Seeking Information: The Role of Information Providers in the Policy Decision Process

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Abstract: The consequences of many policies are complicated and difficult to foresee. Those who are capable of providing information to policy makers often have a vested interest in the outcomes. This gives them an incentive to distort information to manipulate polic decisions. In this article we argue that reputation or penalties for lying do not alway induce information providers to tell the truth. Rather than relying on interested parties, policy makers can create public agencies to collect information about policy consequences. This has the advantage that polic makers can affect the preferences of the information provider. The drawback is that public agencies must exert efforts to collect information. We argue that policy makers create public agencies whose preferences deviates from their own preferences.

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1. Introduction

It is often the case that an elected polic maker is uncertain about the consequences of alternative policies. To obtain information about these consequences, the policy maker can rely on agents who possess information, like bureaucrats and interest groups. Those who are capable of providing information often have a vested interest in the outcome. They are interested parties, and therefore have incentives to give biased information. An alternative way for the polic maker to obtain information about polic consequences is to create an agency and task it with collecting and supplying information. We observe both ways of acquirin information in reality. Sometimes polic makers rely on interested parties. Sometimes they receive information from public agencies.

There exists a voluminous literature on the interaction between policy makers and interested parties. In the last three decades two waves of studies can be distinguished. The first wave was a reaction to Niskanen's seminal study on bureaucrac (Niskanen, 1971). Niskanen's view was that bureaucrats have a monopoly of information which they use to secure budgets that are higher than sociall desired. The implication of the Niskanen model is that although elected polic makers have formal authority, real authorit lies in the hands of informed bureaucrats (see also Aghion and Tirole, 1997). Several authors have criticized the Niskanen model. Their main objection to the model is that politicians are assumed to be completely passive. Allowing an active role of politicians leads to the result that they are not at the bureaucracy's mercy. For example, by direct monitoring (Downs, 1967), oversight (McCubbins and Schwartz, 1984), and administrative procedures (McCubbins, Noll and Weingast, 1987), politicians can limit the power of bureaucracies effectively.

In the mid-eighties, the game-theoretical literature on information transmission led to a second wave of studies on the role of informed parties in the policy decision process. In these studies the focus is on the transmission of information from a knowledgeable agent, like an expert, an interest group, or a bureaucrat, to an uninformed agent, like the president or a legislator (Crawford and Sobel, 1982, Milgrom and Roberts, 1986, Gilligan, 1993, Potters and Van Winden, 1992). One of the basic insights this literature offers is that the transmission of information can be imperfect, because the informed agent may have an incentive to manipulate information in order to bias the policy maker's decision. In principle, this insight is consistent with the prediction of the Niskanen model that bureaucracies have an incentive to use information strategically. However, game theory adds two important elements to the discussion. First, game theoretical models help to identif the conditions under which information providers are able to distort polic decisions. Second, game theory is a useful tool to examine formall how polic makers can create institutions in order to reduce the incentive of information providers to manipulate information. By exploiting this second element, justice is done to the formal authorit of politicians which enables them to change the rules of the game, if so desired.

The objective of this article is twofold. First, we try to identif the conditions under which polic makers can induce interested parties not to distort information by imposin a penalt for lying. Second, we try to explain the motives of public agencies charged with the responsibilit of collecting and supplying information. More generally, this article studies the quality of information polic decisions are based on. This is an important subject, because the qualit of information is likely to affect the quality of policy.

The question if information providers are more likely to provide truthful information when they face a penalty for lying is an old one. For example, Breton and Wintrobe (1975, p. 204) have argued that bureaucrats compete for promotions. A promotion system is one way to punish dissembling information providers and to reward honest information providers. More recently, Lupia and McCubbins (1994a and 1994b) have developed a formal model to examine whether a penalt for lying may dissuade information providers from dissembling. In their model there is a player, called the verifier, who occasionall provides information to the polic maker. When the verifier discovers that the information provider has lied, the information provider has to pay a penalty. Lupia and McCubbins show that in the presence of a verifier, a penalt for lying gives an incentive to an information provider to tell the truth. Although this result is hardl surprising, it is important for two reasons. First, it suggests how polic makers can change the motives of an information provider. Second, it explains why several governments have created (independent) agencies, such as the General Accounting Office in the United States, which are tasked with the evaluation of policies and policy proposals.

Although we can learn a lot from the work by Lupia and McCubbins, it leaves three questions open. First, why do polic makers rely on dubious information providers when there exists a trustworthy verifier? To put it differently, the introduction of an exogenous, knowledgeable, verifier into the model seems to conflict with the spirit of the model. Second, how should we interpret this penalt for lying? Lupia and McCubbins (1994b, p. 109) think of this penalt as a loss in trust between the information provider and the polic maker. By breakin this trust the information provider may lose her abilit to affect future decisions (see also Wittman, 1995, p. 104). However, as long as the effect of lying on trust or reputation is not examined formally, this interpretation remains speculation. Third, are experts willin to provide information when they face a penalt for lying? Lupia and McCubbins implicitl assume that information providers are willin to provide information. In the standard model of information transmission this assumption is not important, because information providers never suffer from providing information. However, the introduction of a penalt for lying may reduce experts' willingness to provide information.

