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Transparency and Pre-meetings*

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Abstract

Some committees are made up of experts, persons interested in both the (subject) matter at hand and in coming across as able decision-makers. Such committees would like to conceal disagreement from the public. We present a theory that describes the reaction of experts to the requirement to publish verbatim transcripts of their meetings: the emergence of an informal 'pre-meeting'; the move of the real debate from the formal meeting to the pre-meeting; and the drop in disagreement in the formal meeting. We analyse what the effect is on accountability and quality of decision-making. Finally, we present evidence suggesting that our model describes the way members of the Federal Open Market Committee in the United States responded to the publication of verbatim transcripts of their meetings.

Keywords: Committees, pre-meetings, reputational concerns, transparency.

JEL codes: D71, D72, D82

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1 Introduction

Transparent decision-making processes are widely regarded as a prerequisite for the working of a representative democracy. One reason is that transparency facilitates democratic accountability. Another reason is that when representatives make decisions behind closed doors, the citizens may suspect that their interests are not fully promoted. Why else the secrecy? Against the background of the potential advantages of transparency, it is hardly surprising that legislation, like the Freedom of Information Act in the United States, tries to foster transparency. More generally, "over thirty countries have passed Open Government codes, which establish the principle that a citizen should be able to access any public document" (Prat, 2005, p.2). However, it is not always clear that this type of legislation succeeds in safeguarding transparency. Stiglitz (1998) was shocked by the focus on secrecy in the Clinton administration when he served as the chairman of the Council of Economic Advisers. Debate in parliaments is another point in case. Typically, debate in Parliament is formally open. In the Netherlands, however, many decisions are actually "pre-cooked" behind closed doors. Before elections, Dutch politicians promise to debate in the open. However, once an administration has been installed, the old habit of bargaining in pre-meetings is continued.

One of the objectives of this paper is to explain why - as Stiglitz (1998, p.17) puts it - "there remains an obsession with secrecy despite America's social consensus in favor of openness". Our paper consists of a theoretical part and an empirical part. In the theoretical part, we develop a framework in order to study the effects of transparency on group decision-making. This framework describes a situation where on behalf of the public a three-person committee has to make a binary decision, deciding for change or maintaining the status quo. Initially, all members are skeptic about change. Each committee member then forms a private view on the proper decision. Before the committee takes a decision, its members can exchange views. In this paper, a transparent decision-making process means that the public observes this exchange of views as the result of, say, the presence of cameras or the publication of verbatim transcripts. A closed decision-making process, by contrast, means that the public does not observe the exchange of views. A crucial feature of our model is that the committee members are concerned about how the public perceives their

decision-making abilities. As in Visser and Swank (forthcoming), such reputational concerns give incentives to the committee members to conceal disagreement from the public. Obviously, in a closed decision-making process, disagreement can be concealed. Once the decision has been made, the committee members form a united front. They will claim their privately held views coincided, and that all therefore favoured the same decision. Moreover, we show that in a closed decision-making process, reputational concerns may induce committee members to distort decisions. The reason is that three skeptics maintaining the status quo may stem from all holding negative private views, but also from conflicting opinions. If three skeptics put aside their doubts and decide for a change, this must mean their privately held views were all favourable. As concurring views signal competence, reputational concerns make deciding for change more attractive. This result of our analysis suggests that citizens should indeed be suspicious of decision-making in secrecy.

In a situation where the decision-making process is transparent, the committee members cannot forge a united front. Possible disagreement shows up when private views are exchanged. The implication is that the committee does not speak with one voice and that there are no incentives to distort the decision. However, transparency does not remove reputational concerns. It is still in members' interests to hide disagreement. We show that transparency induces them to organize a pre-meeting. We call a formal meeting preceded by a pre-meeting an "open" decision-making process. By a pre-meeting, we mean a meeting without cameras and of which no minutes are kept, and that can be used, therefore, to freely exchange views. Lunches and dinners before official meetings are examples, but also a quick exchange in a colleague's office before entering the official, transcribed, meeting. Such informal gatherings can be used to collect all opinions, and to determine what decision is best. Once this has been determined, the members can again show a united front in the formal meeting. If all members participate in the pre-meeting, then an open process is equivalent to a closed process. As above, the committee will speak with one voice, and the decision may be distorted. Imposing transparency, then, does not improve accountability nor the quality of decision-making. However, in case not all members participate in the pre-meeting, decisions may be "pre-cooked" with less information. As a result, from a social point of view, transparency with concomitant pre-meetings is typically inferior to a closed decision-making process. Accountability

increases as one obtains a clearer idea of the views held by different groups (those who did and those who did not participate in a pre-meeting).

One problem with a theory on closed versus open decision-making processes is that it is hard to test. By definition, in closed meetings and in pre-meetings much information on the way decisions are reached remains hidden. However, Meade and Stasavage (2004) point to an interesting exception. Before 1993, meetings of the Federal Open Market Committee (FOMC) were closed. More precisely, members of the FOMC were unaware that these meetings were tape-recorded *and that the tapes were kept*. So, before 1993, FOMC members believed that their meetings were closed. Starting in the fall of 1992, the FOMC came under pressure of Congress to become more transparent. In particular, Congress requested it to provide a detailed account of the discussion taken place. After strong opposition, the FOMC decided to release lightly-edited, but otherwise verbatim transcripts of the meetings with a five year delay. Moreover, transcripts of meetings *before* 1993 were made available. This decision can be regarded as a (small) step towards a transparent decision-making process.

Recently, Meade (2005) has developed a unique data set of the 72 FOMC meetings during the period 1989-1997. This set contains codes of voiced preferences and formal votes of individual FOMC members. Against the background of our theoretical model, this data set is especially interesting, because it covers the years before and after the regime shift of 1993. In the second part of our paper, we use Meade's data set, in addition to anecdotal evidence, to assess whether some of the main predictions of our model make sense. The overall conclusion is that our predictions are broadly consistent with the facts. In particular, the step towards a transparent decision-making process seems to have shifted part of the deliberations from the formal meetings to pre-meetings.

Our paper contributes to a small but growing literature on transparency. Prat (2005) defines transparency as the ability of a principal to observe the agent's behavior and its consequences.[1] Using a model of career concerns (see Holmström 1999),

[1] On the basis of the principal's information, we can distinguish at least five types of transparencies: (1) information about actions; (2) information about consequences of actions; (3) information about voting records (Gersbach and Hahn, 2003); (4) information about the deliberation stage; and (5) the statement after a meeting (Ehrmann and Fratzscher, 2005). This paper focuses on type (4).

Prat shows that the principal always benefits from observing the consequences of an agent's action, but she may suffer from observing the agent's action itself. The reason for this result is that when the action is observed, reputational concerns may induce the agent to ignore private information and to behave as an able agent is expected to behave. Our paper differs from Prat's in that we focus on a group, rather than on a single agent. Moreover, in our model, the principal does observe the decision taken by the group, but does not always observe how this decision is arrived at.

Stasavage (2005b) also examines whether there are arguments against transparency. He analyzes a model in which committee members are representatives, who are concerned about their reputation for being unbiased relative to their principals. He shows that a transparent decision-making process may prompt agents to posture by proposing policies that are most preferred by their principals.

Levy (2004) analyzes the way in which transparency of the decision making process in committees affects decisions. As in our paper, committee members are concerned about their reputations for being capable. In a closed meeting, the public evaluates members' abilities on the basis of the final decision. In Levy, committee members know their own abilities. Low ability members want to conceal their abilities. They can do so by voting for the option that requires little consensus. An important difference between Levy's model and ours is that in her model each committee member is responsible for evaluating a decision on a different dimension. In our model, committee members have a common expertise. As mentioned earlier, one implication of this feature of our model is that committee members want to conceal disagreement.

The paper by Meade and Stasavage (2004) is most closely related to our paper. Like us, they focus on a committee whose members want to convince the public that they are able decision-makers. Moreover, as in our paper transparency relates to the deliberation stage in the decision making process. Finally, they also present empirical evidence consistent with the prediction that more transparency after 1993 has affected deliberations in the FOMC. An important difference with our paper is that committee members in Meade and Stasavage (2004) speak in a sequence. As a result, reputational concerns may lead to herding as in, for example, Scharfstein and Stein (1990) and Ottaviani and Sørensen (2001). By contrast, we assume that

committee members' statements are prepared in advance, so that committee members de facto speak simultaneously. In addition, our paper deviates from Meade and Stasavage, and all the other papers discussed above, in its focus on pre-meetings. As far as we know, we are the first who explore the idea that transparency may give incentives to agents to organize pre-meetings.

