Delegates or Trustees? A Theory of Political Accountability

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Abstract

This paper explores how voters resolve a common dilemma they face on election day: the candidate perceived to be the most competent is not the one most likely to share their policy preferences. The way this dilemma is resolved affects the type of representation incumbents provide: when voters privilege competence, they encourage trustee representation, and when voters emphasize ideological congruence, they encourage delegate representation. Selection on competence is most likely to occur when uncertainty about the policy preferences of politicians is minimal. A surprising implication of our analysis is that ideological congruence between incumbents and voters is not a necessary precondition for trustee representation to be rewarded at the ballot box.

Suppose the public believes that a particular country is helping a terrorist organization acquire weapons of mass destruction. And suppose that the president's intelligence strongly suggests otherwise. If the president fails to attack the regime, she runs the risk of appearing out of step with public opinion. Yet, if the president attacks, she runs the risk of appearing inept if it is later revealed that the accused country was innocent. What will she do – attack or not attack?

In this paper, we show that the answer to this question depends on how the public reacts when an executive's policy choice indicates that she shares the public's policy preferences, yet, at the same time, suggests that she has poor judgement. If voters reward the executive with re-election, they encourage her to act as their *delegate*, i.e., she has an electoral incentive to ignore her expert judgement about which policies promote the general welfare, and instead simply to pursue whatever policies happen to be popular at the moment. Alternatively, if voters punish the executive for having chosen an initially-popular policy that turned out to be inappropriate, they encourage her to act as their *trustee*, i.e., she has an electoral incentive to use her expertise and pursue policies that she believes promote the general welfare. Thus, whether the public evaluates the executive based on the policies she chooses or the outcomes that her policies generate determines whether elections encourage her to behave as a delegate or a trustee.

In determining when voters will judge politicians on the basis of policies and when they will judge politicians on the basis of outcomes, we focus on two factors – the competence and preferences of politicians – that political theorists who study delegate and trustee representation have long recognized as playing a central role in elections. For example, in his critique of delegate representation, J.S. Mill (1962 [1861], 241) focused on the need for wise leaders, but noted that preferences also matter because voters "cannot be expected to postpone their particular opinions, unless in order that they be served by a person of superior knowledge to their own."[1]

[1] See Stokes 2001, for an excellent discussion of the thoughts of Edmund Burke, James Madison, Bernard Manin,

Formal theorists have also recognized the importance of preferences and competence, but existing models of accountability analyze these factors in isolation from each other.[2] In preference-based models (e.g., Morris 2001, Maskin and Tirole 2004, Fox 2007, Canes-Wrone and Shotts 2007), executives have incentives to act as delegates, and may shy away from pursuing policies that are in the public interest. In competence-based models (e.g., Canes-Wrone, Herron, and Shotts 2001; Prat 2005), when the appropriateness of an executive's policy choice is revealed before the next election, citizens vote on the basis of whether the policy generated good outcomes. That is, they employ outcome-based *retrospective voting*, taking "past performance as a prima facie indicator of the government's judgement and competence (or lack thereof)" (Fiorina 1981, 12).

These models are often lumped into the same general category – models of *accountability* – but it is important to note that they are actually quite different, because politicians' electoral incentives depend crucially on which factor, competence or preferences, voters are selecting on. At a purely technical level, our contribution is to synthesize, in the simplest way possible, previous competence-based and preference-based models of electoral accountability. Although our analysis is theoretical, it is rooted in real world issues, as shown by our opening example of a president who is deciding whether to attack a country that has allegedly promoted terrorism. Existing models, by focusing solely on either preferences or competence, simply cannot give a comprehensive analysis of situations where an executive's decision affects how voters evaluate her on both dimensions. The electoral implications of such executive decisions can be substantial, as noted in the *Economist's* commentary on the 2006 midterm elections in the United States:

and John Stuart Mill on whether citizens should evaluate candidates based on competence or preferences.

[2] One line of research analyzes policy competition and valence (Ansolabehere and Snyder 2000, Groseclose 2001, Aragones and Palfrey 2004). But politicians in valence models lack private information about optimal policies and precommit to platforms, so the models cannot be used to analyze retrospective voting and elected officials' roles as trustees or delegates.

> Even if the Democrats win both houses of Congress, Mr Bush will remain commander-in-chief. In the end, the national-security debate boils down to this. Voters doubt that the Democrats take terrorism as seriously as the Republicans do, but they also doubt that the Democrats could be as incompetent in fighting it. One recent poll showed that the Republicans' long-standing advantage as the party people trust to protect America had dwindled to nothing. That should scare the party of Dwight Eisenhower, Ronald Reagan and George Bush senior. (*Economist,* April 22, 2006)

In short, we develop a model to address the following questions: How will a voter vote when he is concerned about the incumbent's preferences as well as her competence? And how will the resulting electoral incentives determine the form of representation, trustee or delegate, provided by elected executives? Our analysis produces several novel results.

In our model, voters must sometimes trade off competence against ideological congruence. When voters privilege competence, they focus only on the outcomes of the policies lawmakers choose, rewarding good outcomes and punishing bad ones. And when voters privilege ideological congruence, they ignore outcomes, and instead hold incumbents to an ideological litmus test – rewarding them with reelection only if their policy positions signal congruence. Our primary result characterizes when voters select on the basis of outcomes and when they select on the basis of policy positions.

Importantly, the criteria upon which the voters select politicians affect the type of representation they receive. And somewhat paradoxically, even though trustee representation is preferred in our setting, voters often induce politicians to behave as delegates. We refer to this phenomenon as the *delegate trap*. More precisely, we show that for elections to promote trustee representation voters must judge incumbents on the basis of outcomes. Nonetheless, for vast swaths of our model's parameter space, the voters ignore outcomes and select on the basis of policy positions.

Fortunately, the delegate trap is not inevitable, and by taking the model's comparative statics,

we get a sense as to when it can be escaped. Specifically, we examine how variation in the model's parameters – the likelihood that lawmakers share the public's policy preferences, the extent to which skill and talent are common among politicians, and the degree to which reelection concerns drive incumbent behavior – affect the type of equilibria that result in our model.

A key lesson from the comparative static analysis is that ideological congruence is neither necessary or sufficient for elections to promote trustee representation. Instead, whether elections promote trustee representation hinges crucially on the degree of uncertainty the public has about the incumbent's policy preferences. As this uncertainty decreases, voters are more likely to reward lawmakers on the basis of outcomes rather than policy positions. The first implication of this finding is that when voters are very confident that the executive shares their preferences, elections will induce her to behave as a trustee. This is broadly consistent with previous analyses, in which preference congruence between a policymaker and her constituents promotes trust (Bianco 1994) and communication (Crawford and Sobel 1982, Mansbridge 1999). However, the second implication of the result is more surprising: elections can also promote trustee representation when the public is quite certain that the incumbent does *not* share its preferences. Accordingly, an increase in the probability that politicians share the public's preferences may fail to increase, and actually may decrease, the probability that the incumbent's policy choices promote the public interest.

