Consulting Experts with Vested Interests: The Power of Benchmarking

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December 21, 2004

Abstract

A decisionmaker gets independent advice from two experts, who can be of two different types. Experts are risk-neutral and prefer certain policies irrespective of the state of nature, so to induce information-sharing the decisionmaker must reward truthful experts. I show that, in this environment, a heterogeneous committee has no informational advantage over a single expert: a decision rule that encourages one expert to be honest immediately makes honesty less attractive for the other. With a homogenous committee, the higher is the correlation between the experts' signals, the more the decisionmaker is willing to pay to secure independent advice.

Keywords: Strategic advice, heterogeneous vs. homogeneous committees, benchmarking, imperfect information, informational efficiency

JEL Classification: D71, D82

1 Introduction

A major conclusion from the literature on strategic advice is that heterogeneous committees, i.e., committees where the participating experts have opposing interests, are informationally superior to homogenous ones (Milgrom and Roberts 1986, Gilligan and Krehbiel 1989, Krishna and Morgan 2001a, 2001b). In other words, to encourage information sharing a decisionmaker should pick advisors who disagree on the desired outcome. Expressed with market terminology, the advisors engage in "informational

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competition", which shifts bargaining power from the informed advisors to the uninformed decisionmaker. By using advisors with opposing interests the decisionmaker ensures that advisors compete rather than collude.

The current paper has two purposes. First, it clarifies that heterogeneous preferences per se do *not* promote informational efficiency. The market analogy is correct in so far that opposing interests preclude collusion between experts, something that could thwart information extraction. However, if collusion can be prevented by other means, competition is more effective in homogenous committees. Second, it extends the study on strategic advice to situations where experts have noisy information. With few exceptions (e.g., Austen-Smith 1993, Battaglini 2002) the literature has assumed that experts are perfectly informed. This assumption simplifies the analysis and, in Krishna and Morgan's words,"ensures that any improvement in information from combining the advice of the experts arises solely from the strategic interaction" (2001b, p. 769). However, as I show below, the assumption also shrouds important aspects of the strategic interaction.

The model looks as follows. A decisionmaker chooses a policy on the unit interval and her objective is to match the policy with an unknown state. The decisionmaker may take advice from two experts, who both have some private information on the state. There are two types of experts: leftists, who prefer policy 0, and rightists, who prefer policy 1. Hence, unlike most previous models on strategic advice, an expert's preferred policy is independent of the state of nature (their interests are "vested"), so to get information transmission I assume that the decisionmaker can commit to reward truthful experts. After the decisionmaker has set up the reward schemes, each expert independently sends her a message. The decisionmaker updates her prior of the state and then chooses a pay-off maximizing policy. Finally, the state is revealed and players collect their payoffs. In the equilibria I investigate, the decisionmaker extracts the same amount of information from both kinds of committees so the "informational advantage" of a certain committee can be measured by the difference in expected reward costs.

It should be stressed that the assumption that the decisionmaker is able to (commit to) reward experts probably is not appropriate in all contexts of strategic advice. My objective here is primarily to understand the different constraints posed by different committee compositions.[1] The results of the paper rest on the assumption that experts are unable to coordinate their strategies. In reality, collusion may be more or less difficult to deter depending on the context. For example, a firm that takes advice from external consultants may find this relatively easy compared with a government that

[1] Frisell (2004) assumes instead that experts have (exogenous) reputational concerns. The results in that paper are similar to the current ones.

must publicly announce to which experts it grants access. However, the case of former French president Francois Mitterand illustrates that it is quite possible. Mitterand's secrecy vis-à-vis his advisors - including his closest collaborators - is famous. In the words of Cole (1994, pp. 104-105),

> *[...]presidential advisers routinely paralleled the work of government ministers. But Mitterand would also set two or more of his Elysée advisers to work on the same policy dossier, usually without informing them of their dual labour. Alternatively, he would call upon the services of outsiders to provide a different perspective. [...] Unlike President Giscard d'Estaing, who regularly met with his advisers, Mitterand dealt on a one-to-one basis with his, corresponding with the bulk of his advisers by means of written notes. In the course of his first presidency, Mitterand reputedly met only once with his assembled Elysée staff.*[2]

