Political Capital

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Abstract

An organization must make a binary choice in each of two periods. The optimal choice depends on an unknown state of nature. The leader of the organization has a stock of political capital and observes a private signal of the state. The leader faces an intertemporal choice problem. She may choose to spend (some of) her political capital to increase the probability that the choice is not the one that would otherwise be made. Her political capital increases if the decision is correct ex post. We characterize the optimal use of political capital by the leader and how it evolves over time. We identify different leadership styles that depend on the initial stock of capital of the leader, the precision of her information, and the importance of the issue to her. We study how differing leadership styles determine the evolution of power within the organization. Finally, we consider issues of optimal organizational design that structure the allocation of power to a leader.

Keywords: Organizations, collective decisions, political capital, leadership styles.

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1 Introduction

"I earned ... political capital, and now I intend to spend it. It is my style."

George W. Bush

Most organizations—in politics, business, and academia—feature leaders who can sway collective decisions. In business, a CEO may persuade her firm's board to approve a project the board is initially skeptical about. She may do so by appealing to personal friendships with members of the board, or even by threatening to resign. In politics, U.S. presidents may coax Congress into passing legislation that does not have the initial support of the majority of members. They may, for example, claim a popular mandate for policies on which they campaigned, or appeal to party unity. Similarly, in academia, a senior faculty member may push to hire a job candidate the recruiting committee is initially inclined to reject, perhaps by exerting influence over junior colleagues.

That leaders have the power to influence decisions is not controversial. Yet, power to influence is not an easy concept to define, as it includes both formal and informal components. For example, in Hollander's (1958; 1960; 1978; 2009) theory of "idiosyncrasy credit" leaders have an account of credit with group members they can spend to deviate from group norms and assert influence (see also Bass, 1990, Ch. 17).[1] These credits are "given and received as rewards" from a leader's social exchange with her followers (Hollander, 1978). Therefore, power to influence derives from the leader's network of friends and allies within the organization, the organization's informal system of favor exchanges, and even the organization's culture (March, 1981, pp. 216–219).

All these elements contribute to the leader's power to sway collective decisions[2] and determine whether and when the leader may choose to exercise this power. In fact, forcing the hand of others on one issue today may have consequences for the leader's future

[1] Similar ideas are present in Homans's (1961) theory of social exchange; for an in-depth discussion that compares Hollander's and Homans's theories see Alvarez (1968).

[2] In this sense, power captures the effectiveness of a leader's "influence activities" (Milgrom and Roberts, 1988).

influence. For example, the leader may lose future influence because she makes enemies among those who are strongly opposed to the alternative she advocates, or because she loses the support of those who feel they owed her just one more favor. But the leader may also increase her future influence if the alternative she advocated turns out to benefit many in the organization. Just as she may be held accountable for supporting the wrong alternative, so may she be rewarded for advocating the right one. As pointed out by Hollander, a leader's stock of credit evolves dynamically: it "increase[s] or decrease[s] as a function of the group's perception of the individual's task performance" (Hollander, 1958). The extent of these effects may depend on a "culture of reward" or "culture of blame" within the organization.

In this paper, we take an economic approach to defining informal power by focusing on a class of leader-specific assets: the leader's *political capital*. This concept is meant to encompass any intangible asset of the leader that (i) affords the leader greater power to influence decisions; (ii) is immediately reduced when the leader chooses to exercise this power;[3] and (iii) dynamically increases if the leader advocates in favor of an alternative that benefited many in the organization.[4] Our objective is twofold: first, we study the leader's problem of whether and when to use her power to influence decisions; second, we study this problem's implications for the design of organizations that induce leaders to use their power effectively.

We analyze a model in which a leader can gain or lose political capital by voicing dissent against a default alternative chosen by other members of her organization. In the model (i) a leader with greater political capital has more power, in the sense that she has a greater chance to affect the decision; (ii) voicing dissent immediately reduces the leader's political capital—we say that the leader *spends* her political capital; but (iii) it

[3] Property (ii) is what distinguishes political capital from the concept of "social capital," which, as argued by Arrow (1999), cannot be spent or invested.

[4] As put by Karl Rove, "the president understands that if we are successful in the prosecution of the war, that will create political capital that can be used to expand on other things whether international or domestic" (Richard L. Berke, *New York Times*, December 12, 2001).

may either increase or decrease her future capital, depending on whether her dissenting opinion turns out to be correct for the organization as a whole.

We study whether the leader chooses to spend her capital on today's decision or save it for a future decision. The leader's optimal choice depends on her stock of capital, the precision of her information, and whether the issue at stake is more or less important for her. For example, the President of the United States may choose to spend her political capital only on issues that were central to her campaign. Similarly, senior faculty may choose to spend their political capital only on job candidates in their own fields.

We show that the leader optimally chooses one of three leadership styles and that the chosen style affects the dynamics of power within the organization. Leaders with sufficient political capital but poor information choose to be *patient*: they save their capital and spend it only on issues that are important to them. Although patient leaders spend their capital sparingly, when they spend it they are unlikely to regain it and therefore their power declines over time. Leaders with intermediate precision of information choose to be *loud*: they spend their capital on all issues and their power declines over time. Finally, the most informed leaders choose to be *strong*: they spend their capital on all issues and their power grows over time.

For a given stock of political capital, leaders with the least precise information are more likely to be patient. Therefore, conditional on disagreeing with the default choice of the organization, leaders are more likely to spend political capital when their information is more precise. But the unconditional probability of spending political capital on any given issue is non-monotonic in the precision of the leader's information—while loud leaders have less precise information than strong leaders, they are more likely to voice their dissent on any given issue.

More political capital does not necessarily induce the leader to voice dissent more often. To put it another way: some patient leaders have more political capital and power than some loud leaders.[5] How more capital affects the leader's decision hinges on the marginal power of political capital and therefore on the shape of the mapping of political capital into power. Intuitively, when the marginal power of capital is greater after the leader's preferred alternative is revealed to be better (respectively, worse) than the default, then a larger initial stock of political capital translates into a greater return (respectively, smaller loss) to voicing dissent. We give a concrete example within a linear framework and show how our results naturally relate to the leader's power "career concerns."

Our flexible, reduced-form approach permits our framework to speak to a range of issues, including the institutional and cultural design of organizations. The leader's initial stock of political capital, and therefore her power, is, in many ways and in many instances, an organizational-design choice (Cyert and March, 1963; Milgrom and Roberts, 1988) reflecting issues such as the political legitimacy of the leader's office or the composition of a firm's board.[6] The experimental literature that builds off Hollander's (1958; 1960) theory of idiosyncrasy credits shows that an organization can affect a leader's stock of political capital by changing their job title and by constructing artificial tasks that show the leader excelling in front of group members (see e.g., Hollander, 1960; Alvarez, 1968). We show that the optimal allocation of power depends on the leader's precision of information and how her power career concerns affect her behavior. Because a leader concerned about her future power may optimally choose to save her political capital for future issues, the organization may need to optimally tradeoff a more active, but less powerful leader with a less active, but more powerful one. For a leader with sufficiently precise information, the

[5]While discussing Homans's theory of social exchange, Alvarez (1968) notes that a leader's stock of credit may be a determinant of a leader's propensity to dissent. However, this relationship need not be monotonic: "high-status persons initially have so much esteem that they can afford to risk the relatively small loss incurred by taking a deviant course; low-status persons have so little esteem that the threat of a relatively large loss is ineffectual [...]; and, finally, middle- status persons do not have sufficient esteem that they can "write off" some losses, but they do have enough esteem to make the threat of losing "their precious all" painful. These may be the reasons why people deviate differentially."

[6]As stated in Hollander (1978): "The effectiveness of leadership also depends upon a leader's legitimacy and authority. Legitimacy may come from appointment, election, or from the willing support of followers. [...] A leader's authority also is related to the nature of the rules governing the activity."

second option dominates, whereas the first option dominates when the leader's information is imprecise. Therefore, it may be optimal to allocate more power to leaders with less precise information.

How changes in political capital map into changes in power to influence decisions also largely depends on institutional details. We show how this mapping can be used to affect how "junior" leaders optimally spend political capital. Finally, we discuss how organizations can induce a more or less active leadership style by promoting organizational cultures that differently reward the leader's contribution—an idea ecohed by General Electric's former CEO Jack Welch's remark that "we reward failure" since doing otherwise would only discourage the daring (Farson and Keyes, 2002).

In their seminal work, Cyert and March (1963) observe that side payments within organizations are often non-monetary and, instead, take the form of policy commitments or promises over future decisions (see also Gibbons, 2019). Our power career concerns capture precisely such non-monetary incentives, and our results show how political capital, appropriately allocated and controlled, can complement monetary incentives for leaders.[7] For example, because of the multitasking nature of a CEO's job, the optimal contract naturally creates issues that are more or less important for her. In this case the CEO's desire to accumulate political capital for future issues that the contract makes important to her may induce her to exert effort to persuade the board also on issues that the contract cannot cover or does not reward.

More broadly, we model a multitasking environment. In such environments, incentives can lead to *crowding out*—the agent exerts greater effort on incentivized tasks at the expense of unincentivized tasks (Holmström and Milgrom, 1991). However, the empirical evidence on this crowding out effect is mixed, suggesting that incentivized tasks may have *positive spillovers* on unincentivized tasks (Lazear, 2000; Belot and Schröder, 2016;

[7] In settings where monetary rewards are not possible or are customarily very low, such as in voluntary associations, clubs, or political parties, the informal incentive schemes we describe are likely to be the most important form of incentives for leaders, if not the only one.

Kuang et al., 2019). Kuang et al. (2019) argues that positive spillovers can result from complementarities between unincentivized and incentivized tasks.[8,9] Our model captures a particular form of complementarity—which we call political capital—that stems from interpersonal relationships within organizations. In particular, we show that positive spillovers (respectively, crowding out) is more likely to occur when a leader holds a lower (resp., higher) stock of political capital.

Related approaches are taken in Li et al. (2017) and Campbell (2017). Li et al. (2017) study relational contracts where the principal allocates "power" to an agent, and then dynamically adjust this allocation depending on the agent's performance. Campbell (2017) considers mechanisms that elicit information from an agent by restricting participation in future decision making. In contrast to both of these papers, we emphasize the influence of a leader when her political capital and power interacts with—but is not entirely controlled by—an organization.

The comparison between our patient and loud/strong leadership styles naturally connects to two commonly discussed leaderships styles in the Full Range Leadership Model (Burns, 1978; Bass, 1985, 1988), namely active and passive management-by-exception (MBE). Active MBE leaders regularly "intervene to correct problems and pointing out mistakes;" passive MBE leaders "intervene only when it is absolutely necessary" (Atwater and Yammarino, 1996). Our non-monotonic comparative static results may offer an explanation for Singh's (2009), Yang's (2015) and Yang and Li's (2017) mixed evidence on the relationship between these leadership styles, a leader's power, and organization performance (see also Atwater and Yammarino, 1996; Bass, 1985, 1990).

There is a large body of work on "leadership"—particularly those papers which con-

[8]This is also discussed briefly in Section 2.3 of Holmström and Milgrom (1991).

[9]Building off Bénabou and Tirole's (2003) single-task model, Al-Ubaydli et al. (2015) provide an alternative explanation for positive spillovers that derives from both the agent and principal having hidden information.

sider signaling by leaders as a means of persuasion.[10,11] Notable examples include Prendergast and Stole (1996), Hermalin (1998), and Majumdar and Mukand (2004).[12] We take a more reduced-form approach to persuasion by the leader, but focus on how and when the leader chooses to exert influence—i.e., her "style." Rotemberg and Saloner (1993, 2000) connect leadership style and organizations, which relates to our Section 5, below. Bertrand and Schoar (2003) show that a significant amount of the heterogeneity in managerial practices can be explained by "style." We suggest a channel in addition to the one(s) they identify and our analysis implies that such styles are not immutable managerial characteristics.[13]

Our framework bears some similarity to Aghion and Tirole (1997)'s notion of "real versus formal authority" in that decision rights are non-contractible so that power and authority are determined within the organization rather than by it. Our concept of spending political capital partially embodies the idea that communication in organizations is costly. We share this idea with the now large literature on communication in organizations initiated by Dessein (2002), although we do not consider strategic information transmission à la Crawford and Sobel (1982).

In our model, political capital affords limited veto power to the leader. In a recent article, Bouton et al. (2018) emphasize that majority voting with veto power combines

[10]The dynamic nature of our analysis and our concern with the stock of political capital suggests a natural connection to work on reputation-effects (Kreps and Wilson, 1982; Kreps et al., 1982; Milgrom and Roberts, 1982; Fudenberg and Levine, 1983, 1986): in long-lived interactions, players have an incentive to give up something today in terms of their payoff to gain a reputation for playing in a certain fashion, which may benefit them down-the-track. In our model, the leader is conscious of the cost of using her influence today in terms of her ability to influence decisions in the future. Unlike the reputation-effects literature, our setup does not require considerations of (sequential) equilibrium as it involves a control problem for the leader. Moreover, our notion of political capital is not synonymous with reputation. For instance, it can be determined in part by organizational design choices. We further discuss the relation between our concept of political capital and reputation in Footnote 16.

[11]The rapidly growing body of work on "Bayesian persuasion" initiated by Kamenica and Gentzkow (2011) shares some similarities with our approach. Such models emphasize how the choice of signal structure can influence a decision maker, whereas we are concerned with the use of power—stemming from political capital—to influence collective decisions.

[12]Caillaud and Tirole (2007) considers leaders creating cascades to influence followers.

[13]Dessein and Prat (2017) take a broad view of organizational capability, introducing the notion of "organizational capital." Our concept of political capital might be thought of as a subset of organizational capital.

positive elements of both majority voting and unanimity. In practice most organizations do not allocate "hard" veto power "forever" to any of their members. Our concept of political capital may therefore be thought of as a more flexible, informal, and dynamic allocation of veto power. We take the perspective that such a flexible structure is naturally present in most organizations and focus on how institutions should be designed to take full advantage of it and incentivize an efficient use of a leader's political capital.

The remainder of the paper is organized as follows. Section 2 introduces our model and discusses some of our modeling choices. Section 3 characterizes the leader's optimal strategy. Armed with this, Section 4 analyzes the relationship between leadership and power—specifically how power evolves, and different leadership styles. Section 5 takes an optimal organization design perspective in light of leadership styles and political capital. Section 6 offers some concluding remarks.

2 The model

Consider an organization which operates for two periods. In each period $t \in \{1, 2\}$, the organization chooses an alternative a_t from the set $\{0, 1\}$. Which alternative is best for the organization depends on an unknown state, $\theta_t \in \{0, 1\}$. In particular, the value $v_t(a_t \mid \theta_t)$ of choosing alternative a_t when the state is θ_t is given by

$$v_t(a_t \mid \theta_t) = \begin{cases} 1 & \text{if } a_t = \theta_t; \\ 0 & \text{otherwise.} \end{cases}$$

In each period t, the organization's *default* choice is optimal ($a_t = \theta_t$) with probability $\pi > 1/2$. Without loss of generality, we can relabel the alternatives in $\{0, 1\}$ such that, for each period t, the default choice is $a_t = 0$. Notice that this implies $\Pr(\theta_t = 0) = \pi$. Deviations from the default choice are possible only if the organization's *leader* spends some of her *political capital* in favor of alternative $a_t = 1$.

The leader's initial stock of political capital is k_1. At the beginning of each period t the state $\theta_t \in \{0,1\}$ is realized, and then the leader privately observes a signal $s_t \in \{0,1\}$ such that $s_t = \theta_t$ with probability $\sigma > \pi$. Upon observing the signal s_t, the leader can choose to *spend* $c > 0$ units of her political capital in favor of alternative $a_t = 1$. If the leader chooses to spend capital, then $a_t = 1$ with probability $P(k_t)$. Hence $P(k_t)$ is the leader's *power* to sway the organization's choice. We assume that $P : \mathbb{R} \to [0,1]$ is increasing and we say that the leader is *irrelevant* whenever $P(k_t) = 0$.[14] For simplicity we assume that irrelevant leaders cannot spend political capital.

Spending political capital also affects the leader's future stock of capital once the state is revealed. In particular, her capital in period 2 is given by[15]

$$k_2 = \begin{cases} k_1 + B(\theta_1) - c & \text{if she spends capital at } t = 1; \\ k_1 & \text{otherwise,} \end{cases}$$

where $B(1) > 0 > B(0)$. Our law of motion of political capital captures the idea that spending political capital is a risky gamble for the leader, as it entails assuming responsibility for her intervention. In contrast, not spending political capital—not voicing dissent—has no effect on the leader's future power.[16] For the remainder of the analysis, we focus on the case $B(1) > c$ so that it is possible for the leader's political capital (and therefore power) to increase.

Within each period, the leader's preferences are aligned with those of the organization. Nevertheless, some issues may matter to the leader more than others. In particular, at the beginning of each period t, the leader observes the importance $\alpha_t \in \{\alpha^L, \alpha^H\}$ of the

[14]In Hollander's theory, the leader is irrelevant when $k_t = 0$: "affiliation with the group—as perceived by the group—ceases when the individual's credit balance reaches zero" (Hollander, 1958).

