The Choice of Political Advisers*

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Abstract

We study the choice of multiple advisers, balancing loyalty, competence, and diverse perspectives. A leader can consult one or both of two advisers. One has views that align closely with the leader's, but her information is imprecise or correlated with the leader's. The other is more biased but has independent and more precise information. We find that the leader consults the most informed expert, adding the other adviser only if the additional communication does not hinder truthful advice from the former. If the leader consults both advisers, we paradoxically find that increasing the more biased expert's bias causes the dismissal of the other adviser. Hence, information trumps political proximity, when seeking advice. Exactly the opposite happens when it comes to delegating decision-making. The leader may choose to delegate, but only to the less biased adviser. The analysis is generalized to the case where the most informed adviser is not necessarily more biased. Reducing the probability that the more informed adviser is also more biased leads to hiring also the other expert. The leader may delegate to the uncertain-bias adviser, although she is possibly more biased, because she is better at aggregating information.

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1 Introduction

Political leaders use all sorts of advisers, associates, experts, and consultants. Access to good and reliable advice is widely recognized as making the difference between successful and poor decision-making:

> The first opinion that one forms of a prince, and of his understanding, is by observing the man he has around him. (Niccoló Machiavelli, The Prince, Ch. 22).

The importance of advisors becomes apparent when we examine the frequent and abrupt changes in personnel during the Trump Presidency. By the conclusion of his term, there was a staggering 92% turnover in the most influential positions, with 45% of positions experiencing repeated turnovers (Denpas, 2021). The institutional role of policy advisors has also come under scrutiny in British politics. Because of the predominant role in the Johnson Government granted to a (later dismissed) controversial Chief Adviser, tensions emerged between the tradition of independent civil servants and the adoption of politically-loyal consultants.

This paper studies the optimal choice of one or more advisers from a pool of available candidates who vary in terms of attributes such as loyalty, competence, and diversity of perspectives. A potential trade-off naturally arises between relying on collaborators of sure loyalty, and seeking the most competent advice. Broadening the set of advisers to include potentially less loyal experts with views different from the leader's own can provide access to a more diverse range of information. So, which advisers should a leader choose when faced with these trade-offs? How should the leader respond when the characteristics of potential advisors change over time? Under what circumstances should the leader delegate decision-making authority to an advisor, and which advisor should be entrusted with this responsibility?

The central role of advisers has long been recognized in social sciences. Since the emergence of the modern state, acquiring technical knowledge has become a paramount attribute for effective leadership. Owing to the escalating intricacies of society, rulers can no longer solely depend on personal connections to govern a nation. Instead, they require the backing of a competent bureaucracy and the counsel of technical experts when making critical decisions.[1] However, identifying good advisers is not as straightforward as merely selecting those with competence. As Max Weber writes in Economy and Society Chapter XI, the leader is in a disadvantaged position due to informational asymmetry:

> Since the specialized knowledge of the expert became more and more the foundation

[1] These features persist in contemporary politics, exemplified by the tradition of parliamentary democracies regularly relying on the expertise of career civil servants. In the United States, the establishment of professionalized civil service careers resulted from 20th-century civil service reforms (Ash, Morelli, and Vannoni, 2022).

> for the power of the officeholder, an early concern of the ruler was how to exploit the special knowledge of experts without having to abdicate in their favor.

When advisors are chosen solely based on competence, the leader unknowingly be influenced by advisors pursuing their own interests. Consequently, a trade-off between loyalty and competence naturally emerges. For instance, in the United States, presidential appointments have often been utilized to place loyal individuals in high-ranking positions, when Presidents prioritize responsiveness to voters over relying on impartial competence (Parsneau, 2013; Krause and O'Connell, 2019).

Beyond competence, the responsibility of a leader as a guardian of the public interest requires that she listens to the diverse voices within society.[2] Overreliance on advisers with similar views may lead to a "group-think" problem. Diverse information from different political camps provides a more comprehensive perspective in decision making.Therefore, a political decision-maker may contemplate enlisting advisors from ideologically distant groups, aligning with findings from prior studies on presidential appointments (Ingraham et al., 1995; Bertelli and Feldmann, 2007; Lewis, 2008). Nevertheless, it remains evident that by relying on advisors with ideologically distant views, the leader exposes to the potential for biased counsel.

The loyalty-competence trade-offs are prominent in the UK and European countries. Following the tradition of Weberian bureaucracy, senior civil servants have been appointed as advisers with a mandate for independence. This convention is rooted in the assumption that policy and administration can be separated, and that bureaucrats can address problems objectively and impartially (Putnam, 1973). However, the tasks of political advisers are intertwined with politics, making it challenging to separate the political and administrative aspects. Furthermore, civil servants are obligated to withhold their ideological affiliations during their tenure. Consequently, political leaders may harbor suspicions of ideological discrepancies during the appointment process, potentially leading to the pursuit of an agenda that diverges from the appointing authority's program. Additionally, mitigating potential conflicts of interest poses a formidable challenge: Merely mandating that political advisers maintain political neutrality, as is required of civil servants, may eliminate the possibility of providing independent and impartial advice grounded in expertise.

Further to choosing one among advisers under these trade-offs, leaders often opt to enlist multiple advisors to augment their decision-making process. By choosing advisors with diverse viewpoints, leaders can cultivate a more comprehensive understanding of the state of the world. As an example, the Bush administration appointed Colin Powell as Secretary of State, despite

[2] Schattschneider (1975) argues that no democratic system no democratic system can endure without achieving a commonly agreed-upon consensus, even amidst the conflicting interests of a pluralistic society.

his well-known opposition to the Iraq war. Donald Rumsfeld, on the other hand, was selected in part due to his contrasting perspective on Iraq (Saunders, 2018).

This paper formulates a formal theoretical analysis of these research questions. We frame the analysis in a cheap talk model in the tradition of Crawford and Sobel (1982) and Battaglini (2002). But unlike earlier work, we differentiate advisers not only in terms of alignment with the leader's preferences, but also along other dimensions such as competence and access to diverse information. Further, we provide a formal model of adviser choice. Specifically, we postulate that a leader (she) may consult (at a small cost) either one or both of two advisers (each denoted as he). One is ideologically closer to the leader, i.e., less biased. Hence, he is also more loyal, as he is more likely to provide truthful advice to the leader in equilibrium. The other adviser possesses more valuable information, either due to greater competence or access to information less correlated with the leader's.

The significance of our formal analysis lies in uncovering the intricate and non-obvious predictions that arise from the strategic interaction between the leader and the advisers. Equilibrium truth telling by the better informed adviser requires that he is not too biased. Importantly, we find that this requirement becomes more stringent when the leader herself is better informed, i.e. if she also receives advice from the other, less biased, adviser. Securing the more valuable information is the leader's priority. Hence, our model predicts that competence trumps political proximity in the optimal choice of advice. The leader hires the more biased but better-informed adviser whenever his equilibrium truth-telling condition is met. She adds the more loyal expert only if the additional information received does not hinder truth-telling from the better-informed advisor.

Subtle comparative static results emerge. Beginning with a scenario where the leader relies on truthful advice from both experts, an increase in the political bias of the better informed adviser leads to dismissing the other one, who is less biased but has less valuable information. Subsequently, if the better-informed expert's bias further increases, the leader switches advisers. The better-informed expert is dismissed, and the politically closer one is hired back.

While the pursuit of advice prioritizes information over political alignment, the opposite result emerges when it comes to delegating decisions. The leader may delegate to the politically closer agent, but never to the better informed one. Delegation occurs under the following conditions: (i) the leader cannot get truthful information from the better informed adviser, (ii) the political views of the agent closer to the leader align sufficiently with those of the better informed expert to access his information, (iii) the bias of the adviser closer with the leader is not so large that his biased action outweighs the superior information he gathers in equilibrium.

We then generalize the analysis to account for the possibility that the political preferences of the more informed adviser are unknown. It is uncertain whether he is as aligned with the leader as the less informed expert, whose preferences are known. This framework is motivated by the observation that, while elected leaders need to make their political ideals manifest to gain electoral support, unelected advisers often keep their political leanings confidential. Indeed, refraining from disclosing one's political views is a crucial aspect of an expert's professional conduct aimed at establishing the credibility of advice.

Many of our earlier findings carry over to this model of "uncertain trade-off." However, the comparative static results are now richer. We demonstrate instances where, beginning with a situation in which the leader consults both experts, raising the bias of the politically closer adviser results in the dismissal of the better-informed expert. Notably, this cannot happen when the better-informed expert is known to more biased. There, an increase in the bias of the more aligned adviser leads to his termination. When the more informed expert is possibly equally biased as the other adviser, the former becomes more attractive ex-ante, yet it is the latter who receives more consultations.

Most importantly, non-trivial comparative static results are no longer limited to changes in advisers' biases. We show that increasing the probability that the better-informed expert is not more biased than the other adviser can make the leader transition from exclusively consulting the more informed expert to employing both.

Another distinction compared to the "certain trade-off" scenario pertains to delegation. Now, the leader may choose to delegate authority to the adviser who is more biased in expectation. This is not because of the better information he is endowed with, but, rather, by the additional information gained in equilibrium from the other adviser, whose bias is certainly low. When communicating with one another, the former conditions his strategy on his type, while the latter does not. For some bias values, the expert with a known low bias communicates truthfully in equilibrium, whereas the more biased type of the other expert babbles. Consequently, the equilibrium information provided by the expert with a known low bias is of such inferior quality that the leader benefits more from delegating to the possibly more biased adviser.