The intuition why homogenous committees promote informational efficiency, in such a non-cooperative environment, can be understood in terms of benchmarking. When experts are biased in the same direction, one expert's message can be used as an effective benchmark with which to evaluate the other's. Whenever the messages differ, the decisionmaker may ignore the expert who reported his most preferred state and trust the other, which will reduce each expert's incentive to distort his message. The benchmarking efficiency depends on how well correlated are the experts' signals. The more likely it is that one expert's message differs from the other's, the higher is the probability that an expert will benefit from distorting his message.[3] To the contrary, with a heterogeneous committee benchmarking is ineffective, for a decision rule that increases one expert's incentive to be honest immediately reduces the other one's.

The remainder of the paper is structured as follows. Section 2 reviews related work. Section 3 presents the formal model. Section 4 characterizes the necessary reward cost for (maximally) informative equilibria with a single lobbyist, a heterogeneous committee and a homogenous committee. Section 5 concludes.

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[2] I am grateful to Emanuelle Auriol for suggesting this case. See also Schifres och Sarazin (1985).

[3] This result has an immediate analogue in the literature on yardstick competition. Consider the problem of inducing work effort when effort is unobservable and performance is also affected by (unobservable) factors outside the worker's control. In case of low performance, the worker may always blame it on "bad luck". By letting compensation depend on how a worker's performance compares with that of other workers, this problem can be attenuated. Intuitively, the higher is the correlation between workers' performances, the more effective becomes such a "yardstick contract". See Tirole (1998) for references.

2 Related literature

In their seminal paper, Crawford and Sobel (1982) study a cheap-talk game with one perfectly informed agent and one uninformed principal. The agent's and principal's preferred decision, as a function of the state, differ by a known amount b. The authors show that the principal can extract some information from the agent if $|b|$ is not too large.[4] In a sense, in the current paper experts are maximally biased as they prefer the same policy *irrespective* of the state, why information transmission is impossible with cheap talk.

Gilligan and Krehbiel (1989) and Krishna and Morgan (2001b) extend the analysis in Crawford and Sobel (1982) by letting the principal consult two experts instead of one. Gilligan and Krehbiel consider simultaneous advice while Krishna and Morgan study a sequential order. Both studies share a major conclusion: the principal can extract more information from two experts than from a single one if and only if experts are biased in opposite directions vis-à-vis the principal (e.g., $b_1 < 0 < b_2$).

The reason why heterogeneity is necessary is that with homogenous committees (e.g., where $b_1 \geq b_2 > 0$) there will always be some decision that the experts jointly prefer to an informed one. Hence, if experts can coordinate their messages they may neutralize the effect of using several advisors. Such coordination is implicitly assumed to take place in Gilligan and Krehbiel (1989) and Krishna and Morgan (2001a), as there is no distinction between a single advisor and a homogenous committee, and occurs endogenously in Krishna and Morgan (2001b) since, with sequential advice, the second expert gets to observe the first one's message. However, there is no reason why such coordination necessarily comes about.

Like the current paper, Austen-Smith (1993) studies strategic advice with imperfectly informed experts. His principal finding is that, in the presence of risk-averse experts, sequential advice may be informationally superior to simultaneous advice. Briefly explained, a (biased) risk-averse expert may be more inclined to send an informative message when he has access to the other expert's information, since the consequences of his message then are easier to foresee.

Milgrom and Roberts (1986) provide a different argument in favor of heterogeneous committees. Their main result is that, if there in each state is at least one advisor who prefers the informed decision to any other decision, the informed decision is the outcome in any pure-strategy Nash equilibrium. However, to get this result they assume that the true state must be included in each advisor's message to the decisionmaker. In a sense, advisors must here tell "the whole truth" but not necessarily "nothing but the

[4] In brief, the players coordinate on a partition of the state space so that the agent prefers to signal according to this partition. With a smaller $|b|$ a finer partition may be possible.

truth".

