CONTESTED PERSUASION*

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ABSTRACT: We show how contest and rent-seeking functions can be thought of as *persuasion functions* that can be derived in a Bayesian setting. Two contestants (such as lobbyists or politicians) produce evidence for a decision-maker (such as an agency head or a voter) who has prior beliefs and possibly other biases and engages in Bayesian updating. The probability of each contestant winning depends on the resources and organization of the contestant, on the biases of the decision-maker, on the truth as well as on other factors. We discuss how this approach can be applied to lobbying government at its three branches (legislative, executive, and judicial, the latter in terms of litigation); political campaigning; general policy formulation and advocacy in the wider media; and ideological struggles.

1 Introduction

Research on the role of media and persuasion in politics shows that resources devoted to arguments and the media matter in shaping political beliefs (e.g., Della Vigna and Kaplan, 2006; Della Vigna and Gentzkow, 2010). These beliefs can be very different across individuals, even when they concern basic facts (as systematically summarized by Zaller, 1992).

However, much of the vast literature on information and signalling (e.g., Grossman and Helpman, Chs 4 and 5, 2001) that deals with persuasion in mainstream economics and rational-choice political science takes as given that prior beliefs, especially when they concern apparently indisputable facts, are common across individuals. Systematic differences in beliefs across individuals in such settings are considered unsustainable in the long run. Moreover, exposures to political advertising and other signals of political persuasion would tend to be systematically discounted and, in the end, would have no effect on the views of sophisticated audiences. Likewise, resources used by political agents are expected to have minimal effects.

Other parts of the literature do consider how resources expended on political campaigns (Baron, 1994; Skaperdas and Grofman, 1995) or lobbying (Che and Gale, 1998; Epstein and Nitzan, 2004; Hirsch and Shotts, 2015) could have an effect on the choices made by voters or government officials. These papers use what are known as *contest success functions* or *contest functions* that relate resources expended by different agents to probabilities of success. One of its first uses was by Tullock (1980) on rent-seeking[1] However, there has been scarcely any research on how these functions might be derivable and used in a persuasion context.

In this chapter we first discuss the derivations of some widely used functional forms for contest functions found in Skaperdas and Vaidya (2012). The derivations are for settings in which a decision-maker (a voter, a judge, a government official) makes choices among contestants (politicians, litigants, lobbyists) solely based on the evidence that they face. The decision-maker is Bayesian but takes this evidence at face value, in the sense that he or she does not make inferences about how this evidence was produced by the contestants. The decision-maker has prior beliefs and biases about the nature of the choice and the contestants produce evidence based on the liquid resources at their disposal as well as on the organization and capital resources that they have created or that backs them up. In the end, the derivations allow us to identify and interpret various parameters in the functional forms as the result of resources and organization of the contestants in addition to the various biases that the decision-maker might have.

In early attempts at modelling political competition (such as the well known Downsian model), no role for campaign expenditures was envisaged. Mueller and Strattman (1994) attempted to address this lacuna by allowing for unin-

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[1] See Hirshleifer (1989) for an examination of functional forms and Jia et. al. (2013) for an overview of different functional forms and their derivations. For an overview of the theory of contests and its applications, see Konrad (2009).

formed voters in the Downsian model which creates a potential need to educate them through political advertising. Interestingly they found that it is difficult to rationalize incentives for voters to donate money and for candidates to use such money for political advertising if the latter was understood to play a narrow role of merely informing voters of the candidates' chosen positions. However if campaign advertising were to be seen to play a broader "persuasive" role making a candidate more likable irrespective of their chosen policy positions, their existence can be readily rationalized. The paper provided a formal definition of such persuasive advertizing altering their policy platforms. The paper thus implied that persuasive role of political advertising appears to be far more relevant towards understanding its ubiquitous use in electoral campaigns relative to its perceived role in merely informing voters of party positions.

In contrast to electoral competition, Congleton (1986, 1991) examined the role of persuasive campaigning in the context of lobbying where interest groups try to influence policy choice by costly messaging. Unlike the more reduced-form contest approach to lobbying (first in Tullock, 1980, and subsequently in many others, including Che and Gale, 1998, Epstein and Nitzan, 2004) which is agnostic about the process by which resources influence win probabilities of competing parties, these papers explicitly incorporate persuasion as the key medium of lobbying where expenditures are targeted at changing the beliefs of a Bayesian audience.