2 Contribution to the Related Literature

Recent leadership research can be divided into three main streams. First, leadership is seen as stemming from the unique qualities that set a leader apart from others. According to the personal biography approach, biological factors may shape leaders' qualities and policy preferences (Alexiadou, 2016; Krcmaric, Nelson, and Roberts, 2020). Komai and Stegeman (2010) argue that rational actors are inclined to willingly follow a more knowledgeable leader.

The second stream views leadership as an effective tool for resolving coordination dilemmas. In this context, well-informed leaders engage with their followers and persuade them to make better choices. For instance, Hermalin (1998) proposes the concept of "leading by example," where a leader sends a costly signal that encourages others to follow suit. Canes-Wrone, Herron, and Shotts (2001) see leadership as a counter to "pandering," which involves implementing policies that a leader considers valuable. Effective leadership is closely tied to the ability to communicate information, as analyzed by Dewan and Myatt (2007, 2008, 2012), who examine the qualities of a leader's judgment and communication skills in relation to effective leadership.

The third stream defines leadership as the ability to collect crucial information from advisers, which is the primary focus of our paper. Studies within this category explore various assumptions regarding the verifiability of advice and the motives of advisers. Krishna and Morgan (2001b) demonstrate the possibility of leaders complementing advice from ideologically opposite experts in a cheap talk model. Che and Kartik (2009) argue that an adviser with different opinions may exert more effort to acquire and disclose verifiable information. Dewatripont and Tirole (1999) analyze decision-making based on competition among advocates of special interests, who may conceal information but not manipulate it freely. Morris (2001) and Ottaviani and Sorensen (2006) examine communication by advisers concerned with their reputation, while Dewan and Squintani (2018) investigate the selection of political leaders who rely on the counsel of trustworthy associates. None of these papers consider heterogeneous adviser information or a leader's choice among multiple advisers, which is the subject of our study.

In addition to communicating with advisers, we investigate delegating to advisers in order to improve decision-making. Delegation has been discussed in various contexts of politics, including legislature delegation to special committees under the closed rule (Gilligan and Krehbiel, 1990; Krishna and Morgan, 2001a) and legislature delegation to bureaucracies (Gailmard, 2002; Fox and Jordan, 2011).

An important result of delegation is the so-called "ally principle" (Bendor, Glazer, and Hammond, 2001): voters, legislators, or other principals should rationally delegate more authority to agents who share their preferences. Numerous studies explore the trade-off between expertise and control when delegating tasks and obtain results that support the ally principle. Bendor and Meirowitz (2004) conduct a thorough analysis of delegation across various models and identify conditions under which the ally principle holds. They argue that the ally principle may be violated when agents are of heterogeneous competence, as the principal may need to prioritize competence over preference similarity.

Building upon the insights of Bendor and Meirowitz (2004), our study takes a further step. In our analysis, the primary determinants of delegation are political alignment and the information an agent possesses in equilibrium, including the information he gathers from other experts.

Our study is also relevant for the literature on presidential appointments, which examines the patterns and reasons behind nomination choices. Specifically, the trade-off we investigate between advisers' political alignment and competence is tied to the ongoing debate regarding the appointment of career civil servants with expertise versus politicians with loyalty. On the one hand, appointing politicians may lead to "amateur government," as they lack expertise and prioritize short-term success. According to this view, political appointments should be minimized, and roles filled with career senior executives (e.g., Cohen, 1998). On the other hand, Moe (1985) argues that presidents need "responsive competence" rather than "neutral competence" to achieve success. In essence, they are compelled to meet the expectations of voters, and the expertise of experienced officers may be ineffective due to a lack of responsiveness. Numerous studies suggest that presidents make partisan appointments when they aim to enhance policy responsiveness.[3]

Normative comparisons between independent bureaucrats and politicians in decision-making bear relevance to our analysis of the trade-offs between competence and political alignment. Maskin and Tirole (2004) suggest that, while Non-accountable bureaucrats are better suited for technical decisions, re-election incentives can correct adverse selection and moral hazard for politicians, but they may also result in policy choices that neglect minority rights due to popularity concerns. Similarly, Alesina and Tabellini (2007) find that bureaucrats are more effective when their technical capabilities outweigh moral hazard concerns.

While we focus on the trade-off between political alignment and competence within appointments and on the advantages of selecting nominees from a diverse political range, existing literature has acknowledged institutional constraints as an additional factor contributing to politically diverse appointments. Under separation of powers, the political affiliation of an appointee frequently mirrors the ongoing struggle between the president and the Senate along the liberal-conservative spectrum, thus limiting the available pool of potential appointees (Saunders, 2022).[4] Also, presidents select nominees whose ideologies strike a balance between presidential policy goals and the ideological inclinations of influential legislative figures (Nixon, 2004).

The trade-off we investigate between selecting loyal or competent subordinates is not exclusive to democracies. Nevertheless, the forces at play in autocracies are likely considerably distinct from those we identify here. While the leader is our model is not exposed to the risk of authority

[3]For example, presidents prioritize loyalty over experience when appointing subcabinet officers (Parsneau, 2013). And trade-offs between loyalty and competence are more pronounced for top-level bureaucratic leadership positions compared to their lower counterparts (Krause and O'Connell, 2019).

[4]Numerous studies offer empirical evidence in support of this argument: Presidents tend to prioritize political alignment in the face of horizontal policy conflicts between the White House and the Senate (Krause and O'Connell, 2016), opt for Supreme Court justices who align with their preferences within the limitations of the existing Court and Senate dynamics (Moraski and Shipan, 1999), and select relatively moderate candidates for the bureaucracy when the opposing party holds the Senate majority (Bonica et al., 2015).

challenges, Egorov and Sonin (2011) examine how dictators choose advisers under the threat of treason. Appointing competent advisers enhances regime stability, but their competence may also heighten the risk of rebellion. Consequently, leaders in weak and fragile regimes opt for loyal but less capable subordinates. Zakharov (2016) delves into dictators' appointments, where competence and loyalty contribute to economic performance and longer tenures, respectively. The trade-off between competence and loyalty becomes evident, as dictators with competent yet less loyal subordinates achieve high economic performance but shorter tenures.

3 Loyalty vs. Information

Model A leader, player 0, makes a decision $\hat{y} \in \mathbb{R}$ to maximize her expected utility $u_0(\hat{y}, x) = -(\hat{y} - x)^2$, which depends on an unknown state x, uniformly distributed on $[0, 1]$. The leader's information about x is represented by a binary signal $s_0 \in \{0, 1\}$ such that $\Pr(s_0 = 1|x) = x$. Before making her decision, and before observing her own signal, the leader may consult (at a small cost) either one or both of two advisers $i = 1, 2$, who each receive a binary signal $s_i \in \{0, 1\}$ informative of x. If consulted, agent i sends a message $\hat{m}_i \in \{0, 1\}$ to the leader. Messages are sent simultaneously if both advisers are consulted.

Each adviser i's utility is $u_i(\hat{y}, x) = -(\hat{y} - x - b_i)^2$, where $b_i > 0$ represents the ideological bias of adviser i. We assume that $b_1 < b_2$ and that the biases are common knowledge. Adviser 1 is ideologically closer to the leader than agent 2, and hence we define him as more loyal. However, his information is less useful to the leader than adviser 2's. While signal s_2 is independent of s_0 and such that $\Pr(s_2 = 1|x) = x$, we distinguish two possibilities with respect to s_1. The first one is that s_1 is less precise than s_2, and the second one is that s_1 is correlated with s_0. Specifically, we introduce an unobserved signal $s_1' \in \{0, 1\}$, again independent of s_0 and such that $\Pr(s_1' = 1|x) = x$. To model that s_1 is less precise than s_2, we stipulate that $s_1 = s_1'$ with probability $p \in (1/2, 1)$, and else $s_1 = 1 - s_1'$. In this case, we say that adviser 1 is less competent than 2. To represent that 1's signal s_1 is correlated with the leader's, we say that $s_1 = s_0$ with probability $\rho \in (0, 1)$, and else $s_1 = s_1'$.

To recap, the timing of the game is as follows. First, the leader chooses whether to consult one or both advisers $i = 1, 2$, at a small cost each. Such choice $A \subseteq \{1, 2\}$ is observed by both advisers. Then, the following communication game is played. The leader observes s_0, and each consulted adviser i sends a message $\hat{m}_i$ based on his observed signal s_i. Finally, the leader chooses action $\hat{y}$. The leader's decision strategy is denoted by $y : (s_0, \hat{\mathbf{m}}_A) \mapsto \mathbb{R}$. Each consulted adviser i's message choice is denoted by $m_i : s_i \to \hat{m}_i$.

