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Producing and Manipulating Information: Private Information Providers Versus Public Information Providers

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Abstract

To reduce the chances of policy failures, policy makers need information about the effects of policies. Sometimes, policy makers can rely on agents who already possess the information. Often, the information does not exist yet. This raises two questions. First, how much resources should be devoted to the production of information? Second should information be produced by a profit-maximizing firm (a private consultant) or by someone who has an interest in policy outcomes (a political adviser)? This paper shows that policy makers may prefer hiring a political adviser for two reasons. First, in contrast to a private consultant, a political adviser need not be fully compensated for exerting effort. Second, a political adviser with moderate preferences produces information of a higher expected quality than a private consultant is induced to do by the optimal monetary incentive scheme. The cost of hiring a political adviser is that she may distort policy decisions by manipulating information. As long as a political adviser is not too biased, the policy maker prefers consulting a political adviser to consulting a private consultant, even if a political adviser and a private consultant are equally costly. Competition among political advisers is shown to reduce the willingness of political advisers to produce information.

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I. Introduction

The consequences of many policies are complicated and difficult to foresee. Elected policy makers usually lack time and abilities for a thorough investigation of the consequences of their decisions. To reduce the chances of policy failures, policy makers often rely on experts. In several countries, the government undertakes a myriad of activities related to the production of information. In the Netherlands, for example, more than 200 public agencies give advice to the government. Although policy makers occasionally consult specialized private firms, public agencies play a dominant role in giving advice.

There exists a large literature on the role of information providers in the policy-decision process. Games of incomplete information are used to study communication between an uninformed policy maker and an informed agent (see, for example, Austen-Smith, 1990 and 1993). It is usually assumed that the informed agent has a vested interest in the policy outcome (Milgrom and Roberts, 1986). Models of communication are applied to interest groups (Potters and Van Winden, 1992), to bureaucrats (for a survey, see Lupia and McCubbins, 1998), voters (Lohmann, 1993), and committee members (Gilligan and Krehbiel, 1987 and 1989). The focus of this literature is on information transmission. A well-known result is that, if there are no costs of supplying information, information transmission requires that the interests of the policy makers and the information providers are not too far apart (Crawford and Sobel, 1982). If supplying information is costly, information transmission depends less on the congruence of preferences [for a survey of the signaling literature see Banks (1991)].

While there is a large literature on information transmission, economists have paid little attention to the production of information. Most models simply assume a specific distribution of information among agents. This assumption is natural in situations where agents possess

information as a by-product of their normal activities. However, policy makers regularly need information which does not exist yet.

The fact that information must sometimes be produced raises two traditional economic questions. First, how much resources should be devoted to the production of information? Information for public policy is often regarded as a public good. It is generally neither desirable nor feasible to exclude anyone from the benefits of information for public policy. Because information is a public good, voluntary arrangements for producing information may lead to a free-rider problem. The free-rider problem provides a justification for government intervention.

Second, should information be produced publicly or privately? In this paper we study decision making when policy makers rely on public information providers and contrast this with decision making when policy makers rely on private information providers. We examine a model in which a policy maker must make a binary decision - implementation or status quo - about a public project on behalf of voters. The consequences of the project are surrounded by uncertainty. Without further information the policy maker runs the risk of making a wrong decision. The policy maker can ask a specialized profit-maximizing firm for advice. We refer to this firm as a private consultant. Alternatively, the policy maker can consult a public adviser. The difference between private consultants and political advisers is that they have different motives. Private consultants are driven by monetary incentives, and they are not concerned with policy outcomes. Political advisers promote what they perceive as the public interest. Their perception of the public interest may deviate from that of the policy maker.

Our model treats information as a good with three specific characteristics. First, experts communicate information to policy makers by reports. Reports typically conclude with a policy recommendation. The reason is that policy makers lack skills and time to fully

understand technical details in reports. The implication is that policy makers receive recommendations rather than information. Following Sah and Stiglitz (1988), we thus assume limited communication between the policy maker and the information provider. Information providers can recommend either implementation or status quo. There is no cost of giving a recommendation. However, producing information involves costly effort. Second, recommendations are rarely based on hard scientific knowledge that can be verified. The costs of discovering the absolute truth are generally too high. Devoting more resources to producing information is supposed to lead to a recommendation which is based on better information. It does not always lead to thicker reports (large models are not always better than small ones). Hence, the policy maker does not observe the adviser's effort. However, if the policy maker implements the project, he observes the consequences of the project. Like most economic decisions, the decision of how much resources to devote to producing information involves a cost-benefit analysis. Third, the production of information is uncertain. In spite of their efforts, experts may make mistakes.

These three characteristics of the good information raise two problems for a policy maker who needs information. First, the weak link between information and advice implies that it is hard for the policy maker to ascertain the effort an adviser has put in producing information. Second, the non-verifiability of information leaves room for an adviser to frame her recommendation. The first problem leads to uncertainty about the quality of information on which a recommendation is based. The second problem leads to uncertainty about the quality of the recommendation, given the quality of information.

We start the analysis by showing that the interaction between a policy maker and a private consultant can be formulated as a standard moral-hazard problem. The policy maker can condition payments to a private consultant on her recommendation and on policy

outcomes. In line with the literature on optimal contracts (see Prendergast, 1999, for a recent survey), we derive the following results. First, the optimal contract induces a risk-neutral private consultant to choose an effort level the policy maker would have chosen, if he were able to produce information about the consequences of the project. Second, risk-aversion on the side of the private consultant raises the problem of a tradeoff between risk and incentives. Third, to meet the participation constraint, the policy maker must fully compensate the private consultant for the effort put in producing information. Finally, an optimal contract eliminates communication problems between the private consultant and the policy maker. Given the information produced by the private consultant, her recommendation is optimal from the policy maker's point of view.

