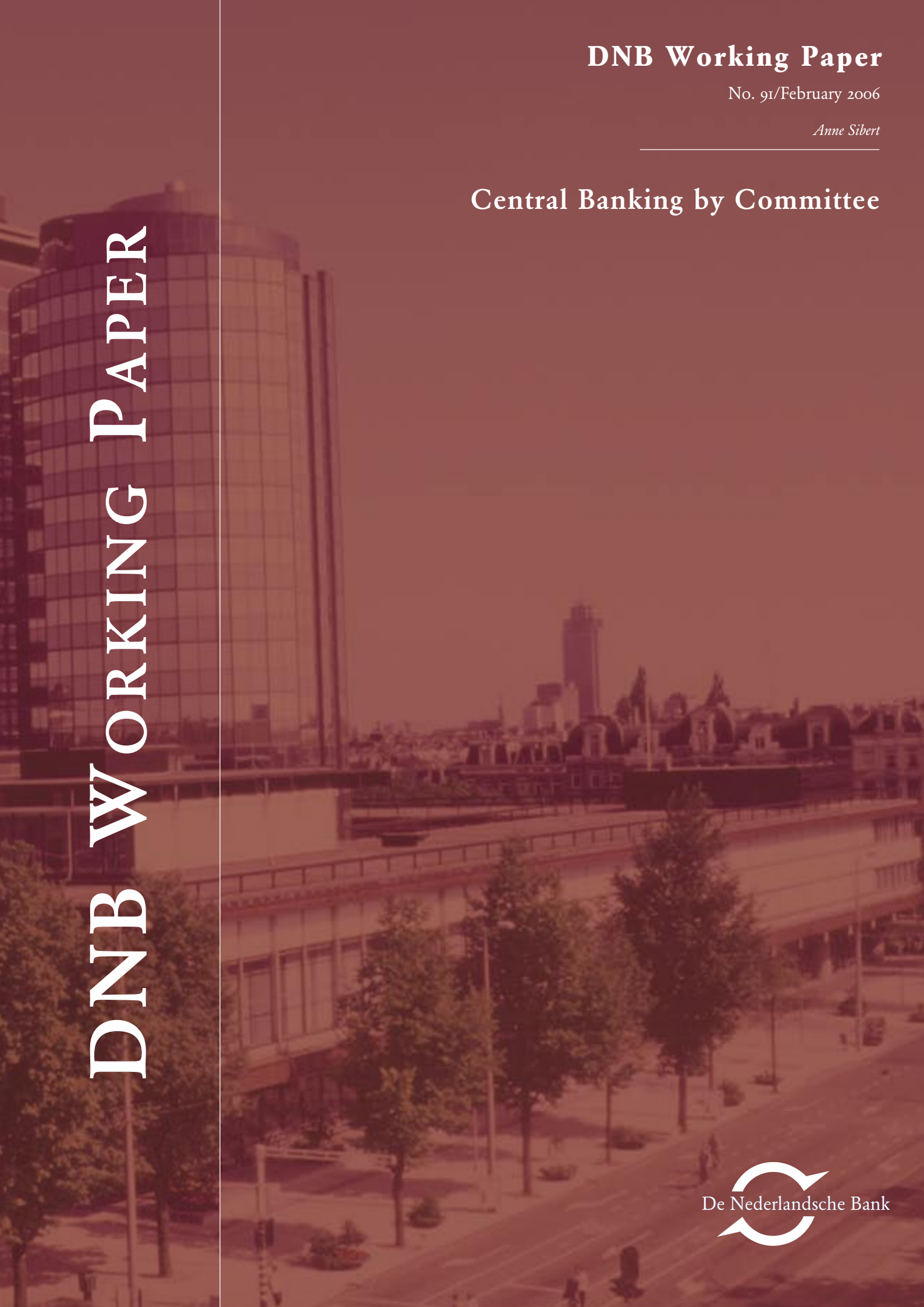

DNB Working Paper

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No. 91/February 2006

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* Views expressed are those of the individual author and do not necessarily reflect official positions of De Nederlandsche Bank.

Working Paper No. 091/2006

February 2006

De Nederlandsche Bank NV
P.O. Box 98
1000 AB AMSTERDAM
The Netherlands

Central Banking by Committee

by

Anne Sibert[1]

Birkbeck College, University of London and CEPR

14 November 2005

Key words: committees, monetary policy
JEL codes: E58, C92, D71

[1]School of Economics, Mathematics and Statistics, Birkbeck College, Malet Street, London WC1E 7HX. Email: asibert@econ.bbk.ac.uk

Abstract

There is a small, but growing, economics literature on the importance and effects of having monetary policy made by a committee, rather than by an individual. Complimenting this is an older and larger body of literature on groups in the other social sciences, particular in social psychology. This paper provides a review of some of this work, focusing on two important features of committees: the effect of their size on performance and whether or not they are more moderate than the members who make them up.

Individual members of a committee acquire idiosyncratic information which the committee uses to make a decision. A result of the famous Condorcet Jury Theorem is that larger committees have more resources, in the form of more information, and are thus better than smaller ones. This result depends on individuals being willing to work as hard at gathering information when they are members of a committee as they would be willing to work if they were acting alone. The economics literature suggests that this may not hold; that individual members may have an incentive to shirk. This phenomenon of a member withholding effort is called *social loafing* in the social pyschology literature. Studies stretching over 125 years document its existence and suggest that it becomes more important as committee size increases and that it disappears when individual members' contributions can be identified and evaluated. The Condorcet Jury Theorem also depends on the committee being able to aggregate members' information and on members being willing to truthfully reveal their information. An excessively formal meeting structure may cause the former to fail to hold; committee members with different objectives may cause the latter not to be true. As a result of shirking and coordination problems, smaller committees may be better than larger ones and the optimal size for a committee is an empirical issue.