The analysis focuses on pure strategy Bayesian equilibrium $(A, \mathbf{m}, y)$. As we shall see, there are multiple equilibria. As is customary when studying communication games, we will select the equilibrium with the highest welfare calculated ex-ante (see, e.g., Crawford and Sobel, 1982). And we note that the ranking of equilibria of every agents in terms of ex-ante welfare is perfectly aligned (omitting the small cost of hiring advisers). In fact, fix any communication game equilibrium $(\mathbf{m}, y)$, the ex-ante expected utility of the leader is:

$$Eu_0(\mathbf{m}, y) = -E_{s_0,\hat{\mathbf{m}}}[E_x\left[(y(s_0, \hat{\mathbf{m}}) - x)^2 | s_0, \hat{\mathbf{m}}\right]],$$

and as we prove later, each adviser i's ex-ante expected utility is $Eu_i(\mathbf{m}, y) = Eu_0(\mathbf{m}, y) - b_i^2$.

Solution. Fix any choice $A \subseteq \{1, 2\}$. Up to interchanging messages $\hat{m}_i$, every equilibrium of the ensuing communication game is uniquely identified by the set $\tilde{B} \subseteq A$ of advisers i who adopt a babbling strategy m_i such that $m_i(0) = m_i(1)$, and by the complementary set $T = A \backslash \tilde{B}$ of advisers who reveal their signal truthfully with a separating strategy m_i such as $m_i(s_i) = s_i$. Further, in equilibrium, the leader will never hire an adviser she expects to babble, hence $A = T$.

There always exists a (babbling) equilibrium in which A is empty. We prove in the appendix that any equilibrium such that A is non-empty is characterized by the following truthtelling condition for every agent $i \in A$.

Lemma 1 *Every equilibrium $(A, \mathbf{m}, y)$ is such that each consulted adviser $i \in A$ communicates his signal s_i truthfully with m_i s.t. $m_i(s_i) = s_i$, for both $s_i = 0, 1$. The equilibrium truthtelling condition for each $i \in A$, $j = 1, 2$, $j \neq i$, is:*

$$b_i \leq \frac{\sum_{s_0 \in \{0,1\}} \sum_{\hat{m}_j \in \{0,1\}} \Delta(s_0, \hat{m}_j)^2 \Pr(s_0, s_i = 0, \hat{m}_j)}{2 \sum_{s_0 \in \{0,1\}} \sum_{\hat{m}_j \in \{0,1\}} \Delta(s_0, \hat{m}_j) \Pr(s_0, s_i = 0, \hat{m}_j)}, \tag{1}$$

where $\Delta(s_0, \hat{m}_j) = E[x | s_0, \hat{m}_i = 1, \hat{m}_j] - E[x | s_0, \hat{m}_i = 0, \hat{m}_j]$. The equilibrium decision of the leader is $y(s_0, \hat{\mathbf{m}}) = E[x | s_0, \hat{\mathbf{m}}]$, for every $\hat{\mathbf{m}} \in \{0, 1\}^2$.

In the above expression, $\Pr(s_0, s_i = 0, \hat{m}_j)$ denotes the total probability that adviser i receives signal $s_i = 0$, and the leader observes signal s_0 and receives message $\hat{m}_j$ from the other adviser j. Because the equilibrium decision of the leader is $y(s_0, \hat{\mathbf{m}}) = E[x | s_0, \hat{\mathbf{m}}]$, for every $\hat{\mathbf{m}} \in \{0, 1\}^2$, the expression $\Delta(s_0, \hat{m}_j) = E[x | s_0, \hat{m}_i = 1, \hat{m}_j] - E[x | s_0, \hat{m}_i = 0, \hat{m}_j]$ denotes by how much adviser i would move the leader's decision if lying when her signal is $s_i = 0$ (i.e., if sending message $\hat{m}_i = 1$ instead of $\hat{m}_i = s_i = 0$), in an equilibrium where i is supposed to tell the truth.

Turning to consider welfare, we obtain the following result.

Lemma 2 *For any equilibrium $(A, \mathbf{m}, y)$, the ex-ante expected utility of the leader is:*

$$W(A, \mathbf{m}, y) = Eu_0(\mathbf{m}, y) = -\sum_{s_0 \in \{0,1\}} \sum_{\hat{\mathbf{m}} \in \{0,1\}^2} E_x\left[[E[x | s_0, \hat{\mathbf{m}}] - x)^2 | s_0, \hat{\mathbf{m}}\right] \Pr(s_0, \hat{\mathbf{m}}). \tag{2}$$

Each adviser i's ex-ante expected utility is $Eu_i(\mathbf{m}, y) = Eu_0(\mathbf{m}, y) - b_i^2$.

The ex-ante equilibrium expected utilities of all players coincide up to a constant. The ex-ante expected utility of the unbiased player, the leader, equals the residual variance of x given the optimal choice $y(s_0, \hat{\mathbf{m}}) = E[x|s_0, \hat{\mathbf{m}}]$ based on the information $(s_0, \hat{\mathbf{m}})$ received in equilibrium.

There are 4 possible equilibria to consider. The equilibrium where both advisers tells the truth, the two equilibria where only one expert, either 1 or 2, is truthful, and the babbling equilibrium. We consider them in sequence.

Before proceeding, we briefly report results by Galeotti et al. (2013) that will be useful to simplify the exposition. They cover the case in which both expert i's signal $s_i \in \{0,1\}$ is an i.i.d. Bernoulli trial, i.e., $\Pr(s_i = 1|x) = x$. They show that in any communication equilibrium $(\mathbf{m}, y)$ in which the leader's information consists of k signals, the bias b_i of each truthful adviser i must be such that $b_i \leq \frac{1}{2(k+2)}$, and the leader's equilibrium welfare is $W(\mathbf{m}, y) = -\frac{1}{6(k+2)}$.

Communication equilibrium characterization. For the equilibrium in which both advisers are truthful and hence consulted, there are 2 constraints to consider: one for expert 1 and one for agent 2. Using expression (1), the truthtelling constraints of adviser $i = 1, 2$ is:

$$b_1 \leq h_{12.i} \equiv \frac{\sum_{s_0 \in \{0,1\}} \sum_{s_j \in \{0,1\}} \Delta_i(s_0, s_j)^2 \Pr(s_0, s_i = 0, s_j)}{2 \sum_{s_0 \in \{0,1\}} \sum_{s_j \in \{0,1\}} \Delta_i(s_0, s_j) \Pr(s_0, s_i = 0, s_j)}, \tag{3}$$

with $j = 1, 2$, $j \neq i$, and $\Delta_i(s_0, s_j) = E[x|s_0, s_i = 1, s_j] - E[x|s_0, s_i = 0, s_j]$ for $s_0 = 0, 1$ and $s_j = 0, 1$. Of course the region of existence of this fully revealing equilibrium is such that $b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$.

The leader's ex-ante welfare W_{12} is calculated with expression (2), which takes the form:

$$W_{12} = -\sum_{(s_0, s_1, s_2) \in \{0,1\}^3} E_x\left[[E[x|s_0, s_1, s_2] - x)^2 | s_0, s_1, s_2\right] \Pr(s_0, s_1, s_2). \tag{4}$$

In the appendix, we calculate formulas $E[x|s_0, s_1, s_2]$ and $\Pr(s_0, s_1, s_2)$ for $(s_0, s_1, s_2) \in \{0,1\}^3$. Using expressions (3)-(4), we calculate the equilibrium thresholds $h_{12.1}$ and $h_{12.2}$ and welfare expression W_{12}, both for the case in which the signal s_1 is less precise than s_2, and for when signal s_1 is correlated with s_0. We omit the precise expressions for $h_{12.1}$, $h_{12.2}$ and W_{12}, as they are cumbersome. These functions are graphed in Figure 1. The threshold $h_{12.1}$ lies below $h_{12.2}$ for all values of p and of ρ. The most stringent requirement is truthtelling by agent 1, whose signal is less informative to the leader. The thresholds $h_{12.1}$ and $h_{12.2}$ take the value $1/10$ for $p = 1$ (respectively, $\rho = 0$), as in this case the leader's information consists of 3 i.i.d. Bernoulli signals. Threshold $h_{12.1}(p)$ increases in p and $h_{12.1}(\rho)$ decreases in ρ, whereas $h_{12.2}(p)$ decreases in p and $h_{12.2}(\rho)$ increases in ρ. That is, as the informativeness of signal s_1 increases, the threshold $h_{12.1}$ becomes less stringent, and the threshold $h_{12.2}$ more demanding.

