

Committees

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COMMENTS
ON!

Abstract

Orange notes: for Ian & Dan.

Green notes: for me (but Ian & Dan should feel free to chime in!).

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1 Introduction

[Democracy] is about making committees work.

Alan Bullock

And a committee works only if it can harness information about the likely consequences of its decisions. This is a complex undertaking. The committee must first *obtain* the information it needs. To do so, it must fight on two fronts: at home, it must motivate its members to *acquire* information, even if this costs them time and effort. Outside, it must motivate external stakeholders to *provide* information, even if this may harm their interests. The committee must then effectively *aggregate* this information: its decision must align with what its information warrants. How should this committee be designed, then, to best achieve these—possibly competing—objectives?

I study this question in a minimalist setting. There is a policy whose public benefit is unknown, and a committee wishes to decide whether to enact or block it. Committee members agree that a beneficial (*good*) policy should be enacted, and that a harmful (*bad*) one should be blocked. Nonetheless, each have different biases against the policy, so their preferences may conflict if the policy's benefit remains uncertain. Outside the committee, there is a lobbyist. He prefers the policy to be enacted, regardless of its public benefit.

To influence the committee, the lobbyist can provide information about the policy's benefit. He does so by designing a public experiment about it, at no cost. Committee members can then acquire additional information. Each member does so privately, and at personal cost. Finally, the committee votes. Votes are cast simultaneously, and a pre-determined *voting mechanism* prescribes (a) the set of votes available to each member and (b) the probability with which the policy will be enacted given their votes.

I ask: is there a voting mechanism which has

1. the lowest expected cost of information acquisition for each member,
2. lowest chance that a good policy is blocked,
3. and the lowest chance that a bad policy is enacted

among all possible voting mechanisms? Briefly put, is there a *dominant* voting mechanism?

This paper proves that a dominant voting mechanism indeed does exist by characterising one: *the dictatorship of the most-demanding member*. In it, one member gets dictatorial control over the policy: only her vote influences the outcome, and she can vote to definitively enact or block the policy. She is *the most-demanding member*: if any member had to decide without a committee

or lobbyist to interfere, she would be the one to obtain the most certainty that the policy is good before enacting it.

There are a myriad of complex mechanisms. Howcome this simple one dominates them all?

1) In a dictatorship, no member expects to acquire any information.

Clearly, the dictator's peers have no incentive to acquire any information; their vote never affects the outcome. The dictator, in contrast, does wish to acquire information unless she is sufficiently certain about the policy's nature. Crucially, however, once the lobbyist provides enough information to deliver that level of certainty, she feels no urge to acquire more of it. In turn, the lobbyist sees no harm—but reaps ample benefit, as I discuss next—in doing so: if he did not, the dictator would simply acquire that information herself. Thus, the dictator receives all her information from the lobbyist, and simply votes accordingly.

2) In a dictatorship, a good policy is never blocked.

A dictatorship incentivises the lobbyist to be the dictator's sole source of information—he provides enough information for the dictator to forgo acquiring any. The lobbyist leverages this position: he provides any additional information that raises the probability that the policy is enacted. As a result, he ensures that the dictator never blocks the policy unless she is certain that it is bad. Otherwise, he could provide additional information that would either merely reinforce the dictator's belief that the policy should be blocked, or convince her that the policy is (likely enough to be) good and turn her verdict around.

3) In the dictatorship of the most-demanding member, a bad policy is least likely to be enacted.

To enact the policy without acquiring further information, a dictator must be sufficiently certain that it is good. That threshold level of certainty is highest for the most-demanding member: at her threshold, any dictator would enact the policy. I show that, in fact, *any* committee would do so too—no committee is more demanding than the most-demanding member. Intuitively, committee members value information the most if they are the dictator; otherwise, a member's vote might fail to incorporate her information into the final outcome anyway. So, at a belief threshold where no dictator would acquire information before enacting the policy, no committee member does so either before voting to enact it.

No committee is more demanding than the most-demanding member; so, no voting mechanism enacts the policy less than the dictatorship of the most-demanding member does. But, under the dictatorship of the most-demanding member, good policies are always enacted. So, this mechanism must be less likely to enact a bad policy than any other.

literature and contribution: in preparation

My paper contributes to a large and multidisciplinary literature on decision-making in committees. Most papers in this literature study how a committee can achieve a number of the following objectives:

1. acquire a lot of information
2. acquire it cheaply
3. invite a lobbyist to provide information
4. aggregate that information efficiently

The answers are messy and often sensitive to the way the model is configured/calibrated. My paper studies how these four objectives can be achieved *together*, and finds an answer that is insensitive to how the model is configured/calibrated.

I will add a list of papers and refine this section.

