cost $C(x) = k_i x^2$, where k_i is a positive constant, the lobby can buy a test which reveals with probability $x \in [0, 1]$ the true state of the world, that is, $t = \omega$. With probability $1 - x$ the test is not successful, no information is obtained and $t = \emptyset$. The result of the test is hard evidence.

Once the test is carried out the interest group decides on what kind of message M to send to P. The set of admissible messages depends on whether the test carried out was public or private. A public test captures the idea of an external expert paid by the lobby who always reveals all what he knows. Hence in this case $M = t$. The underlying idea of a private test is that the interest group can carry out some research and then decide strategically how to use this information. The lobby may hold back information but cannot lie and convince the politician. Thus, if $t = \omega$, then $M \in \{\omega, \emptyset\}$ and if $t = \emptyset$,

[7] Note that, since $q \geq \frac{1}{2}$, if $\Gamma_a > \Gamma_b$, the decision-maker will always choose $D = A$.

[8] We assume that the politician has no access to this information, or that her information acquisition decision took place before the announcement of the agenda and failed to reveal the optimal policy.

then $M = \emptyset$.[9]

(2) The interest group may exert pressure $p \in [0,1]$ on the politician at a cost $C(p) = k_p p^2$, where k_p is a positive constant. The pressure exerted by the lobby can influence the choice of the politician, by altering Γ_w. However, the capacity to alter the decision-maker's incentives, is affected by the "resistance" of the politician to pressure (denoted by $R \in (0,1)$). Therefore, we can define the after-pressure premiums of the politician as:

$$\Gamma_w(p, R).$$

Since the objective of the lobby is to make option $D = B$ more attractive, the effect of p has to be to increase Γ_b with respect to Γ_a. Moreover, we want this capacity to be smaller as the resistance of the politician grows. Formally:

$$\begin{aligned} \frac{\partial \Gamma_a(p,R)}{\partial p} &\leq 0 \text{ and} \\ \frac{\partial \Gamma_b(p,R)}{\partial p} &\geq 0, \text{ with } \frac{\partial^2 \Gamma_b(p,R)}{\partial p \partial R} \leq 0. \end{aligned}$$

We consider the following simple functional forms:[10]

$$\begin{aligned} \Gamma_a(p,R) &= R - p \\ \Gamma_b(p,R) &= R + p(1-R). \end{aligned}$$

With this functional forms, the following result is easy to show. For later reference we state it as a Proposition.

PROPOSITION **1**

- *If* $q = \frac{1}{2}$, *then for every* $p \geq 0$, $EB(D = B) \geq EB(D = A)$.
- *If* $q \in \left(\frac{1}{2}, 1\right)$, *then* $EB(D = B) \geq EB(D = A)$, *if and only if,*

$$p \geq \tilde{p}(q,R) \equiv \frac{(2q-1)R}{1-(1-q)R} < R. \tag{1}$$

[9] One can understand a lie as a conclusion based on very weak arguments, leading P to infer that $M = \emptyset$. Modeling the strategic discretion of an economic agent by what we call a private test is widely used, see Laffont (1999). It was introduced in the literature on informational lobbying by Bennedsen and Feldmann (2002).

[10] In Section 4.1, we will show that these functional forms, exogenously given here can be seen, in fact, as the outcome of a fully defined family of pressure games which may capture pressure in form of monetary contributions to the politician or his political competitors, propaganda campaigns, issue adds or endorsement of candidates.

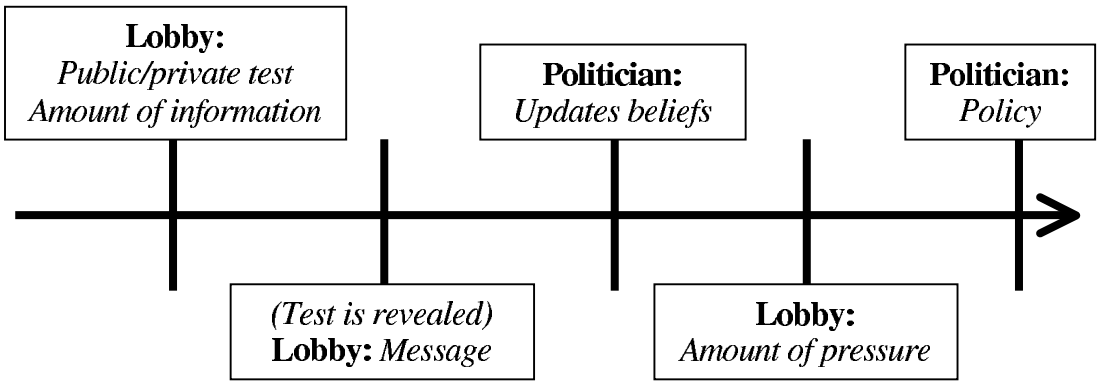

Figure 1: The timeline of the game

- *If* $q = 1$, *then* $EB\left(D = B\right) \geq EB\left(D = A\right)$, *if and only if,* $p \geq \bar{p} \equiv R$.

That is, when there is no prior belief that the state $w = a$ is more likely to occur, then any pressure will make the politician opt for $D = B$. As the likelihood that the true state is a increases, the pressure required to induce policy B increases ($\frac{\partial \tilde{p}(q,R)}{\partial q} > 0$). Finally, if the politician is certain that the state is a, she will only choose policy B, if the pressure exerted is enough to fully compensate her resistance. In general, the threshold $\tilde{p}$ will be higher the higher the resistance R of the politician ($\frac{\partial \tilde{p}(q,R)}{\partial R} \geq 0$).[11]

Summarizing, the game analyzed in this paper has several distinct decision stages. The time-line summarizing the sequence of decisions is described in figure 1. First, the agenda $D \in \{a, b\}$ is given. Then L decides whether the test is public or private and on the amount of information x bought. Third, the result of the test t is revealed and L decides on the message M to send to P. Then P updates his beliefs over the likelihood of each state of the world taking into account the lobby's ability to send messages strategically. Fifth, L decides how much pressure to exert. Finally, the decision over the policy is taken by P and was already analyzed in proposition 1.

This is a sequential game which can be solved by backward induction. The equilibrium concept we apply is perfect Bayesian Nash equilibrium.

[11] This is in line with the literature e.g. in Snyder (1991) the more salient an issue is for politicians, the more costly it is to exert pressure successfully. In the words of Bennedsen and Feldmann (2001), only extreme lobbies (V_B high) implement their preferred outcome by means of pressure.

3 The Decisions of the Interest Group

3.1 The Pressure Level Decision

In our model the interest group does not know how convinced the politician is that policy A is the correct decision. Technically this is true because the lobby does not observe q – he only knows that q is uniformly distributed on $[\frac{1}{2}, 1]$. This assumption implies that the lobby does not know exactly how much pressure is necessary in order to induce his preferred policy B. However, (from Proposition 1) he knows that there exists a threshold level $\tilde{p}(q, R)$ up from which his aim is reached. We can solve this expression (equation (1)) for q which gives the following corollary.

COROLLARY 1 *There exists a critical value*

$$\tilde{q}(p, R) = \frac{p + R(1-p)}{R(2-p)} \tag{2}$$

such that the politician chooses policy B if and only if $q \leq \tilde{q}(p, R)$.