The plan of the paper is as follows. After presenting the model, we characterize exactly when the public will judge lawmakers on the basis of policy and when they will judge lawmakers on the basis of outcomes. We then analyze the model's comparative statics. Finally, we conclude the paper with some broader implications of our analysis for the prospects of accountability in government.

The Model

To gain leverage on this paper's central questions, we consider a two-period model of policy choice in which the public can learn about both the competence and ideological congruence of an executive during her tenure in office. In each period, a single policy is determined. The incumbent politician must stand for re-election after the first period, and thus can be held accountable for her actions.

Voters are modelled as a single representative citizen. The citizen wants the incumbent to select a policy in each period that promotes his interests, but ultimately he seeks to elect a politician who will choose good policies in the future.[3] When deciding whether to re-elect the incumbent, the citizen thus uses all information available at the time of the election, including the incumbent's policy choice as well as information about the effects of the policy choice. We assume that the citizen perfectly learns before the next election whether the incumbent's policy choice promoted his interests. This assumption stacks the deck in favor of the citizen being able to use the electoral process to give the incumbent an incentive to act in the public interest.

Issues and Policies. On some issues, all actors share the same interests – i.e., there is an agreed upon common good. We refer to such issues as matters of *common values*. Other issues have an *ideological* component in that there is no agreed upon common good – i.e., different people have different policy objectives. In a given period, the (exogenous) probability that the government takes up a common values issue is β, and all actors know the nature of the issue being decided.[4]

Throughout our analysis, we focus on the case where, in the first period, the issue is ideological. (When the first period policy is non-ideological, all incumbents in our model act as trustees, a result that we do not emphasize because it parallels Canes-Wrone, Herron, and Shotts's (2001) analysis

[3] We use male pronouns for citizens and female pronouns for politicians.

[4] The assumption that the second-period issue may be one of common values ensures that voters value competence even among politicians who do not share their policy preferences.

of common values policymaking when there is near-certain feedback about the state of the world.) As such, all results and discussions about the nature of representation that follow apply only in situations where policymaking occurs on an ideological issue.

Once Nature determines the type of issue to be considered in a given period, the office holder selects one of two policies, $p \in \{A, B\}$. Which policy benefits the citizen depends on the underlying state of the world, which is determined by Nature. The state of world ω is either A or B, with $\Pr(\omega = A) = \gamma \in \left(\frac{1}{2}, 1\right)$. Policy p benefits the citizen when $p = \omega$, i.e., the citizen wants policy to match the state of the world. When the executive does this, we say that her policy choice is *appropriate*. Appropriate policies yield the citizen a payoff of 1, and inappropriate ones result in a payoff of 0.

Politicians. Politicians differ along three characteristics: policy preferences, competence, and desire for holding office. These characteristics determine a politician's type, which we denote by (t_p, t_c, t_o). On each of these characteristics, a politician can be one of two types, as follows.

All politicians share the public's policy preferences on matters of common value, but on ideological issues some politicians have preferences that diverge from the public's. These divergent politicians have preferences that are independent of the state of the world, with a bias in favor of policy B.[5] Such politicians are *non-congruent*, denoted $t_p = n$, whereas politicians who share the public's preferences on ideological issues are *congruent*, denoted $t_p = c$. All else equal, the citizen prefers congruent politicians.

Politicians also differ in their competence. Specifically, some can ascertain perfectly the state of the world, and others are less able to do so. We refer to the former as *skilled*, denoted $t_c = s$,

[5] We assume that politicians can only be biased in one direction because this assumption is predominant in previous literature, e.g., Austen-Smith 1992, Coate and Morris 1995, Morris 2001, and Stasavage 2007. Footnote 12 discusses how the model could be adapted to situations where politicians from each of two political parties are potentially biased in different directions.

and the latter as *unskilled*, denoted $t_c = u$. All else equal, the citizen prefers skilled politicians.

Asymmetries in skill affect policy choice as follows: At the start of each period, the office holder observes a signal $s \in \{A, B\}$ about the state of the world, the accuracy of which depends on her competence. For a skilled politician, $s = \omega$, i.e., the state of the world is revealed to her with certainty. In contrast, an unskilled politician receives a signal that is informative but noisy, where $\Pr(s = \omega) = q$. We assume that $q > \gamma$, so that for either $s = A$ or $s = B$, Bayes's Rule implies that $\Pr(\omega = s|s) > \frac{1}{2}$, i.e., the executive believes that her signal is probably correct. Thus, a politician aiming to choose the appropriate policy ($p = \omega$) maximizes her chances of doing so by following her signal. It is also worth noting that because $q > \gamma$ an unskilled politician in our model may actually be quite good at discerning what policies promote voters' interests. The only sense in which she is unskilled is that she is relatively less skilled than a $t_c = s$ politician.

Finally, politicians differ in the degree in which they are motivated by electoral considerations. Those that allow electoral considerations to determine their first-period policy choice are dubbed *ambitious*. Those that do not – and who instead allow policy considerations to determine their first-period policy choice – are dubbed *unambitious*. This heterogeneity can be motivated in a number of substantively plausible ways – for example, politicians may simply vary in the value they place on gaining reelection. Moreover, this heterogeneity plays an important role in the model. It ensures that an incumbent's policy choice is always somewhat informative of her underlying policy preferences, which is not only empirically realistic, but also rules out implausible equilibria that would exist if all politicians were solely motivated by re-election.[6]

We now summarize the incumbent's preferences. If she is ambitious, she gets 1 unit of utility if re-elected and 0 otherwise. If she is unambitious and congruent, she gets 1 unit of utility if

[6] An example of such an implausible equilibrium is one in which the voter re-elects the incumbent if and only if she selects policy B.

the first-period policy is $p = \omega$ and 0 otherwise, whereas if she is unambitious and non-congruent, she gets 1 unit of utility if $p = B$ and 0 otherwise. To reduce mathematical clutter, we do not include second-period policy in the politician's utility function, and instead simply assume that the second-period politician chooses the policy she most prefers.[7] The advantage of doing so is parsimony. The disadvantage is that we abstract away from some of the tradeoffs among ego rents, current policy considerations, and future policy considerations that would arise in a model where a politician's utility is a weighted average of these various factors.[8]

A politician's congruence, skill, and ambition are naturally known better by the politician herself than by the public, so we treat each politician's type as private information. Let $\phi \in (0,1), \theta \in (0,1)$, and $\alpha \in (0,1)$ be the prior probabilities that she is congruent, skilled, and ambitious, respectively. Both the incumbent and the challenger are drawn from the same pool of types, and a politician's three characteristics are drawn independently.

The sequence of the model is as follows: (1) Nature draws the incumbent's type and the challenger's type. (2) Nature draws the first-period state of the world ω, and the incumbent's signal s. (3) The incumbent chooses policy p. (4) The citizen observes p, learns ω, and decides whether

[7] To be precise, the incumbent has lexicographic preferences. An unambitious politician's first priority is first-period policy, and her second priority is second-period policy. An ambitious politician's first priority is to maximize her probability of winning re-election, her second priority is first-period policy, and her third priority is second-period policy.

