Individual Accountability, Collective Decision-making

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Abstract

An influential theoretical literature studies a single executive's electoral incentives to knowingly pursue bad policies because they are popular. I develop a model to study pandering in a legislative setting where multiple politicians, each accountable to their own constituency, are responsible for policymaking. Individual politicians receive private information about the best policy for achieving outcomes that citizens value. Politicians then deliberate before selecting policy. Under certain conditions, politicians face electoral incentives to misrepresent their private evidence during deliberation in order to convince their colleagues to adopt a popular policy. I find that these perverse incentives become weaker as the number of politicians involved in policymaking increases. In larger groups, politicians share more responsibility for their policy choices. Individual politicians therefore have less to gain electorally from pandering. This result suggests that in addition to giving politicians more information about which policies are in citizens' best interest, larger groups provide stronger incentives for politicians to use this information.

Keywords: pandering, legislatures, collective decision-making, career concerns

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"But one of the weightiest objections to a plurality in the executive...is that it tends to conceal faults and destroy responsibility....The circumstances which may have led to any national miscarriage or misfortune are sometimes so complicated that where there are a number of actors who may have had different degrees and kinds of agency, though we may clearly see upon the whole that there has been mismanagement, yet it may be impracticable to pronounce, to whose account the evil which may have been incurred is truly chargeable." *Alexander Hamilton, Federalist Paper 70*

"When occasions present themselves, in which the interests of the people are at variance with their inclinations, it is the duty of the persons whom they have appointed to be guardians of those interests." *Alexander Hamilton, Federalist Paper 71*

1 Introduction

In a representative democracy, voters elect politicians to solve public problems on their behalf. Accordingly, politicians want voters to perceive them as competent policymakers who can capably pursue policies that best serve their interests. As Alexander Hamilton observes in *Federalist 71*, however, voters may misunderstand which policies truly serve their interests. Voters and politicians may agree that certain policies tend to be the best response to certain types of problems and politicians may share the preferences of voters for solving public problems. Because politicians, as policy specialists, have more information about the correct response to a particular problem, fully rational voters may nonetheless interpret a policy success as a policy failure or a policy failure as a policy success. In such an environment, voters may incorrectly apportion blame and reward, punishing competent politicians with removal and rewarding incompetent politicians with reelection. Politicians therefore face an electoral incentive to *pander* to voters by selecting policies that voters incorrectly believe to be in their best interest. It is the responsibility of a representative, Hamilton argues, to act in the electorate's best interest even when this is at odds with their beliefs about what policies are in their true interests.

Incentives to pander and their potential to undermine effective problem solving are well understood in settings where an individual politician such as a governor or president is responsible for selecting policy (Canes-Wrone et al. 2001; Prat 2005; Ashworth and Shotts 2010; Fox and Van Weelden 2012). Often in a representative democracy, however, public policy decisions are not made by executives but by groups of elected politicians. Legislatures, committees, and majority party caucuses are responsible for many important policy decisions. Our understanding of pandering incentives and the prospects for effective problem solving in these settings is more limited.

In this paper I use a formal model to examine politicians' incentives to act in the public interest in a collective choice setting. Each politician possesses private information about which policy is best for achieving a policy outcome that voters value. Politicians also have private information about their ability. Highly competent politicians possess better information about which policy is best than their low-ability colleagues. Prior to making their policy decision, politicians deliberate with one another. The group of politicians serves the best interest of the public when the individual politicians cooperate with one another and select the best policy given all of the available private information the members of the group possess.

When the group uses all available information to best serve the public interest, voters endogenously assess their representative's individual competence based on the collective policy decisions of the group. The electoral implications of the collective choice vary for individual members based on local electoral conditions. If effective problem solving requires that the collective selects an unpopular policy, members in safe seats are able and willing to weather voter dissatisfaction. Those who face a stronger challenger in a primary or general election are tempted to manipulate the outcome of the collective decision for their own private electoral benefit. In particular, such members face incentives to misrepresent their private information during deliberation in order to convince their colleagues to select a popular policy.

My primary focus is on how individual politicians' incentives to act in the public interest vary across decision-making units of different sizes. These individual incentives in turn determine whether the collective decisions of the group serve the public interest. The model allows me to rigorously examine a question at least as old as the American founding, namely, are small or large elected decision-making units better equipped to serve the public interest? In *Federalist 70*, Alexander Hamilton expresses concern that elected members of a large collective decision-making body face weaker incentives to act in the public interest than a single decision-maker because blame for an action deemed imprudent by the electorate can be placed on other members. Single executives, he argues, have stronger incentives to act in the public interest because it is easier for the electorate to identify the individual responsible for a mistake or success.

My main result shows that what Hamilton identifies as a weakness of collective decision-making units can in fact be a strength if voters misunderstand which policies are truly in their best interest. The tendency of a collective decision-making body to "conceal faults and destroy responsibility" weakens politicians' incentives to promote popular policies when circumstances call for unpopular decisions. In collective decision-making units, individual members share blame for unpopular policies and credit for popular policies. As the number of politicians involved in producing policy rises, voters become more forgiving of their representative for the group's unpopular decisions and less rewarding for its popular decisions. This attenuates the electoral swing a politician can obtain by manipulating the group into choosing a popular policy. In this way, collective decision-making units align politicians' electoral incentives with the public interest. This main result discloses a mechanism through which larger groups of elected decision-makers may be normatively desirable. In addition to providing politicians with more information about which policy is in the best interest of voters, larger groups also provide stronger incentives for politicians to act on this information.

I use this result to identify conditions under which expanding the size of a group improves the quality of its policymaking even if new members face strong individual electoral incentives to manipulate the group into selecting a popular policy. I discuss the positive and normative implications of this finding for legislative expansion, redistricting, fluctuations in the size of a majority party caucus, party discipline, and legislative committee design.

In an extension, I recover a result from the single-decision-maker literature that individual incentives to choose popular policies are most pronounced when voters are unlikely to learn whether the correct policy was selected before an election. Interestingly, the critical probability of learning whether the group acted correctly or not that prevents any individual from manipulating the group's decision is identical to the single-decision maker case for groups of any size. In a second extension of the baseline model, I show that the popularity of a policy depends on the competence of the least competent politicians. If the least competent politicians are sufficiently informed about how to best solve a problem, they respond to their private information when selecting policy and choose a conventional policy less often than more competent politicians. In this case voters reward conventional policy choices and punish politicians for unconventional policies. If the least competent politicians are sufficiently uninformed, they privilege their prior beliefs about the best policy solution and choose conventional policies more often than competent politicians. In this case voters reward politicians for the unconventional policy.