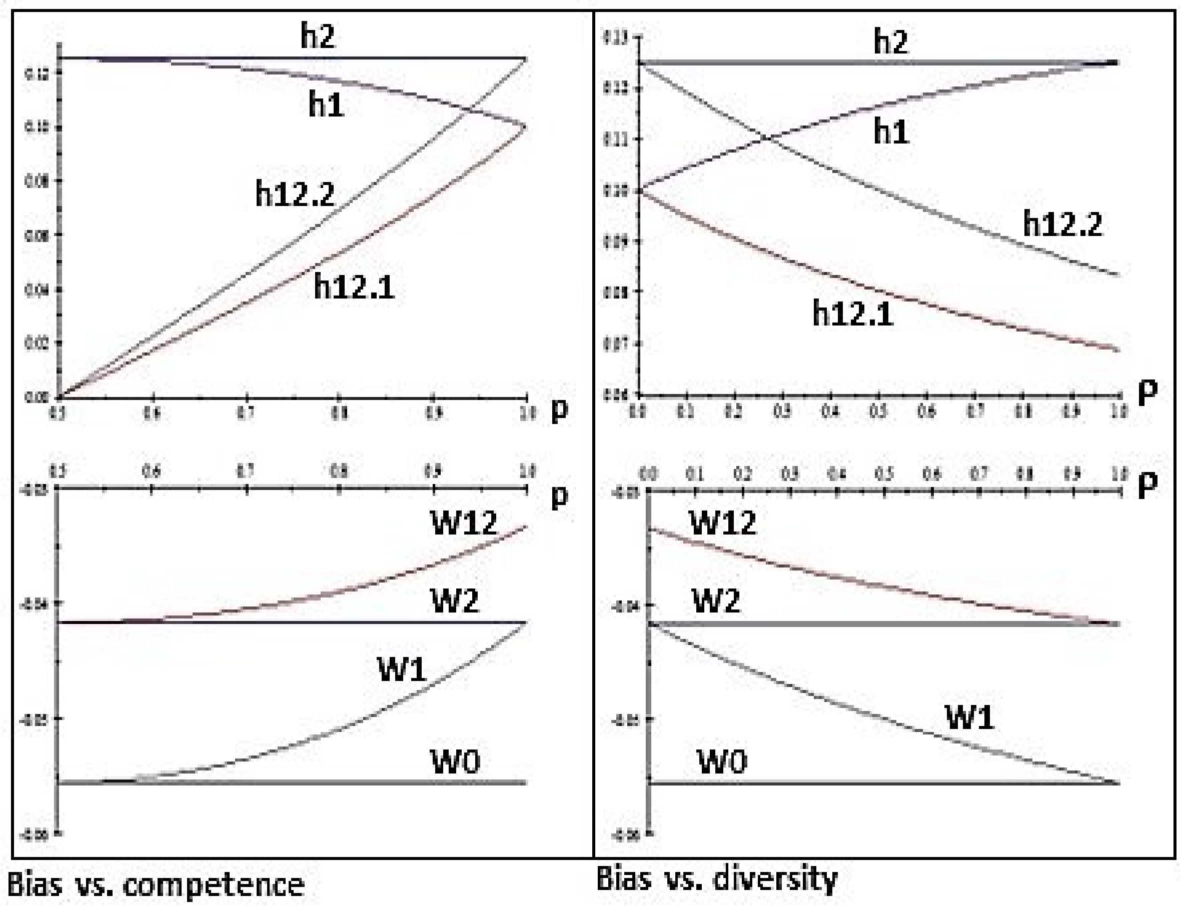

Figure 1: Equilibrium and Welfare Thresholds

The equilibrium welfare for $p = 1$ ($\rho = 0$) is $W_{12} = -1/30$ like when the leader's information consists of 3 i.i.d. Bernoulli signals, whereas for $p = 0$ or $\rho = 1$, $W_{12} = -1/24$ as for the case of 2 i.i.d. Bernoulli signals. The equilibrium welfare W_{12} increases and is concave in p (decreases and is convex in ρ). As the signal of agent 1 becomes more informative to the leader, equilibrium welfare W_{12} increases, but with diminishing returns.

We now turn to consider the equilibrium in which only adviser 1 is consulted. His truthtelling condition is:

$$b_1 \leq h_1 \equiv \frac{\sum_{s_0 \in \{0,1\}} \Delta_1 (s_0)^2 \Pr(s_0, s_1 = 0)}{2 \sum_{s_0 \in \{0,1\}} \Delta_1 (s_0) \Pr(s_0, s_1 = 0)}, \tag{5}$$

with $\Delta_1 (s_0) = E[x|s_0, s_1 = 1] - E[x|s_0, s_1 = 0]$, for $s_0 = 0, 1$. The welfare expression (2) simplifies to:

$$W_1 = -\sum_{(s_0,s_1) \in \{0,1\}^2} E_x \left[[E[x|s_0, s_1] - x)^2 | s_0, s_1 \right] \Pr(s_0, s_1). \tag{6}$$

The expressions $E[x|s_0, s_1]$ and $\Pr(s_0, s_1)$ are calculated in appendix for $(s_0, s_1) \in \{0,1\}^2$, and plugged into the formulas (5) and (6). Again, the precise expressions for $h_{12.1}$ and W_1 are omitted, and graphed in Figure 1. The threshold $h_{12.1}(p)$ equals 1/8 for $p = 1$ and $h_{12.1}(\rho) = 1/8$ for $\rho = 0$, as when the leader holds 2 i.i.d. Bernoulli signals. The threshold $h_{12.1}$ decreases in p and increases in ρ, but it always lies above the threshold $h_{12.1}$. Agent 1's equilibrium truthtelling condition is always more stringent if also agent 2 is truthful. However, we also show that $h_{12.1}$ crosses $h_{12.2}$. For $p = 1$, $W_1(p) = -1/24$ and for $\rho = 0$, $W_1(\rho) = -1/24$, as when the leader decides with 2 i.i.d. Bernoulli signals. For $p = 1/2$, $W_1(p) = -1/18$ and for $\rho = 1$, $W_1(\rho) = -1/18$, as when the leader can count only on her own signal. The welfare $W_1(p)$ increases in p and is concave, whereas $W_1(\rho)$ decreases in ρ and is convex. Of course, $W_1 < W_{12}$ for all p and all ρ. The equilibrium welfare is higher if the leader receives both signals s_1 and s_2 than only s_1.

The calculation of the equilibrium in which only adviser 2 is truthful and consulted is considerably simpler. Because the signal s_2 of agent 2 is independent of s_0 and such that $\Pr(s_2 = 1|x) = x$, the leader holds 2 i.i.d. Bernoulli signals when chooding $\hat{y}$. Hence, this equilibrium exists if and only if $b_2 \leq 1/8 \equiv h_2$, and the leader's welfare is just $W_2 = -1/24$. Of course, h_2 and W_2 are independent of p and ρ. Because agent 1 babbles and he is not consulted, whether his signal s_1 is more or less informative to the leader is irrelevant. Further, $h_1 < h_2$ and $W_1 < W_2$ for all p and all ρ. Because s_1 is less informative to the leader than s_2, the existence of the adviser 1's truthtelling equilibrium is more demanding than the agent 2's equilibrium, and equilibrium welfare is lower. Of course, $W_2 < W_{12}$ for all p and all ρ. The equilibrium welfare is higher if the leader is informed of both signals s_1 and s_2 than only of s_2.

Finally, when the advisers' biases are both too large, $b_1 > h_1$ and $b_2 > h_2$, neither adviser is consulted in the unique equilibrium, as they would both babble. The leader's welfare is $W_0 =$

$-1/18$, as she holds only one Bernoulli signal (her own) when choosing $\hat{y}$. Of course, W_0 is smaller than both W_1 and W_2. The equilibrium welfare is lowest if the leader decides on her own.

The optimal equilibrium. Because we proved in the appendix that $h_{12.1} < h_{12.2} < h_2$, and $h_{12.1} < h_1 < h_2$, we see that not only for some bias pairs (b_1, b_2) the leader can only gather truthful information from the most loyal adviser 1, there are also biases (b_1, b_2) such that she can only consult expert 2. The former is the case when $b_1 \leq h_1$ and $b_2 > h_2$, and the latter when $h_1 < b_1 < b_2 \leq h_2$.

Further, when $b_1 \leq h_1$ and $b_2 \leq h_2$, but either $b_1 > h_{12.1}$ or $b_2 > h_{12.2}$, the leader can get truthful information from either adviser 1 or 2, but not from both. In this case, the leader will only consult adviser 2, who is better informed, because we proved in the appendix that $W_{12} > W_2 > W_1$. In other words, information (either in the form of competence, or of diversity of views) trumps loyalty.

These results lead to the characterization of the optimal equilibrium, which is as follows.

Proposition 1 *If $b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$, then the leader consults both experts. If $h_{12.2} < b_2 \leq h_2$, then she hires only 2, the most informative adviser. If $b_2 > h_2$ and $b_1 \leq h_1$, then the leader hires only 1, the most loyal adviser. If $b_1 > h_1$ and $b_2 > h_1$, then the leader does not consult any expert.*

The optimal equilibrium is depicted in Figure 2. Darker shades denote higher welfare equilibrium. In the darkest area, the leader asks for the advice of both agents. In the intermediate grey area, she consults expert 2, whose signal is most informative. In the lightest grey area, she resorts to the advice of agent 1. In the white area, the leader consults neither expert. Ispection of Figure 2 leads to some of the possibly most interesting results of this section, which are in terms of comparative statics.[5]

Proposition 2 *Suppose that $b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$, so that the leader consults both experts. Increasing the bias b_2 of the most biased adviser 2 leads to dismissing the other adviser 1, and to retaining expert 2, when $h_{12.2} < b_2 \leq h_2$. As the bias b_2 further increases, the leader dismisses adviser 2 and hires back expert 1, when $b_2 > h_2$.*

While it is unexpected that, as the bias of expert 2 grows, the other adviser is dismissed, the result is easy to understand with the aid of our formal analysis. Starting from a situation where

[5] Proposition 2 reports only the most unexpected comparative statics results. There also exist instances such that an increase of bias b_1 leads to dismissing adviser 1 (this is the case when $b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$, and when $b_1 \leq h_1$ and $b_2 > h_2$), and that increasing b_2 causes the discharge of 2, when $b_1 > h_{12.1}$ and $b_2 \leq h_2$.