[8] For example, in a model where incumbents care about second-period policy, an unskilled incumbent who cares a lot about policy might seek to lose office in the hopes that her replacement will be skilled. Such a phenomenon cannot arise in our model. Also, although our model abstracts away from the fact that incumbents can face tradeoffs between current policy and re-election, it can be thought of as a reduced form of a model that allows for such tradeoffs. In the Supplemental Appendix we analyze a model where incumbents vary in the value $v \in (0, \infty)$ that they place on re-election. In that model, *all* incumbents face tensions between policy and electoral objectives, yet the predictions are essentially identical to the ones that we present here.

to re-elect the incumbent. (5) Nature determines the type of issue to be considered in the second period; additionally, Nature draws the second-period state of the world, and the second-period office holder's signal. (6) The second-period office holder chooses policy.

Finally, we turn to our solution concept. Because the model concludes after the second period, we assume that the election winner selects her preferred policy. This allows us to analyze the model as a game of incomplete information between the incumbent and the voter. As such, our solution concept is Perfect Bayesian Equilibrium. A candidate for an equilibrium consists of the following elements: a strategy for the incumbent, which is a mapping from her type and her signal of the state into a policy choice; a strategy for the voter, which is mapping from the incumbent's policy choice and the realized state of the world into a decision of whether to reelect the incumbent; and a system of beliefs for the voter, which is a mapping from each policy and state combination into a probability distribution over the incumbent's type.

Results

As mentioned in the introduction, the literature on political representation has explored in depth two distinct relationships a policymaker can have with her constituents: she can act as their *trustee*, selecting policy based on her best judgement about how to promote the public interest, or she can act as a *delegate*, selecting policy based on the public's (potentially-mistaken) beliefs about the policy that best serves their interests. In our model, trustee representation is clearly preferable in terms of promoting good first-period policy decisions, because the citizen always wants the elected official to match $p = \omega$ and the best way for her to do this is by setting $p = s$. However, the mode of representation she adopts depends on electoral incentives. We show that even though the citizen would like a trustee, in equilibrium, elections often give the incumbent an incentive to act as a delegate. We refer to this phenomenon as the *delegate trap*.

To determine when the delegate trap arises, we proceed in three steps. First, we describe the citizen's selection problem as he decides whether to re-elect the incumbent, taking account of both her policy choice and its resulting outcome. Second, we demonstrate that our model has two types of equilibria, one in which the incumbent has an electoral incentive to act as a trustee and one in which she has an electoral incentive to act a delegate. Third, we characterize how equilibrium electoral incentives depend on the probabilities that politicians are congruent, skilled, and ambitious, as well as the probability that the issue decided in the second period is non-ideological.

The Citizen's Selection Problem

The citizen's expected second-period payoffs are determined by the election winner's type, particularly her competence and preferences. Because this is a two period game, the election winner simply selects her preferred policy in the second period. With probability β the second period issue is non-ideological, and the winner attempts to match policy to the state. With probability $(1-\beta)$ the second period issue is ideological; in such situations, congruent politicians attempt to match policy to the state, and non-congruent politicians simply select policy B. Let $y(t_p, t_c)$ denote the citizen's expected second-period payoff from electing a politician whose policy preferences and competence are characterized by t_p and t_c, respectively.

The ideal type of politician, from the voter's perspective, is one who is both congruent and skilled, because a (c, s) politician always selects the appropriate policy, thereby yielding $y(c, s) = 1$. The worst type of politician is non-congruent and unskilled. When the second period issue is one of common value, a (n, u) politician selects the appropriate policy with probability q, and when the issue is ideological, she selects the appropriate policy only when the state of the world is B, which occurs with probability $(1-\gamma)$, so that $y(n, u) = \beta q + (1-\beta)(1-\gamma)$. Similar derivations yield $y(c, u) = q$ and $y(n, s) = \beta + (1-\beta)(1-\gamma)$. The citizen's preference between a congruent

and unskilled (c, u) versus a non-congruent and skilled (n, s) politician depends on the model's parameters.

Recall that the citizen does not directly observe the incumbent's or challenger's type. However, at the time that he votes, he has observed the incumbent's policy choice and the first-period state of the world. Hence, the citizen updates his prior about the incumbent's type using his knowledge of the incumbent's strategy, her policy choice, and the realized state of the world. Using this updated belief, the citizen calculates his expected payoff from re-electing the incumbent. If his utility from the incumbent is greater than that from electing the challenger, the citizen keeps the incumbent; otherwise, he replaces her. Before proceeding to our main results, we state a lemma that clarifies the citizen's selection problem.

Lemma 1 *Fix the incumbent's strategy and fix the state of the world ω. Then either* ***(1)*** *the voter strictly prefers to re-elect the incumbent if $p = A$ and to remove her if $p = B$,* ***(2)*** *the voter strictly prefers to re-elect the incumbent if $p = B$ and to remove her if $p = A$, or* ***(3)*** *the voter is indifferent both when $p = A$ and when $p = B$.*

Details of all proofs are in the appendix. The intuition for this lemma is the following. The incumbent's type is independent of the state of the world. Thus, given ω, if the voter updates positively on the incumbent when $p = A$, he must update negatively when $p = B$, and vice versa. And because the incumbent and challenger are drawn from the same pool, this means that for any given state of the world, at most one policy, A or B, can guarantee re-election.

Delegate and Trustee Equilibria

We focus on pure strategy equilibria, which always exist in our model.[9] From Lemma 1, we know there are four possible types of citizen behavior: re-elect if and only if $p = A$, re-elect if and only if $p = \omega$, re-elect if and only if $p = B$, and re-elect if and only if $p \neq \omega$. We focus on the first two types.[10] Which type of equilibrium occurs will have a major effect on electoral incentives, which in turn determine the policymaking behavior of electorally ambitious incumbents.

In the first type of equilibrium, the citizen selects on the basis of policy, re-electing the incumbent whenever she chooses the policy that the citizen believes is best, $p = A$. Thus, the incumbent maximizes her chances of re-election by following public opinion, always choosing policy A, even though doing so when her signal is B requires her to go against her expert judgement about how best to promote the citizen's interests. Because the incumbent is electorally rewarded for simply following the public's prior belief about which policy is best, we call this a *delegate equilibrium.*

In the second type of equilibrium, the citizen selects on the basis of outcomes – i.e., she votes *retrospectively* as defined by Fiorina 1981, reelecting the incumbent if and only if the policy she chose improves the citizen's welfare. Since the incumbent is re-elected when her policy choice matches the state of the world, she maximizes her re-election prospects by following her private signal, choosing policy $p = s$. Because the incumbent is electorally rewarded for using her expert judgement when choosing policy, we call this a *trustee equilibrium.* The following lemmas, which

[9] Mixed-strategy equilibria do exist, but only for knife-edge parameter values. See the Supplemental Appendix for details.