2 The Model

A committee of N members, m_1, \dots, m_N , wish to decide whether to *enact* or *block* a policy. The benefit a member m_i obtains from enacting the policy depends on an unknown state of the world, $\omega \in \{\omega_0, \omega_1\}$. When the state is favourable, $\omega = \omega_1$, she obtains a payoff of $u_i \geq 0$ from enacting the policy. When the state is unfavourable, $\omega = \omega_0$, she incurs a payoff loss of 1 instead. Blocking the policy, in contrast, yields her a payoff of 0 in either state. There is also a *lobbyist* outside the committee. He prefers the policy to be enacted regardless of the state.

At the outset of the game, the lobbyist and committee members share the prior belief that $\omega = \omega_1$ with probability $p \in [0, 1]$. The lobbyist can then provide additional *public* information about the state. He does so by committing to perform and publicly disclose the outcome of an (Blackwell) experiment of his choosing. Formally, an experiment is comprised of a measurable space (X, \mathcal{X}) and, for each possible state ω_k , a probability measure P_k over it. Upon observing the outcome of the lobbyist's experiment, players use Bayes Rule to update their prior belief p that $\omega = \omega_1$ to an *interim belief* $r \in [0, 1]$.

I follow a *belief-based approach*¹ and model the lobbyist as directly choosing the distribution μ_l his experiment will induce over interim beliefs. The distribution μ_l must be *Bayes plausible*; i.e., $\mu_l \in \Delta_p([0, 1])$, where:

$$\Delta_p([0, 1]) := \left\{ \mu \in \Delta([0, 1]) : \int_0^1 r d\mu(r) = p \right\} \quad \Delta([0, 1]) := \bigcup_{p \in [0, 1]} \Delta_p([0, 1])$$

After the lobbyist reveals the outcome of his experiment, each committee member acquires additional information about the state. She does so by choosing an additional experiment whose outcome she observes. Committee members acquire this additional information *privately*: neither the experiment m_i chooses to perform nor its outcome are disclosed to anyone.

Following the outcome of her experiment, m_i updates her interim belief r to a *posterior belief* $q_i \in [0, 1]$ that $\omega = \omega_1$. Again, I model each member m_i as choosing the distribution $\mu_i(\cdot | r) \in \Delta_r([0, 1])$ her experiment will induce over her posterior beliefs, given her interim belief r . Conditional on the true state ω , the outcomes of members' chosen experiments are independent.

Producing and providing public information is costless for the lobbyist. In contrast, acquiring private information is costly for committee members: m_i must pay a cost $C_i(\mu)$ to observe the outcome of an experiment which induces the distribution μ over her possible posterior beliefs. The

¹See Kamenica and Gentzkow 2011 and Caplin and Dean 2013.

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cost function $C_i : \Delta([0, 1]) \rightarrow \mathbb{R}^+$ is *uniformly posterior separable*²; i.e., there is a convex function $c_i : [0, 1] \rightarrow \mathbb{R}^+$ whose effective domain contains $(0, 1)$, such that³:

$$C_i(\mu) := \begin{cases} 0 & \text{for } \mu = \{\delta_0, \delta_1\} \\ \int c_i(q) d\mu(q) - c_i(\mathbb{E}_\mu[q]) & \text{otherwise} \end{cases}$$

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Finally, each committee member casts a private vote into a *voting mechanism*. A voting mechanism is a tuple $(D, \{V_i\}_{i=1}^N, \{\mathcal{V}_i\}_{i=1}^N)$ where $V_i \ni v_i$ is a set of possible votes each member m_i may cast, \mathcal{V}_i is the σ -algebra over V_i , and the *decision rule* $D : \prod_{i=1}^N V_i \rightarrow [0, 1]$ is a measurable mapping from the space of possible vote profiles to the probability that the policy is enacted—the *decision*. I further require that the committee's decision rule attain its maximum and minimum over its domain; i.e:

$$\exists \mathbf{v}, \bar{\mathbf{v}} \in \prod_{i=1}^N V_i \text{ such that for all } \mathbf{v} \in \prod_{i=1}^N V_i \quad D(\mathbf{v}) \leq D(\mathbf{v}) \leq D(\bar{\mathbf{v}})$$

For any given voting mechanism, I focus on the lobbyist-preferred perfect Bayesian equilibrium of this game. A perfect Bayesian equilibrium of this game consists of:

1. a voting strategy $\{\tau_i^*(\cdot \mid q, r)\}_{(q,r) \in [0,1]^2}$ where $\tau_i^*(\cdot \mid q, r) \in \Delta(V_i)$ for each member m_i ,
2. an information strategy $\{\mu_i^*(\cdot \mid r)\}_{r \in [0,1]}$ where $\mu_i^*(\cdot \mid r) \in \Delta_r([0, 1])$ for each member m_i , and
3. a strategy $\mu_l^* \in \Delta_p([0, 1])$ for the lobbyist

such that under this fixed voting mechanism:

1. Given other members' strategies, member m_i 's voting strategy maximises her expected payoff at any pair of interim and posterior beliefs $(r, q) \in [0, 1]^2$; i.e.

$$v_i \in \text{supp } \tau_i^*(\cdot \mid q, r) \\ \implies v_i \in \operatorname{argmax}_{v \in V_i} \int_{[0,1]^{N-1}} U_i(r, q_i, \mathbf{q}_{-i}) \times \left\{ \int_{V_{-i}} D(v, \mathbf{v}_{-i}) \tau_{-i}^*(d\mathbf{v}_{-i} \mid r, \mathbf{q}_{-i}) \right\} \mu_{-i}^*(d\mathbf{q}_{-i} \mid r, q_i)$$

where:

- i. the product measure $\mu_{-i}^*(\cdot \mid r, q_i)$ over the posterior beliefs of members $m_{j \neq i}$ is induced

²See, for instance, Caplin, Dean, and Leahy 2022.

³For notational convenience, I assume that $\infty - \infty = \infty$.

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- by those members information strategies, and is conditional on their interim belief r and m_i 's posterior belief q_i ⁴,
- ii. $(V_{-i}, \mathcal{V}_{-i}) := \left(\prod_{j \neq i} V_j, \prod_{j \neq i} \mathcal{V}_j \right)$ is the product space of votes $\mathbf{v}_{-i} \in V_{-i}$ members $m_{j \neq i}$ may submit,
 - iii. the product measure $\tau_{-i}^*(\cdot \mid r, \mathbf{q}_{-i}) := \prod_{j \neq i} \tau_j^*(\cdot \mid r, q_j)$ over the space $(V_{-i}, \mathcal{V}_{-i})$ is induced by the voting strategies of members $m_{j \neq i}$, and is conditional on their interim belief r and posterior beliefs $\mathbf{q}_{-i} \in V_{-i}$, and
 - iv. $U_i(r, q_i, \mathbf{q}_{-i}) := \mathbb{P}_{r, q_1, \dots, q_N}(\omega_1) \times (u_i + 1) - 1$ is the payoff m_i expects from enactment given all players' information about the state, where:

$$\mathbb{P}_{r, q_1, \dots, q_N}(\omega_1) := \left(\frac{r}{1-r} \times \prod_{j=1}^N \frac{q_j/(1-q_j)}{r/(1-r)} \right) \times \left(1 + \frac{r}{1-r} \times \prod_{j=1}^N \frac{q_j/(1-q_j)}{r/(1-r)} \right)^{-1}$$

denotes the probability that $\omega = \omega_1$ given the same collection of information.

2. Given others' strategies, member m_i 's information strategy maximises her expected payoff at any interim belief r she may hold; i.e.

$$\mu_i^*(\cdot \mid r) \in \arg \max_{\mu \in \Delta_r[0,1]} \int \vartheta_i^*(r, q) \mu(dq) - C_i(\mu)$$

where $\vartheta_i^*(r, q)$ is the payoff m_i expects in the subgame where she holds the interim belief r and posterior belief q , given her ensuing voting strategy,

3. The lobbyist's information strategy μ_l^* maximises the probability that the policy is enacted given others' information and voting strategies.

The lobbyist-preferred perfect Bayesian equilibrium (hereon, simply "equilibrium") is the perfect Bayesian equilibrium with the highest probability of enactment.

Dominant Voting Mechanisms

I call a voting mechanism *dominant* if it gives rise to an equilibrium that yields:

- i. a (weakly) higher probability that the policy is blocked when $\omega = \omega_0$,
- ii. a (weakly) higher probability that the policy is enacted when $\omega = \omega_1$, and
- iii. a (weakly) lower expected cost of information acquisition for each committee member

⁴This measure is easily derived using Bayes' Rule, see [Technical Appendix](#).

This is extremely long..?

can we ensure this exists? does it matter for me?

if multiple exist there, the one with lowest info costs

compared to any equilibrium under any other voting mechanism. A dominant voting mechanism—if it exists—yields (weakly) higher equilibrium payoffs for all committee members than any other mechanism.

This paper asks whether such a mechanism indeed exists.

3 Dictatorships

One of the simplest voting mechanisms the committee may adopt is a *dictatorship*, in which one member is delegated *exclusive* and *complete* control over the policy outcome.

Definition 1. A voting mechanism $(\check{D}_i, \{V_j\}_{j=1}^N, \{\mathcal{V}_j\}_{j=1}^N)$ is an m_i -dictatorship if m_i 's control over the policy outcome is:

1. *exclusive*: $\check{D}_i(v_i, \mathbf{v}_{-i}) = \check{D}_i(v_i, \mathbf{v}'_{-i})$ for all $v_i \in V_i$ and $\mathbf{v}_{-i}, \mathbf{v}'_{-i} \in V_{-i}$
2. *complete*: $\exists \underline{v}_i, \bar{v}_i \in V_i$ such that $\check{D}_i(\underline{v}_i, \mathbf{v}_{-i}) = 0$ and $\check{D}_i(\bar{v}_i, \mathbf{v}_{-i}) = 1$ for any $\mathbf{v}_{-i} \in V_{-i}$.

