Corporate lobbying:
A review of the recent literature

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Abstract:

This survey covers recent literature on lobbying, with particular focus on corporate lobbying. Three main research traditions --- contestsfor policy rent, persuasion games, and multiple means models --- are analyzed in detail. Various strategic aspects of lobbying arepresented in the context of a single unified model that encompasses both strategic communication and monetary contributions. Next, thereview investigates into three particular issues in the lobbying literature: (i) Incentive to lobby and the equilibrium amount of lobbying,both in the presence and absence of competitors, (ii) strategic substitution and complementarity of lobbying and contributions,and (iii) the role of intermediation in lobbying. Recent evidence from corporate lobbying is presented.

Keywords: lobbying, political contributions, menu auction, contest, persuasion

JEL: D72, D82, D83

1 Introduction

Measured by observable spending, lobbying represents the single most important channel of corporate political influence (Ansolabehere et al. 2003; Bennedsen and Feldman 2002; de Figueiredo and Cameron 2008). By meeting with the policy makers, hiring lawyers and policy experts, submitting briefs, conveying research results and technical information, engaging in media advertising and PR campaigns, and participating in protests, firms build and maintain influence over policies. Their aim is to seek rents through favorable regulations, tax treatment, public procurements, and aid, or to shelter from rent-extraction by means of arbitrary tax demands.

This study reviews the latest developments in the theory on lobbying, and recent evidence gathered specifically for corporate lobbying. Proliferation of the contest literature, disclosure games, strategic information transmission and communication has changed the landscape of the lobbying modeling in the last decade. Also, the choice from a set of instruments has only recently been addressed in multiple-means models. To our best knowledge, progress in this area since reviews by Grossman and Helpman (2001) and Winden (2003) has not yet been put into a single treatment.

We identify three distinctly different modeling traditions: contests for policy rent, strategic information transmission, and multiple means models. To clarify their differences, the survey is structured such that it investigates separately all modeling features that make the traditions different. In the first step, we reflect the developments of the contest literature of the last decade, especially the attempts to build explicit informational foundations for the contest for policy rent. Secondly, we show how lobbying is modeled by persuasion games with informational search. Third, we build a unified model following Kamenica and Gentzkow (2011) and illustrate how multiple instruments for political influence can be combined within a single setting.

The survey reflects also advances on the empirical front. Lobbying by firms has been selected as the major part of observable lobbying outlays, where benefits can be identified and industries can be classified. Also, growing corporate lobbying raises a growing public concern (The Economist, 2011). In the last decade, a group of articles exploited survey firm-level data on political influence from the World Bank Enterprise Survey and World Economic Forum. In the US, the Lobbying Disclosure Act 1995 revealed the exact lobbying outlays in the United States and provides relatively clean data on the salaries of lobbyists and their staff, and prices per reports and fees for expert consultants. All together, the studies shed the light upon the size of the market, its asymmetries, cost-benefit ratios of lobbying, and the key role of intermediation.

The paper proceeds as follows. Section 2 very briefly presents and classifies the latest theories of lobbying. Section 3 builds a general model and reviews the key modeling ingredients in details and sheds light on the key mechanisms of lobbying models. Section 4 exploits

state-of-the-art knowledge to address the selected questions: When does lobbying pay off? Are lobbying and direct contributions to policy-makers substitutes or complements? What is the effect of regulations on competitive lobbying? What explains the presence of lobbying intermediaries? For each particular question, both theory and evidence is summarized. Section 5 concludes.

2   Theory

The literature on the means of corporate political influence spans across separate fields of economic theory, political economy, and political science. Luckily, in spite of a great variety of contributions, the main ideas can be presented and explained in relative simple and tractable static settings accessible even to non-specialists.

To begin with, we classify the literature into three main families of models. In all what follows, we shall use PM and L as abbreviations for a policy maker and lobby.

2.1   Policy rent

2.1.1   Contests

Influence functions.   The early political economy models allow policies to be influenced by lobbying effort by postulating an influence function that directly maps effort into influence (e.g., Becker 1983; for a survey, see van Winden 2003). Axiomatic restrictions on the properties of the production of influence allow to study the effects of competition, and changes in the influence technology. As a reduced-form approach, the functions bring about several interesting and testable implications, but at the same time abstract from at least two key problems, namely (i) modeling consistently policy-makers' motivations, and (ii) explaining precisely the channels of influence. Instead of developing and calibrating the influence functions, subsequent research thus has switched attention to building explicit microfoundations of influence, asking why policy makers respond to evidence, offers and threats, and how is information shared between lobbyists and policy-makers in the process of exerting influence.

Rent seeking.   At the time when influence functions were in retreat, the rent-seeking tradition associated mainly with Tullock (1980) flourished and now still remains a lively platform for modeling political influence of corporations and other interest groups.[1] A rent-seeking contest constitutes a special form of an influence function; again, investments into political influence are irreversible, and there is no restriction on how the investments should be interpreted and operationalized. The major difference is that a rent-seeking contest is explicit in how the influence is bought (cost function) and how exactly influence affects the policy (through probability of winning a policy rent or gaining share of the policy rent).

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[1]For a survey on outcomes and costs of rent-seeking contests, see Del Rosal (2011).

Technically, rent-seeking contest is a mechanism that distributes a policy prize to the contest winner(s). The prize can be interpreted as the right to set a certain policy. Valuation of the prize may be player-specific. The costs of the effort are captured by a separable cost function, and costs are irreversible up-front payments. The probabilities of winning a prize (or shares of the prize) are given by a predetermined contest-success function (CSF). Two functions are studied most frequently, *Tullock's lottery* and *all-pay auction*. Both are special cases of a logit function, where Tullock lottery represents a case of imperfect discrimination and under a common cost of effort is equivalent to a simple raffle while the all-pay auction represents a perfectly-discriminating contest.

One problem with any CSF is that it is empirically difficult to determine its shape. Hang (2002) shows that an exclusion restriction may serve as a useful test: For a Tullock lottery, excluded lobbyists must have lower valuation than included lobbyists. In contrast, for an all-pay auction, excluded lobbyists are those with the higher valuation. Testing the shape is complicated also by the necessity to control for other properties; for example, since the level of outlays depends on the degree on players' asymmetry, a test for elasticity of effort that uses aggregate spending requires a measure of asymmetry. Even more importantly, the test must control for the possibility to commit to a compromising policy, because in the absence of commitment, an increase in discrimination in most cases increases outlays (Epstein and Nitzan 2004), whereas with commitments, total expenditures fall if discrimination increases (Münster 2006).

Most importantly, like in any model assuming influence, contests put the source of influence into a black box. The effort can represent a variety of channels: (i) a pure transfer to the politicians in the form of campaign contributions or direct compensations, (ii) services provided by an intermediary, for example access facilitation, or (iii) investments into search for valuable evidence. Also, rent-seeking tradition considers lobbying to be a single activity of exerting pressure, and this is at odds with a more refined approach that defines lobbying only as search and communication of evidence.

To answer whether a contest captures also investments into search and communication which is our preferred definition of lobbying, it is first important to see if a CSF can be explained by means of pure informational transmission. The agreement within the rent-seeking camp is not complete. Epstein and Nitzan (2006b, p. 424) doubt that the contest approach is useful for dealing with the role of asymmetric information in politics at all. In contrast, persuasion contests and innovation races demonstrate that a competition in raising knowledge may exhibit properties of a CSF.

Persuasion contests.   Lagerlöf (2007) presumes that a policy maker (PM) wants to award a project to an efficient firm. Each firm knows its efficiency, but nothing else. The lobbying firms (L) search for evidence that would confirm their efficiency, and search outcomes are stochastic. Search is unobservable, so search cannot serve as a signal, and posteriors are

conditional only upon the raised evidence. This model of persuasion contest is interesting as it may produce non-linearity of total outlays in the number of firms. Skaperdas and Vaidya (2011) model competition between lobbyists in gathering either deterministic or stochastic evidence. Uncertainty is ensured by assumption on the PM's decision-making: The PM follows the presented evidence in accordance with a likelihood-ratio function, which generates the necessary stochastic element that ultimately leads to a CSF.

Innovation races. In the literature on research and labor tournaments, the problem is not to convince PM of value of the proposed policy, but to generate the value as such. Consider contestants who competitively search in order to gain extra competence, knowledge, or skill that is valuable to PM. A simple version is in Baye and Hoppe (2003): Suppose two players compete to be awarded a project, with government awarding the project to the better proposal. Each player can search for designs. Then, if the design proposals are independent draws from identical distributions, then the probability that a given player produces the best design equals his share of the total number of designs. Glazer (2008) extends the setup by allowing the government to bargain with several firms that present an equally good design. In these settings, the government is time-consistent because it selects the best design to maximize value, and it is randomness of search that delivers properties of the contest success function, not any property of PM's decision-making.

Innovation races involve at least four fundamental differences if compared to standard contests for rent: (i) Investments are productive (used ex post in production), not unproductive (used only ex ante). (ii) The outcome of investment is private (excludable) input, not a public good (such as public evidence). Thus, unlike for persuasion contest, the use of the investment must be accompanied by a trade between the owner of the competence and the PM. (iii) Payments to the PM are in the bargaining stage, not in the investment stage. Thus, PM effectively seizes part of the rent by bargaining, not by contest. (iv) The role of the contest is not to distribute the rent between the lobbyists and PM, but to create a rent. To sum up, only a narrow class of activities that exert political influence can be modeled as both informational transmission and competitive contest.

2.1.2 Auctions and bargaining

Bargaining and auctions. Irreversibility (or all-pay) property of payments in contests is motivated by observing that lobbying and campaign expenditures are simultaneously submitted by competing parties prior to distribution of the prize, mainly to secure access to PM. Still, one cannot neglect a mechanism where competing lobbyists pay only after they are assigned the policy rent. In that case (modeled either as binding bids or reversible/reimbursed investments), it is interesting to see that the revenue-oriented PM may prefer to establish reversibility. Consider two groups with an identical valuation v. In Tullock's contest with irreversible payments, the government collects $\frac{v}{2}$. If there is a non-cooperative bargaining

protocol where the government alternates take-or-leave offers between the groups, with discount rate $\delta \in (0, 1)$, then, a subgame-perfect equilibrium gives the PM $\frac{v}{2-\delta} > \frac{v}{2}$. In a standard first-price auction, equilibrium bids are even as large as v, and the expected revenue is $v > \frac{v}{2-\delta}$.

Epstein and Nitzan (2006b) study the design of rent allocation when a mixed-objective PM may either organize contest or allocate the policy rent to a higher-value participant. This issue becomes even more interesting when the PM also has agenda-setting power so it can limit the set of policies that can be implemented by the winner of the contest. This constraint imposed by the PM affects the valuations of the contestants, and represents another way how the PM addresses the tradeoff between setting a good policy and raising valuable payments.