[10] There cannot exist an equilibrium in which the citizen re-elects if and only if $p = B$, because only non-ambitious congruent incumbents would choose $p = A$, and the voter would prefer to re-elect when $p = \omega = A$. An equilibrium in which the citizen re-elects if and only if $p \neq \omega$ can exist if politicians are sufficiently likely to be ambitious. Such an equilibrium is similar to the equilibrium in which the incumbent wins re-election if and only if $p = \omega$, with one perverse, and empirically implausible, difference – the incumbent strives to show that she is high quality by picking the *wrong* policy.

follow from our preceding discussion, summarize behavior in delegate and trustee equilibria.

Lemma 2 *(Delegate Equilibria) In an equilibrium where the citizen re-elects if and only if the incumbent selects policy A:*

1. *All ambitious politicians select policy A regardless of their signals.*

2. *All unambitious politicians select their preferred policy: congruent politicians follow their signals and non-congruent politicians select policy B.*

Lemma 3 *(Trustee Equilibria) In an equilibrium where the citizen reelects if and only if the incumbent's policy choice was appropriate ($p = \omega$):*

1. *All ambitious politicians follow their signals.*

2. *All unambitious politicians select their preferred policy: congruent politicians follow their signals and non-congruent politicians select policy B.*

Table 1 summarizes the relationship between the characteristic of politicians that voters select on (either preferences or competence), equilibrium voting behavior (based on either the policies chosen by the incumbent or the resulting outcomes), and equilibrium policy making behavior of electorally-ambitious incumbents (whether such incumbents use their expertise). What Lemmas 2 and 3 make clear is that outcome-based retrospective voting is necessary for elections to promote trustee representation.

Table 1: Equilibria

	Type of Equilibrium	
	Delegate	Trustee
Voter's primary concern	Preferences	Competence
Basis for voter's electoral decision	Policies	Outcomes
Behavior of ambitious politicians	Choose A	Follow signal

Representation and the Delegate Trap

We now give a detailed characterization of equilibria. The main result of this section, Proposition 1, shows how equilibrium policy making behavior depends on the parameters of the model. Before formally stating this result, we briefly sketch the two key lessons it offers about the possibility of trustee representation.

The first lesson is somewhat pessimistic: for wide swaths of the model's parameter space, the only equilibrium of the model is a delegate equilibrium. In such equilibria, executives are willing to sacrifice their reputation for having good judgment in order to signal their ideological congruence with the public. While earlier work has suggested that politicians may be rewarded for such posturing (e.g., Maskin and Tirole 2004, Fox 2007), in these models politicians differ only in their policy preferences. Hence, we show this logic is robust – it holds even in an environment where, in addition to worrying about the public's perception of their policy preferences, politicians must also worry about the public's perception of their competence.

The second lesson is the delegate trap is not inevitable, i.e., under some conditions trustee representation is possible. Namely, when the fraction of skilled politicians in the candidate pool is sufficiently large, elections provide incentives for politicians to utilize their expertise. In particular,

Proposition 1 shows that the minimum fraction of skilled politicians necessary to sustain a trustee equilibrium depends on three key parameters of the model: the fraction of ambitious politicians (α) and the fraction of congruent politicians (ϕ) in the candidate pool, and the likelihood that issues taken up in the future are of common value (β). Exactly how these parameters influence the skill threshold necessary to sustain a trustee equilibrium is dealt with in the next section, where we take the model's comparative statics.

To formally state our proposition, we define a function g, where

$$g(\alpha, \beta, \phi) \equiv \max \left\{ \frac{(1-\phi)[y(c,u) - y(n,u)]}{\phi[y(c,s) - y(c,u)] + (1-\phi)[y(n,s) - y(n,u)]} \cdot \frac{\phi(1-\alpha)}{\phi + \alpha(1-\phi)}, 1 \right\}.$$

Note that g is non-increasing in the fraction of ambitious politicians in the candidate pool (α), so for all $\alpha \in (0,1)$, $0 < g(\alpha, \beta, \phi) \leq g(0, \beta, \phi)$.

Proposition 1 *(Existence) There exists a delegate equilibrium if and only if $\theta \leq g(0, \beta, \phi)$, and there exists a trustee equilibrium if and only if $\theta \geq g(\alpha, \beta, \phi)$.*

[[Figure 1 about here]]

As shown in Figure 1, the minimum proportion of skilled politicians necessary to sustain a trustee equilibrium is $g(\alpha, \beta, \phi)$, and the maximum proportion that can sustain a delegate equilibrium is $g(0, \beta, \phi)$.[11] Thus, the public judges incumbents on the basis of the outcomes of their policy choices, as opposed to the policies themselves, only when skill is sufficiently common among politicians. Otherwise, outcome-based retrospective voting is not time-consistent, and the delegate

[11] For intermediate proportions of skilled politicians, i.e., $\theta \in [g(\alpha, \beta, \phi), g(0, \beta, \phi)]$, it is possible to have either a trustee equilibrium or a delegate equilibrium. In such circumstances, if the citizen expects the incumbent to use her private information to promote his interests, then ambitious incumbents will indeed do so, anticipating electoral rewards whenever $p = \omega$. If, however, the citizen expects the incumbent to ignore her private information and posture in an attempt to prove that she shares his preferences, then ambitious incumbents will indeed do so, setting $p = A$.

trap arises: incumbents have an incentive to blindly follow public opinion despite the fact that the citizen would prefer that they use their expertise.

Intuition for Proposition 1. To see why outcome-based retrospective voting, and hence a trustee equilibrium, cannot be sustained unless politicians are likely to be skilled, suppose that politicians expect to be rewarded when they choose appropriate policies and punished when they choose inappropriate ones. Given these electoral incentives, all incumbents will follow their signals, with the exception of unambitious non-congruent ones, who select policy B regardless of their private information.

Note that retrospective voting requires the citizen to remove an incumbent who inappropriately chooses policy $p = A$ when the state of the world is $\omega = B$. However, given the policymaking behavior that arises when incumbents expect to be judged on the basis of outcomes, the citizen will do so only when politicians are sufficiently likely to be skilled ($\theta > g(\alpha, \beta, \phi)$).

The reason the citizen might stand by an incumbent who chooses policy A inappropriately is that although he updates *unfavorably* about her competence because her policy choice was inappropriate, he updates *favorably* about her congruence because her policy was in step with public opinion. Hence, from the citizen's perspective, when $p = A$ and $\omega = B$, removing the incumbent is is a risky gamble, with both a potential upside – the challenger may turn out to be both congruent and skilled – and a potential downside – the challenger may turn out to be both non-congruent and unskilled. And when skill is insufficiently common, i.e., θ is low, the downside of removing the incumbent outweighs the upside, as it is unlikely that the challenger is skilled.