This result has the following interpretation. Any given level of pressure p convinces the politician to choose alternative B for any level of q smaller than the threshold level $\tilde{q}(p, R)$; i.e. only if the politician is relatively unsure that the correct choice is A. If $p = 0$, then $\tilde{q}(p, R) = \frac{1}{2}$. Since $q \geq \frac{1}{2}$, policy A will almost always be chosen. If $p = R$, then $\tilde{q}(p, R) = 1$ and the politician will choose B whatever her initial conviction concerning the appropriateness of policy A. If pressure equals the resistance of the politician, then policy B will be implemented for sure.[12]

The problem of the interest group is

$$\begin{aligned} \max_p E\Pi(p)_L &\Leftrightarrow \max_p \int_{\frac{1}{2}}^{\tilde{q}(p,R)} V_B dF(q) + \int_{\tilde{q}(p,R)}^{1} V_A dF(q) - k_p p^2 \\ &\Leftrightarrow \max_p V_A + \int_{\frac{1}{2}}^{\tilde{q}(p,R)} \Delta dF(q) - k_p p^2. \end{aligned} \tag{3}$$

The first derivative of the objective function w.r.t. p is strictly positive at $p = 0$, implying that $p^* > 0$. Simple (although tedious) calculations lead to the next lemma which characterizes the solution to this problem.

[12] Remember that we denote this latter pressure level by $\overline{p} = R$. Note that, $\frac{\partial \tilde{q}(p,R)}{\partial R} < 0$ and $\frac{\partial \tilde{q}(p,R)}{\partial p} > 0$.

LEMMA **1** *There exists a function $F(R)$ for $\frac{k_p}{\Delta}$ with the properties that*
(i) $\frac{\partial F(R)}{\partial R} < 0$,
(ii) $\lim_{R\to 0} F(R) = +\infty$ *and*
(iii) $\lim_{R\to 1} F(R) = \bar{K}$, *with* $\bar{K} \in \{1, 2\}$.
The optimal choice of pressure is

$$p^* = \begin{cases} p < \overline{p} & \text{if } \frac{k_p}{\Delta} > F(R) \\ \overline{p} & \text{if } \frac{k_p}{\Delta} \leq F(R). \end{cases} \tag{4}$$

This result tells us that if the resistance R of the politician is sufficiently high, then $F(R)$ is low enough (given the normalized costs of exerting pressure $\frac{k_p}{\Delta}$) and the solution to (3) is interior. In this case the first order condition applies and gives the familiar condition that marginal costs of exerting pressure must equal the marginal benefits,

$$k_p p = \frac{\partial \tilde{q}(p, R)}{\partial p}\Delta. \tag{5}$$

However, for a sufficiently low resistance R, the maximum level $\overline{p} = R$ is affordable. The optimal level of pressure p^* is then a corner solution.

Using the total differential on equation (5) we find that $\frac{\partial p^*}{\partial R} < 0$ (if p^* is an interior solution), which means that the higher the resistance of the politician for a given level of the normalized costs of exerting pressure $\frac{k_p}{\Delta}$, the lower the optimal level of pressure.

We close this Section by stating the expected profits of the lobby from exerting the optimal level of pressure

$$\begin{aligned} E\Pi^P &= V_A + \int_{\frac{1}{2}}^{\tilde{q}(p^*,R)} \Delta 2dq - k_p p^{*2} \\ &= V_A + \Delta[2\tilde{q}(p^*, R) - 1] - k_p p^{*2}. \end{aligned} \tag{6}$$

Using the envelope theorem, we see that $\frac{\partial E\Pi(p^*)_L}{\partial R} < 0$. The higher the resistance of the politician, the lower the profits of the lobby.

3.2 The Information Decision

3.2.1 A Public versus a Private Test

Recall that in our model – apart from exerting pressure – the interest group may acquire costly policy-relevant information, which we capture by a test t revealing with probability $x \in [0, 1]$ the true state of the world. This information may be used in order to influence the politician by sending a message

M. A fundamental choice by the lobby to be made is whether the test is private or public. If the test is successful, that is, $t = w$, we have that after a private test $M \in \{w, \emptyset\}$, while after a public test always $M = w$ holds. One could expect that the interest group prefers the private test because it allows not to reveal the true state when this is not convenient for her. But we will show that the lobby can do better than this because this strategic discretion is only one side of the coin.

A Public Test

Consider a public test. Since the message the lobby sends always coincides with the result of the test, after receiving a message saying the test has failed ($M = \emptyset$) the politician knows this information is true. Thus, the probability the politician assigns to state a after receiving the message that the test has failed is the same as without test, that is, $Pr(w = a, x | M = \emptyset) = q$.

Let us denote by $E\Pi_1^{IP}$ the expected profits when the test is public. Recall that $E\Pi^P$ are the expected profits of the lobby from exerting the optimal level of pressure given in equation (6). Denoting by $E(q) = \frac{3}{4}$ the lobby's expectation of q, we have that

$$E\Pi_1^{IP} = E(q)x \max\{V_A, V_B - k_p\overline{p}^2\} + x\big(1 - E(q)\big)V_B + (1 - x)E\Pi^P. \quad (7)$$

The interest group estimates that with probability $E(q)x$ state a will be revealed in which case the pressure game will be played when it is profitable. Note that here it is common knowledge that the state is a. With probability $x(1 - E(q))$ the test reveals state b and pressure is not necessary. The last possibility is that the test fails, which happens with probability $(1 - x)$. Here again the pressure game will be played but now the politician assigns her prior q to state a. There are three choices of p depending on the result of the test (which is equal to the message):

- If $M = a$, then $p_a \in \{0, \overline{p}\}$.
- If $M = b$, then $p_b = 0$.
- If $M = \emptyset$, then $p_\emptyset = p^*$.

Figure 2 illustrates the following result.

PROPOSITION **2** *Consider a public test. Depending on the normalized costs of exerting pressure one can distinguish the following three regions.*
(i) Region 1: For $\frac{k_p}{\Delta} < F(R)$, *we have that* $p_a = p^* = \overline{p}$.
(ii) Region 2: For $F(R) < \frac{k_p}{\Delta} < \frac{1}{R^2}$, *we have that* $0 < p^* < p_a = \overline{p}$.
(iii) Region 3: For $\frac{1}{R^2} < \frac{k_p}{\Delta}$, *we have that* $0 = p_a < p^* < \overline{p}$.
Moreover, it is always true that $p_b = 0$.