We proceed with analyzing the interaction between a policy maker and a political adviser. We show that the effort level a political adviser chooses depends on her perception of the public interest. A political adviser who has a strong prior either against or in favor of the project exerts less effort than a political adviser who is unbiased. The intuition is that strong priors reduce the probability that information affects advice. The instrumental value of information is therefore small for political advisers with strong priors. An implication of this result is that by choosing a political adviser who is unbiased toward one of the policy alternatives, the policy maker maximizes the effort put in producing information.

Next, we show that, given the information produced by the political adviser, the quality of the recommendation depends negatively on the difference between the policy maker's and political adviser's perception of the public interest. This result is in line with the existing literature on communication. By appointing a political adviser whose perception of the public interest coincides with his own perception, the policy maker maximizes the quality of the recommendation, given the quality of the information produced by the adviser.

Together the above results imply that, when the policy maker can select a political adviser on the basis of her perception of the public interest, then he faces a tradeoff between the quality of the recommendation and the quality of the information the recommendation is based on. We show that, unless the policy maker is neither biased toward implementation of the project nor biased toward status quo, the policy maker does not appoint a political adviser whose perception of the public interest is the same as his own perception.

The difference in motives between private consultants and political advisers does not only affect their levels of effort and their recommendations. The two types of advisers also face a different participation constraint. As mentioned earlier, a private consultant must be fully compensated for her effort. In contrast, a political adviser need not be compensated for her effort. Because the political adviser is intrinsically motivated, she directly benefits from a policy decision based on proper information. As a consequence, the cost of consulting a political adviser does not depend on her effort. This does not imply that a political adviser is always willing to participate as she cannot do her normal activities anymore if she is hired. We show that the political advisor's willingness to participate depends on the policy maker's possibilities of hiring other advisers. Competition among advisers may decrease a political adviser's willingness to participate, and may imply that the policy maker has to rely on a more "extreme" political adviser.

A comparison between the expected policy outcomes when a private consultant is hired and when a political adviser is hired shows that there are two potential benefits of hiring a political adviser. First, in contrast to a private consultant, a political adviser need not be compensated for her effort. Thus, by hiring a political adviser, the policy maker can save on the cost of obtaining advice. Second, a political adviser may produce information of a higher expected quality than the private consultant. The cost of hiring a political adviser is that she

may distort policy decisions by manipulating information. In case the policy maker's and political adviser's perception of the public interest differ, the political adviser may give a recommendation which is inconsistent with the policy maker's interest. If the policy maker is able to appoint an adviser with the "optimal" perception of the public interest, then the benefits of a political adviser outweigh the cost and a political adviser is preferred to a private consultant.¹ The "optimal" perception implies that the political adviser is more concerned with the uncertain consequences of the public project than the policy maker.

The question whether information should be provided publicly or privately is a normative question. However, our analysis can also be seen as an attempt to explain how governments actually obtain information for public policy. For example, our analysis provides an explanation for why in many countries information about policy consequences is mainly produced publicly rather than contracted out to private consultants. Moreover, our analysis gives insight into the relation between elected policy makers and public agencies. One of our results is that a policy maker may deliberately create a public agency whose preferences deviates from his own preferences. The literature on bureaucracy, building on Niskanen (1971), emphasizes that asymmetric information and conflict of interests lead to a principal-agent problem. Our study does not deny principal-agent problems. However, it also shows the benefits of conflicting interests. Because these benefits may outweigh the costs, existing public agencies may be efficient in spite of conflicts of interests. Our efficiency argument is interwoven with the question of institutional design (Wittman, 1995). Why would policy makers create institutions from which they will suffer?

¹This result holds even if the cost of hiring a private consultant is equal to the (opportunity) cost of hiring a political adviser with optimal perception. The qualities of recommendation and information drive our result, rather than saving on the cost of advice.

The paper is organized as follows. Section II presents the model. Section III shows how a policy maker can design a contract to guide the actions of a private consultant. Section IV analyzes the interaction between a policy maker and a political adviser. Section V deals with institutional design. We assume that the policy maker can shape the preferences of a public agency by appointing a head with a certain perception of the public interest. Section VI introduces competition among experts into the model. Section VII concludes.

II. The Model

We consider a situation where citizens have delegated the decision about a public project, X , to a policy maker. As to this project, there are two alternatives: implementation (denoted by $X = 1$) and status quo (denoted by $X = 0$). We assume that the policy maker tries to make a decision which accords with his perception of the public interest. If the policy maker chooses implementation his payoff increases with $p + \mu$, where p denotes the expected social benefit of the project as perceived by the policy maker, and μ is a stochastic term, which is distributed by $f(\mu)$. The expected value of μ is zero. The cumulative distribution of μ is denoted by $F(\cdot)$. Our interpretation of μ is that the consequences of the project are surrounded by uncertainty. If the policy maker chooses $X = 0$, his payoff does not change.