Committees pool members' information and views, thus it seems that monetary policy made by a committee should be more moderate than monetary policy made by a single individual. However, several hundred studies demonstrate that belonging to a committee polarizes its members and, hence, committees may be more extreme than individuals. A particularly harmful form of group polarization occurs when committee members' striving for consensus causes them to stop paying sufficient attention to alternative courses of action. In this case the committee may make terrible decisions that none of its members would have made on their own.

The results of the literature on committee size and committee polarization suggest that the ideal monetary policy committee may not have many more than five members. It should have a well defined objective and it should publish the votes of its members. It should be structured so that members do not act as part of a group, perhaps by having short terms in office and members from outside the central bank. External scrutiny of the decision-making process should be encouraged.

> They sit there in committees day after day, And they each put in a color and it comes out gray. And we all have heard the saying, which is true as well as witty, That a camel is a horse that was designed by a committee. " Allan Sherman
>
> "Deliver us from committees." Robert Frost

1 Introduction

The past decade has seen a shift from monetary policy making by individuals to monetary policy making by committee; the Bank of England Act of 1998 creating the Monetary Policy Committee is a notable example. Pollard (2004) reports that out of 88 central banks in her sample, 79 now make decisions by committee. Both policy makers and academic economists have expressed positive attitudes toward monetary policy committees.

Is making policy by committee a good or a bad thing? The positive attitude of economists contrasts with the more popular view of committees – see the epigraphs above. If there are inherent problems with group decision making, are there ways to structure monetary policy committees to ensure better outcomes?

Until recently the economics literature had little to say on this issue. However, the past few years has seen the development of a small but growing body of work on the significance of monetary policy making by groups, instead of by individuals. Existing alongside this work is a far older and more voluminous literature on groups in the other disciplines, most importantly in social psychology but also in sociology, organizational behaviour and legal studies. The intent of this paper is to review some of the current economics literature and some of the literature in other disciplines, to see in what ways it suggests that committees are beneficial or harmful and to uncover the lessons this work has for monetary policy committees. I will focus on two important aspects of committees: how their performance varies with their size and whether or not they tend to be more moderate than the individuals who comprise them.

An obvious question is whether groups or individuals are better at performing tasks. If groups are better, are large groups always better than small groups, or is there an optimal

size for a group? I consider these questions from both a theoretical and an empirical point of view, surveying the literature from both economics and the other social sciences. I begin with a discussion of the Condorcet Jury Theorem, which suggests that larger committees are better than smaller committees as they have access to more resources (in the form of information).

An assumption of the Condorcet Jury Theorem is that committee members acquire resources effortlessly. If this is not true, then members of a committee may have an incentive to exert less effort than they would have if they were acting alone, a phenomenon known as *free riding* to economists and *social loafing* to social psychologists. I review the theoretical literature – which provides reasons for free riding – and the emprical literature which documents the phenomenon and suggests that the tendency to free ride is greater, the larger is the committee.

Two other hypotheses of the Condorcet Jury Theorem are that committees can costlessly pool information and that their members have an incentive to reveal their information truthfully. The effect of abandoning these assumptions has been surveyed elsewhere – see Gerling, Grüner, Kiel and Schulte (2003) – but, I will briefly discuss why these assumptions may not hold and the consequent effects. I will suggest some of the possible policy implications of these coordination problems for monetary policy.

The trade off between the greater resources enjoyed by larger committees and the costs of the increased tendency to reduce effort as the size of the committee is increased, as well as coordination problems in larger groups, implies that the optimal size for a committee is an empirical issue. I survey the empirical literature measuring committee productivity and committee member satisfaction as a function of committee size.

Committees aggregate the views and information of their individual members. Does the aggregation process make committees more moderate or cautious than individuals? This would appear to be the view from the economics literature. However, joining a group and participating in the deliberation process may change the way that individuals behave and

this leads to a different view in the social psychology literature. Participating in a committee tends to make committee members more extreme, a phenomenon known as *group polarization*. I survey the literature from the social sciences documenting this process.

Does the moderation induced by the aggregation process outweigh the effect of committee membership on individual behaviour, allowing committees to protect societies from truly bad decisions? Or, is this an optimistic view? There are countless real world examples of competent committees making terrible choices. If committees can make horrendous decisions, what tends to make them do so? The social psychology literature suggests conditions that lead groups to choose bad outcomes. I review this literature and its lessons for monetary policy committees.

2 Committee Performance and Committee Size

In this section I review the literature comparing the ability of groups and individuals to perform tasks. I examine the effect of committee size on performance and the implications for the desirable size for a monetary policy committee.

2.1 Condorcet's Jury Theorem

Monetary policy committees are typically faced with a situtation where they must choose between two alternatives, say, leaving interest rates unchanged or changing them by 25 basis points in an obvious direction. This scenario is an example of the dichotomous choice model, first described by Condorcet (1785)

Suppose that a committee has an odd number of members, n, and that each of the members receives an independent noisy signal about which alternative is best. Members are equally competent in that it is equally likely that each receives a correct signal and the signals are informative: each member's signal is more likely to be correct than not. Members vote according to their signals. Condorcet stated that if the committee makes decisions by

majority rule, then the committee is more likely to pick the best option than any of its members, acting on the basis of his information alone, and as the number of committee members goes to infinity, the probability that the committee selects the best outcome goes monotonically to one. These two results were first proved by Condorcet's contemporary, Laplace, in 1812 and together are referred to as the Condorcet Jury Theorem.[2]

Real world committees have have different abilities and Berend and Sapir (forthcoming) extend Condorcet's model to allow for different competencies: they assume that the signal of member $i, i = 1, ..., n$, is correct with probability $p_i \geq 1/2$. It is assumed that decisions are made by majority rule and the authors demonstrate that for any competency structure $(p_1, .., p_n)$, the probability that a *randomly* selected subcommittee with an odd number of members chooses the best alternative is increasing in the the number of its members.

