Predicting Committee Action

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Abstract

Success of a policy often requires both that a good policy be adopted, and that the public or firms correctly anticipate what policy government will adopt. This paper models a relation between committee size and the effectiveness of policy, with a focus on how the accuracy of the public's expectations varies with the size of the governmental committee setting policy. The paper also argues that the demand for access by special interest groups may arise not from a desire to influence policy, but from a desire to learn about government's likely actions.

1 Introduction

A policy will often be more successful if the public knows what the decisions will be; a policy requiring private investment is one important example.[1] Suppose government makes decisions by committee, and that people learn about a committee member's views by listening to him, in person, on television, on radio, or so on. Were all committee members identical, the public's information about the committee's actions would not decline with the committee's size, and could increase. But that conclusion does not apply if the committee members differ, though their preferences are positively correlated. The larger the committee, the less likely that the committee will follow the preferences of any particular member, the less accurate will the public's predictions be, and so the less effective may policy be. Suppose indeed that the beliefs of the committee members are weakly correlated. Then if the committee has many members, knowledge of one member's vote predicts little about what the committee will decide. If the committee consists of a single person, a firm which knows his position knows the committee's decision. On the other hand, if the judgments of committee members show some independence from each other, an increase in the size of the committee increases the probability that the committee correctly estimates the state of nature, and so the more likely it will take appropriate action. Here I explore that tradeoff.

I shall suppose that the limiting factor in communication is the time of the firm—it can hear only one committee member. An alternative assumption is that the time of committee members is limited. Then the more members on the committee, the more speeches they give, and the more likely that a firm will hear the opinions of at least one member. That would argue for larger committees. But with modern communications, and such technology as Tivo recorders, a speech by one member can be heard by many people at different times, so it may be more plausible to suppose that the constraint on information is that the firm hears only one member.

[1] See Wittman (1995) for the related idea that voters become informed about the issues and candidates so that they can better plan.

2 Literature

2.1 Administrative design

My discussion of how an agency's structure affects its effectiveness relates to a large literature on administrative design.[2] Recent research emphasizes the strategic control of agencies—the current majority in the legislature, or the president, or special interest groups, aim to design the agency so that it will pursue particular objectives in the future. For example, the Interstate Commerce Act of 1889 moved the Interstate Commerce Commission out of the Department of Interior and executive branch, with the effect of greatly reducing presidential influence. Or, for another example, requirements that a regulatory commission hold public hearing before issuing a ruling increase the influence of public interest groups.

Another line of research considers how the agency's design affects the quality of its decisions. This literature assumes the existence of an optimal decision, with the agency aiming to find it. For several reasons a committee may do better than an individual decision maker. A committee allows each member to learn from each other (Lombardelli, Proudman and Talbot (2002)), it increases the agency's flexibility in responding to shocks of different magnitudes (Mihov and Sibert (2004)), and it pools the judgment of different individuals.

The benefits of pooling judgments arise from the Condorcet Jury Theorem.[3] The theorem builds on the intuition that if each committee member has an independent probability greater than 1/2 of making the correct decision, then the probability that the majority of the committee makes the correct decision increases with the number of members; the probability approaches 1 as the number of members becomes indefinitely large. Blinder and Morgan (2000) indeed give empirical evidence for good performance of committees.

This result suggests that committees should be very large. But decisions are often made by small committees, say a board of directors of size nine, or a federal regulatory commission of size three. A theoretical justification for small size is the decline in the quality of each member's judgment as committee size increases; for example, high-quality people may be scarce, and so

[2]See Wood (2004) for a review of recent literature.