Menu auctions. The idea of reversible investments (bids) can be approximated by a standard auction where the object to be auctioned is the right to set a policy. Alternatively, it is not the right but the policy itself that is subject to auction. Given that an auction must determine a policy from a set of mutually inconsistent policies, it must be organized as a menu auction where bids are set contingent on policies and possibly other observables (Grossman and Helpman 2001). A winning policy is determined by maximal total bids, and only bids related to the winning policy are collected from the bidders. Thus, there is not a winner who implements a favorable policy, but a winning policy supported by multiple contributors. The menu-auction tends to represent a workhorse model of assignment of policy rent, even if some properties of menu auctions have been subject to discussions, namely (i) the existence of non-truthful equilibria, (ii) extremely large power of PM, implying that L should prefer to focus on other means of influence, including the selection of PM and incentives to avoid participation; and (iii) need of L's commitment when collecting policy-contingent bids.

2.2 Strategic information transmission

Since lobbying is the process of conveying messages from L to PM, a natural question is how precisely communication motivates PM to change the policy. Four groups of models examine strategic communication. The decisive variables are whether the messages are costly or costless, and whether they deliver verifiable or non-verifiable substantive evidence.

2.2.1 Persuasion

The first in the class of strategic information transmission of non-verifiable messages is *cheap talk*, capturing all costless communication of biased L towards PM.[2] The closer aligned are the lobbyist's and policy-maker's preferences, the better cheap talk communication works. Typically, the content of the message is the state of the world, where both lobbyist's and

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[2]For a seminal chapter-long survey of the main developments, see Grossman and Helpman (2001, Ch. 4). For an extension to sequential revelation of information, see Aumann and Hart (2003).

policy-maker's optimal policy are correlated with the true state of the world, but the lobbyist's policy is biased. A costless message on the state, taken in a literal way, may serve as a costless signal if the lobbyist's bias is expected to be low. Although full revelation is generally not achieved, the information improves. Typically, credibility of the cheap talk message further improves in the presence of the opposition that applies counteractive lobbying, and if messages are multidimensional.

The relevance of cheap talk modeling is mainly qualified by the existence of enormous lobbying outlays and the size of the intermediary market, thus the role of cheap talk is seen rather as a starting point for models with the cost of achieving and presenting messages.

When messages are verifiable, message space is type-dependent and we speak of *persuasion games* (Milgrom 1981). Verifiability appears to be particularly useful as a building block of the search models. Verifiability normally enhances credibility of the messages and increases scope for full revelation. Under monotonicity assumptions (i.e., Receiver's best response increasing in type and Sender's utility preferring higher action than Receiver), any rationalizable equilibrium contains full revelation. (For a generalization, see Giovannoni and Seidemann 2007.) In the presence of neologism-proofness (i.e., out-of-equilibrium messages are taken literally), Ryan and Vaithianathan (2011) nevertheless show that verifiability not necessarily facilitates full revelation.

2.2.2 Signaling

A non-verifiable message may deliver extra information to the PM also in the case it is costly to give such a message. The (exogenous or endogenous) cost serves then as a *signal* od the Sender's (L's) type. In a seminal exogenous-cost model, Potters and van Winden (1992) show that signaling is parametrically-dependent: a small signaling cost does not convey information, whereas the large cost deters from lobbying by means of signaling. Only an intermediate cost separates those lobbyists who point to a relevant information from those who exploit the opportunity to mislead. Signaling models also feature other problems typical for information economics: (i) The presence of a costly message in the strategy set may decrease expected lobbyist's payoff, (ii) multiple equilibria and equilibria switches complicate comparative statics, and (iii) pooling equilibria with zero extra information are present for almost any parameters.

Austen-Smith and Banks (2000, 2002) combine costly messages (money burning) with costless messages (cheap talk). The combination increases the scope for credible cheap-talk, hence the existence of the instrument is complementary to the use of another instrument. With endogenous cost and a single lobby, even full revelation is possible. Tovar (2011) made a recent extension of endogenous cost setting with full revelation. Therein, L not only signals at a selected level, but also offers a contribution schedule that is conditional upon all payoff-relevant variables, namely the state of nature and the policy.

2.2.3 Screening

When the access cost is imposed by the PM, we speak of *screening*. This concept of information transmission is attractive because it explains why lobbies agree to paying substantial amounts for being able to successfully communicate messages, even if the messages are not verifiable. This type of information transmission is attractive for two additional reasons: (i) PM prefers to collect access payments instead of letting the signal to be produced by wasteful (money-burning) activities, and (ii) the access fee serves as a rationing device for a time and attention-constrained politician who thereby balances 'lobbying supply' and 'lobbying demand'.

For known bias, groups may separate such that moderate groups never pay but are always listened to, whereas screening is applied only to extremists (Lohmann 1995). For unknown bias, fee is paid either by close groups or extreme groups (Austin-Smith 1995; Lohmann 1993). For a thorough treatment, see Grossman and Helpman (2001, Ch. 5.3). In Section 2.3.2, we will show how screening has recently been used for verifiable messages.

2.2.4 Search

Prior to conveying messages, lobbying needs to obtain evidence or signals that can be communicated. In all heretofore discussed models of strategic communication, the state of nature or any signal was assumed to be the L's inherited private information. Once we abandon the information asymmetry, a firm preferring certain policies needs extra supporting evidence and her bias motivates L to seek extra evidence. In the end, information search complements the persuasion games analyzed above (e.g., Lagerlöf 2007, Henry 2009). Yet, search is not necessarily just an extension of a persuasion game by a pre-play, where the persuasion interaction constitutes a proper subgame. Specifically, if search is unobservable or no-evidence message can be reported, then persuasion is not a proper subgame, hence we cannot solve the search game by inserting subgame equilibria from the persuasion games.

To sum up the section on strategic communication: The basic differences between strategic information transmission and the contest tradition are explicit motivation of PM, explicit description of the influence (through effect upon beliefs), a full description of the structure of the information, and the presence of lesser commitments. The drawbacks of strategic communication are multiplicity of equilibria, difficulty to make robust predictions, and the need to assume extreme sophistication on part of players to support certain equilibria.

2.3 Multiple means models

Although strategic information transmission illuminates communication aspects of lobbying, it is silent on the role of other channels of influence. Multiple-means models address this problem by explicitly modeling the L's choice from several instruments for influence. In

this relatively heterogeneous group of papers, communication mechanisms are combined with bargaining and auction schemes.

Timing is the key aspect to differentiate between these two-instrument two-stage games. For *informational lobbying*, evidence is first gathered and presented, and then bribes follow (show and pay). In *pay for access*, payments are made, and evidence is presented (pay and show). Apriori, it is not clear which timing is more realistic. Notice that the difference in timing depends also on priors and the possibility to restrict access. With symmetric priors, L cannot make an influential message without an extra investment, and evidence-gathering is the necessary first step. Or, once access cannot be restricted, payments are likely to be made after lobbying.

2.3.1 Lobby and pay

Informational lobbying presumes search and communication in the first stage and payments in the second stage. The second stage is either in the form of extra pressure (Dahm and Porteiro 2008a, 2008b) or in the form of non-cooperative bargaining (Bennedsen and Feldman 2006). In the former case, the idea is that PM's posteriors can be modified by buying extra influence. In the latter case, the idea is that if there is a surplus between L and PM associated with a policy change even after strategic information transmission, this surplus can be cashed in by compensating payments. These two different approaches predict different relations between the instruments. A third possibility is lobbying as signaling in the first stage and payments as menu-contributions in the second stage (Tovar 2011). Precisely, menus of contributions are offered first, then signals are produced and finally payments are made. This represents a unique combination of endogenous-cost signaling and common agency in a single framework.

These models differ in how a surplus of a policy change is redistributed between PM and L in the contribution subgame. In *bilateral bargaining*, an explicit non-cooperative bargaining model derives how L compensates PM for a policy change. Another option is to directly set either lobby's or policy-maker's WTP as a measure of compensations. For example, Bennedsen and Feldman (2006) apply policy-maker's WTP for single-group lobbying, and lobby's WTP for multiple-group lobbying (menu auction). Their idea is that a single lobby has a strong bargaining power to capture full surplus, whereas competitive lobbying leads to truthful contributions, where it is the PM who captures the entire surplus. In such a case, comparison of single-group and multiple-group lobbying thus must account for the fact that the bargaining strength of a corporation vis-a-vis politicians is not invariant to the number of players. Moreover, even within menu auctions with multiple groups, truthful contributions are not necessary the outcome; a winning lobby may set a best-response bid that makes PM exactly indifferent but the loser does not participate (see Felgenhauer 2010). Such a bid makes the winning lobby capture full surplus from the policy change.

For several lobbies, each with a different optimal policy, bargaining between PM and lobbies needs to be structured. The structure is determined either as *contest* (where findings

from Section 2.1.1 apply), *auction* (without or with policy commitments; see Epstein, Nitzan 2004), *menu-auction* (with or without PM's private information; see Felgenhauer 2010), or as *multilateral bargaining* (e.g., with a sequence of alternate take-or-leave offers; see Glazer 2008).

2.3.2 Pay and lobby

Alternatively, contributions in the first stage have to be paid to allow lobbying in the second stage ('pay-to-play' politics). This logic conforms with intuition that campaign contributions and some types of lobbying expenditures serve only as tickets for access to PM. The timing effectively belongs into the class of screening models reviewed above. Yet, once the second stage involves presenting verifiable information, it begins to play a strategic role, and the model is better seen as a special case in the class of two-stage models with payments and verifiable communication.

Two papers on pay-to-play politics with verifiable information exist to date. In Austen-Smith (1998), all lobbies that pay ticket are allowed to meet the PM. In Cotton (2009), a single ticket is auctioned in an all-pay auction of two interest groups. Each group possesses a private, jointly independent piece of evidence. Payments in this auction reveal both pieces of evidence, hence ex post verification by the PM serves only to confirm the posteriors.

An all-pay auction of access appears to be an extremely attractive mechanism for the PM, relative to other means including auctions of policy rent and contests for policy rent. Cotton (2009) shows that selling access by means of all-pay auction is preferred to selling policy rent by means of all-pay auction, unless his PM's valuation of the policy is significantly lower than the lobbies' valuations. One observes that screening combined with the persuasion subgame is attractive both (i) relative to other means of information transmission (by securing full revelation and raising more funds) and (ii) relative to other means of raising funds (by getting a better policy).

3 Essentials

To understand more how lobbying influences policy makers, it is essential to review ingredients of the leading models. A detailed knowledge of the main building blocks gives us a chance to check relevance of the models and also its qualitative predictions. We build the comparisons on the grounds of a general setting by Kamenica and Gentzkow (2011) that captures a large class of persuasion mechanisms, including signaling, cheap talk, verifiable evidence, honest mechanisms, and communication with lying costs.