In the next four sections we try to answer these three questions. In Section 2 we examine a rudimentar model of communication. In this model an uninformed polic maker has to make a binary policy decision. To acquire information about the consequences of his decision, the policy maker has to rely on an informed expert. The model leads to the well-known result that the probabilit that the information provider manipulates information in order to affect the polic decision reduces when the preferences of the policy maker and information provider are more closely aligned.

In section 3 we extend the model by allowin the polic maker to consult several informed experts. We show that in this settin the polic maker relies on the expert whose preferences are most consonant with his own. Again this result is not novel (see, for example, Calvert, 1985; and Gilligan, 1993). Moreover, we show that the polic maker ignores the advices given by other experts. The reason is that recommendations made by other experts are less informative. Consequently, these experts cannot be used to discover lies of the selected expert.

In Section 4 we analyze a model in which the expert has to pay a penalt when the polic maker discovers that she has lied. The implication of the results derived in Section 3 is that to discover a lie, the polic maker has to undertake the project.[1] Consequently, in Section 4 we focus on *ex post* monitoring. A drawback of *ex post* monitoring is that the polic maker never discovers a lie when the expert is more biased toward maintaining the status quo than himself.

[1]Even when the project is undertaken the policy maker will not always learn if the expert has lied. In practice the consequences of policies often depend on many factors beyond the expertise of both the policy maker and the expert.

In this case a lie leads to maintaining the status quo, so that the polic maker does not learn the consequences of the project. When the expert is more biased toward undertaking the project than the polic maker, a penalt for lying may reduce the expert's incentive to lie. However, we show that a high penalt for lying may induce the expert not to provide information at all. This result does not stem from a fear of having to pay a penalty. For, the expert can avoid a penalty b alway tellin the truth. The reason for this result is that when the expert faces a high penalt for lying he may prefer a situation in which the polic maker makes an uninformed decision to a situation in which the policy maker makes an informed decision.

In Section 5 we analyze a dynamic model of information transmission to examine the role of reputation and trust in the interaction between the polic maker and the selected expert. We find that reputation buildin does not play a role, because the threat of a polic maker to turn to another expert when he discovers that the expert has lied is not credible. This result casts doubt on the idea that a penalty for lying can be interpreted as a break in trust.

The analysis of the interaction between a policy maker and interested information providers leads to the conclusion that often polic makers cannot prevent interested parties from lying. Consequently, polic decisions are sometimes based on manipulated information. In Section 6 we examine a model in which the polic maker can create a public agency which is tasked with collecting and supplying information. In our view, there are two differences between interested experts, like pressure groups and bureaucrats, and a public information provider. First, interested experts often possess information as a byproduct of their normal activities, while a public agency has to acquire information. Usuall acquirin information involves costs of time and staff. Moreover, it is likel that the qualit of information depends on the efforts exerted on acquirin information. Second, the polic maker cannot determine the preferences of interested experts, but as the creator of a public agency, the polic maker may be able to determine the preferences of the public agency. This raises the question what kind of an agency does the polic maker create In section 6 we show that the policy maker favors a public agency that is relativel "unbiased" toward public projects. The reason is that an unbiased public agency has stronger incentives to collect information than a biased public agency. The implication of this result is that the preferences of the policy maker and the created agency do not coincide. Consequently, as with interested information providers, communication between the polic maker and the created agency is imperfect.

2. A Rudimentary Model of Information Transmission

In this section we discuss a simple model of information transmission.[2] Point of departure is a polic maker who must make a decision about a project *X*. With respect to this project, the polic maker can choose between two alternatives. First, he can decide to undertake the project ($X = 1$), and second, he can decide to maintain the status quo ($X = 0$)

Following Austen-Smith (1990), we do not regard policy as an end in itself, but regard it as a means to an end. For example, polic is intended to enhance efficiency, to alleviate poverty or to increase the probabilit that the polic maker wins the next elections. Often, the polic maker does not know the relationship between polic and real consequences for sure. We model this as follows. When the policy maker chooses $X = 1$, his payoff is equal to:

$$U_P(X = 1 \mid \mu) = p + \mu , \tag{1}$$

where p denotes the polic maker's predisposition toward the project, and μ is a stochastic term. In (1), the stochastic term captures that the polic maker is uncertain about the consequences of the project. We assume that μ is uniformly distributed over the interval $[-h, h]$.

When the policy maker chooses $X = 0$, his payoff is equal to:

$$U_P(X = 0) = 0 . \tag{2}$$

By means of (2), we normalize to zero the payoff to the polic maker when the status quo is maintained.[3]

The polic maker prefers $X = 1$ to $X = 0$, if $\mu > -p$.[4] Throughout this paper we assume that $h > |p|$. The implication of this assumption is that the policy maker has an interest in acquiring

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[2]The model builds on Letterie and Swank (1997). Variations of this model are examined by Austen-Smith (1990), Hopenhayn and Lohmann (1996) and Lupia and McCubbins (1994a+b).

[3]We assume that the status quo does not involve uncertainty. Adding uncertainty to (2) does not affect the results.

[4]Without loss of generality, we assume that the policy maker prefers $X = 0$ to $X = 1$ if $\mu = -p$.

information, because without information about μ the polic maker runs the risk of making a wrong decision.