Berend and Sapir's results are clearly not true for non-randomly selected subcommittees. Karotkin and Paroush (2003) address the question of whether adding two additional members to a committee is beneficial, if doing so would reduce the compentency of the committee. They provide a necessary condition for adding two members of given competencies to a committee of members with given competencies to increase the probability of a correct choice by the committee.

The Condorcet Jury Theorem depends on its assumptions that it is costless for members to acquire information and that the committee is able to costlessly aggregate the information acquired by its members. In subsections 2.2 and 2.3 I discuss the theoretical and empirical literature where the first of these assumptions is abandoned; in subsection 2.4 I briefly review the literature where the second of these assumptions is abandoned. Finally, in subsection 2.5 I consider the empirical literature relating committee size to committee performance and suggest the proper size for a monetary policy committee.

[2]The assertion that Laplace provided the original proof is due to Heyde (1983).

2.2 Free riding in committees

An important assumption of the Condorcet model is that information is costless to obtain. In reality, the acquisition of information entails effort, and thus is costly. If the information can be shared, then it is a public good and this creates a free-rider problem for committees. A number of authors have addressed this issue. An example (in the spirit of Mukhopadhaya's (1999) model of juries and formally presented in Sibert (2005)) of how the free-rider problem can cause large committees to do worse than small committees is as follows.

A monetary policy committee must choose between leaving monetary policy unchanged or changing it; the correct decision depends on the unobservable state of the economy. Members' prior beliefs are that it is equiprobable each of the options is the best choice. By expending effort, a member can acquire additional independent information about which option is best. Specifically, if the member expends effort he observes an independent random draw from a normal distribution with a known variance. The distribution has mean zero if leaving policy unchanged is the best option and a known non-zero mean if changing policy is the best option. There is no conflict over objectives; all members find type one and type two errors equally costly and information can be costlessly pooled.

Conflict arises because information is a public good and it is costly to attain. The members of the committee play a Game of Chicken: each member would prefer to become informed, rather than have the committee be completely uninformed; however, each member's most preferred outcome is for the other members to expend effort becoming informed, while he free rides. Using elementary sampling theory it can be demonstrated that the expected loss to the committee from choosing the wrong policy is decreasing and convex in the number of members who choose to become informed. The outcome is that it is possible that for sufficiently small committees, all members will choose to become informed. However, as a result of the decreasing returns to committee members becoming informed, there is some committee size beyond which committee members will randomise their decision to become informed. This result is not sufficient to ensure that adding committee members worsens

matters. Although individuals are less apt to become informed, there are more members who can potentially be informed. However, it is easy to construct examples where larger committees are more apt to choose the wrong decision than are small committees.

Free-riding problems can occur in committees for other reasons as well. Sibert (2005) adds multiple agents to the career-concerns framework of Dewatripont, Jewitt and Tirole (1999) to demonstrate that larger committees may be less productive than smaller committees because the larger is the committee the less its output is associated with any particular member's input and this can reduce an individual's incentive to exert effort. In general, the output of a committee results from a collective effort. Whan an individual's costly contribution to the effort cannot be distinguished and evaluated, a moral hazard problem results.

2.3 Social loafing

Consistent with economists' predictions that committee members have an incentive to free ride, a salient feature of real world committees is that their output is not good as one might expect, given the capabilities of the individuals who comprise them.[3] Surveying the literature on group performance, Kerr and Tindale (2003) report that, "The ubiquitous finding across many decades of research ... is that groups usually fall short of reasonable productivity baselines ... they exhibit process losses."

Consider a group assigned a simple additive task, such as pulling on a rope, addressing envelopes, or producing noise by yelling. Assuming that there are no coordination problems and that individuals' efforts do not depend on the size of the group, then group output should rise linearly as additional group members are added. However, if individuals tend to shirk when they are part of a group and if an individual's incentive to shirk is increasing in the number of group members, then group performance will be a concave function of the number of members and it may decrease beyond some point. Social psychologists refer to individuals' reduced effort when they are part of a group as *social loafing*. On the other hand,

[3] A notable exception to this is the committee which translated the King James bible.

there is an optimistic view that in some situations individuals might pull together and work harder when they are part of a group, in this case there may be a range over which adding members increases group output per member. For over 125 years, social psychologists and others have attempted to study the effect of group size on individuals' incentives to exert effort when they are part of a group.

In experiments mostly conducted in the 1880s, the French agricultural engineer Max Ringelmann had his subjects pull on a rope as hard as they could.[4] He found that individuals acting alone exerted 63 kg. of pressure on average, dyads (or two-person groups) exerted a total of 118 kg. of pressure on average, triads exerted a total of 160 kg. of pressure on average and eight-person groups exerted a total of 248 kg. of pressure on average.[5] A vast number of later studies found the same results across a range of additive tasks such as clapping and shouting (Latané, Williams and Harkins (1979)) and pumping air (Kerr and Brunn (1981)). The phenomon occurs in groups solving cognitive tasks as well. In one example, Mullen et. al. (1991) did a meta analysis of 20 studies of brain storming. In these studies subjects were divided into face-to-face groups and nominal groups. The latter comprised individuals who were told they were working on their own. The result was that nominal groups generated more ideas than face-to-face groups and losses of productivity per person in face-to-face groups increased with group size. Outside of the laboratory, Liden, et. al. (2004) used a survey methodology to find that social loafing increased with group size in a study of intact work groups in two organizations.