3.1 States and policies

For states of the world in a finite state space $\theta \in \Theta$, let $\Delta(\Theta)$ denote the set of all probability distributions on Θ. A prior is $\mu_0 \in \Delta(\Theta)$. Policies $d \in D$ are from a compact policy space D. L (Sender) has a utility function $u(d, \theta)$ and PM (Receiver) has a utility function $v(d, \theta)$. We denote the PM's optimal set of policies for her belief μ as $d^*(\mu)$.

A frequently presented special case is for two states of the world (low and high), $\Theta = \{\theta_l, \theta_h\}$. Probability of high state is denoted $\mu = \Pr(\theta_h) \in [0, 1]$. The prior probability is $\mu_0 \in [0, 1]$. Consider three policies, $D = \{d_l, d_0, d_h\}$. For each player, expected payoff of any policy $d \in D$ is a linear combination of the payoffs in each state θ, hence is linear in μ. For convenience, L's preferences over policies are invariant to states, such that $0 = u(d_l) \leq u(d_0) < u(d_h) = 1$. For PM, a policy d_l is optimal for PM if $\theta = \theta_l$, and a policy d_h is optimal if $\theta = \theta_h$, i.e., $d^*(0) = d_l$ and $d^*(1) = d_h$. In addition, $d^*(\mu_0) = d_0$, hence d_0 is called *default policy*.

Each persuasion/lobbying/communication mechanism induces a Bayes-plausible lottery (distribution) over the PM's posteriors. Let $\tau(\mu)$ be any *distribution of posteriors* on $\Delta(\Theta)$. Then, for $\tau(\mu)$ to be induced by a persuasion mechanism in a perfect Bayesian equilibrium, the expected posterior probability of each state equals its prior probability, $\int \mu \, d\tau(\mu) = \mu_0$ (Bayes plausibility). In our special case, if the lobbying mechanism leads to exactly m posteriors μ_i, $i = 1, \ldots, m$, then the distribution writes $\tau = (p_1, \ldots, p_m)$, and Bayes-plausibility requires $E_\tau(\mu) = \sum_i p_i \mu_i = \mu_0$.

We will specify the persuasion mechanism in the subsequent section. Now let us specify the values of the persuasion mechanism for the players. First, suppose some selection criterion ensures that optimal policy $d^*(\mu) = \arg\max_D \int v(d, \theta) d\mu(\theta)$ is a singleton for all posteriors induced by the mechanism. Notice that the PM's indirect utility in her posterior μ is constructed in an upper envelope of the PM's continuous expected payoffs (optimal policies), $V(\mu) := \int v(d^*(\mu), \theta) d\mu(\theta)$.

L's value (*indirect utility*) at a PM's posterior μ is $U(\mu) := \int u(d^*(\mu), \theta) \, d\mu(\theta)$.[3] In our special case with a simple state space and L's state-independent preferences, $U(\mu) = u(d^*(\mu))$. The expected value of the mechanism for L is $E_\tau U(\mu) = \sum_i p_i U(\mu_i)$. The mechanism is preferred by L only if $\sum_i p_i U(\mu_i) > U(\sum_i p_i \mu_i) = U(\mu_0)$. It implies that $U(q)$ must be *convex at a point* μ_0. In contrast, with concavity, $U(\mu)$ exhibits risk-aversion, and lobbying mechanism is not implemented if L has veto on its use. Thus, a key issue in lobbying is to determine the shape of $U(\mu)$.

The shape of $U(\mu)$ is based on two things, (i) whether PM's policy $d^*(\mu)$ is concave or convex in μ, and (ii) whether L's payoff is concave or convex in d. In our special case, it is normally assumed that L's payoff is convex in d, and the single important property

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[3]Notice that even if L may have a different posterior than the PM, we must use the PM's posterior. The reason is that the value of a mechanism will be ex ante expected value, where information is symmetric, hence the L's ex ante belief conditional of learning that the PM will have belief μ must also be μ.

is concavity or convexity of function $d^*(\mu)$. For a finite D, $d^*(\mu)$ is a step function at μ where PM changes the policy. These discontinuities make concavities and convexities at points parameter-specific (see Dahm and Porteiro 2008b) and also produce discontinuities in the parameters of the persuasion mechanisms (such as parameters characterizing signal and message technologies). For instance, Bennedsen and Feldman (2006) separately analyze changes of posteriors that are small enough (weak signals) and large enough (strong signals).

Kamenica and Gentzkow (2011) show that if L can design a persuasion mechanism arbitrarily, subject only to Bayes-plausibility, then persuasion works whenever (i) default policy is not the first-best for L and (ii) in the neighborhood around prior μ_0, $d^*(\mu)$ is constant. The idea is based on showing that Bayes-plausible persuasion mechanisms implement posteriors in the convex hull of $U(\mu)$, $C(U, \mu)$. The above conditions imply that $U(\mu_0)$ is in the interior of $C(U, \mu)$, hence there is a mechanism that implements a Bayes-plausible convex combination of payoffs in posteriors, $U(\mu)$, such that $E_\tau U(\mu) > U(\mu_0)$. This process of *concavification* has been used in a variety of similar communication contexts, e.g., in Brocas and Carillo (2007).

One option to avoid step-wise indirect utility is to add such structure to the problem that the PM's optimal policy is stochastic in posteriors on fundamentals (see Dahm and Porteiro 2008a). Suppose the states of the world are characterized by two independent dimensions (θ, r), a fundamental dimension and a PM's type (e.g., ideology, risk aversion, or relative weights attached to contributions). The PM type is private information that influences only $v(\cdot)$, but no other payoff, and the PM cannot communicate her type. A persuasion mechanism is invariant to the PM's type, hence implies a distribution of posteriors where the densities are constant in the type-dimension, and we may let $\mu(\theta) := \mu(\theta, r)$. Then, discontinuity in $U(\mu)$ may disappear, since each $d^*(\mu(\theta))$ is constructed as an expected policy from a distribution of PM-types, not as a (deterministic) policy of a single PM.

As a result, the concavity and convexity of the shape of the distribution of PM-types becomes the third parameter that affects whether lobbying mechanism is desirable. In our special setting, with a parameter $r \in [0, 1]$, suppose that PM's payoffs from 'fitting' the right policy are $v(d_l, \theta_l) = r$ and $v(d_l, \theta_h) = 1 - r$. The payoffs from a policy mismatch is normalized to zero, $v(d_l, \theta_h) = v(d_h, \theta_l) = 0$, and also the default policy d_0 gives only zero. Thus, $d^*(\mu, r) = d_l$ if $\mu \leq r$ and $d^*(\mu, r) = d_h$ if $\mu \geq r$. Then, with any distribution of PM's types $F(r)$, L's expected payoff is $U(\mu) = \Pr(d_h) = \Pr(r \leq \mu) = F(\mu)$. The value of the persuasion mechanism depends only on concavities and convexities in the distribution $F(r)$. In this context, it is clear that Dahm and Porteiro's (2008a) results crucially hinge on risk-neutrality that is imposed by the assumption of a uniform distribution, $F(r) = r$.

There is also a long tradition of a single-dimensional spatial modeling, $\Theta = D \subseteq R$, where optimal policy is a linear function of the expected state $\theta_e := E_\mu \theta$, $d^*(\theta_e) = \theta_e$. L's preferences are either monotonic in policy $d \in D$, or exhibit a constant bias δ, hence the L's optimal policy is $\theta + \delta$. An extension is counteractive lobbying in Cotton (2009), where the state of fundamentals is two-dimensional, $\Theta_1 \times \Theta_2$, and the policy space D is single-

dimensional. The PM's optimal policy is a linear combination of beliefs on fundamentals, $d^*(\theta_{1,e}, \theta_{2,e}) = \theta_{1,e} - \theta_{2,e}$.

3.2 Players' instruments and commitments

3.2.1 L's instruments

In this review, we restrict attention only to instruments that target a single PM, and policies that differ only in content, not in other aspects such as durability of influence (c.f. Harstad and Svensson 2011). The literature analyzes predominantly five instruments of L's political influence:

- *Commitment to a platform.* If the right to set a policy is sold or auctioned to a single winner, the competing lobbies may commit to a platform that will be implemented conditional on winning the right.

- *Search for verifiable evidence.* For search, observability is crucial as it isolates no-search subgame from the subgame with signals produced by search, and the role of PM's expectations of search in a perfect Bayesian equilibrium diminishes to zero. Unobservable search requires barriers both on the PM's side (e.g. prohibitively costly monitoring) and the L's side (e.g., missing incentive to use credible reporting or prohibitively costly reporting).[4] Unobservability brings in at least three effects: (i) First, the set of multiple equilibria tends to enlarge. (ii) Second, the PM knows that extra search is opportunistic (to get better evidence and hide bad evidence), hence anticipates moral hazard. The equilibrium amount of search tends to increase. (iii) Third, L may be subject to pessimistic PM's expectations, called as 'curse of lobbying' or 'trap of information acquisition', which depresses the L's value of the persuasion mechanism even below zero (Lagerlöf 1997).

- *Persuasion by admissible messages.* In cheap-talk games, messages are unverifiable, hence any message is admissible. In persuasion games, messages are verifiable, but presented evidence may be affected by communicating incomplete evidence (strategic concealing). Normally, concealed evidence is not used any further. Stone (2011) developed an interesting extension of strategic concealing where concealed evidence may be put into public domain. Therein, the evidence is only randomly observed by the PM, but the PM is not able to recognize the source of the evidence.

- *Signaling or screening by costly actions.* In signaling or screening games, a costly message is not verifiable. An extension is a two-level 'pay-and-lobby' game where lobbies with access have to communicate only verifiable messages. Interestingly, verification has

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[4]For the sake of interpretation, it is worth mentioning that with a single-type L, unobservability matters only in the construction of the equilibrium, since any L's action correctly inferred and expected in the equilibrium.

a very limited role in equilibrium; it only confirms the correct posteriors of the winner's type that is inferred from the level of contributions (Cotton 2009).

- *Contributions.* One of the main properties of contributions is whether the payments are contingent upon a policy, rent, or any other observable variable. We can identify four forms of the payments. (i) Policy-contingent compensations in the bargaining stage or in menu auctions. Notice that the shape of the marginal cost of compensation affects concavity vs. linearity in $U(\mu)$ in search games with ex post contributions. For example, Dahm and Porteiro (2008b) have an increasing marginal cost thus additional local concavity, whereas Bennedsen and Feldman (2006) assume a constant marginal cost. (ii) Bids in standard auctions that are paid only by winners. (iii) Investments in a contest for a policy rent or PM's attention. These payments are irreversible hence not contingent. (iv) Tickets for access. Again, the tickets are irreversible payments. In addition, this is the only type of contributions that serves an informational role, namely in the context of two-level 'pay-and-lobby' games.