2 Related Literature

The paper builds directly on a subset of the pandering literature in which politicians differ in ability but share the preferences of voters (Canes-Wrone et al. 2001; Prat 2005; Ashworth and Shotts 2010; Fox and Van Weelden 2012).[1] Like much of broader political agency literature

[1]A alternative setup in the pandering literature considers politicians who vary in terms of their preferences (Morelli and Van Weelden 2013; Maskin and Tirole 2004; Fox and Shotts 2009; Maskin and Tirole 2019; Acemoglu et al. 2013). In both approaches, the incumbent typically faces an exogenous or non-strategic challenger in an election. An exception is Kartik et al. (2015) which studies pandering in an electoral compe-

to which pandering models belong, these models focus on a single elected decision-maker.[2] Canes-Wrone et al. (2001) identify conditions under which a decision maker acts in the public interest when a combination of preexisting policy bias, asymmetric information, and career concerns tempt him to pander. Ashworth and Shotts (2010) extend this model to include an informed media that can abate the information asymmetry between voters and their representative. Prat (2005) and Fox and Van Weelden (2012) similarly consider how the information available to a principal affects the incentives of a career-minded agent by comparing transparent and non-transparent decision-making processes. Whether through transparency or an attentive media, the results of these models show that providing voters with more information can either exacerbate or mitigate individual incentives to pander based on underlying model parameters. In my model, a multiplicity of decision-makers endogenously reduces the precision of the information available to voters about their representative. Unlike these alternative mechanisms that affect voter information about an individual decision-maker, my main result shows that increasing the number of decision-makers strictly attenuates an individual's incentives to pander.

A large body of theoretical research has explored whether larger or smaller groups tend to make better decisions in a common-value setting.[3] One of the classic propositions in positive political economy, Condorcet's jury theorem, posits that if each member is more likely than not to vote correctly, larger groups make more accurate decisions in expectation and the probability of reaching a correct decision approaches one in arbitrarily large groups. Previous studies have identified the conditions under which the asymptotic or non-asymptotic parts of the jury theorem hold with both sincere (Ben-Yashar and Paroush 2000; Berend and Sapir 2005) and strategic (Austen-Smith and Banks 1996; Duggan and Martinelli 2001; Fedderson and Pesendorfer 1998; Coughlan 2000) voting. Much of this research considers individual members of juries or expert committees whose payoffs are tied only to the correctness of the

tition setting where two strategic candidates commit to policy positions based on their private information prior to an election.

[2] Duggan and Martinelli (2017) and Ashworth (2012) review this literature.

[3] Austen-Smith and Fedderson (2009) review this literature.

group's decision.[4]

A more recent literature on decision-making in committees considers members who value their reputation and want to be seen by a third-party observer as competent (Levy 2007; Meade and Stasavage 2008; Stasavage 2007; Mattozzi and Nakaguma 2019; Fehrler and Hughes 2018; Gersbach and Hahn 2008, 2012). In this setting, individual members may prefer a suboptimal collective choice if an alternative yields them a better reputation. This literature generally focuses on how transparency and decision-making rules rather than group size influence individual incentives to cooperate to produce accurate decisions. An exception is Hahn (2017b) who shows that smaller groups can be superior to larger groups when committee members deliberate sequentially and a third party observes their deliberation. Members fear that their arguments will not stand up to the scrutiny of their colleagues and are therefore reluctant to speak up in larger groups. In my model, voters do not observe deliberation and value their reputation only among voters and not among their colleagues. Expressing a minority opinion therefore does not directly disincentivize the sharing of private information. Hahn (2017a) and Visser and Swank (2007) identify a mechanism more closely related to mine although neither paper focuses on how the size of the group affects individual incentives to cooperate. In Hahn (2017a), it is more difficult for an outside observer to assess the individual competence of members of large groups than small groups. Hahn (2017a) uses this result to study the self-selection of low and high-ability members onto committees and abstracts away from individual incentives to participate in effective problem solving once on the committee. Visser and Swank (2007) produce a result most similar to mine but with a different information structure. They show that as groups grow in size, the difference in individual reputation from selecting a popular policy and an unpopular policy declines as the size of the group increases. They obtain this result in a setup in which individual members communicate simultaneously before selecting policy and do not know their own competence. In my setup, members also communicate simultaneously before selecting policy but unlike

[4] A recent exception is Midjord et al. (2017) where members also suffer disutility from voting against the correct decision.

in Visser and Swank (2007) members know their own competence. Politicians can therefore manipulate the group's decision by misrepresenting the quality of their information about which policy is best.

As noted above, much of the pandering literature and political accountability literature more generally focuses on the interaction between a representative voter and a single decision maker. Relatively few models consider this relationship when a single elected decision-maker is not wholly responsible for policy. These come in two varieties, those that consider a single elected politician and one or more unelected participants in the policymaking process (Ujhelyi 2014; Fox and Jordan 2011) and those that consider multiple elected politicians. In the latter category Fox and Van Weelden (2010) and Buisseret (2016) both consider a setup in which a pair of elected politicians, a proposer and veto player, make policy jointly prior to an election. This paper provides an additional contribution to this second category. It is the first to explicitly study pandering in a legislative context using a setup familiar to the political accountability literature.

3 Model

A group of $n \geq 3$ (odd) legislators selects policy on behalf of n representative voters.[5] Members of the group are either high or low ability and voters want to elect high ability representatives. All members know their own ability and receive private signals about which policy is the best solution to a public problem. High ability members receive higher quality signals than low ability members. The group then chooses policy in two stages. Members first communicate with one another about which policy they should select after receiving their private signals. After this communication stage the members vote on which policy to enact and the policy that receives the majority of votes is implemented. Each member then stands for reelection against a challenger whose expected ability is common knowledge. Prior

[5] I follow convention in the principal-agent literature and use "he/him/his" to refer to the legislators (agents) and "she/her/hers" for voters (principals).

to the election, voters observe the policy that the group selects and update their beliefs about their representative's ability. They then choose between the challenger and the incumbent, electing the candidate who they believe is most likely to be of high ability.

3.1 Interpretation

Before proceeding with the formal setup, it is useful to consider three possible interpretations of the model. First, the group of n politicians can refer to an entire legislature. In this interpretation the legislature is tasked with solving a public problem that all citizens of the polity agree should be resolved. Everybody wants the economy to stabilize and recover from economic recession, a pandemic to be contained, and the nation to be protected against foreign aggression. For any class of problems, a general consensus exists regarding the type of policies that tend to be correct solutions. Prevailing economic wisdom may, for example, hold that stimulus rather than austerity in most cases is the proper policy response to a recession. The correct response to any specific problem, however, is unknown to voters. All members of the legislature and their staffs research and form individual beliefs about which policy is the best solution to a specific crisis. Some legislators are quite successful at investigating which policy is correct and find very strong evidence that one course of action is better than the other. Others receive less decisive information from their investigation. After conducting their individual research, the legislators all meet to deliberate about what policy should be implemented and then vote to select the policy. This interpretation focuses on the problem solving dimension of Congressional politics that Adler and Wilkerson (2012) emphasize. They argue that while the Congressional literature tends to focus on ideological and partisan conflict, much of what Congress does is bipartisan, routine, and sustained problem solving. Moreover, they find evidence that voters reward and punish their representatives electorally based on their assessment of their problem-solving capacity.