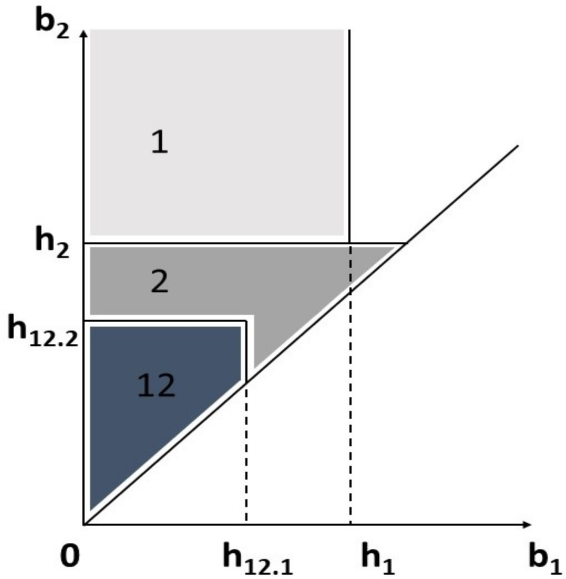

Figure 2: Optimal Equilibrium

$b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$ so that the leader extracts truthful information from both advisers, increasing the bias b_2 of adviser 2 leads to a situation where it is impossible for both experts to be truthful in equilibrium: $h_{12.2} < b_2 \leq h_2$. The adviser then needs to choose an adviser, and she will secure the more valuable information of expert 2. As the bias b_2 grows further however, expert 2 will not be truthful in equilibrium anymore. The leader will need to resort to the inferior information of the more loyal adviser 1.

Delegation. The final part of this section considers whether the leader prefers to retain authority, or to delegate to either one of the two agents, who will then seek the advice of the other two players before making a decision. We show in the appendix that the leader only delegates to agent 1, and only if she anticipates that he will be more informed than she is in equilibrium. However, Proposition 3 reports an interesting difference between the two cases of the tradeoff between loyalty and information we consider. The precise conditions under which delegation takes place are in appendix.

Proposition 3 *The leader delegates authority only to the most loyal agent* 1 *and only if he is not too biased. When adviser* 1*'s signal is less precise than* 2*'s, the leader delegates to* 1 *if he is fully informed in equilibrium, and she is not. When the signal of agent* 1 *is correlated with the leader's, she delegates to* 1 *if he has more information than she does in equilibrium.*

While when it comes to consulting advisers, information trumps loyalty, exactly the opposite happens when delegating decisions. The leader never delegates to the most informed, more biased, agent 2. This is because agent 2's information, while more valuable than agent 1's, is never more valuable than the leader's own information, in this model.

Nevertheless this does not mean that the leader will never delegate decisions. Somewhat paradoxically, she may delegate to agent 1, whose information is less valuable than 2's. This is because 1 is not only ideologically closer to the leader than 2. He is also ideally placed to gather information from both the leader and adviser 2, as his bliss point lies between theirs. In sum, the leader delegates to agent 1 not because his personal information is superior to hers, but because he gets better information in equilibrium than she does.

4 Uncertain trade off

Model and solution. We generalize the model of section 3 by making adviser 2's bias private information. Specifically, 2's bias is $b_1 > 0$ with probability q, and $b_2 > b_1$ with probability $1 - q$. Expert 2 may or may not be less loyal than adviser 1, so that the trade off faced by the leader when consulting adviser 1 or 2 is uncertain. We denote each expert i's bias type space by B_i, so that $B_1 = \{b_1\}$ and $B_2 = \{b_1, b_2\}$. Again, agent 1's signal s_1 is less informative to the leader's than adviser 2's. For brevity, we frame the analysis for the case in which s_1 is less precise: $\Pr(s_1 = s_1' | s_1') = p \in (1/2, 1)$.

We prove in the appendix that, up to interchanging messages, every equilibrium $(A, \mathbf{m}, y)$ is identified by the set of advisers' truthtelling types $T = (T_1, T_2)$, $T_i \subseteq B_i$ for each $i = 1, 2$. Each bias type $b_i \in T_i$ reveals his signal s_i truthfully, whereas every type $b_i \notin T_i$ pools on message $\hat{m}_i = 1$. The equilibrium decision of the leader is $y(s_0, \hat{\mathbf{m}}) = E[x|s_0, \hat{\mathbf{m}}]$, for every $\hat{\mathbf{m}} \in \{0,1\}^2$, and she consults only advisers i such that T_i is nonempty.

The truthtelling condition $\hat{m}_i = s_i$ when $s_i = 0$ for all truthful bias types $b_i \in T_i$ is, again, condition (1) of Lemma 1. The only difference is that here adviser 2 may be of two different bias types, b_1 and b_2, who may pick different equilibrium strategies. In an equilibrium in which adviser 2 tells the truth if and only if his bias is b_1, the leader's decision $y(s_0, \hat{m}_1, \hat{m}_2)$ when receiving message $\hat{m}_2 = 1$ equals $E[x|s_0, \hat{m}_1, \hat{m}_2 = 1]$ which is smaller than $E[x|s_0, \hat{m}_1, s_2 = 1]$. In fact, the leader takes into account the possibility that adviser 2's signal is $s_2 = 0$, and he is sending $\hat{m}_2 = 1$ only because his type is b_2 and he is babbling. The expression $\Delta_2(s_0, \hat{m}_1) = E[x|s_0, \hat{m}_1, \hat{m}_2 = 1] - E[x|s_0, \hat{m}_1, \hat{m}_2 = 0]$ in condition (1) is thus smaller than in the equilibrium truthtelling condition of adviser 2 in section 3, where 2 is not differentiated in two bias types.

Communication equilibrium characterization. The only difference with the analysis in section 3 concerns the equilibria of the communication game in which the strategy of adviser 2 differs across his two types b_1 and b_2. So, all results earlier derived still apply, as far as the equilibria in which expert 2's strategy is the same across his types is concerned. The full information equilibrium, which we denote $\mathcal{E}_{12}$, exists when the truthtelling constraints (3) are satisfied for adviser 1 and both types of expert 2. The constraint of expert 1 is $b_1 \leq h_{12.1}(p,q)$, whereas the constraint of the two types of adviser 2 are $b_1 \leq h_{12.2}(p,q)$ and $b_2 \leq h_{12.2}(p,q)$, but because $b_1 < b_2$, they are subsumed into $b_2 \leq h_{12.2}(p,q)$. The threshold functions $h_{12.1}$ and $h_{12.2}$ take the same form as in section 3, and so does the welfare W_{12}.

The equilibrium $\mathcal{E}_1$ in which only expert 1 tells the truth exists when his bias b_1 is such that $b_1 \leq h_1(p)$. It yields welfare W_1, and again the expressions h_1 and W_1 are as in section 3. The equilibrium $\mathcal{E}_2$ in which both bias types b_1 and b_2 of adviser 2 are truthful, and expert 1 babbles, exists if and only $b_2 \leq h_2 = 1/8$ (again, the condition $b_1 \leq h_2$ is redundant, because $b_1 < b_2$). Again, it yields welfare $W_2(p) = -1/24$. The babbling equilibrium in which neither expert conveys information to the leader always exists and yields welfare $W_0 = -1/18$.

Things become more interesting in the following equilibria, in which the two bias types of adviser 2 choose different strategies in equilibrium.

The equilibrium $\mathcal{E}_{12L}$ where expert 1 and the "loyal" bias type b_1 of adviser 2 are truthful, whereas the bias type b_2 babbles, exists when two thruthtelling conditions are met. Using expression (1), the truthtelling condition of the loyal type of player 2 is:

$$b_1 \leq h_{12L.2}(p,q) \equiv \frac{\sum_{s_0\in\{0,1\}}\sum_{s_1\in\{0,1\}}\tilde{\Delta}_2(s_0,s_1)^2 \Pr(s_0,s_2=0,s_1)}{2\sum_{s_0\in\{0,1\}}\sum_{s_1\in\{0,1\}}\Delta(s_0,s_1)\Pr(s_0,s_2=0,s_1)}, \tag{7}$$

with $\Delta(s_0,s_1) = E[x|s_0,m_2=1,s_1] - E[x|s_0,m_2=0,s_1]$. Note that we plug s_1 in lieu of m_1 in $\Delta(s_0,s_1)$ and $\Pr(s_0,s_2=0,s_1)$ because the unique type of expert 1 is truthful.

Likewise, the truthtelling condition of adviser 1 is

$$b_1 \leq h_{12L.1}(p,q) \equiv \frac{\sum_{s_0\in\{0,1\}}\sum_{m_2\in\{0,1\}}\Delta(s_0,\hat{m}_2)^2 \Pr(s_0,s_1=0,\hat{m}_2)}{2\sum_{s_0\in\{0,1\}}\sum_{m_2\in\{0,1\}}\Delta(s_0,\hat{m}_2)\Pr(s_0,s_1=0,\hat{m}_2)}, \tag{8}$$

with $\Delta(s_0,\hat{m}_2) = E[x|s_0,s_1=1,\hat{m}_2] - E[x|s_0,s_1=0,\hat{m}_2]$. The condition for existence of equilibrium $\mathcal{E}_{12L}$ is that $b_1 \leq h_{12L}(p,q) \equiv \min\{h_{12L.1}(p,q),\, h_{12L.2}(p,q)\}$.