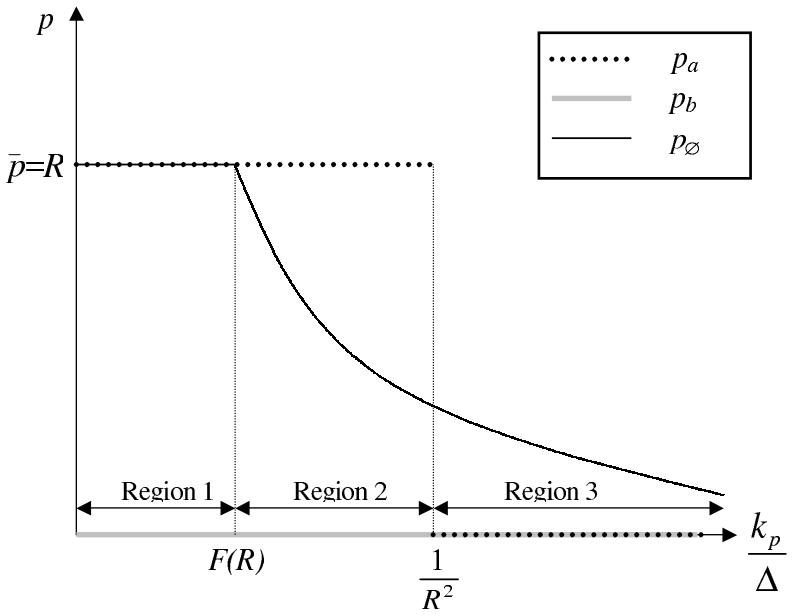

Figure 2: The optimal level of pressure when the test is public

PROOF OF PROPOSITION **2**:
Note that $p_b = 0$ because after revealing $w = b$ no pressure is needed to induce policy B. Lemma 1 implies the behavior of p^* (since the F.O.C. of the problem of the interest group (of equation (3)), is strictly positive at $p = 0$, it follows that $p^* > 0$). Concerning p_a we have that $p_a = \overline{p}$ if and only if $V_B - k_p\overline{p}^2 \geq V_A$. Since $\overline{p} = R$, this is equivalent to $\frac{k_p}{\Delta} \leq \frac{1}{R^2}$. It remains to show that $F(R) < \frac{1}{R^2}$ for all R. The F.O.C. of the problem of the interest group (equation (5)), is strictly negative at $p = \overline{p}$ if and only if $\frac{k_p}{\Delta} > \frac{1}{R^2(2-R)}$. Since $\frac{1}{R^2(2-R)} \leq \frac{1}{R^2}$, using Lemma 1 we can conclude that region 2 exists if and only if $R < 1$. ■

A Private Test
Consider now a private test. Suppose the test is successful and that the state is not the ideal one for the interest group ($t = a$). It is easy to see that the lobby can do better than revealing the true state by sending the message that the test has failed ($M = \emptyset$). Therefore, when receiving this message the politician knows that it is more likely than q that the true state is a. Bayes' rule gives $Pr(w = a, x|M = \emptyset) = \frac{q}{1-x(1-q)} > q$. Note that

$\frac{\partial Pr(w=a,x|M=\emptyset)}{\partial x} > 0$.[13] The higher the quality of the test, the higher the probability the politician assigns to state a after receiving the message that the test has failed.

Clearly, the update of beliefs after a private test affects the thresholds in Proposition 1 and corollary 1. The new values are

$$\tilde{p}(q,R,x) = \frac{(2q-1)R + x(1-q)R}{1-(1-q)R - x(1-q)(1-R)} \qquad \text{and} \qquad (1')$$

$$\tilde{q}(p,R,x) = \frac{p + R(1-p) - x(R+(1-R)p)}{R(2-p) - x(R+(1-R)p)}.^{14} \qquad (2')$$

Note that it is true that $\tilde{q}(p,R,x) \leq 1$ (since $p \leq R$), with equality if and only if $p = R$.[15] Since $\frac{\partial \tilde{p}(q,R,x)}{\partial x} > 0$, the higher the quality of the test, the higher the threshold value $\tilde{p}(q,R,x)$ that makes the politician choose policy B. Moreover, since $\frac{\partial \tilde{q}(p,R,x)}{\partial x} \leq 0$, the higher the quality of the test, the lower the threshold value $\tilde{q}(p,R,x)$. For a given level of pressure politicians with a relatively high prior probability q are no longer induced to choose as the lobby wishes – although for $x = 0$ the pressure level was sufficient. This is the other side of the coin.

Let us denote by $E\Pi_2^{IP}$ the expected profits of the interest group when the test is private. We have that

$$E\Pi_2^{IP} = x\big(1-E(q)\big)V_B + \Big(1 - x\big(1-E(q)\big)\Big)E\Pi^P(x). \qquad (8)$$

The interest group estimates that with probability $x(1-E(q))$ the test reveals state b and pressure is obsolete. However, with the opposite probability $(1-x(1-E(q)))$ the test does not reveal state b, the lobby sends message $m = \emptyset$ and the pressure game will be played. Note that in the latter case the politician updates her prior probability q.

Comparison of Both Tests

The optimal test choice of the lobby is formalized in the following Proposition.

PROPOSITION **3** *The interest group always prefers the public test.*

[13] Moreover, we have that $Pr(w=a, x=0|M=\emptyset) = q$ and $Pr(w=a, x=1|M=\emptyset) = 1$.

[14] To be precise, for $p \in [0, \overline{p})$ the threshold $\tilde{q}(p,R,x)$ is the maximum between this expression and $\frac{1}{2}$, while for $p \geq \overline{p}$ we have that $\tilde{q}(p,R,x) = 1$.

[15] It is also true that $\tilde{q}(p=R,R,x) = 1$ (for all x), $\tilde{p}(q,R,x=0) = \tilde{p}(q,R)$, $\tilde{q}(p,R,x=0) = \tilde{q}(p,R)$, $\tilde{p}(q,R,x=1) = R$ and $\tilde{q}(p<R,R,x=1) = 0$.

- *In region 1 it is indifferent between both tests.*
- *In region 2 and 3 the public test is strictly preferred.*

PROOF OF PROPOSITION **3**:
Define $\gamma(x)$ to be the difference between the expected profits under both tests, that is,

$$\gamma(x) = E\Pi_2^{IP} - E\Pi_1^{IP}. \tag{9}$$

Note that if $x = 0$, then $\gamma(0) = 0$.

Region 1: From Lemma 1 (and Proposition 2) we know that under both tests the optimal amount of pressure in region 1 is $\overline{p}$. Hence the objective functions (7) and (8) coincide as well as the optimal amount of information. Therefore $\gamma(x) = 0$.

Region 3: Note that for $x = 1$ the updated probability the politician assigns to state a is equal to one. But in region 3 we have that $p_a = 0$. Therefore, if x is sufficiently large, exerting pressure is not profitable ($p_\emptyset = 0$). Formally, there exists $\overline{x}$ such that for all $x \geq \overline{x}$, $\gamma(x)$ has the following functional form (after canceling the term $x(1 - E(q))V_B$)

$$\gamma(x) = \Big(1 - x\big(1 - E(q)\big)\Big)E\Pi^P(x) - E(q)xV_A - (1 - x)E\Pi^P.$$

Note that by definition for this range of values for x $E\Pi^P(x) = V_A$, while $E\Pi^P > V_A$. Hence $\gamma(x) < 0$.

Now let $x \in (0, \overline{x})$. Here we have (using equation (6) and again after canceling the term $x(1 - E(q))V_B$)

$$\begin{aligned}\gamma(x) = \Big(1 - x\big(1 - E(q)\big)\Big)&\left(V_A + 2\Delta\left[\tilde{q}(p^*(x), R) - \frac{1}{2}\right] - k_p p^*(x)^2\right) \\ &- E(q)xV_A - (1 - x)E\Pi^P.\end{aligned}$$

Straightforward calculations show that $\gamma(x)$ is convex.

With this we have shown that in region 3 for any strictly positive amount of information ($x > 0$) we have that $\gamma(x) < 0$.