[3]Good surveys are in Grofman and Owen (1986) and in Miller (1986).

the larger the committee the lower the average quality of its members.[4] Or the quality of judgment may decline because an increase in committee size reduces each committee member's probability of casting a decisive vote, and so induces each to work less on the job. Such free riding makes the optimal committee size small.[5] Indeed, in a large committee, effort by each member may approach zero. Consider a committee with majority rule. Since the probability that a member is pivotal approaches zero as the committee size increases, the equilibrium cannot have all members informed. Uninformed members would randomize between, say, the two alternatives under consideration. The randomization reduces the probability that an informed member is pivotal. Thus, the equilibrium with many members has no one incur the cost of collecting information,[6] and with each member voting in accord with whatever signal he saw about the state of nature.[7]

2.2 Central banking

Much of my interest is in communication between the agency and the public. This topic is of special interest in central banking, under the rubric of "transparency." Indeed, the Chairman of the Federal Reserve Board, Ben Bernanke, has made it a main consideration. He writes (Bernanke (2004))

> ....policymaking at most central banks is done by a committee. In the United States, nineteen people (twelve of whom get to vote at any given meeting) serve on the Federal Open Market Committee (FOMC). The diversity of views and opinions likely to exist among the members of a large committee create further challenges for effective communication. However, vehicles do exist to help convey the breadth of opinion on the Committee. For example, the minutes of FOMC meetings describe the range of viewpoints and many of the key considerations underlying policy decisions.

[4]For the standard result with decision makers who are endogenously endowed with private information, see Young (1988), Austen-Smith and Banks (1996), and Feddersen and Pesendorfer (1998). Karotkin and Paroush (2003) calculate the optimal committee size under such conditions.

[5]Persico (2004) discusses how voting rules affect each member's effort. Mukhopadhaya (2003) shows how a juror's information does depend on the jury's size.

[6]For a fine survey of the literature on decisions by committees, see Gerling et al. (2005).

[7]For proof when members have identical abilities, see Austen-Smith and Banks (1996). See also Coughlan (2000).

> In my view, releasing these minutes more promptly than is now done would provide useful and more timely information for the public. Although at times it feels cacophonous, the willingness of FOMC members to present their individual perspectives in speeches and other public forums provides the public with useful information about the diversity of views and the balance of opinion on the Committee.

Communication is important because often monetary policy will be more effective if people expect the policy to continue. Thus, improving the predictability of short-term interest rates can reduce risk premiums in asset markets and influence shorter-term yields. And since the values of long-term assets are affected by the whole trajectory of expected short-term rates, a central bank which aims to affect long-term rates must affect investors' expectations of future short-term rates; the central bank can affect expectations by informing investors and the public about its objectives, its assessment of the economy, and its policy strategy. A famous example of the importance of expectations and of statements was the reaction of the newly appointed Alan Greenspan to the stock market crash of 1987. The FOMC explicitly reassured the markets that the Federal Reserve would supply sufficient liquidity to support the economy.

Central banks have improved communication with the public. In particular, since 1999 the Federal Open Market Committee of the Federal Reserve Bank in the United States publishes immediately after a meeting a statement explaining its decision, and its outlook for economic conditions and monetary policy. Ehrmann and Fratzscher (2005a) find that though this increased communication reduced the uncertainty of the financial markets about monetary policy, even before 1999 communications from Federal Reserve officials were informative. Kohn and Sack (2003) corroborate that such statements convey important information to market participants. Ehrmann and Fratzscher (2005b) show that, as I will assume, committee members differ in their statements.

2.3 Access

My approach is the obverse of the view that individuals, or special interests, seek access to politicians with the goal of informing politicians. A common view has a lobbyist buy access through campaign contributions (see Herndon

(1982), Langbein (1986), Baron (1989), Snyder (1990), and Austen-Smith (1995)). This explanation, however, may be time-inconsistent: after receiving the contributions, a politician may benefit little from granting access to former contributors.

To deal with this problem, other authors study the information a politician gains from special interests. The information can concern the importance of the problem a legislator addresses (Hansen (1991), Smith (1995)), the policy's effectiveness (Smith (1995)), and the electoral consequences of different policies (Kingdon (1984) and Hansen (1991)). Smith (1984) considers legislators relying on lobbyists who can best predict the political consequences of different actions. Hall (2000) argues that a legislator gives access to organized interests because they give informational subsidies: lobbyists selectively subsidize the information and legislative labor costs of members who already agree with them. Lobbyists thereby make it easier for a legislator to advance a policy objective he has in common with the group. Several other papers model legislators who aim to take positions popular in their districts, and groups who provide private information to legislators (see Austen-Smith (1993) and Rasmussen (1993)).