Less related papers include Shin (1994) and Dewatripont and Tirole (1998). Dewatripont and Tirole provide a rationale for the use of partisan advocates. However, like other papers on specialization, the efficiency gains stem from the advocates' increased incentive to amass information, not from the heterogeneity of interests as such. In the current paper, the informational precision of lobbyists is given and incentives to collect information are abstracted from. In Shin's model, an arbitrator is to determine the appropriate compensation to a plaintiff. Shin shows that the arbitrator's optimal decision rule changes with the informational precision of the involved parties. In the present paper, a change in informational precision changes the cost of inducing honesty from a homogenous committee.

3 The Model

A government is about to make a policy decision, $d \in [0, 1]$. There is a continuum of states $\omega \in [0, 1] = \Omega$, and the government's objective is, firstly, to match the state of nature with the corresponding policy (i.e., it maximizes $\Pr(d = \omega)$), and, secondly, to minimize the expected cost of doing so. Before making the decision the government may consult two lobbyists, $i = 1, 2$. There are two types of lobbyists, leftists and rightists. A leftist lobbyist's payoff from the implemented policy is $1 - d$, and a rightist's is d. In addition, the lobbyists get linear utility from monetary rewards.

Players have a common, atomless prior over states $\mathrm{F}(\omega)$, which, for simplicity, I assume to be uniform. Each lobbyist receives a private signal of the state, $s_i \in [0, 1]$. A signal is informative, i.e., it reflects the true state, with probability $q \in (0, 1]$, and is completely uninformative (the prior is unaffected) with probability $1-q$. The lobbyists' signals are independent conditional on the state. A lobbyist's posterior after receiving signal s is given by

$$\begin{aligned} \mathrm{g}(\omega) &= q && \text{for } \omega = s, \\ \mathrm{g}(\omega) &= 1 - q && \forall \omega \neq s. \end{aligned}$$

The game works as follows. The government starts out by committing to reward truthful lobbyists. Note that in this one-shot model, commitment is necessary for the government has no ex-post incentive to honor its promises. After receiving their signals, each lobbyist independently sends a message to the government, $m_i \in [0, 1]$. The government then makes its decision. Finally (possibly after a long time), the state is revealed and players collect their payoffs.[5]

Note that with the chosen setup, honesty from more than one lobbyist does not increase informational efficiency. In case of two identical messages, one is obviously superfluous, and in case of two different messages the government is indifferent between those policies. This simplifies the analysis considerably since committees can be compared in terms of expected reward costs only. Effectively, this setup allows me to separate (potential) strategic effects of combining multiple experts from pure information aggregation – without assuming that experts are perfectly informed.

I shall assume that negative rewards are not possible. If they were, the government could deter dishonesty without costs (or even with a profit) by penalizing erroneous lobbyists severely enough.[6]

Strategies and Equilibria

Formally, a (pure) strategy for lobbyist i is a mapping l_i: $[0,1] \longrightarrow [0,1]$. A strategy for the government is (i) a decision rule $d : [0,1]^2 \longrightarrow X$, where X is the space of Borel probability measures over the unit interval, and (ii) two reward schemes r_i : $[0,1] \times \Omega \longrightarrow \Re_+$.[7] To eliminate mirror image equilibria I assume that the government interprets messages literally. This simply means that an "honest" lobbyist reports his actual signal. In what follows, I focus on perfect Bayesian equilibria (PBE) where all lobbyists are honest.

In an honest equilibrium, after two identical messages $m_1 = m_2 = m$ the posterior probability of state m is one. (The event that both lobbyists received signal m in some other state than m is a set of probability measure zero.) After two different messages m and n the posterior of these states is the same.[8] Note that since the government can induce information-sharing through monetary rewards, maximizing its accuracy implies that the government's decision rule must be ex-post optimal. Hence, in an honest equilibrium, the government's decision rule must be of the following form:

$\mathrm{d}^*(m,m) = m,$

[5]For simplicity I assume that the state becomes known with certainty but this is not necessary. Since experts are risk-neutral it is sufficient that the government can condition rewards on *some* information that is correlated with the state.

[6]Limited sanctions are particularly appealing when experts are imperfectly informed, for the government can not determine whether incorrect advice is due to an expert's distorting his information or just his limited ability to acquire it in the first place.