To acquire information about μ, the polic maker can consult an expert. We assume that the expert observes μ. In line with the information problem the polic maker faces we assume that the polic maker asks the expert the followin question: Should I undertake the project or should I maintain the status quo? In terms of our model this question can be formulated as: is $\mu > -p$? The expert sends a message to the polic maker. One can think of this message as a written report, or as an assertion the adviser makes to the polic maker at dinner. After the policy maker has received the message, he makes a decision about the project.

When modellin communication between two players, one has to make assumptions about the language the players use and understand. We make these assumptions explicit by - what game theorists call - the message space. The message space is the entire set of messages an expert can send. In principle, the message space is infinitel large. The reason is that the expert can say or write anything he wishes. However, in many game-theoretical models the message space is restricted to all ‘relevant’ messages. In the model under consideration relevant messages are all sensible answers to the question formulated by the policy maker. Thus, we define the message space as $\{Y, N\}$, where message Y expresses that the expert recommends undertaking the project, and message N expresses that the expert recommends maintaining the status quo.

In this paper, we assume that the expert is goal-oriented. Like the polic maker she cares about polic consequences. So the expert is an interested party, who cares about outcomes. When the policy maker undertakes the project, the payoff to the expert is given by:

$$U_A(X = 1 \mid \mu) = a + \mu . \tag{3}$$

As in (2), we normalize to zero the payoff to the adviser when the policy maker maintains the status quo.

$$U_A(X = 0) = 0 . \tag{4}$$

To predict the outcomes of the game we make use of the Bayesian-Nash equilibrium concept. In a Bayesian-Nash equilibrium the players' strategies are optimal responses to each others, and prior beliefs are updated according to Bayes' Rule. Let us first discuss a possible strategy for the expert. The expert wants the policy maker to choose $X = 1$ if $\mu > -a$ and wants the polic maker to choose $X = 0$ if $\mu \leq -a$. Suppose that sending message *Y* gives an at least as high probability that the policy maker chooses $X = 1$ as message *N*. Then, it is optimal for the expert to send message *Y* if $\mu > -a$ and to send message *N* otherwise.

Now consider the problem the polic maker faces. Given the expert's strategy, the message sent by the expert contains information about μ. Message *Y* implies that $\mu > -a$, and message *N* implies that $\mu \leq -a$. Using Bayes' Rule, it is eas to derive the expectation of μ conditional on the message sent by the expert:

$$E(\mu \mid Y) = \frac{1}{2}(h - a) \tag{5}$$

$$E(\mu \mid N) = -\frac{1}{2}(h + a). \tag{6}$$

It is optimal for the polic maker to follow the expert if followin her yields a higher payoff than ignoring her. This requires that

$$p + \frac{1}{2}(h - a) > 0 \rightarrow a < h + 2p \tag{7}$$

$$p - \frac{1}{2}(h + a) < 0 \rightarrow a > 2p - h \tag{8}$$

If (7) and (8) are satisfied, then a communicative equilibrium exists, in which the expert bases his message on μ, and the policy maker always follows the expert. If (7) or (8) is violated, it is not optimal for the polic maker to follow the expert. Consequently, it is optimal for the polic maker to ignore the expert's recommendation, and to base his decision about the project on *p*. It is well-known that in models of information transmission a non-communicative equilibrium, in which the expert chooses a message randomly and the policy maker ignores the message sent, always exists. However, if (7) and (8) are satisfied, a non-communicative equilibrium is not stable (see Swank, Letterie and Van Dalen, 1999). To see this suppose a non-communicative equilibrium and that (7) and (8) are satisfied. Now suppose that the expert believes that there is an infinitesimal probabilit that the polic maker follows her recommendation. The implication is that it becomes optimal for the expert to send message *Y* if $\mu \leq -a$, and message *N* otherwise. Given this strategy, it is no longer optimal for the polic maker to ignore the message sent by his expert. Hence, the non-communicative equilibrium breaks down.

Our simple model of information transmission provides two basic insights. First, polic makers base polic on experts' recommendations only if the *expect* to benefit from so doing. From (7) and (8) it is eas to see that this requires that experts' and polic makers' preferences are not too dissimilar. Second, followin experts' recommendations may lead to deception. If (7) and (8) are satisfied and μ lies in the interval $(-a, -p)$ $[(-p, -a)]$, then the polic maker chooses $X = 1$ $(X = 0)$, while he should choose $X = 0$ $(X = 1)$. In case of deception, the expert has cheated or lied (recall that the polic maker asks to the expert if he should undertake the project). Clearly, the probability of deception or cheating is positively related to the absolute difference between *a* and *p*. Only if $a = p$, deception does not occur.

In Section 3-5 we focus on the question of if the polic maker can reduce the probabilit of deception.