Region 2: In this region, if x is sufficiently large, then $p_\emptyset(x) \in \{0, \overline{p}\}$. since $p_a = \overline{p}$, it is true that $\max\{V_A, V_B - k_p\overline{p}^2\} = V_B - k_p\overline{p}^2$. Implying that $p_\emptyset(x) = \overline{p}$. Therefore, there exists $\exists\overline{x}$ such that for all $x \geq \overline{x}$, $\gamma(x)$ has the following functional form (after canceling the term $x(1 - E(q))V_B$)

$$\begin{aligned}\gamma(x) &= \Big(1 - x\big(1 - E(q)\big)\Big)(V_B - k_p\overline{p}^2) \\ &\quad - E(q)x(V_B - k_p\overline{p}^2) - (1 - x)E\Pi^P(p^*) \\ &= (1 - x)[V_B - k_p\overline{p}^2 - E\Pi^P(p^*)].\end{aligned}$$

Since in region 2 $p^* < \overline{p}$, we have that $E\Pi^P(p^*) > E\Pi^P(\overline{p}) = V_B - k_p\overline{p}^2$ and it follows that for all $x \geq \overline{x}$ the function $\gamma(x) < 0$. The remaining reasoning is as in region 3. ■

The intuition behind this result is simple. On one hand, a private test allows the interest group to hold back information when revealing this information would do harm to her. On the other hand, since the politician is aware of this possibility, she extracts strategic meaning from an uninformative message. This changes her beliefs over the likelihood of each state of nature and makes it more difficult for the lobby to "convince" her by exerting pressure. The Proposition says that the second effect is always larger than the former.

The lobby is indifferent in the first region because here the maximal amount of pressure will be exerted under both tests. None of the effects plays any role here.

Since we compared two types of tests for the same amount of information bought, equation (7) left out the cost of information. The exact expression for the expected profits of the interest group is

$$\begin{aligned} E\Pi^{IP} = {} & E(q)x \max\{V_A, V_B - k_p\overline{p}^2\} + x\big(1 - E(q)\big)V_B \\ & + (1-x)E\Pi^P - k_i x^2, \end{aligned} \tag{10}$$

where

$$E\Pi^P = V_A + 2\Delta\left[\tilde{q}(p^*, R) - \frac{1}{2}\right] - k_p p^{*2}. \tag{7}$$

Note that when $x^* = 0$, then $E\Pi^{IP} = E\Pi^P$. Hence, if $x^* > 0$, then $E\Pi^{IP} > E\Pi^P$. Moreover, for all values of x, we have that $E\Pi^{IP} > E\Pi^I$, where the latter is the expected payoff of only buying information without exerting pressure. Hence, the lobby always combines the provision of information together with political pressure.

3.2.2 The Optimal Amount of Information

The following result is summarized in figure 3. As before, figure 3 is divided in the three regions we defined in Proposition 2.

PROPOSITION **4** *In all regions the optimal amount of information x^* is strictly positive.*

- *In region 1 and 3 it is strictly increasing in the cost of exerting pressure k_p.*

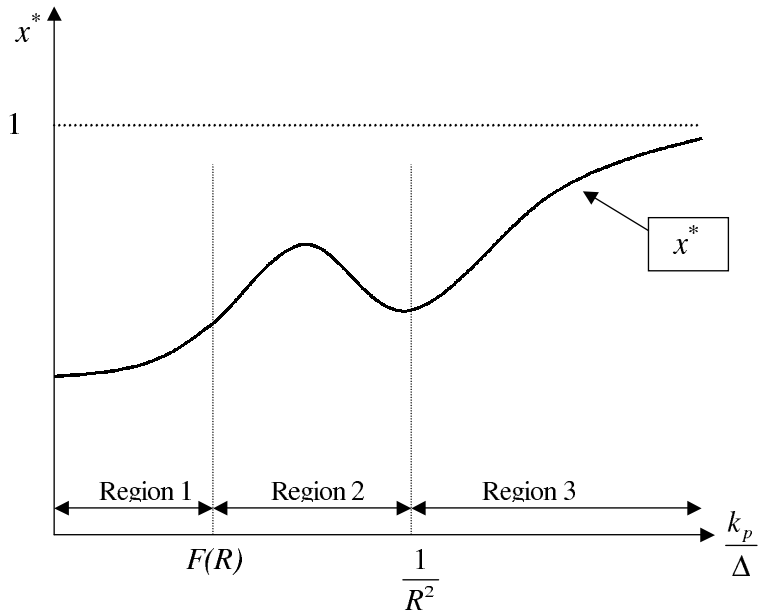

Figure 3: The lobby's information acquisition decision as a function of the costs of pressure

- *In region 2 it is first (close to region 1) increasing and then (close to region 3) decreasing in the cost of exerting pressure k_p.*

Proof of Proposition 4:
In order to determine the optimal amount of information x^* the interest group maximizes the expression in equation (10) with respect to x. The first order condition, which is the same for all regions, is

$$E(q)\max\{V_A, V_B - k_p\overline{p}^2\} + \big(1 - E(q)\big)V_B - E\Pi^P - 2k_i x = 0. \qquad (11)$$

This expression is continuous in x. Since the second order condition is strictly negative, the objective function is strictly concave. Hence, the optimal amount of information x^* is strictly positive if and only if the first order condition evaluated at $x = 0$ is strictly greater than zero.
Region 1: In region 1, we have that $p^* = \overline{p}$ implying that $E\Pi^P = V_B - k_p\overline{p}^2$. Also, $p_a = \overline{p}$ and therefore $\max\{V_A, V_B - k_p\overline{p}^2\} = V_B - k_p\overline{p}^2$. With this simplification the first order condition (11) at $x = 0$ becomes

$$\big(1 - E(q)\big)k_p\overline{p}^2 > 0.$$

Moreover, the first order condition is increasing in k_p. In a concave function this ensures that $\frac{\partial x^*}{\partial k_p} > 0$.

Region 2: In region 2, we know already that $p^* < \overline{p}$ implying that $E\Pi^P = V_A + 2\Delta[\tilde{q}(p^*, R) - \frac{1}{2}] - k_p p^{*2}$. Also, $p_a = \overline{p}$ and therefore $\max\{V_A, V_B - k_p\overline{p}^2\} = V_B - k_p\overline{p}^2$. With this the first order condition (11) reads as

$$2\Delta[1 - \tilde{q}(p^*, R)] - E(q)k_p\overline{p}^2 + k_p p^{*2} - 2k_i x = 0. \tag{11.1}$$

Moreover, with the envelope theorem we establish that it holds that $\frac{\partial x^*}{\partial k_p} > 0$ if and only if $p^* > \sqrt{E(q)}\overline{p}$.

On the boundary between region 1 and 2, this is fulfilled, since here $p^* = \overline{p}$. Together with the continuity of the first order condition and the fact that $x^* > 0$ in region 1, we have that $\frac{\partial x^*}{\partial k_p} > 0$ and $x^* > 0$ at the border of region 1 and 2.