More generally, our paper belongs to the far more extensive literature on committees (see Gerling et al., 2005, for a recent survey). This literature deals with topics like the optimal size of a committee (see, for example, Mukhopadhaya, 2003, and Persico, 2000), the optimal voting rule in a committee (see for example, Feddersen and Pesendorfer, 1998, and Ladha, 1992), and communication among committee members (see, for example, Austen-Smith, 1990, Coughlan, 2000, and Meirowitz, 2004 and 2005). In this paper, we assume a given size of the committee. Moreover, we avoid problems of imperfect communication by assuming committee members to be homogeneous. This assumption ensures that members do not have incentives to fool each other (see Li et al, 2001, and Visser and Swank, forthcoming).

Our paper is organised as follows. The next section presents the model. The analysis is presented in Sections 3-6. Section 7 elaborates on the empirical relevance of our analysis. Section 8 concludes.

2 The Model

As we apply our model to the FOMC in Section 7, we phrase our model in terms of monetary policy. However, the model can be applied to a host of committees.

On behalf of the public, a three-person committee has to decide between maintaining the status quo, $X = 0$, and adjusting the funds rate, $X = 1$. By normalization, status quo delivers a payoff equal to zero. If the funds rate is adjusted, the expected payoff to each member (and the public) equals $p + \mu$. The parameter p is the ex ante expected payoff from a funds rate adjustment. The stochastic term μ captures that the state of the economy, and therefore the effect of the rate adjustment, is uncertain. We assume that $\mu \in \{-u, u\}$, with equal prior probability. Moreover, we assume that (i) $p < 0$, implying that the committee has a bias against adjusting the funds rate; (ii) $p + u > 0$, implying that the socially optimal decision depends on the state of the economy.

At the beginning of the game, each member $i \in \{1,2,3\}$ possesses a private signal about μ, $s_i \in \left\{s^b, s^g\right\}$. A signal refers to a member's assessment of μ (b is bad and g is good). Whether this signal is informative depends on a member's type, t_i. Each member can be smart or dumb, $t_i \in \{sm, du\}$. The prior probability that a member is smart equals π. A smart member has a fully informative signal about μ. His view on μ is flawless, $\Pr(\mu = u \mid s^g, sm) = \Pr\left(\mu = -u \mid s^b, sm\right) = 1$. A dumb member receives an uninformative signal: $\Pr(\mu = u \mid s^g, du) = \Pr\left(\mu = u \mid s^b, du\right) = \frac{1}{2}$. He does not learn anything new about the expected value of the rate change. A member does not know his own competence, only the probability with which he is smart, π.[2] The ex ante probabilities of μ, and the prior probability π are common knowledge.

Preferences over the alternatives consist of two parts, one reflecting the public interest, and one reflecting reputational concerns. Specifically, member i's preferences are represented by:

$$U_i(X=1) = p + \mu + \lambda \hat{\pi}_i(X=1;\cdot) \quad (1)$$

$$U_i(X=0) = \lambda \hat{\pi}_i(X=0;\cdot) \quad (2)$$

$\hat{\pi}_i$ denotes the posterior belief held by the 'market' or the 'public' that a committee member is smart. We assume that when updating its beliefs, the market does not observe μ. The idea is that even ex post it is often hard to evaluate policy decisions. Most of our results, however, do not hinge on the assumption that μ is not observed. The market does observe the funds rate decision, and, depending on the way the decision-process is organized, may observe how the funds rate decision is arrived at. The parameter λ measures how much committee members care about their reputation. Notice that the committee members have homogenous preferences. We use (1) and (2) with $\lambda = 0$ to represent the public's interest.

We discuss three decision-making processes. In a *closed* decision-making process, the committee publishes a voting record, but does not publish a transcript of the meeting. Within the committee, the funds rate decision is made in two stages. In the first stage, the communication stage, each member sends a message, $m_i \in \left\{m^b, m^g\right\}$. By this we mean that a member presents an analysis of μ. In the second stage, the

[2] "Dumb" may mean "less smart". What matters for the results is that a smart type has a higher likelihood of correctly assessing the state of the economy than a dumb type.

voting stage, the messages sent are common knowledge, and the members vote on the funds rate, $v_i \in \{v^b, v^g\}$, where $v_i = v^b$ ($v_i = v^g$) denotes that i votes against (in favour of) a funds rate adjustment. We assume that messages are sent simultaneously, and that votes are cast simultaneously. The relationship between the individual votes cast and the decision on the project is determined by the voting rule. This decision-making process tries to capture the situation at the FOMC before 1993. In a *transparent* decision-making process, the committee is required to publish a verbatim transcript of the meeting. The decision process is characterized by the same communication and voting stages. Finally, an *"open"* decision-making process, tries to capture the main characteristics of what we believe to be the actual situation after 1993. The process within the FOMC meeting is as in the second arrangement, but Governors can decide to organize a pre-meeting, in which they may exchange their views and may coordinate their statements for the formal meeting.

3 A Closed Decision-Making Process

As there is no conflict of interest, members share their information ($m_i = m^x$ if $s_i = s^x$ for $x \in \{g, b\}$), and individual voting strategies coincide (see Coughlan 2000, and Visser and Swank, forthcoming). If member 1 prefers one alternative over the other, so do members 2 and 3. The voting rule is therefore immaterial. We will therefore say that the committee votes, rather than a member.

We start the analysis with the derivation of the decision rule that is first-best from the public's perspective. Let k denote the number of positive signals received by the three members, and let $\mathsf{E}(\mu \mid k)$ denote the expected value of μ conditional on k (out of 3) positive signals. Furthermore, let k^{FB} be such that $p + \mathsf{E}[\mu|k] > 0$ for $k \geq k^{FB}$ and $p + \mathsf{E}[\mu|k] < 0$ for $k < k^{FB}$.

Definition 1. The first-best decision rule consists of two parts. First, information is shared. Second, the rate is changed if and only if $k \geq k^{FB}$.

To ensure that the committee operates in an interesting environment, we make the following assumption.

Assumption 1: $p + \mathsf{E}(\mu \mid 3) > 0$

If Assumption 1 were violated, $X = 1$ would never be in the public interest. The determination of k^{FB} is a statistical matter. As $p < 0$, $p + \mathsf{E}(\mu \mid 1) < 0$. Hence, the optimal decision rule is characterized by either $k^{FB} = 2$ or $k^{FB} = 3$. It is easy to verify that if the absolute value of p is sufficiently large, then $k^{FB} = 3$. The reason is that a strong bias against $X = 1$ should be compensated by much evidence for $\mu = u$. Moreover, if the value of π is relatively small, then $k^{FB} = 3$. For the moment we assume that $k^{FB} = 3$. At the end of this subsection, we will show how $k^{FB} = 2$ affects the results.

Under which conditions is the first-best decision rule an equilibrium outcome of the game? As information is shared in the meeting, and as voting strategies will coincide, answering this question amounts to establishing the conditions under which the committee votes for a rate change if and only if $k = 3$. We first derive the posterior beliefs, assuming that the decision on X is made in accordance with the first-best decision rule. By assumption, under a closed decision-making process, the public does not observe how decisions are reached. It only observes the final decision. However, knowing that decisions are made in line with the first-best decision rule, the public can infer from $X = 1$ that $k = 3$, and from $X = 0$ that $k < 3$. One can verify that

$$\hat{\pi}(X = 1) = \frac{1 + 2\pi + \pi^2}{1 + 3\pi^2}\pi > \pi \tag{3}$$

$$\hat{\pi}(X = 0) = \frac{7 - 2\pi - \pi^2}{7 - 3\pi^2}\pi < \pi \tag{4}$$

A rate change commands a higher reputation than maintaining the status quo. The reason for this result is that an adjustment implies that all committee members hold the same view about the state of the economy (a favourable view). Maintaining the status quo may either result from all members holding the same (negative) view, or from conflicting evidence about the state of the economy. As in our model smart committee members hold identical views, whereas dumb members may differ in opinion, the decision with the higher degree of concurrence of privately held views gives rise to a higher reputation. Hence, $X = 1$ signals a higher degree of competence than $X = 0$.