Under full information, the policy maker would choose $X = 1$ if $\mu > -p$ and $X = 0$ if $\mu \leq -p$.² However, the policy maker does not observe μ . The implication is that without information about μ the policy maker would choose $X = 1$ if $p > 0$, and $X = 0$ if $p \leq 0$. It is evident that, if $0 < F(-p) < 1$, then the policy maker runs the risk of making a wrong decision about the project.

²Without loss of generality, we assume that if the policy maker is indifferent between implementation and status quo, she chooses status quo.

The policy maker lacks time or abilities to examine μ .³ To gain information about μ , the policy maker can hire an adviser.⁴ An adviser receives a signal γ , which may contain information about μ . The quality of the adviser's signal depends on her effort $e \geq 0$, which cannot be observed by the policy maker. With probability $\pi(e)$, the signal is fully informative, implying $\gamma = \mu$, where $\pi(e)$ is increasing and concave and $\pi(0) = 0$. With probability $1 - \pi(e)$, the signal is uninformative. Then, γ is drawn from $f(\gamma)$. Except when $e = 0$, neither the adviser nor the policy maker knows whether or not the signal is informative.⁵ After receiving the signal, the adviser makes a recommendation. She can either recommend $X = 1$ or recommend $X = 0$. Communication between the policy maker and the adviser is limited to the recommendation made by the adviser. Information is thus soft. It cannot be instantaneously verified by the policy maker. However, if the policy maker chooses $X = 1$, he can infer μ from his payoff. The adviser is effort averse. Her cost of supplying effort is $c(e)$. The function $c(e)$ is increasing and convex, with $c(0) = 0$.

Concerning the type of the adviser we make two alternate assumptions. In the next Section, we assume that the adviser is a private consultant, who is concerned with her wage and effort. When giving advice, a private consultant has not any interest of society in mind⁶. The payoff to a private consultant is $w^{PC} - c(e)$, where w^{PC} denotes the private consultant's

³We thus assume that producing information requires expertise the policy maker does not possess. For less complicated decisions, the policy maker can choose to specialize (Gilligan and Krehbiel, 1989).

⁴We assume that the policy maker cannot hire more than one adviser.

⁵The assumption that $\pi(e) > 0$ for $e > 0$ is made for convenience. The assumption ensures an interior solution of effort. The free-rider problem concerning the production of information becomes more profound if $\pi(e) = 0$ for $e < \bar{e} > 0$.

⁶As a citizen, the private consultant might be affected by the decision about the project. We assume that the private benefit of producing information is negligible.

wage. For expositional simplicity, we assume that the private consultant's reservation wage is equal to zero. In Section 4 we assume that the policy maker can hire a political adviser at a fixed, exogenous cost, r . We think of the political adviser as a politician (or public servant), who has expert knowledge. The parameter r reflects that when the political adviser gives advice, she cannot do her normal activities anymore. As a consequence, the payoff to both the policy maker and the political adviser decreases. Like the policy maker, a political adviser is concerned with the public interest. However, because of differences in normative values or ideology, the political adviser's perception of the public interest may differ from that of the policy maker. If the policy maker hires a political adviser and chooses $X = 1$, then the payoff to the political adviser is $a + \mu - c(e) - r$, where a denotes the expected social benefit of the project as perceived by the political adviser. If the status quo is maintained, then the payoff to the adviser is $-c(e) - r$. The difference between a and p reflects the difference between the policy maker's and the political adviser's perception of the public interest.

A straightforward interpretation of the two types of advisers is that some people are driven by extrinsic incentives, while others are driven by intrinsic incentives. To emphasize this difference, we assume that political advisers do not respond to monetary incentives, because they are infinitely risk averse to income risk. We discuss the implications of this assumption at the end of the paper. Besides their motives, political advisers and private consultants are the same. They have the same abilities, and they attach the same cost to effort. The implication is that we can use the same functions, $\pi(e)$ and $c(e)$, for different advisers.

III. Asking a Private Consultant for Advice

Because a private consultant is concerned with her wage and effort, the policy maker must compensate the private consultant for her effort by offering a monetary reward. The problem is

that the policy maker does not observe effort. The relationship between the policy maker and the private consultant is similar to the relationship between the principal and the agent in the basic moral-hazard model with hidden knowledge. The moral-hazard literature suggests that the principal can design a contract to guide appropriate actions by the agent. This Section discusses the optimal contract in our model from the policy maker's point of view.

The policy maker observes the recommendation made by the private consultant and, provided that the policy maker chooses $X = 1$, μ . Consequently, it is natural to focus on the following reward scheme. The policy maker pays w_0 if the consultant recommends $X = 0$. The policy maker pays w_1 if the consultant recommends $X = 1$ and $\mu \leq q$, where q is an evaluation criterion, determined by the policy maker. Finally, the consultant receives w_2 if he recommends $X = 1$ and $\mu > q$.

Suppose that the policy maker follows the consultant's recommendation. An optimal reward scheme must induce the consultant to recommend $X = 1$ if $\gamma > q$, and $X = 0$ otherwise. Therefore, the reward scheme must satisfy the following two restrictions:

$$\pi(e)w_2 + [1 - \pi(e)][(1 - F(q))w_2 + F(q)w_1] > w_0 \quad (1)$$

$$\pi(e)w_1 + [1 - \pi(e)][(1 - F(q))w_2 + F(q)w_1] < w_0. \quad (2)$$

The left-hand sides of (1) and (2) give the consultant's expected wage if he recommends $X = 1$ for $\gamma > q$ and $\gamma \leq q$, respectively.