A problem with the social psychology literature for economists is that most of the work does not consider tasks that are similar to monetary policy making. There are exceptions. Henningsen, Cruz and Miller (2000), for example, had 189 participants work either alone or in 4-person or 8-person groups. Each participant was asked to read information for the

[4]The experiments are described in Parks and Sanna (1999).

[5]Ingham, Levinger, Graves and Peckham (1974) later verified that the concavity of performance as a function of size was not due entirely to coordination problems instead of shirking. In their experiments all of the rope pullers were blind folded and all except the one at the head of the line were confederates who had been briefed not to pull. Other researchers, such as Latané, Williams and Harkins (1979) replicated this result with clapping and shouting tasks.

ostensible purpose of making a future individual or group decision later on. Individuals who anticipated working alone recalled more of what they had read than did those who anticipated working in groups.

Given that social loafing appears to be a wide-spread phenomenon, it is useful to ask what features of groups might mitigate it. Williams, Harkins and Latané (1981) used a cheering task to demonstrate that social loafing could be eliminated when individuals' contributions could be identified. Williams, et. al. (1989) recruited members of the Ohio State Swim Team and staged a "meet" with prizes. They found that relay team swimmers swam laps faster than individuals when times were announced, but slower when they were not. George (1992) used a survey methodology and found that sales people working in groups for a large US retailer engaged in social loafing, but that social loafing and perceived task visibility were negatively related.

A study by Harkins and Jackson (1985) suggested that it is not indentifiability per se that reduces social loafing, but the ability to evaluate individuals' performance. In their experiments, Harkins and Jackson gave four-person groups brainstorming tasks: to identify uses for different objects. Half of the groups were led to believe that their responses were identifiable; the other half were told that their responses were not identifiable. In addition, half of the groups were told that everyone was generating uses for the same object while half were told that groups were generating uses for different objects. Only when both identifiability and comparability were present – so that evaluation was possible – was social loafing eliminated.

Another variable that may lessen social loafing is *group cohesiveness*. Social psychologists define group cohesiveness as the appeal that group members have for each other. It is a function of group homogeneity, the amount of communication between members, the size of the group, outside pressure, the status of the group and past success.[6] Karau and Williams (1997) did two sets of experiments using dyads made up of friends and dyads made up

[6]See Sanna and Parks (1999) and Buchanan and Huczynski (1997) for a discussion of this.

of strangers. In the first, secretarial students typed both individually and collectively in simulated word-processing pools and in the second set of experiments groups worked apart or together on an idea-generation task. Both sets of studies supported the hypothesis that social loafing is lower in cohesive groups. Karau and Hart (1998) generated different levels of cohesiveness in laboratory groups by having 59 dyads discuss a controversial issue and then work, both apart and together on an idea-generation task. They defined a groups cohesiveness as the strength of agreement that the group had on the issue and found that groups with low-cohesiveness experienced social loafing while groups with high cohesiveness worked as hard together as they did apart.

The literature on social loafing has some policy implications for monetary policy committees. One is that it can be reduced if members contributions can be both identified and evaluated. An obvious way to identify contributions is to publish members' votes. Publication is not enough for evaluation; the public needs some way of evaluating an individual's votes. One way to do this is to give the committee a clearly defined goal. If the goal is ambiguous, the public might be unsure whether votes that turned out to be consistent with – say – too high inflation, were a result of incompetence or an objective function that put a lot of weight on some factor other than inflation. Another implication is that social loafing is more likely to occur in large monetary policy committees than in small ones. Thus, it would appear to be especially important for large committees to identify the contributions of individuals and to be as specific as possible about their goals.[7]

These implications suggest that, at least for the purposes of mitigating social loafing, the Bank of England's MPC is well designed. It is relatively small, has a precise goal and its members' votes are published. From this point of view, the FOMC and the ECB's Governing Council are less well designed. Both are large. The FOMC publishes the votes of its members, but as it appears that members tend to vote with the Chairman whether they agree or not, this is not particularly informative. Transcripts are published, but with a five-

[7]It might also seem that the literature favours promoting group cohesiveness. However, as I shall discuss in Section 3, enhanced cohesiveness can have other effects as well and these may be harmful.

year lag. The ECB provides nothing that would identify the contribution of an individual Governing Council member to the monetary policy process. The ECB's goal is fairly clear: inflation below but close to two percent. The Federal Reserve Act of 1913 asks the Federal Reserve's FOMC to pursue the impossible and poorly defined task of promoting maximum employment, stable prices, and moderate long-term interest rates.

2.4 A coordination problem: exchanging information in committees

A hypothesis of the Condorcet model is that it is possible and costless for committees to share information and that committee members have an incentive to truthfully reveal what they know. There exists a large body of theoretical literature that abandons this assumption; the results of a few of the papers are mentioned here.[8] I first consider papers where members are willing to reveal their information truthfully, but cannot costlessly do so.

Sah and Stiglitz (1988) consider corporate committees which must decide to approve or not approve projects. They find the optimal committee size when members have a limited ability to share their decentralized information and it is costly to add additional committee members. Ley and Steel (1998) show that if information exchange is costly, with the cost depending on the committee size, and information is correlated then the more highly correlated is the idiosyncratic information, the smaller is the optimal committee size.