My approach offers a new explanation for access. Rather than examining how a firm attempts to influence the government official, I show how a firm and an official can both benefit from knowing each other's beliefs. That can explain why contributions often take the form of meetings or of lectures.

3 Assumptions

3.1 Projects

The state of nature is either good or bad. The prior probability that the state of nature is good is γ. In period 1 the committee (or the agency for which it works) decides whether to invest in a project, and each firm can also make an investment. The agency's investment costs K. A firm's investment costs K_i. The return from the investment has two parts. The public return is $R0$ if the agency invested and the firm invested, and the state of nature is good. The public return is zero otherwise. The firm earns R_i if the firm invested, and the agency invested, and the state of nature is good. Otherwise the firm earns nothing. Notice that these assumptions imply that a firm's expected profits from investment increase with its confidence that the agency

will invest.

3.2 Committee

The agency's decision is made by a committee consisting of n members. The committee must decide whether to undertake a proposed project. Each committee member sees a private signal of the state of nature. The signal he sees is correct with probability s, with $s1/2$. The larger is s, the greater the agreement among the committee members.

3.3 Firm

The one firm I consider profits from investing in period 1 only if the state of nature in period 2 is good, and the agency invests; when the firm decides whether to invest it does not observe the agency's decision. Thus, the firm's expected profits are higher the better it can predict the agency's action. The firm can hear from one committee member his beliefs about the state of nature.

4 Committee aware of what firm heard

The optimal decisions of both the firm and of the agency depend on what they know about the firm's information. For if the agency knows whether the firm heard from a committee member who saw a good signal or instead a bad signal, it knows what the firm will do. But if the agency does not know what the firm heard, it cannot be sure that the firm will invest when the agency does, and so investment by the agency is unattractive. I shall consider these two cases in turn, considering first a committee which knows what the firm heard.

4.1 One committee member

The simplest case has a committee with one member. That is, a single executive sees a signal of the state of nature and decides whether the agency will invest. With probability s when the executive sees a signal for the good state of nature (for brevity, a good signal), his signal is correct. The probability that the committee member sees a good signal is $\gamma s+(1-\gamma)(1-s)$.

The probability that the state of nature is good given that he saw a good signal is

$$\frac{s\gamma}{s\gamma + (1-s)(1-\gamma)}. \tag{1}$$

If the agency invests and the firm invests after hearing that the executive saw a good signal, then the firm's expected profit is $R_i \frac{s\gamma}{s\gamma+(1-s)(1-\gamma)} - K_i$. The agency invests if $K + K_i < \frac{s\gamma}{s\gamma+(1-s)(1-\gamma)}(R + R_i)$. When this condition holds, expected social welfare is

$$\gamma s(-K - K_i + R + R_i) + (1-\gamma)(1-s)(-K - K_i). \tag{2}$$

4.2 Three committee members

Now suppose the committee has three members, which makes a decision by majority vote. The probability that the committee correctly estimates the state of nature is the probability that 2 or more members correctly estimate it.

Assume the firm hears from one committee member, who saw a good signal, and the committee knows that the firm heard about this signal. Notice the tradeoff here. The larger the committee, the more likely will the agency correctly predict the state of nature, making the investment more attractive. But the larger the committee, the less accurate is the firm's prediction of the agency's decision.