A second interpretation of the model broadens its application to encompass a greater variety of policy areas. Rather than interpreting the n legislators as the entire legislature, the group can represent the members of a majority party caucus. As a majority, these legislators can set the legislative agenda and enact the policies they choose (Cox and McCubbins 2005). This interpretation expands the scope of issue areas that the model applies to, allowing it to capture policy areas in which there is intraparty consensus on the existence of a problem but weak or nonexistent interparty consensus. Parties may for example disagree fundamentally about whether inequality or access to health care are problems that need to be addressed by the government. In this case the common-value setup of the model does not apply to the entire legislature but does apply to a majority caucus attempting to resolve a problem that it and its members' constituents identify as salient. Moreover, this interpretation enables the model to characterize legislative policymaking in a highly partisan or polarized environment in which shared beliefs about the common good are limited and interparty deliberation occurs less frequently than the model requires if the group is interpreted as an entire legislature.

Third, the n legislators can be interpreted as members of a legislative committee. In their capacity as overseers of executive agencies and developers of detailed legislation, these subgroups of the legislature regularly engage in problem solving. While voters may be attuned to their representative's activities in committee, the model admits an alternative interpretation of the voter and election more applicable to committees. The outside observer who decides whether an incumbent will retain his position can represent a party leader. The leader is uncertain about a committee member's ability, observes the committee's decision-making, and then assesses the competence of its members. She then chooses whether to reappoint the committee member in the next session or replace him with another member of the caucus.

Given these three interpretations of the model, I refer to the n legislators in the setup and subsequent analysis simply as a "group" of legislators. I return to these specific interpretations in the discussion of the model's results below and highlight several implications for each type of group.

3.2 Policy process

The groups selects one of two policies, $y \in \{0, 1\}$. Policy is selected by a single simultaneous vote of all members. All members vote for one of the two policies (they may not abstain). The policy that receives a simple majority of votes is enacted.

3.3 Uncertainty about the state of the world

One state, $\omega = 0$, is known to be more likely. Formally, $Pr(\omega = 0) = \pi > 1/2$, which is common knowledge. Politicians are better informed about the state of the world than voters. At the start of the game, each member receives a private, conditionally independent signal about the state, $s_i \in S = \{0, 1\}$. How informative this signal is to a legislator depends on his ability, $\theta_i \in \Theta = \{H, L\}$. A "high ability" legislator learns the state with probability one: $Pr(s_i = \omega|\theta_i = H) = 1$. A "low ability" legislator receives an imperfect but privately informative signal:

$$Pr(s_i = \omega|\theta_i = L) = q > \pi$$

Because $q > \pi$, a low ability member's signal is sufficiently precise that his posterior belief about the most likely state corresponds to his signal. I relax this assumption in Section 7.2.

The probability of observing a signal that matches the state is independent of the state. Each member is of high ability with probability 1/2 which is common knowledge. I refer to the ability and signal pair (θ_i, s_i) as a member's *type*. Let (θ, s) denote the n-tuple of member types and let Ψ denote the set of all possible type realizations. Members know their own type but not the type of any other member. This can be interpreted as legislators possessing private non-verifiable information about their staff's ability to effectively research a problem. This can be a product not only of their staff's experience or competence but also their resources and time constraints. After learning their type, members communicate once and simultaneously by sending a message $m_i \in \Theta \times S$ about their type to their colleagues.[6]

[6]Simultaneous communication assumes that members prepare their speeches to their colleagues in advance and allows herding problems to be ignored (Visser and Swank 2007, 339).

Each member observes all messages. Given the messages and his own private information about his type, each member updates his beliefs about the state of the world.

3.4 Uncertainty about the ability of legislators

Voters do not know the type of any politician. All voters observe y before the election. Voters never observe m and do not observe either the individual votes of legislators or the vote totals.[7] The voters also do not observe the state, ω, prior to the election. I relax this assumption in Section 7.1. There are two possible information sets for voters, one in which they observe $y = 0$ and another in which they observe $y = 1$. Let $\mu_i(y)$ denote the voter's posterior belief that their representative is high ability after observing y.

3.5 Elections and electoral incentives

Each legislator stands for reelection against a challenger who is of high ability with probability k_i. All k_i are common knowledge. Each of the n voters observe y and update beliefs about their representative's type. The incumbent wins the election if and only if the voter believes the incumbent is at least as likely to be of high ability than the challenger: $\mu_i(y) \geq k_i$.[8] Legislators are strictly reelection seeking. If they win the election, they earn a payoff of 1 and a payoff of 0 if they lose. Results are fundamentally unchanged if legislators also value policy or earn a reelection payoff greater than or less than 1.[9]

3.6 Sequence of play

The sequence of play is as follows:

1) Nature selects the state, ω, and legislator types.

2) Each legislator observes his type, (θ_i, s_i), and sends a message, m_i.

[7] I discuss this assumption in Section 6.3.

[8] I do not explicitly model voters' payoffs or their voting strategy. They are passive players whose beliefs are directly tied to their representative's payoff.

[9] Details available upon request.

3) Each legislator observes all messages and casts a vote for which policy to enact.

4) Each voter observes the chosen policy, y, and updates her beliefs.

5) The election is held, payoffs are realized and the game ends.

4 Public Interest Equilibrium

The solution concept is weak perfect Bayesian equilibrium.[10] I am interested in identifying the conditions under which the collective always chooses the policy that is in the best interest of voters. More precisely, my analysis is focused on identifying the conditions under which an equilibrium exists in which the group always selects the policy that is optimal given the totality of the dispersed information that its members possess. In such an equilibrium, the probability that the optimal policy is selected is maximized. I define a *public interest equilibrium* as an equilibrium that displays this property. To define this formally let

$$y^* \equiv \underset{y \in \{0,1\}}{\operatorname{argmax}} \ (1-y)Pr(\omega = 0|\theta, s) + yPr(\omega = 1|\theta, s)$$

For each possible realization of member types, $y^*(\theta, s)$ returns the policy that is most likely to match the state. That is, $y \in y^*(\theta, s)$ if and only if $Pr(\omega = y|\theta, s) \geq 1/2$. I show in the Appendix that for all n, $y^*(\theta, s)$ is unique for all (θ, s). Let σ denote an equilibrium and let

$$y_\sigma : \Psi \to \Delta\{0, 1\}$$

denote the distribution over policies that the group selects in equilibrium for each possible realization of types, (θ, s).

Definition 1 (Public Interest Equilibrium) *An equilibrium σ is a public interest equi-*

[10] Weak perfect Bayesian equilibrium combines sequential rationality with the requirement that beliefs be updated according to Bayes' rule wherever possible. The more familiar concept of perfect Bayesian equilibrium requires that players observe each others' actions. In this game voters do not observe the messages that members send to their colleagues.

librium if and only if $y_\sigma(\theta, s) = y^*(\theta, s)$ *for all* (θ, s).

For ease of exposition, I analyze a particular PIE in which all members truthfully report their type to their colleagues and all members vote for the policy they believe is most likely to match the state. I refer to this equilibrium as a *sincere public interest equilibrium* (SPIE).