As a consequence, committee members who care considerably about their reputations may be willing to accept a rate change if that decision yields a considerable

boost in reputation, even though sufficient evidence showing the adequacy of the change is lacking. The incentive to do so is strongest in case the number of views favouring a rate change falls just short of $k^{FB} = 3$, so for $k = 2$. Hence, the first-best decision rule is an equilibrium outcome if

$$\lambda\hat{\pi}\left(X=0\right) \geq p + \mathsf{E}\left[\mu \mid 2\right] + \lambda\hat{\pi}\left(X=1\right) \tag{5}$$

$$\lambda \leq \lambda_c^* = -\frac{p + \mathsf{E}\left[\mu \mid 2\right]}{\hat{\pi}\left(X=1\right) - \hat{\pi}\left(X=0\right)} \tag{6}$$

The right-hand side of (6) is positive, because of our assumption that $k^{FB} = 3$. Thus, for the first-best decision rule to be an equilibrium outcome, reputational concerns should not be too important.

Now suppose that $\lambda > \lambda_c^*$, so that the first-best decision rule is not part of an equilibrium. Can it be an equilibrium for the committee to vote for a rate adjustment with probability one not just if $k = k^{FB} = 3$, but also if $k = 2$? Suppose it can. Then, $X = 1$ would imply that either the private views of all members were the same or the private views of just two members would coincide (and be supportive of a rate change). Similarly, $X = 0$ would result either from the private views of all members being the same or from the views of two members coinciding (and being against a rate change). That is, a rate adjustment would no longer be concomitant to more signal concurrence than maintaining the status quo, and so $\hat{\pi}\left(X=1\right) = \hat{\pi}\left(X=0\right) = \pi$ would hold. That is, the reputational benefits needed to compensate for the cost of distorting the funds rate decision (rate change even for $k = 2 < k^{FB}$) would be absent. The upshot is that if $\lambda > \lambda^*$, an equilibrium in which the committee favours a rate adjustment with probability one in case of $k = 2$ cannot exist. The committee vote will be in mixed strategies. The next proposition characterizes the equilibrium.

Proposition 1 *Suppose a closed decision procedure. Furthermore suppose that* $k^{FB} = 3$. *Let* γ_c^* *satisfy* $\lambda\hat{\pi}\left(X=0,\gamma_c^*\right) = p + \mathsf{E}\left[\mu \mid 2\right] + \lambda\hat{\pi}\left(X=1,\gamma_c^*\right)$. *If* $\lambda \leq \lambda_c^*$, *the committee votes* $v = v^g$ *if* $k = 3$, *and* $v = v^b$ *in case* $k \leq 2$. *If* $\lambda > \lambda_c^*$, *the committee votes* $v = v^g$ *if* $k = 3$; $v = v^g$ *with probability* γ_c^*, *and* $v = v^b$ *with probability* $1 - \gamma_c^*$, *if* $k = 2$; $v(k) = v^b$ *if* $k \leq 1$.

The main message of Proposition 1 is that reputational concerns may distort

the funds rate decision. Since $X = 1$ indicates similarity of signals, it improves the members' reputations. By contrast, $X = 0$ damages members' reputations. Reputational concerns may then induce the committee to favour a rate change too often.

Apart from the effects of reputational concerns on the funds rate decision, the model has another important implication. It is in the committee members' interest to conceal conflicting signals, as divergence of private views would signal lack of competence.

If a statement concerning the decision is made public after the meeting, it will provide a summary of the deliberations, containing non-attributed opinions showing committee-wide support for the decision taken. Schultz, a former Governor and Vice-Chairman of the FOMC states it succinctly: "We should argue in the Board meetings but close ranks in public" (Greider 1988, p. 390).[3]

So far we have assumed that $k^{FB} = 3$. Suppose now that $k^{FB} = 2$. What are the implications for our results? If $k^{FB} = 2$, and the decision on X is made in line with the first-best decision rule, the degree of signal concurrence is the same for either decision. There is therefore no reason to deviate from the first-best decision rule with a view to improving one's reputation. The desire to hide dissenting views about the state of the economy remains. Now suppose that $k^{FB} = 1$, implying that the committee should choose $X = 0$ if and only if all members receive a negative signal.[4] Obviously, in that case $X = 0$ signals that all members have received the same signal. So, reputational concerns may then induce committee members to choose $X = 0$ too often from a social point of view.

4 A Transparent Decision-Making Process

In a fully transparent process, the statements members make during the meeting become public. The main implication of transparency is that the market will not base its beliefs about the committee members' abilities on the funds rate decision anymore. Rather, it will base its beliefs directly on the messages sent. It is an

[3] In the political science literature, this phenomenon is referred to as the norm of consensus, see e.g. Epstein, Segal and Spaeth (2001).

[4] Of course, this requires $p > 0$.

equilibrium for all members to share their information. To see why, note that because all members are smart with a positive probability, the signals are correlated: if $s_i = s^x$, then it is more likely that any other member has received the same signal s^x than the opposite one. It is then best from a reputational perspective to share one's information. Given the transparency, once information has been shared, the committee members can no longer influence the reputation they command by the decision on X. Hence, the committee members have no incentive anymore to deviate from the first-best decision rule. They therefore vote favourably only if $k \geq k^{FB}$. As in case of a closed decision-making process, the voting rule is immaterial.

Proposition 2 *Suppose committee decision-making is transparent. Then, in equilibrium the committee implements the first-best decision rule.*

Proposition 2 suggests that transparency is in the public's interest. It seems to serve the twin goals of improving accountability and policy decisions. However, a caveat is in order. Transparency may hurt the committee members since the public becomes aware of disagreement in the committee. The relevant posteriors for member 1 become

$$\hat{\pi}_1(s_1 = s_2 = s_3) = \frac{1 + 2\pi + \pi^2}{1 + 3\pi^2}\pi > \pi \tag{7}$$

$$\hat{\pi}_1(s_1 = s_2 \neq s_3) = \hat{\pi}_1(s_1 = s_3 \neq s_2) = \pi \tag{8}$$

$$\hat{\pi}_1(s_1 \neq s_2 = s_3) = \frac{1 - \pi}{1 + \pi}\pi < \pi, \tag{9}$$

where we have written the posteriors as functions of the signals, as signals are observed by the public. This shows that the worst situation for member 1 is that he turns out to be an outlier (see 9). Clearly, this gives incentives to committee members to discover ways of concealing disagreements. This is the topic of the next section.

5 An "Open" Decision-Making Process

5.1 The Desire to Organize a Pre-meeting

In this section, we make a distinction between two kinds of committee members. Member $i \in \{1, 2\}$ is called a Governor, and member $i = 3$ is called a President. At zero costs, the Governors can organize a pre-meeting in which they share information and coordinate the statements to be made in the formal meeting. If Governors share information and $s_1 \neq s_2$, they can decide to feign in the formal meeting that both have received s^b or s^g. We assume that Governors stick to what they decide in the pre-meeting discussion. In this way, the Governors can conceal possible disagreement between them. We make this distinction between Governors and President because it seems to be an important feature of the reality at the FOMC to be discussed in the next section. We do not want to describe the distinction as an equilibrium outcome of our model. We would argue that in the present model differences in, say, weights attached to reputation would not be a plausible explanation for the presence of all Governors at the pre-meeting and the absence of all Presidents from it. We think it is more plausible that the determining factor is the concentration of Governors in Washington, and the Presidents' dispersion across the USA.

If the public thinks the decision-making process is transparent, then the ex post reputations are given by (7)-(9). Then, deviating from a transparent decision-making process by organizing a pre-meeting never hurts a Governor's expected reputation, and it may actually improve. If $s_1 = s_2$, organizing a pre-meeting does not hurt a Governor's reputation; if $s_1 \neq s_2$, organizing a pre-meeting improves the expected reputation. Of course, if their privately held views coincide, they will jointly report that view in the formal meeting. What to report, however, in case of conflicting opinions? Given (7)-(9), from a reputational perspective, the Governors are indifferent between jointly favouring a rate change and jointly favouring the status quo in the public meeting.[5] Suppose that $k^{FB} = 3$. Then a conflict of opinion among Governors is sufficient evidence that it would be best not to change the funds rate, irrespective of the President's information. Therefore, in case of $s_1 \neq s_2$, Governors will jointly favour the status quo in the formal meeting. Let m_{12}^x denote that the

[5] This is so because $\Pr\left(s_3^g | s_1 \neq s_2\right) = \Pr\left(s_3^b | s_1 \neq s_2\right) = \frac{1}{2}$.