Making use of formula (2), the ex-ante welfare is:

$$W_{12L}(p,q) = -\sum_{s_0\in\{0,1\}}\sum_{s_1\in\{0,1\}}\sum_{\hat{m}_2\in\{0,1\}} E\left[(E[x|s_0,s_1,\hat{m}_2]-x)^2\,|s_0,s_1,\hat{m}_2\right]\Pr(s_0,s_1,\hat{m}_2). \tag{9}$$

In the appendix, we calculate the formulas for $E[x|s_0,s_1,\hat{m}_2]$, $\Pr(s_0,s_1,\hat{m}_2)$, and $\Pr(s_0,s_1,s_2)$ for $(s_0,s_1,s_2) \in \{0,1\}^3$ and $\hat{m}_2 = 0,1$. We plug them into the expressions (8)-(9) to derive the functions $h_{12L.1}$, $h_{12L.2}$ and W_{12L}, which we omit because they are cumbersome.

The threshold $h_{12L.2}$ is convex, decreases in p, and increases in q, and such that $h_{12L.2}(1,1) = 1/10$, $h_{12L.2}(1,1/2) = 1/8$, $h_{12L.2}(0,1/2) = 1/16$, and $h_{12L.2}(0,1) = 1/20$. The threshold $h_{12L.1}$ is concave, increases in p, and decreases in q, with $g(1/2, q) = 0$ for all q, $g(1, 0) = 1/8$ and $g(1, 1) = 1/10$. The welfare W_{12L} increases and is convex in p and q, and such that $W_{12L}(1, 1) = -1/30$ as in the case the leader holds 3 i.i.d. Bernoulli signals; $W_{12L}(1/2, 1) = W_{12L}(1, 0) = -1/24$, as for 2 i.i.d. signals; and $W_{12L}(1/2, 0) = -1/18$, as with 1 signal.

Turning to the equilibrium $\mathcal{E}_{2L}$ in which the loyal type b_1 of expert 2 is truthful, whereas adviser 1 and the bias type b_2 of expert 2 babbles, the formula (1) yields the truthtelling condition of the loyal type of player 2:

$$b_1 \leq h_{12L}(q) \equiv \frac{\sum_{s_0 \in \{0,1\}} \Delta_2 (s_0)^2 \Pr(s_0, s_2 = 0)}{2 \sum_{s_0 \in \{0,1\}} \Delta(s_0) \Pr(s_0, s_2 = 0)}, \tag{10}$$

with $\Delta(s_0) = E[x|s_0, \hat{m}_2 = 1] - E[x|s_0, \hat{m}_2 = 0]$ for $s_0 = 0, 1$.

Expression (2) gives the ex-ante leader's payoff:

$$W_{2L}(q) = -\sum_{s_0 \in \{0,1\}} \sum_{\hat{m}_2 \in \{0,1\}} E\left[(E[x|s_0, \hat{m}_2] - x)^2 | s_0, \hat{m}_2 \right] \Pr(s_0, \hat{m}_2). \tag{11}$$

In the appendix, we calculate $E[x|s_0, \hat{m}_2]$, $\Pr(s_0, \hat{m}_2)$ and $\Pr(s_0, s_2)$ for $s_0 = 0, 1$, $s_2 = 0, 1$ and $\hat{m}_2 = 0, 1$, to obtain functions h_{2L} and W_{2L} (again, omitted). The threshold h_{2L} increases and is concave in q and is independent of p, with $h_{2L}(0) = 1/16$ and $h_{2L}(1) = 1/8$. The welfare $W_{2L}(q)$ increases and is convex in q, with $W_{2L}(1) = -1/24$, as with 2 i.i.d. signals, and $W_{2L}(0) = -1/18$, as with 1 signal.

The optimal equilibrium. We prove in the appendix that the equilibria of the communication game are intuitively ranked in terms of welfare.[6]

Lemma 3 *The equilibria of the communication game are Pareto ranked:* $\mathcal{E}_{12} > \{\mathcal{E}_2, \mathcal{E}_{12L}\} > \{\mathcal{E}_{2L}, \mathcal{E}_1\}$. *There exist functions* $g_1, g_2 : q \mapsto p$ *such that* $W_2(p, q) > W_{12L}(p, q)$ *if and only if* $p < g_2(q)$ *and* $W_{2L}(p, q) > W_1(p, q)$ *if and only if* $p < g_1(q)$. *The function* g_1 *strictly increases in* q *with* $g_1(0) = 0$ *and* $g_1(1) = 1$, *whereas* g_2 *strictly decreases in* q *with* $g_2(0) = 1$ *and* $g_2(1) = 0$.

In words, the equilibrium $\mathcal{E}_{12}$ in which all types of both advisers are truthful is top welfare ranked for all values of p and q. Then come both the equilibrium $\mathcal{E}_2$, in which both types of expert 2 tell the truth, and the equilibrium $\mathcal{E}_{12L}$, where expert 1 and type b_1 of adviser 2 are truthful. The ranking of these two equilibria among each other depends on the parameters (p, q). The equilibrium $\mathcal{E}_2$ is Pareto superior when p and q are low, i.e., formally $p < g_2(q)$. Intuitively, the leader does not consult adviser 1 when his signal precision p is low, and when the probability q that expert 2 is loyal is low, as it is then important to secure the truthful advice of both types

[6] We use the notation $S > S'$ to say that all elements of a set S dominate all elements of another S'.

of adviser 2. Both $\mathcal{E}_2$ and $\mathcal{E}_{12L}$ uniformly Pareto dominates both equilibria $\mathcal{E}_1$, where only adviser 1 is truthful, and $\mathcal{E}_{2L}$, where only expert 2 is truthful and only if he is loyal. Again, these two equilibria are not Pareto ranked for all (p, q). The equilibrium $\mathcal{E}_1$ dominates when p is high and q is low, that is, $p > g_1(q)$. As is intuitive, the leader prefers the advice of expert 1 to that of the loyal type of 2 when 1's signal precision p is high, and when the probability q that expert 2 is loyal is low.

Lemma 3 partitions the parameter space in four regions, depending on the equilibrium welfare ranking. In the "top region," characterized by high p, the optimal equilibria are such that expert 1 is consulted: equilibria $\mathcal{E}_{12L}$ and $\mathcal{E}_1$ dominate $\mathcal{E}_2$ and $\mathcal{E}_{2L}$, respectively. In the region to the right of the (p, q) space, where q is high, the equilibria $\mathcal{E}_{12L}$ and $\mathcal{E}_2$ are better than $\mathcal{E}_{2L}$ and $\mathcal{E}_1$, because the leader is not overly worried about the risk that 2 is disloyal. In the "bottom region," p is low and hence the leader wishes to consult expert 2: the equilibria $\mathcal{E}_2$ and $\mathcal{E}_{2L}$ outrank $\mathcal{E}_{12L}$ and $\mathcal{E}_1$. Finally, in the "leftmost region," the equilibria $\mathcal{E}_2$ and $\mathcal{E}_1$ dominate $\mathcal{E}_{12L}$ and $\mathcal{E}_{2L}$: the leader is not interested in consulting adviser 2 unless she can get a truthful message from his loyal type.

The optimal communication equilibrium characterization does not end with this result, however, because it is not always the case that the optimal equilibrium among $\mathcal{E}_{12L}$, $\mathcal{E}_1$, $\mathcal{E}_2$ and $\mathcal{E}_{2L}$ exists for all bias values (b_1, b_2) in the four different regions of the (p, q) space. We prove in the appendix that the equilibrium existence threshold functions are such that: $h_{12.1} < h_{12L} < \{h_1, h_{2L}, h_{12.2}\} < h_2$. So, the existence conditions $b_1 < h_{12.1}$ and $b_2 < h_{12.2}$ of equilibrium $\mathcal{E}_{12}$ are satisfied only for smaller values of b_1 than equilibrium $\mathcal{E}_{12L}$'s condition $b_1 < h_{12L}$, and for smaller b_2 than $\mathcal{E}_2$'s condition $b_2 < h_2$. Further, equilibrium $\mathcal{E}_{12L}$ only exists for smaller b_1 than both $\mathcal{E}_{12L}$ and $\mathcal{E}_1$. However, the existence range of $\mathcal{E}_{12L}$ and $\mathcal{E}_1$ is not ordered in terms of inclusion. Lemma 4 below identifies one third threshold function g_3, identified by the condition $h_1(p, q) = h_{2L}(p, q)$. The threshold function g_3 determines whether equilibrium $\mathcal{E}_1$'s existence condition $b_1 \leq h_1$ is tigther or looser than $\mathcal{E}_{2L}$'s existence condition $b_1 \leq h_{2L}$. When $h_1(p, q) > h_{2L}(p, q)$, the existence region of $\mathcal{E}_1$ in the bias parameter (b_1, b_2) space strictly contains the existence of $\mathcal{E}_{2L}$, and vice versa.

Lemma 4 *There exists a strictly increasing function $g_3 : q \mapsto p$ such that $h_1(p, q) > h_{2L}(p, q)$ if and only if $p > g_3(q)$. The function g_3 is such that $g_1(q) < g_3(q) < g_2(q)$ for low q. As q grows, g_3 first crosses g_2 and then g_1 to finally join g_1 again at $q = 1$, with $g_3(1) = 1$.*

We prove in the appendix that the optimal equilibrium is determined by the functions g_1, g_2, and g_3. We depict them in Figure 3, where function g_1 is in black, g_2 in red, and g_3 in green.