Congleton (1986) examined two settings. In one setting advertising always reaches the audience perfectly. Here the interested parties can choose the extremity of their message and make it more persuasive by increasing the repetitions. Increased repetitions make the message more "preponderant" from the audience's point of view who make a Bayesian inference by treating political messages as if they were an experimental observation. The setting bears some similarity with deterministic evidence model of Skaperdas and Vaidya (2012) where resources directly help produce a more persuasive message which is assumed to reach the relevant audience with certainty. It is richer than Skaperdas and Vaidya (2012) in that the content of the message is also examined. However a Nash equilibrium does not exist. The deterministic link between advertising and voter response implies that any campaign (which is a combination of choice of message and repetitions) undertaken by one participant can be defeated by the other by an appropriate change in strategy.

In the second setting, Congleton (1986) considered an imperfect advertising case where a message only reaches stochastically to the audience. Here the message content is pre-determined but the chances of it reaching the audience depends on the frequency of costly repetitions. The paper hypothesized that the win probability of either party depends on costly message repetitions. A Nash equilibrium exists under fairly general conditions and it is possible for advertising expenditures to be excessive relative to social optimum. This setting bears resemblance to the discrete evidence model of Skaperdas and Vaidya (2012) where the chance of a message reaching the audience is stochastic and depends on resources expended.

Congleton (1991) extended this line of analysis by examining how ideol-

ogy of the decision maker who is the target of such persuasive lobbying affects the incentives of interest groups to expend rent-seeking expenditures. Ideological conviction is captured by the relative degree to which the decision-maker's priors about alternative theories approach unity when making a Bayesian inference based on the relative preponderance of evidence presented by self-interested parties. The paper found that under conditions of symmetry, strong ideological conviction on the decision-maker's part tends to reduce rent seeking expenditures when the competing groups take voter ideology as exogenous. When both perceptions about merits of alternative policies and voter ideology are manipulable, the paper shows that rent-seeking expenditures may increase when groups internalize the complementarities between expenses aimed at influencing these. Methodologically, the approach taken by the paper is distinct from the contest approach and is one of influencing the median voter's subjective probability distribution over alternative costs of a relevant policy variable and therefore their preferred policy.

From the above discussion it is apparent that the literature that aims to explicitly analyse persuasive aspects of rent-seeking expenditures seems to have evolved mostly independently to the contest approach to studying rent-seeking. In this context, Skaperdas and Vaidya (2012) provides a bridge by which these two related but mostly distinct approaches can be linked together. The paper shows that the more analytically tractable contest models can have an explicit foundation through a Bayesian inferential process with the parameters having natural interpretations such as priors or biases. Hence the paper suggests that one can also study the impact of ideology and other factors on the degree of persuasive rent-seeking within the framework of traditional contest models which are generally more intuitive and analytically tractable.

In the second part of the paper we discuss the areas of applications that such "persuasion functions" could be used. They include lobbying government at its three branches (legislative, executive, and judicial, the latter in terms of litigation); political campaigning; general policy formulation and advocacy in the wider media; and ideological struggles. The mass media, of course, and as its name implies plays an important intermediary role in all the different levels in which political persuasion is conducted.

2   Contest Functions as Persuasion Functions

We consider settings in which two contestants, labelled A and B, expend resources to persuade an audience or a decision-maker (D) about the correctness or appropriateness of their respective positions. The decision-maker could be a voter, a legislator or a legislative staffer, a judge, an agency head subject to lobbying, or simply a citizen who listens to two different perspectives on a policy issue. Conditional on her preferences, the decision-maker would like to make the right decision but has her own prior beliefs and other biases (to be discussed later). The voter would like to pick the better candidate, possibly in terms of ideology and competence. The legislator would like to sponsor legisla-

tion that is close to her beliefs but also possibly balances other interests (such as re-election). The judge would like to make the right choice about guilt or innocence. The agency head might prefer to implement an administrative rule that balances the intent of legislation, taking into account the practicalities of implementation. And, the citizen would like to have a position on a given issue that she considers to be closer to the truth. The objectives of the decision-maker can thus be complex and multi-dimensional. However, we do not need to include them here because we are concerned with just the probabilities of choosing one of the two competing sides (A and B) based on their actions.