An inability to aggregate information can have a dire effect on committee performance if it takes the form of an *information cascade*. To see how this works, consider an example adapted from Bannerjee (1992) and Bikhchandani, Hirshleifer and Welch (1998). Suppose a monetary policy committee must decide between keeping the interest rate unchanged or changing it in an obvious way. The monetary policy committee meeting – perhaps because the monetary policy committee has many members – has a formal structure where the chairman proposes one of the alternatives, then each member in turn says whether he is

[8] See Gerling, Grüner, Kiel and Schulte (2003) for a more extensive survey.

willing to go along with it or not. If a majority agree, the option is selected. Assume further that the information structure is the same as in the Condorcet model. Prior to the meeting each member, including the chairman, receives an independent signal about which alternative is best; the signals are informative and *ex ante* of the same quality.

If the first person to express an opinion after the chairman received a signal favouring the chairman's proposed option, he will go along with the chairman's proposal. If his signal does not favour the option then he knows that the chairman received a different signal and it is equally likely that each of the two options is best. He resolves his dilemma by throwing a fair coin. If the result of the toss favours the chairman's proposal he goes along with it. Suppose that – either because his signal favoured it or because of the result of the coin toss – the first person to speak after the chairman votes for the chairman's proposal. The second person will go along with the proposal no matter what his own signal suggests because he knows that the chairman's signal favoured the proposal and that with probability 2/3, so did that of the first person to speak after the chairman. Likewise, everyone at the table will go along with the chairman's proposal; they are in an information cascade. The chairman's suggestion is carried unanimously and the only reason for this is one piece of perhaps quite noisy information received by the chairman and the greater than even odds that the first person to speak after the chairman received the same information.

Even if committees are able to costlessly pool their information, they may not have an incentive to do so. An example of why this might be is due to Li, Rosen and Suen (2001). To see how their model works for a monetary policy committee, imagine a committee with a chairman who is trying to solicit views from two members: a hawk and a dove. There are two possibilities, either a sizable inflationary demand shock has occurred or it has not, and there are two possible policy reactions, to raise the interest rate or to keep it unchanged. Both the hawk and the dove prefer the "correct" response, raising the interest rate if the shock occured and keeping it unchanged if the shock did not occur. However, because they disagree about what inflation rate the committee should aim for, they do not share a view

about the relative costliness of type I and type II errors. The hawk prefers the outcome where the shock does not occur and the interest rate is increased to the outcome where the shock occurs and the interest rate is not increased; the dove prefers the outcome where the shock occurs and the interest rate is not increased to the outcome where the shock does not occur and the interest rate is increased.

The hawk and the dove each receive a signal in the form of an observation drawn from a particular distribution with a continuous density function if the shock occurred and from a different distribution with a continuous density function if it did not. The signals are the private information of the recipients and the chairman, who does not receive a signal, must ask the members to report what they learned. Given their reports, the chairman uses a known decision rule to choose whether or not to raise the interest rate. The authors show that for any such decision rule that responds to small changes in what the members report, there is no equilibrium where committee members tell the truth. If a member believed that the other member would tell the truth, he would have an incentive to shade his own information to tilt the decision toward his own preferred outcome. They argue that information sharing requires voting; that the fear of being pivotal limits the incentive to misprepresent information. However, even with voting members are tempted into manipulation and counter-manipulation. The more that committee members can be induced to weight type I and type II errors equally – and thus come closer to sharing preferences – the less is the incentive to misrepresent the truth and the better is information sharing.

The policy advice from the first of the previous two papers is that meetings should be structured to avoid information cascades; perhaps this is best done by avoiding large committees with an excessively formal meeting structure. The advice from the second is that information is more easily shared if objectives are similar across members. Perhaps this can be accomplished with a formal goal of a point target with a symmetric weighting of deviations from the target.

2.5 *What is the optimal size for a monetary policy committee?*

Analysing the optimal size for a committee is difficult without a precise specification of the nature of the committee's tasks. Types of tasks typically analysed by social pyschologists are additive tasks, disjunctive tasks and conjunctive tasks. *Additive* tasks, as previously mentioned, are ones where the group's potential performance, is the sum of individual potential performances performances. *Disjunctive* tasks are tasks where the group's potential performance depends on that of its most competent member. Examples are groups that must come up with a solution to a problem. *Conjunctive* tasks are tasks where the group's potential performance depends on that of its least competent member; these are groups where every member must complete a task, such as climbing a mountain.[9]

With conjunctive groups, increasing the size of the group increases the likelihood of an especially incompetent member. This coupled with a tendancy to engage in social loafing and coordination problems means that such groups should be as small as possible. One would expect that if adding additional members is costless, then in the absence of social loafing or coordination problems, additive groups and disjunctive groups should be as large as possible. With social loafing and coordination problems, there is a trade off between the benefits of increased resources (in additive groups) and an increased chance of an especially competent member (in disjunctive groups) and increased costs associated with coordination problems and with losses due to social loafing. The optimal size of such a group is then an empirical issue. Frank and Anderson (1971) studied two-, three-, five- and eight-member groups and found what appears to be both the expected and the typical result that large groups tended to be better at disjunctive tasks and small groups tend to be better at conjunctive tasks.

Monetary policy making does not appear to fit easily into social psychologists' task taxonomy. It has elements of a disjunctive task. If all members of the committee seek to maximise a know social welfare function, then there is a best action for the committee and monetary policy can be viewed as a problem-solving task. The most competent member

[9] See Frank and Anderson (1971) for a discussion of this taxonomy.

of the committee can suggest what the committee should do, but unlike the solution to a puzzle or a mathematics problem, his proposal may not be seen by other members of the committee as the best. Hence, other members of the committee may not vote for his solution. The influence of the most competent member on committee performance depends on how convincing he is and how sure he is right. To the extent that the most competent member has a disproportionate influence, this tends to make larger monetary policy committees potentially better than small ones. If the information available depends on the size of the committee because members receive independent signals, then this too tends to make larger groups potentially better because their standard errors are smaller.