3. Multiple Experts

In the simple model of information transmission, there is only one informed agent. Clearly, this is an extreme case. For many projects, there are more experts to whom the polic maker can turn.[5] The presence of multiple experts raises two questions. First, on which expert(s) does the polic maker rely? Second, does the presence of multiple experts affect their incentives to lie

To answer these questions we replace the assumption of a single expert with the assumption that there are *n* experts, who all send a message to the polic maker about the desirabilit of the project. To analyze the model, we need some additional notation. Let a_i denote adviser A_i`s predisposition toward the project. Furthermore, let $m_i = \{Y_i, N_i\}$ denote the message space of A_i. As before, we normalize to zero the payoff to A_i when the status quo is maintained. When the project is undertaken the payoff to A_i is given by:

[5]The existence of multiple experts who are willing to provide information to polic makers is the key idea of the seminal paper on fire-alarms by McCubbins and Schwartz (1984).

$$U_{A_i}(X = 1) = a_i + \mu\,. \tag{9}$$

Analogous to the model discussed in the previous section, in the present model not any adviser has an incentive to send Y_i if $\mu \le -a_i$ or N_i if $\mu > -a_i$. Therefore, suppose that A_i sends Y_i if $\mu > -a_i$, and N_i otherwise. How does the polic maker respond to the messages he receives To answer this question it is convenient to distinguish three cases.

Case 1: $a_h > a_l > p$. Given the supposed strategies of the advisers, it is eas to see that the polic maker follows the message sent by A_l, and ignores the message sent by A_h. $a_h > a_l$ implies that when A_l recommends $X = 1$, so does A_h. Then, A_h does not provide additional information about μ. Moreover, $a_h > a_l > p$ implies that when A_h sends message N_h, while A_l sends message Y_l, the polic maker learns that $\mu \in (-a_l, -a_h]$, so that $\mu \le -p$. Consequently, the polic maker chooses $X = 0$, thereby ignoring A_h. When both A_l and A_h recommend $X = 0$, N_h does not provide additional information. Notice that this arguments hold for all pairs of adviser. Hence if in case 1, A_l is the adviser whose predisposition is closest to that of the policy maker, the polic maker relies on A_l rather than on an adviser with $A_i > A_l$.

Case 2: $p > a_h > a_l$. Reasonin as above, it is eas to show that in this case, the polic maker relies on A_h rather than on A_l.

Case 3: $a_l < p$ and $a_h > p$. To examine whether the polic maker bases his decision about the project on A_l or A_h, suppose that the two experts give conflicting recommendations: N_l and Y_h. From this set of messages, the policy maker infers that $\mu \in [-a_l, -a_h)$. The polic maker chooses $X = 0$ if

$$p - \frac{1}{2}(a_l + a_h) > 0 \rightarrow a_h - p < p - a_l. \tag{10}$$

Equation (10) shows that the polic maker follows the expert whose predisposition toward the project is closest to that of himself. Notice that if (10) is satisfied (violated), the policy maker ignores the message sent b a_l (a_h).

Together the three cases impl that once the polic maker has selected the optimal expert, he ignores the messages that he receives from all other experts. This implication seems to fly in the face of empirical evidence. For, in reality policy makers often rely on several experts. However, in the present model experts are knowledgeable, and consequences of the project are surrounded by one type of uncertainty. When polic makers are not sure that experts are knowledgeable, as in Swank (1999), and projects have several types of consequences, as in Swank, Letterie and Van Dalen (1999), the policy maker may rely on several experts. When experts sometimes make mistakes, polic makers may also rely on several experts. However, in an imperfect information model, multiple experts are used by the polic maker to reduce the probabilit of basing polic on an uninformed expert. Multiple experts are not used to prevent experts from manipulating information. The point of this section is that the polic maker cannot use other experts to verify the message sent by the selected expert. This brings us back to our basic question: Does the presence of multiple experts reduce the probability of deception? The answer to this question is qualified yes, because the presence of multiple experts enables the polic maker to select an expert whose preferences are closest to his own. However, unless the expert's preferences coincide with the polic maker's preferences, the probability of deception is not eliminated.

4. A Penalty for Lying

In this section we examine if the policy maker can reduce the probability of deception b penalizing experts who are discovered to have lied. The analysis of penalties for cheatin experts raises three questions. First, how does the policy maker discover that the expert lies? In the previous section we have shown that the policy maker cannot use other experts to discover that the selected expert lies. As a consequence, without another source of information, such as a verifier, the policy maker has to undertake the project to discover that an expert lies. One implication is that the polic maker cannot discover that an expert, who is more biased toward the status quo than himself, lies. We therefore restrict attention to the case $a>p$. Another implication is that, in case of a one-shot game, a penalt for lying is not credible. Once the polic maker has made his decision about the project, he has no incentive anymore to impose a penalt for lying.[6] In this section, we assume that the polic maker can commit himself to imposin a penalt when he discovers that an expert has lied. Second, how should we interpret this penalty? We assume that the expert directl suffers from a penalty, but that the polic maker does not directl benefit from it. Following, Lupia and McCubbins (1994a, p.106) one may think of the penalt for lying

[6] I thank one of the referees for bringing my attention to this point.

as a damage to the expert's reputation. However, in the next section we will show that the penalt for lying should not be interpreted as a threat to the expert of losing influence on future polic decisions.[7] Third, does a penalt for lying affect the expert's incentive to provide information To answer this question we allow the expert to choose between participating and not participating in the policy decision process at the beginning of the game, that is before she observes μ. We assume that the expert can commit herself to not giving advice. One interpretation of this assumption is that interested parties have to maintain relationships with the polic maker to give advice. By ending this relationship, the expert commits herself.