Theorem 1 establishes that there is a committee member, denoted \check{m} and called the *most-demanding member*, whose dictatorship is a dominant voting mechanism. The rest of this section discusses Lemma 1, which lays the groundwork for Theorem 1 by characterising the equilibria dictatorships induce.

Lemma 1. In the equilibrium of an m_i -dictatorship:

1. m_i 's voting strategy satisfies:

$$\mathbb{E}_{\tau_i^*(\cdot | r, q)} \check{D}_i = \begin{cases} 0 & \text{for } q < (1 + u_i)^{-1} \\ 1 & \text{otherwise} \end{cases}$$

at any interim belief $r \in [0, 1]$.

2. m_i 's information acquisition strategy $\{\mu_i^*(\cdot | r)\}_{r \in [0, 1]}$ is the unique one which satisfies:

$$\text{supp } \mu_i^*(\cdot | r) \subseteq \{\min\{r, \underline{q}_i^*\}, \max\{r, \bar{q}_i^*\}\}$$

where the threshold beliefs \underline{q}_i^* and \bar{q}_i^* satisfy $\underline{q}_i^* \leq (1 + u_i)^{-1} \leq \bar{q}_i^*$.

3. The lobbyist's information strategy μ_l^* is the unique distribution satisfying:

$$\text{supp } \mu_l^* \subseteq \{0, \max\{p, \bar{q}_i^*\}\}$$

i hope to make the point that none can be relaxed—relaxing exclusivity (override mechanisms) destroys result

4. No member except m_i expends a positive cost to acquire information:

$$C_j(\mu_j^*(\cdot | r)) = 0 \quad \text{for every } r \in [0, 1]$$

In an m_i -dictatorship, m_i has exclusive control over the policy outcome, and thus exclusive influence over the lobbyist's incentives. She votes to ensure that the policy outcome maximises her expected payoff: the policy is enacted whenever she expects (weakly) positive payoff from enacting it, and it is blocked whenever she does not.

m_i 's information strategy also takes a simple form, and is fully characterised by her two *thresholds of persuasion*, \underline{q}_i^* and \bar{q}_i^* . m_i acquires additional information about the state if and only if her interim belief r falls between these thresholds. In turn, the information she acquires ensures precisely that her posterior belief equals one of these thresholds. Importantly, these thresholds of persuasion always bracket m_i 's *threshold of indifference*, $(1 + u_i)^{-1}$: the posterior belief which would leave her indifferent between enacting and blocking the policy. This reflects that m_i never acquires costly but "useless" information—a costly experiment whose outcome would always lead to the same vote. In contrast, m_i acquires no further information when her interim belief lies beyond these thresholds, $r \notin (\underline{q}_i^*, \bar{q}_i^*)$. Instead, she immediately takes the decision her interim belief favours. Her peers, having no influence over the outcome, never acquire costly information about the state.

explain why
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helps later.

In turn, the lobbyist wishes to maximise the probability that the committee enacts the policy. In an m_i -dictatorship, this amounts to maximising the probability that m_i 's posterior belief weakly exceeds her threshold of indifference, $(1 + u_i)^{-1}$, so that she votes for enactment. Owing to m_i 's simple information strategy, the lobbyist can restrict himself to interim beliefs beyond m_i 's thresholds of persuasion, $r \notin (\underline{q}_i^*, \bar{q}_i^*)$. Interim beliefs between these thresholds merely prompt m_i to distribute her posterior beliefs back to her thresholds of persuasion, but those outside that interval prompt her to vote without acquiring further information ⁵.

This reduces the lobbyist's problem to a simple Bayesian Persuasion exercise à la Kamenica and Gentzkow 2011. When m_i 's prior belief already exceeds her upper threshold of persuasion \bar{q}_i^* , the lobbyist provides no further information. m_i then almost surely enacts the policy, without acquiring any additional information herself. Otherwise, the lobbyist's information strategy either induces the interim belief 0, or \bar{q}_i^* . The former is more than enough to persuade m_i to block the policy. In fact, it removes any doubt that the state disfavours the policy, and as such is only induced when

⁵Matysková and Montes 2023 establish a more general version of this argument in a setting with a single "Sender" (replacing the lobbyist) and a single "Receiver" (replacing the dictator). They show that the Sender can restrict himself to interim beliefs where the Receiver acquires no further information, provided that the latter has a uniformly posterior separable cost of acquiring information.