Definition 2 (Sincere Public Interest Equilibrium) *In a sincere public interest equilibrium, all members truthfully report their type to their colleagues and all members vote for the policy they believe is most likely to match the state.*

In the Appendix I provide a complete formal definition of a SPIE in addition to players' strategies players' beliefs. It is straightforward to verify that a SPIE is a PIE. In a SPIE, all available information is revealed to all members in equilibrium. All members thus have the same posterior belief about the optimal policy. They then vote unanimously to implement the optimal policy given all possible available information. Analysis of a SPIE clarifies the strategic incentives that politicians face when communicating and selecting policy in the shadow of an election and how these incentives may undermine a PIE. After analyzing the SPIE below, I establish that a PIE exists if and only if a SPIE exists.

4.1 Voter Beliefs in SPIE

In a SPIE, voters observe the policy that the group selects and update their beliefs about their representative's ability using Bayes' rule:

$$\mu_i(y) = \frac{Pr(y|\theta_i = H)}{Pr(y|\theta_i = H) + Pr(y|\theta_i = L)}$$

Because all information is truthfully exchanged between legislators in equilibrium, if any legislator is of high ability the group learns the true state of the world and selects the correct policy with probability one. Therefore if one's own representative is high ability, the group selects the correct policy. Because $\omega = 0$ with probability π, it follows that

$Pr(y = 0|\theta_i = H) = \pi$ and $Pr(y = 1|\theta_i = H) = 1 - \pi$. If one's representative is of low ability, two events are possible. On the one hand, at least one other legislator may be of high ability. In this case the group selects the optimal policy. This occurs with probability $1 - (1/2^{n-1})$. On the other hand, all legislators may be of low ability. This occurs with probability $1/2^{n-1}$. The policy that the group of low ability legislators chooses depends on the combination of signals that its members receive. Let n_0 denote the number of low ability legislators who receive a $s_i = 0$ signal in a group of n low ability legislators. In a SPIE, all signals are truthfully shared and the group chooses the optimal policy given this realization of low quality signals. By Bayes' rule, $y = 0$ is optimal if and only if

$$Pr(\omega = 0|n_0) = \frac{Pr(n_0|\omega = 0)\pi}{Pr(n_0|\omega = 0)\pi + Pr(n_0|\omega = 1)(1 - \pi)} \geq 1/2$$

Conditional on the state, n_0 is a binomially distributed random variable where $s_i = 0$ is a success, n_0 is the number of successes out of n trials, and the success probability is q if $\omega = 0$ and $1 - q$ if $\omega = 1$. For any q then, a unique number of successes, $n_0(q)$, can be found such that in equilibrium a group of low ability members selects $y = 1$ if $n_0 < n_0(q)$ and $y = 0$ if $n_0 \geq n_0(q)$. For $q > \pi$, $n_0(q) = \frac{n+1}{2}$ so that the policy that receives a simple majority of signals associated with it is selected. From this the probability that a group of low ability members selects $y = 0$ can be expressed for $q > \pi$ as

$$\lambda(q) = \pi \sum_{i=\frac{n+1}{2}}^{n} \binom{n}{i} q^i (1 - q)^{n-i} + (1 - \pi) \sum_{i=\frac{n+1}{2}}^{n} \binom{n}{i} (1 - q)^i q^{n-i}$$

$$= \pi \sum_{i=\frac{n+1}{2}}^{n} \binom{n}{i} q^i (1 - q)^{n-i} + (1 - \pi)(1 - \sum_{i=\frac{n+1}{2}}^{n} \binom{n}{i} q^i (1 - q)^{n-i})$$

This expression states that the probability that a group of low ability members selects $y = 0$ is the weighted probability that it receives a simple majority of correct signals when the state is 0 and a simple majority of incorrect signals when the state is 1. The probability that it selects the correct policy is thus independent of the state and less than one. Therefore groups of low ability legislators choose $y = 0$ less often than a group with high ability legislators: $\lambda(q) < \pi$. It follows that

$$Pr(\theta_i = H|y = 0) = (1 - \frac{1}{2^{n-1}})\pi + \frac{\lambda(q)}{2^{n-1}} < \pi$$

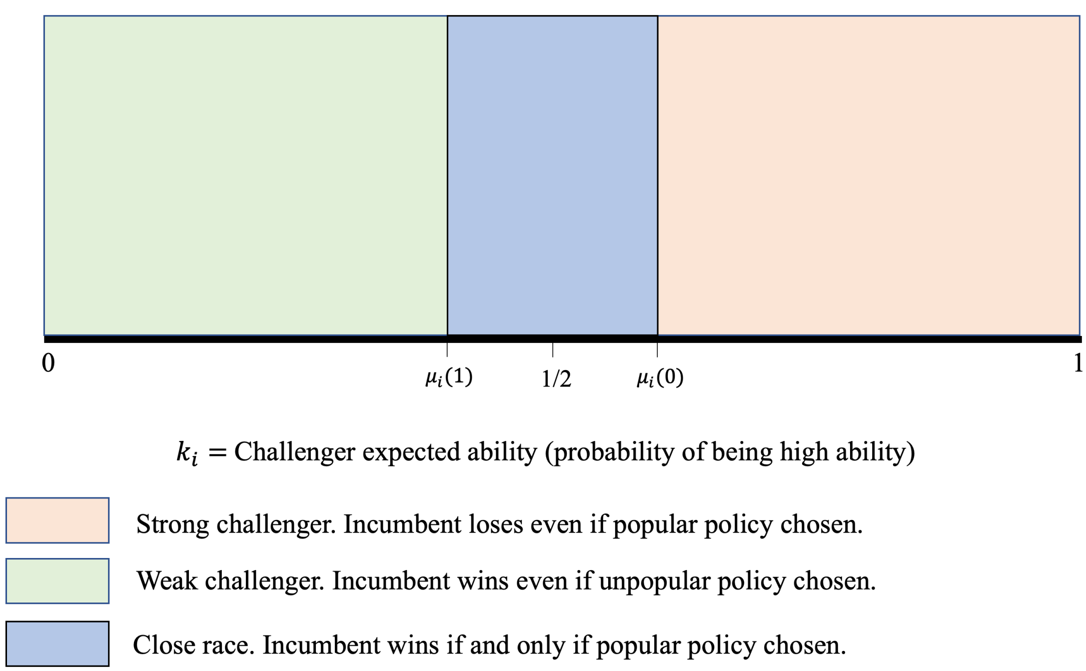
Voters therefore form more favorable beliefs about their representative after observing $y = 0$ than $y = 1$:

$$\mu_i(1) = \frac{(1-\pi)}{(1-\pi) + Pr(y = 1|\theta_i = L)} < 1/2 < \frac{\pi}{\pi + Pr(y = 0|\theta_i = L)} = \mu_i(0)$$

4.2 Existence of SPIE

Voter beliefs in a SPIE partition the space of challengers that any individual member may face in an election into three electorally relevant regions. Figure 1 depicts this. If a member

Figure 1: Election results



faces a challenger of expected quality $k_i \leq \mu_i(1)$, he wins the election even if the group selects the unpopular policy. If a member faces a challenger of expected quality $k_i > \mu_i(0)$, he loses the election even if the group selects the popular policy. The electoral fortune of these safe legislators and doomed legislators does not depend on the policy that the group selects. They therefore are willing to cooperate with their fellow legislators in selecting the policy that best serves the public interest.[11] If a member faces a challenger of expected quality $k_i \in (\mu_i(1), \mu_i(0)]$, he wins reelection if and only if the group selects the popular policy, $y = 0$. These members in *close races* prefer that the group selects $y = 0$ even when the best information available to the group implies that $\omega = 1$ is more likely. Close races undermine the existence of a SPIE.