[7]Conditioning an expert's reward only on his own message is without loss of generality. Since all agents' utility is linear in money, once the government has found a decision rule that minimizes the lobbyists' "total" incentive to deviate from honesty (as measured by the sum of their alternative payoffs), all reward schemes that exactly satisfy the lobbyists' incentive constraints are payoff-equivalent.

[8]Specifically, the posterior probability of states m and n is $\frac{q(1-q)}{1-q^2}$.

$d^*(m,n) \in \triangle^{\{m,n\}}$.

To put some structure on the set of possible equilibria I shall restrict attention to decision rules that are *monotone* in the following sense: suppose that after receiving messages o and m, the government implements policy o with probability λ. If the government instead receives messages o and n , where $o > n > m$, the decision rule is monotone if policy o is implemented with at least probability λ. The analogous condition must hold for the case $o < n < m$. A monotone decision rule has the appealing feature that higher (lower) messages do not lead to lower (higher) decisions. In particular, it implies that a rightist's preferred deviation from honesty is to send message 1, and a leftist's is to send message 0.

4 Results

4.1 A single lobbyist

For comparison I start by solving for the expected reward cost with a single lobbyist. To reiterate, since lobbyists are only interested in policy per se, to induce honesty the government must compensate the lobbyist for the implicit loss of reporting some other state than his most preferred one. Since negative rewards are not possible, the optimal reward scheme must be of the following form,

$$r = \begin{cases} f(m) & \text{if } m = \omega, \\ 0 & \text{otherwise.} \end{cases}$$

The optimal function $f(m)$, i.e., the minimum contingent reward the government must pay to secure honest advice, is simple to derive. Suppose the government consults a rightist lobbyist. The lobbyist's direct payoff from truthfully revealing signal s, given that the government follows his advice, is s. With probability q he also gets reward $f(s)$. Hence, on expectation, honestly reporting signal s pays $s + qf(s)$. The rightist's best deviation from an honest equilibrium is to send signal 1. However, his expected reward is then zero since the event that the state is 1, given some other signal, is a set of probability measure zero. Hence, to deter dishonesty, $f(m)$ must satisfy

$$m + qf(m) \geq 1, \quad \text{for all } m \in [0,1].$$

The optimal reward scheme is

$$r = \begin{cases} \frac{1-m}{q} & \text{if } m = \omega, \\ 0 & \text{otherwise.} \end{cases}$$

Note that the optimal (contingent) reward decreases with the lobbyist's precision. That is, competent lobbyists will get smaller rewards, but will get them with higher probability. By the same argument however, reward *costs* are independent of q. The expected reward cost is simply

$$q\mathrm{E}\left[\frac{1-\omega}{q}\right] = \frac{1}{2}.$$

4.2 A heterogeneous committee

Let the first message in a message pair (m_1, m_2) be the leftist's. Suppose the decision rule after message pair (0, 1) reads

$$\mathrm{d}(0,1) = \begin{cases} 0 & \text{with probability } 1-\lambda, \\ 1 & \text{with probability } \lambda, \end{cases}$$

for some $\lambda \in [0,1]$. Consider now the rightist's situation after some signal s. The probability that the leftist also received signal s is q^2, and that he received some other signal $t \neq s$ is $1-q^2$. Suppose the government has committed to pay reward $\mathrm{f}_2(m)$ if $m_2 = \omega$. Given that the leftist is honest, honesty pays the rightist

$$q^2 s + (1-q^2)\mathrm{E}\left[\mathrm{d}(t,s)\right] + q\mathrm{f}_2(s).$$

If the rightist deviates and recommends policy 1, his expected payoff is instead

$$q^2\mathrm{d}(s,1) + (1-q^2)\mathrm{E}\left[\mathrm{d}(t,1)\right] \geq q^2((1-\lambda)s+\lambda) + (1-q^2)((1-\lambda)\mathrm{E}[t]+\lambda),$$

where the inequality follows from monotonicity. Using $\mathrm{E}[t] = 0.5$ gives the following necessary condition for honesty:

$$q\mathrm{f}_2(s) \geq q^2\lambda(1-s) - (1-q^2)\mathrm{E}[\mathrm{d}(t,s)] + 0.5(1-q^2)\left(1+\lambda\right). \qquad (1)$$