Interpretation of Proposition 1. It may seem that Proposition 1 simply tells us that citizens will sometimes stick with a politician known to be unskilled because they have a favorable perception of her ideological congruence. While the proposition does indeed say this, it also tells us much more. Specifically it tells us *when* voters will place a premium on ideological congruence over competence.

For example, Figure 1 illustrates that the competence threshold that must be met for elections to induce trustee behavior is explicitly linked to the degree of uncertainty about lawmakers' policy preferences – i.e., $g(\alpha, \beta, \phi)$ is highly dependent on the probability of congruence ϕ. And it turns out that there's something quite surprising here, as suggested by the nonmonotonic shape of $g(\alpha, \beta, \phi)$: trustee equilibria are easiest to sustain when executives are either *very likely* (high values of ϕ) or *very unlikely* (low values of ϕ) to share voters' policy preferences. The logic behind this result, as well as other comparative statics of the model, is discussed in the next section.

Second, and more subtly, it is worth noting that uncertainty about competence promotes trustee representation whereas uncertainty about preferences hinders trustee representation. To see why, suppose the voter knows the incumbent's competence. Then the only information signaled by an incumbent's policy choice is information about her congruence, so trustee equilibria cannot exist. Hence, to escape the delegate trap, uncertainty about an incumbent's skill is crucial. Such uncertainty makes the incumbent worry about choosing policies that fail to promote voters' interests and makes it possible that voters will judge incumbents on the basis of outcomes as opposed to policies.[12]

Comparative Statics

We now discuss how various parameters of the model affect $g(\alpha, \beta, \phi)$, the minimum fraction of skilled politicians in the candidate pool necessary to sustain a trustee equilibrium.

[12] It should also be noted that although our model only allows non-congruent politicians to be biased in one particular direction, i.e., in favor of policy B, it can also be used to address situations where politicians can be biased in either direction. For example, consider a variant with two political parties, one composed of politicians who are either congruent or biased in favor of policy A and another composed of politicians who are either congruent or biased in favor of policy B. So long as the voter does not have a strong ex ante preference for one party, our analysis applies to such a partisan model, and all of our main results continue to hold.

Proposition 2 *(Comparative Statics) The minimum fraction of skilled politicians in the candidate pool necessary to sustain a trustee equilibrium is* ***(1)*** *decreasing in the fraction of ambitious politicians in the candidate pool* (α)*,* ***(2)*** *decreasing in the likelihood that future issues are of common value* (β)*, and* ***(3)*** *single peaked in the fraction of congruent politicians in the candidate pool* (ϕ)*, with* $\lim_{\phi \to 0} g(\alpha, \beta, \phi) = \lim_{\phi \to 1} g(\alpha, \beta, \phi) = 0$.

In any trustee equilibrium, three conditions must be satisfied. First, all politicians follow their signals, except unambitious non-congruent ones, who rigidly select policy B. Second, the citizen votes retrospectively when the state of the world is A. Third, the citizen votes retrospectively when the state of the world is B, replacing the incumbent when $p = A$ and keeping her when $p = B$. Only the third condition is sensitive to the model's parametrization, so understanding the voter's decision calculus when $p = A$ and $\omega = B$ is the key to understanding this proposition.

Recall that when all incumbents except the non-congruent and unambitious follow their signals, as is the case in a trustee equilibrium, a citizen who observes $p = A$ and $\omega = B$ draws a favorable inference about the incumbent's congruence and an unfavorable inference about her skill. Thus, in deciding whether to replace the incumbent when $p = A$ and $\omega = B$, the citizen must weigh the cost of downgrading on congruence against the benefit of upgrading on skill. In the following discussion, we focus on how variation in each of the model's parameters influences this tradeoff.

The Proportion of Ambitious Politicians (α)**.** In a trustee equilibrium, increasing the likelihood that the incumbent is ambitious decreases the signaling effect of selecting policy A when the state of the world is B. If $\alpha = 0$, meaning that no politicians are ambitious, only politicians who are both unskilled and congruent select $p = A$ when $\omega = B$; hence, upon observing $p = A$ and $\omega = B$, the citizen knows for sure that the incumbent is congruent. However, as α increases, the probability that an unskilled and non-congruent politician selects A when the state is B in a trustee equilibrium increases, and, in turn, the weight the citizen attaches to the incumbent being

congruent decreases. This reduces the citizen's concern over downgrading on congruence if she elects the challenger, so she is more willing to elect the challenger in the hopes of upgrading on skill after observing $p = A$ and $\omega = B$. Thus, the more likely politicians are to be ambitious, the lower is the skill cutoff $g(\alpha, \beta, \phi)$ necessary to sustain a trustee equilibrium.

The Probability of a Common Values Issue in the Second Period (β). Increasing the likelihood that future issues are non-ideological increases the importance of electing a skilled politician. Hence, the greater is β, the greater is the benefit of upgrading on skill, so as β increases, $g(\alpha, \beta, \phi)$ decreases, i.e., a trustee equilibrium can be sustained for a smaller probability θ that politicians are skilled. Put differently, when skill is likely to be valued in the *future*, the voter rewards demonstrations of skill – i.e., the matching of policy to the state – in the *present*, even though the issue at hand is ideological in nature. This comparative static links the type of representation that a lawmaker provides at time t to expectations about the issues to be dealt with at time $t + 1$, an implication that future empirical research on over time variation in the behavior of policy makers may wish to take into account.

The Proportion of Congruent Politicians (ϕ)**.** Proposition 2 shows that $g(\alpha, \beta, \phi)$ is smallest when ϕ is very close to either 0 or 1. In other words, a trustee equilibrium is easiest to sustain when politicians are either extremely likely to be congruent or extremely unlikely to be congruent.

The fact that trustee representation occurs when the probability of congruence is very high, i.e., $\phi \approx 1$, is not surprising given previous work. As Mansbridge (1999) notes in her analysis of race, gender, and representation, descriptive representation by politicians who are highly likely to share their constituents' preferences facilitates trust between a lawmaker and her constituents, and this trust enhances the lawmaker's ability to pursue policies she believes to be in her constituents' best interest. Bianco (1994, Figure 5, p. 81) goes further; in his model, a high probability of preference congruence is not only a sufficient condition, but also a necessary condition, for an equilibrium in

which the incumbent is not electorally punished when she goes against voters' prior beliefs about what policies best promote their interests.[13] Both of these works have a flavor similar to Crawford and Sobel (1982), which shows that communication between two parties becomes more difficult as their preferences diverge.