We turn now to the boundary of region 2 and 3. Here, on one hand, it is true that $\frac{k_p}{\Delta} = \frac{1}{\overline{p}^2} = \frac{1}{R^2}$. This implies that the first order condition of the problem of the interest group, equation (5), evaluated at $p = \overline{p}$ is strictly smaller than zero and therefore there exists a unique p^* that satisfies the first order condition and this value is a maximum. On the other hand, p^* is an interior solution determined by equation (5). Together one obtains

$$\zeta(p) = (2 - p)^2 p - R(2 - R) = 0. \tag{12}$$

Note that $\zeta(p)$ is increasing in p if and only if $p < \frac{2}{3} = \tilde{p}$, $\zeta(\tilde{p}) > 0$, $\zeta(0) < 0$ and $\zeta(\sqrt{E(q)}\overline{p}) > 0$. Hence, we have that $p^* < \sqrt{E(q)}\overline{p}$ and $\frac{\partial x^*}{\partial k_p} < 0$.[16]

We show now that on the boundary of region 2 and 3 $x^* > 0$ holds. The first order condition (11.1) evaluated at $x = 0$ is strictly greater than zero if and only if

$$\eta(p, R) = 2[1 - \tilde{q}(p^*, R)] - E(q) + \frac{p^{*2}}{R^2} > 0.$$

Note that we used that $\frac{k_p}{\Delta} = \frac{1}{R^2}$ and $\overline{p} = R$. Furthermore it must hold that $\zeta(p^*) = 0$. Substituting the value for $\tilde{q}(p^*, R)$ from equation (2) gives

$$\eta(p, R) = 2\frac{R - p}{R(2 - p)} - E(q) + \frac{p^{*2}}{R^2}.$$

Although for $R = 0.6$ equation (12) has the three solutions, only $p = 0.31819$ is smaller than one. For these values $\eta(p = 0.31819, R = 0.6) \simeq 0.2 > 0$. The fact that $\frac{\partial \eta(p,R)}{\partial p} = 2\frac{\zeta(p)}{R^2(2-p)^2}$ implies that $\frac{\partial \eta(p,R)}{\partial p}\big|_{p=p^*} = 0$. This means that $\eta(p^*, R) > 0$ for all p^*.

Region 3: In region 3, we have that $p^* < \overline{p}$ which implies that $E\Pi^P = V_A +$

[16] Note that $p^* > \tilde{p}$ is impossible. In this case $\zeta(p) = 0$ if and only if $p^* = \overline{p} = R = 1$. The first equality is not true in region 2.

$2\Delta[\tilde{q}(p^*,R)-\frac{1}{2}]-k_p p^{*2}$. Also, $p_a=0$ and therefore $\max\{V_A, V_B-k_p\overline{p}^2\}=V_A$. Therefore the first order condition (11) becomes

$$\big(1-E(q)\big)\Delta-2\Delta\left(\tilde{q}(p^*,R)-\frac{1}{2}\right)+k_p p^{*2}-2k_i x=0. \tag{13}$$

With the envelope theorem we establish that it holds that $\frac{\partial x^*}{\partial k_p}>0$. ■

From this Proposition it can be extracted first, that the lobby will always choose to combine the two instruments it has in order to influence the politician (here we have that $x>0$ and we already know from Subsection 3.1 that $p>0$).

Moreover, we see how the interaction between these two instruments generates important effects. In Regions 1 and 3 (that is for extreme values of the cost of exerting pressure), we obtain a somehow "expected" result: Pressure and information are substitutes. The more expensive it is to exert pressure, the more the interest group will shift to information provision. However, in Region 2, we see that this is not always the case, and that there exists a range of values for k_p/Δ such that an increase in the cost of exerting pressure results in a smaller amount of information being acquired by the lobby.

This surprising result can be explained through the interaction of the information provision activity, with the use of pressure. An increase in the cost of pressure has the direct effect of reducing the profitability of the "pressure game" and hence, decreases the relative price of information. However, this is only the first effect. When the lobby provides information, it may reveal an undesired piece of evidence that confirms the politician's prior (that the state is a). In this case, the lobby has to counteract through a very extreme pressure choice to get his preferred policy. An increase of the cost of pressure, therefore, ends up having a more negative impact on the profitability of the information provision.

4 Discussion of the Model

4.1 A Pressure Game

The aim of this Subsection is to give a rational for the so far exogenously given functional forms of the basic model without presenting a completely microfounded model of interest group activity (like e.g. in Prat (2002)).

Consider that the benefits of the politician are given by her reelection chances. If the policy choice turns out to be correct, then reelection chances

are high, that is,

$$\begin{aligned} r_H = B_A^a &= Pr[reel|\ \omega = a, D = A] \\ &= B_B^b = Pr[reel|\ \omega = b, D = B]. \end{aligned}$$

Whereas reelection chances are low,

$$\begin{aligned} r_L = B_B^a &= Pr[reel|\ \omega = a, D = B] \\ &= B_A^b = Pr[reel|\ \omega = b, D = A], \end{aligned}$$

in case of an inadequate policy. We assume that $0 < r_L < r_H < 1$. So the decision matters for the politician.

When the lobby tries to influence the politician by means of pressure, we distinguish two benchmark pressure games the lobby may play affecting the payoffs of P.[17]

- The penalize-game: the interest group may penalize the politician for taking a decision that is opposite to the group's preferences. This leaves the payoff in case that $D = B$ unchanged and induces

$$Pr[reel|\ \omega = b, D = A, p] = r_L(1-p) \text{ and}$$

$$Pr[reel|\ \omega = a, D = A, p] = r_H(1-p).$$

- The support-game: the lobby may support the politician when taking her favorite decision. Here only the payoffs in case of $D = B$ are changed to

$$Pr[reel|\ \omega = b, D = B, p] = r_H + (1-r_H)p \text{ and}$$

$$Pr[reel|\ \omega = a, D = B, p] = r_L + (1-r_L)p.$$

In order not to restrict the lobby to either of these benchmarks, we consider that he can choose at which rate to combine both pressure games. Let $\alpha \in [0,1]$, be the fraction of effort in pressure devoted to penalize the politician.

Then, for given levels of p and α, the expected payoffs for the politician of policy A are

$$E\Pi(A) = qr_H(1-\alpha p) + (1-q)r_L(1-\alpha p),$$

[17] We comment at the end of this Subsection on the interpretation of pressure we have in mind.

while the expected payoffs of policy B are

$$E\Pi(B) = q\left(r_L + (1-r_L)(1-\alpha)p\right) + (1-q)\left(r_H + (1-r_H)(1-\alpha)p\right).$$

Therefore, the legislator chooses B if and only if

$$p \geq \frac{(2q-1)(r_H - r_L)}{(1-r_L)(1-\alpha) + \alpha r_H - (1-q)(r_H - r_L)}.^{18}$$

Defining $R(r_H, r_L, \alpha) = \frac{(r_H - r_L)}{(1-r_L)(1-\alpha)+\alpha r_H}$, we can rewrite the last condition as:

$$p \geq \tilde{p}(q, R) \equiv \frac{(2q-1)R}{1-(1-q)R}.$$

Which is exactly what we have obtained in the reduced game (equation (1)).

We proceed now to analyze the optimal pressure-game mix of the lobby. The lobby will choose the combination of penalize-support (given by α) that minimizes the resistance of the politician ($R(r_H, r_L, \alpha)$). From here we obtain:

PROPOSITION **5** *The optimal pressure choice is:*

- *The lobby will never choose to combine to penalize and to support the politician, i.e.,* $\alpha^* \in \{0, 1\}$.
- *The lobby will choose to* ***penalize*** *the politician* ($\alpha^* = 1$)*, if her overall initial support in the electorate is sufficiently large, i.e., if* $r_H + r_L \geq 1$.
- *The lobby will choose to* ***support*** *the politician* ($\alpha^* = 0$)*, otherwise.*

Given that the pressure game we have developed is intended to be a "shortcut" for a microfounded model with several politicians competing for votes, one may identify the penalizing-game with an interest group that supports the opposition while the support-game favors the politician in office. With this interpretation in mind the Proposition suggests that it is never optimal for the lobby to support simultaneously the policymaker and the opposition, since it is always more effective to choose one single "objective" for the pressure activity. We think that there is evidence to support this result.