The two contestants expend resources, R_a and R_b, to produce evidence (e_a and e_b), each in their favor. Evidence can be thought of as being either a deterministic or stochastic function of the resources expended as well as of a fixed input that we can identify as *organization*. That is, we can think of as each contestant having an evidence production function $F_i(\bar{K}_i, R_i), i = A, B$, where $\bar{K}_i$ denotes the organizational fixed input of contestant i and the function is increasing in both of its arguments. This fixed input can include the infrastructure of the organization in terms of office space, databases and information technology, the levels or expertise and knowledge, as well as level of access to the decision-maker that the contestant has. Obviously, both inputs of $F_i(\bar{K}_i, R_i)$ should increase the produced evidence in favor of i and have characteristics that production functions typically have (even though we will not have to invoke them here since we will not apply them to particular game-theoretic models).The sequence of moves is as follows.

1. A and B expend resources R_a and R_b to produce evidence e_a and e_b.

2. Based on e_a and e_b, D updates her prior beliefs using Bayes' rule.

3. Given the posterior beliefs obtained, D chooses between the proposals advocated by A and B.

The sequence of moves, the evidence production functions, the interpretation of the evidence and the nature of the decision rule used by D are common knowledge for the two contestants. The question is, then, how the probability of winning for the two contestants varies with the resources expended by them.

In Skaperdas and Vaidya (2012) we have derived asymmetric forms of previously used contest functions under plausible conditions for the behavior of the decision-maker. In the second stage, based on the evidence produced by the two contests, D assesses the likelihood ratio that A is the appropriate choice L^a.[2] Letting π denote $D's$ prior belief that A is the appropriate choice, we can determine $D's$ posterior probability that A is the appropriate choice (denoted by π^*) using Bayes' rule, so that:

$$\pi^* = \frac{\pi L^a}{(1 - \pi) + \pi L^a} \tag{1}$$

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[2] By definition, the likelihood ratio equals $L^a = \frac{\Pr(e_a, e_b | A)}{\Pr(e_a, e_b | B)}$. It is assumed that this ratio can be subjectively constructed directly as stated by Kadane and Schum (p.127) in making a holistic assessment of the probative force of evidence.

We first discuss the case of deterministic evidence production function. Then, the evidence obtained by contestant i, is given by $e_i = F_i(\bar{K}_i, R_i)$. Apart from resources and organization, the "truth" - literally or in the sense of how close to the preferences of D are the proposals of each contestant - can also expected to play a role in evidence production. For example, if the truth were to be with contestant A, we could have evidence production functions

$$e_a = \phi F(\bar{K}_a, R_a) \text{ and } e_b = (1 - \phi)F(\bar{K}_b, R_b) \tag{2}$$

where $\phi > 1/2$ and $F(\cdot, \cdot)$ is common to both contestants. In this case, ϕ is a parameter that measures the degree to which the evidence production process can discriminate in favor of the truth. Clearly, with ϕ close to 1 the contestant who has the truth with her can more easily produce evidence in her favor compared to her opponent. With ϕ very close to $1/2$, however, there is barely any advantage in having the truth with you. The degree of discrimination in favor of the truth that D possesses (that is, how close ϕ is to 1) could depend for the case of, say property litigation, on how well-defined property rights are and for the case of voters on how well-informed they are in general and how effective is the media in filtering through misleading or false statements by politicians.

Another component that needs to be defined is the likelikood ratio L^a. We assume that the decision-maker's determination of L^a takes a *power-law form*:

$$L^a(e_a, e_b) = \lambda \left(\frac{e_a}{e_b} \right)^\mu, \text{where } \lambda, \mu > 0.$$

This power-law form is present in many physical and social settings.[3] The parameter λ is a measure of the bias that the decision-maker has in favor of the evidence presented by one contestant against the evidence produced by the other contestant. With $\lambda > 1$, D is biased in favor of $A's$ evidence, whereas $\lambda < 1$ represents bias in favor of $B's$ evidence. One source of this bias could be "cognitive" or "cultural" capture of financial regulators that Kwak (2013) and others have identified as part of the regulatory failures that led to the Great Financial Crisis. The parameter could also represent the media filter (or bias through which D might view the evidence produced by the contestants.