The communication equilibrium existence characterization described by the function g_3 is especially relevant in relation with the welfare ranking described by g_1. The latter determines

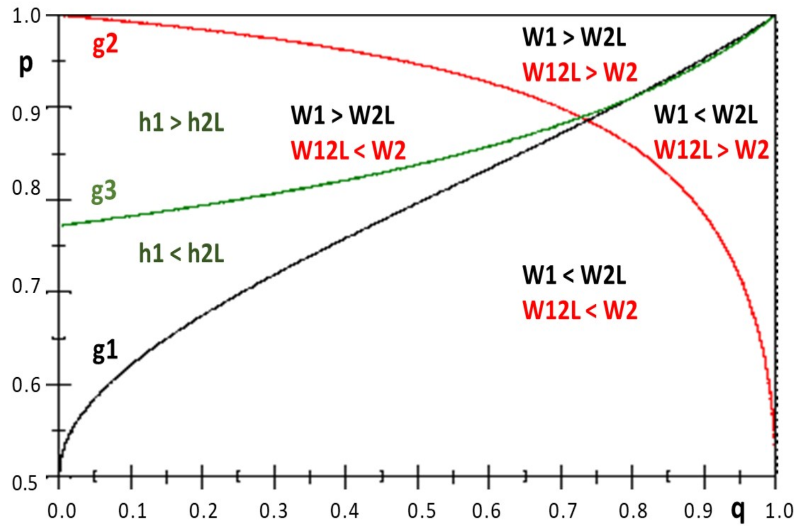

Figure 3: Uncertain Bias: Optimal Equilibrium Regions

whether equilibrium $\mathcal{E}_1$ is better or worse than $\mathcal{E}_{2L}$ in terms of welfare, whereas the former whether equilibrium $\mathcal{E}_1$ exists for lower bias values b_1 than equilibrium $\mathcal{E}_{2L}$ or vice versa. So, whenever the parameters (p, q) identify a point above both curves g_1 and g_3, it is both the case that $\mathcal{E}_1$ dominates $\mathcal{E}_{2L}$ and that it exists for a larger set of biases b_1. If the bias values (b_1, b_2) are such that none of the superior equilibria $\mathcal{E}_{12}$, $\mathcal{E}_2$ and $\mathcal{E}_{12L}$ are available, the leader hires only adviser 1 as the optimal communication equilibrium is $\mathcal{E}_1$. Suppose instead that (p, q) lies above g_1 and below g_3. Then, while again $\mathcal{E}_1$ dominates $\mathcal{E}_{2L}$, it is also the case that $h_1(p,q) < h_{2L}(p,q)$. When the equilibria $\mathcal{E}_{12}$, $\mathcal{E}_2$ and $\mathcal{E}_{12L}$ do not exist, the optimal equilibrium available to the leader will be either $\mathcal{E}_1$ or $\mathcal{E}_{2L}$ depending on whether $b_1 \le h_1(p,q)$, or $h_1(p,q) < b_1 \le h_{2L}(p,q)$. The same arguments hold symmetrically when (p, q) identify a point below g_1.

The results in Lemmas 3 and 4 lead to the following characteration of the optimal communication equilibrium, which we denote as $\mathcal{E}^*$.

Proposition 4 *The optimal equilibrium $\mathcal{E}^*$ of the communication game in the case of uncertain tradeoff is as follows:*

1. *If $b_1 \le h_{12.1}(p,q)$ and $b_1 \le h_{12.1}(p,q)$ then $\mathcal{E}^* = \mathcal{E}_{12}$, if $b_1 > h_{12L.2}(p,q)$ and $b_2 \le h_2(p,q)$ then $\mathcal{E}^* = \mathcal{E}_2$, and if $b_1 \le h_{12L.2}(p,q)$ and $b_2 > h_2(p,q)$ then $\mathcal{E}^* = \mathcal{E}_{12L}$;*

2. *If $h_{12.1}(p,q) < b_1 \le h_{12L}(p,q)$ and $h_{12.2}(p,q) < b_2 \le h_2(p,q)$, then $\mathcal{E}^* = \mathcal{E}_2$ when $p < g_2(q)$, and $\mathcal{E}^* = \mathcal{E}_{12L}$ when $p > g_2(q)$;*

3. *If $h_{12L}(p,q) < b_1 \le \max\{h_{2L}(p,q), h_1(p,q)\}$ and $b_2 > h_2(p,q)$, then $\mathcal{E}^* = \mathcal{E}_{2L}$ when*

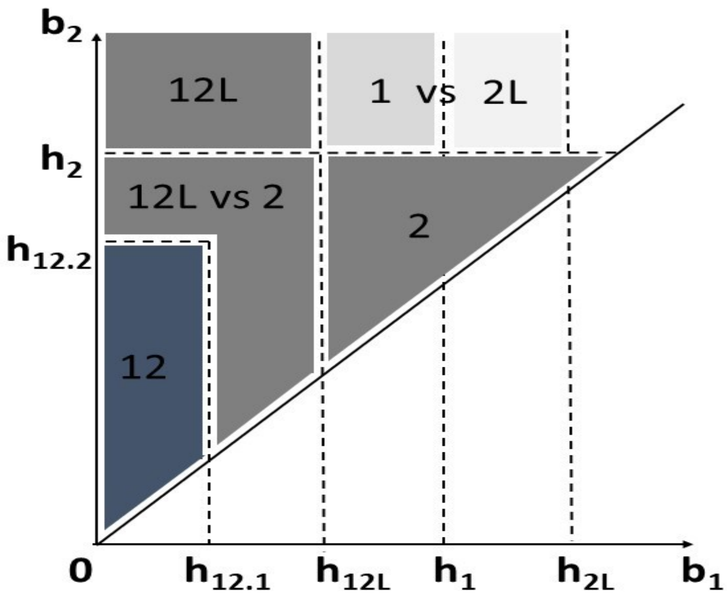

Figure 4: Uncertain Tradeoff: Optimal Equilibrium

$p < g_1(q)$ *or* $h_1(p,q) < b_1 \leq h_{2L}(p,q)$, *and* $\mathcal{E}^* = \mathcal{E}_1$ *when* $p > g_1(q)$ *or* $h_{2L}(p,q) < b_1 \leq h_1(p,q)$.

The optimal communication equilibrium $\mathcal{E}^*$ is illustrated in Figure 4. The darker shaded area identifies the region where the optimal equilibrium is $\mathcal{E}_{12}$: the leader hires both advisers because they are not much biased. The leader consults both experts also in the top left region where $b_1 \leq h_{12L.2}(p,q)$ and $b_2 > h_2(p,q)$, although she knows that adviser 2 babbles if his bias is b_2, because the optimal equilibrium is $\mathcal{E}_{12}$. Instead, only expert 2 is consulted in the bottom right region close to the 45' degree line. Here, $b_1 > h_{12L.2}(p,q)$ and $b_2 \leq h_2(p,q)$ and the optimal equilibrium is $\mathcal{E}_2$. In the inverse L-shaped region where $h_{12.1}(p,q) < b_1 \leq h_{12L}(p,q)$ and $h_{12.2}(p,q) < b_2 \leq h_2(p,q)$, both equilibria $\mathcal{E}_2$ and $\mathcal{E}_{12L}$ are available to the leader. Whether she hires both experts or only expert 2 depends on whether or not the information of expert 1 is sufficiently valuable and expert 2 sufficiently loyal, i.e., on whether the point (p,q) is above or below curve g_2 in Figure 3. Somewhat unexpectedly, as expert 2 becomes more likely loyal, the leader may switch from consulting only him to hiring both advisers.

The description of the optimal communication equilibrium $\mathcal{E}^*$ in the top-right region of Figure 4, where $h_{12L}(p,q) < b_1 \leq \max\{h_{2L}(p,q), h_1(p,q)\}$ and $b_2 > h_2(p,q)$ is more intricate. When $b_1 \leq \min\{h_{2L}(p,q), h_1(p,q)\}$, then both equilibria $\mathcal{E}_{2L}$ and $\mathcal{E}_1$ are available to the leader. She consults either adviser 1 or 2 depending on whether 1 is sufficiently informed or 2 sufficiently likely loyal, that is, depending on whether (p,q) is above or below curve g_1 in Figure 3. When $\min\{h_{2L}(p,q), h_1(p,q)\} < b_1 \leq \max\{h_{2L}(p,q), h_1(p,q)\}$, then only one of the equilibria $\mathcal{E}_{2L}$ and

$\mathcal{E}_1$ exist. The equilibrium available to the leader is also the one she prefers as long as (p, q) is not between curves g_1 and g_3. Specifically, the optimal equilibrium is $\mathcal{E}_1$ if (p, q) is above both g_1 and g_3, whereas it is $\mathcal{E}_{2L}$ if (p, q) is below both g_1 and g_3. If instead (p, q) is above g_1 and below g_3, then $\mathcal{E}_1$ would yield higher welfare to the leader than $\mathcal{E}_{2L}$, but the leader must resort to hiring only expert 2 because the equilibrium $\mathcal{E}_1$ does not exist. The opposite happens when (p, q) is below g_1 and above g_3.