3.2.2 L's commitments

Commonly, L has significantly less commitment devices at disposal than PM. Still, two types of L's commitments can be found in lobbying models. The first is *ex post policy-contingent payment.* For example, in a menu auction, lobbyists commit to payments conditional on policy adopted (see Bennedsen and Feldman 2006). In Tovar (2011), contribution is also contingent upon the state of the world, and a *state-and-policy-contingent ex post payment* represent the strongest type of L's commitment to an ex post payment. Notice that in an unregulated environment, the lack of L's commitment could theoretically be replaced by a commitment by PM to request payments affront and then return some of them back.

In contests, a winner normally realizes his or her first-best policy. The second type of L's commitment is when contestants commit to realizing a certain compromising outcome (*policy/platform commitment/announcement*). This commitment strategically decreases the opponents' valuations. Epstein and Nitzan (2004) show in a spatial setting that if valuations are endogenous due to the option of policy commitments, moderation of aggressiveness of the opponent is a first-order effect to the loss of value from own policy. Münster (2006) adds that moderation is incomplete for imperfect discrimination, and complete for perfect discrimination.

3.2.3 PM's objectives

The first generation of the rent seeking contests limited the PM's role only to the distribution of the prize by the rules of CSF. However, an implicit idea was that the PM intentionally generates rents as contest prizes because he or she values benefits associated with the rent-seeking investments. The early contest literature thus focused on the contest design for a

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purely revenue-oriented PM.

To make PM's decision-making more realistic, one may postulate a PM with a mixed objective who shapes parameters of the contest (see Epstein and Nitzan 2006). Then, the very first choice of the PM is to determine whether to use the contest at all or rather hand out the prize to the highest-valuation group. For a mixed-objective PM, another important strategic variable becomes the presence of policy restrictions that bind the contest winner, change contestants' valuations, and also their efforts. To sum up, a mixed objective PM solves a number of tradeoffs before initiating a contest that are absent for a purely revenue-oriented PM.

A mixed objective is present not only in contests, but also in menu-auction, pay-for-access models, and it naturally takes place in bargaining between L and PM. For strategic information transmission per se, contributions are not present, hence the tradeoff between policy and revenue does not exist. However, in multiple means models that apply information transmission in an early stage, the exact shape of PM's motivation plays a largely significant role for the design of contributions schemes. The key issue is how to structure the interaction to both extract information and collect payments for a mixed-objective PM. This topic is now at the frontier of the research interest. For example, Cotton (2011) identified the optimal contest for PM's attention for lexicographic preferences that value revelation in the first place and payments in the second place.

3.2.4 PM's commitments

The literature frequently constrains the PM in the interaction with lobbies, hence either implicitly assumes commitment devices or works with time-inconsistent behavior. The most complex commitment is the *commitment to the rules* of a contest, including the use of collected payments (e.g., the shape of CSF), the promise to sell policy (not only agenda or access), the lack of separate bilateral bargaining with additional side-payments, and the promise to keep policy restrictions (agenda restrictions) prior to the contest. The incentive of the PM to break a promise moreover varies in parameters. Consider three examples:

1. Cotton (2009) lets PM choose ex ante from two different classes of all-pay auctions. In one, the right to set policy is sold, and in the other, it is access that is sold. Both are organized exactly in the same way and differ only in the last moment, after payments are collected. Therein, the PM has an incentive to switch from policy-sale rules to access-sale rules because it implies a policy improvement without extra cost.

2. The promise to sell policy may be suboptimal ex post if payments reveal additional information. Consider a symmetric setting with two lobbies and multiple policy choices in the spirit of Bennedsen and Feldman (2006). If two oppositely extreme groups offer similar amounts, then PM updates priors very little and prefers the neutral default

policy over the lottery over the extreme policies. The rules of the policy sale however dictate to identify the buyer of the policy and realize his or her policy. (See also Section 3.3.4 on the role of default policy.)

3. Time-inconsistency may also be present when the PM sets agenda in Stage 1 (Epstein and Nitzan 2006b). The PM thereby restricts the policy set of the winner of the contest and thereby changes valuations and efforts. Once the winner is determined, PM may have an incentive to lift the restriction and extend the reduced agenda set in order to generate a better policy both for the contest winner and himself/herself.

Another PM's commitment is *commitment to verification*, including random auditing (see Cotton 2011). Consider pay-for-access models, where lobbies truthfully reveal evidence by contributions because their equilibrium expectations involve that verification will be undertaken (Cotton 2009). If verification is costless for PM, then commitment to verification is not necessary. But costless verification would then be inconsistent with the assumption that access is rationed due to limited (costly) attention. In contrast, if verification is costly, then ex post verification is time-inconsistent and an announcement to verify must be binding.

The existence of the PM's commitment may be partly explained by strategic delegation to intermediaries such as aides and lobbyists. Specifically for contests with imperfect discrimination, there have been several attempts to build microfoundations for imperfectly discriminating CSF. Konrad (2009) recognizes three derivations of microfoundations for CSFs: (i) axiomatic, (ii) stochastic, and (iii) innovation-race based. The stochastic derivation is mostly product of imperfect monitoring of contributions (Jia 2008). In an innovation race, a valuable skill that is rewarded by PM is acquired randomly. There is not a fundamental difference between the two explanations: In either case, players efforts are subject to a shock, either a shock into perception of the efforts (imperfect monitoring) or a shock to the production of the efforts (innovation race).

3.2.5 PM's environment

The PM may be restricted not only by its commitments but also by regulations dictated by the exogenous environment. For example, PM may be subject to mandatory disclosure of private information which affects equilibrium bids of lobbies in menu auctions. Felgenhauer (2010) examines information asymmetry where it is the government or bureaucracy that disposes with private information, and lobbies engage in menu auction contributions. From the PM's perspective, the regime of *secrecy* (no mandatory disclosure of PM's information) is preferred to *transparency* as it raises expected equilibrium bids; hence transparency must be imposed by regulation. From the social point of view, however, transparency is preferred only if lobbies are sufficiently similar, hence their equilibrium bids do not change the PM's default policy. (The default policy is set to be socially first-best policy.) If lobbies are sufficiently asymmetric, transparency cannot protect the default policy. Secrecy provides partial protection to the

default policy, since it involves mixed strategies where default policy remains with a positive probability.

3.3 Communication

A general lobbying game starts with common priors μ_0. Nature selects unobservable $\theta \in \Theta$. Then, we have to distinguish between models with *pure persuasion*, and models of *search and persuasion*. In pure persuasion models, the signal is exogenously acquired by L and a persuasion mechanism applies directly. In search and persuasion models, L makes a decision on whether to acquire a signal or not, and then communicates.[5]

3.3.1 Persuasion mechanism

A persuasion mechanism is a combination of a signal and message technology. The *signal technology* is a family of distributions $\{\pi(s|\theta)\}_{\theta \in \Theta}$ over S, where a signal realized is $s \in S$. A *message technology* is the other component of the persuasion mechanism. For messages $m \in M$, it involves a family of cost functions $c(\cdot|s)$, where the cost of message m after observing s is $c(m|s) \in R^+ \cup \infty$ (infinite cost is used to characterize verifiability). Often, $M = P(\Theta)$, where $P(\Theta)$ is the set of all subsets of Θ.

Notice how restrictions on message costs serve to define verifiability. In cheap talk games, the cost is zero (or constant), hence signal-independent. For persuasion with verifiable evidence (Milgrom 1981), the signal is perfectly informative, message space is $M = P(\Theta)$, message cost is constant if L does not say an explicit lie ($s \in m$) and infinity for an explicit lie ($s \in \neg m$). In an honest mechanism, L must tell the 'whole' truth, and nothing but the truth, hence the cost is constant only if the whole truth is revealed ($s = m$), and is infinity otherwise ($s \neq m$).

How to interpret messages? Traditionally, messages are assumed to have literal meaning. In cheap-talk (signal technology is perfectly informative for L, message cost is zero or constant across all messages), the set of the presented messages is completely state-independent. In persuasion games, a signal involves observable evidence (e.g., logical arguments or documents that cannot be fabricated) that restricts the set of plausible messages. Messages are then verifiable, and the set of the admissible messages is signal-dependent. In persuasion games, a standard message set includes also an 'empty message' equal to the message set with priors.

What is important about a message is not only its substantive or literal content that is verified by evidence, but also the signaling function that is verified by willingness to produce that costly signal. Thus, the information received from a message has two dimensions. Relevance of the dimensions determine whether it is money or words that speak louder. In

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[5]Since we have common priors, this action cannot have any strategic role, and possibility not to acquire a signal is only important to study the participation condition. With asymmetry, search has a third, signaling effect upon the PM's posteriors.

signaling and screening, only the cost-dimension is assumed to be relevant.

3.3.2 Signal technology

In the classic information transmission setups, involving cheap talk and persuasion games, L exogenously receives a perfectly informative private signal, and the setting can be studied as one of pure asymmetric information. A different case is when L has no information and may obtain a signal. Two major signalling technologies (a.k.a. search/evidence-production/investigation functions) appear in the literature:

- *Hard evidence.* Signal space includes only two outcomes, truth and 'no-evidence', $S = \{\theta, \varnothing\}$. For $s = \varnothing$, the only admissible message (not infinite cost) is $m = \varnothing$. For $s = \theta$, the set of admissible messages are S. Thus, hard evidence cannot be fabricated, but unfavorable evidence can be presented as lack of evidence. This setting is used also in search models that use contest with evidence (Lagerlöf 2007). The signal distributions normally feature a common precision level, $\pi(\theta|\theta) = \omega \in [0,1], \theta \in \Theta$. Thus, in our special case, ex ante probabilities of $(\theta_l, \varnothing, \theta_h)$ are $(\omega(1 - \mu_0), 1 - \omega, \omega\mu_0)$.

- *Noisy signals.* Signal space does not include no-evidence, but noise over all states of the world, $S = \Theta$. In our special case, let a common precision be again $\pi(\theta|\theta) = \omega \in [0,1]$. The ex ante probabilities of (θ_l, θ_h) are now $(\omega(1-\mu_0)+(1-\omega)\mu_0, \omega\mu_0+(1-\omega)(1-\mu_0))$. (See also Brocas and Carrillo, 2007.)

Hard evidence is not necessarily the preferred evidentiary structure for L. Consider our setup where the PM has symmetric preferences and symmetric priors $\mu_0 = \frac{1}{2}$, hence selects $d^*(\mu) = d_l$ if $\mu < \frac{1}{2}$ and $d^*(\mu) = d_h$ if $\mu > \frac{1}{2}$. Recall that the L's expected payoff is defined by the probability of getting a favorable policy d_h, $\Pr(d_h)$. For both evidentiary structures, the probability of favorable policy is equal to the probability of delivering favorable evidence, $\Pr(d = d_h) = \Pr(s = \theta_h)$, and the probability of unfavorable policy is equal to probability of delivering unfavorable evidence, $\Pr(d = d_l) = \Pr(s \in \{\theta_l, \varnothing\})$. This is because the relevant posterior associated with the favorable evidence satisfies $\mu_h \geq \frac{1}{2}$ (i.e., d_h is implemented), and the relevant posterior associated with unfavorable evidence satisfies $\mu_l \leq \frac{1}{2}$ (i.e., d_l is implemented). Thus we may compare the structures by studying only the probability of delivering favorable evidence.