Given these assumptions about evidence production and its evaluation, the decision-maker's posterior probability that A has the right proposal takes the following additive form:

$$\pi^*(R_a, R_b) = \frac{\pi \lambda \phi F(\bar{K}_a, R_a)^\mu}{(1 - \pi)(1 - \phi)F(\bar{K}_b, R_b)^\mu + \pi \lambda \phi F(\bar{K}_a, R_a)^\mu} \tag{3}$$

The probability that B has the right proposal is naturally $1 - \pi^*(R_a, R_b)$. To go from these posterior probabilities to the persuasion function that capture the win

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[3] For example, research in psychophysical experiments it is well established that quantitative human perception (such as sensation of relative brightness of light or loudness of sound, as well as judgments concerning intensity of attitudes and opinions) of stimuli follows a power law. See Stevens (1976) and pages 127-133 of Sinn (1983) for a survey of these findings.

probabilities as perceived by A and B, we might consider two alternative decision rules that D might use to arrive at a decision at stage 3 of the process we have described. One possible rule is that the decision-maker makes a probabilistic decision (akin to tossing an unfair coin)

Choose A with probability π^* and B with probability $1 - \pi^*$. (Rule 1)

Another possible rule is to choose the proposal with the higher posterior:[4]

$$\text{Choose } A \text{ if and only if } \pi^* > \frac{1}{2} \qquad \text{(Rule 2)}$$

Under both rules, the win probabilities of the contestants can take the additive asymmetric functional form in (3). (To arrive at the additive function under rule 2, it is assumed that contestants have a uniform distribution over π, instead of knowing its realized value with certainty.)

Under rule 2, the persuasion function can also be an asymmetric perfectly-discriminatory one (or, the all-pay auction) as given by:

$$P_A(R_a, R_b) = \begin{cases} 1 & \text{if } \frac{F(\bar{K}_a, R_a)^\mu}{F(\bar{K}_b, R_b)^\mu} > \frac{(1-\pi)(1-\phi)}{\pi\phi\lambda}; \\ 0 & \text{if } \frac{F(\bar{K}_a, R_a)^\mu}{F(\bar{K}_b, R_b)^\mu} \leq \frac{(1-\pi)(1-\phi)}{\pi\phi\lambda}. \end{cases} \qquad (4)$$

This contest function differs from typical applications of all-pay auctions (Hillman and Riley, 1989, Kovenock et. al, 1996) only in that it is asymmetric and also it does not include an outcome that has a probability of $1/2$.

The classes of functional forms in (3) and (4) are the ones that have been used overwhelmingly in contests. Their derivation in a persuasion setting provides a justification for using them in such settings. It also allows for ready interpretations of the various potential sources of asymmetry that may be empirically significant. In particular, in either (3) or (4), the chance of success for A increases (and the chance of success for B decreases) with:

- An increase in resources used by A (higher R_a) and a decrease in the resources used by B (lower R_b).

- A better organization by A (higher $\bar{K}_a$) and a less capable organization by B (lower $\bar{K}_b$).

- Higher prior belief by D that A is correct (higher π).

- Higher bias on the part of D in favor of the evidence presented by A (higher λ)

- When the truth is with A ($\phi > 1/2$) and the more the evidence production process favors the truth (higher ϕ).

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[4]More generally, especially for litigation settings, the rule can be

Choose A if and only if $\pi^*(R_a, R_b) > \gamma$ where $\gamma \in (0, 1)$.

This rule would allow for the standard of "beyond reasonable doubt" where γ is considerably higher than $1/2$.