[15]In our model, political capital does not depreciate in time. As put by Karl Rove, "if you don't spend it, it's not like treasures stuck away in a storehouse someplace; it is perishable." (Richard L. Berke, *New York Times*, December 12, 2001). The depreciation of political capital can be easily incorporated into our framework.

[16]In practice there may be reputational components to political capital such that, when the leader does not spend political capital, $k_2 = k_1 + N(\theta)$, with $N(1) \leq 0 \leq N(0)$. In Appendix B we show that our qualitative results carry over if such reputational concerns are small compared to $B(\theta) - c$.

period-t issue to her, such that the value $u_t\left(a_t \mid \theta_t, \alpha_t\right)$ for the leader of choosing alternative a_t when the state is θ_t is given by

$$u_t\left(a_t \mid \theta_t, \alpha_t\right) = \begin{cases} \alpha_t & \text{if } a_t = \theta_t; \\ 0 & \text{otherwise,} \end{cases}$$

where $0 < \alpha^L < \alpha^H$.[17] The prior probability that the period-t issue is of high importance to the leader is $\Pr(\alpha^H) \in (0, 1)$.

2.1 Discussion of the model

Our reduced-form approach allows us to delineate three channels in which organizational design can affect how leaders use their political capital. These different channels naturally map into the elements described in the social psychology literature we discussed in the introduction. First, the initial stock of political capital k_1 is meant to capture the leader's legitimacy and credit at the time she is appointed as "leader." Second, the function P is meant to capture institutional details that determine how political capital maps into power to influence decisions. Third, the law of motion of capital B captures aspects of the organization's culture that differently reward the leader's contribution. We will return to each of these three elements and discuss how they can be optimally designed in Section 5.

The state-independent cost of spending capital, c, aligns with Hollander's (1958) view that a leader "loses credits" for deviating from group norms. Whether the value of c depends on k_t is a key distinction between Hollander's theory and Homans's related theory of social exchange. However, the empirical literature has failed to provide conclusive evidence either way (Alvarez, 1968).

In the next section, we study the optimal strategy for the leader of a given organization. We do so under one regularity assumption about the organization itself. For some values of the model's parameters, the leader may prefer to spend capital in favor of an

[17]Our qualitative results hold if α_t is modeled as a continuous rather than a binary variable.

alternative that she does not believe to be optimal for the organization, i.e., she spends capital in favor of $a_t = 1$ when she believes that $\theta_t = 0$ with probability greater than $1/2$. In fact, if the current decision is of low importance to her ($\alpha_t = \alpha^L$), she may choose to spend political capital in favor of alternative $a_t = 1$ solely in the hope of accumulating more capital, and therefore power, in the future (if $\theta_t = 1$). Because our focus is on the intertemporal decision of *when* to spend political capital, rather that in favor of which alternative, we rule out this perverse incentive for the leader. We thus impose some structure on the function P. Assumption 1 says that the organization is designed in such a way that the leader does not spend her capital in favor of alternatives she does not believe in (when she prefers alternative $a_t = 0$).[18]

Assumption 1 *Spending political capital in period* 1 *when* $s_1 = 0$ *results in an expected decline of the leader's power.*[19]

3 The leader's optimal strategy

We now study the leader's optimal strategy. We proceed backward, starting from period $t = 2$. Lemma 1 says that in period 2 the leader optimally spends political capital if and only if she prefers alternative $a_2 = 1$ and she is not irrelevant.

Lemma 1 (The leader's optimal strategy in period 2) *In period* 2*, a non-irrelevant leader spends political capital if and only if she prefers alternative* $a_2 = 1$*.*

Proof. In Appendix A. ■

Intuitively, in period 2 the leader only needs to choose whether to influence the decision on the period-2 issue, without any consideration to the future trajectory of her

[18]For example, if $c < 1/2$, then Assumption 1 precludes the function $P(k_t) = c$ for $k_t = c$, $P(k_t) = 1$ for all $k_t > c$, and $P(k_t) = 0$ otherwise.

[19]I.e., $\Pr(\theta_1 = 1|s_1 = 0)(P(k_1+B(1)-c)-P(k_1))+(1-\Pr(\theta_1 = 1|s_1 = 0))(P(k_1+B(0)-c)-P(k_1)) \leq 0$.

political capital. Therefore, she spends capital in favor of alternative $a_2 = 1$ if and only if she believes it to be optimal for the organization.

The leader's optimal strategy in period 2 does not depend on the amount of capital accumulated, k_2, or on the relative importance to her of the period-2 issue, α_2. In contrast, her optimal strategy in period 1 depends on both her initial stock of capital, k_1, and the relative importance of the period-1 issue, α_1. This is because the leader trades off the chance of influencing the period-1 decision with the possibility of increasing or decreasing her power to influence the period-2 decision.

To study this tradeoff, we express the leader's expected payoff from the period-2 decision as a function V of her political capital in period 2. Using Lemma 1:

$$V\left(k_2\right) = \bar{\alpha}\pi + \bar{\alpha}\left(2\Pr\left(\theta_2 = 1 \mid s_2 = 1\right) - 1\right)\Pr\left(s_2 = 1\right)P\left(k_2\right) \tag{1}$$

where $\bar{\alpha}$ is the expected importance to the leader of the period-2 issue.[20] The first term is the leader's expected payoff if she does not spend capital in period 2. The second term is the additional value for her of having political capital to optimally spend in period 2.

If the leader does not spend capital in period 1, then the organization takes the default choice and the leader retains all her initial stock of capital. Therefore, the leader's expected payoff is given by

$$\alpha_1\left(1 - \Pr\left(\theta_1 = 1 \mid s_1\right)\right) + V\left(k_1\right). \tag{2}$$

If instead she chooses to spend capital in favor of alternative $a_1 = 1$, then the organization chooses that alternative with probability $P\left(k_1\right)$ and the default choice with the remaining probability. Furthermore, her capital will evolve stochastically. With probability $\Pr\left(\theta_1 = 1 \mid s_1\right)$, k_2 equals $k_1 + B(1) - c$; otherwise, k_2 equals $k_1 + B(0) - c$. Therefore,

[20] I.e., $\bar{\alpha} = \Pr(\alpha^H)\alpha^H + (1 - \Pr(\alpha^H))\alpha^L$.

the leader's expected payoff is given by

$$\alpha_1 \left[(1 - \Pr(\theta_1 = 1 \mid s_1)) + P(k_1)(2\Pr(\theta_1 = 1 \mid s_1) - 1) \right] + \\ + \Pr(\theta_1 = 1 \mid s_1) V(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1 \mid s_1)) V(k_1 + B(0) - c) \,. \quad (3)$$

The optimal choice for the leader depends on the comparison of the values in (2) and (3). Proposition 1 says that a non-irrelevant leader spends political capital in favor of alternative $a_1 = 1$ whenever the issue is of high importance to her or her information is sufficiently precise.[21]

Proposition 1 (The leader's optimal strategy in period 1) *There exists a cutoff* $\sigma^*(k_1)$ *such that a non-irrelevant leader spends political capital in period 1 if and only if she prefers alternative* $a_1 = 1$ *and either* $\alpha_1 = \alpha^H$ *or* $\sigma > \sigma^*(k_1)$.

Proof. In Appendix A. ■

Intuitively, when the period-1 issue is of high importance to the leader, she optimally spends her capital to influence the period-1 decision, rather than saving her capital for a future issue which, in expectation, is of lower importance. Instead, when the period-1 issue is of low importance, the leader needs to choose between the chance of influencing the period-1 decision and the possibility to save more capital for a future issue which, in expectation, is of greater importance. Since the leader loses political capital only when she spends it in favor of an alternative that turns out to be wrong, a leader with sufficiently precise information prefers to spend political capital also when the period-1 issue is less important to her. In contrast, a leader with very imprecise information faces a great risk of seeing her political capital reduced if she spends it in period 1. Hence, she prefers to save her capital for future issues if the period-1 issue is of low importance to her.

[21] This precision-of-information cutoff is a function of all parameters of the model. However, in Proposition 1 and throughout the paper, we will simply denote this cutoff as a function of the leader's period-1 stock of political capital k_1, i.e., $\sigma^*(k_1)$, where the dependency on other parameters is implicit. We do this because the focus of the paper is on the effect of political capital on the leader's behavior.

4 Leadership and power

4.1 The evolution of power

The leader's political capital increases whenever she spends it in favor of alternative $a_1 = 1$ and this alternative turns out to be optimal for the organization, i.e., $\theta_1 = 1$. By Proposition 1, the leader spends political capital only if she prefers alternative $a_1 = 1$. If the leader prefers alternative $a_1 = 1$, then this alternative a_1 is indeed optimal with probability

$$\Pr(\theta_1 = 1 \mid s_1 = 1) = \left[1 + \frac{1-\sigma}{\sigma}\frac{\pi}{1-\pi}\right]^{-1},$$

which is increasing in σ. Therefore, leaders with better private information are more likely to see their capital increase when they spend it. But capital matters for the leader, as well as for the organization, only insofar as it translates into power to affect decisions. Proposition 2 says that, when the leader optimally spends her political capital, she expects her power to grow if and only if her information is more precise than a threshold, which depends on her initial stock of capital.[22,23]

Proposition 2 (The evolution of power) *There exists a cutoff $\bar{\sigma}(k_1) \in (\sigma^*(k_1), 1]$ such that if the leader optimally chooses to spend her political capital, then*

1. *if $\sigma > \bar{\sigma}(k_1)$, the leader's power is expected to grow over time;*

2. *if $\sigma < \bar{\sigma}(k_1)$, the leader's power is expected to decline over time.*

Proof. In Appendix A. ■

A leader who expects her power to grow whenever she optimally spends her capital will spend capital on *all* issues, even those of low importance, i.e., $\bar{\sigma}(k_1) > \sigma^*(k_1)$.

[22]When the leader's information is less precise, so that $\sigma < \sigma^*(k_1)$, the leader's power remains constant whenever $\alpha_1 = \alpha^L$. Nevertheless, her power is expected to decline whenever she optimally chooses to spend her political capital, i.e., $\alpha_1 = \alpha^H$ and $s_1 = 1$.

[23]This threshold is no larger than 1 because we assumed $B(1) > c$, i.e., it is possible for the leader's political capital (and therefore power) to increase.

Intuitively, spending capital improves the period-1 decision but may cost future power. However, when the leader expects her power to grow, there is no such tradeoff: spending capital both improves the period-1 decision *and*, in expectation, increases the leader's power.

Proposition 2 says that small differences in either the quality of a leader or her initial stock of political capital may lead to different outcomes in terms of the evolution of power within the organization. Consider two organizations with leaders with information and capital $(\sigma, k_1) : \sigma^*(k_1) < \sigma < \bar{\sigma}(k_1)$ and $(\sigma', k_1) : \bar{\sigma}(k_1) < \sigma'$, respectively. In period 1, both organizations have the same function P and culture, and leaders with the same initial stock of capital, and therefore power. Furthermore, the two leaders behave identically: they both spend their political capital whenever they dislike the default choice of their respective organizations. Therefore, the two organizations, as well as the leaders, may appear to be identical and following the same leadership style, to an observer that cannot directly measure a leader's precision of information.[24] Yet, in expectation, the leader with precision σ' will have greater power in period 2. In contrast, the leader with precision $\sigma < \sigma'$ will see her power decline. Hence, the first organization develops a more concentrated decision-making process; the second develops a more diffused decision-making process.

4.2 Leadership styles

Propositions 1 and 2 together reveal three possible leadership styles:[25]

Patient. A patient leader spends political capital only on issues that are of high importance to her. Her power is expected to decline over time.

Loud. A loud leader spends political capital on all issues. Her power is expected to decline over time.

[24] The only difference between the two leaders is that the leader with lower precision will spend her capital with slightly higher probability.

[25] Of course, leaders with so little political capital that they have no power to influence decisions at all adopt a fourth style: irrelevant.

Strong. A strong leader spends political capital on all issues. Her power is expected to grow over time.

A leadership style simultaneously determines the role that a leader chooses to play within the organization and how power evolves within the organization. In particular, only organizations that feature a strong leader are likely to develop concentrated power structures where a single person takes most decisions. In our model, this translates in the leader having greater power in period 2, and therefore a greater probability that the organization will choose alternative $a_2 = 1$. Thus, while a loud and a strong leader with the same initial stock of political capital k_1 will produce identical outcomes in period 1, they are likely to produce different outcomes in period 2, when their stock of political capital is expected to differ.

We now study what induces a leader to choose one of the three styles.

Proposition 3 (Optimal leadership styles) *A non-irrelevant leader is patient if $\sigma < \sigma^* (k_1)$, loud if $\sigma \in [\sigma^* (k_1), \bar{\sigma} (k_1))$, and strong if $\sigma \geq \bar{\sigma} (k_1)$.*

Proof. In Appendix A. ■

Proposition 3 connects with the both theoretical and empirical findings in the management science literature. The distinction between patient and "active" (i.e., loud or strong) leadership styles that we identify finds a natural parallel in the distinction between passive and active management-by-exception (MBE) leadership styles in the Full Range Leadership Model (Burns, 1978; Bass, 1985, 1988). Furthermore, our analytical characterization of active-MBE leaders having more precise information (e.g., greater expertise) than passive-MBE leaders is consistent with empirical findings in Atwater and Yammarino (1996).[26]

Figure 1 shows the optimal leadership style in the (σ, k_1) space. The figure is drawn for a simple case we shall return to at several stages when building intuition for our

[26]For example, they find that active-MBE leaders are more likely to have greater expertise than passive-MBE leaders.

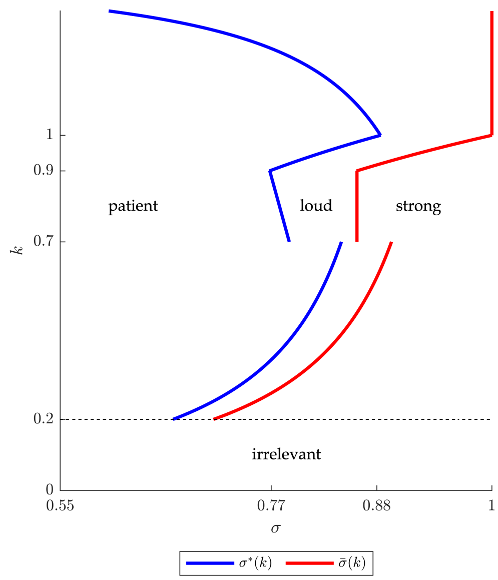

Figure 1: Leadership styles in the (σ, k_1) space for $P = P_L$ and parameter values $c = 0.2, B(1) = -B(0) = 0.3, \pi = 0.55, \alpha^L = 1, \alpha^H = 30, \Pr(\alpha^H) = 0.95$.

results. In this special case, the leader's capital evolves with law of motion $B(\theta)$ such that $B(1) = -B(0) \equiv b > c$, capital translates into power (piece-wise) linearly, and the leader is irrelevant whenever she has less than c units of capital:[27]

$$P(k_t) = P_L(k_t) = \begin{cases} 0 & \text{if } k_t < c; \\ \max\{k_t, 1\} & \text{if } k_t \geq c. \end{cases}$$

Figure 2 depicts this function.

In this special case, if the leader has less than c units of political capital, she cannot influence the organization's decision and is therefore irrelevant. However, if her capital is greater than c, but her information is sufficiently imprecise, she prefers to use her power sparingly, only spending political capital when more important issues arise. Such a patient leader eventually loses the little power she has, as her political capital tends to decrease over time. In contrast, when her information is very precise, the leader opti-

[27]Recall that $c > 0$ is the fixed cost of spending capital in favor of alternative $a_t = 1$.

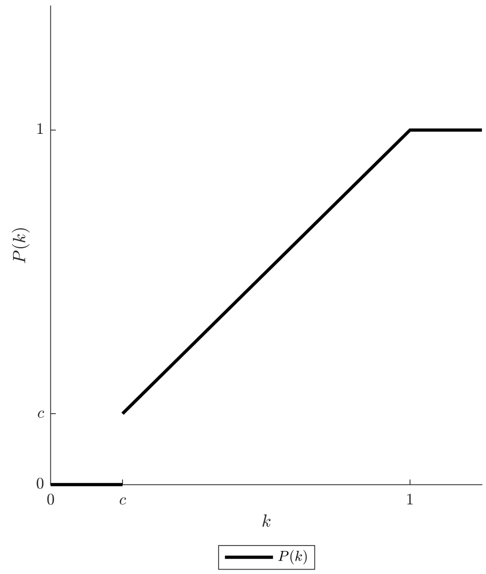

Figure 2: The piece-wise linear function $P = P_L$.

mally chooses a strong style. Such a leader is so sure of herself that she spends political capital on any issue on which she disagrees with the default choice. She does so at no expected cost, because her information is so precise that spending political capital results in an expected growth in power. Between these two extremes lies a leadership style that we call *loud*. A loud leader is sufficiently sure of herself to spend capital on all issues on which she disagrees with the default choice. But her information is not precise enough to avoid frequent mistakes. In fact, her probability of making mistakes is large enough that her power will decline.

