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Voting in large committees with disesteem payoffs: A 'state of the art' model ☆

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ABSTRACT

We consider a committee of experts that decides to approve or reject an innovation on behalf of society. In addition to a payoff linked to the correctness of the committee's decision, each expert receives disesteem payoffs if he/she votes in favor of an ill-fated innovation or votes against an innovation that proves to be beneficial. We find that the predictions of the model are sensitive to the signal technology. In the standard Condorcet framework experts' signals are i.i.d. conditional on the state of the world, implying that the state of the world is approximated with arbitrary precision by a sufficiently large number of signals. Under this assumption, any combination of disesteem payoffs leads to acceptance with too high a probability. However, if this assumption is relaxed, depending on the relative size of the disesteem payoffs the committee may accept or reject the innovation with too high a probability.

1. Introduction

The rationale for delegating a decision to a group of experts rather than an individual is clear: committees aggregate multiple sources of information and expertise, and therefore allow for more informed decisions. However, by participating in a committee, experts may face idiosyncratic payoffs tied to the correctness of their personal vote. An example is FDA committees, where committee members may be exposed to a negative payoff if they vote to approve a drug that proves to be fatal for some users, or vote against a drug that successfully treats a previously incurable illness. For instance, when Posicor, a drug to treat high blood pressure, resulted in the death of over 140 people, numerous newspaper articles (including an article that received the prestigious Pulitzer Prize) singled out individual committee members based on their vote

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– while the committee as a whole made the wrong decision, only committee members who personally voted for the drug were scrutinized.

In this paper we analyze committee behavior when, in addition to caring that the committee makes the right decision, each committee member faces a negative disesteem payoff if his/her individual vote is shown to differ from the appropriate choice.[1] As in the FDA example, we consider a committee that decides whether or not to adopt an innovation, in an environment where the quality of the innovation becomes evident only if it is adopted. Because of this one-sided revelation of quality, committee members are only exposed to disesteem payoffs when the innovation is accepted.

In this environment, we find that disesteem payoffs generically distort the decision away from perfect information aggregation in large committees. When the disesteem payoff for voting to reject a good innovation (type II error) is large relative to the payoff for voting to accept a bad innovation (type I error), then the predictions of the model are intuitive and the committee will vote to accept the innovation with too high a probability.

However, when the disesteem payoff for a personal type I error is large relative to the payoff for a personal type II error, the predictions of the model depend on the technology that generates the private information of the committee members. In our model, each committee member receives a private signal that indicates that the innovation is either good or bad. The Condorcet framework, which is the standard model used to analyze information aggregation in committees, assumes that each signal is i.i.d. conditional on the true state of the world. This implies that the aggregation of information held by a sufficiently large group of individuals reveals the state of the world with arbitrary precision. In contrast, we consider a model that includes the Condorcet framework as a special case, but that also allows for an alternative signal technology. Specifically, our model also considers the case where each expert's signal is i.i.d. conditional on a *state of the art*, a random variable that equals the state of the world with high probability, but which may also be incorrect. This implies that the aggregation of information held by a large group of individuals conveys the false state of the world with a probability that is bounded away from zero.

We show that under the standard Condorcet signal technology (*state of the world*), a large committee of experts will always act rashly, accepting the innovation with too high a probability. That is, no matter how large the disesteem payoff for voting to accept a bad innovation, there is no over-caution in large committees of experts. This finding, while interesting in and of itself, is not robust: under the alternative state-of-the-art signal technology, where the collective knowledge contained in even a very large number of signals has some probability of being wrong, when the disesteem payoff for personal type I error is relatively large, a large enough committee will always reject the innovation regardless of the information held by its members.

To see the intuition behind this difference in the state of the world and state of the art models, consider the case of a large committee where the disesteem payoff for voting to accept a bad innovation is relatively large. One might expect this to give rise to over-caution under the state of the world model: if the committee accepts the innovation then personal errors are harshly punished only for those who vote to accept. However, if the committee is over-cautious, then the (large) committee practically never approves a bad innovation, which eliminates the impact of the payoff for a type I error. In contrast, this intuition fails in the state of the art model since there is always a positive probability that the state of the art is wrong, which implies that over-caution can be the unique equilibrium given a large relative payoff for a type I error.

The paper is organized as follows. Following a review of the literature, section 2 introduces the payoff structure and the process that generates each expert's opinion (signal). Section 3 characterizes the limit results of the general state-of-the-art model, and compares the state of the world and state of the art models. All proofs are relegated to Appendix A. In a supplementary Appendix, available online, we present suggestive evidence that larger committees reject innovations more frequently using data on the voting patterns of FDA committees, and include an analysis of information aggregation under the state of the art view of expertise without disesteem payoffs, which is a special case of our model.[2]

Literature review

This paper contributes to the game theoretic literature on information aggregation in committees (see Austen-Smith and Banks, 1996 for an early reference and recent surveys by Gerling et al., 2005 and Li and Suen, 2009). Our paper is closely related to a subset of the committee literature that considers information aggregation when voters have a common interest in making the right decision and additional "idiosyncratic" payoffs that condition on the individuals' votes.[3]

In Visser and Swank (2007), committee members deliberate on whether to accept a project prior to voting. The members are concerned about the value of the project and their reputation for being well informed. The market, whose judgment

[1] This payoff can be purely intrinsic (self-esteem), or as in Brennan and Pettit (2004) and Ellingsen and Johannesson (2008), esteem payoffs can reflect an agent's payoff from their general regard by other members of society (also see the discussion of the relevant psychological and classical literature in Brennan and Pettit).

[2] All the results in the absence of disesteem payoffs are analogous to those of the literature on the Condorcet jury theorem with strategic voters (see Austen-Smith and Banks, 1996; McLennan, 1998 and Feddersen and Pesendorfer, 1998). For a general version of the Condorcet jury theorem, see Peleg and Zamir (2012).

[3] In another branch of the literature the committee members have no concern for the aggregate decision and care only about voting (or giving recommendations) to maximize the belief that the "market" holds about their level of competence – i.e. the precision of their private signals. See e.g. Ottaviani and Sorensen (2001) and Levy (2007).