When evidence production is stochastic, the production functions $\phi F(\bar{K}_a, R_a)$ and $(1 - \phi)F(\bar{K}_a, R_a)$ can be thought of probabilities that each contestant's probability of finding a favorable piece of evidence of a fixed value. In such stochastic settings, the persuasion functions are of the following difference-form variety, with $A's$ probability of winning:

$$P_a(R_a, R_b) = \alpha + \beta\phi F(\bar{K}_a, R_a) - \gamma(1-\phi)F(\bar{K}_a, R_a) + \Delta(1-\phi)\phi F(\bar{K}_a, R_a)F(\bar{K}_a, R_a) \tag{5}$$

where $\alpha, \beta, \gamma > 0$, Δ can be either positive or negative, and all parameters are suitably constrained so that $P_a(R_a, R_b) \in [0, 1]$. Although this functional form is more difficult to interpret in places, similar comparative statics to those we have just outlined above for (3) and (4) hold for (5) as well. This functional form has been barely used in the contests literature (with Baik, 1998, Che and Gale, 2000, and Skaperdas et al, 2016, being exceptions).

3 Applications: Levels of persuasion and the media

Political persuasion is not just relevant for understanding politics. It can also have much to do with economics and, in particular, in influencing the distribution of income. It is becoming evident that the increasing levels inequality that have been observed in rich Western countries (and became widely publicized with the popularity of Piketty, 2014) are not just the result of purely economic forces. Acemoglu and Robinson (2008) have used abstractly a contest model to show how democracy could lead to the same economic outcomes as non-democracy as a result of the economic power of elites. Stiglitz (2013) has identified numerous concrete ways in which greater economic resources lead to great political power which, in turn, lead to higher levels of economic resources, thus creating a self-reinforcing cycle of increasing inequality. The key mechanism in that process can be considered to be the use of economic resources in political persuasion. In this section, we outline specific areas in which persuasion functions could be applied to, especially for understanding their economic impact.

3.1 Lobbying government

Governments are lobbied in all of its branches. Legislators and their staff are lobbied in order to introduce and shape legislation as well as for providing services to their constituents. The executive branch of government is lobbied in order to influence legislation as well as, and perhaps even more importantly, in order to move policies that is the prerogative of the executive and in order to influence the actual implementation of legislation and regulation. The various agencies of government have much discretion about decisions that are critical

for some interest groups and these groups naturally expend significant resources in lobbying for a favorable decision.

The judicial branch is considered above the political fray and therefore lobbying the courts is not a normal activity. However, the judicial branch and litigation are largely about persuasion, and the way we have derived contest functions is through persuasion.[5] That is, contrary to much of the literature on rent-seeking and lobbying, where the activity is considered essentially venal,[6] our approach involves decision-makers who make their decisions on the merits of the evidence presented to them, just as judges and juries are supposed to be doing. The decision-makers have biases and their own preferences but they provide a chance to the lobbyists/contestants to argue in favor of their respective cases. However, in our approach, the organizational and resource advantage that a lobbyist might have is not discounted by the decision-maker. That is a possible major mechanism through which having access to more money could lead to more favorable economic outcomes.

An example of how the persuasion function in (3) could be implemented in a game for the case of lobbying the executive or leglislative branch is now briefly introduced.[7] The organization ($\bar{K}_i$), resource (R_i), prior (π), and bias (λ) parameters can remain the same as in (3) (or it can be replaced by either (4) or (5)). What needs further elaboration is the degree of "truth" parameter ϕ. In lobbying settings the main concern is policy and the "truth" can be considered in terms of the policy that the government official lobbied considers natural or fair.

We think of policy in one dimension. In particular, we suppose each lobbyist $i = A, B$ has preferences $V_i(t \mid \hat{t}_i)$ over a one-dimensional policy variable $t \in R$ that are single-peaked at $\hat{t}_i$ (which denotes lobbyist i's "ideal" position) so that the further away is t from it, the lower is the utility of the lobbyist.[8] We assume that without loss of generality $\hat{t}_a < \hat{t}_b$. Each lobbyist can attempt to influence the implemented level of t by costly persuasive lobbying to the decision-maker. The decision maker can be a pivotal member in the relevant legislative body or an agency head responsible for design and delivery of the policy. We assume that the decision-maker is pre-disposed towards implementing a "status quo" position $\tilde{t}$ unless he is convinced to do otherwise in light of the arguments presented by the lobbyists. For example, in the case of a law's implementation, $\tilde{t}$ could be the interpretation the decision-maker has about the intent of the legislation. For the case of legislative lobbying, $\tilde{t}$ could be the legislator's interpretation of the intent of the voters. Other interpretations of $\tilde{t}$ are naturally possible.