Conditional on preferring alternative $a_1 = 1$ to the default choice, both a loud and a strong leader will voice their dissent. Nevertheless, we now show that loud leaders are indeed "louder" in the sense that they have a higher probability of voicing their dissent on any given issue. Proposition 4 states this result. Figure 3 provides an illustration for the special case when $P = P_L$, $B(1) = -B(0)$, and the leader has an initial stock of political capital $k_1 = 0.4$.

Proposition 4 (Loud means loud) *The probability that a non-irrelevant leader spends political*

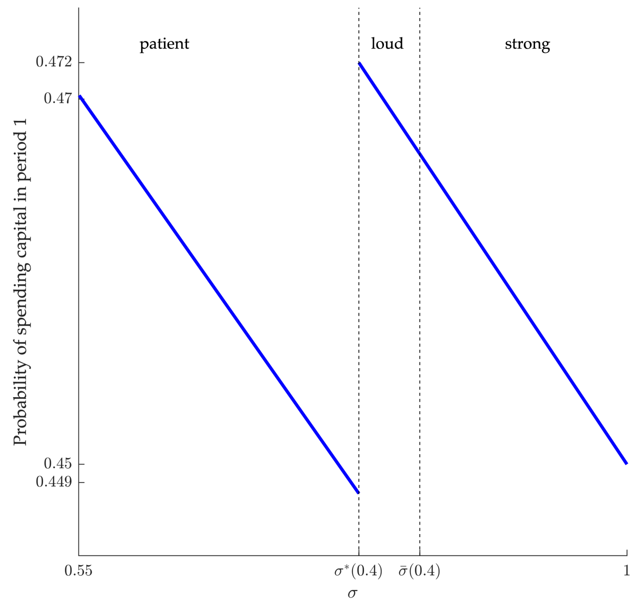

Figure 3: The leader's probability of spending political capital in period 1 for $P = P_L$ and parameter values $k_1 = 0.4, c = 0.2, B(1) = -B(0) = 0.3, \pi = 0.55, \alpha^L = 1, \alpha^H = 30, \Pr(\alpha^H) = 0.95$.

capital in period 1 *has local maxima at* $\sigma = \pi$ *and* $\sigma = \sigma^*(k_1)$*, and is strictly decreasing in* σ *for* $\sigma < \sigma^*(k_1)$ *and* $\sigma > \sigma^*(k_1)$*.*

Proof. In Appendix A. ■

To gain some intuition, consider a loud and a strong leader. Both leaders voice dissent whenever they disagree with the default choice. But a loud leader's information is less precise than that of a strong leader. Since the default choice is right more than half of the time, a loud leader is more likely to disagree with it than a strong leader in the first place. Thus, leaders who choose a loud style are those with the highest probability of voicing disagreement with the default choice on any given issue.

4.3 Political capital and leadership styles

We now explore how political capital affects the leader's choice of a style. By spending political capital in period 1, the leader suffers an expected loss of capital of

$$c - \Pr(\theta_1 = 1 \mid s_1 = 1)B(1) + [1 - \Pr(\theta_1 = 1 \mid s_1 = 1)]B(0)$$

but may also benefit from influencing the period-1 decision. In particular, the expected period-1 benefit of spending capital is

$$\alpha_1 \left[2 \Pr\left(\theta_1 = 1 \mid s_1 = 1\right) - 1\right] P\left(k_1\right).$$

An increase in political capital increases the benefit from voicing dissent while not changing the expected loss of capital. However, the leader does not care about political capital *per se*. Rather, she cares about political capital only in the measure in which this translates into power to influence future decisions.

To illustrate this distinction, consider a thought experiment in which capital and power coincide (i.e., $P(k_t) = k_t$ and $k_1 \in (0, 1)$, $k_1 - c - B(0) \geq 0, k_1 - c + B(1) \leq 1$). In this case, more political capital increases the prosperity of the leader to spend capital. However, in the real world, not all marginal increases in capital translate to the same marginal increase in power. In our model, this is captured by the fact that the function P maps political capital into a probability in $[0, 1]$. Therefore, the function P is necessarily concave (or convex) for some values of k_t, so that the marginal power of capital P' is decreasing (increasing). For example, a leader who is initially very powerful but short of being able to dictate decisions (i.e., $P\left(k_1\right) = 1 - \varepsilon$ for $\varepsilon > 0$ small) has little to gain from capital accumulation but faces a (relatively) large downside risk if she spends capital on the wrong alternative. Therefore, if the period-1 decision is of sufficiently low importance she will prefer to be patient.

To characterize the relationship between political capital and leadership styles, and how this is mediated by the manner in which capital translates into power, we first build intuition by analyzing the simple (piece-wise) linear function P_L and $B(1) = -B(0) \equiv b > c$.

Suppose $P = P_L$, $B(1) = -B(0) \equiv b > c$, and consider a non-irrelevant leader who initially holds little capital: $c \leq k_1 < 2c + b$. The second inequality implies that if the leader chooses to spend capital, she faces the risk of becoming irrelevant. In fact, if the state is later revealed to be $\theta_1 = 0$, the leader will remain with capital $k_2 < c$, and therefore $P(k_2) = 0$. This potential cost of spending capital—losing the status of powerful leader—is increasing in the initial stock of capital. Therefore, a leader with marginally more capital (and therefore power) has a greater incentive to be patient and save her capital for the future. Now consider a leader who initially holds much power, but short of what would be enough to dictate decisions whenever she spends capital: $1-(b-c) < k_1 \leq 1$. The first inequality implies that if the leader chooses to spend capital, she may be in the future able to dictate decisions. If she spends capital and the state is later revealed to be $\theta_1 = 1$, her capital will increase by a quantity $b-c > 0$. Yet, the leader will only experience an increase of power equal to $1 - P(k_1) < b - c$. This increase in power is decreasing in the initial stock of capital. Therefore, a leader with marginally more capital (and therefore power) has a greater incentive to be patient and save her capital for the future. Proposition 5 formalizes this intuition and says that the effect of political capital on the leader's style is non-monotonic: more capital may both increase or decrease the propensity of the leader to spend capital (see also Figure 1).[28]

Proposition 5 (The effect of capital on leadership styles when $P = P_L$) *Suppose* $B(1) =$

[28]The result that more capital may decrease a leader's propensity to spend capital is driven by the shape of the function P. In particular, for $P = P_L$, leaders with capital just above c or just below 1 face asymmetric gains/losses in power. In the former case, the leader faces little downside risk from spending capital; in the latter case, the leader faces little upside benefit from spending capital.

$-B(0) \equiv b$. Let $P = P_L$ and let

$$\Sigma^P (k_1) \equiv \{\sigma \in (\pi, 1] : \sigma < \sigma^* (k_1)\}$$

be the interval of leader's information precisions that induce her to optimally choose to be patient. If $\Sigma^P (k_1)$ is non-empty for some $k_1 \geq c$, then the length of $\Sigma^P (k_1)$ increases with k_1 when $k_1 \in [c, 2c + b)$ and when $k_1 \in [1 - (b - c), 1)$. Otherwise, it decreases with k_1.[29]

Proof. In Appendix A. ■

This example illustrates how the shape of the function P affects the relationship between political capital and leadership styles. Intuitively, the function P transforms the potential gains and losses in political capital into gains and losses in the leader's expected payoff from the period-2 decision according to $V (k_2)$ in (1). When spending political capital, the potential gain is proportional to $P (k_1 + B(1) - c) - P (k_1)$; the potential loss is proportional to $P (k_1) - P (k_1 + B(0) - c)$. Therefore, a marginal increase in the initial stock of political capital is more likely to induce the leader to voice her dissent when the marginal power of capital P' is large at $k_1 + B(1) - c$ and at $k_1 + B(0) - c$ compared to what it is at k_1. Proposition 6 makes this intuition more precise.[30]

Proposition 6 (The effect of capital on leadership styles) *Let*

$$\Sigma^P (k_1) \equiv \{\sigma \in (\pi, 1] : \sigma < \sigma^* (k_1)\}$$

be the interval of leader's information precisions that induce her to optimally choose to be patient.

[29] Note that the length of $\Sigma^P (k_1)$ is greater than the length of of $\Sigma^P (k_1')$ if and only if $\Sigma^P (k_1') \subseteq \Sigma^P (k_1)$.

[30] Formally, Proposition 6 is stated under the assumption that P admits a right-hand derivative P' everywhere. It is straightforward to extend the statement to cases where the right-hand derivative need not exist by considering the "discrete" derivative of P.

If $\Sigma^P(k_1)$ is non-empty for some $k_1 \in \mathbb{R}$, then the length of $\Sigma^P(k_1)$ increases with k_1 if

$$(1-\pi)\sigma^*(k_1)P'(k_1+B(1)-c)+\pi(1-\sigma^*(k_1))P'(k_1+B(0)-c) < \left[(1-\pi)\sigma^*(k_1)+\pi(1-\sigma^*(k_1))-\frac{\alpha^L}{\bar{\alpha}}\right]P'(k_1). \quad (4)$$

Otherwise, it decreases with k_1.

Proof. In Appendix A. ■

5 Organization design

5.1 Optimal allocation of political capital

Organizations have limited ability to determine the initial stock of political capital of a leader. For example, in politics, different electoral systems may give more or less legitimacy to the president, or even guarantee that a majority of the legislature supports her platform. Therefore, while the legislature maintains its independence, the president's initial stock of political capital is in part determined by institutional choices. Similarly, board of directors may delegate more or less authority to a CEO, and shareholders may choose board members that are personally close to the CEO. Therefore, while the board has the ultimate control over the CEO, the CEO's initial stock of capital is in part determined by the composition of the board itself. In both cases, the organization may allocate more or less political capital, and therefore power, to the leader, but only within limits.

We now study the optimal allocation of political capital to the leader when the organization operates with an exogenously given function, P.[31] The organization can choose

[31] In the next section we endogenize the choice this function, P.

any initial stock of political capital[32] $k_1 \leq \bar{k}$ to maximize

$$\mathbb{E}\left[\sum_{t=1}^{2} v_t\left(a_t \mid \theta_t\right) \,\middle|\, k_1\right].$$

The optimal allocation of political capital $k^*(\sigma)$ obviously depends on the precision of the leader's information σ and uniquely identifies the optimal allocation of power

$$P^*(\sigma) := P(k^*(\sigma)).$$

Our main result is that the functions P^* and k^* are not necessarily monotonic. That is, the optimal allocation of political capital (and therefore of power) may give more capital (and hence power) to a less informed leader.

Proposition 7 (The optimal allocation of political capital) *The optimal allocation of political capital $k^*(\sigma)$, and therefore power $P^*(\sigma)$, is not necessarily monotonic in σ. It is equal to $\bar{k}$ for all $\sigma \in (\pi, 1)$ if*

$$(1-\pi)\pi[(P(k_1) - P(k_1 + B(0) - c)) - (P(k_1 + B(1) - c) - P(k_1))] \leq \frac{\alpha^L}{\bar{\alpha}} P(k_1) \qquad (5)$$

holds when $k_1 = \bar{k}$. It is U-shaped if (5) *does not hold for all $k_1 \leq \bar{k}$ and the length of $\Sigma^P(k_1)$ increases with k_1 at $k_1 = \bar{k}$ (see Proposition 6).*

Proof. In Appendix A. ■

Figure 4 depicts a case when the optimal allocation of power is U-shaped. Intuitively, the organization values the leader's interventions in the decision process. Yet, while for each issue taken individually the organization's incentives are perfectly aligned with those of the leader, the leader's choice of whether to spend her political capital on a given

[32] We assume that allocating capital, and therefore power, is costless. However, more concentration of political capital may be costly if a powerful leader alienates other members of the organization or reduces their inventive to acquire information. The key result of this section is actually reinforced when allocating political capital is costly.

issue depends on its relative importance *to her*. Since the organization views all issues as equally important, it faces a tradeoff. On the one hand, if the leader spends her political capital often enough, the organization wishes to make her interventions as effective as possible, and hence prefers to allocate more power to the leader. On the other hand, as we discussed in Section 4.3, more power may induce the leader to embrace a patient leadership style, therefore saving her political capital when the issue at stake is of low importance to her.[33] Said otherwise, for a given leadership style, the organization wishes to maximize the leader's initial stock of political capital; for a given stock of political capital, the organization strictly prefers a more *active* (loud or strong) leader to a patient one. Therefore, depending on the leader's information, the organization may need to trade off a more active but less powerful leader with a less active but more powerful one.

Obviously, this tradeoff is not present if the leader optimally chooses an active leadership style whenever she is allocated an initial stock of political capital equal to the maximal stock $\bar{k}$. In this case the organization prefers to allocate as much power as possible to the leader, no matter how precise her information is—a "flat" allocation of power:

$$\sigma^*(\bar{k}) = \pi \Rightarrow P^*(\sigma) = P(\bar{k}) \text{ for all } \sigma \in (\pi, 1).$$

This corresponds to condition (5) in Proposition 7 holding for $k_1 = \bar{k}$. By Assumption 1, the left hand side of (5) is strictly between 0 and 1. Therefore, a flat allocation of power is optimal when the leader values low-importance issues almost as much as high-importance ones (α_L close to $\bar{\alpha}$) so that her incentives almost perfectly align with those of the organization. On the contrary, a flat allocation of power is less likely to be optimal when some issues are much less important than others to the leader, when the loss in power for spending capital on the wrong alternative is much greater than the gain for spending capital on the right alternative, or when the default choice is less likely to be correct.

[33]This tension arises because of the concavity of the function, P, close to $k_t = 1$.

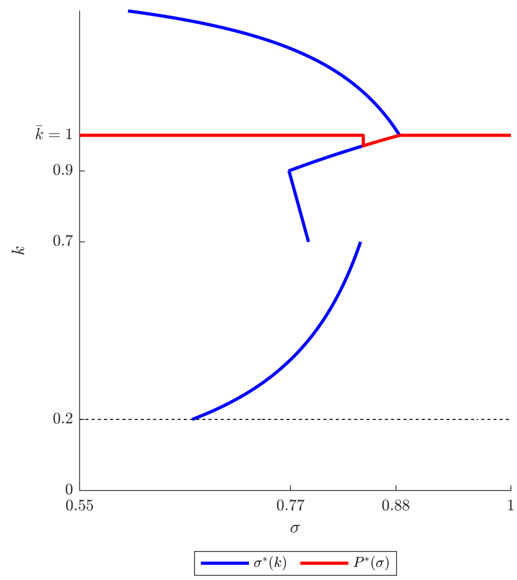

Figure 4: The optimal allocation of power when $\bar{k} = 1$ and $P = P_L$ with parameter values $c = 0.2, B(1) = -B(0) = 0.3, \pi = 0.55, \alpha^L = 1, \alpha^H = 30, \Pr(\alpha^H) = 0.95$.

Since sufficiently well-informed (and non-irrelevant) leaders always choose to be active (i.e., $\sigma^*(\bar{k}) < 1$), when the leader is sufficiently well-informed, the organization can afford to maximize the effectiveness (power) of the leader's interventions without inducing a patient leader. However, for leaders with less precise information ($\sigma < \sigma^*(\bar{k})$) the organization needs to choose between maximizing the leader's power and inducing an active leader. We now show that this tradeoff may induce the organization to optimally allocate more power to a less informed leader.

Suppose that for low values of σ the leader optimally chooses to be patient for any $k_1 \leq \bar{k}$. This corresponds to condition (5) in Proposition 7 not holding for all $k_1 \leq \bar{k}$. Then if the leader is sufficiently uninformed, the organization prefers to give the leader all the power that it can, as to make the leader as effective as possible when she chooses to spend her political capital. Yet, for higher values of σ, the leader may optimally choose to be loud (or strong), and therefore to be active more often, but only if the organization gives her less power. Now suppose that the organization's function P is such that, for a leader with initial stock of political capital equal to $\bar{k}$ and information $\sigma = \sigma^*(\bar{k})$, a marginal increase in the initial stock of political capital induces the leader to be patient. By Proposition 6, this corresponds to

$$(1-\pi)\sigma^*(k_1)\,P'(k_1+B(1)-c)+\pi(1-\sigma^*(k_1))P'(k_1+B(0)-c)<$$
$$\left[(1-\pi)\sigma^*(k_1)+\pi(1-\sigma^*(k_1))-\frac{\alpha^L}{\bar{\alpha}}\right]P'(k_1)\,. \quad (6)$$

Then for a leader with information just short of $\sigma^*(\bar{k})$, the organization can afford an active leader by giving up only a very small amount of the leader's power. Therefore, the organization strictly prefers an active, yet less powerful leader. This means that there exists a level of σ at which the organization optimally switches from a very effective but patient leader to a less effective but more active one. Figure 4 depicts such a situation when $P = P_L$ and $B(1) = -B(0)$. In this case, a non-monotonic allocation of power is more likely to be optimal when the maximum amount of power $P(\bar{k})$ that the organization can allocate to the leader is close to 1 or c so that, by Proposition 5, a marginal increase in the initial stock of political capital induces the leader to be patient.[34]

The actual value of $\hat{\sigma}$ at which the organization optimally switches from a very effective but patient leader to a less effective but more active one, naturally depends on how much the organization values having a more active leader. Since the cost of having a patient leader is proportional to the likelihood that the leader will save her political capital for future issues, $\hat{\sigma}$ is, all else equal, decreasing in $\Pr(\alpha^L)$.