To remedy the incomplete applicability of the social psychology literature, Blinder and Morgan (2000) designed a simple computer model of the economy and had subjects solve a monetary-policy-making problem. Their model was a fairly simple two linear equation model; the first equation related the deviation of employment from the natural rate to last period's desviation, the deviation of the real interest rate from its "natural" rate, a fiscal term and a shock. The second equation related inflation to a weighted average of the previous four periods' inflation, last period's deviation of the unemployment rate from its natural rate and a shock. The fiscal term was time varying and the challenge for students was to use the nominal interest rate to stabilise inflation and unemployment in response to movements in this variable.

The 100 subjects – who were mainly Princeton undergraduates – knew nothing about the model's specification, although they did understand basic macroeconomics. The authors divided the subjects into five-person groups and had them play four sets of ten rounds. In the first round they played as individuals; in the second they played as groups, half the groups making decisions by majority rule and half by unanimous consent; in the third round they played as individuals again and in the fourth round they played as groups again, exchanging the method by which they had made decisions in round two. It was found that the five-person groups were significantly better at the task than were the individuals.

Lombardelli, Proudman and Talbot (2005) performed similar experiments using students from the LSE. They found that the average five-person committee's performance was significantly better than the average of their individual members' performances, although not better than the performance of their best member.

In related work with a different methodology, Brocato, Kumar and Smith (1989) came to a different conclusion. They examined forecasting by groups versus forecasting by individuals. They studied a medium-sized multinational petroleum marketing and refining organisation where a committee of six upper-level executives predicted spot petroleum prices 45 days later every two weeks. They compared these predictions with predictions of the executives in a laboratory setting where they were presented with what the executives had noted as the relevant fundamentals from different time periods and asked to make forecasts. The researchers found that the individual forecasts were markedly superior to the group forecasts. They postulated that some of their result may have been due to social loafing and some to coordination problems involving the way that the group interacted, which led to entertaining irrelevant information.

As it is difficult to measure the performance of many groups, including monetary policy committees, one approach to determining the optimal size of a committee has been to assign committees tasks and to then ask members whether they felt that the committee was too small or too large for the task it was given. In a famous early study, Slater (1958) studied 24 groups of two to seven male undergraduates whe were given analytical problems to discuss and to suggest solutions to. He asked the group members whether their group was too large or too small to get the best results and found that groups of size five did the best, receiving significantly fewer complaints of being too small than groups of size four and significantly fewer complaints of being too big than groups of size six. Members of larger groups felt that their groups were disorderly and wasted time and that members were too pushy and competitive. Members of smaller groups did not give reasons for their dissatisfaction; Slater speculated that the members of small groups disliked overt conflict.

In a similar experiment, Lundgren and Bogart (1974) divided students in Introductory Psychology at the University of Cincinnati in 1970 into small (5-member) and large (15-member) groups. The students were told to discuss and reach consensus on a series of attitude statements concerning societal change. They found that students in the small groups expressed greater satisfaction with their experience than students in the large groups.

Perhaps the reasons behind the the above results follow from the way that groups interact. Very small groups have the common problem that members tend to avoid dissent. There are idiosyncratic features as well: dyads can be efficient (parents are an example), but often there is considerable tension between members; triads are unstable (as anyone who has lived in a three-child household can attest to); four-person groups tend to split into pairs. Five-person groups appear to be liked because they allow for discussion and a diversity of opinion as well as allowing for a majority decision.[10] Beyond seven to nine members, the participation of members decrease and members become less satisfied. Groups of over twelve people find mutural interaction difficult.[11] As size increases so do motivational losses and coordination problems become more important. There is no consensus on the optimal size for a group solving problems or making judgements, but five person groups appear to be especially popular. Napier and Gershenfeld (1999), for example, claim that, "a group of five seems to be optimal in a number of situations."

As a consequence of most of the above evidence, it appears that monetary policy committees should probably have at least five members, but they should not be much larger. The Bank of England's MPC with its nine members may be slightly too large; the 12-person FOMC is almost certainly too large. The ECB's Governing Council, which currently comprises the six members of the Executive Board and the governors of the national central banks of the 12 nations which have already adopted is clearly way too big.

Under the originally specified arrangements, the governors of the central banks of the 10 accession countries would also become members of the already unwieldy committee upon

[10] See Napier and Gershenfeld (1999) for a discussion of this.
[11] See Furnham (1997).

the adoption of the euro. If the three "old" EU countries which have not adopted the euro were to do so, then the original arrangements would have called for a 31-member committee! Realising the absurdity, these arrangements have been changed. The six members of the Executive Board are to retain permanent voting status. When the voting members exceed 21, the total number of voting members at any time is to be limited to 21 and voting rights are to be rotated among the national central bank governors. Participation in deliberations is, however, still open to all national central bank governors. Perhaps a better system would be to separate the political and technical aspects of monetary policy making at the ECB. Allow the national central bank governors to specify the operational goal of the ECB, such as a specific inflation target, and have the implementation carried out solely by the Executive Board.

3 Extreme Views in Committees

Committees are the subjects of endless jokes and comments, where they are depicted as conservative and cautious. Lee Iacocca (1984, p. 52), for example, commented that, "By the time the committee is ready to shoot, the duck has flown away ." In this section I examine whether or not this view is warranted.