If the above restrictions are satisfied, then the consultant's expected utility from making effort e is:

$$\pi(e)[(1 - F(q))w_2 + F(q)w_0] + [1 - \pi(e)][(1 - F(q))^2w_2 + [1 - F(q)]F(q)w_1 + F(q)w_0] - c(e) \quad (3)$$

The first term in square brackets gives the consultant's expected utility when she receives an informative signal about μ . As the consultant recommends $X = 1$ if $\gamma > q$, and $X = 0$ otherwise, the consultant receives either w_2 or w_0 . The probabilities of receiving w_2 and w_0 , conditional on an informative signal, are equal to the probabilities of $\mu > q$ and $\mu \leq q$, respectively. The last term in square brackets gives the consultant's expected payoff when she receives an uninformative signal about μ . In case of an uninformative signal, the consultant receives w_1 if $\mu \leq q$ and $\gamma > q$. The probability that the consultant receives w_2 , conditional on an uninformative signal, is equal to the probability that $\mu > q$ and $\gamma > q$ will jointly occur.

The consultant's effort results from maximizing (3) with respect to e , yielding the first order condition:

$$F(q)[1 - F(q)](w_2 - w_1)\pi'(e) = c'(e) \quad (4)$$

Equation (4) implicitly defines the consultant's choice of e , e^{PC} , as a function of w_1 , w_2 and q : $e^{PC} = e^{PC}(w_1, w_2, q)$. Application of the implicit function theorem shows that $e_q^{PC} \leq 0$ for $F(q) \geq 1/2$, $e_q^{PC} < 0$ for $F(q) < 1/2$, $e_{w_1}^{PC} < 0$ and $e_{w_2}^{PC} > 0$, where e_J^{PC} denotes the partial derivative of $e^{PC}(\cdot)$ with respect to J . The intuition behind the effects of w_1 and w_2 on effort is straightforward. The results concerning q imply that the consultant's effort is highest if $F(q) = 1/2$. To understand why, first note that the consultant exerts effort to avoid a costly mistake (recommending $X = 0$ if $\mu > q$ or recommending $X = 1$ if $\mu \leq q$). When $F(q)$ is close to zero or close to one, the probability of a costly mistake is close to zero, even if the consultant does not exert effort. The reason is that in those cases, an uninformative signal is likely to lead to the same decision about the project as an informative signal. In contrast, when $F(q) = 1/2$, the probability of a costly mistake is $1/2$ if the consultant receives an uninformative signal. Because

effort reduces the probability of a costly mistake, the benefits of effort are then relatively large.

From the policy maker's point of view, the optimal reward scheme maximizes the sum of his utility and the consultant's utility, the total surplus, and distributes as much gains as possible to himself. The joint surplus is:

$$\pi(e^{PC})[1 - F(q)] \left(p + \frac{\int \mu f(\mu) d\mu}{1 - F(q)} \right) + [1 - \pi(e^{PC})][1 - F(q)]p - c(e^{PC}) \quad (5)$$

The first-order conditions for q and w_1 are:

$$-f(q)p - f(q)\pi(e^{PC})q + \pi'(e^{PC})e_q^{PC} \int_q \mu f(\mu) d\mu - c'(e^{PC})e_q^{PC} = 0 \quad (6)$$

and

$$\pi'(e^{PC})e_{w_1}^{PC} \int_q \mu f(\mu) d\mu - c'(e^{PC})e_{w_1}^{PC} = 0, \quad (7)$$

respectively. Combining (6) and (7) gives:

$$q^{PC} = -\frac{p}{\pi(e^{PC})}, \quad (8)$$

where q^{PC} is the optimal evaluation criterion. Combining (4) and (7) gives:

$$w_2 - w_1 = \frac{\int_q \mu f(\mu) d\mu}{F(q)[1 - F(q)]} \quad (9)$$

Without specifying $f(\mu)$, it is hard to interpret (9). In the special case that μ is uniformly

distributed on $[-h, h]$, (9) simplifies to $w_2 - w_1 = h$, implying that the deviation of w_2 from w_1 is equal to the amount of uncertainty about μ . Finally, the policy maker chooses w_0 and w_1 to meet the participation constraint and the restrictions (1) and (2). Because, by assumption, the policy maker captures all rents, the consultant is just compensated for the costs of her efforts.

Before discussing our results, two remarks are in order. First, so far we have assumed that the policy maker follows the consultant's recommendation. It is easy to show that a low absolute value of p and a high value of $\pi(e^{PC})$ make it more likely that it is in the policy maker's interest to follow advice. Second, we have assumed that the policy maker hires a consultant. Of course, this requires that the value of information is higher than $c(e^{PC})$.

The evaluation criterion, q^{PC} , implies that there is not a communication problem between the policy maker and the private consultant. If the policy maker had received a signal about μ , he would have chosen $X = 1$ if $\gamma > q^{PC}$, and $X = 0$ otherwise. Moreover, the effort level chosen by the private consultant is the same as the effort level the policy maker would have chosen if he had been able to produce information about μ . Hence, in our model, delegation is not distortionary. Of course, the reason for this result is that both players in our model are risk neutral. The literature on moral hazard shows that, if agents are risk averse, the first-best solution cannot be achieved, because risk aversion raises a tradeoff between risk and incentives. The same holds in our model.