The lobbyists first choose their policy positions (or proposals) for which they

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[5] For models of litigation based on contests see Hirshleifer and Osborne (2001) and Robson and Skaperdas (2008).

[6] See, for example, Tullock (1980) or most of Grossman and Helpman (2001).

[7] See Skaperdas and Viadya (2015) for further development. The persuasion functions in (4) and (5) could be similarly implemented in principle (but, to our knowledge, has not been tried yet).

[8] For notational brevity, we will henceforth denote the utility functions as simply $V_i(t)$.

would like to advocate and, given the proposals, they choose levels of resources they devote to lobbying. Now, coming back to ϕ we can think of it as a function of the policy proposals, denoted t_a and t_b, and the status quo position $\widetilde{t}$, with the following properties: ϕ is higher the closer is t_a and the further away is t_b from $\widetilde{t}$. An example of such a $\phi(t_a, t_b)$ is $\frac{|t_b - \tilde{t}|}{|t_a - \tilde{t}| + |t_b - \tilde{t}|}$.[9] That is, it becomes harder to argue your case to the decision-maker when you take a position that is further away from the status quo and your opponent takes a position closer to the status quo policy.

With this background, the payoff functions for the two lobbyists are the following:

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\begin{aligned}
\pi_a(R_a, R_b; t_a, t_b) &= \pi^*(R_a, R_b)[V_A(t_a \mid \hat{t}_a)) - V_A(t_b \mid \hat{t}_a))] \\
&\quad + V_A(t_b \mid \hat{t}_a)) - R_a \\
\pi_b(R_a, R_b; t_a, t_b) &= (1 - \pi^*(R_a, R_b))[V_B(t_b \mid \hat{t}_b)) - V_B(t_a \mid \hat{t}_b))] \\
&\quad + V_B(t_a \mid \hat{t}_b)) - R_b
\end{aligned}
\tag{6}
$$

The first term of each payoff function is the probability of the lobbyist's winning, but should be considered now as a function of both policy positions as well as the resources devoted to lobbying. The payoff in the event of winning is the difference in the value of the policy positions between winning and losing, whereas the value of the opponent's policy is a base that is guaranteed.

Note that if the two lobbyists were to choose the same policy positions (i.e., $t_a = t_b$), then there would be no reason to expend any resources to guarantee that the position will be implemented. It turns out that, under plausible conditions under (3), the two lobbies will never choose the same policy positions to propose to the decision-maker. Moreover, when the lobbyists are similar in terms of most preferred outcomes, organization and the decision-maker is not too biased, the lobbyists both choose to advocate for their own most preferred position. Only when there are significant asymmetries in terms of organization, most preferred outcomes, and decision-maker bias does the lobbyist with the disadvantage moderate his policy proposal.

3.2   Political Campaigns

Another area in which money and persuasion are playing an increasingly important role is that of political campaigning. The contestants are the candidates and the decision-makers are the voters. Since persuasion functions have been derived for a single decision-maker, a model based on them could literally apply to a single voter. Then, the probability of winning for each candidate would have to be derived by appropriately aggregating over all voters' probabilistic choices. Baron (1994) and Skaperdas and Grofman (1995) have used a simplified symmetric form of (3). To our knowledge, however, there have been no

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[9]When $t_a = t_b = \widetilde{t}$, we have $\phi(\widetilde{t}, \widetilde{t}) = 1/2$.

studies that examine political campaigns with the asymmetries found in (3), (4), or (5).

The preferences of an individual voter can be accommodated through the ϕ term we have just discussed (for example $\phi = \frac{|t_b - \tilde{t}|}{|t_a - \tilde{t}| + |t_b - \tilde{t}|}$), where $\tilde{t}$ now represents the most preferred policy outcome for the voter and t_a and t_b are the policy positions advocated by the two candidates. The voter can also have personal likes and dislikes of the politicians in ways that can be accommodated by the prior π, as well as a biased treatment of the arguments and evidence provided by the candidates that can be summarized by the parameter λ. On the contestant-candidates' side, organization and resources expended can still be represented by the two inputs in the evidence production function $F(\bar{K}_i, R_i)$. Especially for presidential candidates the two broad types of inputs - in terms of resources expended on voter lists, investments in a "ground game" as well as money expended on advertising and other media - are to be found in media discussions of politics.