3.1 Are committees more moderate than single policy makers?

It appears to be a common view among academic economists and policy makers that monetary policy committees move more slowly and produce less extreme outcomes than do individual policy makers. Waller (2000, p. 306), for example, says that it is widely believed that, "having policy set by a group rather than by a single central banker keeps policy from going to extremes." Former Vice-Chairman of the Board of Governors of the Federal Reserve, Alan Blinder (1998, p 20) comments

> While serving on the FOMC, I was vividly reminded of a few things all of

> us probably know about committees; that they laboriously aggregate individual preferences; that they need to be led; that they tend to adopt compromise positions on difficult questions; and – perhaps because of all of the above – that they tend to be inertial.

Economists see committees as moderate and slow moving because they view committee decisions as reflecting a weighted average of the views of individuals who make up the committee and (at least a partial) pooling of the these individuals' idiosyncratic information. Participation in the committee is not seen as changing committee members' preferences. Akerlof (1991), however, argues that a more modern view of behaviour, based on research in other social science disciplines, is that individuals' utility functions change over time and that the changes can be unforeseen and even unrecognized. One of the situations that can percipitate a dramatic change in utility is membership in a group.[12]

Social pyschologists have long believed that belonging to a group can have a profound effect on group members' preferences; group members behave differently when they are part of a group then when they act on their own. Over fifty years ago, the famous social pyschologist Solomon Asch demonstrated this in a series of classic experiments detailed in Asch (1951). In these experiments, college students were formed into groups of eight and were shown two cards; the first had a vertical bar, the second had three vertical bars of varying heights. The students were told that Asch was studying visual perception and they were each asked to guess in turn which of the three bars on the second card was of the same height as the vertical bar on the first card. The correct answer to this question was obvious. Unbeknownst to the last student in each group to answer the question in each of the experiments, the seven other students were previously briefed confederates of the author. In one third of the experiments the confederates were instructed to give the correct answer; in these trials this yielded a unanimous correct response from the entire group. In the other two-thirds of the experiments the confederates were told to give the incorrect response. When faced with a unanimous and obviously wrong answer from the confederates who had

[12] One way that social psychologists appear to explain this is that groups establish norms, or rules of behaviour, and punish deviants. See, for example, Buchanan and Huczynski (1997).

previously responded, the real subject went along with the erroneous answer one third of the time. Asch commented, "The tendency to conformity in our society is so strong that reasonably intelligent and well-meaning young people are willing to call white black."

In another set of experiments, Muzafer Sherif (1937) had members of seven dyads observe a pinpoint of light in a dark room. If one does this, there is an optical illusion called the "autokinetic effect" which makes the light seem to move. Both members in turn were asked to stare at the light for two seconds and then report where it had moved. This was repeated until there were 50 responses from each individual. Unbeknownst to one member of each group, the other member was a confederate who had been briefed about how far to say the light was moving. For example, in one group the informed subject had been told to always give a distance between one and three inches, in another the informed subject was told to always say between two and four inches. Sherif defined the group's norm to be the range given to the confederate. The entire experiment was then repeated with just the naive subjects. It was found that in the first set of experiments, both members of each dyad tended to say that they saw the light within the group's prescribed range – even though there was no real movement of the light at all. In the second set of experiments, the naive subjects tended even more strongly to see the light move in the range that had been given to the informed subject in their dyad in the first set of experiments.

In another famous early work, Stoner (1961) compared individual and group decisions involving risk. He presented groups of management students with 12 scenarios involving hypothetical individuals faced with decisions involving uncertainty. An example is:

> A man with a severe heart ailment must seriously curtail his customary way of life if he does not wish to undergo a medical operation which might cure him completely or might prove fatal.

For each scenario, the students were given a list of odds that the risky action would be successful and they were asked to check to the lowest odds in the list that would cause them to advise the hypothetical individual to pursue the risky strategy. The students were then

allowed to deliberate the matters in groups. Stoner found that the groups' decisions were not the average of the students' original decisions. Instead, and surprisingly, for ten out of the twelve hypothetical scenarios, the groups' decisions were riskier; in the other two scenarios the groups' decisions were less risky. Stoner called the phenomenon of a group being willing to accept greater risk after deliberation a *risky shift*. Stoner's results led to a vast number of additional studies: in most of – although not all of – the given scenarios, groups would accept more risk than individuals.

Researchers soon realised that the outcome where the group was more cautious than its members had been before deliberation occurred for scenarios where, before deliberation, the individual members had favoured more cautious decisions than than they did for the other scenarios. Thus, when the individual members of the group were predisposed toward caution, group deliberation led to a choice that was more cautious than than the mean pre-deliberation choice of the group. This led Moscovici and Zavalloni (1969) to propose the *group-polarization hypothesis*.

Moscovici and Zavalloni examined French students' attitudes toward their president and toward the United States and found that pre-discussion attitudes were positive toward the president and negative toward the United States; deliberation made their views more positive and more negative respectively. Following over 300 hundred studies on this phenomenon, it is now an accepted empirical regularity that group deliberation tends to result in a mean opinion that is more extreme than the group's mean original position.[13] University of Chicago law professor Cass Sunstein (1999) comments, "Group polarization is the conventional consequence of group deliberation."[14]

[13] See Buchanan and Huczynski (1997) for a discussion of this. Most studies have been by social pyschologists. However, the topic has also been of interest to legal scholars studying juries: Schkade, Sunstein and Kahneman (2000) studied 500 six-person mock juries' pre- and post-deliberation views on punishment and dollar damages. A rare contribution from the economics literature is Cason and Mui's (1997) study of group polarization in the team-dictator game.

[14] A variable which might be expected to influence the strength of group polarization is group size. The Lundgren and Bogart (1974) study, mentioned in the last section, found that group size had a weak to moderate positive effect on group polarization.