To analyze how a penalty for lying affects information transmission, suppose that at the beginning of the game the expert has chosen to participate. The resulting game differs from the simple game discussed in section 2 in the expert's payoff function. In the present game the payoff to the expert is:

$$U_A(X = 1 \mid \mu > -p) = a + \mu \tag{11}$$

$$U_A(X = 1 \mid -p > \mu > -a) = a + \mu - f \tag{12}$$

$$U_A(X = 0) = 0, \tag{13}$$

where $f \geq 0$ denotes the penalty for lying. Equations (11-13) impl that regardless of the size of f it is optimal for the expert to send message Y if $\mu > -p$. Moreover, if $f < a - p$, then it is optimal for the expert to send message Y if $\mu > f - a$. The intuition behind the expert's strategy is straightforward. When sending a message, the expert compares the benefits from lying with the costs of lying. The higher is f, the higher are the costs of lying. Moreover, the higher are a and μ, the higher are the benefits from lying. If f is large relative to a, lying never pays.

The polic maker follows the expert if he expects to benefit from followin her advice, implying:[8]

$$p + \frac{1}{2}(h + f - a) > 0 \rightarrow a < \frac{1}{2}p + h + f \tag{14}$$

[7] When experts are bureaucrats, policy makers can punish lying by withholding promotion.

[8] Because $a > p$ the policy maker always chooses $X = 0$ if the expert sends message N.

Because (14) is less restrictive than (7), the condition for a communicative equilibrium is weaker with a penalt than without a penalt for lying (of course, provided that the expert has chosen to participate). The reason is that a penalt for lying induces the expert to behave like an expert whose preferences are closer to the polic maker's preferences. As argued before, similarity of preferences makes a communicative equilibrium more likely to occur.

Let us now examine under which conditions an expert is willin to participate. We assume that (14) is satisfied and that in case the expert does not participate, the policy maker bases his decision about the project on p. The expert chooses between participating and not participating before she observes μ. If she chooses to participate, her expected payoff is equal to:

$$\begin{aligned} U_A(\mu \mid f < a - p) &= \text{Prob}(\mu < -p)\,[a + \frac{1}{2}(h - p)] + \text{Prob}(f - a < \mu \le -p)\,[a + \frac{1}{2}(f - a - p) - f] \\ &= \frac{1}{2h}(h + p)[a + \frac{1}{2}(h - p)] + \frac{1}{4h}(a - f - p)^2 \end{aligned} \tag{15}$$

The first term of (15) denotes the expert's expected payoff when she recommends the project and does not lie. The second term denotes the expert's expected payoff when she lies and has to pay a penalty. As argued before, if $f \geq a - p$, the expert never lies. Then the last term of (15) is equal to zero.

The expert chooses to participate if participating yields a higher expected payoff than not participating. If $p<0$ and the expert does not participate, the policy maker chooses $X = 0$. Consequently, the expected payoff to the expert would be equal to zero. Because (15) is positive, the expert chooses to participate if $p<0$.

If $p>0$ and the expert chooses not to participate, the policy maker chooses $X = 1$. Accordingly, the expert's expected payoff would be equal to a. It is optimal for the expert to participate if (15) is higher than a. It is easy to show that this requires that

$$f < a - p - \sqrt{(h - p)(2a - p - h)}. \tag{16}$$

Equation (16) shows that when the penalt for lying is sufficientl high, an expert who is strongly biased toward undertaking the project chooses not to participate. This result conflicts with the conclusion of Lupia and McCubbins (1994a) that the amount the polic maker can learn from the expert is non-decreasing in the size of *f*. To understand our result, suppose that the expert is strongly biased toward undertaking the project. Thus, the expert wants the polic maker to maintain the status quo only if μ is very low. Furthermore, suppose that the policy maker is weakl biased toward undertaking the project. He wants the expert to send message *N* for a wide range of values of μ. A high penalt for lying, induces the expert to behave like the polic maker if he would observe μ. From the expert's point of view, the cost of a penalt for lying is that there is a high probabilit that the status quo will be maintained. The expert can avoid this cost b choosing not to participate. For, $p>0$ implies that when the expert does not participate the polic maker chooses to undertake the project.

Overall, our analysis suggests that a penalty for lying as a means of decreasing the probabilit of deception is limited for two reasons. First, a problem with a penalt for lying is that polic decisions often have asymmetric implications for the information flows to the policy maker (*cf.* Hopenhayn and Lohmann, 1996). In our model the polic maker cannot discover a lie when the status quo is maintained, but can discover a lie when the project is undertaken. Second, a high penalt for lying may induce an expert not to provide information about the consequences of policies. Consequently, a penalt for lying may reduce the probabilit that the polic maker makes good decisions.

5. An Infinitely Repeated Game of Information Transmission

In most models of information transmission, the relation between the polic maker and the expert is characterized by a one-shot game. But often policy makers and experts have an ongoing relationship. Therefore, the interaction between a polic maker and an expert should be modeled as a repeated game. It is well known that a one-shot game and a repeated game may yield different outcomes. In discussing congressional-bureaucratic relations, Wittman (1995, p 104) remarks "even prisoners' dilemma games may yield optimal outcomes if there is an infinitely repeated sequence and the player's time discount is not too great." In the prisoners' dilemma game, repetition allows cooperation. In each period, players have an incentive to default, but defaulting now makes cooperation impossible in the future. Players compare the short-run costs of cooperation with the long-run benefits. If the players do not discount the future too heavily, the long-run benefits outweigh the short-run costs.