$\omega = \omega_0$. Thus, the lobbyist ensures that m_i never blocks the policy when $\omega = \omega_1$. In contrast, the latter exactly equals m_i 's upper threshold of persuasion; so when m_i enacts the policy, she never does so with more information than necessary to persuade her.

Proof, Lemma 1:

1. Since m_i has exclusive control, we can define the measurable function $\check{f}_i : V_i \rightarrow [0, 1]$ to be $\check{f}_i(v_i) := \check{D}_i(v_i, \mathbf{v}_{-i})$ for any arbitrary $\mathbf{v}_{-i} \in V_{-i}$. Then, $v_i \in \text{supp}$ only if:

$$\begin{aligned} v_i &\in \arg \max_{v \in V_i} \int_{[0,1]^{N-1}} U_i(r, q_i, \mathbf{q}_{-i}) \times \left\{ \int_{V_{-i}} \check{f}_i(v_i) \tau_{-i}^*(d\mathbf{v}_{-i} \mid r, \mathbf{q}_{-i}) \right\} \mu_{-i}^*(d\mathbf{q}_{-i} \mid r, q_i) \\ \implies v_i &\in \arg \max_{v \in V_i} \check{f}_i(v_i) \times \int_{[0,1]^{N-1}} U_i(r, q_i, \mathbf{q}_{-i}) \mu_{-i}^*(d\mathbf{q}_{-i} \mid r, q_i) \\ \implies v_i &\in \arg \max_{v \in V_i} \check{f}_i(v_i) \times [q_i \times (1 + u_i) - 1] \end{aligned}$$

where the last implication follows from the martingale property of posterior beliefs; i.e., $\mathbb{E}_{\mathbf{q}_{-i}} \mathbb{P}_{r, q_1, \dots, q_N} = q_i$. Thus, $\tau_i^*(\cdot \mid r, q)$ is an equilibrium only if:

$$\mathbb{E}_{\tau_i^*(\cdot \mid r, q)} \check{f}_i(\cdot) = \begin{cases} 0 & q < (1 + u_i)^{-1} \\ 1 & q > (1 + u_i)^{-1} \end{cases}$$

When $q = (1 + u_i)^{-1}$, m_i is indifferent between enacting and blocking the policy, hence any vote. He must then submit the lobbyist-preferred vote; i.e., $\mathbb{E}_{\tau_i^*(\cdot \mid r, (1+u_i)^{-1})} \check{f}_i(\cdot) = 1$.

2. m_i only needs to decide whether to maximise or minimise the enactment probability of the policy. So, she can without loss of generality restrict to information strategies where $|\text{supp } \mu_i^*(\cdot \mid r)| \leq 2$ for all $r \in [0, 1]$. Furthermore, for any interim belief, m_i can restrict herself to either acquiring no information, or acquiring information that has decision-making value; i.e., $(1 + u_i)^{-1} \in \text{conv}(\text{supp } \mu_i^*(\cdot \mid r))$ for any $|\text{supp } \mu_i^*(\cdot \mid r)| = 2$. Lastly, note that Theorem 1 in Caplin, Dean, and Leahy 2022 implies that m_i 's strategy must be *Locally Posterior Invariant* since C_i is uniformly posterior separable; i.e., for any $\tilde{r} \in \text{conv}(\text{supp } \mu_i^*(\cdot \mid r))$, $\mu_i^*(\cdot \mid \tilde{r})$ is the unique distribution satisfying $\text{supp } \mu_i^*(\cdot \mid \tilde{r}) = \text{supp } \mu_i^*(\cdot \mid r)$.

Letting $\{q_i^*, \bar{q}_i^*\} := \text{supp } \mu_i^*(\cdot \mid (1 + u_i)^{-1})$ where $q_i^* \leq \bar{q}_i^*$, we thus conclude:

- (a) for all $r \in [q_i^*, \bar{q}_i^*]$, $\mu_i^*(\cdot \mid r)$ is the unique distribution such that $\text{supp } \mu_i^*(\cdot \mid r) = \{q_i^*, \bar{q}_i^*\}$.
- (b) for all $r \notin [q_i^*, \bar{q}_i^*]$, $\mu_{i;r}^* = \delta_r$.

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which proves our claim.

- Given members' voting and information strategies, let $\zeta_i^*(r)$ be the equilibrium enactment probability under the m_i -dictatorship, given the interim belief r . Denote the concave envelope of this function as $\hat{\zeta}_i^*(r)$. These two functions are given by:

$$\zeta_i^*(r) := \begin{cases} 0 & r \leq \underline{q}_i^* \\ \frac{r - \underline{q}_i^*}{\bar{q}_i^* - \underline{q}_i^*} & r \in [\underline{q}_i^*, \bar{q}_i^*] \\ 1 & r \geq \bar{q}_i^* \end{cases} \quad \hat{\zeta}_i^*(r) := \begin{cases} \frac{r}{\bar{q}_i^*} & r \leq \bar{q}_i^* \\ 1 & r \geq \bar{q}_i^* \end{cases}$$

That $\hat{\zeta}_i^*(r)$ is indeed the concave envelope of $\zeta_i^*(r)$ can be easily verified: any concave function that coincides with ζ_i^* at $r = 0$ and $r = \bar{q}_i^*$ must weakly lie above $\hat{\zeta}_i^*(r)$ on the interval $[0, \bar{q}_i^*]$.

