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Committees with leaks

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ABSTRACT

We analyze the quality (informativeness and efficiency) of advice obtained from a committee of careerist experts where voting is secret but voting profiles are 'leaked' with an exogenously given probability. We show that fully informative voting is achievable only when the common prior is not too informative, the committee uses the unanimity rule and faces random leakage. It is then shown that informativeness and efficiency are mutually exclusive properties of committees with careerist experts.

1. Introduction

The relative quality of expert advice across fully transparent and fully secretive committees has been the subject of a number of papers.[1] Our objective is to look into the performance of secretive committees that face an exogenously given probability with which the recommendations of its members are collectively 'leaked' to an evaluator (EV) of expertise. Such committees will be called *committees with leaks*.[2] When experts care only for the EV's beliefs regarding their individual expertise (i.e., they are pure careerists) we show (see Theorem 1) that to obtain informative voting (i.e. voting in accordance to one's updated beliefs) as an equilibrium outcome it is necessary and sufficient to have a committee that (a) uses the unanimity voting rule and faces a leakage threat and (b) the common prior is not too informative. We then show (see Theorem 2) that informative voting hurts social welfare.

Gersbach and Hahn (2001) were the first to explore the dichotomy between information acquisition and optimality in expert committees. They compared a fully transparent and a fully secretive committee in a dynamic model and found that a secretive process allows for better decisions while a transparent process leads to better identification of the talents of the experts. Sibert (2003) similarly argues that secretive processes yield better decisions by reducing the incentive of agents

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[1] See for example Gersbach and Hahn (2001, 2011), Sibert (2003), Fingleton and Raith (2005), Levy (2007a), Meade and Stasavage (2008), Swank and Visser (2010) and Seidmann (2010).

[2] An example of the scenario we motivate could be the recent case involving the meetings of the members of the Federal Reserve Bank of New York that were initially considered to be confidential but ended up being public. Forty six hours of these 'officially closed door' meetings held in 2012 were secretly audio taped, and transcripts based on these recordings were released publicly. Other examples include the various instances of leakage conducted by organizations such as Wikileaks, that have caused a lot of controversy in recent times.

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to distort their actions to signal their types. In our framework, the tendency to distort actions is present both in a fully secretive and a fully transparent committee. Our model is closely related to the work by Levy (2007a). She compares a fully transparent with a fully secretive committee to show that careerist experts exhibit conformist (herding) or non-conformist (anti-herding) tendencies so that their votes may not be informative or efficient in either environment.[3] Given this, our result that leakage threats yield non-distorted advice is new. Moreover, Levy (2007a) finds that if the common prior is sufficiently high (or informative) and biased towards the status quo alternative, a secretive committee with the unanimity rule induces the highest level of welfare. We show that this result holds true in a richer environment where the committee is not only restricted to be either fully transparent or fully secretive, but also allows for the possibility of random leaks (of any degree). However, Levy (2007a) does not report welfare results when the prior is low (or largely uninformative). We show that for such cases, the opposite result holds where secrecy hurts welfare and it is optimal to have perfectly transparent committees if one is confined to the unanimity rule. Interestingly, we also find that in every such situation of low prior, the simple majority rule yields the maximum welfare.[4]

2. The model

There are two possible actions A and B. Information about which should be the 'correct choice' is available from three equally salient and independent sources (or *dimensions*), called 1, 2 and 3. The true *state* in dimension i is $w_i \in W = \{a, b\}$, $i = 1, 2, 3$, with the following interpretation: B is the *correct action according to dimension* i if and only if $w_i = b$. Let $\mathcal{W} = \{a, b\}^3$ with $w = (w_1, w_2, w_3) \in \mathcal{W}$ being a state vector. Let $\pi = \Pr[w_i = b] > 1/2$ be the *common prior* for each dimension i.[5] The choice of an action is swayed by the decision of a *committee* composed of three *experts* called $i = 1, 2, 3$. Expert i is proficient exclusively in dimension i and receives a private signal $s_i \in S = \{a, b\}$ about the true state w_i in his dimension of expertise. The informative precision, denoted by t_i, of the signal s_i is called expert i's *talent*, with $t_i \in T = [1/2, 1]$ so that $\Pr[s_i = a | w_i = a] = \Pr[s_i = b | w_i = b] = t_i$. Expert i's talent is his private information and it is common knowledge that t_i is *uniformly and independently* distributed over the support T.