One natural interpretation is to think of pressure as political endorsement by special interest groups. The idea is that voters are not fully informed how they are affected by a particular policy outcome and that such information is

[18] We suppose here that when indifferent P chooses B.

costly. Endorsement works as a guideline for the voting decision that may affect the electoral outcome. The benchmark of the support-game corresponds then to endorsement of the politician (in office) while the penalize-game represents endorsement of the opposition. It is natural to endorse only one politician. See Grossmann and Helpman (1999) for a formal model and a review of the empirical findings.

Of course, one may also see pressure as money given to P or to her political competitors in order to finance reelection campaigns. Some support for Proposition 5 can be found by analyzing the data for the last Electoral Cycle of 2002 in the US. From the Top 100 Overall Donors, more than 70 per cent of the contributors clearly addressed their contributions towards one single political party (with the funds given to one party being at least double than the contributions to the other).[19]

Other interpretations of pressure are efforts to make the electorate more sensitive to the issues that matter for the lobby like May Day marches or propaganda-campaigns of the lobby.[20]

4.2 The Timing of the Game

In our model the interest group chooses first the investment in information and then the pressure level. This is a natural assumption because most political decisions in democratic institutions follow a timetable in which the information transmission (think of hearings) is not directly followed by the decision making. If this is the case, there is at least time for the lobby to exert pressure.

Moreover, it is easy to see that, in our model, the interest group always prefers the sequence information-pressure to pressure-information or simultaneous activities. The reason is that he can adjust the pressure level to the result of the information activity, which is like having an additional degree

[19] There is also an issue of dual contributions which seems of lesser importance. In the 2000 US Presidential Elections. From the Top 20 Contributors to each of the two main canditates, only three of them (Ernst and Young, Citigroup Inc and Goldman Sachs Inc) contributed with similar quantities to the two candidates, all the other contributors clearly addressed their donors towards one single political party. Dual contributions may be explained taking into account political access, see Gill and Lipsmeyer (2003). All computations have been made on the basis of the data reported by the Center for Responsive Politics. See: `http://www.opensecrets.org/overview/topcontribs.asp?cycle=2002`, `http://www.opensecrets.org/2000elect/contrib/P80000912.htm` and `http://www.opensecrets.org/2000elect/contrib/P00003335.htm`.

[20] An example of such a propaganda campaign is the effort of the association of chemists in Germany or Spain. The message of these campaigns is that at a chemist's shop one gets not only medicines but also advice.

of freedom.[21] Therefore, the lobby would endogenously choose the sequence information-pressure we have adopted, whenever it is feasible.

4.3 The Politician's Informational Update

It seems to us that the fact that the lobby's investment in information may turn out to be detrimental to advance his issues is an important assumption to derive our result that "pressure" and "information" may be complements. To see this consider, as done in Bennedsen and Feldmann (2002), that the politician updates her belief only from the evidence presented and not from the evidence that is withheld by the interest group. This would be analogous to considering that the politician is "naive" in updating her information and, after the failed report of a private test, she does not update her belief.

In such and environment, the fact that a private test allows to hold back information (now at no cost) implies trivially that the lobby prefers the private test. Maximization of the expression in equation (8), where the expected payoffs of the pressure game are now independent of x, yields that the optimal amount of information is always positive and pressure and information are substitutes.

It also turns out that in this setting the investment in information is never lower but sometimes higher than before (because it is more profitable) and, more surprisingly, that both the lobby and the politician may be better-off under this belief formation than in the presence of a fully-rational politician. Note however that this is not an equilibrium of this game since, if rational, the policymaker will always update her beliefs after a failed report from a private test.

We think that in many situations in reality information provision may be detrimental. Suppose a politician has to take a policy decision and that it is known that a lobby has made an investment in preparing his reasoning. Assume that the lobby fails to mention certain important consequences of the policy or the reasoning concerning certain consequences is weak and easily defeated. Then it seems plausible that the lobby's credibility suffers. An example for this situation may be the "Agenda 2010" package of economic reforms proposed by the German government in April 2003. In order to prevent the impression of blocking the reforms, the German Trade Union Federation (DGB) proposed an alternative which was immediately rejected by economic experts. This left the general public with the impression that there is no alternative to the government's plan.[22]

[21] This reasoning can formalized comparing the expected payoffs of both sequences.

[22] The DGB exerted also political pressure via e.g. May Day marches. See e.g. The Economist, March 22nd 2003, "Germany's Reforms: Dreaming of an economic revival"

4.4 Observable Investment in Information

An implicit assumption needed for the policy-maker to be able to update her beliefs is that the lobby's search activity is observable. It may be possible to relax this assumption along the lines in Bennedsen and Feldmann (2001). These authors show that if the politician is rational and forms optimal expectations about the incentives of the lobby to acquire information, she will, in equilibrium, update her beliefs after a lobby's failed report, even if the lobby's activity is unobservable. So the key feature of our model that information transmission makes it sometimes more difficult to exert pressure afterwards is still there. However, note that Bennedsen and Feldmann use a model in which the information acquisition decision is binary (buy or do not buy a given quantity) while in our model the decision over the quantity of information bought is endogenous.

4.5 Several Interest Groups

An important limitation of our analysis is that we restrict attention to only one interest group. We leave for future research the question whether the exerted pressure of several interest groups neutralize and induces more information to be bought.[23] However, we consider our setting to be reasonable, because among the results in Austen-Smith and Wright (1992) is that in equilibrium the politician is often lobbied by just one of two competing groups. Moreover, the group doing the lobbying is the group that disagrees with the legislator's voting disposition.

5 The Relevance of the Analysis

5.1 Welfare Analysis

In this section we will concentrate on the impact of the lobbying activity on the accuracy of the policy-maker decision. Our main finding is that when an interest group both provides information and exerts pressure, the relationship between "information" and "welfare" is ambiguous. An increase in the

and June 7th 2003, "German reforms: The Chancellor gets his way so far", Deutsche Welle, May 25th 2003, "German Unions Rally Thousands against Schröder's Reform Plans" or Handelsblatt, May 9th 2003, Milliardenschweres Gegenkonzept der Gewerkschaften zur "Agenda 2010" and "Wirtschaftsforscher sprechen sich gegen Konjunkturprogramm aus: Aus Sicht der Ökonomen stellen die Gewerkschaften falsche Diagnosen".

[23] An extension of this model may be possible using the common agency framework of Bernheim and Whinston (1986) like in Bennedsen and Feldmann (2001).

amount of information provided may be socially harmful.