[34]As can be inferred from Figure 4, when either (6) does not hold or (5) holds for some $k_1 \leq \bar{k}$, if the loss in power needed to induce a loud leader is sufficiently *small* but strictly positive for very low values of σ, the optimal allocation of power is (strictly) increasing in σ and never induces a patient leader. Nevertheless, a U-shaped allocation of power may still be optimal, even if both (6) does not hold and (5) olds for some $k_1 \leq \bar{k}$, if the loss in power needed to induce a loud leader is sufficiently *large* for very low values of σ, but becomes *small* (and positive) for larger values of σ.

5.2 Institutional design

Our reduced-form model affords us to take a flexible approach as to how political capital maps into power to influence decisions. In fact, power to influence is distinct from political capital—in particular, organizational details, such as procedural norms, institutions, and rights to veto, induce different mappings from political capital into power. In our model, this implies that the function P is in part determined by institutional design. For example, if decisions are taken by majority voting, such as in a parliament or in a committee, the support of the pivotal median voter has very different consequences on the leader's ability to influence decisions than the support of any other member of the organization. In this case, the function P has an 'S' shape. The requirement of a broader consensus, such as supermajorities, would shift the vertical section of the S-shaped function to the right. Furthermore, the inclusion in a committee of other powerful personalities with effective veto powers may limit the amount of power afforded to the leader for any stock of political capital.

In practice, institutional design variables such as voting rules or the presence of veto players are typically "sticky"—often, as is the case for political institutions, to control the behavior of future leaders. We therefore take a long-term view and ask what type of institutions are more conducive to organizational welfare behind a veil of ignorance, i.e., given a possible distribution F of future leaders with precision of information σ and initial stock of political capital k_1.

Our previous results highlight the importance of providing incentives for the leader to spend her political capital often enough in the interest of the organization. This is particularly important for leaders who, while not irrelevant, hold a small stock of initial political capital and are at risk of becoming irrelevant if they lose too much political capital. As we have seen, the incentives for such leaders depend on the shape of the function P which translates political capital into power to affect decisions. It is therefore natural to ask what type of institutions favor a more active role of junior leaders. To make more precise our analysis of this scenario, in this section we make the assumption that there exists a level of political capital $\underline{k}$ such that $P(k_t) = 0$ for all $k_t < \underline{k}$. (In the case of our linear function P_L, $\underline{k} = c$, i.e., the cost of spending capital in favor of alternative $a_t = 1$)

Essentially, the institutional designer has two levers. First, he can choose the maximum amount of power $\bar{P} \leq 1$ to give to leaders with sufficient political capital. Second, he can choose how fast junior leaders can climb the power ladder, by choosing institutional details that make the function P raise more or less steeply from $P(\underline{k})$ to $\bar{P}$.

One possible option is to give all leaders who are not irrelevant a constant amount of power: $P(k) = \bar{P}$ for all $k_t \geq \underline{k}$. Such a design has the virtue of making all leaders, even those with little capital, very effective. Proposition 8 says that such a constant function is not always optimal.

Proposition 8 (Optimal institutions) *There exist parameters c and b and distribution F such that the optimal function P is strictly increasing for some $k_t \geq \underline{k}$.*

Proof. In Appendix A. ■

Intuitively, a constant function P does not leverage any career concern of the leader to induce her to be active and spend capital on issues that are not very important to her. Thus, junior leaders with little capital will be patient. Since this design aims to maximize the effectiveness of leaders, then it serves best this objective when $\bar{P} = 1$. Furthermore, since career concerns incentives are relevant only for leaders who optimally choose to be patient, this design is optimal when most leaders are expected to hold large initial stocks of political capital.

Otherwise, the optimal function needs to leverage the career concerns of the leader, and so P must be strictly increasing for some k_t. On the one hand, this design makes leaders with little capital more valuable for the organization, as they will use their power more often. On the other hand, this design has two drawbacks. First, leaders with little capital are less effective when they choose to spend it. Second, some leader that, under the design with constant power, would optimally choose to be active are now induced to be patient, as they fear that spending political capital may decrease their future power. Therefore, a design that leverages the leader's career concerns is optimal only when most leaders have either very little or very large initial stocks of political capital.

5.3 Organizational culture

Organizations vary as much in culture as they do in structure.[35] For example, an organization may embody a *culture of reward*, where success draws more attention than failure or, conversely, a *culture of blame*, where failure draws more attention.

The culture of an organization has a clear effect on leadership styles. As put by Groysberg, Lee, Price and Cheng (2018), "for better *and* worse, culture and leadership are inextricably linked." Entrepreneurs often underlined that innovation relies on encouraging experimentation and even failure. In the words of IBM's Thomas Watson Sr., "the fastest way to succeed is to double your failure rate" (Farson and Keyes, 2002). Therefore, organizations may adopt cultures that place relatively greater emphasis on leaders' positive contributions to incentivize more active leadership styles. We focus on the effect of organizational culture on leader's accumulation of political capital.[36] A leader in an organization with a greater culture of reward is expected to accumulate more political capital when the alternative she spends her capital on is revealed to be correct, and to lose less political capital when the alternative is revealed to be incorrect. Thus, a greater culture of reward is expected to increase the propensity of the leader to spend her political capital and is conducive to a patient leader becoming loud, and a loud leader becoming strong. The reverse can be concluded for a leader in an organization with a greater culture of blame.

[35] See Kreps (1986) and Young (1993) for early economic models of organizational culture, and Hermalin (2013) for a particularly pertinent contribution on leadership and corporate culture.

[36] Here we restrict our attention to the effect of culture on capital accumulation. However, one could also consider the effect of organizational culture on the shape of the function P.

To formally analyze the relationship between organizational culture and its effect on leadership styles we consider variations of the law of motion of political capital. Recall that a leader with an initial stock of political capital k_1 has period-2 capital given by

$$k_2 = \begin{cases} k_1 + B(\theta_1) - c & \text{if she spends capital;} \\ k_1 & \text{otherwise,} \end{cases}$$

where $B(1) > 0 > B(0)$ and $B(1) > c$. We measure the relative importance of reward and blame by the values of $B(1)$ and $B(0)$. When the alternative that the leader spends her capital on is revealed to be correct her capital increases from k_t to $k_t + B(1) - c$, otherwise it decreases to $k_t + B(0) - c$. Thus, a greater $B(1)$ provides the leader with more reward, and a greater $B(0)$ provides the leader with less blame. We say that an organization with $B(\theta_1)$ has a *greater culture of reward* than $\hat{B}(\theta_1)$ if $B(1) \geq \hat{B}(1)$ and $B(0) \geq \hat{B}(0)$. Proposition 9 says that a greater culture of reward increases the propensity of the leader to spend political capital and is conducive to patient leaders becoming loud, and loud leaders becoming strong.

Proposition 9 (*Culture of reward or blame*) *Let $\Sigma^P(k_1) \equiv \{\sigma \in (\pi, 1] : \sigma < \sigma^*(k_1)\}$ and $\Sigma^S(k_1) \equiv \{\sigma \in (\pi, 1] : \sigma \geq \bar{\sigma}(k_1)\}$ be the intervals of leader's information precisions that induce her to optimally choose to be patient and strong, respectively. An increase in the culture of reward decreases the length of $\Sigma^P(k_1)$, and increases the length of $\Sigma^S(k_1)$.*

Proof. In Appendix A. ∎

The intuition for Proposition 9 can be understood most clearly by returning to the tradeoff faced by a leader who faces a low-importance period 1 issue, $\alpha_1 = \alpha^L$, and receives the signal $s_1 = 1$. The expected payoff of spending political capital in period 1 is then

$$\alpha^L \left[(1 - \Pr(\theta_1 = 1 \mid s_1 = 1)) + P(k_1)(2\Pr(\theta_1 = 1 \mid s_1 = 1) - 1) \right]$$
$$+ \Pr(\theta_1 = 1 \mid s_1 = 1) V(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1 \mid s_1 = 1)) V(k_1 + B(0) - c).$$

Her expected payoff of not spending political capital in period-1 is instead given by

$$\alpha^L (1 - \Pr(\theta_1 = 1 \mid s_1 = 1)) + V(k_1).$$

Recall that the future value of capital V is increasing in the level of period-2 capital. Therefore, a greater culture of reward increases the benefits of spending capital in period 1 via an increase in the expected stock of period-2 capital. On the other hand, changes in the culture (i.e., $B(1)$ or $B(0)$) do not affect the expected payoff of not spending capital. A similar logic shows that the expected period-2 power is weakly increasing as $B(1)$ increases and/or $B(0)$ decreases. Thus, the threshold required for a leader to accumulate power over time, $\bar{\sigma}(k_1)$, is decreasing as the culture of reward increases.

Given Proposition 9, it may be tempting to view a greater culture of reward as analogous to an increase in the leader's power or an upward shift in the function P. However, this is not the case. As we discussed in Section 5.2, an increase in power or upward shift of the function P can create incentives for both loud and patient leadership styles; that is, there is an ambiguous effect on the the leader's propensity to spend political capital. For example, a leader with a high level of capital, say $P(k_1) = 1 - 2\varepsilon$ for some sufficiently small $\varepsilon > 0$, facing a low importance period-1 issue, $\alpha_1 = \alpha^L$, has little incentive to spend capital—at most, she may attain an additional 2ε units of power. An upward shift in the function to $\hat{P}$ such that $\hat{P}(k_1) = 1 - \varepsilon$ would further reduce this incentive, since now the leader can attain at most an additional ε units of power. In contrast, a greater culture of reward has an unambiguous effect: it increases the leader's propensity to spend capital.

The key difference between an increase in the culture of reward and an increase in power is the timing of the effects they produce. An increase in power affects the leader's period-1 power and hence her ambitions to accumulate power for the following period. A greater culture of reward does not affect a leader's period-1 power. Instead, it only increases the expected future power returns of spending capital today.

6 Concluding Remarks

We have offered a simple framework for thinking about how collective decisions in an organization are influenced by a leader's political capital. This framework is rich enough to capture issues like managerial "style" and the endogenous evolution of political capital, yet simple enough to permit a complete characterization of the leader's optimal strategy and to analyze issues of organizational design and the allocation of power. Perhaps our most striking result is that the optimal allocation of power is non-monotonic in the precision of the leader's information.

Since at least Crawford and Sobel (1982) economists have been interested in how an expert with superior information to, but different preferences from, a decision maker can convey information and thus affect decisions. In a sense, cheap-talk models are about how information filters up a hierarchy. By contrast, we are concerned with how information flows down and how it is mediated by *power*. In our model, power stems from political capital.[37]

Future leaders themselves have the ability to invest in their initial stock of political capital. In fact, alliances and friendships may be built well before the leader assumes her position, often at significant costs. In our model, from the point of view of the leader, political capital (and therefore power) and her own precision of information (or 'talent') are complements. Thus, the leader's optimal investment in political capital (weakly) increases with the precision of her information.

[37]C.f. the incomplete contracts literature, which also has a well-defined notion of economic power (Grossman and Hart, 1986; Aghion and Tirole, 1997; Aghion and Holden, 2011).

Organizations and their leaders may also invest in the quality of the information they possess (via training, workshops, further education, investments in technology, etc.). Should this investment be concentrated on the organization's leader or spread across all decision makers? Investing in the leader's information may not be optimal from the organization's perspective if the leader is patient and avoids making decisions in an attempt to preserve her political capital. But investing in other decision makers may also be wasteful if their decisions are likely to be revised by the leader. In our model, the value the organization attains from a marginal increase in the precision of the leader's information is increasing in the leader's political capital, whilst the relationship is reversed for the accuracy of the default choice—a measure of the precision of the information spread across all decision makers. Intuitively, the organization is better off when a more informed decision is made. When the leader has a higher level of political capital, her opinion is more likely to be decisive. Therefore, the organization relies heavily on the leader's information and experience, and thus places greater value on marginal increases in the precision of her information. In contrast, a leader with a lower level of political capital is less likely to take the final decision. Therefore, the organization relies more heavily upon the collective wisdom of its members, and thus places greater value on marginal increases in the precision of the information spread across all decision makers.

There is now a sizable literature on "persistent performance differences" in organizations.[38] A striking empirical finding due to Bertrand and Schoar (2003) is that individual (top) managers have a significant impact on both firm behavior and performance. Remarkably, these are related to certain observable characteristics of managers such as their educational background or age. Our theory suggests that one potentially important unobservable characteristic of a CEO is her political capital. Moreover, since the realizations of decisions are stochastic this capital evolves over time. Finally, organizational design can affect managerial style in this regard.

[38]See Gibbons (2006), Chassang (2010) and Ellison and Holden (2014) among many other contributions.

We can also think of regulatory reforms as having an impact on the allocation of power. The Sarbanes-Oxley Act (2002) introduced a number of measures, one of which was aimed at increasing independence in the Board of Directors, ostensibly by requiring a majority of independent directors (Linck et al., 2009). This presumably limits the power of the CEO which, in the context of our results, may lead to a better alignment of the incentives of the leader/CEO and the organization.

Finally, as we have stressed, within an organization who is "the leader" may depend on context. In firms it is perhaps natural to think of the CEO as the unitary leader. By contrast, in an academic department, the role of leader may depend on the topic of the decision to be made—such as the subfield of a hiring decision. It may also be the case that in some circumstances it is better to think of the leader as a group of members in the organization rather than a single individual. This immediately raises questions of how such groups form, their stability, and other issues. Such questions may be an interesting prospect for future work.

A Omitted Proofs

Proof of Lemma 1. First note that, since $\sigma > \pi$, the leader prefers alternative $a_2 = 1$ to alternative $a_2 = 0$ if and only if $s_2 = 1$.

Let k_2 be a non-irrelevant leader's period-2 stock of political capital. Spending political capital in period 2 yields expected utility equal to

$$\alpha_2(1 - \Pr(\theta_2 = 1|s_2)) + \alpha_2(2\Pr(\theta_2 = 1|s_2) - 1)P(k_2);$$

not spending political capital yields expected utility equal to $\alpha_2(1 - \Pr(\theta_2 = 1|s_2))$. The net benefit of spending capital is then given by

$$\alpha_2(2\Pr(\theta_2 = 1|s_2) - 1)P(k_2). \tag{7}$$

Since $\sigma > \pi$,

$$\Pr(\theta_2 = 1|s_2) \begin{cases} > 1/2 & \text{if } s_2 = 1; \\ < 1/2 & \text{otherwise.} \end{cases} \tag{8}$$

Furthermore, because the leader is not irrelevant, $P(k_2) > 0$. Hence, the net benefit of spending political capital is positive (negative) if $s_2 = 1$ ($s_2 = 0$). ■

Proof of Proposition 1. Let k_1 be a stock capital that makes the leader not irrelevant. Recall that the value of holding a stock k_2 of political capital in period 2 is given by

$$V(k_2) = \bar{\alpha}\pi + \bar{\alpha}\left(2\Pr\left(\theta_2 = 1 \mid s_2 = 1\right) - 1\right)\Pr\left(s_2 = 1\right)P\left(k_2\right), \tag{9}$$

where $\bar{\alpha}$ is the expected value of α_2.

Spending political capital in period 1 yields expected utility equal to

$$\begin{aligned}\alpha_1(1 - \Pr(\theta_1 = 1|s_1)) + \alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1) - 1)\\ + \Pr(\theta_1 = 1|s_1)V(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1))V(k_1 + B(0) - c);\end{aligned} \tag{10}$$

not spending political capital yields expected utility equal to

$$\alpha_1(1 - \Pr(\theta_1 = 1|s_1)) + V(k_1). \tag{11}$$

Thus, the leader spends capital in period 1 if and only if the difference between (10) and

(11) is positive, i.e., if

$$\alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1) - 1) + \Pr(\theta_1 = 1|s_1)V(k_1 + B(1) - c) \\ + (1 - \Pr(\theta_1 = 1|s_1))V(k_1 + B(0) - c) - V(k_1) > 0. \tag{12}$$

We now consider three different cases for the value of the period-1 signal, $s_1 \in \{0, 1\}$, and the issue's importance, $\alpha_1 \in \{\alpha^L, \alpha^H\}$.