Proposition 1 *A sincere public interest equilibrium exists if and only if no member is in a close race.*

All proofs are in the Appendix. While a member in a close race cannot affect policy by voting against $y = 0$ (votes are unanimous in equilibrium and policy decided by majority rule), he can manipulate the group's decision by lying in the communication stage. A low ability member who receives an $s_i = 1$ signal, for example, can raise the probability that the group selects $y = 1$ and therefore the probability that he is reelected by sending a false message $m_i = (H, 0)$ rather than the truth as equilibrium requires. If no other member is a high type, this lie ensures that the group selects the popular policy even if all other members receive an $s_i = 1$ signal. In this case his deception almost certainly results in the selection of the incorrect policy but ensures victory in an election that he is guaranteed to lose in equilibrium.

4.3 Existence of PIE

In general, truthful reporting and unanimous voting are not necessary in a PIE. In any PIE, however, $y_\sigma(\theta, s) = y^*(\theta, s)$ for all (θ, s). It follows that for each y and θ_i, $Pr(y|\theta_i)$ is the

[11] If members care at all about policy, they strictly prefer to cooperate.

same in every PIE. Thus voter posterior beliefs are equivalent in every PIE. This implies that if a member is in a close race in a SPIE, he is also in a close race in every PIE. A single member in a close race undermines the existence of a PIE because the member can lie about his type and induce the group to select $y = 0$ for some (θ, s) where $y^*(\theta, s) = 1$.

In principle, an alternative PIE may be immune to this sort of manipulation. That is, is there a PIE in which a member who wants to raise the probability that the group selects the popular policy cannot do so? I turns out that there is not.

Proposition 2 *A PIE exists if and only if a SPIE exists.*

For certain pairs of type realizations, (θ, s) and (θ', s'), such that $(\theta_{-i}, s_{-i}) = (\theta'_{-i}, s'_{-i})$ for all $-i \neq i$, and $(\theta_i, s_i) \neq (\theta'_i, s'_i)$, member i's information is pivotal in the sense that $y^*(\theta, s) = 0$ and $y^*(\theta', s) = 1$. A PIE requires that if member i plays his equilibrium strategy, the group selects $y = 0$ for (θ, s) and $y = 1$ for (θ', s'). This implies that if member i plays the strategy prescribed to him if he is type (θ_i, s_i) when he is type (θ'_i, s'_i), the group must choose $y = 0 \neq y^*(\theta', s')$ if the type realization is (θ', s'). Thus the fact that PIE requires the group's decision to depend on an individual's strategy when his information is pivotal enables the member to manipulate the group's decision.

5 Group size and public interest

Having identified the necessary and sufficient conditions for a PIE to exist, I can now analyze how individual legislators' incentives to act in the public interest vary across decision-making units of different sizes. The endogenous beliefs of voters determine which legislators want to act against the public interest. That is, they determine the bounds on the interval of challengers for whom an incumbent legislator faces a close race, $(\mu_i(1), \mu_i(0)]$. If changing a parameter results in the collapse of this interval, I say that "fewer individual races are close."[12] If fewer races are made close, then some members who initially faced close races

[12]The notion of "fewer individual races" I use conforms to a standard extension of cardinality to infinite sets. Namely, if $\mu'_i(1) < \mu_i(1) < \mu_i(0) < \mu'(0)$, then $|(\mu_i(1), \mu_i(0)]| < |(\mu'_i(1), \mu'_i(0)]|$ in the sense that there

either become safe against an electoral challenge or find themselves trailing their opponent to a sufficient degree that the popular policy cannot save them. These legislators no longer face an electoral incentive to act against the public interest and a PIE can potentially be brought into existence.

To understand how the size of the group influences the closeness of individual races, it is necessary to understand how voter beliefs change as the size of the group rises or falls. Regardless of the size of the group, if at least one member is high ability, the correct policy is selected in a PIE with probability one. The size of the group therefore has no effect on the probability that it chooses $y = 0$ conditional on one's own representative being of high ability. Formally, $Pr(y = 0|\theta_i = H) = \pi$ for all n.

The size of the group affects $Pr(y = 0|\theta_i = L)$ through two channels. First, the probability that at least one other member is high ability, $1 - \frac{1}{2^{n-1}}$, is strictly increasing. This raises the probability that the group selects $y = 0$, as groups with a high ability member always select the correct policy. Second, the probability that a group of n low ability members selects the correct policy is also increasing in n. To see this, recall that for either state, the probability that a group of n low ability members selects the right policy is the probability that at least a simple majority of members receives a correct signal,

$$\sum_{i=\frac{n+1}{2}}^{n} \binom{n}{i} q^i (1-q)^{n-i}$$

Ben-Yashar and Paroush (2000) prove that this probability is strictly increasing in n odd.

As n rises, more information becomes available to the group in a PIE and the group selects the correct policy with a higher probability. Because $y = 0$ is more likely to be the correct policy, a group of low-ability members selects $y = 0$ with a higher probability as n rises. Thus as the group becomes larger, $Pr(y = 0|\theta_i = L)$ rises and approaches π.

It follows that voters form more favorable beliefs about their representative when $y = 1$

exists an injective function $\chi : (\mu_i(1), \mu_i(0)] \to (\mu_i'(1), \mu_i'(0)]$.

and less favorable beliefs when $y = 0$ as n rises. Formally, $\mu_i(1)$ is strictly increasing in n and $\mu_i(0)$ strictly decreasing. As the group becomes larger, its decisions become less informative about any one individual legislator's role in the determination of policy and therefore less informative about his ability. In a small group, an individual member's message is more likely to be consequential for the group's decision than in a large group. Compared to a larger group, if he is of low ability, there is a higher probability that the group makes an incorrect decision. There are few other potential high ability colleagues and his signal is more likely to be pivotal in a group of low ability legislators. Because of this effect of group size on voter beliefs, the set of challengers who run a close race against each individual legislator is smaller in a large group than in a small group.

Proposition 3 *In larger groups of legislators, fewer individual races are close.*

The logic of this result extends to $n \geq 1$, implying that fewer challengers run close races against any individual legislator in a group of three legislators than in a "group" made up of a single legislator—e.g. an executive.