We will study if the mixture of information-provision and pressure by the lobby increases the probability of taking an erroneous decision, or vice versa. Firstly, let us define the ex-ante probability of mistake ($\Pr(Error)$) as:

$$\Pr(Error) = \Pr(w = a)\Pr(D = B|w = a) + \Pr(w = b)\Pr(D = A|w = b).$$

It is straightforward to check that in the absence of any lobbying activity, this mistake probability is:

$$\Pr(Error)_{|NoL} = 1 - q \leq \frac{1}{2}.$$

Now we will proceed to study how the presence of an interest group affects this probability. We have shown in the preceding sections that the behavior of the lobby can be characterized in three different regions, determined by the cost of exerting pressure. As we will see, these regions will, as well, determine the probability that the politician chooses the wrong policy.

COROLLARY 2 *The ex-ante probability of mistake in the presence of a lobby* ($\Pr(Error)_{|L}$) *is:*

- *In Region 1 (low costs of pressure):*

$$\Pr(Error)_{|L} = q.$$

- *In Region 2 (intermediate costs of pressure):*

$$\begin{array}{ll} \Pr(Error)_{|L} = q & \text{If } q \leq \tilde{q}(p^*) \\ \Pr(Error)_{|L} = 1 - q + x^*(2q - 1) & \text{If } q > \tilde{q}(p^*) \end{array}$$

- *In Region 3 (high costs of pressure):*

$$\begin{array}{ll} \Pr(Error)_{|L} = q(1 - x^*) & \text{If } q \leq \tilde{q}(p^*) \\ \Pr(Error)_{|L} = (1 - q)(1 - x^*) & \text{If } q > \tilde{q}(p^*) \end{array}$$

Several insights can be extracted from this Corollary. First, in all the regions but the first one (when the pressure is always total), the probability of a wrong policy decision depends on whether the pressure exerted by the lobby is enough to convince the politician (i.e. $q \leq \tilde{q}(p^*)$) or not, and it is always higher when this pressure is successful.

Secondly, the lobbying activity is always welfare decreasing in regions 1 and 2, since in these regions $\Pr(Error)_{|L} \geq \Pr(Error)_{|NoL}$. Moreover, and

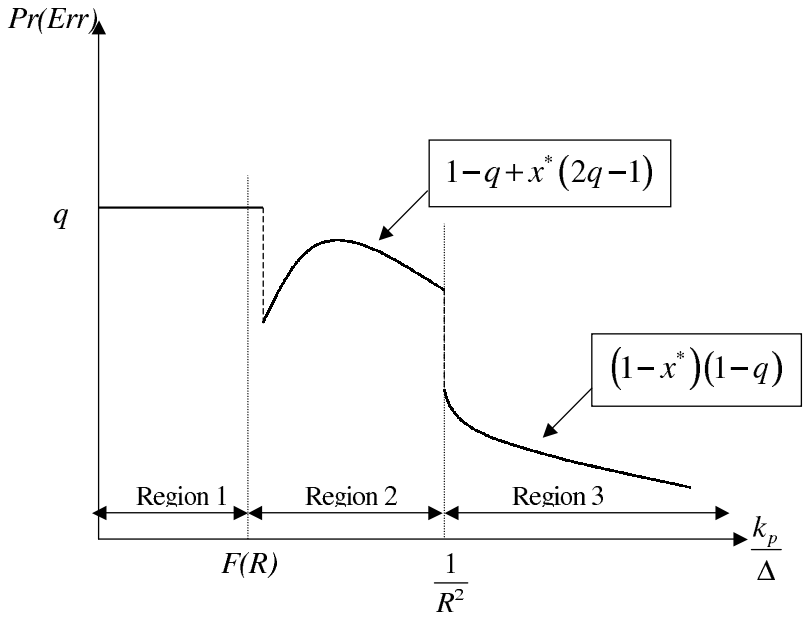

Figure 4: Probability of a mistake in the decision as a function of the cost of pressure (for a high value of q)

more surprisingly, for intermediate levels of cost-of-pressure (i.e., in Region 2), it may be the case that the more information the lobby provides, the higher the probability of a mistake in the decision. This striking result has a clear explanation. The lobby by choosing to provide information increases the probability of convincing the politician without the need of exerting pressure, but also increases the probability of revealing undesired information (that the true state is a) that reassures the politician in her prior position. This generates an extreme lobbying behavior (full pressure after an undesired report) that makes the provision of information socially detrimental. Figure 4 shows such a case.

Finally, it is worth noting that it can be the case that the lobby succeeds in convincing the politician to choose B by means of pressure (i.e. $q \leq \tilde{q}(p^*)$) but still, the lobbying activity is socially desirable from the perspective of the accuracy of the decision. In Region 3, when $q \leq \tilde{q}(p^*)$ we have that:

$$\begin{aligned} \Pr(Error)_{|L} &= q(1-x^*) < \Pr(Error)_{|NoL} = 1-q \\ &\iff x^* > 1 - \frac{1-q}{q}. \end{aligned}$$

This implies that even if the pressure exerted biases the politician's choice,

this inefficiency can be overwhelmed by the flow of policy-relevant information that the system receives.

All these results have implications for the comparison of the analysis performed with the existing literature, as well as for the debate concerning the reform of party financing. We will elaborate on theses issues in the following Subsections.

5.2 Comparison of the Results to the Literature

We compare our results to the literature by focusing on the following key-issues.

How likely is the politician to make the full-information decision? Austen-Smith and Wright (1992) propose a model that focuses on the strategic information transmission between one politician and two interest groups who have opposite interests. Lobbies have no possibility to exert pressure. They show that the more important is an issue to the interest group, the more likely is the legislator to make the correct full-information decision. In our model this requirement translates to a sufficiently high Δ. Our analysis shows that this is only a necessary condition. In our model, it is true that the costs of information transmission $\frac{k_i}{\Delta}$ must be sufficiently low. But since a lobby may also reach its aim by exerting pressure, the costs of this alternative $\frac{k_p}{\Delta}$ must be sufficiently high to reach region 3. Note that there is a potential incompatibility in both requirements. For high Δ, the value of $\frac{k_p}{\Delta}$ is likely to be relatively low and to belong to region 1 or 2 where pressure prevails over information transmission. The final decision, hence, is likely to be biased in favor of the lobby's interest.

What is the amount of information transmitted? In the related work by Bennedsen and Feldmann (2001), the interaction of information provision and pressure, induces the lobby to provide less information, in the sense that it is more likely that the lobby decides not to provide information. Although we do not provide a closed form solution for the optimal amount of information bought under a private test, it seems to us that in our model the consequences of a private test are similar. The reason is that in both models the same informational externality is present. In Bennedsen and Feldmann (2001) the decision is qualitative (provide a fixed amount of information or not). Our model shows that the results are crucially altered, if the lobby can choose both the quantity and the type of information it acquires. We find that the lobby chooses public information, and that, for a given amount of information bought under both tests, more information is transmitted because no information is hold back.

What is the amount of pressure exerted? Our model allows to compare a lobby that transmits information and exerts pressure to one that only does the later (represented by the line of $p_\emptyset$ in figure 2). We already pointed out that the interaction of the two activities can induce the interest group to exert more pressure than in the absence of information transmission. This suggests that models that do not take into account strategic information transmission may underestimate the amount of "pressure" exerted (e.g. the bribes paid in Snyder (1991)).