$s_1 = 1$ *and* $\alpha_1 = \alpha^H$. We now show that the leader always spends capital in this case. By substituting (9) into (12) and simplifying, we obtain that the leader spends political capital if and only if

$$\alpha^H P(k_1)(2\Pr(\theta_1 = 1|s_1 = 1) - 1) + \bar{\alpha}\,(2\Pr(\theta_2 = 1 \mid s_2 = 1) - 1)\Pr(s_2 = 1) \times \\ \Big(\Pr(\theta_1 = 1|s_1 = 1)P(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1 + B(0) - c) - P(k_1)\Big) > 0. \tag{13}$$

Dividing by

$$(2\Pr(\theta_1 = 1|s_1 = 1) - 1) = (2\Pr(\theta_2 = 1|s_2 = 1) - 1),$$

which is positive for all $\sigma > \pi$, gives an equivalent condition for (13):

$$\alpha^H P(k_1) + \bar{\alpha}\Pr(s_2 = 1) \times \\ \Big(\Pr(\theta_1 = 1|s_1 = 1)P(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1 + B(0) - c) - P(k_1)\Big) > 0.$$

Since $\alpha^H > \bar{\alpha}$ and $B(1) > c$, the left hand side of the above inequality is strictly greater than

$$\begin{aligned}
&\bar{\alpha}P(k_1) + \bar{\alpha}\Pr(s_2 = 1)(1 - \Pr(\theta_1 = 1|s_1 = 1))\Big(P(k_1 + B(0) - c) - P(k_1)\Big) \\
&\geq \bar{\alpha}P(k_1) - \bar{\alpha}\Pr(s_2 = 1)(1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1) \\
&> 0,
\end{aligned}$$

since $P(\cdot)$ is non-negative and $\Pr(s_2 = 1)(1 - \Pr(\theta_1 = 1|s_1 = 1)) < 1$. We conclude that the inequality (13) holds.

<u>$s_1 = 1$ *and* $\alpha_1 = \alpha^L$.</u> We now show that there exists a threshold value $\sigma^*(k_1)$ such that the leader spends political capital if and only if $\sigma > \sigma^*(k_1)$. By substituting (9) into (12) and simplifying in a similar manner as the above case, we obtain that the leader spends political capital if and only if

$$\begin{aligned}
&\alpha^L P(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P(k_1 + B(1) - c) - P(k_1)) \\
&\qquad -(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P(k_1) - P(k_1 + B(0) - c)) > 0. \quad (14)
\end{aligned}$$

Recall that $B(1) > c$ and $0 > B(0)$, and so

$$P(k_1 + B(1) - c) - P(k_1) \geq 0 \quad \text{and} \quad P(k_1) - P(k_1 + B(0) - c) \geq 0.$$

It then follows that the left hand side of inequality (14) is increasing in σ, since

$$\Pr(\theta_1 = 1|s_1 = 1)\Pr(s_2 = 1) = \Pr(\theta_1 = 1|s_1 = 1)\Pr(s_1 = 1) = \sigma(1 - \pi)$$

is increasing in σ, and $(1 - \Pr(\theta_1 = 1|s_1 = 1))\Pr(s_2 = 1) = (1 - \sigma)\pi$ is decreasing in σ. Furthermore, for σ sufficiently close to one, inequality (14) holds. We conclude that there exists a threshold value $\sigma^*(k_1) < 1$ that solves (14) with equality such that the leader spends political capital if and only if $\sigma > \sigma^*(k_1)$.

$\underline{s_1 = 0 \textit{ and } \alpha_1 \in \{\alpha^L,\, \alpha^H\}}$. From (12), the leader spends capital if and only if

$$\alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1 = 0) - 1) + \Pr(\theta_1 = 1|s_1 = 0)[V(k_1 + B(1) - c) - V(k_1)] \\ + (1 - \Pr(\theta_1 = 1|s_1 = 0))[V(k_1 + B(0) - c) - V(k_1)] > 0. \tag{15}$$

But by Assumption 1 we have

$$\Pr(\theta_1 = 1|s_1 = 0)(P(k_1 + B(1) - c) - P(k_1)) \\ + (1 - \Pr(\theta_1 = 1|s_1 = 0))(P(k_1 + B(0) - c) - P(k_1)) \leq 0, \tag{16}$$

and, substituting the value of $V(\cdot)$, as per (9), we infer that the left hand side of (15) has strict upper bound $\alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1 = 0) - 1)$. This upper bound is negative, since since $\Pr(\theta_1 = 1|s_1 = 0) < 1/2$, and so the inequality (15) never holds. We conclude that the leader does not spend political capital.

Since the three cases are exhaustive, we have proven the proposition. ■

Proof of Proposition 2. Consider a non-irrelevant leader with initial stock of political capital $k_1 \in \mathbb{R}$, period-1 power $P(k_1) > 0$, and precision of information σ. By Proposition 1, a non-irrelevant leader spends political capital in period 1 only if she receives a signal $s_1 = 1$. Therefore, when the leader optimally spends political capital in period 1, her expected period-2 power is equal to

$$\Pr(\theta_1 = 1|s_1 = 1)P(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1 + B(0) - c).$$

Thus, when the leader spends political capital, her power is expected to grow if and only if

$$\Pr(\theta_1 = 1|s_1 = 1)P(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1 + B(0) - c) \geq P(k_1). \tag{17}$$

The left hand side of above inequality increases with σ because $\Pr(\theta_1 = 1|s_1 = 1)$ increases with σ; the right hand side is constant in σ. We conclude that there exists a threshold value $\bar{\sigma}(k_1)$ that solves (17) with equality such that if the leader chooses to spend her political capital, then

1. if $\sigma > \bar{\sigma}(k_1)$, the leader's power is expected to grow over time;

2. if $\sigma < \bar{\sigma}(k_1)$, the leader's power is expected to decline over time.

It remains to prove that $\bar{\sigma}(k_1) \leq 1$ and $\bar{\sigma}(k_1) > \sigma^*(k_1)$.

$\underline{\bar{\sigma}(k_1) \leq 1}$. If $\sigma = 1$, then $\Pr(\theta_1 = 1|s_1 = 1) = 1$. It is then immediate that (17) holds, since P is increasing and $B(1) > c$. We conclude that $\bar{\sigma}(k_1)$ is bounded by 1.

$\underline{\bar{\sigma}(k_1) > \sigma^*(k_1)}$. By definition of $\sigma^*(k_1)$, a leader with $\sigma = \sigma^*(k_1)$ must be indifferent between spending and saving capital on an $\alpha_1 = \alpha^L$ issue when $s_1 = 1$. That is, the following equality must hold:

$$\begin{aligned} &\alpha^L P(k_1) + \bar{\alpha}\Pr(s_1 = 1)\Pr(\theta_1 = 1|s_1 = 1)P(k_1 + B(1) - c) \\ &\quad + \bar{\alpha}\Pr(s_1 = 1)(1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1 + B(0) - c) = \bar{\alpha}\Pr(s_1 = 1)P(k_1). \end{aligned} \tag{18}$$

By contradiction, suppose $\bar{\sigma}(k_1) \leq \sigma^*(k_1)$. Then there exists σ' such that (17) and (18) both hold. Given (17), the left hand side of (18) is bounded below by $\alpha^L P(k_1) + \bar{\alpha}\Pr(s_1 = 1)P(k_1)$, which strictly exceeds the right hand side of (18) because $P(k_1) > 0$ and $\alpha^L > 0$—a contradiction. ■

Proof of Proposition 3. Follows immediately from the definition of the four leadership styles (see Section 4.2) and Propositions 1 and 2. ■

Proof of Proposition 4. Let k_1 be a non-irrelevant leader's initial stock of political capital. By Proposition 1, if $\sigma \geq \sigma^*(k_1)$, the leader optimally chooses to spend political capital in period 1 whenever she prefers alternative $a_1 = 1$, which occurs with probability

$$\Pr(s_1 = 1) = \pi - \sigma(2\pi - 1);$$

if $\sigma < \sigma^*(k_1)$, she optimally chooses to spend political capital in period 1 if she prefers alternative $a_1 = 1$ *and* $\alpha_1 = \alpha^H$, which occurs with probability

$$\Pr(s_1 = 1)\Pr(\alpha^H) = \Pr(\alpha^H)\pi - \sigma(2\pi - 1)\Pr(\alpha^H).$$

Because $\pi > 1/2$, both probabilities are decreasing in σ. Furthermore, the probability of spending political capital is discontinuous at $\sigma^*(k_1)$. This discontinuous jump is positive and equal to $\Pr(s_1 = 1)(1 - \Pr(\alpha^H))$. We conclude that the probability of spending capital in period 1 is strictly decreasing in σ for all $\sigma \neq \sigma^*(k_1)$ and has local maxima at $\sigma = \pi$ and $\sigma = \sigma^*(k_1)$. ■

Proof of Proposition 5. This result is a special case of Proposition 6, where the general function P is substituted from the piece-wise linear function $P_L \ : \ P_L(k_t) = 0 \ \ \forall k_t < c,$ and $P_L = \max\{k_t,\, 1\}$ otherwise, and $B(1) = -B(0) \equiv b > c$. For simplicity, within this proof, we assume $2b + c < 1$; however, the result holds more generally and can be shown similarly.

Proposition 6 says that, for nonempty $\Sigma^P(k_1)$, if $P'(k_1) \neq 0$ then $\sigma^*(k_1)$ is increasing in k_1 if and only if

$$\begin{aligned}&\Pr\left(\theta_1 = 1 \mid s_1 = 1, \sigma = \sigma^*\left(k_1\right)\right)\frac{P'\left(k_1 - c + b\right) - P'\left(k_1\right)}{P'\left(k\right)} < \\ &\Pr\left(\theta_1 = 0 \mid s_1 = 1, \sigma = \sigma^*\left(k_1\right)\right)\frac{P'\left(k_1\right) - P'\left(k_1 - c - b\right)}{P'\left(k_1\right)} - \frac{\alpha^L}{\bar{\alpha}\Pr\left(s_1 = 1 \mid \sigma = \sigma^*\left(k_1\right)\right)}.\end{aligned} \tag{19}$$

Recall that when $\sigma = \sigma^*(k_1)$ the following *indifference condition* must hold

$$\alpha^L P(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_1 = 1)(P(k_1 + b - c) - P(k_1)) \\ +(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_1 = 1)(P(k_1 - b - c) - P(k_1)) = 0, \quad (20)$$

where (with some abuse of notation) we omit the $\sigma = \sigma^*(k_1)$ dependencies in the above indifference condition. This condition comes from equation (14) in the proof of Proposition 1; note that $\Pr(s_1 = 1) = \Pr(s_2 = 1)$.

We wish to show that when $P = P_L$, $\Sigma^P(k_1)$—equivalently: $\sigma^*(k_1)$ is increasing in the political capital regions $R_1 := [c, 2c + b)$ and $R_2 := [1 - (b - c), 1)$, and otherwise is decreasing. We divide the argument in four cases.

$\underline{k_1 \in R_1.}$ For all $k_1 \in R_1$, we have $P'(k_1) = 1$, $P'(k_1 - b - c) = 0$, and $P'(k_1 - c + b) = 1$, since $P = P_L$. Thus, the condition for $\Sigma^P(k_1)$ to be increasing (19) simplifies to

$$0 < \Pr\left(\theta_1 = 0 \mid s_1 = 1, \sigma = \sigma^*\left(k_1\right)\right) - \frac{\alpha^L}{\bar{\alpha}\Pr\left(s_1 = 1 \mid \sigma = \sigma^*\left(k_1\right)\right)}, \quad (21)$$

for $k_1 \in R_1$. Furthermore, in region R_1 the indifference condition (20) simplifies to

$$\alpha^L k_1 + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_1 = 1)(k_1 + b - c - k_1) \\ -(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_1 = 1)k_1 = 0,$$

since for all $k_1 \in R_1$ we have $P_L(k_2) = k_2$ for $k_2 \in \{k_1,\, k_1 + b - c\}$, and $P_L(k_1 - b - c) = 0$, and after rearranging we attain

$$\frac{\alpha^L}{\bar{\alpha}\Pr\left(s_1 = 1 \mid \sigma = \sigma^*\left(k_1\right)\right)} = -\Pr(\theta_1 = 1|s_1 = 1)\frac{k_1 + b - c}{k_1} + 1.$$

Returning to (21), we see that the right hand side can be expressed as

$$\Pr\left(\theta_1 = 0 \mid s_1 = 1\right) + \Pr(\theta_1 = 1|s_1 = 1)\frac{k_1 + b - c}{k_1} - 1,$$

which is strictly larger than

$$\Pr\left(\theta_1 = 0 \mid s_1 = 1\right) + \Pr(\theta_1 = 1|s_1 = 1) - 1 = 0.$$

It is immediate that the right hand side of (21) is positive. Thus, the inequality (21) holds and we infer that $\Sigma^P(k_1)$ is increasing in the region R_1.

$\underline{k_1 \in R_2}$. For all $k_1 \in R_2$, we have $P'(k_1) = 1$, $P'(k_1 + b - c) = 0$, and $P'(k_1 - c - b) = 1$. Thus, the condition for $\Sigma^P(k_1)$ to be increasing (19) simplifies to

$$-\Pr\left(\theta_1 = 1 \mid s_1 = 1, \sigma = \sigma^*\left(k_1\right)\right) < -\frac{\alpha^L}{\bar{\alpha}\Pr\left(s_1 = 1 \mid \sigma = \sigma^*\left(k_1\right)\right)}. \tag{22}$$

Furthermore, in region R_2 the indifference condition (20) simplifies to

$$\begin{aligned}\alpha^L k_1 + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_1 = 1)(1 - k_1)& \\ + (1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_1 = 1)(k_1 - b - c - k_1) &= 0,\end{aligned}$$

since for all $k_1 \in R_2$ we have $P_L(k_2) = k_2$ for $k_2 \in \{k_1,\ k_1 - b - c\}$, and $P_L(k_1 + b - c) = 1$, and after rearranging we attain

$$\frac{\alpha^L}{\bar{\alpha}\Pr\left(s_1 = 1 \mid \sigma = \sigma^*\left(k_1\right)\right)} = -\Pr(\theta_1 = 1|s_1 = 1)\frac{1}{k_1} - (1 - \Pr(\theta_1 = 1|s_1 = 1))\frac{k_1 - b - c}{k_1} + 1.$$

Returning to (22), we see that the right hand side can be expressed as

$$
\begin{aligned}
&\Pr(\theta_1 = 1|s_1 = 1)\frac{1}{k_1} + (1 - \Pr(\theta_1 = 1|s_1 = 1))\frac{k_1 - b - c}{k_1} - 1 \\
&> \Pr(\theta_1 = 1|s_1 = 1) + (1 - \Pr(\theta_1 = 1|s_1 = 1))\frac{k_1 - b - c}{k_1} - 1 \\
&> -\Pr(\theta_1 = 0|s_1 = 1),
\end{aligned}
$$

but this exceeds the left hand side of (22). We conclude that (22) holds and $\Sigma^P(k_1)$ is increasing in the region R_2.

$\underline{k_1 \in R_3 := [2c + b, 1 - (b - c))}$. For all $k_1 \in R_3$ we have $P'(k_1) = P'(k_1 - c \pm b) = 1$. Thus, the condition for $\Sigma^P(k_1)$ to be increasing (19) simplifies to

$$
0 < -\frac{\alpha^L}{\bar{\alpha} \Pr\left(s_1 = 1 \mid \sigma = \sigma^*\left(k_1\right)\right)}.
$$

This inequality never holds since $\alpha^L > 0$. We conclude that $\Sigma^P(k_1)$ is decreasing in the region R_3.

$\underline{k_1 \in R_4 := [1, \infty)}$. For all $k_1 \in R_4$, we have $P'(k_1) = 0$. By Proposition 6, $\Sigma^P(k_1)$ is decreasing in the region R_4.

Since the four cases are exhaustive, we have proven the proposition. ∎

Proof of Proposition 6. For nonempty $\Sigma^P(k_1)$, the length of $\Sigma^P(k_1)$ is simply $\sigma^*(k_1) - \pi$. Note that the length of $\Sigma^P(k_1)$ is weakly increasing in $\sigma^*(k_1)$.

To prove the proposition, we consider the effect of a marginal increase in k_1 on the length of $\Sigma^P(k_1)$, or equivalently the value of $\sigma^*(k_1)$.

From equation (14) in the proof of Proposition 1, if $\sigma = \sigma^*(k_1)$, then the following indifference condition holds:

$$\Phi(k_1,\sigma) \equiv \alpha^L P(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P(k_1 + B(1) - c) - P(k_1))$$
$$+(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P(k_1 + B(0) - c) - P(k_1)) = 0. \tag{23}$$

$\Phi(k_1,\sigma)$ is the net benefit of spending capital in period 1 when $\alpha_1 = \alpha^L$ and $s_1 = 1$. Note that $\Phi(k_1,\sigma)$ is increasing and continuous in σ.