For search with hard evidence, there are three outcomes $(\theta_l, \varnothing, \theta_h)$ with probabilities $(\frac{\omega}{2}, 1 - \omega, \frac{\omega}{2})$. The unfavorable evidence θ_l is concealed, and the reported outputs are $(\varnothing, \theta_h)$, with probabilities $(1 - \frac{\omega}{2}, \frac{\omega}{2})$. For a noisy signal, there are two outcomes (θ_l, θ_h) with probabilities $(\frac{1}{2}, \frac{1}{2})$, and both are disclosed. As a result, L's expected payoff in the two structures are $\frac{\omega}{2} \leq \frac{1}{2}$, and the noisy technology is relatively superior to the hard-evidence technology.

3.3.3   Search

Often, the lobbyists select from the family of evidence-production functions with different precisions ω, where a search cost function $C(\omega)$ is convex. The selected precision level may be the L's private information. The quality of the signal is not only subject to choice of L, but may be also *strategically distorted* by the PM. As discussed in the stochastic foundations for CSFs, the low elasticity of prize to relative effort in CSF may be due to noise about lobbyists efforts. This noise may be introduced strategically by delegation to a staff member who commits systematic errors.

Can quality be interpreted interchangeably as quantity? Lagerlöf (2007), Dahm and Porteiro (2008a) and Henry (2009) interpret the level of precision as *the amount* of lobbying, hence their setup makes no distinction between the two. The difference actually might be suppressed for private tests (or unobservable search), where outcomes of search can be jammed into a single message. However, with public tests or observable (repeated) search, quantity and quality are different features. For example, Brocas and Carrillo (2007) characterize the optimal stopping rule in the flow of public signals (i.e., the optimal quantity) as a function of the quality of a single signal.

Another issue for search function is *specialization*. In the presence of revolving-door lobbyists, there should not be a fundamental difference in the available technologies between PM and L, and the PM may dispose with the option of the extra search. Notice also that specialization implies sequential interaction, hence first-mover (dis)advantages to lobbyists, and second-mover (dis)advantages to policy-makers. Specialization thus becomes less realistic once PM finds Stackelberg leadership more valuable.

The literature makes a difference between a *private* test/search and *public* test: For private search, it is possible to withhold evidence and report an empty message. Observability of search then makes a difference. With *observable search*, PM interprets empty message as both unsuccessful search (no evidence) and concealed evidence. With *unobservable search*, an empty message covers not two but three events at the same time: no search, search without evidence, and search with unfavorable evidence.

When test is public, evidence cannot be withheld. Imposing public test (or mandatory disclosure rule) makes observable not only search outcome, but also search itself. Thus, analyzing the effect of the public test relative to the private test crucially depends on whether we start with observable or unobservable search. With *observable search*, the public test only separates unfavorable evidence from no-evidence. With *unobservable search*, public test separates no-search, no-evidence, and unfavorable evidence, and the effects of mandatory disclosure are therefore more complex.

3.3.4 Empty message

A literal meaning of empty message, $m = \varnothing$, is to say nothing but confirm priors. In the absence of search, an empty message is just one out of all messages. With search and private test, four options arise for the interpretation of the empty message:

1. Absence of no-evidence outcome ($\varnothing \in \neg S$), observable search: This is a standard persuasion game preceded by search in an early stage, and $M = P(\Theta)$. Under verifiability restrictions, an empty message has zero strategic effect, since full disclosure appears (Milgrom 1981, Henry 2009). The idea is that unless private evidence is the worst possible, it is ex post better to separate oneself from types with the worse evidence. This 'sharpening' of the messages ultimately leads to full revelation where truth and nothing but the truth is communicated.

2. Absence of no-evidence outcome, unobservable search: An empty message is now used to conceal unfavorable evidence behind no-search. For example, in Henry (2009), all positive signals are reported, all negative signals are withheld, and the Receiver (PM) understands that the hidden signals are negative. Revelation is incomplete, because the number of positive signals only probabilistically indicates the number of negative signals.

3. No-evidence outcome ($\varnothing \in S$), observable search: An empty message now captures also the existence of no-evidence outcome. Again, the empty message is ex post always used strategically to conceal bad evidence, namely to conceal bad evidence behind no-evidence.

4. No evidence, unobservable search: In this most complex case, an empty message jams no-search, unfavorable evidence, and no-evidence.

We have seem that the empty message interacts especially with no-evidence outcome. One effect of the empty message in the presence of no-evidence outcome is to bring asymmetry into an otherwise symmetric model. Let us return to a comparison of hard-evidence vs. noisy signal technologies. Consider our special case with a symmetric prior $\mu_0 = \frac{1}{2}$ and observable search for hard evidence with no-evidence outcome, where the precision level is $\omega \in [0, 1]$. Search delivers either of three outcomes, $s \in \{\theta_l, \varnothing, \theta_h\}$. L discloses only two outcomes, $m \in \{\varnothing, \theta_h\}$; unfavorable evidence is hidden by showing no evidence, $m(\theta_l) = \varnothing$. Unconditional probability of obtaining no evidence is $\Pr(\varnothing) = 1 - \omega$.

By Bayes rule, the relevant posteriors write $\mu_\varnothing := \Pr(\theta_h | \varnothing) = \frac{1-\omega}{2-\omega} \in (0, \frac{1}{2})$ and $\mu_h := \Pr(\theta_h | \theta_h) = 1$. This creates asymmetry in posteriors $(\mu_\varnothing, \mu_h)$ around the prior $\mu_0 = \frac{1}{2}$. The asymmetry is important if there is a default policy d_0 that serves as PM's insurance against extremes, for instance by providing a state-invariant payoff. In our setting specifically, it is important whether the posterior $\mu_\varnothing$ implements a default policy, $d^*(\mu_\varnothing) = d_0$. If so, then the

default policy fully absorbs (neutralizes) the indirect cost of search associated with posteriors at empty message, which makes value of search positive for L.

In contrast, for *noisy search without no-evidence outcome*, search leads to two outcomes. The relevant posteriors are $(\mu_l, \mu_h) = (\Pr(\theta_h|\theta_l), \Pr(\theta_h|\theta_h)) = (1 - \omega, \omega)$. With symmetric neutralization around $\mu_0 = \frac{1}{2}$, either both posteriors are neutralized, $d^*(\mu_l) = d^*(\mu_h)$, or none of posteriors is neutralized, $d^*(\mu_l) \neq d^*(\mu_0) \neq d^*(\mu_h)$. Unlike for hard evidence search, noisy search (where errors are symmetric) is either uninformative or the indirect search cost cannot be absorbed. In contrast to comparison in Section 3.3.1, this particular aspect makes noisy technology relatively inferior to the hard-evidence technology.

4 Selected topics

4.1 To lobby or not to lobby

4.1.1 Single lobby

In the context of a single lobby that conducts observable search, we have stressed that the key thing is the property of L's expected indirect utility in posteriors, $U(\mu)$. In the *absence of contribution subgames*, this indirect utility is derived from the PM's policy decision based on his or her upper envelope of expected utilities of all policies, evaluated at the respective posterior. The existence of policy-switches in μ makes the shape of the L's expected indirect utility generally ambiguous. Specifically, conflicting preferences between PM and L imply that the L's utility is step-wise at the critical posteriors (i.e., at levels that make PM change his or her optimal policy), which implies that the utility is neither convex nor concave. With a larger number of policies, the number of policy-switches increases and complexity grows. For instance, some differences between Dahm and Porteiro (2008b) and Bennedsen and Feldman (2006) stem only from the fact that the former have two policies, while the latter allow for three policies.

With steps in $U(\mu)$, an important variable is the *relative* position of the priors to the critical level of posteriors. In our symmetric setting with two policies, $\{d_l, d_h\}$, PM selects $d^*(\mu) = d_l$ if $\mu < 1/2$ and $d^*(\mu) = d_h$ if $\mu \geq 1/2$; the critical posterior that defines a policy-switch is $\overline{\mu} := 1/2$. The incentive to lobby can be found either directly (by calculating expected payoffs) or indirectly (by checking concavity or convexity at prior). First, if $\mu_0 > \overline{\mu}$, L never has a strict incentive to lobby since default policy d_h is her first-best policy. Alternatively, we may say that search brings a negative expected payoff because of concavity at point μ_0 over alternatives $(\mu_\varnothing, \mu_h)$. In contrary, if $\mu_0 < \overline{\mu}$, then L's search for hard evidence with success rate ω implies $\mu_h = 1$, policy $d^*(\mu_h) = d_h$, and gain 1, all with probability $\omega\mu_0$. With probability $1 - \omega\mu_0$, an empty message is presented, and the posterior is $\mu_\varnothing = \frac{(1-\omega)\mu_0}{1-\omega\mu_0} < \mu_0 < \frac{1}{2}$. This implies policy $d^*(\mu_\varnothing) = d_l$, and zero gain. As a result, the L's expected payoff is $\omega\mu_0 \geq 0$, and L always lobbies. Notice also that the positive expected payoff of search is equivalent to

a convexity at point μ_0 over $(\mu_\varnothing, \mu_h)$.

With subsequent *contribution subgames*, the PM's policy choice in each posterior is affected by contributions offered by L, and the structure of the interaction can be modeled as non-cooperative bargaining. There, the additionally important aspects are the existence of surplus, bargaining powers, and transaction costs. Consider our special case and let the PM have value αr from correctly fitting d_l policy with state θ_l, and $\alpha(1 - r)$ from correctly fitting d_h policy with θ_h, where $\alpha r > 1$. Payoffs from misfits are normalized to zero. Without contributions, the critical level for a policy-switch is $\overline{\mu} := r$, and $d^*(\mu) = d_l$ if $\mu < \overline{\mu}$ and $d^*(\mu) = d_h$ if $\mu \geq \overline{\mu}$. To change policy from d_l to d_h, the PM has to be compensated by at least $\max\{0, \alpha(r - \mu)\}$, hence total surplus from the policy change is $S(\mu) := 1 - \alpha(r - \mu)$. If $S(\mu) \leq 0$, there is no compensation. The critical level for a compensation to be feasible is at $\underline{\mu} := \frac{\alpha r - 1}{\alpha}$. Thus, with contribution subgames, we have (i) no compensation for $\mu \in [0, \underline{\mu})$, (ii) positive compensation for $\mu \in [\underline{\mu}, \overline{\mu})$, and (iii) no compensation for $\mu \in [\overline{\mu}, 1]$. Let $\hat{U}(\mu)$ be L's equilibrium payoff in the contribution subgame, where $\hat{U}(\mu) \geq U(\mu)$ since a non-contribution subgame that does not affect the PM's posteriors can always be chosen by L. We have (i) $\hat{U}(\mu) = U(\mu) = 0$ for $\mu \in [0, \underline{\mu})$, (ii) $\hat{U}(\mu) \in [0, 1]$ for $\mu \in [\underline{\mu}, \overline{\mu})$, and (iii) $\hat{U}(\mu) = U(\mu) = 1$ for $\mu \in [\overline{\mu}, 1]$.