Does the politician make on average "better" decisions with lobbying than without? The above mentioned analysis by Austen-Smith and Wright (1992) suggests that the answer to this question is yes. In our more general model the answer is ambiguous. If the costs of exerting pressure $\frac{k_p}{\Delta}$ are low enough to be in region 1, then enough pressure to implement policy B will always be exerted. Since the probability that this decision is correct is smaller than $\frac{1}{2}$, the politician will make on average "worse" decisions. However, if the status quo is region 3, few pressure is exerted and the amount of information transmitted is large. As shown in the previous Section, in this case the activity of the lobby is likely to be socially desirable. It is certainly welfare improving when the pressure exerted is not successful and only information transmission prevails. But it can also be beneficial even if it succeeds in biasing the politician's behaviour, when the amount of information the lobby provides in exchange is sufficiently large.

5.3 The Reform of Party and Candidate Financing

The laws establishing the rules of payments from interest groups to parties and candidates are or have been subject of reform in many western countries (see the Introduction). In our simple model the notion of the pressure interest groups may exert on politicians is a very broad one. One interpretation is to see it as money paid to parties or candidates in exchange for (later) favors when politicians have to take political decisions. Analogously, the costs of exerting pressure k_p may be viewed as depending on limits on contributions, severity of sanctions in case of violation and enforcement of law. In this sense the creation of the Federal Election Commission in the United States in 1974 increased these costs.[24] With this interpretation in mind our integrated analysis of both lobbying activities leads to important and intuitive guidelines for these reforms.

[24] The Federal Election Commission (FEC) is the independent regulatory agency charged with administering and enforcing the federal campaign finance law. The FEC has jurisdiction over the financing of campaigns for the U.S. House, the U.S. Senate, the Presidency and the Vice Presidency.

We have seen that the simple formula "a higher cost of exerting pressure implies higher welfare" does not always work. It is important to point out that if the status quo belongs to region 2 and a change in the legislation increases the costs of exerting pressure not enough to leave this region, a non-desired effect may occur. In this region disclosing more information may be harmful for the politician, as it generates a more extreme lobbying behaviour. *Thus, our model implies that if a new legislation is to improve the status quo unambiguously it must establish a sufficiently high cost of exerting pressure.*

Concerning this aim one also has to take into account that what is at stake (in our model Δ) may be different for different issues. If a given legislation succeeds in establishing a cost of exerting pressure that locates, say a gun-right-lobby, in region 3, this same legislation may locate a tobacco-lobby in region 2 – because what is at stake is higher in the latter case. However, locating the issue with the highest Δ in region 3 is sufficient to locate all other issues there, too. *Therefore, a second guideline that follows from our model is that if a new legislation is to improve the status quo unambiguously for all issues it must be made for the worst case in which what is at stake is highest.*

One also has to keep in mind that Region 3 is the more difficult to reach, the more innovative interest groups are to find (new) loopholes to exert pressure. Many real life situations are very difficult to evaluate because an economic agent interacting with a politician on the behalf of a lobby may not be easily identified as such. Moreover, often it is not easy to see if the politician got "too" favorable terms in the interaction. An example helps to make this point.

Consider a public relations consultant who has ties to politicians as well as to private firms (among them the armaments industry). This firm may also act as a small editor specialized in publishing the memoirs of politicians. It is difficult to evaluate its relationship to a politician, say a defense minister, who during her office term gets payments from contracts – previous to the office term – for publishing her memoirs when retired and for seminars given. The same firm may offer loans to young members of parliament. In the latter case the problem is not so much to know whether the interest rate was "too" favorable as to know about the interaction as such.[25]

Thus, it is perfectly conceivable that a new legislation increases the costs

[25] These two examples are based on recent scandals in Germany, see e.g. The Economist, Jul 19th 2002, "Schröder in trouble", Handelsblatt, Jul 19th 2002, "Defense minister fired" or Deutsche Welle, Jul 23th 2002, "Lobbyist's Money Strains German Politics" (to be found at `http://kleist.dwelle.de/english/current_affairs/currentaffairs1.html`).

of exerting pressure via "known channels" such that one ends up in region 3. But at the same time interest groups have an incentive to find "new channels" (which may even be more expensive than the old ones under the old legislation but) which are now cheap enough to belong to region 2. *Our model implies that if a new legislation is to improve the status quo unambiguously it must refer to all possible ways interest groups have to exert pressure on politicians.*

6 Concluding Remarks

We have developed a model of interest group activities that analyzes the incentives of an interest group to provide a political decision-maker with policy-relevant information and to exert pressure on her. The novel feature of the model is precisely the integrated analysis of these two activities that are well understood – when treated separately. We see our model therefore, together with Bennedsen and Feldmann (2001), as a very first step towards an integrated theory of lobbying behavior.

Rather than reviewing our results here we summarize the basic flavor as follows. The combination of both lobbying activities generates a shift towards the transmission of more credible information but, at the same time, induces a more extreme lobbying behavior in exerting pressure. As a result both lobbying activities may be complements and the welfare implications are ambiguous because they depend on the relative costs of both activities. Both conclusions are important for reform activities. Moreover, the analysis yields empirical predictions on the choice between information transmission and exertion of pressure in different legislative environments.

One important implication of our model is the following prediction. Interest groups having the possibility to influence a policy-maker by both exertion of pressure and transmission of information prefer external experts (public test) over experts with close ties to the lobby (private test). They do so because these experts are more credible even though undesired information may be revealed. The less credible expert may reinforce the politician in her belief that the policy proposed by the interest group is not adequate and more pressure may be needed to be exerted.

Since the test choice may seem counter-factual several comments are in order. First, external experts are used.[26] Second, it is also true that pri-

[26] In this respect the articles by Mandel (1999), Posner (1999) and Thornton and Ward (1999) reporting the growing business of economic expert testimony are very interesting. Although they refer primary to economic litigation support – which is not our focus –, many of their examples, like decisions on mergers, have a political dimension and

vate tests are observed in reality. However, this may be due to the fact that in these cases the exertion of pressure is not possible (maybe because of problems of access to politicians, see the analysis in Austen-Smith (1995) and (1998)). It is easy to see that in our model when pressure cannot be exerted, the lobby is indifferent between both tests. Third, in our model there are only two extreme ways to transmit information (either publicly, or through a private test). Instead one can think of a more general set-up in which the lobby chooses among a continuum of experts ranked by their credibility (the probability that they reveal the truth, no matter what they learn). Our analysis suggests that in a mixed information-pressure game, the lobby will choose an expert with a relatively high credibility in order not to worsen his capacity to convince the politician by means of pressure. Fourth, our setting excludes many interesting considerations, like the possibility that the lobby "buys" an expert who writes a report in favor of the lobby's interest in order to counterbalance an already existing "bad" public test. All this shows that the choice of the test may be an interesting topic for future research.

Finally, casual observation suggests that lobbies' access to politicians and, hence, their capacity to influence the policy outcome by means of pressure, is more limited in Europe than in the U.S.. In this respect, for instance, the legislation governing campaign contributions are generically more restrictive in Europe. In spite of this access difficulties to exert pressure, European interest groups do not seem to opt for a more informational lobbying relative to the American ones. Our model provides a possible explanation for this lack of substitutability among the two ways of lobbying. The reason is the strategic effects that providing information has over the policy-maker and, therefore, over the profitability of engaging in costly pressure. As a result, an increase in the cost of exerting pressure can lead to a reduction, both in the pressure exerted and in the information transmitted in equilibrium. Certainly, more research, both theoretical and empirical would be needed to assess the relevance of this complementarity among information and pressure in lobbying activities that we have spotted.

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seem to support our prediction.

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