Lemma 2 *For a given capital level k_1, a marginal increase in capital has opposite effects on $\Phi(k_1,\sigma)\Big|^{\sigma=\sigma^*(k_1)}$ and $\sigma^*(k_1)$:*

$$\frac{\partial\Phi(k_1,\sigma)}{\partial k_1}\Bigg|^{\sigma=\sigma^*(k_1)} > 0 \quad \textit{if and only if} \quad \frac{\partial\sigma^*(k_1)}{\partial k_1} < 0.$$

Proof. Suppose that a marginal increase in capital from k_1 to k_1' results in an increase in the $\sigma^*(k_1)$-leader's net benefit, i.e.,

$$\Phi(k_1',\sigma^*(k_1)) > \Phi(k_1,\sigma^*(k_1)) = 0.$$

Then, since $\Phi(k_1',\sigma)$ is increasing in σ, the value σ' such that

$$\Phi(k_1',\sigma') = 0, \qquad \text{or equivalently} \qquad \sigma' = \sigma^*(k_1'),$$

is strictly less than $\sigma^*(k_1)$. Similarly, if a marginal increase in k_1 results in a decrease in the $\sigma^*(k_1)$-leader's net benefit then $\sigma^*(k_1') > \sigma^*(k_1)$. ■

From the above lemma, we have that $\Sigma^P(k_1)$ is increasing if and only if

$$\left.\frac{\partial \Phi(k_1,\sigma)}{\partial k_1}\right|^{\sigma=\sigma^*(k_1)} = \alpha^L P'(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P'(k_1 + B(1) - c) - P'(k_1))$$

$$+ (1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P'(k_1 + B(0) - c) - P'(k_1))$$

$$< 0.$$

Rearranging and simplifying terms yields (4) in the proposition. ■

Proof of Proposition 7. We begin by stating two facts that will be useful in proving the proposition.

Lemma 3 *For any given initial stock of political capital, the organization strictly prefers an active (loud or strong) leader to a patient leader.*

Proof. Suppose $\alpha^L = \alpha^H > 0$ so that the leader's payoff function is a monotonic transformation of the organization's payoff function. By Proposition 1 (in particular, see (14) in the proof of Proposition 1) the leader strictly prefers to spend political capital in period 1 whenever she prefers alternative $a_1 = 1$. Therefore, the organization strictly prefers the leader to spend political capital in period 1 whenever she prefers alternative $a_1 = 1$. ■

Lemma 4 *Fix a leadership style in patient, loud, strong, the organization strictly prefers a leader with a greater initial stock of political capital.*

Proof. To see this, fix the leader's style. A higher initial stock of political capital strictly increases the leader's power in period 1 and, for any realization of events, weakly increases the leader's power in period 2. Since whenever the leader spends political capital, the organization strictly prefers alternative $a_1 = 1$ to be implemented, absent a change in the leader's style, the organization prefers a leader with a greater initial stock of political capital. ■

We now prove that if (5) holds when $k_1 = \bar{k}$, then $k^*(\sigma) = \bar{k}$ for all $\sigma \in (\pi, 1)$. Let (5) hold at $k_1 = \bar{k}$. Recall from the proof of Proposition 1 (in particular, see (12)) that a leader with initial stock of political capital equal to $\bar{k}$ adopts an active leadership style if and only if

$$\Big(2\Pr(\theta_1 = 1|s_1 = 1) - 1\Big)\Bigg(\alpha^L P(\bar{k}) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P(\bar{k} + B(1) - c) - P(\bar{k}))$$
$$-(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P(\bar{k}) - P(\bar{k} + B(0) - c))\Bigg) > 0.$$

Notice that $2\Pr(\theta_1 = 1|s_1 = 1) - 1$ is strictly positive for all $\sigma > \pi > 1/2$. Furthermore, the term in the second parenthesis is (i) increasing in σ (see (14) in the proof of Proposition 1), and (ii) non-negative for $\sigma = \pi$ since (5) holds at $k_1 = \bar{k}$. Therefore, a leader with initial stock of political capital equal to $\bar{k}$ adopts an active leadership style for all $\sigma > \pi$. By Lemmas 3 and 4, then the optimal allocation of political capital equals $\bar{k}$ for all $\sigma \in (\pi, 1)$.

We now prove that if (5) does not hold for all $k_1 \leq \bar{k}$ and the length of $\Sigma^P(k_1)$ increases with k_1 at $k_1 = \bar{k}$, then there exists a unique $\hat{\sigma} \in (\pi, 1)$ such that $k^*(\sigma) = \bar{k}$ for $\sigma < \hat{\sigma}$, $k^*(\hat{\sigma}) < \bar{k}$, and $k^*(\sigma)$ increases with σ for $\sigma \geq \hat{\sigma}$. I.e., the optimal allocation of political capital is U-shaped. Recall from Proposition 6 that $\Sigma^P(k_1)$ increases with k_1 at $k_1 = \bar{k}$ if

$$(1-\pi)\sigma^*\left(\bar{k}\right)P'\left(\bar{k} + B(1) - c\right) + \pi(1 - \sigma^*\left(\bar{k}\right))P'\left(\bar{k} + B(0) - c\right) <$$
$$\left[(1-\pi)\sigma^*\left(\bar{k}\right) + \pi(1 - \sigma^*\left(\bar{k}\right)) - \frac{\alpha^L}{\bar{\alpha}}\right]P'\left(\bar{k}\right). \quad (24)$$

We prove this in four steps:

Step 1. Because (5) does not hold for all $k_1 \leq \bar{k}$, from the proof of Proposition 1 (in particular, see (12)), there exists a unique $\underline{\sigma}$ such that the leader optimally chooses to be patient for any $k_1 \leq \bar{k}$ if and only if $\sigma < \underline{\sigma}$. By Lemma 4, the optimal allocation of political capital equals $\bar{k}$ for all $\sigma < \underline{\sigma}$.

Step 2. By Propositions 2 and 3, a leader with $\sigma > \sigma^*(\bar{k})$ optimally chooses to be active for $k_1 = \bar{k}$. By Lemmas 3 and 4, then the optimal allocation of political capital equals $\bar{k}$ for all $\sigma > \sigma^*(\bar{k})$.

Step 3. Because (5) does not hold for all $k_1 \leq \bar{k}$ and (24) holds, there exist an interval $\hat{\Sigma} = [\underline{\sigma}, \sigma^*(\bar{k}))$ such that a leader with information of precision $\sigma \in \hat{\Sigma}$ optimally chooses a patient style if $k_1 = \bar{k}$ but optimally chooses an active style for $k(\sigma) < \bar{k}$ such that

$$k(\sigma) = \max\{k : \sigma = \sigma^*(k)\}. \tag{25}$$

By Lemmas 3 and 4, for any $\sigma \in \hat{\Sigma}$, the optimal allocation of political capital is either equal to $\bar{k}$ or to $k(\sigma)$.

Step 4. By Proposition 6 and (24), $d\sigma^*(k)/dk \mid_{k=\bar{k}} > 0$. Therefore there exists $\sigma \in \hat{\Sigma}$ for which the optimal allocation of political capital is equal to $k(\sigma) < \bar{k}$. Since $\sigma^*(k)$ is an increasing function there exists a unique $\hat{\sigma} \in \hat{\Sigma}$ such that $k^*(\sigma) = \bar{k}$ for $\sigma < \hat{\sigma}$, $k^*(\hat{\sigma}) < \bar{k}$, and $k^*(\sigma)$ increases with σ for $\sigma \geq \hat{\sigma}$. ■

Proof of Proposition 8. Consider the case where $B(1) = -B(0) \equiv b > c$. We begin by introducing some notation. Let $q = \Pr[\alpha_t = \alpha^H]$, $\omega = \Pr[s_t = 1]$, and $p_s(\theta) = \Pr[\theta_t = \theta \mid s_t = s]$. For a given function P, a leader with initial stock of political capital k_1 and precision of information σ, let $V(\sigma, k_1; P)$ denote the expected utility of the organization over the two periods.

Consider the function

$$P_M \ : \ P_M(k_1) = \begin{cases} 1 & \text{for } k \geq \underline{k} \\ 0 & \text{otherwise,} \end{cases}$$

and suppose there is a leader with initial stock of political capital $k_1 \in [\underline{k}, \underline{k} + b - c)$ and precision of information σ. When $P = P_M$, it follows from (14) that she is loud if and only if

$$\sigma \geq \sigma^*_M := \frac{\bar{\alpha}\pi - \alpha^L}{\bar{\alpha}\pi}.$$

If $\sigma < \sigma_M^*$ (i.e., the leader is patient), then the organization's expected utility is

$$\begin{aligned} V(\sigma, k_1; P_M) =& (1-\omega)p_0(0) + \omega(1-q)p_1(0) + \omega q p_1(1) + \big[(1-\omega) + \omega(1-q)\big]\mathbb{E}[v_2 \mid k_1; P_M] \\ &+ \omega q\Big[p_1(1)\mathbb{E}[v_2 \mid k_1 + b - c; P_M] + p_1(0)\mathbb{E}[v_2 \mid k_1 - b - c; P_M]\Big], \end{aligned} \tag{26}$$

where

$$\mathbb{E}[v_2 | k_2; P] = \omega p_1(1)P(k_2) + \omega p_1(0)(1 - P(k_2)) + (1-\omega)p_0(0) \tag{27}$$

denotes the organization's period-2 expected utility from a leader with period-2 capital k_2 and function P. Define the values E_+ and E_- such that

$$E_+ := \mathbb{E}[v_2 \mid k_1 + b - c; P_M] = \omega p_1(1) + (1-\omega)p_0(0),$$

and

$$E_- := \mathbb{E}[v_2 \mid k_1 - b - c; P_M] = \omega p_1(0) + (1-\omega)p_0(0).$$

Thus, (26) can be expressed as

$$\begin{aligned} V(\sigma, k_1; P_M) =& (1-\omega)p_0(0) + \omega(1-q)p_1(0) + \omega q p_1(1) \\ &+ \big[(1-\omega) + \omega(1-q)\big]E_+ + \omega q\Big[p_1(1)E_+ + p_1(0)E_-\Big], \end{aligned} \tag{28}$$

Now consider the function

$$P_\eta \ : \ P_\eta(k_1) = \begin{cases} 1 & \text{for } k \geq \underline{k} + b - c \\ \eta & \text{for } \underline{k} \leq k < \underline{k} + b - c \\ 0 & \text{otherwise,} \end{cases}$$

where $1/2 \leq \eta < 1$,[39] and suppose there is a leader with initial stock of political capital $k_1 \in [\underline{k}, \underline{k} + b - c)$ and precision of information σ. When $P = P_\eta$, it follows from (14) that she is loud (or strong) if and only if

$$\sigma \geq \sigma_\eta^* := \frac{\bar{\alpha}\pi\eta - \alpha^L \eta}{\bar{\alpha}[(1-\pi)(1-\eta) + \pi\eta]}$$

Notice that $\sigma_\eta^* < \sigma_M^*$ for all $\eta < 1$ and equality holds for $\eta = 1$. If $\sigma > \sigma_\eta^*$ (i.e., she is a loud or strong leader), then the expected utility of the organization is

$$\begin{aligned} V(\sigma, k_1; P_\eta) =& (1-\omega)p_0(0) + \omega\Big[p_1(1)\eta + p_1(0)(1-\eta)\Big] + \big[(1-\omega)\big]\mathbb{E}[v_2 \mid k_1; P_\eta] \\ &+ \omega\Big[p_1(1)\mathbb{E}[v_2 \mid k_1 + b - c; P_\eta] + p_1(0)\mathbb{E}[v_2 \mid k_1 - b - c; P_\eta]\Big]. \end{aligned}$$

Noting that $\mathbb{E}[v_2 \mid k_1 + b - c; P_\eta] = E_+$ and $\mathbb{E}[v_2 \mid k_1 - b - c; P_\eta] = E_-$, it follows that

$$\begin{aligned} V(\sigma, k_1; P_\eta) =& (1-\omega)p_0(0) + \omega\Big[p_1(1)\eta + p_1(0)(1-\eta)\Big] + \big[(1-\omega)\big]\mathbb{E}[v_2 \mid k_1; P_\eta] \\ &+ \omega\Big[p_1(1)E_+ + p_1(0)E_-\Big]. \end{aligned} \tag{29}$$

We now show that when $\alpha^L/\bar{\alpha} < (1-\pi)\pi$ there exists values of $\eta \in [1/2, 1)$ and a distribution F with full support over $(\pi, 1] \times [\underline{k}, \infty)$ such that an organization with function $P = P_\eta$ attains strictly higher expected utility than an organization with $P = P_M$, i.e.,

$$\int_{(\sigma, k_1)} V(\sigma, k_1; P_\eta) - V(\sigma, k_1; P_M)\, dF(\sigma, k_1) > 0. \tag{30}$$

This will suffice to show that the optimal function (which need not be P_η) is strictly increasing for some $k \geq \underline{k}$. The assumption that $\alpha^L/\bar{\alpha} < (1-\pi)\pi$ ensures that $\sigma_M^* > \pi$ and, hence, $[\sigma_\eta^*, \sigma_M^*) \cap (\pi, 1]$ is non-empty.

[39]This lower bound on η is sufficient to ensure that Assumption 1 is satisfied.

Let the distribution F be concentrated in the region $R := [\sigma^*_\eta, \sigma^*_M) \times [\underline{k}, \underline{k} + b - c]$ so that

$$\int_{(\sigma,k_1)\in R} dF(\sigma, k_1) > 1 - \varepsilon,$$

for some $\varepsilon > 0$ sufficiently small. A lower bound on the LHS of (30) is then

$$\int_{(\sigma,k_1)\in R} V(\sigma, k_1; P_\eta) - V(\sigma, k_1; P_M)\, dF(\sigma, k_1) - 2\varepsilon, \tag{31}$$

since $0 < V(\sigma, k_1; P) \leq 2$ for any function P.

Now notice that for any leader with $(\sigma, k_1) \in R$ she will be patient if the organization has $P = P_M$ and she will be loud (or strong) if $P = P_\eta$. The former provides the organization with expected utility (28) and the latter provides expected utility (29). Furthermore, for any $(\sigma, k_1) \in R$, as $\eta \to 1^-$

$$V(\sigma, k_1; P_\eta) \to \bar{V}(\sigma, k_1) := (1-\omega)p_0(0) + \omega p_1(1) + \big[(1-\omega)\big]E_+ + \omega\Big[p_1(1)E_+ + p_1(0)E_-\Big].$$

Simple algebra shows that $\bar{V}(\sigma, k_1) > V(\sigma, k_1; P_M)$ for any $(\sigma, k_1) \in R$ and $\bar{V}(\pi, k_1) = V(\pi, k_1; P_M)$. However, since $\sigma^*_M > \pi$, for η sufficiently close to one $\sigma^*_\eta > \pi$, and $\bar{V}(\sigma, k_1) - V(\sigma, k_1; P_M)$ will be bounded away from 0 for all $(\sigma, k_1) \in R$. That is,

$$L := \inf_{(\sigma,k_1)\in R} \Big(\bar{V}(\sigma, k_1) - V(\sigma, k_1; P_M)\Big) > 0.$$

Hence, there exists $\bar{\eta} \in [1/2, 1)$ such that for all $\eta > \bar{\eta}$

$$V(\sigma, k_1; P_\eta) - V(\sigma, k_1; P_M) > L/2 \qquad \text{for all } (\sigma, k_1) \in R.$$

It follows that for $\eta > \bar{\eta}$

$$\int_{(\sigma,k_1)\in R} V(\sigma, k_1; P_\eta) - V(\sigma, k_1; P_M)\, dF(\sigma, k_1) - 2\varepsilon$$
$$> L/2(1-\varepsilon) - 2\varepsilon.$$

Thus, if $\varepsilon \leq L/(L+4)$ (i.e., F is sufficiently concentrated in the region R) then an organization with $P = P_\eta$ such that $\eta > \bar{\eta}$ will attain strictly higher expected utility than an organization with $P = P_M$. This shows that for parameter values and distributions specified above, the optimal function must be strictly increasing for some $k \geq \underline{k}$; this completes the proof. ■

Proof of Proposition 9. Recall from the proof of Proposition 6 that the length of $\Sigma^P(k_1)$ is simply $\sigma^*(k_1) - \pi$ if it is nonempty, and the value $\sigma^*(k_1)$ is defined to be the σ-value such that the following indifference condition holds

$$\alpha^L P(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_1 = 1)(P(k_1 + B(1) - c) - P(k_1))$$
$$+(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_1 = 1)(P(k_1 + B(0) - c) - P(k_1)) = 0. \quad (32)$$

We denote the left hand side of (32) by the function $\Phi(k_1, \sigma \mid B)$.

We wish to show that an increase in the culture of reward decreases $\sigma^*(k_1)$. First, note that $\Phi(k_1, \sigma \mid B)$ is increasing and continuous in σ. Second, because the function P is weakly increasing, $\Phi(k_1, \sigma \mid B)$ is increasing in the culture of reward: for $B, \hat{B}$ such that $B(1) \geq \hat{B}(1)$ and $B(0) \geq \hat{B}(0)$ we have

$$\Phi(k_1, \sigma \mid B) \geq \Phi(k_1, \sigma \mid \hat{B}) \qquad \text{for all } k_1, \sigma. \quad (33)$$

Now, by definition, we have $\Phi(k_1, \sigma^*(k_1) \mid B) = 0$, where $\sigma^*(k_1)$ is defined with respect to the culture function B. Let $\hat{B}$ be a lower culture of reward function, i.e., $\hat{B}(1) \leq B(1)$

and $\hat{B}(0) \leq B(0)$. It is immediate from (33) that

$$\Phi(k_1, \sigma^*(k_1) \mid \hat{B}) \leq 0.$$

If equality holds, then $\sigma = \sigma^*(k_1)$ satisfies the indifference condition under the lower culture of reward parameters given by $\hat{B}$ and so $\Sigma^P(k_1)$ has unchanged length. If strict inequality holds, then, since Φ is increasing and continuous in σ, there exists a value $\hat{\sigma} > \sigma^*(k_1)$ such that

$$\Phi(k_1, \hat{\sigma} \mid \hat{B}) = 0.$$

Thus, the length of $\Sigma^P(k_1)$ increases as the culture of reward decreases. This completes the proof.