The condition $\mathbb{E}_\mu \zeta_i^*(\cdot) = \hat{\zeta}_i^*(p)$ is then sufficient for the optimality of μ for the lobbyist (Kamenica and Gentzkow 2011). It is easily seen that the distribution μ_l^* defined in Lemma 1 satisfies this condition.

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□

4 A Dominant Dictatorship

The equilibrium of an m_i -dictatorship pivots on the dictator's upper threshold of persuasion, \bar{q}_i^* . In this equilibrium, the dictator acquires no information herself; all her information comes from the lobbyist. The lobbyist, in turn, ensures she never blocks the policy when the state is favourable; if she does block it, it is because the lobbyist induced an interim belief of 0. In contrast, he never *over-persuades* m_i to enact the policy; the lobbyist ensures that m_i 's interim belief never *strictly* exceeds her upper threshold of persuasion—unless her prior belief already does.

Thus, the member with the highest upper threshold of persuasion extracts the most information from the lobbyist. I call her the *most-demanding member* of the committee.

Definition 2. Member m_i is the *most-demanding member* of the committee, denoted \check{m} , if $\bar{q}_i^* = \max \{\bar{q}_1^*, \bar{q}_2^*, \dots, \bar{q}_N^*\} =: \check{q}$.

What makes a member most-demanding: 1. low u_i , low cost of acquiring info. Derive expression for \bar{q}_i^* in appendix.

The dictatorship of the most-demanding member clearly dominates any other member's: though no dictatorship burdens committee members with information costs or blocks the policy in a

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favourable state, an \check{m} -dictatorship minimises the chance that the policy is enacted in an unfavourable state. In fact, it dominates *every* voting mechanism the committee may adopt.

Theorem 1. The dictatorship of the most-demanding member is a dominant voting mechanism.

Theorem 1 rests on two fundamental insights:

1. If a voting mechanism enacts the policy weakly more often than an \check{m} -dictatorship would, it is dominated by an \check{m} -dictatorship.
2. Every voting mechanism enacts the policy weakly more often than an \check{m} -dictatorship would, provided it allows the committee to vote to enact it; i.e., $\max_{v \in V} D(v) = 1$.

The first is easy to see. An \check{m} -dictatorship clearly minimises committee members' information costs: they end up bearing none. While doing so, it also ensures that the policy is almost surely enacted when $\omega = \omega_1$. So, any mechanism which achieves a higher total probability of enacting the policy must enact the policy (i) more often when $\omega = \omega_0$, and (ii) weakly less often when $\omega = \omega_1$. Such a mechanism is clearly dominated by an \check{m} -dictatorship.

or "vote for a.s. enactment"?

are the conditional prob.s clear from lemma 1 etc?

To see the second, suppose the lobbyist ignores the committee's intricate voting mechanism and conducts the experiment tailored for an \check{m} -dictatorship. The resulting interim belief is either 0 or $\check{q} - \check{m}$'s upper threshold of persuasion. Under an \check{m} -dictatorship, the former blocks the policy, and the latter enacts it. Under this arbitrary mechanism, the former may still block the policy, but it may enact it with positive probability, too. The latter, however, certainly enacts it. Indeed, the interim belief \check{q} (weakly) exceeds every member's upper threshold of persuasion; if a member were deciding alone, she would enact the policy without acquiring further information. So, whenever such a member believes that her peers have no relevant private information anyway, she will wish to do the same.

Theorem 1, Proof: Where m_i is the most-demanding member, I use $\check{Q} := \bar{q}_i^*$ to simplify notation in the ensuing. I fix $\left(\{V_j\}_{j=1}^N, \{\mathcal{V}_j\}_{j=1}^N, D\right)$ to be an arbitrary voting mechanism, and let \check{D} denote the voting rule for the dictatorship of the most-demanding member.

I will use Claim 2 to establish the Theorem:

Claim 2. Any voting mechanism induces an equilibrium where committee members:

- (a) acquire no information for interim beliefs $r \in \{0\} \cup [\check{Q}, 1]$; i.e., $\mu_{1;r}^* = \dots = \mu_{N;r}^* = \delta_r$ for such interim beliefs.