Consider a firm which heard from a committee member who saw a good signal. Suppose the committee adopts the project (or invests) if a majority saw a good signal. The probability that the majority saw a good signal is the probability that one other or two other committee members saw a good signal. The probability that 2 committee members saw a good signal given that a particular member did is

$$s_2 \equiv \frac{2s^2\gamma(1-s)}{s\gamma + (1-s)(1-\gamma)} + 2\left(1 - \frac{s\gamma}{s\gamma + (1-s)(1-\gamma)}\right) s(1-s). \tag{3}$$

. The probability that 3 committee members saw a good signal given that a particular member did is

$$s_3 \equiv \frac{s^3\gamma}{s\gamma + (1-s)(1-g)} + \left(1 - \frac{s\gamma}{s\gamma + (1-s)(1-\gamma)}\right)(1-s)^2. \tag{4}$$

If the firm heard from a committee member who saw a good signal, the probability that it will earn R_i from investing is the conditional probability that the agency invests and that the state of nature is good. Therefore, the firm will invest if

$$K_i < R_i \frac{s\gamma}{s\gamma + (1-s)(1-\gamma)}(s_2 + s_3). \tag{5}$$

4.2.1 Social welfare

Consider next expected social welfare. Recall that I consider a committee which knows that the firm heard from a member who saw a good signal. The agency invests if two or three of its members saw a good signal. The probability that the state of nature is good given that two members saw a good signal and one saw a bad signal is

$$\gamma_2 \equiv \frac{3s^2(1-s)\gamma}{3s^2(1-s)\gamma + 3(1-s)^2 s(1-\gamma)}. \tag{6}$$

The probability that the state of nature is good given that three members saw a good signal is

$$\gamma_3 \equiv \frac{s^3\gamma}{s^3\gamma + (1-s)^3(1-\gamma)}. \tag{7}$$

Suppose the agency invests when at least two of its members saw a good signal, and it knows that the firm heard from a member who saw a good signal, and it knows that the firm invests. Consider expected aggregate welfare when the committee knows that the firm heard from a member who saw a good signal, and so the firm invests. Let s_j be the probability that j committee members saw a good signal given that a particular member did. Let γ_j be the probability that the state of nature is good when j committee members saw a good signal. Then expected aggregate welfare given that the firm heard from a committee member who saw a good signal, and that the firm invests, is $-K_i - (s_2 + s_3)K + (R + R_i)(s_2\gamma_2 + s_3\gamma_3)$. The general expression is complicated, but becomes simple in the limiting case where $s = 1/2$ and$\gamma = 1/2$; expected welfare is then $-K_i - \frac{3}{4}K + \frac{3}{8}(R + R_i)$.

Clearly, if the firm invests when it heard from a committee member who saw a good signal, then social welfare is higher when the committee consists of three people than when it consists of one person—an increase in the size of the

committee increases the probability that the committee correctly estimates the state of nature. Under a large committee, however, the firm may choose not to invest. We saw that under a committee of size 1, a firm which heard of a good signal will invest if $K_i < R_i \left(\frac{s\gamma}{s\gamma+(1-s)(1-\gamma)}\right)$. But with a committee of size 3, the firm must consider the probability that the agency will invest when the firm heard from a committee member who saw a good signal. The probability that the committee will invest is the probability that at least one other committee member saw a good signal, namely $s_2 + s_3$, or

$$\frac{3s^2(1-s)\gamma}{3s^2(1-s)\gamma + 3(1-s)^2 s(1-\gamma)} + \frac{s^3\gamma}{s^3\gamma + (1-s)^3(1-\gamma)}. \tag{8}$$

A firm which heard from one committee member who saw a good signal will invest if K_i is less than R_i times the probability that the agency invests and that the state of nature is good, or if

$$K_i < R_i(s_2\gamma_2 + s_3\gamma 3). \tag{9}$$

The right-hand side of this expression is less than $R_i \left(\frac{s\gamma}{s\gamma+(1-s)(1-\gamma)}\right)$ (which determines whether the firm will invest when the committee has one member). The difference between the two expressions is $\frac{(1-s)^2 s\gamma}{\gamma+s-2s\gamma-1}$, which is negative for $s > 1/2$. That is, with a committee of 3 the firm's uncertainty about the committee's decision can make the firm avoid investment, though it would invest if the committee had one member. And, of course, if the firm does not invest, social welfare is zero. Here, then, a single executive is superior to decision by committee.