In a similar manner, we can show that an increase in the culture of reward increases $\Sigma^S(k_1)$. This follows since the value $\bar{\sigma}(k_1)$ is defined such that

$$\Pr(\theta_1 = 1|s_1 = 1)P(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1 = 1))P(k_1 + B(0) - c) = P(k_1).$$

It is straightforward to see that an increase in $B(1)$ or $B(0)$, leads to a decrease in $\bar{\sigma}(k_1)$ and hence an increase in $\Sigma^S(k_1)$, as required. ■

B Additional materials

We show that our qualitative results hold for a more general law of motion of political capital. In particular, we consider the law of motion

$$k_2 = \begin{cases} k_1 + B(\theta_1) - c & \text{if she spends capital at } t = 1; \\ k_1 + N(\theta_1) & \text{otherwise,} \end{cases}$$

where $B(1) > 0 > B(0)$ and $N(1) \leq 0 \leq N(0)$. As in our benchmark model, we focus on $B(1) > c$ and, in addition, we assume the following condition:

$$\Pr(\theta_1 = 1 \mid s_1 = 1)P(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1 \mid s_1 = 1))P(k_1 + B(0) - c) >$$
$$\Pr(\theta_1 = 1 \mid s_1 = 1)P(k_1 + N(1)) + (1 - \Pr(\theta_1 = 1 \mid s_1 = 1))P(k_1 + N(0)) - \frac{\alpha^H P(k_1)}{\bar{\alpha}\Pr(s_2 = 1)}. \tag{34}$$

This condition ensures that the leader's expected loss in future power when she spends capital in period 1 and $s_1 = 1$ (the left hand side) is not too large compared to the expected loss if she chooses not to spend capital (the first element of the right hand side). In the spirit of our analysis in Section 5, we remark that the organization would find it optimal to design institutions that meet this condition.

Before presenting our results, we clarify the structure of this appendix. Throughout we use the following naming convention: Proposition n' (Lemma n') refer to the extended version of Proposition n (Lemma n) from the main text. We state and prove the extended versions of proposition and lemma statements if and only if the statement or proof differs from that of the main text. Where necessary, we provide brief discussion of differences between the general model's results and those of the main text.

Extended results

Lemma 1 and the respective proof holds verbatim. Proposition 1 also holds verbatim; however, the proof differs. In particular, condition (34) is required to ensure that the leader will spend her capital on high importance issues when she prefers alternative $a_1 = 1$. If condition (34) did not hold, then the leader would never spend her capital.

Proposition 1′ (The leader's optimal strategy in period 1) *There exists a cutoff $\sigma^*(k_1)$ such that a non-irrelevant leader spends political capital in period 1 if and only if she prefers alternative*

$a_1 = 1$ *and either* $\alpha_1 = \alpha^H$ *or* $\sigma > \sigma^*(k_1)$.

Proof of Proposition 1′. Let k_1 be a stock capital that makes the leader not irrelevant. From Lemma 1, the value of holding a stock k_2 of political capital in period 2 is given by

$$\begin{aligned} V(k_2) &= \bar{\alpha}\Pr(s_2 = 1)\Big(P(k_2)\Pr(\theta_2 = 1 \mid s_2 = 1) + (1 - P(k_2))\Pr(\theta_2 = 0 \mid s_2 = 1)\Big) \\ &\qquad + \bar{\alpha}\Pr(s_2 = 0)\Pr(\theta_2 = 0 \mid s_2 = 0) \\ &= \bar{\alpha}\pi + \bar{\alpha}\left(2\Pr(\theta_2 = 1 \mid s_2 = 1) - 1\right)\Pr(s_2 = 1)\, P(k_2)\,, \end{aligned} \tag{35}$$

where $\bar{\alpha}$ is the expected value of α_2.

Spending political capital in period 1 yields expected utility equal to

$$\begin{aligned} &\alpha_1(1 - \Pr(\theta_1 = 1|s_1)) + \alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1) - 1) \\ &\qquad + \Pr(\theta_1 = 1|s_1)V(k_1 + B(1) - c) + (1 - \Pr(\theta_1 = 1|s_1))V(k_1 + B(0) - c); \end{aligned} \tag{36}$$

not spending political capital yields expected utility equal to

$$\begin{aligned} &\alpha_1(1 - \Pr(\theta_1 = 1|s_1)) + \\ &\qquad + \Pr(\theta_1 = 1|s_1)V(k_1 + N(1)) + (1 - \Pr(\theta_1 = 1|s_1))V(k_1 + N(0)). \end{aligned} \tag{37}$$

Thus, the leader spends capital in period 1 if and only if the difference between (36) and (37) is positive, i.e., if

$$\begin{aligned} &\alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1) - 1) + \Pr(\theta_1 = 1|s_1)\Big(V(k_1 + B(1) - c) - V(k_1 + N(1))\Big) \\ &\qquad + (1 - \Pr(\theta_1 = 1|s_1))\Big(V(k_1 + B(0) - c) - V(k_1 + N(0))\Big) > 0. \end{aligned} \tag{38}$$

We now consider three different cases for the value of the period-1 signal, $s_1 \in \{0, 1\}$, and the issue's importance, $\alpha_1 \in \{\alpha^L, \alpha^H\}$.

$s_1 = 1$ *and* $\alpha_1 = \alpha^H$. We now show that the leader always spends capital in this case.

By substituting (35) into (38) and simplifying, we obtain that the leader spends political capital if and only if

$$\begin{aligned}
&\alpha^H P(k_1)(2\Pr(\theta_1 = 1|s_1 = 1) - 1) + \bar{\alpha}\,(2\Pr(\theta_2 = 1 \mid s_2 = 1) - 1)\Pr(s_2 = 1) \times \\
&\Bigg(\Pr(\theta_1 = 1|s_1 = 1)\Big(P(k_1 + B(1) - c) - P(k_1 + N(1))\Big) \\
&\qquad + (1 - \Pr(\theta_1 = 1|s_1 = 1))\Big(P(k_1 + B(0) - c) - P(k_1 + N(0))\Big)\Bigg) > 0.
\end{aligned} \tag{39}$$

Dividing by

$$(2\Pr(\theta_1 = 1|s_1 = 1) - 1) = (2\Pr(\theta_2 = 1|s_2 = 1) - 1),$$

which is positive for all $\sigma > \pi$, gives an equivalent condition for (39):

$$\begin{aligned}
&\alpha^H P(k_1) + \bar{\alpha}\Pr(s_2 = 1) \times \\
&\Bigg(\Pr(\theta_1 = 1|s_1 = 1)\Big(P(k_1 + B(1) - c) - P(k_1 + N(1))\Big) \\
&\qquad + (1 - \Pr(\theta_1 = 1|s_1 = 1))\Big(P(k_1 + B(0) - c) - P(k_1 + N(0))\Big)\Bigg) > 0.
\end{aligned}$$

This condition is precisely the assumed inequality (34). We conclude that the leader spends her capital if $s_1 = 1$ and $\alpha_1 = \alpha^H$.

$s_1 = 1$ *and* $\alpha_1 = \alpha^L$. We now show that there exists a threshold value $\sigma^*(k_1)$ such that the leader spends political capital if and only if $\sigma > \sigma^*(k_1)$. By substituting (35) into (38) and simplifying in a similar manner as the above case, we obtain that the leader spends political capital if and only if

$$\begin{aligned}
\alpha^L P(k_1) + &\Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)\Big(P(k_1 + B(1) - c) - P(k_1 + N(1))\Big) \\
&- (1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)\Big(P(k_1 + N(0)) - P(k_1 + B(0) - c)\Big) > 0.
\end{aligned} \tag{40}$$

Recall that $B(1) > c$ and $N(1) \leq 0$, and so

$$P(k_1 + B(1) - c) - P(k_1 + N(1)) \geq 0,$$

and $N(0) \geq 0$ and $B(0) < 0$, so that

$$P(k_1 + N(0)) - P(k_1 + B(0) - c) \geq 0.$$

It then follows that the left hand side of inequality (40) is increasing in σ, since

$$\Pr(\theta_1 = 1|s_1 = 1)\Pr(s_2 = 1) = \Pr(\theta_1 = 1|s_1 = 1)\Pr(s_1 = 1) = \sigma(1 - \pi)$$

is increasing in σ, and $(1 - \Pr(\theta_1 = 1|s_1 = 1))\Pr(s_2 = 1) = (1 - \sigma)\pi$ is decreasing in σ. Furthermore, for σ sufficiently close to one, inequality (40) holds. We conclude that there exists a threshold value $\sigma^*(k_1) < 1$ that solves (40) with equality such that the leader spends political capital if and only if $\sigma > \sigma^*(k_1)$.

$s_1 = 0$ *and* $\alpha_1 \in \{\alpha^L, \alpha^H\}$. From (38), the leader spends capital if and only if

$$\begin{aligned} \alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1 = 0) - 1) + \Pr(\theta_1 = 1|s_1 = 0)[V(k_1 + B(1) - c) - V(k_1 + N(1))] \\ + (1 - \Pr(\theta_1 = 1|s_1 = 0))[V(k_1 + B(0) - c) - V(k_1 + N(0))] > 0. \end{aligned} \tag{41}$$

But by Assumption 1 (in the main text) we have

$$\begin{aligned} \Pr(\theta_1 = 1|s_1 = 0)\Big(P(k_1 + B(1) - c) - P(k_1 + N(1))\Big) \\ + (1 - \Pr(\theta_1 = 1|s_1 = 0))\Big(P(k_1 + B(0) - c) - P(k_1 + N(0))\Big) \leq 0, \end{aligned}$$

and, substituting the value of $V(\cdot)$, as per (35), we infer that the left hand side of (41) has strict upper bound $\alpha_1 P(k_1)(2\Pr(\theta_1 = 1|s_1 = 0) - 1)$. This upper bound is negative, since since $\Pr(\theta_1 = 1|s_1 = 0) < 1/2$, and so the inequality (41) never holds. We conclude that the leader does not spend political capital.

Since the three cases are exhaustive, we have proven the proposition. ■

Proposition 3 characterizes the three leadership styles (patient, loud, and strong) in terms of the leader's precision of information, σ. For given k_1, this characterization showed that there exists intervals of σ that induce each of the three leadership styles such that, as σ increases, the leader's style shifts from patient to loud to strong.

With the more general law of motion of political capital, a leader may grow power even when she does not spend capital, and a poorly informed leader may expect her power to grow, while a more informed leader may expect her power to decline over time. Thus, Proposition 2 of the main text need not hold.

For this appendix, we omit the strong leadership style and redefine the patient and loud leadership styles as follows. A leader is said to be: *patient* if she spends political capital only on issues that are of high importance to her; *loud* if she spends political capital on all issues. Since our main results depend on whether a leader spends her capital on all issues or only issues that are of high importance to her (i.e., whether she is an "active" leader) and not on whether her power is expected to grow over time, we can attain similar results with this (redefined) patient-loud dichotomy of leadership styles. With these definitions we attain Proposition 3′ below.

Proposition 3′ (Optimal leadership styles) *A non-irrelevant leader is patient if* $\sigma < \sigma^*(k_1)$ *and otherwise is loud.*

Proof of Proposition 3′. Follows immediately from the definition of the leadership styles and Proposition 1′. ■

Propositions 4 and 5 and the respective proofs hold verbatim and so are omitted. Below we present Proposition 6′. This is analogous to Proposition 6. However, the condition (42) is modified to capture the more general law of motion.

Proposition 6′ (The effect of capital on leadership styles) *Let*

$$\Sigma^P(k_1) \equiv \{\sigma \in (\pi, 1] : \sigma < \sigma^*(k_1)\}$$

be the interval of leader's information precisions that induce her to optimally choose to be patient. If $\Sigma^P(k_1)$ is non-empty for some $k_1 \in \mathbb{R}$, then the length of $\Sigma^P(k_1)$ increases with k_1 if

$$\begin{aligned}(1-\pi)\sigma^*(k_1)\Big(P'(k_1 + B(1) - c) - P'(k_1 + N(1))\Big)\\ + \pi(1-\sigma^*(k_1))\Big(P'(k_1 + B(0) - c) - P'(k_1 + N(0))\Big) < -\frac{\alpha^L}{\bar{\alpha}}P'(k_1).\end{aligned} \tag{42}$$

Otherwise, it decreases with k_1.

Proof of Proposition 6′. For nonempty $\Sigma^P(k_1)$, the length of $\Sigma^P(k_1)$ is simply $\sigma^*(k_1) - \pi$. Note that the length of $\Sigma^P(k_1)$ is weakly increasing in $\sigma^*(k_1)$.

To prove the proposition, we consider the effect of a marginal increase in k_1 on the length of $\Sigma^P(k_1)$, or equivalently the value of $\sigma^*(k_1)$.

From equation (40) in the proof of Proposition 1′, if $\sigma = \sigma^*(k_1)$, then the following indifference condition holds:

$$\begin{aligned}\Phi(k_1, \sigma) \equiv &\alpha^L P(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P(k_1 + B(1) - c) - P(k_1 + N(1)))\\ &+(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P(k_1 + B(0) - c) - P(k_1 + N(0))) = 0.\end{aligned} \tag{43}$$

$\Phi(k_1, \sigma)$ is the net benefit of spending capital in period 1 when $\alpha_1 = \alpha^L$ and $s_1 = 1$. Note that $\Phi(k_1, \sigma)$ is increasing and continuous in σ.

Lemma 2′ *For a given capital level k_1, a marginal increase in capital has opposite effects on*

$\Phi(k_1, \sigma)\Big|^{\sigma=\sigma^*(k_1)}$ *and* $\sigma^*(k_1)$*:*

$$\frac{\partial \Phi(k_1, \sigma)}{\partial k_1}\Bigg|^{\sigma=\sigma^*(k_1)} > 0 \quad \textit{if and only if} \quad \frac{\partial \sigma^*(k_1)}{\partial k_1} < 0.$$

Proof. Suppose that a marginal increase in capital from k_1 to k_1' results in an increase in the $\sigma^*(k_1)$-leader's net benefit, i.e.,

$$\Phi(k_1', \sigma^*(k_1)) > \Phi(k_1, \sigma^*(k_1)) = 0.$$

Then, since $\Phi(k_1', \sigma)$ is increasing in σ, the value σ' such that

$$\Phi(k_1', \sigma') = 0, \qquad \text{or equivalently} \qquad \sigma' = \sigma^*(k_1'),$$

is strictly less than $\sigma^*(k_1)$. Similarly, if a marginal increase in k_1 results in a decrease in the $\sigma^*(k_1)$-leader's net benefit then $\sigma^*(k_1') > \sigma^*(k_1)$. ■

From the above lemma, we have that $\Sigma^P(k_1)$ is increasing if and only if

$$\begin{aligned}
&\frac{\partial \Phi(k_1, \sigma)}{\partial k_1}\Bigg|^{\sigma=\sigma^*(k_1)} \\
&= \alpha^L P'(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P'(k_1 + B(1) - c) - P'(k_1 + N(1))) \\
&\qquad + (1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P'(k_1 + B(0) - c) - P'(k_1 + N(0))) \\
&< 0.
\end{aligned}$$

Rearranging and simplifying terms yields (42) in the proposition. ■

Below we present Proposition 7′. This is analogous to Proposition 7. However, the condition (44) is modified to capture the more general law of motion.

Proposition 7′ (The optimal allocation of political capital) *The optimal allocation of political capital* $k^*(\sigma)$*, and therefore power* $P^*(\sigma)$*, is not necessarily monotonic in* σ*. It is equal to* $\bar{k}$

for all $\sigma \in (\pi, 1)$ if

$$(1-\pi)\pi[(P(k_1) - P(k_1 + B(0) - c)) - (P(k_1 + B(1) - c) - P(k_1)) \leq \frac{\alpha^L}{\bar{\alpha}} P(k_1) \qquad (44)$$

holds when $k_1 = \bar{k}$. It is U-shaped if (44) *does not hold for all $k_1 \leq \bar{k}$ and the length of $\Sigma^P(k_1)$ increases with k_1 at $k_1 = \bar{k}$ (see Proposition 6′).*

Proof of Proposition 7′. We begin by stating two facts that will be useful in proving the proposition.