Analogously, the leftist's payoff from honesty after some signal s, given that the rightist is honest, is

$$q^2(1-s) + (1-q^2)(1-\mathrm{E}\left[\mathrm{d}(t,s)\right]) + q\mathrm{f}_1(s).$$

Deviating and sending message 0 gives

$$q^2(1-\mathrm{d}(0,s))+(1-q^2)(1-\mathrm{E}\left[\mathrm{d}(0,t)\right])\geq q^2(1-\lambda s)+(1-q^2)(1-\lambda\mathrm{E}[t]).$$

Hence, the leftist's expected reward must satisfy

$$q\mathrm{f}_1(s)\geq q^2 s(1-\lambda)+(1-q^2)\mathrm{E}[\mathrm{d}(t,s)]-0.5(1-q^2)\lambda. \tag{2}$$

Combining (1) and (2) gives that the total expected reward must satisfy

$$q\mathrm{f}_1(s)+q\mathrm{f}_2(s)\geq q^2\lambda(1-s)+q^2 s(1-\lambda)+0.5(1-q^2)\left(1+\lambda\right)-0.5(1-q^2)\lambda,$$

which reduces to

$$q\mathrm{f}_1(s)+q\mathrm{f}_2(s)\geq q^2(\lambda+s-2\lambda s-0.5)+0.5. \tag{3}$$

Note that the right-hand-side of (3) is increasing in λ when $s<0.5$, and vice versa. Recall that λ is the probability that policy 1 is implemented after message pair $(0,1)$. Intuitively, the higher is this probability – and, by monotonicity, the higher is the probability that policy 1 is implemented after any message pair $(s,1)$ – the more attractive becomes dishonesty for the rightist. Hence, in low states honesty is more expensive to induce the higher is λ, and vice versa.

Using $\mathrm{E}[s]=0.5$ reduces (3) to

$$q\mathrm{E}\left[\mathrm{f}_1(s)+\mathrm{f}_2(s)\right]\geq 0.5. \tag{4}$$

Hence, we have the result that there is *no* virtue of consulting a heterogeneous committee as opposed to a single lobbyist. (It is trivial to find a decision rule such that (4) is satisfied with equality.) Intuitively, since the interests of different types of lobbyists are perfectly opposed, increasing one's incentive for honesty immediately decreases the other's incentive by the same magnitude. This highlights the fact that the results in Gilligan and Krehbiel (1989) and Krishna and Morgan (2001a, 2001b) hinge crucially on the presumption that experts have partially common interests.

Proposition 1 *When the interests of different experts are perfectly opposed, a heterogeneous committee has no informational advantage compared with a single lobbyist.*

4.3 A homogenous committee

Now consider a homogenous committee, for example, consisting of two rightists. Suppose anew that one lobbyist gets signal s. Given that the other lobbyist is honest, honesty gives the lobbyist

$$q^2 s + \left(1 - q^2\right) \mathrm{E}\left[\mathrm{d}(t, s)\right] + \mathrm{f}_i(s) q. \tag{5}$$

If the lobbyist deviates and recommends policy 1, his expected payoff is

$$q^2 \mathrm{d}(s, 1) + \left(1 - q^2\right) \mathrm{E}\left[\mathrm{d}(t, 1)\right]. \tag{6}$$

This holds for both lobbyists so the reward schemes must satisfy

$$\mathrm{f}_i(s) q \geq q^2 \left(\mathrm{d}(s, 1) - s\right) + \left(1 - q^2\right) \left(\mathrm{E}\left[\mathrm{d}(t, 1)\right] - \mathrm{E}\left[\mathrm{d}(t, s)\right]\right) \quad i = 1, 2.$$

Now, the term $\mathrm{d}(s, 1)$ is obviously decreasing in the probability that the lower policy, s, is chosen. By monotonicity, the expression $\mathrm{E}[\mathrm{d}(t, 1)] - \mathrm{E}[\mathrm{d}(t, s)]$ is also (weakly) decreasing in the probability that the lower policy in a message pair is implemented. To see this, suppose for example that s is the higher message of s and t. If s is implemented with probability μ after message pair (t, s) then monotonicity implies that policy 1 must be implemented with at least probability μ after message pair $(t, 1)$. Hence, the difference is weakly decreasing in μ. It follows that the decision rule that puts the least constraint on rewards is simply

$$\mathrm{d}^*(s, t) = \min(s, t) \text{ for all } s, t \in [0, 1].$$

Intuitively, when two rightist lobbyists recommend different policies, the decision-maker should always implement the lower one. This strategy makes each lobbyist pivotal to the decision only when he sends the lowest message, which gives the least incentive for dishonest behavior. The reverse argument obviously holds for leftist lobbyists.