Governors state m^x, $x \in \{g, b\}$ in the formal meeting.

Proposition 3 *Suppose a transparent decision-making process, and* $k^{FB} = 3$. *The Governors have an incentive to organize a pre-meeting in which they share their information and tune their messages,* $m_{12} = m_{12}^b$ *in case of* $s_1 \neq s_2$.

What if instead $k^{FB} = 2$? A conflict of opinion between Governors is insufficient evidence for a decision on the interest rate. The President's information is decisive. However, for given voting behaviour in the transparent meeting, if the Governors tune their messages in the pre-meeting, the decision on X is actually made by the Governors. The President does not play a role anymore. As a result, when $k^{FB} = 2$ the cost of organizing a pre-meeting is that the President's signal is not utilized. For instance, suppose that the Governors decide to organize a pre-meeting and to state m_{12}^g if $s_1 \neq s_2$. Then, in case $s_1 \neq s_2$, and $s_3 = s^b$, the funds rate is adjusted, although an adjustment yields a negative payoff, $p + \mathsf{E}[\mu|1] < p < 0$. Likewise, when the Governors decide to organize a pre-meeting and to state m_{12}^b if $s_1 \neq s_2$, then in case $s_1 \neq s_2$, and $s_3 = s^g$, the status quo is maintained while the funds rate should be adjusted, $p + \mathsf{E}[\mu|2] > 0$. Thus, a pre-meeting gives rise to a distortion. As the reputational gains are the same, but the costs of stating m_{12}^b are smaller than those of m_{12}^g ($|p + \mathsf{E}[\mu|2]| < |p + \mathsf{E}[\mu|1]|$), the Governors are more tempted to support the status quo in the formal meeting.

Proposition 4 *Suppose a transparent decision-making process, and* $k^{FB} = 2$. *Define*

$$\lambda_T := \frac{p + \mathsf{E}[\mu|2]}{\hat{\pi}_1(s_1 = s_2 = s_3) - \hat{\pi}_1(s_1 \neq s_2 = s_3)} \tag{10}$$

If $\lambda \leq \lambda_T$, *the Governors have no incentive to organize a pre-meeting. If* $\lambda > \lambda_T$, *they do have such an incentive. Then,* $m_{12} = m_{12}^b$ *in case of* $s_1 \neq s_2$.

The main result of this sub-section is that, in general, Governors have an incentive to gather before the formal meeting to avoid the embarrassment of dissensus becoming public. The only reason they do not enter a pre-meeting discussion in case of $\lambda < \lambda_T$ and $k^{FB} = 2$ is the absence of the President. Of course, had the President been able to join, Governors and President would have met before the formal meeting.

5.2 Behaviour in an "open" decision-making process

Now suppose that the Governors have organized a pre-meeting in which they share information. What does behaviour in the pre-meeting and subsequently in the formal meeting look like? It will be useful to discuss the case where $k^{FB} = 3$ first.

5.2.1 $k^{FB} = 3$

Let k_m be the number of messages m^g in the formal meeting. Let $m_3 = m_3^x$, $x \in \{g, b\}$, denote the President's statement in the formal meeting. Can the following strategies be part of an equilibrium? In the pre-meeting, Governors decide to state in the formal meeting m_{12}^x if $s_1 = s_2 = s^x$, and m_{12}^b if $s_1 \neq s_2$. The President shares his information in the official meeting, $m_3 = m_3^x$ if $s_3 = s^x$. Voting strategies coincide, and the voting rule is immaterial. The committee votes $v = v^g$ if $k_m = 3$, and $v = v^b$ otherwise. To show that this can be an equilibrium, we first derive the posterior beliefs corresponding to these strategies:

$$\hat{\pi}_1\left(m_{12}^g, m_3^g\right) = \frac{1 + 2\pi + \pi^2}{1 + 3\pi^2}\pi > \pi \tag{11}$$

$$\hat{\pi}_1\left(m_{12}^g, m_3^b\right) = \pi \tag{12}$$

$$\hat{\pi}_1\left(m_{12}^b, m_3^g\right) = \frac{3 + \pi}{3 + 3\pi}\pi < \pi \tag{13}$$

$$\hat{\pi}_1\left(m_{12}^b, m_3^b\right) = \frac{3 + \pi^2}{3 + 3\pi^2 - 2\pi^3}\pi < \pi \tag{14}$$

From these posterior believes it immediately follows that m_{12}^g is better for member 1's expected reputation than m_{12}^b. Of course, the reason is that the market takes into account that in case of conflicting signals, both Governors express negative opinions in the formal meeting. Accordingly, m_{12}^g indicates agreement in privately held views. The Governors may therefore be tempted to state m_{12}^g in case of conflicting signals. In the event that $s_3 = s_3^g$, this would lead to a distorted decision on the funds rate. They can resist the temptation, and state m_{12}^b rather than m_{12}^g in case of $s_1 \neq s_2$,

if[6]

$$\begin{aligned} & \frac{1}{2}\lambda[\hat{\pi}_1\left(m_{12}^b, m_3^g\right) + \hat{\pi}_1\left(m_{12}^b, m_3^b\right)] \\ \geq \quad & \frac{1}{2}(p + \mathsf{E}\left[\mu \mid 2\right]) + \frac{1}{2}\lambda[\hat{\pi}_1\left(m_{12}^g, m_3^g\right) + \hat{\pi}_1\left(m_{12}^g, m_3^b\right)] \end{aligned} \tag{15}$$

implying

$$\lambda \leq \lambda_{pm}^* = -\frac{p + \mathsf{E}\left[\mu \mid 2\right]}{\hat{\pi}_1\left(m_{12}^g, m_3^g\right) + \hat{\pi}_1\left(m_{12}^g, m_3^b\right) - \left(\hat{\pi}_1\left(m_{12}^b, m_3^g\right) + \hat{\pi}_1\left(m_{12}^b, m_3^b\right)\right)} \tag{16}$$

If $\lambda \leq \lambda_{pm}^*$, then the governors are not willing to distort the rate decision in order to improve their reputations.

Given the imputed equilibrium behaviour, the voting strategy of the committee is optimal. Once the statements have been made in the formal meeting, the reputations are fixed. The voting strategy then maximizes the project value given the statements made.

Finally, we show that the President shares his information. In the imputed equilibrium the ex ante expected reputation of a President, conditional on a signal $s_3 = s^x$, equals π. This is so because a signal in isolation contains no information about the President's competence. That is,

$$\Pr\left(m_{12}^g | s_3^g\right)\hat{\pi}_3\left(m_{12}^g, m_3^g\right) + \Pr\left(m_{12}^b | s_3^g\right)\hat{\pi}_3\left(m_{12}^b, m_3^g\right) = \pi \tag{17}$$

$$\Pr\left(m_{12}^b | s_3^b\right)\hat{\pi}_3\left(m_{12}^b, m_3^b\right) + \Pr\left(m_{12}^g | s_3^b\right)\hat{\pi}_3\left(m_{12}^g, m_3^b\right) = \pi \tag{18}$$

Here, $\hat{\pi}_3\left(m_{12}^g, m_3^g\right) > \pi > \hat{\pi}_3\left(m_{12}^b, m_3^g\right)$, and $\hat{\pi}_3\left(m_{12}^b, m_3^b\right) > \pi > \hat{\pi}_3\left(m_{12}^g, m_3^b\right)$ as concurrence in statements given in the formal meeting is a stronger sign of competence than differences in publicly stated opinions. Now suppose the President were to overstate the merits of the rate change, by stating m_3^g if s_3^b. This would decrease the likelihood attached to the higher reputation in (17), and increase the likelihood attached to the lower reputation in (17). The result would be an expected reputation smaller than π. The President, then, wants to honestly report s_3^b. A similar type of reasoning shows that the President does not want to understate s_3^g by claiming m_3^b.