Expert i provides an *advice* $m_i \in M = \{a, b\}$ simultaneously and independently along with the other experts and the advice (or simply *vote*) a (likewise b) is construed as the pronouncement that "a (likewise b) is the true state according to dimension i". Denote by $\mathcal{M} = \{a, b\}^3$ the set of vote profiles with $m = (m_1, m_2, m_3) \in \mathcal{M}$. The *decision* of the committee is denoted by d_x and is defined by the *voting rule* $x \in X = \{2, 3\}$ as follows: $d_x : \mathcal{M} \to \{A, B\}$ such that $d_x = A$ if and only if $|\{i : m_i = a\}| \geq x$. If $x = 2$ we call this *majority* while if $x = 3$ we call this *A-unanimity* (or, unanimity in short). The voting rule x is common knowledge.

There is an evaluator (EV) whose goal is to estimate rationally the individual talents of the three experts by using Bayes' rule whenever possible.[6] The true states w_i, $i = 1, 2, 3$, are revealed to the EV after all votes are cast and the committee decision d_x (that is always observed by the EV) is reached. A *committee* under the prospect of a possible leakage, denoted by the pair $C = (x, p)$, consists of a *secret committee* with voting rule x and an *exogenous probability* $p \in P = [0, 1]$ with which the vote profile $m = (m_1, m_2, m_3) \in \mathcal{M}$ is revealed to the EV. Expert i's (voting) *strategy* is a function $\sigma_i : T \times S \times P \times X \to M$ and let $\sigma = (\sigma_1, \sigma_2, \sigma_3)$ be a strategy profile. Let $\zeta_i : T \times S \times P \times X \to M$ be the *conjecture* held by the EV about expert i's voting strategy with $\zeta = (\zeta_1, \zeta_2, \zeta_3)$. Let $\tau(m_i, w_i, \zeta) = \mathbb{E}(t_i | (m_i, w_i), \zeta)$ be the talent evaluation function which is simply the expectation held by the EV about the true value of expert i's talent, given his advice m_i, the observed state w_i and the conjecture ζ. The pay-off function of expert i is simply τ. We assume that each expert is an expected utility maximizer and votes in order to maximize the *expected evaluation of his talent* τ held by the EV, where the expert's expectations are based solely on his private signal, his talent, the common prior π and the prior distribution of talents.

Equilibrium notion: The above environment leads to a Bayesian game of reputational cheap talk where we employ the notion of perfect Bayesian equilibrium. As in Levy (2007a) we consider symmetric equilibria in pure strategies where the following hold: (i) each expert votes as if they are pivotal at each event where their individual votes are not revealed to the EV,[7] (ii) the EV's conjecture coincides with the voting strategies followed by the experts and (iii) updating of beliefs by all players follows Bayes' rule wherever possible. We solely focus on equilibria where every expert's vote is *responsive to his signal* (i.e., a voting decision depends on the posterior beliefs that are formed by using private signals) and ignore mirror equilibria where the meaning of the 'messages' is reversed.

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[3] The possibilities of herding and anti-herding have been explored in earlier works by Holmstrom (1999), Scharfstein and Stein (1990), Zwiebel (1995) and Ottaviani and Sorensen (2006a, 2006b), although these works do not address voting in committees.

[4] Levy (2007b) includes the case for small priors in her welfare analysis for two alternatives and two member committees and considers two rules: (a) biased against the prior and (b) biased in favor of the prior. While in our model we only consider voting rules that are at most biased in favor of the prior, by allowing for a 3-member committee we are able to compare different degrees of this bias (viz. through simple majority (zero bias) or through unanimity (positive bias)). Of course given a 2-member framework, Levy was unable to address the no-bias case. Levy shows that for a rule biased in favor of the prior, a transparent procedure welfare dominates when the prior is small. We provide richer insights into this by showing that when the prior is small, a rule with a smaller bias in favor of the prior (i.e. simple majority rule which has zero bias) welfare dominates a rule with a stronger bias.

[5] Since $\pi > 1/2$, one may think of B as the "conventional" choice.

[6] As standard in reputational models (see Levy, 2007a or 2007b), we do not model explicitly a utility function for the evaluator.

[7] Pivotality is redundant for the events where the voting profile m is observed by the EV.