IV. Asking a Political Adviser for Advice

Now suppose that the policy maker hires a political adviser. For the moment, we assume that the political adviser is a monopolist of information. Thus, if the policy maker wants advice, he has to rely on the political adviser. In Section VI, we will relax this assumption to examine the implications of competition between advisers. By assumption, the policy maker cannot guide

the actions of a political adviser by monetary rewards. The implication is that the recommendation made by the political adviser is “cheap talk” (Crawford and Sobel, 1982). It is well-known that in cheap-talk games several equilibria may exist. We focus on an equilibrium in which information transmission between the players is possible. Moreover, we assume a “natural” language, in the sense that the political adviser’s recommendation always reflects her preferred action.

Suppose that the policy maker always follows the political adviser’s recommendation. It is then optimal for the political adviser to recommend $X = 1$ if $X = 1$ yields a higher expected payoff, conditional on γ , than $X = 0$. The political adviser thus recommends $X = 1$, if $\pi(e)(a + \gamma) + [1 - \pi(e)]a > 0$, implying:

$$\gamma > -\frac{a}{\pi(e)}. \quad (10)$$

Equation (10) gives the evaluation criterion used by the political adviser. When the political adviser chooses effort, her expected payoff is:

$$\pi(e) \left[1 - F\left(-\frac{a}{\pi(e)}\right) \right] \left[a + \frac{\int \mu f(\mu) d\mu}{1 - F\left(-\frac{a}{\pi(e)}\right)} \right] + [1 - \pi(e)] \left[1 - F\left(-\frac{a}{\pi(e)}\right) \right] a - c(e) - r \quad (11)$$

The first two terms of (11) give the expected benefits of effort. The last two terms give the cost of effort and the political adviser’s opportunity cost, respectively. Maximizing (11) with

respect to e yields:⁷

$$\pi'(e) \int_{-\frac{a}{\pi(e)}}^{\mu} f(\mu) d\mu = c'(e) \quad (12)$$

Equation (12) implicitly defines the political adviser's choice of e , e^{PA} , as a function of a , $e^{PA} = e^{PA}(a)$. The implicit function theorem applied to (12) shows that $e_a^{PA}(0) = 0$, $e_a^{PA} < 0$ for $a > 0$, and $e_a^{PA}(a) > 0$ for $a < 0$. These findings imply that a political adviser, who is “unbiased” ($a = 0$), exerts most effort. The more the political adviser is biased toward one of the policy choices, the less effort she will make. The intuition is straightforward. The probability that, without information about μ , the political adviser makes a costly mistake decreases with the absolute value of a . The reason is that the probability that information about μ changes the political adviser's preferences over policies is small when she is strongly biased. As a consequence, the expected benefits of information decreases with $|a|$. Note that a political adviser with $a = p$ exerts the same level of effort as a private consultant who faces an optimal monetary incentive scheme [compare (7), (8), and (12)].

So far, we have assumed that the policy maker follows the political adviser's recommendation. Let us now identify the conditions under which it is optimal for the policy maker to follow this strategy. Given the political adviser's strategy, it is optimal for the policy

⁷Throughout, we assume that the second-order condition for a maximum is satisfied. This requires that the absolute value of a is not too large.

maker to choose $X = 1$ when the political adviser recommends $X = 1$, if implementation yields a higher expected payoff than status quo. It is easy to verify that this requires:

$$p > - \frac{\pi(e^{PA}) \int_{-\frac{a}{\pi(e^{PA})}}^{\infty} \mu f(\mu) d\mu}{1 - F\left(-\frac{a}{\pi(e^{PA})}\right)}. \quad (13)$$

Analogously, we can show that it is optimal for the policy maker to choose status quo when the political adviser recommends status quo if:

$$p \leq - \frac{\pi(e^{PA}) \int_{-\frac{a}{\pi(e^{PA})}}^{\infty} \mu f(\mu) d\mu}{F\left(-\frac{a}{\pi(e^{PA})}\right)}. \quad (14)$$

Condition (13) and (14) imply that it is only optimal for the policy maker to follow the political adviser' recommendation if a does not deviate too much from p . Clearly, the conditions become less restrictive, the higher the value of $\pi(e^{PA})$ and the lower $|p|$.

Finally, we must determine the participation constraint. As usual, the participation constraint depends on the agent's reservation utility, r . The political adviser participates if the net-benefit of giving advice exceeds r :

$$\left[1 - F\left(-\frac{a}{\pi(e^{PA})}\right)\right] a + \pi(e^{PA}) \int_{-\frac{a}{\pi(e^{PA})}}^{\infty} \mu f(\mu) d\mu - c(e^{PA}) > r. \quad (15)$$

Equation (15) shows that if the opportunity cost of giving advice is too high, the participation

constraint is not satisfied. It is evident that, if (15) is violated, a political adviser chooses $e = 0$.

Our analysis shows that asking a political adviser for advice rather than a private consultant has three implications. First, as argued in Section III, there is not a communication problem between a private consultant and the policy maker. Unless $a = p$, consulting a political adviser raises a communication problem. The recommendation made by a political adviser may induce the policy maker to choose policy, which conflicts with his own interest. Second, in contrast to a private consultant, a political adviser need not be compensated for her effort. As a consequence, consulting a political adviser may be cheaper than consulting a private consultant. This depends on the political adviser's reservation utility r . If $r < w^{PC} = c(e^{PC})$, hiring a political adviser is less costly than hiring a private consultant. Finally, the type of adviser determines the quality of information. It is easy to verify that, if $p < a < 0$ or $0 > a > p$, then the probability that a political adviser receives an informative signal is higher than that a private consultant receives an informative signal. If $a < p < 0$ or $0 > p > a$, then the reverse holds. Together, these results imply that a political adviser with $a = p$ yields the same quality of information and the same quality of recommendation as a private consultant. If, in addition, $r = w^{PC}$, then consulting a private consultant is equivalent to consulting a political adviser with $a = p$.