Unless PM extracts full surplus, we have that $\hat{U}(\mu) > 0$ for intermediate beliefs $\mu \in [\underline{\mu}, \overline{\mu})$. Since zero surplus exists at low beliefs, we have, around $\mu = \underline{\mu}$, that there are points at which $\hat{U}(\mu)$ is *convex*. If L can extract either some but *not all surplus*, then $\hat{U}(\mu) < 1$ for all intermediate beliefs. Thus, at $\mu = \overline{\mu}$, there is a step in $\hat{U}(\mu)$. Therefore, in the neighborhood of $\overline{\mu}$, there are points where $\hat{U}(\mu)$ is *concave*. In other words, unless L extracts full surplus, the step in L's indirect utility exists both with and without contributions. Bennedsen and Feldman (2006) serve as a good example how these problems are suppressed: The extra risk-proclivity associated with zero surplus around $\underline{\mu}$ is entirely avoided by assuming positive surplus for all posteriors. Secondly, the convexity at $\overline{\mu}$ is eliminated by vesting L with full bargaining power.

Alternatively, Dahm and Porteiro (2008a,b) construct the contribution stage as a unilateral purchase of *extra pressure*. They start with the PM who is expected to set policy d_h with probability μ. (Recall a stochastic PM and a uniform distribution of types, $F(r) = r$.) Hence, in the absence of contributions, $U(\mu) = \mu$, and L is risk-neutral. Their novelty is that extra pressure $\pi \in R^+$ can be purchased at a constant cost $c > 0$. The pressure modifies the posteriors over the states as if a simple raffle applies. Namely, the total 'evidence' in favor of θ_h is $\mu + \pi$, and total 'evidence' in favor of θ_l is $1 - \mu$. As a result, $\hat{U}(\mu) = \Pr(d_h) = \frac{\mu + \pi}{1 + \pi}$.

Solving for the equilibrium pressure, $\pi^*(\mu)$, we obtain that the pressure is decreasing and concave in the posterior μ, and the expected L's utility is surprisingly *convex* in the posterior. A lobby becomes risk-loving, independently on the level of posteriors. This modeling of the contribution/pressure subgame has nevertheless a couple of drawbacks, including lack of foundations for the selected functional form and sensitivity to the distribution of PM-types (as discussed in Section 3.1). Moreover, consider the presence of counteractive lobbying. If two

competing groups have identical pressure technologies and valuations, then their equilibrium marginal returns from pressure investments (π_1, π_2) must be identical, hence the levels of evidence must equal, $\mu + \pi_1^* = 1 - \mu + \pi_2^*$, and the equilibrium posterior is $\frac{1}{2}$. Each group's share of the prize is one half, and expected payoff of search is for each lobby linear in the posteriors. As a result, each lobby remains risk-neutral.

To sum up, lobbying by means of search and subsequent persuasion tends to occur with (i) a low search cost, (ii) large bargaining power of the lobby in the contribution subgame, (iii) unfavorable status quo that increases the gain in the case of success and lowers the indirect cost of search, and (iv) large stakes.

4.1.2 Multiple lobbies

With competition of heterogenous lobbies, the participation decision of individual lobbies and the aggregate level of lobbying are potentially separated issues. To start with, focus on the results achieved for contest over policy rent. This literature has produced a bulk of comparative-statics observations on how aggregate and individual lobbying changes with (i) the level of discrimination, (ii) contribution caps, (iii) player exclusion, and (iv) the number of prizes.

A first general result is that, ceteris paribus, perfect discrimination induced more effort for symmetry and imperfect discrimination works better for large asymmetry (Hang 2002; Epstein and Nitzan 2006b; Wang 2010). The explanation goes through participation decision of less interested players. Non-participation of an individual contestant has a first-order effect on relaxing the overall contest activity, hence values of the discrimination parameter that encourage non-participation are suboptimal. This issue can be best addressed if both the level of discrimination and relative productivity of efforts can be simultaneously optimized. Then, an all-pay auction with its conditionally optimal relative productivity raises more than any logit CSF with its conditional relative productivity, including Tullock's lottery (Epstein, Mealem, and Nitzan 2011).

Participation of low-valuation lobbies may also be encouraged by setting a ceiling to high-level payments. A standard effect of such a cap is to decrease both the highest payments and the total expenditures, hence it represents, from the perspective of the PM a costly prize redistribution. This property nevertheless varies in the contest success function. While for Tullock's lottery, the aggregate expenditures do fall (Hang 2002), Che and Gale (1998) show that in all-pay auction, a rigid contribution cap makes the low-valuation lobbyist more proactive, and total expenditures may even rise. Kaplan and Wettstein (2006) argue that a non-rigid contribution cap (i.e., discontinuous but not infinite marginal cost) re-establishes the result that aggregate contributions decrease in an all-pay auction with a cap. Che and Gale (2006) nevertheless show that even with a non-rigid cap, the non-intuitive effect emerges as long as the relative effect of 'leveling of the playing field' is strong enough. This only confirms the intuition that too large asymmetry in contests is, from revenue-maximization perspective,

not desirable. For recent contributions, see also Pastine and Pastine (2010) and Grossman and Dietl (2011).

Does the structure of prizes matter in a contest? Can prize redistribution induce wider participation and stimulate total effort? For all-pay auctions, Siegel (2009) derives the number of participating players as a linear function of the number of prizes. In a fairly general setting, he shows that increasing the number of prizes and thereby attracting additional players makes existing players weakly worse off. In a review of multiple-prize contests, Sisak (2009) demonstrates that adding an additional prize to encourage additional participation has ambiguous properties on individual efforts of contestants. Epstein and Nitzan (2006a) show that by sufficiently asymmetrically reducing the prize (valuations) for all players may paradoxically boost total expenditures.

For the PM, it pays off to stimulate participation even if influence is only through communication. With informational rent-seeking, majority of models suggest that the PM prefers more intense competition with a larger number of competitors. In Bennedsen and Feldman (2006), competition increases the incentive for search because unsuccessful search is interpreted against the lobbying group only if the other group is *also* unsuccessful. If contributions is allowed, then this effect represents an information rent to the group with *less informative technology* in the case both groups are unsuccessful. This serves as extra motivation for participation of a weaker player.

When informational lobbying yields a collective benefit but side-payment gives a private benefit, then non-participation is differently motivated for each of the instruments. Non-participation in lobbying activities is primarily motivated by free-riding, and the total amount of lobbying depends on whether demand for lobbying benefits exhibits neutrality or non-neutrality known from public good games. In contrast, non-participation in contributions is motivated by the absence of bargaining surplus. An example of interaction of these two instruments is Polk and Schmutzler (2005). They examine a tradeoff of firms that select from collective-good lobbying (industry-specific benefits) and private-good lobbying (firm-specific benefits), and show that the option of the private-good lobbying crowds out the use of the collective-good lobbying.

4.1.3   Evidence

Corporate political influence has traditionally been measured by campaign contributions and the exact influence has been ascribed to buying favorable roll call vote. The results of roll call voting studies exploiting the U.S. evidence since 1970s are nevertheless inconclusive, and the structure of campaign contributions also reveals that the campaign contributions are in fact more individual and not through Political Action Committees within firms (Ansolabehere et al. 2003).

Lobbying expenses represent an alternative measure of political influence. Data on lobbying outlays are nonetheless notoriously hard to collect, and the only extra evidence of lobbying

beyond survey data is from participation in interest group associations. The virtual lack of evidence is mostly related to weak or non-existent lobbying regulations, even in developed countries such at the EU countries (Chari, Hogan and Murphy 2010.) The major significant exception is the United States, where the Lobbying Disclosure Act 1995 has revealed relatively clean data on the salaries of lobbyists and their staff, prices per reports, and fees for expert consultants.

In the U.S., the magnitude of reported lobbying expenses turns out to be of a higher order than direct payments. Ansolabehere et al. (2003) find for firms with both PACs and a Washington lobby, the ratio of lobbying expenditures to PAC contributions is 10 to 1. Similarly Bennedsen and Feldman (2002) show that the top 100 contributing interest groups gave a total $144 million to federal candidates during the 1998 election cycle, and spent over $1 billion on lobbying activities during that period. Lobbying also brings large returns, but of a much lower scale than previously estimated returns to campaign contributions. Richter et al. (2009) measure quid-pro-quo in terms of tax benefits (tax breaks including R-D credits and tax depreciation schedules) and observe that for each additional $1 spent on lobbying, a mean firm receives $6-$20 tax benefits. A downside of these particular estimates is that they do not treat the potential endogeneity of the lobbying firms.

Once the size of the market and relative profitability is measured, the next step is to investigate the determinants of lobbying. De Figueiredo and Cameron (2009) exploit the institutional and political variation across the U.S. states. Their first result is that ideological distance between the lobbying group and the legislature increases outlays; this complies with a standard signaling model with non-verifiable information and endogenous cost where a stronger signal is needed to persuade the legislature if the lobby's bias is larger (Austen-Smith 1995). For corporations specifically, the distance is coded zero for Republican legislature and one for Democratic legislature. Their second result shows the strong positive effect of the budgeting cycle upon the total lobbying outlays (a 23% increase during a budget year), independent on the electoral cycle. Also, the length of the legislative session matters; each extra 10 days results in 6% increase in the lobbying rates. Hence, corporate influence is much less related to electoral campaigns than previously thought. Thirdly, the size of the legislature does not matter. The authors' interpretation is that lobbying brings a non-rival benefit to legislators, not a private good.

Another topic are determinants on the industry- or firm-level. In a sample of lobbying expenditures for tax benefits, Richter et al. (2009) show that lobbying expenditures follow a skewed, power-law distribution, and only a small fraction of firms do lobby. Bombardini and Trebbi (2009) examine incentives to lobby collectively. Sectors characterized by a higher degree of competition (more substitutable products and a lower concentration of production) tend to lobby more together through a sector-wide trade association, while sectors with higher concentration and more differentiated. Their idea is that individual lobbying pays off only in oligopolies where product-specific protection may increase both prices and profits (recall

tax-overshifting); in competitive markets, these measures increase prices but decrease profits.

4.2 Strategic substitution and complementarity

4.2.1 Theory

Does the possibility of providing direct contributions affect the usefulness of lobbying? And vice versa, does lobbying change the effect of direct contributions? In the theoretical literature, the instruments are typically pure or impure substitutes. Consider an increase in the bargaining power of a single lobby. In Section 4.1, we have seen that it makes a lobby more likely to search. At the same time, the increase implies less payments in each relevant contribution subgame. Overall, we observe less payments and more lobbying, i.e., substitution.