Corollary 1 *Fewer individual races are close for any member of a group than for a single decision maker.*

Proposition 3 implies that the expansion of the size of a decision-making body can bring a public interest equilibrium into existence if one initially does not exist as original members in close races face a different electoral environment in a larger group. Because voter beliefs monotonically collapse on the prior, for any $k_i \neq 1/2$, there is a sufficiently large size of the group such that legislator i does not want to manipulate the group's decision.

When a new member is added to the legislature, however, he brings with him a new challenger. Depending on how close the new k_i are to $1/2$, the addition of new members may cause a PIE to cease to exist. If districts in the existing legislature are uncompetitive such that no members face the temptation to manipulate policy for personal gain, adding new members from competitive districts can undermine the group's capacity to serve the public interest.

To understand the policy consequences of such an expansion, consider an initial n-member group and assume that a PIE exists. Members of this group honestly report their types to their colleagues and always select the best policy given all possible information that can be learned about the state. Now assume l new members are added such that for all l members, $k_i = 1/2$. These new members always want to manipulate the legislature's decision for sufficiently low probabilities of state revelation. There is therefore no equilibrium in which all legislators are truthful and vote for the best policy with the best information. That is, the group can no longer exploit all available information to choose the optimal policy. Original members, however, should understand that their new colleagues want to mislead them. A reasonable response from the original members in such a situation would be to ignore the new legislators and continue making policy as before with their original colleagues as a bloc. As long as the original members make up a majority in the new legislature, the original-member bloc can continue sharing all information truthfully, believing each other, and implementing the consensus optimal policy through a unanimous vote. Under these strategies, the new legislature makes policy decisions based on the same amount of information as the old legislature and selects the optimal policy with the same ex ante probability.

Proposition 4 *If $n - 3$ or fewer new members are added to a group that serves the public interest, an equilibrium exists in which the new group chooses the correct policy with the same probability as the original group.*

Proposition 4 establishes that an equilibrium in which old members play these strategies exists for any modest addition of new members to the group. While the addition of new members in close races can undermine the ability of the legislature to use all available information, it does not destroy its ability to fully exploit existing sources of information in the public interest.

6 Discussion

6.1 Legislative expansion

Proposition 4 applies to expansions of a decision-making body in which the original n challengers, k_i, do not change when new members (and challengers) are added. In this sense there is no "redistricting" when the legislature is expanded. A new state or territory is added to a country, new districts within the territory are created, and representatives from these are admitted to the legislature with no reworking of the existing members' districts. The historic growth of the U.S. Senate fits this mode of expansion. The expansion of the House of Representatives over its history, by contrast, is characterized by continual reapportionment and redistricting. Proposition 4 does not apply in this case. If the original legislature serves the public interest and redistricting makes some of the original legislators' districts sufficiently competitive (even after expansion makes fewer individual races close), then the original legislators can no longer form a bloc within the new legislature that serves the public interest. Unlike modest expansions without redistricting, modest expansions with redistricting are not guaranteed to admit an equilibrium in which the probability of problem solving by the new legislature is as high as it was in the original legislature.

A further implication of Proposition 4 relates to the expansion of a decision-making body from one politician to multiple. Consider a single executive who serves the public interest. Now minimally expand the decision-making body from a single executive to a committee by adding two additional politicians. The original executive still wants to serve the public interest but cannot unilaterally form a majority bloc within the committee and continue making policy decisions alone. It is therefore not guaranteed that an equilibrium exists in which the probability that the committee chooses the correct policy is weakly higher than the probability that the original executive selects the correct policy.

6.2 Party Caucus Expansion

Interpreting the n legislators as a majority party caucus suggests a further implication of an expansion in the size of the decision-making group. Party majorities typically expand from election to election by bringing in legislators from more competitive districts. In terms of the model, a rise in n should tend to add members in close races. Proposition 4 is therefore of particular relevance in an application of the model to party caucuses. New members may not contribute to the quality of majority policymaking but need not do harm. This applies to any magnitude of increase in the majority's membership for a legislature of a fixed size, as the original caucus by definition forms a majority bloc in the new legislature.

Relatedly, a contraction in the size of the party majority may be of little consequence for the party's capacity to solve problems if a member from a competitive district is lost. Losing a member from an uncompetitive district, on the other hand, does harm the party's ability to solve problems. In particular, a member who knows he will lose the upcoming election has no electoral incentive to do anything but cooperate with his colleagues to solve problems in the time he has remaining before the inevitable defeat. If his replacement faces a more competitive electoral environment or belongs to the opposing party, the caucus loses a member who it can trust to truthfully share information and faithfully work to find policy solutions to items on the party's agenda.

6.3 Transparency and Party Discipline

I have assumed that voters only observe y and not the individual votes of their legislators. This assumption is made only for ease of analysis unessential to my results. If the vote is made transparent, in a SPIE only two profiles of votes can be observed with positive probability. All members unanimously vote for either 0 or 1 depending on which maximizes the probability of state matching. Voters learn no more from observing individual votes than they do from observing just the outcome. Given equilibrium voting strategies, lies in the communication stage also result in unanimous votes. Deviation and equilibrium payoffs in the communication stage are therefore identical in a model with transparency to those in the model without transparency. All that needs to be considered is whether any legislator can gain by voting for the opposite policy as his colleagues in the voting stage. All that is required to rule out deviant voting behavior is off-path voter beliefs that do not reward legislators who vote differently than the rest of the legislature. There is little if any rationale within the model to expect voters to reward such behavior. Both punishing and rewarding beliefs survive standard equilibrium refinements.

This logic extends to *any* PIE. In a PIE the optimal policy is always selected given all available information. There may, for example, exist a PIE in which a large but non-unanimous majority votes for the optimal policy while others vote for the opposite. Because the optimal policy is always selected, there is no electoral rationale for such equilibrium legislative voting behavior. Voters use the policy decision to make inferences about their representative's contribution in the communication stage. Their own member's vote provides no additional information. In no such equilibrium can a member escape individual judgment based on the collective decision. This rules out a PIE in which members in close races agree to share their information with the legislature and in exchange are allowed to performatively vote against an unpopular policy to get reelected.

This implies that in a PIE, members of a majority party caucus are judged not on the basis of their floor votes but on the policy that the majority party caucus selects. If the members of the party caucus share information truthfully in order to select the best policy to address a perceived problem, no member of the party caucus can save himself by voting against the party on an unpopular bill.

6.4 Legislative organization and committee design

The model's results imply that legislative committees made up of members who do not face a competitive competition with a challenger are most effective at solving problems within their domain of oversight or legislation. This implies that, like members of a party caucus or the legislature as a whole, members who anticipate a fierce primary or general election challenge are tempted to manipulate the committee into taking popular but suboptimal actions. While voters may not pay sufficient attention to the actions of the committee that their representative sits on, interest groups or donors may. The voters in the model can alternatively be interpreted as these third party observers who choose to support the incumbent or challenger.