However, from Proposition 2 and Figure 1, we see that although high congruence is a sufficient condition for a trustee equilibrium in our model it is, quite surprisingly, not a necessary condition. Specifically, if congruence is extremely likely then the only equilibrium is a trustee equilibrium, and if congruence is extremely unlikely there exist both a delegate equilibrium and a trustee equilibrium, whereas for moderate probabilities of congruence the only equilibrium is a delegate equilibrium.[14]

Why is it possible to have a trustee equilibrium in the absence of congruence? When the incumbent is extremely unlikely to be congruent, it is difficult for her to signal that she is in fact congruent. Thus, if the public expects incumbents to follow their signals, a failure to do so will have a marginal impact, at best, on the public's perception of the incumbent's ideological congruence. However, failure to follow one's signal *will* make it more likely that the chosen policy does not match the state of the world, an event that leads the public to downgrade on the incumbent's competence. Hence, trustee equilibria can be sustained even in the absence of congruence. It is interesting to note that there are examples of politicians with preferences that are clearly non-congruent with their electorates who win re-election because they have a proven track record of competence, the

[13] Bianco's model differs from ours in that he assumes there is no variation in incumbent competence, voters never learn whether a policy succeeded, and voters are not forward-looking. However, in insightful discussions outside the scope of his model (e.g., p. 79) he explores the implications of the fact that voters may draw inferences about an incumbent's type based on her actions.

[14] To be precise, fix $\theta < \max_{\phi \in (0,1)} g(\alpha, \beta, \phi)$. Then there exist ϕ_1, ϕ_2, and ϕ_3, where $\phi_1 < \phi_2 < \phi_3$, and the equilibrium depends on congruence as follows: if $\phi < \phi_1$ there exist both a delegate equilibrium and a trustee equilibrium, if $\phi \in (\phi_1, \phi_2)$ there is only a delegate equilibrium, if $\phi \in (\phi_2, \phi_3)$ there exist both a delegate equilibrium and a trustee equilibrium, and if $\phi > \phi_3$ there is only a trustee equilibrium.

canonical example being Republican Rudy Giuliani, former mayor of New York City.

Conclusions

We have developed a new model of electoral accountability, one in which voters are concerned about both the competence and preferences of elected officials. The model illuminates when voters will judge incumbents on the basis of the outcomes of their policy choices as opposed to just the policy choices themselves. The model also makes explicit the connection between the mode of electoral selection and the type of representation – delegate or trustee – the public receives. We conclude by discussing two additional implications of our analysis.

On Institutional Reforms to Encourage Retrospective Voting. To induce officials to act as trustees, citizens must vote retrospectively, judging incumbents by the outcomes they generate as opposed to the policies they pursue. However, often in American politics, it appears that the public does not judge officials on the consequences of their policy initiatives. Almost three decades ago, Morris Fiorina (1980, 46) argued that

> We hold our politicians individually accountable for the proposals they advocate, but less so for the adoption of those proposals, and not at all for overseeing the implementation of those proposals and the evaluation of their results. In contemporary America officials do not govern, they merely posture.

Many would assert that the above quote aptly characterizes contemporary politics as well.

Fiorina attributed the lack of retrospective voting to the fact that decentralized political parties and America's system of separated powers obscure responsibility for policy outcomes. While being able to assign responsibility for outcomes is surely a *necessary* condition for citizens to vote retrospectively – see, e.g., Berry and Howell's (2007, pp. 847-8) discussion of how retrospective

voting in nonpartisan school board elections may be facilitated by information available to voters as well as by board members' clear, single-issue job responsibilities – our work demonstrates that such knowledge is not *sufficient*. Accordingly, attempts to resurrect retrospective voting via increased governmental accountability, whether through the civic mindedness of the electorate or via institutional reforms that decrease the incidence of divided government, may simply be of no avail.

Recall that in our model, a unitary executive has sole control over the instruments of public policy. In addition, the public always learns whether the incumbent's policy choice was appropriate. Together, these factors enable the public to assign responsibility for outcomes, yet outcome-based retrospective voting is often time-inconsistent. There are three root causes of this tension in our model: First, the executive possesses better information than the public about the appropriateness of alternative policy courses. Second, the executive's information is not necessarily perfect. Third, the public is uncertain of the executive's underlying policy preferences.

Little can be done to alleviate the first two causes; both are inevitable aspects of policymaking in numerous policy domains, particularly in matters of foreign policy. Thus, institutional change can only realistically address the third issue, preference uncertainty. Accordingly, in thinking about how political institutions structure electoral incentives, one must pay careful attention to their effects on the public's information about the policy preferences of lawmakers. Institutional features that reduce uncertainty about politicians' preferences encourage them to behave as trustees, whereas institutions that increase uncertainty will encourage them to behave as delegates.

For example, there has been much debate about the normative consequences of the recent trend towards increased ideological homogeneity within the Democratic and Republican congressional delegations (McCarty, Poole, and Rosenthal 2006). While there are surely many costs associated with this trend, one potential benefit our model suggests is that as uncertainty about each party's underlying preferences declines, the public becomes more able to credibly commit to judging the

parties on the basis of the success, or failure, of their policies.

On the Relationship Between Electoral Ambition and Congruence. Politicians are often criticized both for being too concerned about re-election (e.g., Fearon 1999) *and* for being insufficiently concerned about re-election (e.g., Dickerson 2005). Our model provides an explanation for this paradox, by predicting when ambition will be valued in a politician – namely, when it is clear that she is likely to have policy preferences that differ from her constituents. Otherwise, the perception that she is too ambitious can harm her electoral prospects.

The rationale for this prediction is straightforward. The only reason a non-congruent politician would use her information to promote her constituents' interests is if she wishes to be re-elected. In contrast, a congruent politician will naturally tend to promote her constituents' interests, unless electoral ambition, combined with electoral incentives to act as a delegate, induces her to posture and choose popular policies that actually harm her constituents' interests.

Appendix

Before presenting the proofs, we first introduce some notation and then show how Bayes's Rule is used to calculate voter beliefs in various information sets. Write $\pi(t_p, t_c|p, \omega)$ for the probability the citizen assigns to the incumbent's type being (t_p, t_c) when the incumbent's policy choice is p and the state of the world is ω. Having observed (p, ω), the citizen's expected payoff from re-electing the incumbent is $U_I(p, \omega) \equiv \sum_{t_p,t_c} y(t_p, t_c)\pi(t_p, t_c|p, \omega)$. The citizen re-elects the incumbent if $U_I(p, \omega)$ is greater than that from electing the challenger, $U_{CH} \equiv y(c, s)\phi\theta + y(c, u)\phi(1-\theta) + y(n, s)(1-\phi)\theta + y(n, u)(1-\phi)(1-\theta)$

We now turn to illustrating how updating works in our model. For example, in a delegate equilibrium, if $\omega = A$, then the incumbent plays $p = A$ in the following situations: with probability $\phi\theta$ she is congruent and skilled; with probability $\phi(1-\theta)(\alpha + (1-\alpha)q)$ she is congruent, unskilled, and either ambitious or receives the correct signal; with probability $(1-\phi)\theta\alpha$ she is non-congruent, skilled, and ambitious; and with probability $(1-\phi)(1-\theta)\alpha$ she is non-congruent, unskilled, and ambitious. Applying Bayes's Rule yields voter beliefs for a delegate equilibrium when $p = A$ and $\omega = A$, e.g., $\pi(c, s|A, A) = \frac{\phi\theta}{\phi[\alpha+(1-\alpha)(\theta+(1-\theta)q)]+(1-\phi)\alpha}$.