One important issue that is not covered by the approach to persuasion functions we take in this paper is how exactly are the resources and organization of the candidates procured through individuals and groups in campaign financing. This issue and the appropriate aggregation of the probabilities of winning over all voters are open questions as far as using our approach for the study of political campaigns.

3.3 Policy advocacy and ideological struggles

What are considered mainstream views or "median" policies change over time. Over decades the changes that occur can be profound. From the New Deal to the early seventies the attitudes towards governments and markets in mainstream debate in the United States were rather different than what has followed since then. Over centuries the changes can be even more profound. Enlightenment thought brought a competely different frame of thinking about - and forms the deep ideological underpinning of - the social, political, and economic world that we live in now. Before the bulk of the modern world was formed, a *revolution of the mind* occurred in the words of Israel (2010). Major and minor intellectuals propagandized their (then) radical enlightenment ideas with fervor but they could not do that by themselves, without the apparent support of enlightened - though perhaps guilty - aristocrats, the new rich, and poor literate commoners. On the other side, were formidable conservative forces countering enlightenment ideas that arguably engage in rear-guard action to this day.

Unless one is an ardent economic determinist (so as to argue that economic conditions completely dictate ideologies and the latter are just an epiphenomenon), ideological struggles as well as more pedestrian policy disputes should have at least some real effects and matter in both the short run and the long run. At any particular time, mainstream views can be close to the truth but they can also veer off in directions that can plunge societies in long-term decline that they are incapable of arresting precisely because of the ideological blinkers

they have and cannot shed.

The ingredients of our approach can be used to study ideological and policy competition, and some of them have been used by Grijalva (Ch.2, 2013). The contestants of two centuries or more ago could be ideological entrepreneurs or small groups of them. In recent times interests are much more organized than in the past and the evidence production functions $F_i(\bar{K}_i, R_i)$ are well-suited, and money has probably become more important in both constructing organizations and providing other resources.[10] While older viewpoints can be thought of as having high prior beliefs on the part of many decision-makers, if new ideologies are attractive in other ways and the "truth" is with them, then you can have ideological change that can take off. What mediates, however, whether the truth can come out easily or not is the media.

3.4 On the Mass Media's role

Suppose one side were to possess the absolute truth. The parameter ϕ then would represent the ability of the decision-maker to discriminate in favor of the truth, with ϕ close to 1 representing high ability to discriminate and ϕ close to 1/2 indicating low ability to discriminate. Media that is capable, independent, and well-resourced for investigation could provide voters, government officials, and citizens in general with high ability to discriminate among false and true claims. Low levels of resources on the part of journalists, and editors and publishers with friends in high places could reduce that ability of media to discriminate in favor of the truth and engage in "he said, she said" journalism that might obscure rather than illuminate differing viewpoints. The increasing sophistication of modern media operations of interest groups, political candidates, and lobbyists might actually have made it more difficult for mass media to discriminate in favor of the truth.[11]

4 Concluding Remarks

With the development of the modern state, within the ideal type of which the state has the legitimate monopoly in the means of violence, the main instrument for contesting power is persuasion - from parliaments and the offices of bureaucratic agencies, to political campaigns, to judicial courts, to ideological struggles, and the court of public opinion. Modern politics is about hardly more than persuasion. In this chapter we have outlined the derivation of contest functions in persuasion contexts in which contestants produce evidence in order to influence an audience. Along the way we have shown how organization, resources, different types of biases on the part of the audience, as well as

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[10] Phillips-Fein (2010) provides evidence on the long-term investments provided over decades in favor of reversing both the ideological underpinning and the policies of the New Deal.

[11] There is even a subfield within anthropology and sociology that studies the production of ignorance that has been dubbed *agnotology (*Proctor and Schiebinger, 2008). The ability of the tobacco companies to obscure the scientific results about the health effects of tobacco use for decades is a prominent example that has been studied within that literature.

the truth influence the probability that the position of each contestant will be adopted by the audience. This way we provide better underpinnings for the use of contest functions in political contexts that involve persuasion and derive natural interpretations for parameters that can be useful in such contexts.

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