- (b) vote to maximise the probability that the policy is executed for interim beliefs $r \geq \check{Q}$, but to minimise it for $r = 0$; i.e.:

$$\mathbb{E}_{\tau_{1;r,r}^*, \dots, \tau_{N;r,r}^*} D(\mathbf{v}) = \begin{cases} \max_{\mathbf{v} \in V} D(\mathbf{v}) := \bar{D} & r \geq \check{Q} \\ \min_{\mathbf{v} \in V} D(\mathbf{v}) := \underline{D} & r = 0 \end{cases}$$

Claim 2, Proof: Assume that all members except m_i employ the asserted strategies. I will first show that the asserted strategies are a best response for m_i , in that case. I then show that, in the relevant subgames, there is no strategy profile that is (a) a mutual best response for all committee members, and (b) preferred by the lobbyist to those asserted above.

Now let $\pi_i(q_i; r)$ be the payoff m_i expects under this voting mechanism given (i) the interim belief r , (ii) her posterior belief q_i , (iii) other members' strategies, and (iv) that she votes optimally at each posterior belief. Since other committee members acquire no private information, we have:

$$\pi_i(q_i; r) = \max_{\tau \in \Delta(V_i)} [q_i \times (1 + u_i) - 1] \times \int_{V_{-i}} \int_{V_i} D(v, \mathbf{v}_{-i}) \tau(dv) \tau_{-i;r,r}^*(d\mathbf{v}_{-i})$$

For $q > (1 + u_i)^{-1}$, $\pi_i(q; r)$ is strictly increasing in the probability that the policy is enacted. For $q < (1 + u_i)^{-1}$, it is strictly decreasing in the same probability. Thus, when $q > (1 + u_i)^{-1}$, m_i 's optimal voting strategy must maximise the probability that the policy is enacted given others' voting strategies, but when $q < (1 + u_i)^{-1}$, it must minimise it. When $q = (1 + u_i)^{-1}$, $\pi_i(q_i; r) = 0$; so, any voting strategy is a best response. m_i 's equilibrium strategy must then be lobbyist-preferred one, and maximise the probability that the policy is enacted. This verifies Claim 2's assertion on optimal voting strategies, and gives:

$$\pi_i(q; r) = \begin{cases} \bar{D} \times [q \times (1 + u_i) - 1] & q \geq (1 + u_i)^{-1} \\ \underline{D} \times [q \times (1 + u_i) - 1] & q < (1 + u_i)^{-1} \end{cases}$$

whenever $r \in \{0\} \cup [\check{Q}, 1]$.

When $r = 0$, $\Delta_0([0, 1]) = \delta_0$; so $\mu_{i;0}^* = \delta_0$. When $r \geq \check{Q}$, the strategy $\mu_{i;r}^* = \delta_r$ delivers the highest probability that the policy is executed given members' ensuing voting strategies; so, if $\mu_{i;r}^* = \delta_r$ is a best response for m_i , it is also part of her equilibrium information strategy. So to

conclude our proof, we wish to show:

$$\int_0^1 [\pi_i(q; r) - \pi_i(r; r)] d\mu(q) - C_i(\mu) \leq 0 \quad \text{for all } \mu \in \Delta_r([0, 1]) \quad (4.1)$$

whenever $r \geq \check{Q}$.

To this end, define $\check{\pi}_i(q_i)$ to be the payoff m_i expects under an m_i -dictatorship given her posterior belief q_i ; i.e., $\check{\pi}_i(q_i) := \max\{0, q_i \times (1 + u_i) - 1\}$. Since $\bar{q}_i \geq \check{Q}$, Lemma 1 implies that:

$$\int_0^1 [\check{\pi}_i(q) - \check{\pi}_i(r)] d\mu(q) - C_i(\mu) \leq 0 \quad \text{for all } \mu \in \Delta_r([0, 1]) \quad (4.2)$$

did i show
this in the
proof of the
lemma?

whenever $r \geq \check{Q}$. So, we are done once we show:

$$\int_0^1 \tilde{\pi}_i(q; r) d\mu(q) \leq 0 \quad \text{for all } \mu \in \Delta_r([0, 1]) \quad (4.3)$$

where $\tilde{\pi}_i(q, r) := [\pi_i(q, r) - \pi_i(r, r)] - [\check{\pi}_i(q) - \check{\pi}_i(r)]$.

To see this, first note that $\pi_i(q, r) - \check{\pi}_i(q) \leq \pi_i((1 + u_i)^{-1}, r) - \check{\pi}_i((1 + u_i)^{-1}) = 0$, so $\tilde{\pi}_i(q, r)$ is piecewise linear, decreasing below $q = (1 + u_i)^{-1}$, and increasing above $q = (1 + u_i)^{-1}$. Therefore, $\tilde{\pi}_i(\cdot, r)$ is a concave function for any $r \geq \check{Q}$. Combined with the fact that $\tilde{\pi}_i(r, r) = 0$, this gives:

$$\int_0^1 \tilde{\pi}_i(q; r) d\mu(q) \leq \int_0^1 \tilde{\pi}_i(q; r) d\delta_r(q) = 0 \quad \text{for all } \mu \in \Delta_r([0, 1])$$

by Jensen's Inequality.