For committees, a second practical implication follows from the model if committee members are assigned by party leaders to solve problems. Namely, the model admits predictions about how a party leader should design a committee to best enable it to solve problems. Consider a party leader charged with assigning committee positions who understands the electoral incentives facing potential members of the committee. The leader should avoid assigning members from highly competitive districts to important committees. Long tenured members of the legislature in safe seats should be expected to fill the most important committees. Members from competitive districts should be assigned to larger committees where the pooling of blame and reward attenuates their temptation to promote popular policies. In particularly competitive electoral environments, it may not be feasible to fill an existing committee with a combination of party members that can credibly solve problems. In such an environment, the creation of a smaller special committee of members from safe seats or who face impending defeat (or retirement) may be the best solution to ensure a problem is properly addressed.

It should be noted that the model is agnostic regarding the process of committee assignment. It simply provides predictions for how committee assignments should be made if party leaders design committees in order to solve policy problems through oversight or the development of detailed legislation. This mode of assignment is broadly consistent with an informational theory of committees (Gilligan and Krehbiel 1987). The model's predictions about the composition of committees are more limited from the perspective of alternative theories of committee design (Shepsle and Weingast 1987; Cox and McCubbins 2005; Groseclose and King 2001). Its implications for the problem-solving capacity of the committee, however, continue to hold as long as voters, donors, or interest groups are sufficiently attentive to the work of the committee.

Committee assignment can alternatively be interpreted in the following way. Rather than voters or interest groups judging the capability of legislators on committees, party leaders can play the role of the outside observer. The leadership forms a judgment about a committee member's ability based on the committee's decisions and then compares this assessment to her beliefs about the ability of another member of the caucus in a subsequent session. In this interpretation, members committees should be more equipped to solve problems and less prone to pander to the party leadership if the leader believes ex ante that a replacement is insufficiently capable in the committee's policy domain. Highly specialized or technical committees should therefore have the greatest problem solving capacity. If only a few members of the caucus have experience in economics or banking, for example, a finance committee should be well equipped to solve problems. Members of the committee do not expect that the leadership will believe an alternative member of the caucus will be more capable even if it recommends an unpopular policy. This is in contrast to a committee whose members oversee a more general policy area that requires generic human capital such that leadership has little reason to believe ex ante that there is much heterogeneity in member ability. Members on these committees may fear that an unpopular decision will result in their replacement in the next session and thus take popular actions when these are not warranted. The model's results imply that these concerns can be mitigated by making generalized committees larger than the more specialized committees.

7 Extensions

7.1 State revelation

I have assumed that prior to the election voters never learn whether the correct policy was selected or not. I now relax this assumption and allow voters to observe the state with probability $\rho > 0$ after the group selects policy and before the election. If the state is revealed and voters see that the policy is incorrect, they learn that all members of the group are low ability and replace their representative with a challenger. If they observe the correct policy, they form favorable beliefs about their representative's ability regardless of whether the popular or unpopular policy turns out to be correct. Thus if legislators anticipate that the state will be revealed, it is strictly in their electoral interest to cooperate and maximize the probability of choosing the right policy.

If voters remain ignorant of the state, their beliefs about their representative's type, conditional on the policy that the group chooses, are identical to those in the baseline model. Members in close races win the election if and only if the popular policy is selected. Members in close races therefore want to induce the selection of the popular policy if and only if the probability of state revelation is sufficiently low. If this probability is too high, their gambit is electorally *harmful* as it raises the probability that the group chooses the wrong policy.

To find a critical probability above which members in close races prefer that the group matches policy to the state, consider when a member would want to overturn the group's decision. A member in a close race wins reelection when the group selects $y = 1$ in a PIE only if $\omega = 1$ and the state is revealed. If the group selects $y = 0$, he wins *unless* $\omega = 1$ and the state is revealed. Let ζ_i a member's belief that $\omega = 0$. A legislator strictly benefits from overturning the group's decision if and only if

$$\rho < \frac{1}{2(1 - \zeta_i)}$$

If the group has at least one high ability member, it selects $y = 1$ in a PIE if and only if $\omega = 1$. Therefore if the group has at least one high ability member, a legislator in a close race wants to overturn its decision if and only if $\rho < 1/2$. He knows that if the group's decision is overturned, it selects the wrong policy with certainty: $\zeta_i = 0$. He therefore wants to overturn the decision if and only if the state is more likely to remain hidden than be revealed.

If all members are low types, then a member's belief about the state depends on n_0, the proportion of $s_i = 0$ signals received by the group. For a fixed n, a very low n_0 is strong evidence that $\omega = 1$. In this case, for large n, $\zeta_i \approx 0$. As n_0 rises, so does ζ_i as a greater number of $s_i = 0$ signals provide weaker evidence that $\omega = 1$. Overturning the group's decision no longer implies that the wrong policy is selected with near certainty. Overturning the decision may even correct what would have been a wrong decision. Changing the group's decision is least distortionary at $n_0 = \frac{n-1}{2}$ where

$$\zeta_i = \frac{\pi(1-q)}{\pi(1-q)+(1-\pi)q} < 1/2$$

Therefore if a member in a close race can raise his probability of winning the election by overturning the group's decision, he must want to overturn the group's decision in the event that all members are low ability and exactly $\frac{n-1}{2}$ members receive $s_i = 0$. Therefore if

$$\rho \geq \bar{\rho} \equiv \frac{\pi(1-q)+(1-\pi)q}{2(1-\pi)q} \in (1/2, 1)$$

no member in a close race can ever benefit by making the group choose $y = 0$ when it would otherwise choose $y = 1$.

Proposition 5 *If at least one member is in a close race, a PIE exists if and only if $\rho \geq \bar{\rho}$.*

Interestingly, $\bar{\rho}$ is unaffected by n. To understand why, consider an $(L, 1)$ type in a close race in a SPIE. If he falsely reports $m_i = (L, 0)$, this lie affects the group's decision if and only if all members are low ability and $n_0 = \frac{n-1}{2}$. The threshold $\bar{\rho}$ is defined as the probability of state revelation such that the is no electoral benefit conferred by changing the group's decision in precisely this event. When he evaluates the expected payoff of this lie, he conditions on the event that exactly half of his colleagues receive each signal. No matter how large the group is, his colleagues' signals cancel each other out. Only his private signal, $s_i = 1$, is informative.

Thus while fewer and fewer individual races become close as n rises, the probability of state revelation necessary to deter members in close races from manipulating the group's decision remains constant. This result applies as a decision-making unit expands from one member to multiple as well. Unlike the legislators, an executive can manipulate policy directly. If he is of type $(L, 1)$, he has the same posterior belief about ω as the $(L, 1)$ legislator who conditions on $n_0 = \frac{n-1}{2}$.