V. The Optimal Political Adviser from the Policy Maker's Point of View

In the previous Section we have shown that the political adviser's perception of the public interest determines her effort level. Thus, a affects the quality of information on which policy decisions are based. In addition, we have shown that a affects the quality of the recommendation. If a deviates from p , then the recommendation made by the political adviser may be inconsistent with the policy maker's preferences. In this Section we derive the optimal

value of a from the policy maker's perspective. The idea is that the policy maker can create a public agency with monopoly power and can shape its preferences by appointing a head with the appropriate perception of the public interest.

What value of a is optimal for the policy maker? To answer this question, we use (10) to write the expected payoff to the policy maker as a function of a :

$$\left[1 - F\left(-\frac{a}{\pi(e^{PA})}\right)\right]p + \pi(e^{PA}) \int_{-\frac{a}{\pi(e^{PA})}}^{\infty} \mu f(\mu) d\mu - r. \quad (16)$$

After differentiating (16) with respect to a , and using (12), we can write the first-order condition as:

$$f\left(-\frac{a}{\pi(e^{PA})}\right) Z(p - a) = e_a^{PA} c'(e^{PA}) \quad (17)$$

where

$$Z = \frac{a \pi'(e^{PA}) e_a^{PA} - \pi(e^{PA})}{[\pi(e^{PA})]^2} < 0. \quad (18)$$

Equation (17) implicitly defines the optimal value of a , \hat{a} , as a function of p .

Proposition: If $p=0$, then $\hat{a}=0$. If $p>0$, then $0 < \hat{a} < p$. If $p<0$, then $p < \hat{a} < 0$.

Proof: Using (12), it is easy to see that if $p = 0$, then condition (17) is satisfied iff $\hat{a} = 0$. The proof for the other two cases is by contradiction. Suppose $p > 0$. If $\hat{a} \geq p$, then the LHS of (17) is greater than or equal to zero, while the RHS is smaller than zero. Hence, $\hat{a} < p$. If $\hat{a} \leq 0$,

then the RHS of (17) is greater than or equal to zero, while the LHS is smaller than zero.

Hence, $\hat{a} \geq 0$. The proof for the case that $p < 0$ is analogous. □

The proposition says that a policy maker, who is biased toward implementation (status quo) consults an expert who is less biased toward implementation (status quo) than himself. Against the background of our earlier result that the effort level depends negatively on $|a|$, the above proposition is hardly surprising. Recall that the policy maker consults an adviser in order to avoid a policy failure. In the present model, imperfect communication and a wrong signal received by an adviser are the possible reasons for a policy failure. By appointing a political adviser whose perception of the public interest coincides with that of himself, the policy maker prevents a policy failure owing to imperfect communication. By appointing a political adviser with $a = 0$, the policy maker minimizes the probability that the adviser receives an incorrect signal about μ . The proposition shows that when the policy maker selects a political adviser, he faces a trade-off between the quality of information and the quality of recommendations.

Our insight is related to Gilligan and Krehbiel's (1987,1989) analysis of the congressional committee system. They argue that only committee members with moderate preferences have an incentive to specialize, i.e. to produce information. In their work, however, moderate preferences mean preferences closely aligned to the preferences of the median member in Congress. Their argument refers to the credibility of advice, i.e. the quality of the recommendations, given the quality of information. Our analysis shows that there is also another story. Moderate preferences, in the sense of no strong bias toward implementation or status quo, induces a political adviser to look harder for information.

VI. Choosing Between a Political Adviser and a Private Consultant

So far, we have assumed that the policy maker can consult either a political adviser or a private consultant. In this section, the policy maker can choose between hiring a political adviser and hiring a private consultant. We maintain the assumption that the policy maker consults one adviser.

The fact that the policy maker can hire a private consultant may affect the participation decision of the political adviser. Suppose that the policy maker prefers consulting a private consultant to consulting no adviser, so that when the political adviser does not participate, a private consultant will be hired. The political adviser's participation constraint is:

$$\left[1 - F\left(-\frac{a}{\pi(e^{PA})}\right)\right]a + \pi(e^{PA}) \int_{-\frac{a}{\pi(e^{PA})}}^0 \mu f(\mu) d\mu - c(e^{PA}) - r > \left[1 - F\left(-\frac{p}{\pi(e^{PC})}\right)\right]a + \pi(e^{PC}) \int_{-\frac{p}{\pi(e^{PC})}}^0 \mu f(\mu) d\mu - c(e^{PC}) \quad (19)$$

where e^{PC} follows from (7).⁸ A comparison between (15) and (19) that the availability of a private consultant may tighten the participation constraint of the political advisor. The reason is that the political advisor's fall-back position may be better if the policy maker can consult a private consultant. For example, consider the case of a political adviser with $a = p$. Condition (15) implies that a political adviser with $a = p$ is willing to give advice if the opportunity cost r is not too large. However, when a private consultant is available, a political adviser with $a = p$

⁸Note that we assume that the compensation the policy maker gives to the private consultant affects the payoff of the political adviser in the same way as it affects the payoff of the policy maker. This is a direct implication of our assumption that, like the policy maker, the political adviser is concerned with the public interest and, hence, with the government budget.

is never willing to give advice if $r > 0$. Hence, competition among advisers may decrease a political adviser's willingness to participate.