A different story emerges is when we study the effects of deregulation of one instrument upon the equilibrium level of the other instrument. For this purpose, Bennedsen and Feldman (2006) have built out a setting which allows for 16 configurations of multi-player lobbying: un/observable search, strong/weak signals, with/without contributions, and with/without lobbying. The effects of introduction of contributions upon lobbying are conditional upon participation, which depends upon asymmetry of valuations. For symmetry, contributions intensify the competition in terms of informational search (*complementarity*). For sufficiently asymmetric lobbies, introduction of contributions implies that the group with the less effective search technology decides not to participate in info-collection and the decision-maker receives less information (*substitution*).

To return to our setting with a single lobby, Bennedsen and Feldman (2006) derive that for observable search and contributions, lobbying is fully crowded out (*pure substitution*). We will show that this striking result crucially hinges upon two assumptions: (i) Surplus from attaining L's first-best policy is positive, $S(\mu) > 0$ for $\mu \in [0, 1]$. (ii) PM has zero bargaining power, hence her utility is constant with introduction of contributions.

To see crowding-out, denote the equilibrium L's compensations in Stage 2 as $C(\mu)$. We know that the PM's indirect utility $W(\mu)$ is derived as an upper envelope of the expected utilities over policies, $W(\mu) := v(d^*(\mu), \mu)$. Since $v(d, \mu)$ is linear in μ for each $d \in D$, the upper envelope from the linear functions is convex. Now, by the two assumptions stated above, $C(\mu) = W(\mu) - W(d_h; \mu)$, which is a difference between a convex and linear function; i.e., $C(\mu)$ is convex. L's expected utility is $\hat{U}(\mu) = 1 - C(\mu)$. As a difference between a linear and convex function, it is a concave. With a concave $\hat{U}(\mu)$, L is risk-averse and does not lobby. Lobbying is crowded-out by the introduction of contributions. By eliminating any of the two assumptions, pure substitution (full crowding out) is no longer present.

To receive complementarity requires a special framework. Dahm and Porteiro (2008a,b) derive complementarity in the case of single lobby for high costs of pressure in the contribution subgame. However, this result is derived in the setup with contribution subgame defined as a pressure subgame, where the shape of $U(\mu)$ depends on the distribution of PM's types. Hence,

it is not robust to other ways of modeling contribution subgames and to other distributions of PM's types, as discussed in Section 4.1.1.

If lobbying and payments are assumed to achieve two different things, not just a policy change, then they can be *complements by assumption.* In pay-to-play politics, only those who pay the access fee (or pay the highest fee) are allowed to present their evidence (Austen-Smith 1995, Lohmann 1995, Cotton 2009). Or, lobbying facilitates payments to PM: Damania, Fredriksson and Mani (2004) suppose that lobbying may be directed at undermining law enforcement, so as to make corruption easier. This complementarity between the two instruments is generated purely by assumptions on the production of political influence.

4.2.2 Evidence

The theoretical part has looked separately at direct payments versus information provision. But, these two are idealized activities that cannot be perfectly disentangled in the empirics and that capture both legal and illegal activities. An alternative is to examine bribes as a measure of contributions and political influence as a measure of lobbying.

Three recent papers examine the strategic substitution between corruption and political influence. Chong and Gradstein (2010) exploit World Bank's World Business Environment Survey survey data and study only the measure of political influence of firms upon the executive, legislature, and the national level of the ministries. Given that many determinants may be endogenous to political influence, they use instrumental variables, namely for the firm size (legal organization of the firm), firm growth (level of education) and institutional quality (GDP). With or without instrumental variables, the firm size and low level of institutional quality are robustly associated with the perception of having more influence. Much weaker evidence is for state ownership, exporting firms, and very weak evidence is for competitiveness of the industry, which is one of the major differences.

Bennedsen, Feldman, and Lassen (2011) confirm that the stage of development and maturity of a firm is conductive to lobbying. Firm-level determinants affect corruption and political influence in the opposite directions. Large, old, government-owned, and export-oriented firms use more influence than bribes; smaller firms or firms in a fragmented industry choose corruption. When using instruments, the influential firms use less corruption, but corrupting are not less influential. They propose the idea of *asymmetric substitutes*: Strong firms have access to both political influence and bribes, whereas weak firms have to resort to corruption only. The asymmetric substitution is a challenge to competitive informational lobbying whose main prediction is that the competitors with high stakes bribe under almost any condition.

Kaufmann and Vicente (2011) use country-level evidence from Executive Opinion Survey 2004-2005 of the Global Competitiveness Report (World Economic Forum). Their definition of Legal Corruption involves variables that proxy lobbying, such as Influence of Well-Connected in Procurement, Influence of Legal Contributions to Political Parties, Independence of the Judiciary from Influence, Influence on Laws and Regulations-Respondent's Industry. For Illegal

Corruption, the variables proxy rather direct payments and bribes, such as Illegal Donations to Political Parties, Frequency of Bribes in Influencing Laws and Policies, and Frequency of Bribes in Procurement. The evidence shows that more of illegal corruption occurs for the low income levels, low political accountability and high inequality. To conclude, and increase in income inequality, business cycle slumps, structural changes and pro-competitive practices make firms more likely to bribe than lobby, be it supply-driven or demand-driven bribes.

A disadvantage of this approach is that that corruption comprises activities targeting the rule enforcers (with only a small portion of political corruption), whereas lobbying is directed at rule makers (Campos and Giovannoni 2007; Harstad and Svensson 2011). This is not perfectly aligned with our theoretical interest on pure political influence. Once we mix activities that lead to qualitatively different outcomes, the key differences between the instruments will be not only in the cost side and externalities they produce, but also in the properties/qualities of the product, namely (i) durability and (ii) appropriability (collective or private benefit). Then, it will be the barriers to entry and appropriability of lobbying benefits that help to explain to explain stylized facts, e.g. why mainly large firms in developed countries prefer lobbying to corruption.

4.3 Intermediaries

4.3.1 Theory

Why does the influence go through intermediaries (lobbyists, lawyers)? Why do politicians give the right to auction access to specific gate-keepers? And why don't they exploit better competition between the lobbyists and other producers of relevant expertise?

Except for Johnson (1996), recent economics is silent on the choice between working alone through establishing a corporate PR office or hiring a lobbyist. Three groups of tentative hypotheses are discussed in the empirical literature. The standard arguments for the existence of the intermediation industry, such as specialization, networks and economies of scale, apply. Secondly, a corruption-driven hypothesis subscribes to the lack of transparency: an intermediary is the agent for the 'dirty' job assigned by the principal. A successful lobbyist is a skillful bribe negotiator who charges a high premium for silence and stability of covert deals and internalizes risks associated with crime detection. The benefits to the firm are then twofold: (i) The cost of detection decreases. (ii) The rules covering third party lobbyists' conduct are often less restrictive than those covering their employers. For example, in the US municipal finance industry, underwriters cannot make campaign contributions to those from whom they solicit business. But an underwriter is free to hire a lobbyist who faces no such restrictions (Retnasaba 2006).

Alternatively, the intermediaries charge the premium for reputation; investigation and verification require credible and trustworthy agents. Also, lobbyists may be predominantly efficient communicators who handle excess of information under time and attention con-

straints. The lobbyists may not have strong advantage in technical expertise, but they may still possess with politician-specific expertise such as the knowledge of the politician's constituency. Lobbyists may charge premium stemming purely from social relations, generated by the fact that barriers to social networks are large relatively to barriers to entry into issue expertise, where academia and industry experts are available. Finally, we have seen that the PM prefers imperfectly discriminative contests under asymmetry (recall evidence of large asymmetries in corporate interests) which can be achieved by delegating advice to imperfect agents.

4.3.2 Evidence

The lobbyists are important for whom they know and have access to, and this makes them earn a large premium. Estimating the value of lobbyist's political connections from stock markets is one strategy. Gely and Zardkoohi (2001) study firms whom retain law firms as lobbyists. The firms show abnormal gains when one of the partners at that firm obtains a federal cabinet position. This effect disappears when anti-lobbying laws are enacted. Blanes-i-Vidal et al. (2010) offer to date one of the empirically cleanest identification strategies to measure the value of a political connection. For revolving-door lobbyists who were previously congressional staffers, they measure how exit of the former employer affects their payoff. The premium for connections is above 20%, and lasts for over three years.

Bertrand et al. (2011) compare the connection premium with the expertise premium using price tags per report. The connection is proxied by individual campaign contributions of the lobbyist to the PM. Expertise is measured by concentration of lobbyist's assignments across 76 issues; another proxy is if a lobbyist spends at least 25% of his assignments in each active year on the same issue. From price tags per report, the report-level analysis reveals that (i) the premium of having a relevant specialist in the report is 3-5% and (ii) the premium of having a relevant connected lobbyist is 8-10%. Extra evidence on time profile of the lobbyists' assignment shows that lobbyists change topics as their connections switch committee assignments. There are also revenue cycles independent on the time profile of issues.

These report-level findings can be combined with more aggregate findings. For example, in de Figueiredo and Cameron (2008), the size of the legislature does not matter for the overall level of lobbying outlays. In Bertrand et al. (2011), lobbying works better if delivered through a lobbyist with multiple connections and well-posited legislators. Thus, the number of connected legislators makes a difference. An explanation of both facts may lie in the organization of parties that distinguishes between marginal and inframarginal legislators. Extra legislators that change the size of the legislature are marginal backbenchers, and these may be irrelevant for lobbyists. Consequently, aggregate size does not matter, whereas lobbying an individual inframarginal legislator matters.

5   Conclusions

This review covers three main modeling traditions of lobbying, contest for policy rent, strategic communication, and multiple-means models. In the first part, it focuses on their developments in the last decade, and specifically on the emergence of multiple means models that involve search, persuasion, and contributions in a single game. The survey presents different approaches to modeling aspects such as state spaces, preferences, lobbies' instruments, policy-makers' and lobbies' commitments, bargaining, evidence verifiability, message costs, observability of search and the presence of the empty messages. In the second part, we look into the recent theory and evidence on three selected issues: Incentive to lobby and the magnitude of lobbying for a single lobby and multiple lobbies, the relationship between lobbying and contributions (including bribes), and the role of lobbying intermediaries.

To summarize, the recent literature models policy makers as strategic players who benefit both from extra information and extra contributions provided by corporate interests. Moreover, strategic policy-makers who design access fees may improve their information and collect campaign funds at the same time. By pitting one group against each other they extract huge surplus, and if they encourage wide participation, they obtain large rents and more precise information.