□

Claim 3. The dictatorship of the most-demanding member is a dominant voting mechanism.

Claim 3, Proof: In the equilibrium the dictatorship of the most-demanding member induces, no committee member acquires private information about the state. Any other voting mechanism must thus result in a weakly higher expected cost of information acquisition for each member.

To conclude the proof, it suffices to show that any fixed voting mechanism achieves:

- (a) a lower probability that the policy is enacted when $\omega = \omega_1$, and
- (b) a lower probability that the policy is blocked when $\omega = \omega_0$

than the dictatorship of the most-demanding member.

Recall (from Lemma 1) that, under this dictatorship, the lobbyist's equilibrium information strategy is the unique distribution $\check{\mu}_l$ such that $\text{supp } \check{\mu}_l = \left\{0, \min\{p, \check{Q}\}\right\}$. Therefore, the dictator never blocks the policy unless her interim belief is $r = 0$; i.e. $\omega = \omega_0$ is revealed. The policy is implemented whenever $\omega = \omega_1$.

Note that, due to Claim 2, the probability that the policy is executed following interim beliefs $r = 0$ and $r = \check{Q}$ are \underline{D} and \bar{D} , respectively. Therefore, if the lobbyist employs the strategy $\check{\mu}_l$ described above, we get:

$$\mathbb{P}_{D, \check{\mu}_l}(\text{enact} \mid \omega = \omega_1) = \bar{D} \quad \mathbb{P}_{D, \check{\mu}_l}(\text{enact} \mid \omega = \omega_0) = 1 - \mathbb{P}_{\check{\mu}_l}(r = 0 \mid \omega_0) \times (1 - \underline{D})$$

The lobbyist's equilibrium information strategy, μ_l^* , must weakly increase at least one of these probabilities. Since the probability that the policy is enacted cannot exceed \bar{D} in either state, we conclude that:

$$\mathbb{P}_{D, \mu_l^*}(\text{enact} \mid \omega = \omega_1) \leq \bar{D} \leq 1$$

$$\mathbb{P}_{D, \mu_l^*}(\text{enact} \mid \omega = \omega_0) \geq 1 - \mathbb{P}_{\check{\mu}_l}(r = 0 \mid \omega_0) \times (1 - \underline{D}) \geq 1 - \mathbb{P}_{\check{\mu}_l}(r = 0 \mid \omega_0)$$

□

□

better to
do this in
two “steps”
rather than
“claim”s.

5 Discussion

Scrapped Sections

6 Overrides and Dictatorships

Overrides are dominated by dictatorships. See the note in my compass lexecon notebook.

In general, how one member's vote influences the policy outcome will depend on the votes her peers submit. Certain mechanisms, however, may privilege a particular member to *override* the rest: allow her a vote that (almost surely) guarantees that the policy is enacted or blocked, regardless of her peers' votes. Such mechanisms will be central to Theorem 1, the main result of this paper. I call them *overrides*.

Definition 3. A voting mechanism $(\overset{\star}{D}_i, \{V_j\}_{j=1}^N, \{\mathcal{V}_j\}_{j=1}^N)$ is an m_i -*override* if for some $v_i, \bar{v}_i \in V_i$:

$$\forall \mathbf{v}_{-i} \in V_{-i} : \quad \overset{\star}{D}_i(v_i, \mathbf{v}_{-i}) = 0 \quad \text{and} \quad \overset{\star}{D}_i(\bar{v}_i, \mathbf{v}_{-i}) = 1$$

A particularly simple override—indeed, one of the simplest voting mechanisms—is a *dictatorship*, which bestows the privileged member exclusive authority over the policy outcome.

Definition 4. An m_i -override $(\overset{\star}{D}_i, \{V_j\}_{j=1}^N, \{\mathcal{V}_j\}_{j=1}^N)$ is an m_i -*dictatorship* if:

$$\overset{\star}{D}_i(v_i, \mathbf{v}_{-i}) = \overset{\star}{D}_i(v_i, \mathbf{v}'_{-i}) \quad \text{for any } \mathbf{v}_{-i}, \mathbf{v}'_{-i} \in V_{-i} \text{ and } v_i \in V_i$$

Theorem 1 establishes that there is a committee member—denoted $\overset{\star}{m}$ and called the *most-demanding member*—such that every $\overset{\star}{m}$ -override (and hence every $\overset{\star}{m}$ -dictatorship) is a dominant voting mechanism. In the rest of this section, I lay the groundwork for Theorem 1: I characterise the equilibria override mechanisms induce, and introduce the most-demanding member of the committee.