Now suppose $\lambda > \lambda_{pm}^*$. Assume voting strategies are as before. Because $\lambda > \lambda_{pm}^*$,

[6]Note that $\Pr\left(s_3^g | s_1 \neq s_2\right) = 1/2$.

the Governors are now willing to distort the rate change decision to strengthen their expected reputation. However, stating m_{12}^g with probability one in case of $s_1 \neq s_2$ cannot be part of an equilibrium. If the Governors were to do this, m_{12}^b would indicate concurrence of signals, and would therefore boost the Governors' reputations. Instead of an equilibrium in pure strategies, an equilibrium in mixed strategies exists. Let $\gamma_{pm} = \Pr(m_{12} = m_{12}^g | s_1 \neq s_2)$ denote the probability that the Governors express positive statements in case of conflicting opinions. In such an equilibrium, given posterior beliefs and $s_1 \neq s_2$, the Governors are indifferent between stating m_{12}^b and stating m_{12}^g. That is, γ_{pm}^* satisfies

$$\begin{aligned} & \frac{1}{2}\lambda[\hat{\pi}_1\left(m_{12}^b, m_3^g; \gamma_{pm}^*\right) + \hat{\pi}_1\left(m_{12}^b, m_3^b; \gamma_{pm}^*\right)] \\ = \; & \frac{1}{2}\left(p + \mathsf{E}\left[\mu \mid 2\right] + \lambda\hat{\pi}_1\left(m_{12}^g, m_3^g; \gamma_{pm}^*\right)\right) + \frac{1}{2}\lambda\hat{\pi}_1\left(m_{12}^g, m_3^b; \gamma_{pm}^*\right) \end{aligned} \tag{19}$$

We have $0 < \gamma_{pm}^* < \frac{1}{2}$, as a rate change should remain the decision commanding the higher reputation to compensate for the distortion.

What has to be checked is whether the assumed voting strategies are best replies. In particular, what should be checked is that if m_{12}^g and m_3^g, the President is willing to vote favourably. It is optimal for the Governors to vote favourably if and only if $k_m = 3$. For the behaviour of the President, the voting rule matters. If a majority is sufficient for a rate change, the voting behaviour of the President is immaterial. If instead unanimity is required, the President should also cast a favourable vote for the rate change to take place. Once statements have been made in the formal meeting, reputations are set. The President will cast a favourable vote if and only if

$$p + \mathsf{E}\left[\mu | m_{12}^g, m_3^g; \gamma_{pm}^*\right] > 0, \tag{20}$$

where we have added γ_{pm}^* to indicate that the expected value depends on the statement strategy of the Governors. Notice that this restriction is stronger than Assumption 1.

Finally, the analysis showing that the President shares his private information in the formal meeting in case of $\lambda \leq \lambda_{pm}^*$ carries over to the $\lambda > \lambda_{pm}^*$ case. The above discussion leads to the following proposition.

Proposition 5 *Suppose* $k^{FB} = 3$.

(a) If $\lambda \leq \lambda^*_{pm}$, Governors share their information in the pre-meeting. (i) If $s_1 = s_2 = s^x$, then $m_{12} = m^x_{12}$, and if $s_1 \neq s_2$, then $m_{12} = m^b_{12}$; (ii) If $s_3 = s^x$, then $m_3 = m^x_3$, for $x \in \{g, b\}$; (iii) The voting rule is immaterial. If $k_m = 3$, then $v = v^g$; and $v = v^b$ otherwise.
(b) If $\lambda > \lambda^*_{pm}$, and (20) holds, the voting rule is immaterial. If (20) does not hold, suppose the voting rule equals majority. Governors share their information in the pre-meeting. (i) If $s_1 = s_2 = s^x$, then $m_{12} = m^x_{12}$, if $s_1 \neq s_2$, then $m_{12} = m^g_{12}$ with probability γ^*_{pm}, and $m_{12} = m^b_{12}$ with probability $1 - \gamma^*_{pm}$, with γ^*_{pm} satisfying (19); (ii) If $s_3 = s^x$, then $m_3 = m^x_3$ for $x \in \{g, b\}$; (iii) If $k_m = 3$, then $v = v^g$, and $v = v^b$ otherwise, for $i \in \{1, 2, 3\}$.
(c) If $\lambda > \lambda^*_{pm}$, and (20) does not hold, and the voting rule is unanimity, the status quo will always be maintained.

Proposition 5 states that if reputational concerns are sufficiently strong, the funds rate decision deviates from the first-best decision. In case of majority voting, the result will be too frequent an adjustment of the funds rate. If instead unanimity is required, the nature of the distortion depends on whether the President is convinced by the arguments put forth by the Governors in the public meeting. If he is, and he holds a favourable view himself, the committee favours a rate change too often. If he is not, no rate change takes place at all.

5.2.2 $k^{FB} = 2$

To derive behaviour in the open decision-making process if $k^{FB} = 2$, attention can be limited to the case where $\lambda > \lambda_T$ (see Proposition 4). We showed that Governors want to gather before the formal meeting and favour the status quo in the formal meeting in case of conflicting opinions as this causes the smallest distortion. However, with a rate change commanding a higher expected reputation, the temptation is again to favour a rate change in case of conflicting opinions. For $\lambda \leq \lambda^{**}_{pm}$, the Governors can resist this temptation, where

$$\lambda^{**}_{pm} := -\frac{2p}{\hat{\pi}_1\left(m^g_{12}, m^g_3\right) + \hat{\pi}_1\left(m^g_{12}, m^b_3\right) - \left(\hat{\pi}_1\left(m^b_{12}, m^g_3\right) + \hat{\pi}_1\left(m^b_{12}, m^b_3\right)\right)}.$$

and with posterior reputations defined in (11)-(14). For $\lambda > \lambda^{**}_{pm}$, Governors will follow a mixed strategy in case of conflicting opinions. The voting rule determines

whether they can have their way in the formal meeting, or should be able to convince the President of the quality of their joint assessment. Let γ_{pm}^{**} satisfy

$$\begin{aligned} & \lambda\hat{\pi}_1\left(m_{12}^b, m_3^g; \gamma_{pm}^{**}\right) + \lambda\hat{\pi}_1\left(m_{12}^b, m_3^b; \gamma_{pm}^{**}\right) \\ = \; & 2p + \lambda\hat{\pi}_1\left(m_{12}^g, m_3^g; \gamma_{pm}^{**}\right) + \lambda\hat{\pi}_1\left(m_{12}^g, m_3^b; \gamma_{pm}^{**}\right) \end{aligned} \tag{21}$$

As before, $\gamma_{pm}^{**} < \frac{1}{2}$.

Proposition 6 *Suppose $k^{FB} = 2$.*
(a) Suppose $\lambda \in (\lambda_T, \lambda_{pm}^{**}]$. Governors share information in the pre-meeting. (i) If $s_1 = s_2 = s^x$, then $m_{12} = m_{12}^x$, and if $s_1 \neq s_2$, then $m_{12} = m_{12}^b$; (ii) If $s_3 = s^x$, then $m_3 = m_3^x$, for $x \in \{g, b\}$; (iii) The voting rule is immaterial. If $k_m \geq 2$, then $v = v^g$; and $v = v^b$ otherwise.
(b) Suppose $\lambda > \lambda_{pm}^{**}$ and majority rule. Governors share information in the pre-meeting. (i) If $s_1 = s_2 = s^x$, then $m_{12} = m_{12}^x$, and if $s_1 \neq s_2$, then $m_{12} = m_{12}^g$ with probability γ_{pm}^{**}, and $m_{12} = m_{12}^b$ with probability $\left(1 - \gamma_{pm}^{**}\right)$, with γ_{pm}^{**} satisfying (21); (ii) If $s_3 = s^x$, then $m_3 = m_3^x$, for $x \in \{g, b\}$; (iii) For $i \in \{1, 2\}$, $v_i = v^g$ if and only $k_m \geq 2$; v_3 is immaterial.
(c) Suppose $\lambda > \lambda_{pm}^{**}$ and unanimity. Behaviour is as described under (b), except for the President's voting strategy: $v_3 = v^g$ in the following cases (i) (m_{12}^g, m_3^g); (ii) $\left(m_{12}^g, m_3^b\right)$ and $p + \mathsf{E}\left[\mu | m_{12}^g, m_3^b; \gamma\right] \geq 0$; (iii) $\left(m_{12}^b, m_3^g\right)$ and $p + \mathsf{E}\left[\mu | m_{12}^b, m_3^g; \gamma\right] \geq 0$; otherwise $v_3 = v^b$.

As in the case of $k^{FB} = 3$, the more Governors care about their reputations, the more often a distortion in the direction of a rate change occurs. With $k^{FB} = 2$, the higher is λ, the more often a distorted rate change results in case of $(s_1, s_2, s_3) \in \left\{\left(s^g, s^b, s^b\right), \left(s^b, s^g, s^b\right)\right\}$. This is due to the fact that a rate change commands a higher reputation than maintaining the status quo. There is a second distortion that is not operative in case of $k^{FB} = 3$. It stems from the fact that conflicting opinions among Governors is no longer indicative as to right rate decision in case of $k^{FB} = 2$. However, reputational concerns induce them to jointly favour the status quo. This causes the committee to stick to the status quo too often. That is, if $(s_1, s_2, s_3) \in \left\{\left(s^g, s^b, s^g\right), \left(s^b, s^g, s^g\right)\right\}$, the rate is not changed at all (under (a)), or only with a probability γ_{pm}^{**} (under (b) and (c)).