On the other hand, we show that competitive lobbying contest is often detrimental to business interests. Lobbyists often gain low or even negative payoffs when lobbying instruments are available and therefore benefit from regulation of instruments. First and foremost, competition in a lobbying contest dissipates much of the prize that caps on contributions remedy. Secondly, the possibility of concealing evidence generates pessimistic policy-makers' expectations that generate 'an information trap' that forces lobbyists to make excessive effort. Hence, imposing mandatory disclosure of search may be to the benefit of lobbies.

The review also covers recent evidence on corporate lobbying, generated from cross-country surveys and lobbying data disclosed in the U.S. since 1995. We observe a large benefit-cost ratio for those firms that lobby, even if not that striking as for campaign contributions. The firms resort to intermediaries who dominate the market with influence. The distribution of returns of intermediaries is highly skewed. Only large and connected firms tend to lobby; small firms rather bribe. In terms of instruments for influence, with minor exceptions, lobbying and corruption are substitutes rather than complements.

References

[1] Ansolabehere, S., de Figueiredo, J.M., and Snyder, J.M. (2003) Why is There so Little Money in U.S. Politics? *Journal of Economic Perspectives* 17(1): 105–130.

[2] Aumann, R. J., and Hart, S. (2003) Long Cheap Talk. *Econometrica* 71(6): 1619-1660.

[3] Austen-Smith, D. (1995) Campaign contributions and access. *American Political Science Review* 89: 566–581.

[4] Austen-Smith, D. (1998) Allocating Access for Information and Contributions. *Journal of Law, Economics, and Organization* 14 (2): 277–303.

[5] Austen-Smith, D. and Banks, J.S. (2000) Cheap Talk and Burned Money. *Journal of Economic Theory* 91(1): 1–16.

[6] Austen-Smith, D. and Banks, J.S. (2002). Costly signaling and cheap talk in models of political influence. *European Journal of Political Economy* 18: 263–280.

[7] Baye, M.R., and Hoppe, H.H. (2003) The strategic equivalence of rent-seeking, innovation, and patent-race games. *Games and Economic Behavior* 44: 217–226.

[8] Becker, G. (1983) A theory of competition among pressure groups for political influence. *Quarterly Journal of Economics* 98: 371–400.

[9] Bennedsen, M., and Feldmann, S.E. (2002) Lobbying Legislatures. *Journal of Political Economy* 110(4): 919–946.

[10] Bennedsen, M., and Feldmann, S.E. (2006) Informational lobbying and political contributions. *Journal of Public Economics* 90: 631–656.

[11] Bennedsen, M., Feldmann, S.E., and Lassen, D. D. (2009) Strong firms lobby, weak firms bribe: A survey-based analysis of the demand for influence and corruption. EPRU Working Paper Series, 2009-08.

[12] Bertrand, M., Bombardini, M., and Trebbi, F. (2011) Is It Whom You Know or What You Know? An Empirical Assessment of the Lobbying Process. NBER Working Paper 16765.

[13] Blanes-i-Vidal, J., Draca, M., and Fons-Rosen, C. (2010) Revolving Door Lobbyists. CEP Discussion Papers, No 993. Centre for Economic Performance, London School of Economics and Political Science, London, UK.

[14] Bombardini, M., and Trebbi, F. (2009) Competition and Political Organization: Together or Alone in Lobbying for Trade Policy?, NBER Working Paper No. 14771.

[15] Brocas, I., and Carrillo, J.D. (2007) Influence through ignorance. *RAND Journal of Economics* 38(4): 931-947.

[16] Campos, N., and Giovannoni, F. (2007) Lobbying, corruption and political influence. *Public Choice* 131: 1–21.

[17] Chari, R., Hogan, J., and Murphy, G. (2010) *Regulating Lobbying: A Global Comparison.* Manchester: Manchester University Press.

[18] Che, Y., and Gale, I.L. (1998) Caps on Political Lobbying. *American Economic Review* 88(3): 643–651.

[19] Che, Y., and Gale, I.L. (2006) Caps on Political Lobbying: Reply. *American Economic Review* 96(4): 1355–1360.

[20] Chong, A., and Gradstein, M. (2010) Firm-level Determinants of Political Influence. *Economics & Politics* 22 (3): 233–256.

[21] Cotton, C. (2009) Should we tax or cap political contributions? A lobbying model with policy favors and access. *Journal of Public Economics* 93: 831–842.

[22] Cotton, C. (2011) Competing for the Attention of Decision Makers, mimeo.

[23] Dahm M., and Porteiro, N. (2008a) Side-Effects of Campaign Finance Reform. *Journal of the European Economic Association* 6(5): 1057–1077.

[24] Dahm M., and Porteiro, N. (2008b) Informational lobbying under the shadow of political pressure. *Social Choice and Welfare* 30: 531–559.

[25] Damania, R., Fredriksson, P.G., and Mani, M. (2004) The persistence of corruption and regulatory compliance failures: Theory and evidence. *Public Choice* 121(3): 363–390.

[26] De Figueiredo, J.M., and Cameron, C. (2008) Endogenous Cost Lobbying: Theory and Evidence. CELS 2009 4th Annual Conference on Empirical Legal Studies Paper. Available at SSRN: http://ssrn.com/abstract=1443559

[27] Del Rosal, I. (2011) The Empirical Measurement of Rent-Seeking Costs. *Journal of Economic Surveys* 25(2): 298–325.

[28] Epstein, G. S., Mealem, Y., and Nitzan, S. (2011) Political culture and discrimination in contests. *Journal of Public Economics* 95: 88–93.

[29] Epstein, G. S., and Nitzan, S. (2004) Strategic restraint in contests. *European Economic Review* 48: 201–210.

[30] Epstein, G. S., and Nitzan, S. (2006a) Reduced prizes and increased effort in contests. *Social Choice and Welfare* 26: 447–453.

[31] Epstein, G. S., and Nitzan, S. (2006b) The politics of randomness. *Social Choice and Welfare* 27: 423-433.

[32] Felgenhauer, M. (2010) Transparency and special interests. *Economics Letters* 106(1): 4–7.

[33] Gely, R., and Zardkoohi, A. (2001) Measuring the Effects of Post-Government Employment Restrictions. *American Law and Economics Review* 3: 288–311.

[34] Giovannoni, F., and Seidmann, D.J. (2007) Secrecy, two-sided bias and the value of evidence. *Games and Economic Behavior* 59(2): 296–315.

[35] Glazer, A. (2008) Bargaining with Rent Seekers. *Journal of Public Economic Theory* 10(5): 859–871.

[36] Grossmann, M., and Dietl, H. (2011) Asymmetric contests with liquidity constraints. *Public Choice*, forthcoming, DOI 10.1007/s11127-010-9724-4.

[37] Grossman, G. M. and Helpman, E. (2001) *Special Interest Politics*. Cambridge: MIT Press.

[38] Harstad, B., and Svensson, J. (2011) Bribes, Lobbying, and Development. *American Political Science Review* 105(1): 46–63.

[39] Helpman, E. and Persson, T. (2001) Lobbying and Legislative Bargaining. *The BE Journal of Economic Analysis & Policy* 1 (1): Art. 3

[40] Henry, E. (2009) Strategic Disclosure of Research Results: The Cost of Proving Your Honesty. *Economic Journal* 119: 1036–1064.

[41] Jia, H. (2008) A stochastic derivation of the ratio form of contest success functions. *Public Choice* 135: 125–130.

[42] Johnson, P. E. (1996) Corporate political offices in a rent-seeking society. *Public Choice* 88: 309–331.

[43] Kamenica, E., Gentzkow, M. (2011) Bayeasian Persuasion. *American Economic Review* 101: 2590–2615.

[44] Kaplan, T. R. and Wettstein, D. (2006) Caps on Political Lobbying: Comment. *American Economic Review* 96(4): 1351–54.

[45] Kaufmann, D., and Vicente, P.C. (2011) Legal Corruption. *Economics & Politics* 23(2): 195–219.

[46] Konrad, K. A. (2009) *Strategy and Dynamics in Contests*. Oxford: New York.

[47] Lagerlöf, J. (1997) Lobbying, information, and private and social welfare. *European Journal of Political Economy* 13: 615–637.

[48] Lagerlöf, J. (2007) A theory of rent seeking with informational foundations. *Economics of Governance* 8(3): 197–218.

[49] Lohmann, S. (1993) A Signaling Model of Informative and Manipulative Political Action. *American Political Science Review* 87(2): 319–333.

[50] Lohmann, S. (1995) Information, access, and contributions: a signaling model of lobbying. *Public Choice* 85: 267–284.

[51] Milgrom, P. (1981). Good news and bad news: representation theorems and applications. *Bell Journal of Economics* 12: 350–391.

[52] Münster, J. (2006) Lobbying Contests with Endogenous Policy Proposals. *Economics & Politics* 18(3): 389–397.

[53] Pastine, I., and Pastine, T. (2010) Politician preferences, law-abiding lobbyists and caps on political contributions. *Public Choice* 145: 1–21.

[54] Polk, A., and Schmutzler, A. (2005) Lobbying against environmental regulation vs. lobbying for loopholes. *European Journal of Political Economy* 21: 915-931.

[55] Potters, J., and van Winden, F. (1992) Lobbying and asymmetric information. *Public Choice* 74: 269–292.

[56] Retnasaba, G. (2006) Do Campaign Contributions and Lobbying Corrupt? Evidence from Public Finance. *Journal of Law, Economics & Policy* 2 (1): 145–170.

[57] Richter, B.K., Samphantharak, K., and Timmons, J.F. (2009) Lobbying and Taxes. *American Journal of Political Science* 53(4): 893-909.

[58] Siegel, R. (2009) All Pay Contests. *Econometrica* 77(1): 71–92.

[59] Sisak, D. (2009) Multiple-Prize Contests – The Optimal Allocation of Prizes. *Journal of Economic Surveys* 23(1): 82–114.

[60] Skaperdas, S., and Vaidya, S. (2011) Persuasion as a contest. *Economic Theory*, forthcoming, DOI: 10.1007/s00199-009-0497-2.

[61] Stone, D.F. (2011) A signal-jamming model of persuasion: interest group funded policy research. *Social Choice and Welfare* 37(3): 397–424.

[62] The Economist (2011) Money and politics. *The Economist*, October 1st 2011, p. 70.

[63] Tovar, P. (2011) Lobbying costs and trade policy. *Journal of International Economics* 83: 126–136.

[64] Tullock, G. (1980) Efficient rent-seeking. In Buchanan, J.M. , Tollison, R.D., and Tullock, G. (eds.) *Toward a Theory of the Rent-Seeking Society*. College Station: Texas A&M University Press, 97–112.

[65] Winden, F. (2003) Interest Group Behavior and Influence. In Rowley, C.K., and Schneider, F. (eds.), *The Encyclopedia of Public Choice*, Springer US, 118–129.

[66] Wang, Z. (2010) The Optimal Accuracy Level in Asymmetric Contests. *The B.E. Journal of Theoretical Economics*, Topics 10(1): Art. 13.

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