Lemma 3′ *For any given initial stock of political capital, the organization strictly prefers an active (loud or strong) leader to a patient leader.*

Proof. Suppose $\alpha^L = \alpha^H > 0$ so that the leader's payoff function is a monotonic transformation of the organization's payoff function. By Proposition 1′ (in particular, see (40) in the proof of Proposition 1′) the leader strictly prefers to spend political capital in period 1 whenever she prefers alternative $a_1 = 1$. Therefore, the organization strictly prefers the leader to spend political capital in period 1 whenever she prefers alternative $a_1 = 1$. ■

Lemma 4′ *Fix a leadership style in patient and loud, the organization strictly prefers a leader with a greater initial stock of political capital.*

Proof. To see this, fix the leader's style. A higher initial stock of political capital strictly increases the leader's power in period 1 and, for any realization of events, weakly increases the leader's power in period 2. Since whenever the leader spends political capital, the organization strictly prefers alternative $a_1 = 1$ to be implemented, absent a change in the leader's style, the organization prefers a leader with a greater initial stock of political capital. ■

We now prove that if (44) holds when $k_1 = \bar{k}$, then $k^*(\sigma) = \bar{k}$ for all $\sigma \in (\pi, 1)$. Let (44) hold at $k_1 = \bar{k}$. Recall from the proof of Proposition 1′ (in particular, see (38)) that a leader with initial stock of political capital equal to $\bar{k}$ adopts an active leadership style if and only if

$$\Big(2\Pr(\theta_1 = 1|s_1 = 1) - 1\Big)\times \\ \Bigg(\alpha^L P(\bar{k}) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_2 = 1)(P(\bar{k} + B(1) - c) - P(\bar{k} + N(1))) \\ - (1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_2 = 1)(P(\bar{k} + N(0)) - P(\bar{k} + B(0) - c))\Bigg) > 0.$$

Notice that $2\Pr(\theta_1 = 1|s_1 = 1) - 1$ is strictly positive for all $\sigma > \pi > 1/2$. Furthermore, the term in the second parenthesis is (i) increasing in σ (see (40) in the proof of Proposition 1′), and (ii) non-negative for $\sigma = \pi$ since (44) holds at $k_1 = \bar{k}$. Therefore, a leader with initial stock of political capital equal to $\bar{k}$ adopts the loud leadership style for all $\sigma > \pi$. By Lemmas 3′ and 4′, then the optimal allocation of political capital equals $\bar{k}$ for all $\sigma \in (\pi, 1)$.

We now prove that if (44) does not hold for all $k_1 \leq \bar{k}$ and the length of $\Sigma^P(k_1)$ increases with k_1 at $k_1 = \bar{k}$, then there exists a unique $\hat{\sigma} \in (\pi, 1)$ such that $k^*(\sigma) = \bar{k}$ for $\sigma < \hat{\sigma}$, $k^*(\hat{\sigma}) < \bar{k}$, and $k^*(\sigma)$ increases with σ for $\sigma \geq \hat{\sigma}$. I.e., the optimal allocation of political capital is U-shaped. Recall from Proposition 6′ that $\Sigma^P(k_1)$ increases with k_1 at $k_1 = \bar{k}$ if

$$(1-\pi)\sigma^*\left(\bar{k}\right)\Big(P'\left(\bar{k} + B(1) - c\right) - P'\left(\bar{k} + N(1)\right)\Big) \\ + \pi(1 - \sigma^*\left(\bar{k}\right))\Big(P'\left(\bar{k} + B(0) - c\right) - P'\left(\bar{k} + N(0)\right)\Big) < -\frac{\alpha^L}{\bar{\alpha}}P'\left(\bar{k}\right). \tag{45}$$

We prove this in four steps:

Step 1. Because (44) does not hold for all $k_1 \leq \bar{k}$, from the proof of Proposition 1′ (in particular, see (38)), there exists a unique $\underline{\sigma}$ such that the leader optimally chooses to be patient for any $k_1 \leq \bar{k}$ if and only if $\sigma < \underline{\sigma}$. By Lemma 4′, the optimal allocation of political capital equals $\bar{k}$ for all $\sigma < \underline{\sigma}$.

Step 2. By Propositions 1′, a leader with $\sigma > \sigma^*(\bar{k}) \in [\pi, 1)$ optimally chooses to be active for $k_1 = \bar{k}$. By Lemmas 3′ and 4′, then the optimal allocation of political capital equals $\bar{k}$ for all $\sigma > \sigma^*(\bar{k})$.

Step 3. Because (44) does not hold for all $k_1 \leq \bar{k}$ and (45) holds, there exist an interval $\hat{\Sigma} = [\underline{\sigma}, \sigma^*(\bar{k}))$ such that a leader with information of precision $\sigma \in \hat{\Sigma}$ optimally chooses a patient style if $k_1 = \bar{k}$ but optimally chooses an active style for $k(\sigma) < \bar{k}$ such that

$$k(\sigma) = \max\{k : \sigma = \sigma^*(k)\}. \tag{46}$$

By Lemmas 3′ and 4′, for any $\sigma \in \hat{\Sigma}$, the optimal allocation of political capital is either equal to $\bar{k}$ or to $k(\sigma)$.

Step 4. By Proposition 6′ and (45), $d\sigma^*(k)/dk\ |_{k=\bar{k}} > 0$. Therefore there exists $\sigma \in \hat{\Sigma}$ for which the optimal allocation of political capital is equal to $k(\sigma) < \bar{k}$. Since $\sigma^*(k)$ is an increasing function there exists a unique $\hat{\sigma} \in \hat{\Sigma}$ such that $k^*(\sigma) = \bar{k}$ for $\sigma < \hat{\sigma}$, $k^*(\hat{\sigma}) < \bar{k}$, and $k^*(\sigma)$ increases with σ for $\sigma \geq \hat{\sigma}$. ■

Proposition 8 and the respective proof holds verbatim and so is omitted. Below we present Proposition 9′. This is analogous to Proposition 9. However, we omit the second implication of Proposition 9, which relates to the strong leadership style.

Proposition 9′ (*Culture of reward or blame*) *Let $\Sigma^P(k_1) \equiv \{\sigma \in (\pi, 1] : \sigma < \sigma^*(k_1)\}$ be the interval of leader's information precisions that induces her to optimally choose to be patient. An increase in the culture of reward decreases the length of $\Sigma^P(k_1)$.*

Proof of Proposition 9′. Recall from the proof of Proposition 6′ that the length of $\Sigma^P(k_1)$ is simply $\sigma^*(k_1) - \pi$ if it is nonempty, and the value $\sigma^*(k_1)$ is defined to be the σ-value such that the following indifference condition holds

$$\begin{aligned}\alpha^L P(k_1) + \Pr(\theta_1 = 1|s_1 = 1)\bar{\alpha}\Pr(s_1 = 1)(P(k_1 + B(1) - c) - P(k_1 + N(1)))\\ +(1 - \Pr(\theta_1 = 1|s_1 = 1))\bar{\alpha}\Pr(s_1 = 1)(P(k_1 + B(0) - c) - P(k_1 + N(0))) = 0.\end{aligned} \tag{47}$$

We denote the left hand side of (47) by the function $\Phi(k_1, \sigma \mid B)$.

We wish to show that an increase in the culture of reward decreases $\sigma^*(k_1)$. First, note that $\Phi(k_1, \sigma \mid B)$ is increasing and continuous in σ. Second, because the function P is weakly increasing, $\Phi(k_1, \sigma \mid B)$ is increasing in the culture of reward: for $B, \hat{B}$ such that $B(1) \geq \hat{B}(1)$ and $B(0) \geq \hat{B}(0)$ we have

$$\Phi(k_1, \sigma \mid B) \geq \Phi(k_1, \sigma \mid \hat{B}) \qquad \text{for all } k_1, \sigma. \tag{48}$$

Now, by definition, we have $\Phi(k_1, \sigma^*(k_1) \mid B) = 0$, where $\sigma^*(k_1)$ is defined with respect to the culture function B. Let $\hat{B}$ be a lower culture of reward function, i.e., $\hat{B}(1) \leq B(1)$ and $\hat{B}(0) \leq B(0)$. It is immediate from (48) that

$$\Phi(k_1, \sigma^*(k_1) \mid \hat{B}) \leq 0.$$

If equality holds, then $\sigma = \sigma^*(k_1)$ satisfies the indifference condition under the lower culture of reward parameters given by $\hat{B}$ and so $\Sigma^P(k_1)$ has unchanged length. If strict inequality holds, then, since Φ is increasing and continuous in σ, there exists a value $\hat{\sigma} > \sigma^*(k_1)$ such that

$$\Phi(k_1, \hat{\sigma} \mid \hat{B}) = 0.$$

Thus, the length of $\Sigma^P(k_1)$ increases as the culture of reward decreases. This completes the proof. ■

References

Aghion, Philippe and Jean Tirole, "Formal and Real Authority in Organizations," *Journal of Political Economy*, 1997, *105* (1), 1–29.

_ **and Richard Holden**, "Incomplete Contracts and the Theory of the Firm: What Have

We Learned over the Past 25 Years?," *Journal of Economic Perspectives*, 2011, *25* (2), 181–197.

Al-Ubaydli, Omar, Steffen Andersen, Uri Gneezy, and John A. List, "Carrots That Look Like Sticks: Toward an Understanding of Multitasking Incentive Schemes," *Southern Economic Journal*, 2015, *81* (3), 538–561.

Alvarez, Rodolfo, "Informal Reactions to Deviance in Simulated Work Organizations: A laboratory experiment," *American Sociological Review*, 1968, *33* (895–912).

Arrow, Kenneth J., "Observations on Social Capital," in Partha Dasgupta and Ismail Serageldin, eds., *Social Capital: A Multifaceted Perspective*, Washington D.C.: World Bank, 1999.

Atwater, Leanne E. and Francis J. Yammarino, "Bases of power in relation to leader behavior: A field investigation," *Journal of Business and Psychology*, 1996, pp. 3–22.

Bass, Bernard M., *Leadership and performance beyond expectations*, New York, N.Y.: Free Press, 1985.

— , "The inspirational process of leadership," *Journal of Management Development*, 1988, *7*, 21–31.

— , *Bass and Stogdill's handbook of leadership*, New York, N.Y.: Free Press, 1990.

Belot, Michèle and Marina Schröder, "The Spillover Effects of Monitoring: A Field Experiement," *Management Science*, 2016, *62* (1), 37–45.

Bénabou, Roland and Jean Tirole, "Intrinsic and Extrinsic Motivation," *Review of Economic Studies*, 2003, *70*, 489–520.

Bertrand, Marianne and Antoinette Schoar, "Managing with Style: The Effect of Managers on Firm Policies," *Quarterly Journal of Economics*, 2003, *118* (4), 1169–1208.

Bouton, Laurent, Aniol Llorente-Saguer, and Frédéric Malherbe, "Get Rid of Unanimity Rule: The Superiority of Majority Rules with Veto Power," *Journal of Political Economy*, 2018, *126* (1), 107–149.

Burns, James M., *Leadership*, New York, N.Y.: Harper & Row, 1978.

Caillaud, Bernard and Jean Tirole, "Consensus Building: How to Persuade a Group," *American Economic Review*, 2007, *97* (5), 1877–1900.

Campbell, Arthur, "Spending Political Capital," *Working paper*, 2017.

Chassang, Sylvain, "Building routines: Learning, cooperation, and the dynamics of incomplete relational contracts," *American Economic Review*, 2010, *100* (1), 448–465.

Crawford, Vincent P. and Joel Sobel, "Strategic information transmission," *Econometrica*, 1982, *50* (6), 1431–1451.

Cyert, Richard M. and James March, *A Behavioral Theory of the Firm*, Englewood Cliffs, N.J.: Prentice-Hall, 1963.

Dessein, Wouter, "Authority and communication in organizations," *Review of Economic Studies*, 2002, *69* (4), 811–838.

_ **and Andrea Prat**, "Organizational Capital, Managerial Heterogeneity, and Firm Dynamics," *Working paper*, 2017.

Ellison, Glenn and Richard Holden, "A Theory of Rule Development," *Journal of Law Economics and Organization*, 2014, *30* (4), 649–682.

Farson, Richard and Ralph Keyes, "The Failure-Tolerant Leader," *Harvard Business Review*, 2002.

Fudenberg, Drew and David K. Levine, "Subgame-Perfect Equilibria of Finite and Infinite Horizon Games," *Journal of Economic Theory*, 1983, *31*, 251–268.

— **and** — , "Limit Games and Limit Equilibria," *Journal of Economic Theory*, 1986, *38*, 261–279.

Gibbons, Robert, "What the Folk Theorem Doesn't Tell Us," *Industrial and Corporate Change*, 2006, *15* (2), 381–386.

— , "March-ing Towards Organization Economics," *Working paper*, 2019.

Grossman, Sanford J. and Oliver Hart, "A Theory of Vertical and Lateral Integration," *Journal of Political Economy*, 1986, *94* (691-719).

Groysberg, Boris, Jeremiah Lee, Jesse Price, and J. Yo-Jud Cheng, "The Leader's Guide to Corporate Culture," *Harvard Business Review*, 2018.

Hermalin, Benajmin E., *The Handbook of Organizational Economics*, Princeton University Press,

Hermalin, Benjamin E., "Toward an economic theory of leadership: Leading by example," *American Economic Review*, 1998, *88* (5), 1188–1206.

Hollander, Edwin P., "Conformity, status, and idiosyncrasy credit," *Psychological Review*, 1958, *65* (117–127).

— , "Competence and conformity in the acceptance of influence," *Journal of Abnormal and Social Psychology*, 1960, *61* (365–369).

— , "Leadership Dynamics: A Transactional Perspective," *Technical Report*, 1978.

— , *Inclusive leadership: The essential leader-follower relationship*, Routledge/Taylor & Francis Group, 2009.

Holmström, Bengt and Paul Milgrom, "Multitask principal-agent analyses: Incentives contracts, asset ownership and job design," *Journal of Law, Economics and Organization*, 1991, (7), 24–52.

Homans, George C., *Social Behavior: Its Elementary Forms*, New York, N.Y.: Harcourt Brace, 1961.

Kamenica, Emir and Matthew Gentzkow, "Bayesian Persuasion," *American Economic Review*, 2011, *101* (6), 2590–2615.

Kreps, David M., *Technology, Innovation, and Business Strategy*, Nippon Keizai Shumbunsha Press,, 1986.

— **and Robert Wilson**, "Reputation and Imperfect Information," *Journal of Economic Theory*, 1982, *27*, 253–279.

— **, Paul Milgrom, John Roberts, and Robert Wilson**, "Rational Cooperation in the Finitely Repeated Prisoner's Dilemma," *Journal of Economic Theory*, 1982, *27*, 245–252.

Kuang, Lini, Ni Huang, Yili Hong, and Zhijun Yan, "Spillover Effects of Financial Incentives on Non-Incentivized User Engagement: Evidence from an Online Knowledge Exchange Platform," *Journal of Management Information Systems*, 2019, *36* (1), 289–320.

Lazear, Edward P., "Performance Pay and Productivity," *American Economic Review*, 2000, *90* (5), 1346–1361.

Li, Jin, Niko Matouschek, and Michael Powell, "Power Dynamics in Organizations," *American Economic Journal: Microeconomics*, 2017, pp. 217–241.

Linck, James S., Jeffry M. Netter, and Tina Yang, "The effects and unintended consequences of the Sarbanes-Oxley Act on the supply and demand for directors," *The Review of Financial Studies*, 2009, *22* (8), 3287–3328.

Majumdar, Sumon and Sharun W Mukand, "Policy gambles," *American Economic Review*, 2004, pp. 1207–1222.

March, James, “Decisions in Organizations and Theories of Choice,” in A. Van de Ven and W. Joyce, eds., *Perspectives on Organization Design and Behavior*, New York, N.Y.: Wiley Interscience, 1981.

Milgrom, Paul and John Roberts, “Predation, Reputation, and Entry Deterrence,” *Journal of Economic Theory*, 1982, (27), 280–312.

_ **and** _ , “An Economic Approach to Influence Activities in Organizations,” *American Journal of Sociology*, 1988, pp. 154–179.

Prendergast, Canice and Lars Stole, “Impetuous youngsters and jaded old-timers: Acquiring a reputation for learning,” *Journal of Political Economy*, 1996, pp. 1105–1134.

Rotemberg, Julio J. and Garth Saloner, “Leadership Style and Incentives,,” *Management Science*, 1993, *39* (11), 1299–1318.

_ **and** _ , “Visionaries, Managers, and Strategic Direction,” *RAND Journal of Economics*, 2000, *31* (4), 693–716.

Singh, Amarjit, “Organizational Power in Perspective,” *Leadership and Management in Engineering*, 2009, *9* (4), 165–176.

Yang, Inju, “Positive effects of laissez-faire leadership: conceptual exploration,” *Journal of Management Development*, 2015, *34* (10), 1246–1261.

_ **and Ming Li**, “Can absent leadership be positive in team conflicts? An examination of leaders’ avoidance behavior in China,” *International Journal of Conflict Management*, 2017, *28* (2), 146–165.

Young, H. Peyton, “The Evolution of Conventions,” *Econometrica*, 1993, *61* (1), 57–84.