6 Does Transparency Achieve the Intended Goals?

As argued in the introduction, the demand for transparency may arise for at least two reasons. First, transparency is a necessary condition to hold decision-makers responsible for the decisions they take. Hence, any information that becomes available thanks to requiring deliberations to take place in public and that allows one to better evaluate the quality of individual decision-makers should be valued. Secondly, transparency is viewed as a means to take away the suspicion that secrecy induces decision-makers to improve their own lot at the cost of the public's. We now consider either claim in turn.

Does requiring transparency improve accountability if decisions are made by a group? We have argued that the pressure to become transparent gives rise to pre-meeting discussions. If all members participate, the complete discussion that takes place in a closed meeting moves to the pre-meeting. The transcript of the formal meeting merely shows full support for the decision reached in the pre-meeting. Accountability is not improved. If, however, only Governors participate in the pre-meeting, transparency does allow one to learn more about the debate taking place between Governors on the one hand, and the President on the other before a decision is reached. As a result, it improves the market's view of the quality of decision-makers: the number of information sets on which these views can be based increases. Note that transparency does not lead to pre-meetings in case $k^{FB} = 2$ and reputational concerns are small. In this case, transparency allows for full accountability.

Does transparency lead to less distorted policies? A number of considerations plays a role. For $k^{FB} = 2$, the quality of decision-making either stays the same or goes down. In a closed decision-making process the rate change is not distorted as either decision commands the same reputation. For values of $\lambda \leq \lambda^{**}_{pm}$, transparency requirements do not give rise to a pre-meeting, and therefore no policy distortions arise. For $\lambda > \lambda^{**}_{pm}$, a pre-meeting does take place, and distortions are inevitable. In case of unanimity, it may actually induce the President to vote for status quo no matter what.

If instead $k^{FB} = 3$, a comparison is more complex as now the decision on the rate change can be distorted in either decision-making process. Both the threshold value of λ that determines whether committee members distort and the number of

signal sets for which the distortion occurs vary with the decision-making process. First, the incidence of the distortion. The rate change decision is distorted for more signal sets in a closed meeting than in an "open" meeting. In a closed meeting, the decision is distorted if two out of three signals are positive. In an open meeting, an additional condition should hold: one of the two positive signals should be held by the President. For example, suppose $s_1 = s_2 = s^g$ and $s_3 = s^b$, and assume that λ is sufficiently high to lead to distorted decisions. Then, in a closed meeting, the members implement the rate change with probability γ. A distorted decision results as $k = 2 < k^{FB} = 3$. In an open decision-making process, however, the President's negative statement in the official meeting leads the committee to maintain the status quo.

Now consider the threshold value that determines whether the decision is distorted. A comparison of (6) and (16) shows that their numerators have the same value, but that the value of the denominator in (6) is smaller than the value of the denominator in (16). As a result, $\lambda_c^* > \lambda_{pm}^{**}$, meaning that Governors in a pre-meeting distort the decision for lower values of λ than when the three committee members operate in a closed decision-making process. The reason is that the reputational gains compared to the costs of distorting the rate change decision are larger in case of an open decision-making process than in a closed process. It also follows that, for given parameter values, $\gamma_{pm}^* > \gamma_c^*$. This means that if the signal sets are such that committee members consider distorting the rate decision, they do so more frequently in a pre-meeting than in a closed decision-making process.

For $k^{FB} = 3$, then, there are two opposing forces that determine under which decision-making process the decision is distorted most: the number of signal sets is larger in case of a closed decision-making process than in an open process, but the likelihood with which the rate change is distorted for a given information set is smaller. For values of λ such that $\gamma_{pm}^* > \gamma_c^* \approx 0$, the fact that in closed decision-making process the number of signal sets for which the decision is distorted is higher than in an open decision-making is less of a concern. So for relatively low values of λ, a closed decision-making process gives rise to less costly distortions than an open decision-making process. For higher values of λ, the reverse holds. Now $\gamma_c^* > 0$, and as a consequence the fact that members consider distorting the decision for more signal sets under a closed decision-making process than under an open decision-

making process makes the former process perform worse than the latter.

7 The FOMC: A Case Study

Our models generate at least two main predictions. First, reputational concerns give incentives to committee members to conceal disagreements. Second, making the debate in meetings more open prompts committee members to organize pre-meetings. As a consequence, deliberation takes place in informal pre-meetings rather than in formal meetings. In this section, we examine to what extent the behavior of members in the FOMC fits our two predictions for the 1989-1997 period.

At the outset, we would like to emphasize that the FOMC case deviates from our theoretical models in at least two important respects. First, in our model the committee members are equal. In the FOMC, however, the Chairman is by far and large the most important member.[7] The dominance of Greenspan, for example, was so strong that it was sometimes difficult to distinguish between the FOMC and Greenspan.[8] In our opinion, this does not mean that reputational concerns have not played a role under Greenspan. Below, we present anecdotal evidence that it was Greenspan who strongly pressed for unanimity and consensus. Moreover, it was Greenspan who often took the initiative for one-to-one pre-meetings. One possible interpretation of all this is that Greenspan wants "his FOMC" to be considered an outstanding committee. Second, as mentioned in the introduction, in 1993, the FOMC decided to release verbatim transcripts of its meetings with a five year delay. Clearly, this is only a small step towards opening the deliberation stage in the FOMC meetings. In our theoretical models, however, the deliberation stage in the formal meeting is either closed or open. It is therefore quite likely that our theoretical analysis overestimates the consequences of the regime shift in 1993.

Anecdotal Evidence

Recently, two books by former Fed Governors have been published. Blinder (2004)

[7] Chappel, McGregor and Vermilyea (2005) assess that under Arthur Burns, the opinion of the Chairman counted as much as the opinions of the other FOMC members together.

[8] Blinder (2005, p. 11) mentions the Greenspan Fed as an example for a situation where it is hard to tell whether a given central bank uses group or individual decisionmaking.

wrote a book on how central banking has changed over the past 15 years.[9] Meyer (2004) wrote a book in which he provides an insider's view of the Fed. Both books contain much information relevant for an evaluation of our two main predictions.

Do FOMC members conceal disagreements? Blinder (2004, p. 26) calls the FOMC "collegial". In such a committee, he argues, "individual members are expected to fall in line behind the group's decision". The Chairman plays an important role in building a consensus: "... the desire to maintain the *appearance* of unity will sometimes force even a dominant chairman to tack in either the hawkish or dovish direction in order to keep wavering committee members on board" (Blinder, 2005, p. 58-59, italics in original). Meyer (2004, p. 52), who never dissented during his term as a Governor, also mentions a norm of conforming to the majority: "Once the majority view (...) is apparent at FOMC meetings, the Committee is expected to rally around it".

Has transparency led to pre-meetings in the FOMC case? A hint to the answer to this question is Greenspan's response to the pressure from Congress that the FOMC should become more transparent. He argued that in a meeting "members need to feel free to trade ideas, question assumptions, advance hypotheses, make projections, speculate on alternative policies and possible outcomes, and especially to change their views in response to the arguments of others". He felt that such would no longer be possible if Congress had its way. He conjectured that the request of Congress would induce an important change: "[a] tendency would arise for one-on-one pre-meeting discussions, with public meetings merely announcing already agreed-upon positions or each participant to enter the meeting with a final position not subject to the views of others" (Greenspan, as quoted in Meade and Stasavage 2004, pp. 18-19).