Does an ongoing relationship between a polic maker and an expert reduce the probabilit of deception Like Wittman, Lupia and McCubbins (1998, p. 211) believe it might: “The threat of sanctions is also thought to hold lobbyists in line.” However, it is eas to see that repetition of the simple game of Section 3 does not affect its outcomes. Suppose that the polic maker selects the best available expert in the first period. Moreover, suppose that the expert’s preferences do not coincide with the policy maker’s preferences. In line with the dynamic prisoners’ dilemma game, one can imagine that the polic maker threatens the expert to turn to another expert if she lies. However, carryin out the threat implies that the policy maker will consult another, less credible expert, or no expert at all, in the future. Clearly, this threat is not credible. If the selected expert has lied, in the next period it is again optimal for the polic maker to consult this expert and to say to turn to another expert if she lies. Moreover, as argued in Section 2, if a communicative equilibrium exists, a non-communicative equilibrium is not stable. The polic maker therefore cannot choose for a non-communicative equilibrium. Given that the adviser sends informative messages, it is optimal for the policy maker to follow his adviser.

Why does repetition solve prisoners’ dilemmas under certain conditions, but does not solve the problem of deception The reason is that in prisoners’ dilemma games, the one-shot game leads to inferior outcomes for both players, while in our game the outcomes of the one-shot game are optimal for the expert. Consequently, the outcomes of the one-shot game are not a threat to the expert.

6. Creating a Public Information Provider

So far we have assumed that to obtain information the polic maker has to rely on experts who are affected by his decision. The polic maker faces the problem that interested parties may try to manipulate his decision by distorting information. We have argued that a penalty for lying is only an imperfect means to solve this problem. Moreover, we have shown that also in a dynamic setting, interested experts may have incentives to distort information.

To reduce the probabilit of deception, the polic maker may create an agency that is charged with the responsibilit of collecting and supplying information. Clearly, this alternative is not academic. In most countries public agencies, being tasked with providing information to polic makers, abound. By creating a public agency, the policy maker need not to rely anymore on interested parties. The advantage of creatin a public agency is that the polic maker can affect the predisposition of the agency towards public projects. For example, the polic maker can appoint a head of the agency on the basis of his preferences. A drawback of creating a public agency is that it must exert an effort to collect information, while interested parties may possess information as a by product of their normal activities.

This section is divided into two parts. In the first part we study how the incentive of an agency to collect information is related to its preferences. In the second part, we examine the desired preferences of the public agency from the policy maker's point of view.

6.1 Introducing effort into the model

In this subsection, we modify the simple model of polic advice by replacin the assumption that the expert observes μ with the assumption that the expert can increase the probabilit that she learns μ by putting more effort in her work. Moreover, we assume that effort is costly. The resulting game is described in Table 1.

Table 1. Policy Advice When the Agency Have to Make Efforts to observe μ

Players: policy maker (*P*), Agency (*A*)

Order of Actions

(1) Nature draws μ from a uniform distribution on $[-h, h]$.

(2) The agency chooses effort *e*.

(3) The agency receives a signal γ. With probabilit $\pi(e)$ the signal γ is full informative, in the sense that $\gamma = \mu$. With probability $1 - \pi(e)$ the signal γ is not informative. We assume that $\pi(0) = 0$, $\pi^{/}(e) > 0$ and $\pi^{//}(e) < 0$. When the signal is not informative, nature draws γ from a uniform distribution on $[-h, h]$.

(4) The expert sends a message to the policy maker, $m \in \{Y, N\}$.

(5) The policy maker chooses *X*, $X \in \{0, 1\}$.

Payoffs

Policy maker: $U_P(X = 1 | \mu) = p + \mu$; $U_P(X = 0) = 0$

Expert: $U_A(X = 1 | \mu) = a + \mu - c(e)$; $U_A(X = 0) = -c(e)$

with $c(0) = 0$, $c^{/}(e) > 0$, and $c^{//}(e) > 0$.

The game presented in Table 1 deviates from the model discussed in Section 2 in three respects. First, the expert must make an effort to observe μ. Second, neither the expert nor the polic maker is sure whether the expert has observed an informative signal about μ, and finally, the payoff to the expert depends directl on the effort she has made. The assumptions about the relationship between the probability that the expert observes an informative signal and her effort imply that without any effort, the expert remains ignorant about the consequences of the project ($\pi(0) = 0$), and that by exertin more effort the expert increases the probability that she receives an informative signal. The present model captures that a public agency does not possess information as a byproduct of its normal activities, but must make an effort to acquire information.