Social psychologists provide a number of reasons for the phenomenon of group polarisation. One is the *social comparison* theory. This refers to individuals' desires to been seen and to see oneself in a socially favourable light. People originally express opinions that are less extreme than their true opinions because they fear being thought of as deviant. However, upon hearing other people express similar opinions, they are willing to shift their opinions, becoming more extreme. This lessens the acceptability of moderate opinions, causing people to become even more extreme. A second reason is called the *persuasive arguments* theory. In this view, group members are influenced by the number and quality of the arguments put forward in favour of a position. If a majority of members initially support a particular view than a majority of the arguments put forward will be in favour of this view. This tends to further increase support for the view as additional members are convinced. A third theory is the *self-categorization explanation*. Having indentified with the group, group members may distance themselves from out-group views not shared by any group member and adjust their opinions to minimise the discrepancy between their own view and an extreme norm or prototypical position of the group.[15,16]

As a consequence of group polarisation it is not obvious that groups such as monetary policy committees are more moderate than the individuals comprising them would be if they were not part of the group. On the one hand, groups tend to be more middle-of-the-road than their individual members because their decisions reflect a compromise between more extreme group members. On the other hand, group membership and deliberation makes the views of individual members less moderate. It is also debatable whether moderation is a good thing. In Waller (2000), Sibert (2003) and Mihov and Sibert (forthcoming) the smoother inflation path generated by committees tends to raise welfare; in Kristen-Gerach (2005), the slow and muted response to shocks is undesirable.

[15] See Friedkin (1999) for a discussion of these theories.

[16] Economics might justify group polarisation as resulting from a failure to aggregate decentralised information properly. An example is the information cascade story of the last section.

3.2 Does committee decision making protect society from horrendous decisions?

> "We always carry out by committee anything in which any one of us alone would be too reasonable to persist." Frank Moore Colby

Blinder (1998) has argued that having committees make monetary policy instead of individuals protects society from "truly horrendous decisions". Yet, casual observation suggests that groups of competent individuals often make appalling decisions: the Bay of Pigs fiasco, the Watergate coverup, the launching of the space shuttle *Challenger*. While the reasons for this are not well understood, social psychologists suggest that a possible explanation for this phenomenon is a particular type of group polarisation referred to as *groupthink*. Described by Irving Janis (1982), who studied US foreign policy disasters, groupthink occurs when a committee is sufficiently cohesive that members' striving for consensus causes them to stop giving due consideration to alternatives.

Janis argued that groupthink is facilitated by structural faults in committees: insulation from outsiders; a lack of diversity in opinions and view points; tolerance of decisions which have not been methodically analysed; leaders who have actively advocated solutions. Group cohesiveness contributes by surpressing internal dissension. External stress, in the form of pressure from some external agent, also plays a role.

Whyte (1993) tested for the existence of a variant of groupthink by studying escalating commitment to a losing course of action. He had 200 graduate students and 125 senior undergraduate students who were studying organizational behaviour make decisions about allocating resources to a failing project. He found that group decision making amplified trends apparent at the individual level in terms of both frequency and severity. It is more difficult to test the significance of the factors explaining groupthink and available evidence does not completely support the Janis's entire model.[17] Nevertheless, the framework has

[17]Schafer and Chrichlow (1996), for example, find that some of the factors mentioned by Janis (such as a lack of tradition of impartial leadership) matter and some (such as, goup homogeneity) do not. See also Kerr and Tindale (2003).

remained popular with psychologists and political scientists for interpreting real world fiascos.[18]

While the welfare effect of group polarisation is unclear, the damaging effect of groupthink is obvious. The solution to groupthink is to get group members to stop thinking and behaving as group members and to encourage outside examination of the group's decision-making process. The Bank of England's Monetary Policy Committee is an example of how this can be done. Group members are encouraged to act as individuals: there is no obvious attempt at consensus. Members' votes are published; membership in the group is rotated; published minutes allow external scrutiny of the ideas and arguments considered; a portion of the group is made up of external members from outside of the Bank of England. The Governing Council of the ECB – with its emphasis on secrecy and consensus – contrasts. The President of the ECB insists that consensus usually prevails;[19] Janis listed an illusion of unanimity as one of groupthink's symptoms.

4 Conclusion

This review paper has focussed on two aspects of groups and their importance for monetary policy making. First, what is the optimal size for a monetary policy committtee? A larger group has more resources and hence a better quality potential output. This suggests that larger committees are better than smaller ones. On the other hand, the discrepancy between actual and potential output may rise with group size. The economics literature provides the reasons for the motivational losses and coordination failures that produce this result. The literature from the other social sciences provides empirical support. It is thus argued that a reasonable size for a monetary policy committee is about five and that committees that are

[18] See Parks and Sanna (1999) for a discussion of this. See also Smith (1985) for a study of groupthink and the Iranian hostage rescue mission and Hensley and Griffen (1986) for a study of groupthink and the Kent State University's disastrous decision to extend its gymnasium over parat of the area where students and Ohio National Guard members confronted each other in 1970

[19] See, for example, President Duisenberg's comments during the November 2000 monetary dialogue between the President of the ECB and the Committee on Economic and Monetary Affairs of the European Parliament.

significantly larger may not be as effective.

Second, are committees more moderate than individual policy makers? While the pooling of views and information may tend to make committees more middle-of-the-road than individuals, the literature from social psychology suggests that committees may polarize their members. Thus, it is possible that committees are more extreme. A possible consequence is that they may be more apt to make horrendous decisions than their members.

There are other aspects of group behaviour that have been studied extensively in the social psychology literature, but which have received little attention in the debate on monetary committees and which are not addressed here. These include the role of the chairman, the way that the committee makes decisions and the question of how groups should deliberate.

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