Did the pre-meetings actually take place? Meyer (2004, p. 50) leaves no doubt that they did: "To ensure that he (Greenspan) has the votes to support his policy recommendation, the Chairman visits with the members of the Board in advance of FOMC meetings". The nature of the pre-meetings has changed over time: "After a while, the Chairman abandoned the private talks before the FOMC meetings and instead used the Monday Board meeting (the day before the FOMC meeting)

[9] We also draw on Blinder (2005).

to share with us his views on the outlook and indicate where he was leaning with respect to policy. Unlike the FOMC meeting the next day, the discussions at the Monday Board meeting did not consist of prepackaged presentations. They were a much truer give-and-take, a serious exchange of ideas, with each of us questioning one another along the way". In his book, Blinder does not explicitly write about pre-meetings. However, his remark about the statement that accompanies a monetary policy decision is enlightening: "Toward the end of Greenspan's chairmanship, candidate drafts of the statement were vetted by FOMC members prior to the meeting" (Blinder, 2005, footnote 19). Finally, it is worth mentioning that "Reserve Bank Presidents are not part of the pre-meeting discussions at the Board (Meyer, 2004, p. 51).

All in all, there exists anecdotal evidence suggesting that (i) there was a tendency to conformism in the FOMC; (ii) during Meyer's term as a Governor (1996-2002) pre-meetings were held; (iii) in both (i) and (ii), the Chairman played an essential role.

Data on Vote Dissents and Voice Dissents

Let us now examine whether our predictions are consistent with the dataset composed by Ellen Meade (2005). This set contains codes of voiced policy preferences and formal votes of individual FOMC members, drawn from the transcripts and voting records of the 72 FOMC meetings during the period 1989-1997.[10] Following Meade and Stasavage (2004), to examine the effects of the regime shift in 1993, we consider two sub-periods, one before 1993 and the other after 1993.[11] The dataset thus covers four years (1989-1992, 32 meetings, see Table 1) in which members were under the (wrong) impression that their deliberations were secret and four years (1994-1997, 32 meetings) in which they realized that their remarks would be made public in the course of time.

Do we observe in this dataset a tendency to conceal disagreement? Table 1 reports 48 vote dissents in 64 meetings.[12] This seems to be a small number. More

[10]The data file is on http://research.stlouisfed.org/publications/review/past/2005/. See Meade (2005) for a description.

[11]The observations for 1993 are excluded, because it is hard to determine whether members then knew that the debate in the FOMC would become public.

[12]Henry Chappell et al. (2005, p. 11) report that just 7.8 percent of all votes during the 1966-1996 period were dissenting.

importantly, the number of voice dissenting opinions is higher (75). Thus, when members of the FOMC verbally dissent from the Chariman's proposal, sometimes they do not subsequently dissent in the official vote. This may indicate that committee members indeed conceal disagreements.

Does the regime shift in 1993 change the nature of the debate in the FOMC meetings as predicted by our model? Table 1 shows that while dissenting views in the policy go-around were already infrequent before 1993 (48 on a total of 325 opinions), they became very rare in later years. This is especially true for the Governors of the Board, who almost always presented a united front with the Chairman after 1993. There was also a sharp decrease in the number of members – again, Governors in particular – that voiced dissent but supported the Chairman's funds rate proposal when it came to voting (reported as "Inconsistent voice dissents" in Table 1). So, we see a convergence of speech and voting behaviour after 1993. This observation is in line with the anecdotal evidence that after 1993 pre-meetings were held in which Board members participate.

TABLE 1

Characteristics of FOMC meetings over 1989-1992 and 1994-1997[1]

Number of:	**1989-1992**	**1994-1997**	**% change**
Meetings	32	32	0
Number of voice and votes	325	320	-2
Vote dissents	35	13	-63
of which Governors	16	2	-88
Voice dissents	48	27	-44
of which Governors	*17*	*5*	*-71*
Inconsistent voice dissents[2]	27	16	-41
of which Governors	*9*	*3*	*-67*
Meetings having three or more voice dissents	9	4	-56
Meetings having three or more vote dissents	4	0	-100

[1] Numbers of dissents refer to voting members only. Chappell et al. (2005, p. 111) find that "...nonvoting alternates have no appreciable influence over policy outcomes".
[2] Members who voiced dissent but formally voted in favour of the Chairman's interest rate proposal.

Possible Caveats

The above findings are clearly consistent with our theory. We should make sure,

however, that the differences in voice and vote dissents between the two sub-periods were not due to differences in the state of the economy. More specifically, the decline in voice and vote dissents through the years may simply reflect that monetary policy was less complicated, less controversial or less special after 1993 than before. This does not seem to be the case, though. First of all, the funds rate was altered twice as much after 1993 than before (see Table 2). Perhaps more importantly, the first sub-period was one of monetary easing, whereas the second sub-period had seven rate increases, some of which fell on stony ground with the Clinton administration.[13]

Table 2 Characteristics of monetary policy over 1989-1992 and 1994-1997

Number of:	**1989-1992**	**1994-1997**	**% change**
Changes in funds rate	5	10	100
of which increases	*0*	*7*	-
Policy directive not in line with previous bias	5	8	60
Outliers vis-à-vis range of Taylor rules:[1]			
- various measures of inflation	2	3	50
- various measures of the output gap	7	12	71

[1] Figures refer to the number of quarters in which the funds rate was outside a range of various Taylor rules over the respective periods.

A somewhat more sophisticated way of looking at the issue is to examine for each FOMC meeting whether the decision on rate and bias was in line with the bias adopted at the previous meeting.[14] If not, we regard the economic conditions at the time of the current meeting as special. This is either a meeting at which an asymmetric bias adopted at the previous meeting was discontinued without a rate change, or a meeting at which a rate change was not preceded by an asymmetric bias. There were eight such meetings in the second sub-period and just five in the first (see second row of Table 2). So, also from this perspective, there is no reason to assume that monetary policy has become less complicated after 1993.

As a final test, we have examined in how many quarters the funds rate differed from what a Taylor rule would prescribe. A Taylor rule explains Fed behaviour (i.e., the funds rate) from combinations of observed values of inflation and the output gap.[15] Former Fed-economist Sharon Kozicki (1999) considers a number of Taylor

[13] See, e.g., Woodward (2000, pp. 122-123).

[14] The bias prepares financial markets for possible future changes in the funds rate.

[15] See John Taylor (1993). Although it is somewhat controversial as a beacon for monetary policy

rules, each based on different definitions of inflation and the output gap. In Table 2 we report how often the funds rate fell outside the range of rule recommendations one obtains by varying these definitions. Monetary policy could be called complicated or special if actual fund rates fall outside this range. Again, it turns out that monetary policy was not more special before 1993 than after.

The above leads to the conclusion that monetary policy was likely to be more complicated after 1993 than before 1993. Therefore, the decrease in the number of voice dissents in FOMC meetings cannot easily be explained by a change in the economic environment.

8 Conclusion

In this paper we have analyzed the effects of having a committee deliberate in public or in private. An important feature of our analysis is that committee members are concerned with the public's perception of their decision-making abilities. We have shown that (1) reputational concerns give incentives to conceal disagreements; (2) in a closed decision-making process, committee members may distort decisions in an attempt to boost their reputations; (3) transparency may shift debate from the formal meeting to closed, informal meetings; (4) if transparency indeed shifts discussions, it does not increase welfare; (5) the predictions of our model are consistent with data and anecdotal evidence on the behavior of members of the FOMC in the years before and after the FOMC became more open in 1993.

Although we have applied our model to monetary policy, we believe its scope is much wider. In the introduction we have already mentioned politics. These days, transparency is especially an important theme in discussions about European political institutions. Stasavage (2005a) has looked at the effects of attempts to make the European Council of Ministers more transparent. His findings are in line with some of our theoretical results. For example, he observes a tendency to presenting a united front in the European Council of Ministers despite internal divisions. In addition, he argues how the Council has used subsidiary committees in order to prevent disagreements from becoming public. This finding is in the spirit of our

among central bankers, Meyer (2004) finds it "... a useful set of guidelines for making monetary policy" (p. 44).

analysis. The warning for backroom discussions or for deals to be done over lunch when European institutions are required to become more transparent is fully in line with our findings.