As the simple game of polic advice, the present game has communicative and non-communicative equilibria. We will focus on communicative equilibria, in which the polic maker follows his expert. Given that the policy maker follows advice, when does the expert send message *Y*, and when does she send message *N*, given effort *e*? Because in the present model, the expert does not know whether the signal she receives is informative, she has to form an expectation of μ conditional on the signal γ:

$$E_A(\mu \mid \gamma) = \pi(e)\gamma \tag{17}$$

where $E_A(\mu \mid \gamma)$ denotes the expert's expectation of μ given the signal γ. The expert sends message *Y* rather than message *N* if she expects to benefit from the project. Thus, the expert sends message *Y* if

$$\gamma > -\frac{a}{\pi(e)}, \tag{18}$$

and message *N* otherwise. A necessar condition for a communicative equilibrium is that the expert's preferences over policies depends on the signal she receives. Consequently, a communicative equilibrium requires that $a > -\pi(e)h$ and $a < \pi(e)h$.

Before the expert sends a message, she chooses effort *e*. The expected payoff to the expert when she chooses *e* is:

$$E[U_A(e)] = \pi(e)\frac{1}{2h}(h + \frac{a}{\pi(e)})\left[a + \frac{1}{2}\left(h - \frac{a}{\pi(e)}\right)\right] + [1 - \pi(e)]\frac{1}{2h}(h + \frac{a}{\pi(e)})a - c(e) \tag{19}$$

The first two terms of the right-hand side of equation (19) denote the expected benefits of effort, and the third term denotes the costs of effort.

The optimal effort level results from maximizing (19) with respect to *e*. After some straightforward algebra, we obtain the first-order condition:

$$\frac{1}{4}\pi'(e)\left[h - \frac{a^2}{h[\pi(e)]^2}\right] - c'(e) = 0. \tag{20}$$

Equation (20) implicitl defines the equilibrium value of *e* as a function of *a* and *h*: $e^* = e^*(a,h)$.[9] The implicit function theorem applied to (20) shows that $e_a^* < 0$ if $a > 0$, $e_a^* > 0$ if $a < 0$, and $e_h^* > 0$, where e_a^* and e_h^* denote the partial derivative of $e^*(a,h)$ with respect to *a*

[9]It is easy to show that the second-order condition requires that $a^2 < [2h[\pi(e)]^3[c''(e) - \pi(e)''c'(e)/\pi'(e)]/[\pi'(e)]^2$. Because the RHS of this expression is higher than zero, the second-order condition is satisfied if the absolute value of *a* is not too large.

and *h*, respectively. The result that $e_a^* < 0$ if $a > 0$ and $e_a^* > 0$ if $a < 0$ implies that effort decreases with the absolute value of *a*. Thus, an expert who is polic neutral exerts most effort $[e_a^*(0,h) = 0]$. The more the expert is biased toward one of the two policies, the less effort she exerts. $e_h^* > 0$ implies that effort increases with uncertaint about the consequences of the project.

The intuition behind these results is straightforward. The effort the expert is willin to make depends on the expected benefits of acquiring information. As argued in the previous section, the expected benefits of information increase with *h*. Moreover, we have argued that individuals who are strongly biased toward one of the policies benefit less from information than individuals who are weakl biased. The reason is that the probabilit that information induces a strongly biased person to change his preferences over policies is small. Consequently, the expected benefits of information decreases with $|a|$.

So far, it has been assumed that it is optimal for the policy maker to follow his adviser. It is straightforward to show that this requires that

$$p + \frac{1}{2}\pi\left[h - \frac{a}{\pi(e^*)}\right] > 0 \rightarrow a < 2p + \pi(e)h$$

and

$$p - \frac{1}{2}\pi\left[h + \frac{a}{\pi(e^*)}\right] \leq 0 \rightarrow a \geq 2p - \pi(e)h$$

The above equations show that, in the present model, a communicative equilibrium requires that the probability that the adviser receives a correct signal is large enough.

6.2 Granting Appointment Power to the Policy Maker

As mentioned above the advantage of creatin a public agency is that the polic maker can try to affect the preferences of the agency. In the above model this implies that the policy maker can choose *a* by appointing experts with the proper preferences. Once the policy maker has chosen *a*, the game between the policy maker and the expert is the same as above. In a communicative equilibrium the expected payoff to the polic maker when he appoints an expert is therefore equal to:

$$
\begin{aligned}
E[U_p(a)] = {} & \pi[e^*(a)]\frac{1}{2h}\left(h + \frac{a}{\pi[e^*(a)]}\right)\left[p + \frac{1}{2}\left(h - \frac{a}{\pi[e^*(a)]}\right)\right] \\
& + (1 - \pi[e^*(a)])\frac{1}{2h}\left(h + \frac{a}{\pi[e^*(a)]}\right)p
\end{aligned}
\tag{21}
$$

Differentiating (23) with respect to *a* yields the first-order condition:

$$
\frac{p - a}{\pi[e^*(a)]} + \frac{1}{2}\pi'[e^*(a)]e_a^*\left[\frac{h^2\pi^2 + a(a - 2p)}{\{\pi[e^*(a)]\}^2}\right] = 0. \tag{22}
$$

Let us denote a^* the predisposition towards the project of the expert being appointed by the policy maker. From (22) the following proposition can be derived.

Proposition: With communication between the policy maker and the expert, $p>0$ implies $0<a^*<p$, and $p<0$ implies $p<a^*<0$.