On the other hand, in a trustee equilibrium, if $\omega = A$, then the incumbent plays $p = A$ in the following situations: with probability $\phi\theta$ she is congruent and skilled; with probability $\phi(1-\theta)q$ she is congruent, unskilled, and receives the correct signal; with probability $(1-\phi)\theta\alpha$ she is non-congruent, skilled, and ambitious; and with probability $(1-\phi)(1-\theta)q\alpha$ she is non-congruent, unskilled, ambitious, and receives the correct signal. Applying Bayes's Rule yields voter beliefs for a trustee equilibrium when $p = A$ and $\omega = A$, e.g., $\pi(c, s|A, A) = \frac{\phi\theta}{\phi[\theta+(1-\theta)q]+(1-\phi)\alpha[\theta+(1-\theta)q]}$. Rather than detailing all of the beliefs for different values of p and ω used in the proofs that follow, we simply plug in the relevant ones wherever they are needed.

Proof of Lemma 1. Since ϕ and θ are the same for all politicians, and ω is independent of the in-

cumbent's type, $U_{CH} = U_I = \Pr(p = A|\omega) U_I(A,\omega) + \Pr(p = B|\omega) U_I(B,\omega) = \Pr(p = A|\omega) U_I(A,\omega) + (1 - \Pr(p = A|\omega)) U_I(B,\omega)$. Since U_{CH} is a convex combination of $U_I(A,\omega)$ and $U_I(B,\omega)$ the lemma holds.■

The next four lemmas prove Proposition 1.

Lemma 4 *For any p, ω, if $\pi(c,s|p,\omega) + \pi(c,u|p,\omega) \geq \phi$, $\pi(c,s|p,\omega) + \pi(n,s|p,\omega) \geq \theta$, and $\pi(c,s|p,\omega) \geq \phi\theta$, with at least one inequality strict, then the citizen's expected utility from the incumbent given p and ω is strictly greater than his expected utility from the challenger.*

Proof. The voter's expected utility from re-electing the incumbent given p and ω is simply his expected utility from each of the possible types of incumbents, weighted by his beliefs about the incumbent's type

$$\begin{aligned} U_I(p,\omega) &= \pi(c,s|p,\omega) y(c,s) + \pi(c,u|p,\omega) y(c,u) + \pi(n,s|p,\omega) y(n,s) + \pi(n,u|p,\omega) y(n,u) \\ &= \pi(c,s|p,\omega)[\beta + (1-\beta)] + \pi(c,u|p,\omega)[\beta q + (1-\beta) q] \\ &\quad + \pi(n,s|p,\omega)[\beta + (1-\beta)(1-\gamma)] + \pi(n,u|p,\omega)[\beta q + (1-\beta)(1-\gamma)]. \end{aligned}$$

Substituting $\pi(n,u|p,\omega) = 1 - \pi(c,s|p,\omega) - \pi(c,u|p,\omega) - \pi(n,s|p,\omega)$ and simplifying yields $U_I(p,\omega) = \beta q + (1-\beta)(1-\gamma) + (1-\beta)(q+\gamma-1)[\pi(c,s|p,\omega) + \pi(c,u|p,\omega)] + \beta(1-q)[\pi(c,s|p,\omega) + \pi(n,s|p,\omega)] + (1-q)(1-\beta)\pi(c,s|p,\omega)$. Since $(1-\beta)(q+\gamma-1) > 0$, $\beta(1-q) > 0$, and $(1-q)(1-\beta) > 0$, the result holds.■

Lemma 5 *In either a delegate or trustee equilibrium the voter strictly prefers to re-elect the incumbent when $p = A$ and $\omega = A$.*

Proof. By Lemma 4 it suffices to show **(1)** $\phi < \pi(c,s|A,A) + \pi(c,u|A,A)$, **(2)** $\theta < \pi(c,s|A,A) + \pi(n,s|A,A)$, and **(3)** $\phi\theta < \pi(c,s|A,A)$. For a delegate equilibrium, **(1)** $\phi < \frac{\phi[\alpha+(1-\alpha)(\theta+(1-\theta)q)]}{\phi[\alpha+(1-\alpha)(\theta+(1-\theta)q)]+(1-\phi)\alpha}$, as $\alpha < \alpha + (1-\alpha)(\theta + (1-\theta)q)$, **(2)** $\theta < \frac{\theta[\alpha+(1-\alpha)\phi]}{\theta[\alpha+(1-\alpha)\phi]+(1-\theta)[\alpha+(1-\alpha)\phi q]}$, as $\alpha + (1-\alpha)\phi q <$

$\alpha + (1-\alpha)\,\phi$, and **(3)** $\phi\theta < \frac{\phi\theta}{\phi\theta+\phi(1-\theta)[\alpha+(1-\alpha)q]+(1-\phi)\alpha}$, as the denominator is less than one. For a trustee equilibrium, **(1)** $\phi < \frac{\phi[\theta+(1-\theta)q]}{\phi[\theta+(1-\theta)q]+(1-\phi)\alpha[\theta+(1-\theta)q]}$, as $\alpha\,[\theta + (1-\theta)\,q] < \theta + (1-\theta)\,q$, **(2)** $\theta < \frac{\theta[\phi+(1-\phi)\alpha]}{\theta[\phi+(1-\phi)\alpha]+(1-\theta)q[\phi+(1-\phi)\alpha]}$, as $q[\phi + (1-\phi)\,\alpha] < \phi + (1-\phi)\,\alpha$, and **(3)** $\phi\theta <$ $\frac{\phi\theta}{\phi\theta+\phi(1-\theta)q+(1-\phi)\theta\alpha+(1-\phi)(1-\theta)\alpha q}$, as the denominator is less than one.■

Lemma 6 *There exists a delegate equilibrium if and only if* $\theta \leq g(0,\beta,\phi)$.

Proof. Lemma 2 (see the main text) establishes optimality of the incumbent's strategy and Lemmas 1 and 5 prove optimality of voter behavior when $\omega = A$. What remains is to confirm that it is optimal for the voter to re-elect the incumbent iff $p = A$ when $\omega = B$. By Lemma 1, it is sufficient to show that $U_I\,(B,B) \leq U_{CH}$. First, we rearrange terms:

$$\begin{aligned} U_I\,(B,B) &= \pi\,(c,s|B,B)\,y\,(c,s) + \pi\,(c,u|B,B)\,y\,(c,u) + \pi\,(n,s|B,B)\,y\,(n,s) + \pi\,(n,u|B,B)\,y\,(n,u) \\ &= \frac{1}{\phi\theta + q\phi\,(1-\theta) + (1-\phi)\,\theta + (1-\phi)\,(1-\theta)}\cdot \\ &\quad [\phi\theta y\,(c,s) + q\phi\,(1-\theta)\,y\,(c,u) + (1-\phi)\,\theta y\,(n,s) + (1-\phi)\,(1-\theta)\,y\,(n,u)] \\ &= \frac{1}{1-\phi\,(1-q)\,(1-\theta)}\cdot [U_{CH} - (1-q)\,\phi\,(1-\theta)\,y\,(c,u)]\,. \end{aligned}$$