Let us now examine how the participation constraint depends on a . Collecting all the terms in (19) to the left-hand side and differentiating with respect to a results in:

$$F\left(-\frac{p}{\pi(e^{PC})}\right) - F\left(-\frac{a}{\pi(e^{PA})}\right) \quad (20)$$

where we have used (12) to simplify. Clearly, the expression in (20) is negative if $a < p$, zero if $a = p$, and positive if $a > p$. Hence, a political adviser's participation constraint is less tight, the more her perception of the public interest deviates from that of the policy maker. The intuition is that participation gives a political adviser the opportunity to distort policy decisions by manipulating information. This is beneficial for political advisers with $a \neq p$, and the more so, the more a deviates from p . Thus, only a political adviser whose perception of the public interest deviates sufficiently from that of the policy maker is willing to participate when a private consultant is available. In the extreme case $r = 0$, a sufficient condition is $a \neq p$. The higher is r , the more a must deviate from p to make participation beneficial for a political adviser.

Let us now consider the policy maker's optimal choice of adviser if he can choose between a political adviser and a private consultant. The policy maker prefers a political adviser with perception a to a private consultant if:

$$\left[1 - F\left(-\frac{a}{\pi(e^{PA})}\right)\right]p + \pi(e^{PA}) \int_{-\frac{a}{\pi(e^{PA})}}^{\infty} \mu f(\mu) d\mu - r > \left[1 - F\left(-\frac{p}{\pi(e^{PC})}\right)\right]p + \pi(e^{PC}) \int_{-\frac{p}{\pi(e^{PC})}}^{\infty} \mu f(\mu) d\mu - c(e^{PC}) \quad (21)$$

Suppose $a = p$. In Section IV we have shown that a political adviser with $a = p$ provides the same quality of information and the same quality of recommendation as a private consultant. Hence, for $a = p$, condition (21) reduces to $r < c(e^{PC})$. The policy maker prefers a political adviser with $a = p$ to a private consultant only if a political adviser is less costly than a private consultant. However, as we have just shown, a political adviser with $a = p$ is only willing to participate if $r = 0$. Hence, the policy maker will have to rely on a private consultant if $a = p$, unless $r = 0$.

If $a \neq p$, two aspects change. First, the quality of information and the quality of recommendation provided by a political adviser with $a \neq p$ differ from that provided by a private consultant. As we have shown in Section V, the policy maker maximizes his payoff by appointing a political adviser who is relatively “unbiased”. Since the policy maker prefers a political adviser with $a = \hat{a}$ to a political adviser with $a = p$, it follows that he prefers a political adviser with $a = \hat{a}$ to a private consultant, unless the cost of hiring a political adviser (r) is much higher than the cost of hiring a private consultant [$c(e^{PC})$]. Second, the participation constraint of the political adviser, given by (19), is not binding if a deviates sufficiently from p . If (19) is satisfied for $a = \hat{a}$, both the policy maker and the political adviser with $a = \hat{a}$ are better off if the policy maker hires the political adviser rather than a private consultant. If (19) is not satisfied for $a = \hat{a}$, the political adviser with “optimal” perception is not willing to participate. Still, the policy maker may hire a political adviser rather than a private consultant. A political adviser whose perception of the public interest deviates more from that of the policy maker in comparison with a political adviser with $a = \hat{a}$, may be willing to participate and may be preferred to a private consultant. The policy maker will trade off the benefits and the cost of hiring a political adviser who is too “unbiased”. The benefits are better quality of information than a private consultant produces and, depending on r and $c(e^{PC})$,

saving on the cost of advice. The cost is a worse quality of recommendation. For a range of values of a , the benefits may outweigh the cost. Hence, the availability of a private consultant may result in hiring a more “extreme” political adviser, i.e. an adviser whose preferences deviate more from that of the policy maker.

VII. Concluding Remarks

The main contribution of this article has been to provide an explanation for why policy makers often consult political advisers, who are concerned with policy outcomes, rather than private consultants, who are driven by monetary incentives. We have argued that political advisers have two benefits. First, in contrast to private consultants, political advisers need not to be fully compensated for the effort they put in generating information. Second, political advisers may put more effort in generating information than private consultants. Consulting political advisers also has costs. While private consultants make recommendations in line with the policy maker’s interests, political advisers may manipulate information in order to distort policy decisions. We have shown that, when a policy maker hires a political adviser who has the “proper” perception of the public interest, consulting a political adviser yields a higher payoff than hiring a private consultant.

In addition, this paper explains why policy advice is sometimes institutionalized. In several policy areas, the law requires that before implementation of a public project, specific public agencies are consulted. Basically, such laws give monopoly power to a political adviser, and therefore reduces competition among advisers. We have shown that competition among advisers may increase the cost of advice.

Although we believe that our analysis gives insight into the working of the policy decision process, it is based on several restrictive assumptions. Relaxing some of these

assumptions would help to obtain a more complete picture of the role of advisers in the policy decision process. Other assumptions are relatively innocuous. We finish this paper with a short discussion about five important assumptions.