7.2 Quality of information

In the baseline model I assume that low ability members are privately informed in the sense that if $s_i = 1$, they believe that $y = 1$ is more likely before the communication stage. This assumes that $q > \pi$. If $q \leq \pi$, then prior to the communication stage low ability members privately believe $y = 0$ is more likely even if $s_i = 1$. Individual members are privately *uninformed* in this case. For a single decision maker, this implies that in a public interest equilibrium, low-ability decision makers choose $y = 0$ with probability one. High-ability decision makers continue to select the correct policy with probability one and therefore ex ante select $y = 0$ with probability π. In a PIE then, a low-ability decision maker selects $y = 0$ with a higher probability than a high-ability decision maker. The reverse is true for the baseline model where $q > \pi$. Consequently, for $q \leq \pi$, voters form more favorable beliefs if $y = 1$ than if $y = 0$. The policy associated with the ex ante *unlikely* state is now the popular policy. If low-ability decision makers are of sufficiently low quality, voters reward unconventional policy solutions.

This generalizes to multiple decision-makers. While individual low-ability members always privately believe that $y = 0$ is the best policy prior to communication, the pooling of their weak information can convince them that $y = 1$ is a better choice. If a sufficiently large number of low-ability members receive $s_i = 1$ signals, Bayes' rule implies that $y = 1$ is more likely than $y = 0$. When this occurs, the group selects $y = 1$ in a PIE. Recall that for $q > \pi$ the minimum number of $s_i = 0$ signals for which the group selects $y = 0$ is a simple majority: $n_0(q) = \frac{n+1}{2}$ for $q > \pi$. For $q = \pi$, this threshold falls by one. The group selects $y = 0$ if $\frac{n-1}{2}$ or more members receive $s_i = 0$ signals. With this lower threshold, the group favors $y = 0$ and selects it with a higher probability than a group with at least one high ability member. Voters therefore form more favorable beliefs about their representative when the group selects $y = 1$ than when it selects $y = 0$—i.e. $\mu_i(0) < 1/2 < \mu_i(1)$ if $q \leq \pi$.

Proposition 6 *If low ability legislators are privately uninformed, the unconventional policy, $y = 1$, is popular: $\mu_i(0) < \mu_i(1)$. If low ability legislators are privately informed, the conventional policy, $y = 0$, is popular: $\mu_i(1) < \mu_i(0)$.*

The decision threshold, $n_0(q)$, declines as q becomes smaller. Members require a higher number of $s_i = 1$ signals to select $y = 1$ as the quality of their signals deteriorates. Eventually, for q close to $1/2$, the group always selects $y = 0$ even if all members observe $s_i = 1$. Thus as the quality of their individual information declines, the group increasingly falls back on the prior to inform its decision and chooses $y = 0$ with a higher probability. For voters, $y = 0$ provides increasingly strong evidence that their representative is low ability as the quality of low ability members declines. The gap between $\mu_i(0)$ and $\mu_i(1)$ widens and more individual races become close.

An analogous result holds for the baseline case where $q > \pi$. Here groups of low ability members select the correct policy with the same probability in each state as a simple majority of signals decides policy. As their signals become increasingly precise, they select the correct policy with continuously higher probability. In the limit, they become identical to high ability members and always choose the correct policy. For higher quality low ability members, the group's decision is a less precise signal to voters about the ability of their representative. For q arbitrarily close to 1, only legislators who face a challenger of expected ability $k_i = 1/2$ face incentives to manipulate the group's decision.

Thus on both $[1/2, \pi]$ and $(\pi, 1]$, fewer races become close as q rises. Uninformed legislators choose $y = 0$ less often as the quality of their information rises while informed legislators choose $y = 0$ more often. It remains to be considered how the set of close races changes at $q = \pi$. For $q > \pi$ arbitrarily close to π, groups of privately informed low ability members more closely resemble a group of high ability members than a group of privately uninformed low ability members when $q = \pi$. The uninformed group selects $y = 0$ with a higher probability than a group of high ability members while the informed group selects $y = 0$ with a lower probability than high ability members. The probability that the (barely) informed group selects $y = 0$, however, is closer to the probability that a group of high ability members selects $y = 0$ than is the probability that the uninformed group selects $y = 0$ when $q = \pi$. Privately informed groups are more responsive to the information available to the group than uninformed groups. As a result, $y = 0$ is a stronger signal to voters about member ability when $q = \pi$ than when $q > \pi$ is in the neighborhood of π. Thus fewer races are close for $q > \pi$ than $q \leq \pi$.

Proposition 7 *As low ability legislators become more informed, fewer individual races are close.*

Finally, just like in the baseline model with privately informed low ability members, as n rises, fewer individual races become close for $q \leq \pi$.

Proposition 8 *With privately uninformed legislators, fewer individual races are close in larger groups than smaller groups.*

As the size of the group expands, more shared information is made available to the group in a PIE. Members of a larger group privilege their prior belief less than members of a smaller group. They therefore make the correct decision with a higher probability in large groups than in small groups. This means that the probability they select $y = 0$ declines as the group expands. For all $q > 1/2$, this probability approaches π as n becomes arbitrarily large. As a result, the decision of the group becomes less informative to voters and fewer races are close as n rises.

8 Conclusion

In *Federalist 70*, Alexander Hamilton expressed fear that members of a large collective decision-making body would have weaker incentives to act in the public interest than a single decision-maker because blame for an action deemed imprudent by the electorate could be placed on other members. In this paper I have shown that under certain conditions, what Hamilton recognized as a weakness of collective decision-making units can in fact be a strength. If voters are less informed about what policies are in their interest than those who they appoint to make decisions on their behalf, they may improperly punish those responsible for unpopular policies and improperly reward those responsible for popular policies. In this setting, the sharing of blame enables members of large legislatures to bear the electoral consequences of unpopular policies where executives or members of small legislatures cannot.

While this is a virtue of large decision-making units, the model does not imply that larger collectives necessarily choose better policies than small collectives or that expanding a group will necessarily improve its capacity to solve public problems. Whether any group of elected decision-makers can effectively solve problems or not can depend on the specific policy area, point in the election cycle, member preferences, and the competitiveness of each member's race for reelection.

The model provides a strong basis for several further extensions. A central feature of the model is the communication stage in which all members deliberate prior to voting on the policy to enact. In the contemporary U.S. Congress where the number of problems to address is large and members' time scarce, careful deliberation on every issue may be untenable. A natural extension would consider a setup in which members either do not communicate at all or deliberate only with a few members of the legislature. If members do not share the same beliefs about the best solution to the problem, the individual votes of the legislators may communicate useful information to voters about their representatives that they do not in the model with full deliberation. I have also assumed that high ability members always learn which policy is the correct response to any problem. Intuitively, as high ability members decline in ability, voter posterior beliefs should move closer to their prior as the expected decisions of higher ability groups become less distinct from the decisions of lower ability groups. If this conjecture is true, fewer races will be close if high ability members receive imperfect signals. Verifying this intuition is left for future work. Finally, in the public interest equilibrium I analyze, legislators always maximize the probability that the appropriate policy is selected to address a public problem. In a single period of legislation, which the model focuses on, a public interest equilibrium is clearly normatively desirable. It is maximally effective at optimizing policy today. Because all members endogenously share a collective reputation, it is much less effective at screening politicians who will choose optimal policies tomorrow. While beyond the scope of this paper, exploring equilibria that are more adept at selection is a natural avenue for further analysis of the model.

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