Using this fact, algebra establishes that $U_I\,(B,B) \leq U_{CH}$ if and only if $\theta \leq$ $\frac{(1-\phi)[y(c,u)-y(n,u)]}{\phi[y(c,s)-y(c,u)]+(1-\phi)[y(n,s)-y(n,u)]}$. Accordingly, a delegate equilibrium exists if and only if $\theta \leq g(0,\beta,\phi)$.■

Lemma 7 *There exists a trustee equilibrium if and only if* $\theta \geq g\,(\alpha,\beta,\phi)\,.$

Proof. By reasoning as in the proof of Lemma 6, we only need $U_I\,(A,B) \leq U_{CH}$. When $\omega = B$, there are two ways the incumbent plays $p = A$ in a trustee equilibrium: she is congruent, unskilled, and $s = A$ or she is non-congruent, unskilled, ambitious, and $s = A$. Thus

$$\begin{aligned} U_I\,(A,B) &= \pi\,(c,u|A,B)\,y\,(c,u) + \pi\,(n,u|A,B)\,y\,(n,u) \\ &= \frac{1}{\phi + (1-\phi)\,\alpha}\,[\phi y\,(c,u) + (1-\phi)\,\alpha y\,(n,u)]\,. \end{aligned}$$

A trustee equilibrium requires $U_I(A,B) \leq U_{CH}$. Algebra establishes that this is so if and only if $\theta \geq \frac{\phi(1-\alpha)}{\alpha+\phi(1-\alpha)} \cdot \frac{(1-\phi)[y(c,u)-y(n,u)]}{\phi[y(c,s)-y(c,u)]+(1-\phi)[y(n,s)-y(n,u)]}$. Accordingly, a trustee equilibrium exists if and only if $\theta \geq g(\alpha,\beta,\phi)$.■

Proof of Proposition 2. Substituting for $y(\cdot,\cdot)$ we have $g(\alpha,\beta,\phi) = \frac{(1-\phi)(1-\beta)(q+\gamma-1)}{\phi(1-q)+(1-\phi)\beta(1-q)} \cdot \frac{\phi(1-\alpha)}{\phi+\alpha(1-\phi)}$.

Part 1. The sign of $\frac{\partial g(\alpha,\beta,\phi)}{\partial \alpha}$ depends only on the sign of the derivative of $\frac{\phi(1-\alpha)}{\phi+\alpha(1-\phi)}$ with respect to α, which is negative. **Part 2.** The sign of $\frac{\partial g(\alpha,\beta,\phi)}{\partial \beta}$ depends only on the sign of the derivative of $\frac{(1-\phi)(1-\beta)(q+\gamma-1)}{\phi(1-q)+(1-\phi)\beta(1-q)}$ with respect to β, which is negative. **Part 3.** By inspection, it is obvious that $\lim_{\phi\to 0} g(\alpha,\beta,\phi) = \lim_{\phi\to 1} g(\alpha,\beta,\phi) = 0$. To show that g is single peaked we begin by differentiating: $\frac{\partial g}{\partial \phi} = \frac{-(1-\beta)(q+\gamma-1)(1-q)}{[\phi(1-q)+(1-\phi)\beta(1-q)]^2} \cdot \frac{\phi(1-\alpha)}{\phi+\alpha(1-\phi)} + \frac{(1-\phi)(1-\beta)(q+\gamma-1)}{\phi(1-q)+(1-\phi)\beta(1-q)} \cdot \frac{(1-\alpha)\alpha}{(\phi+\alpha(1-\phi))^2}$. Algebra establishes that $\frac{\partial g}{\partial \phi} \geq 0 \Leftrightarrow (1-\phi)^2\alpha\beta - \phi^2 \geq 0$. The left hand side is positive when $\phi = 0$, negative when $\phi = 1$, and decreasing in ϕ, so g is single peaked.■

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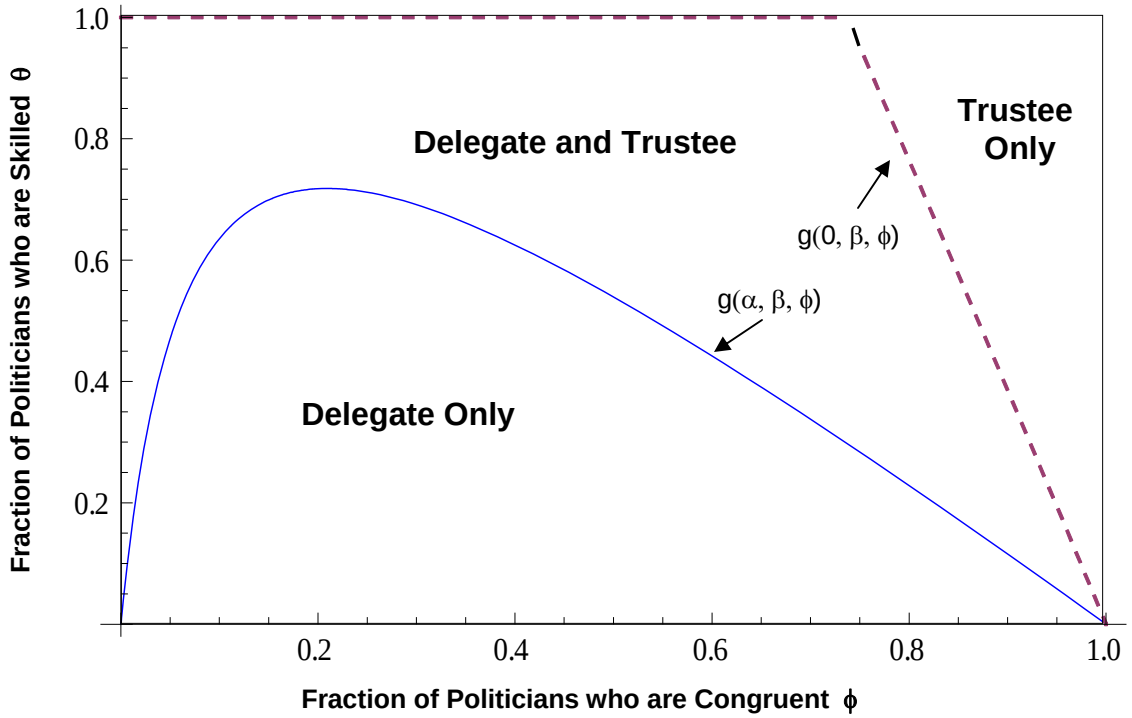
Figure 1: Delegate and Trustee Equilibria



Key: solid line is $g(\alpha, \beta, \phi)$, dashed line is $g(0, \beta, \phi)$

Parameter values for the figure: $\alpha = 0.7$, $\beta = 0.1$, $\gamma = 0.8$, $q = 0.85$