First, in order to emphasize the difference between private consultants and political advisers, we have assumed that political advisers are infinitely averse to income risk, whereas private consultants are risk-neutral. Risk-aversion on the part of private consultants, raises a tradeoff between risk and incentives. The policy maker must compensate the private consultant for income risk. Risk-aversion thus makes private consultants less attractive. When political advisers would respond to monetary rewards, the policy maker could design a contract that induces the political adviser to put more effort in producing information. In addition, the policy maker could reduce the political adviser's incentive to manipulate information. Political advisers who are responsive to monetary rewards are therefore more attractive than political advisers who are not. Hence, our assumptions concerning the advisers' risk attitudes underestimate rather than overestimate the relative benefits of political advisers.

Second, throughout the paper we have assumed that information about the consequences of the project becomes available when the project has been implemented. In reality it is often difficult to assess the consequences of projects, even *ex post*. Without information about policy consequences, it is not possible to design a contract that induces private consultants to put effort in generating information. Note that the assumption that information becomes available after the project has been implemented does not affect the behavior of political advisers.

Third, we have assumed that the policy maker can select a political adviser on the basis of her perception of the public interest. This assumption is less innocuous than the previous ones. The reason is that our main results hinge on the assumption that the policy maker can

hire a political adviser with the “proper” perception of the public interest. The problem of the selection of such an adviser is partly solved by self selection. Not all political advisers are willing to participate. Moreover, in practice, heads of public agencies are often former politicians. Indeed, our main motivation for writing this paper was the observation that in the Netherlands, policy makers often appoint former, well-known politicians to direct the research of public agencies that give advice to the government.

Fourth, we have assumed that information is soft: neither the policy maker nor the information provider can verify whether or not information is correct. Our result that the quality of the recommendation depends on the difference between the policy maker’s and political advisers preferences hinges on this assumption. If we had assumed that information is hard, implying that information can be instantaneously verified, the policy maker would consult a political adviser with an opposite perception of the public interest. Such an adviser would have the strongest incentive to collect information. Clearly, in case of hard information, the credibility of recommendations is not important anymore.

Finally, we have made several simplifying assumptions about the political process. For example, we have assumed that the policy decision is delegated to a single individual, and that this individual is only concerned with outcomes. The implication of these assumptions is that the only reason why a policy maker consults advisers is to avoid policy failures. In reality, often several policy makers are involved in making policy decisions. The implication is that a policy maker may want to consult an adviser to persuade other policy makers to support his policy proposals (Swank, Letterie and Van Dalen, 1999). Introducing elections into the model may also affect our results. Elections may induce policy makers to consult advisers to justify his policies, rather than to obtain information. Moreover, distortions in the election process may imply that the optimal adviser from the policy maker’s point of view is different from the

optimal adviser from the electorate's point of view.

References

Austen-Smith, David (1990), Information Transmission in Debate. *American Journal of Political Science*, 34: 124-152.

Austen-Smith, David (1993), Interested Experts and Policy Advice: Multiple Referrals under Open Rule, *Games and Economic Behavior*, 5(1), January 1993, pp. 3-43.

Banks, Jeffrey S. (1991), *Signaling Games in Political Science*, New York: Harwood Academic.

Crawford, V., and Sobel, J. (1982), Strategic Information Transmission, *Econometrica*, 50, pp. 1431-1451.

Gilligan, Thomas W., and Krehbiel, Keith (1987), Collective Decisionmaking and Standing Committees: An Informational Rationale for Restrictive Amendment Procedures, *Journal of Law, Economics and Organization*, 3(2), Fall 1987, pp. 287-335.

Gilligan, Thomas W., and Krehbiel, Keith (1989), Collective Choice without Procedural Commitment, In: Ordeshook, Peter C. (Ed.), *Models of Strategic Choice in Politics*, Ann Arbor: University of Michigan Press, pp. 295-314.

Gilligan, Thomoas W., and Krehbiel, Keith (1997), Specialization Decisions Within Committee, *Journal of Law, Economics, and Organization*, 13, pp. 366-386.

Lohmann, Susanne (1993), A Signaling Model of Informative and Manipulative Political Action, *American Political Science Review*, 87(2), June 1993, pp. 319-333.

Lupia, A., and M.D. McCubbins (1998), *The Democratic Dilemma: Can Citizens Learn What*

They Really Need to Know?, Cambridge: Cambridge University Press.

Milgrom, Paul, and Roberts, John (1986), Relying on the Information of Interested Parties, *Rand Journal of Economics*, 17, pp. 18-32.

Niskanen, W.A. Jr. (1971), *Bureaucracy and Representative Government*, Chicago: Aldine-Atherton.

Potters, Jan, and Van Winden, Frans (1992), Lobbying and Asymmetric Information, *Public Choice*, 74(3), October 1992, pp. 269-292.

Prendergast, Canice (1999), The Provision of Incentives in Firms, *Journal of Economic Literature*, 37(1), March 1999, pp. 7-63.

Sah and Stiglitz (1988), Committees, Hierarchies and Polyarchies, *Economic Journal*, 98, June 1988, pp. 451-470.

Swank, Otto H., Wilko Letterie, and Hendrik P. van Dalen (1999), An Economic Theory of Policy Advice, *Journal of Law, Economics, and Organization*, 15(3), October 1999, pp. 602-614.

Wittman, Donald (1995), *The Myth of Democratic Failure; Why Political Institutions Are Efficient*, Chicago: University of Chicago Press.