9 Appendix

Proof of proposition 4: The benefits and costs of deviating from a transparent decision-making process are exclusively determined by the Governors' actions in case of conflicting signals, $s_1 \neq s_2$. Assume $s_1 = s^g$ and consider Governor 1. This is without loss of generality. In a transparent process, his expected payoff equals

$$\begin{aligned}&\Pr\left(s_3^g|s_1 \neq s_2\right)\left(p + \mathsf{E}\left[\mu|2\right] + \lambda\hat{\pi}_1\left(s_1 = s_3 \neq s_2\right)\right) + \\ &\Pr\left(s_3^b|s_1 \neq s_2\right)\left(0 + \lambda\hat{\pi}_1\left(s_1 \neq s_2 = s_3\right)\right)\end{aligned}$$

The payoff in the pre-meeting depends on the way the Governors tune signals. First suppose that $m_{12} = m_{12}^g$ in case of $s_1 \neq s_2$. Then, deviating from a transparent process yields Governor 1

$$\begin{aligned}&\Pr\left(s_3^g|s_1 \neq s_2\right)\left(p + \mathsf{E}\left[\mu|2\right] + \lambda\hat{\pi}_1\left(s_1 = s_2 = s_3\right)\right) + \\ &\Pr\left(s_3^b|s_1 \neq s_2\right)\left(p + \mathsf{E}\left[\mu|1\right] + \lambda\hat{\pi}_1\left(s_1 = s_2 \neq s_3\right)\right)\end{aligned}$$

It then follows that a Governor does not want to deviate from a transparent process for $\lambda \leq \lambda_t := -\frac{p+\mathsf{E}[\mu|1]}{\hat{\pi}_1(s_1=s_2=s_3)-\hat{\pi}_1(s_1\neq s_2=s_3)}$. If instead $m_{12} = m_{12}^b$ in case of $s_1 \neq s_2$, then deviating yields Governor 1

$$\begin{aligned}&\Pr\left(s_3^g|s_1 \neq s_2\right)\left(0 + \lambda\hat{\pi}_1\left(s_1 = s_2 \neq s_3\right)\right) + \\ &\Pr\left(s_3^b|s_1 \neq s_2\right)\left(0 + \lambda\hat{\pi}_1\left(s_1 = s_2 = s_3\right)\right)\end{aligned}$$

A Governor does not want to deviate if $\lambda \leq \lambda_T := \frac{p+\mathsf{E}[\mu|2]}{\hat{\pi}_1(s_1=s_2=s_3)-\hat{\pi}_1(s_1\neq s_2=s_3)}$. Because $|p + \mathsf{E}\left[\mu|2\right]| < |p + \mathsf{E}\left[\mu|1\right]|$ (as $\mathsf{E}\left[\mu|1\right] = -\mathsf{E}\left[\mu|2\right] < 0$), $\lambda_T < \lambda_t$, it follows that the Governors want to deviate from a transparent process if $\lambda > \lambda_T$.

Proof of Proposition 6: The proof is analogous to the proof of Proposition 5 given in the text. We will (i) show the relevance of λ_{pm}^{**}; (ii) argue that $\lambda_T > \lambda_{pm}^{**}$

may hold; and (iii) show the relevance of the conditions in (c).

(i) Suppose that behaviour is as described under Proposition 6 (a). Suppose $s_1 \neq s_2$. The Governors prefer m_{12}^b rather than m_{12}^g if

$$\begin{aligned} & \Pr\left(s_3^g | s_1 \neq s_2\right)\left[0 + \lambda\hat{\pi}_1\left(m_{12}^b, m_3^g\right)\right] + \Pr\left(s_3^b | s_1 \neq s_2\right)\left[0 + \lambda\hat{\pi}_1\left(m_{12}^b, m_3^b\right)\right] \\ \geq & \Pr\left(s_3^g | s_1 \neq s_2\right)\left[p + \mathsf{E}\left[\mu|2\right] + \lambda\hat{\pi}_1\left(m_{12}^g, m_3^g\right)\right] \\ & + \Pr\left(s_3^b | s_1 \neq s_2\right)\left[p + \mathsf{E}\left[\mu|1\right] + \lambda\hat{\pi}_1\left(m_{12}^g, m_3^b\right)\right] \end{aligned}$$

As $\mathsf{E}\left[\mu|1\right] = -\mathsf{E}\left[\mu|2\right] < 0$, this inequality reduces to $\lambda \leq \lambda_{pm}^{**}$.

(ii) For the equilibrium discussed in (a) to exist, $\lambda_T > \lambda_{pm}^{**}$ must hold. It can readily be checked that the denominator of λ_T is larger than the denominator of λ_{pm}^{**}. This inequality may hold as the numerator of λ_T may be smaller or bigger than than the numerator of λ_{pm}^{**}.

(iii) The President votes favourably in case of (i), (m_{12}^g, m_3^g), because the number of positive signals is at least two. In the remaining two cases, he has to weigh the possibilities that two signals are positive and that only one is.

10 References

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

Blinder, Alan, 2004, The Quiet Revolution. Central Banking goes Modern, New Haven, Yale University Press.

Blinder, Alan, 2005, Monetary Policy by Committee: Why and How?, mimeo, Princeton Univeristy.

Chappell, Jr, Henry W., Rob Roy McGregor and Todd Vermilyea, 2005, Committee Decisions on Monetary Policy. Evidence form Historical Records of the Federal Open Market Committee, Cambridge, MA, MIT Press.

Coughlan, Peter J., 2000, In Defense of Unanimous Jury Verdicts: Mistrials, Communication, and Strategic Voting, American Political Science Review, 94, 375-393.

Ehrmann, Michael and Marcel Fratzscher, 2005, Transparency, Disclosure and the Federal Reserve, Working Paper Series, No. 457, European Central Bank.

Epstein, Lee, Jeffrey A. Segal and Harold J. Spaeth, 2001, The Norm of Consensus on the U.S. Supreme Court, American Journal of Political Science, 45, 362-377.

Feddersen, Timothy and Wolfgang Pesendorfer, 1998, Convicting the Innocent: The Inferiority of Unanimous Jury Verdicts under Strategic Voting, American Political Science Review, 92, 23-35.

Gerling, Kerstin, Hans Peter Grüner, Alexandra Kiel and Elisabeth Schulte, 2005, Information Acquisition and Decision Making in Committees: A Survey, European Journal of Political Economicy, 29, 563-597.

Gersbach, Hans and Volker Hahn, 2003, Voting Transparency, Conflicting Interests and the Appointment of Central Bankers, Economics and Politics, 16, 321-345.

Holmström, Bengt R., 1999, Managerial Incentive Problems - A Dynamic Perspective -, Review of Economic Studies, 66(1), 169-182.

Kozicki, Sharon, 1999, How useful Are Taylor Rules for Monetary Policy? Economic Review, Federal Reserve Bank of Kansas City.

Levy, Gilat, 2004, Secretive vs. Transparent Committees and the Group Reputation Effect, London School of Economics.

Li, Hao, Sherwin Rosen and Wing Suen, 2001, Conflict and Common Interests in Committees, American Economic Review, 91, 1478-1497.

Meade, Ellen E., 2005, The FOMC: Preferences, Voting and Consensus, Federal Reserve Bank of St. Louis Review, 87, 93-101.

Meade, Ellen E. and David Stasavage, 2004, Publicity of Debate and the Incentive to Dissent: Evidence from the US Federal Reserve, London School of Economics.

Meyer, Laurence H., 2004, A Term at the Fed - An Insider's View-, HarperCollins, New York.

Meirowitz, Adam, 2004, In Defense of Exclusionary Deliberation: Communication and Voting with Private Beliefs and Values, Princeton University.

Meirowitz, Adam, 2005, Deliberative Democracy or Market Democracy: Designing Institutions to Aggregate Preferences and Information, Princeton University.

Mukhopadhaya, Kaushik, 2004, Jury Size and the Free Rider Problem," Journal of Law, Economics and Organization, 29, 24-44.

Ottaviani, Marco and Peter Sørensen, 2001, Information Aggregation in Debate: Who Should Speak First?, Journal of Public Economics, 81, 393–421.

Persico, Nicola, 2004, Committee Design with Endogenous Information, Review of Economic Studies, 2004, 71, 165-191.

Stasavage, David, 2005a, Does Transparency Make a Difference? The Example of the European Council of Ministers, London School of Economics.

Stasavage, David, 2005b, Polarization and Public Deliberation, London School of Economics.

Scharfstein, David S., and Jeremy C. Stein, 1990, Herd Behavior and Investment, American Economic Review, 80, 465-479.

Stiglitz, Joseph, 1998, Distinguished Lecture on Economics in Government: The Private Uses of Public Interests: Incentives and Institutions, Journal of Economic Perspectives, 12, 3-22.

Taylor, John B., 1993, Discretion Versus Policy Rules in Practice, Carnegie-Rochester Conference Series on Public Policy, 39, 195-214

Young, H. Peyton, 1988, Condorcet's Theory of Voting, American Political Science Review, 82, 1231-1244.

Visser, Bauke and Otto H. Swank, forthcoming, On Committees of Experts, Quarterly Journal of Economics.