Let us derive the expected reward cost for a homogenous committee under $\mathrm{d}^*()$. The payoff from honest behavior, (5), becomes

$$q^2 s + (1 - q^2)(\Pr(t < s)\mathrm{E}[t \mid t < s] + \Pr(t \geq s)s) + \mathrm{f}_i(s) q.$$

With a uniform prior, this equals

$$q^2 s + (1 - q^2)\frac{s^2}{2} + (1 - s)s + \mathrm{f}_i(s) q,$$

which reduces to

$$s\frac{(q^2s+2-s)}{2}+\mathrm{f}_i(s)q.$$

The payoff from deviating, (6), reduces to

$$q^2s+0.5(1-q^2).$$

Hence, the expected reward must satisfy

$$\mathrm{f}_i(s)q\geq\frac{(1-s)^2(1-q^2)}{2}.$$

This means that the cheapest reward scheme that induces honesty from a homogenous rightist committee is

$$r_i^* = \begin{array}{cc} \frac{(1-m)^2(1-q^2)}{2q} & \text{if } m_i=\omega, \\ 0 & \text{otherwise.} \end{array}$$

The total expected reward cost is thus

$$2q\mathrm{E}\left[\frac{(1-\omega)^2(1-q^2)}{2q}\right]=\frac{1-q^2}{3}.$$

The homogenous leftist case is completely analogous. The reward cost for a homogenous committee is decreasing in the lobbyists' informational precision. The intuition is that high precision implies high correlation between signals. Given that the other lobbyist behaves honestly, the higher is the probability that the other lobbyist received the same signal as the first, the smaller is the probability that the first lobbyist benefits from a unilateral deviation. In the limit, as noise disappears, information is extracted at zero cost. I summarize these findings below.

Proposition 2 *With independent advice,*

(i) homogenous committees are superior to heterogeneous ones,

(ii) the informational advantage of homogenous committees increases with the correlation between experts' signals.

5 Discussion

In this paper I model strategic advice in a risk-neutral environment. An uninformed decisionmaker receives independent policy recommendations from two experts. The lobbyists prefer certain policies irrespective of the state of nature and must be rewarded to share their information. When experts are biased in the same direction, one expert's message can be used as an effective benchmark with which to evaluate the other's. Whenever the messages differ, the decisionmaker may ignore the expert who reported his most preferred state and trust the other, which reduces each advisor's incentive to distort his message. Using the terminology of Milgrom and Roberts (1986), with a homogenous committee the decisionmaker has a credible *skeptical* strategy.

This approach obviously does not work when experts are biased in opposite directions. Indeed, since the policy game is a zero-sum game between heterogeneous experts, there is *no* benefit from consulting two experts instead of one. This contrasts several previous results on strategic advice.

The model makes use of a few restrictive assumptions. The first concerns the representation of noisy information in a world with continuous state space, which may be done in numerous ways. To make sure that information revelation always takes place, it is assumed that the decisionmaker primarily cares about informational accuracy, and, secondly, minimizes reward costs. Together, these assumptions makes it possible to isolate the strategic effect of combining multiple experts, and simplifies the comparison between different kinds of committees. However, the results are not due to this particular setup. In Frisell (2004) analogous results are reached in a model with binary state space and exogenous reputational rewards, but the analysis becomes considerably more cumbersome.

Finally, the informational advantage of homogenous committees increases with the correlation between experts' signals. This result has an analogue in the literature on "yardstick competition", namely that efficient benchmarking (for example between firm managers) requires that outputs are highly correlated. This means that the higher is the correlation between the experts' signals, the more resources the decisionmaker is willing to spend to prevent experts from coordinating their strategies.

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