The agency has yet another alternative. It may choose to invest even if only one member saw a good signal. Using the same reasoning as before, such a rule can induce the firm to invest when it would not were the agency to follow a rule of investing only when a majority of the members saw a good signal. That is, the agency may invest even though it knows that in a particular case the investment will likely generate a negative return.

4.3 Large committee

Consider an indefinitely large committee. If the firm knows that a committee member saw a good signal, and that the committee decides by majority vote, then a firm which heard of a good signal estimates the probability that the committee will favor the investment as the probability that the state of nature

is good given that the signal observed by the committee member was good. The firm will therefore invest if

$$K_i < R_i \left(\frac{s\gamma}{s\gamma + (1-s)(1-\gamma)} \right). \tag{10}$$

Expected welfare when the committee knows what the firm heard, and when the firm invests if it heard of a good signal, is then $\gamma s(-K - K_i + R + R_i) - (1-\gamma)(1-s)K_i$. Notice that the condition here for the firm to invest is the same as under a committee of one: under a committee of one, the firm knows what the agency will do, but doesn't know what the state of nature will be when the agency invests; under a very large committee, the firm is uncertain about what the agency will do, but knows that the agency will invest only if the state of nature is good. So though the firm's investment decision is the same under a committee of size 1 and under a very large committee, social welfare is necessarily higher under a very large committee—the agency never invests when the state of nature is bad. Recall that under a committee of size 3, the firm which heard of a good signal may choose not to invest though it would invest under a committee of size 1. Social welfare is therefore not a monotonic function of committee size: an increase of the committee size from 1 to 3 may reduce social welfare, but a further increase to a large size can increase it.

5 Committee unaware of what firm heard

I so far supposed that that the committee knows what the firm heard—whether the firm heard from a committee member who saw a good signal or who saw a bad signal. Here I shall consider the opposite assumption—the committee does not know what the firm heard. Suppose, in particular, that the firm heard from a committee member chosen at random from all committee members. For simplicity, I will consider a large committee. With a probability approaching 1, when the majority of the committee saw a good signal, a fraction s of the members saw a good signal. Thus, with probability s the firm heard from a committee member who had seen a good signal. Similarly, when a majority of the committee saw a bad signal, with probability s the firm heard from a committee member who saw a bad signal. Thus, if the firm invests when it hears of a good signal, and if the majority of the

committee saw a good signal, then expected welfare is

$$\gamma(-K + s(-K_i + R + R_i)) - (1 - \gamma)(1 - s)K_i. \tag{11}$$

Comparing social welfare when the committee does know and does not know what the firm heard gives the benefits of such knowledge, $\gamma K(1 - s)$. This positive value is a benefit the agency gains from giving access to the firm, which allows the committee to learn what the firm heard. This informational effect relates to other work that sees lobbyists as providing valuable information to a governmental official. But the flavor here differs, focusing on what the lobbyist knows, rather than on the lobbyist attempting to persuade the governmental official.

As I showed above, access can also prove beneficial because it informs a firm about the agency's intentions. Such information can be provided in other ways. Thus, Congressional oversight committees are sometimes viewed as greatly influencing an agency's policies, with public hearings one mechanism through which such influence is exerted. I view oversight hearings as generating an additional benefit—they inform Congress and the public of what the agency is likely to do. Public speeches or announcements by the agency heads cannot substitute for oversight hearings: in hearings the agenda is set by Congress, rather than by the official who may not know what interests Congress and the public. Similarly, Congressional confirmation hearings for an official who will head an agency or participate on a decision-making committee not only can inform the public about what the committee member's positions will be.

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6 Notation

n Size of committee

R_i Return to firm when it invests and state of nature is good

R Public return to agency when it invests and state of nature is good

s Probability signal is correct

γ Prior probability that state of nature is good.