Proof: The proof is by contradiction. Suppose that $p>0$ and $a^* \geq p$, so that $e_a^*<0$. Using (22), it is eas to show that $a^* \geq p$ requires $(a^*)^2 - 2a^*p + h^2\pi^2 \leq 0$. Moreover, communication requires that $h^2\pi^2>(a^*)^2$. By combining these requirements we obtain that $2(a^*)^2-2a^*p<0$, implyin $a^*<p$, which is inconsistent with $a^* \geq p$. Now suppose that $p<0$ and $a^* \leq p$, so that $e_a^*>0$. Equation (22) implies that $a^* \leq p$ requires $(a^*)^2 - 2a^*p + h^2\pi^2 \leq 0$.Consequently, $2(a^*)^2-2a^*p<0$, so that $a^*>p$, which is inconsistent with $a^* \leq p$. Finally, $a = 0$ implies that $e_a^* = 0$. Therefore, from (22) it directly follows that $p \neq 0$ implies that $a \neq 0$.

Q.E.D.

The proposition says that a polic maker who is biased toward undertaking the project (maintaining the status quo) consults an expert who is less biased towards undertaking the project (maintaining the status quo) than himself. Against the background of our earlier result that, the lower is $|a|$, the more the expert exerts effort, the above proposition is hardly surprising. Recall that the polic maker consults an expert in order to avoid a costl mistake. In the present model, imperfect communication and a wrong signal received by an expert may induce the polic maker to make a costl mistake. By appointing an expert whose predisposition coincides with that of himself, the policy maker prevents costly mistakes which are the result of imperfect communication. This is one of the lessons we have learnt from cheap-talk games. By appointing an expert characterized by $a = 0$, the policy maker minimizes the probability that the expert receives an incorrect signal about μ. The proposition implies that when the polic maker appoints an expert he faces a trade-off between enhancing communication and encouraging thorough investigation of the consequences of the project. The nature of this trade-off becomes clear when we analyze the effect of h on a^*. Application of the implicit function theorem to (22) shows that an increase in h induces the polic maker to choose an expert whose predisposition is closer to that of himself. The reason is that an increase in h has a positive effect on the expert's efforts, so that encouraging effort becomes less important. Consequently, the policy maker can appoint an expert whose predisposition is closer to that of himself.

Concluding Remarks

In this paper we have analyzed simple models of polic advice in order to improve our understanding of the interaction between decision makers and information providers. Let us summarize our main points. (a) Interested parties may have an incentive to distort information in order to manipulate policy decisions. (b) High penalties for lying may refrain interested parties from providing information. (c) Penalties for lying should not be interpreted as a break in trust. (d) Public agencies, charged with the responsibilit of collecting and supplying information, are less biased toward public projects than the policy maker.

Point a is an old point. Point b implies that a penalty for lying is an imperfect means to induce information providers to tell the truth. Point c raises questions about the conventional interpretation of a penalty for lying as a damage to reputation. The reason is that repeated interaction between a policy maker and an information provider does not lead the information provider to tell the truth. Point d is the result of our assumption that public information providers have to exert efforts to collect information. We have shown that unbiased information providers exert more efforts than biased information providers. This gives an incentive to the polic maker to hire unbiased information providers. On the other hand, to reduce the probabilit that information providers manipulate information, the policy maker should hire information providers whose preferences are the same as his own preferences. Consequently, when hiring public agents to collect information the polic maker faces a tradeoff between the probabilit of an informed agent and the probability of deception.

It is worth notin that when the polic maker chooses to create a public agency, interested parties may still have incentives to supply information. The reason is that public agencies sometimes make mistakes. Suppose, for example, that a public agency is biased toward maintaining the status quo and recommends that the project should be undertaken. Furthermore suppose that an interested party, being biased toward undertaking the project, recommends that the status quo should be maintained. In this case, advice of the interested party is credible. The polic maker can infer from it that the public agency has based his recommendation on wrong information. Thus, the existence of a public agency does not rule out a role of interested parties in the polic decision process. In fact, interested parties verify the information supplied by the public agency. Notice that this view conflicts with that of Lupia and McCubbins (1994) in which a public agency plays the role of verifier.

In Section 6, I assumed that a polic maker can simpl pick the preferences of his adviser. We made this assumption to emphasize that the preferences of an adviser are not only important for information transmission between the polic maker and the adviser, a well-known point in the literature, but are also important for the adviser's incentives to collect information. Although the assumption that polic makers can pick preferences of their agents is not uncommon in social sciences[10], a literal interpretation is unsatisfactory. Attitudes toward polic alternatives are often vaguely defined. Moreover, individual attitudes are probabl less important than the mission of a public agency. A better interpretation is therefore that polic makers shape the mission of public agencies being tasked with giving policy advice.

Throughout this article it was assumed that interested parties are full informed. In our models, conflicting recommendations are only the result of conflicting preferences. Of course disagreement among interested parties may also arise from imperfect information or different views. Incorporating these aspect into our model will affect our results. For example, uncertaint about the competency of interested parties gives them an incentive to appear well-informed. So, they will care about their reputation. However, imperfect information is not likel to reduce the incentive for information providers to manipulate information. Moreover, imperfect information reduces rather than enhances the usefulness of penalties for lying to dissuade information

[10]A well-known example in the literature on monetary policy is Rogoff (1985), who argues that policy makers should delegate monetary policy to a conservative central banker.

providers from manipulating information.

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