The comparison with the analysis of section 3 is intuitive. Now, the trade-off between adviser 1 and 2 is uncertain, because 2's bias may be the same as 1's. So, the leader consults 2 for a broader set of bias parameters (b_1, b_2). It is no longer the case that expert 2 is dismissed for high values of b_2, as long as $b_1 \leq h_{12L}$. In this case, truthful communication from the loyal type of expert 2 is enough to seek 2's advice. Further, it may even be the case that adviser 2 is the only one consulted for large b_2. This happens for $h_{12L} < b_1 \leq h_{2L}$, if the likelihood q that 2 is not more biased than 1 is sufficiently high relative to 1's precision p, i.e., when (p, q) is below g_1 or g_3 in Figure 3.

Comparative statics. As is the case for section 3, also the current analysis uncovers non-trivial comparative statics, which we report in Proposition 2.[7]

Proposition 5 *The main comparative statics results when expert 2's bias is private information are as follows.*

1. *Suppose $b_1 \leq h_{12.1}(p, q)$ and $b_2 \leq h_{12.2}(p, q)$ so that both advisers are consulted, and bias b_2 increases. When $p > g_2(q)$, neither adviser is dismissed. If $p < g_2(q)$, then expert 1 is fired when $h_{12.2}(p, q) < b_2 \leq h_2(p, q)$, and hired back as $b_2 > h_2(p, q)$.*

2. *Suppose that $b_1 \leq h_{12L}(p, q)$ and $b_2 > h_2(p, q)$, so that the leader hires both 1 and 2, and b_1 increases. If $p > g_1(q)$, then expert 2 is dismissed when $b_1 > h_{12L}(p, q)$. If also $p < g_3(p)$, then 2 is hired back, and 1 discharged, when $h_{12L}(p, q) < b_1 \leq h_1(p, q)$. If $g_3(q) < p < g_1(p)$, expert 1 is fired when $h_{12L}(p, q) < b_1 \leq h_{2L}(p, q)$ and hired back as $b_1 > h_{2L}(p, q)$, when 2 is dismissed.*

3. *Suppose that $h_{12.1}(p, q) < b_1 \leq h_{12L}(p, q)$, $h_{12.2}(p, q) < b_2 \leq h_2(p, q)$ and $p < g_2(q)$: the leader only consults expert 2. An increase in the probability q that 2 is loyal leads to hiring also adviser 1, when $p > g_2(q)$.*

[7]Again, we omit detailing the (less interesting) instances where increasing an adviser i's bias b_i leads to his dismissal.

These results are significantly richer than in case of certain tradeoff between advisers studied in section 3. Here, increasing b_2 when $b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$ need not lead to dismissing either expert 1 or 2. In the region above the red curve in Figure 3, i.e., when $p > g_2(q)$, both advisers are retained for all b_2. It is so unlikely that expert 2's bias is b_2 that it is not worth firing 1 to make sure that both bias types of 2 are truthful. In contrast, increasing b_2 when $b_1 \leq h_{12.1}$ and $b_2 \leq h_{12.2}$ leads to dismissing expert 1, when 2's bias is known to be b_2. Interestingly, reducing expert 2's bias to possibly equal 1's, leads to consulting expert 1 more often, in this instance. In fact, neither expert is ever dismissed here, regardless of how large b_2 is. The bias type b_2 is so improbable that it does not affect the leader's hiring choices.

Further, increasing the bias b_1 may now lead to firing adviser 2, instead of 1. This happens as b_1 crosses h_{12L} when $b_2 > h_2$ and $p > g_1(q)$, i.e., (q, p) is above the black curve in Figure 3. If (q, p) is also above the green curve, $p > g_3(q)$, then further increasing b_1 leads to dismissing also expert 1, when b_1 crosses h_1. If instead (q, p) is between the black and green curves, $g_1(q) < p < g_3(q)$, increasing b_1 above h_1 leads to hiring back expert 2 and dismissing 1. The opposite pattern of dismissals takes place as b_1 increases when $g_3(q) < p < g_1(q)$. First, expert 1 is fired as b_1 crosses h_{12L}, and then 2 is fired and 1 hired back when b_1 crosses h_{2L}. Finally also 1 is dismissed when b_1 crosses h_1.

Finally, non-trivial comparative statics is not limited here to changes in biases. In the "inverse-L" shaped region where $h_{12.1}(p, q) < b_1 \leq h_{12L}(p, q)$ and $h_{12.2}(p, q) < b_2 \leq h_2(p, q)$, as expert 2 becomes more likely loyal (i.e., q increases), the leader may switch from consulting only him to hiring both advisers. This is because g_2 decreases in q (cf. Figure 3). Hence, an increase of q holding p constant may lead to crossing g_2, switching from the region in which $W_2(p, q) > W_{12L}(p, q)$ to the region where this inequality is reversed. As the equilibrium $\mathcal{E}_{12L}$ now dominates $\mathcal{E}_2$, the leader hires expert 1 although this implies that type b_2 of expert 2 will not be truthful anymore.

Delegation. As in section 3, we conclude by considering delegation, characterized Proposition 6, below. Unlike in the case agent 2 is known to be more biased than 1, the leader delegates to agent 2, in some cases. The precise conditions under which delegation takes place are in appendix.

Proposition 6 *The leader delegates to agent* 1 *if he is not too biased and would access all information truthfully in equilibrium, whereas she would not. The leader delegates to agent* 2 *when he is not too biased, and either one of two possibilities arise:*

1. *The leader would only get a truthful message from agent* 1 *in equilibrium, whereas* 2 *obtains all information and* 1 *does not;*

2. The leader is truthfully informed only from type b_1 of agent 2 in the top welfare equilibrium, whereas the leader (and possibly also agent 1) are truthful to agent 2.

It is interesting that the leader may prefer to delegate to adviser 2, despite him being more biased than 1 in expectation. This is not because 2 is a more competent adviser. But rather because it may be that agent 2 obtains the leader's and/or expert 1's information in equilibrium, and not vice versa. For both types of 2 to truthfully inform a player $i = 0, 1$, the bias b_2 of 2's disloyal type must not be too different from b_i, player i's bias. Instead, truthtelling by (the unique type of) player i to adviser 2 requires only that b_i is not too different from $qb_1 + (1-q)\, b_2$, the average bias of 2.

5 Conclusion

Selecting advisors represents a pivotal yet unresolved aspect of evaluating effective leadership. Our investigation delves into the optimal choice of advisors for a leader, considering the delicate balance between loyalty, competence, and diversity of perspectives. The leader can enlist either one or both of two advisors. One is politically closer to the leader, and the other has more valuable information, due to higher competence or access to less correlated data sources. She adds the loyal adviser only if his additional information does not disrupt equilibrium truth-telling by the better informed adviser. Hence, information trumps loyalty, in our analysis.

We uncover intriguing comparative statics. If the leader initially consults both advisers, increasing the bias of the better-informed adviser causes the dismissal of the other agent, although he is politically more aligned with the leader. Further increasing the better informerd adviser's bias eventually leads to his removal, and to rehiring the other expert.

Next, we analyze whether the leader's may benefit from delegating decision-making to one of the agents. In contrast to seeking advice, we find that political alignemnt is the dominant concern. The leader may delegate only to the more aligned adviser, and only when he is able to collect information that she would not have access to in equilibrium.

Partially motivated by the consideration of independent bureaucrats whose political views are not to be disclosed, we subsequently examine the scenario of an 'uncertain tradeoff' between a definitely aligned adviser and a more informed expert who may or may not have greater bias. The analysis reveals non-obvious implications. We identify situations where a lower probability of the better-informed expert being more biased results in increased reliance on the less competent but definitely aligned adviser. Delegating to the expert with uncertain bias, who may potentially be misaligned, might become the preferred choice. However, this preference does not stem from the better information the expert is endowed with, but rather from the possibility that he may access superior information in equilibrium.

Our model makes a valuable contribution to leadership literature by offering a framework for selecting a diverse pool of advisors based on multiple characteristics. While prior research has primarily concentrated on institutional constraints related to advisor appointments, such as the separation of powers or regime type, it has often overlooked the inherent trade-offs between loyalty and informativeness among advisors. Our framework has the potential for further extensions in multiple directions, and it leaves numerous questions open for exploration in future studies.

It would be interesting to study the dynamic relationship between a leader and her pool of allies/advisers. History has repeatedly shown the transformation of former adversaries into future allies and vice versa, underscoring the ever-evolving nature of political alliances. The reputations of both the leader and their advisers can exert significant influence. Disloyal advisers may offer valuable counsel to safeguard reputations and maintain positions of influence, while unbiased advisers might temper their information to avoid potential conflicts with the leader (cf. Morris, 2001). When advice lacks informative value or conflicts with the leader's objectives, the timing of an adviser's dismissal may need to be considered in light of its potential impact on the leader's reputation.

Further research questions arise from the insights of Hermann and Preston (1994), who observed that the composition of an advisory team significantly hinges on a president's leadership style. According to Johnson (1974), presidents' leadership styles can be categorized into three types. The formalistic style aims to minimize human error through hierarchical structures. The collegial approach places a premium on teamwork, shared responsibilities, consensus-building, and receptiveness to diverse information sources. In contrast, the competitive style encourages overlapping spheres of authority, promoting information gathering and diverse opinions. Studying a formal model encompassing these leadership styles and their effects on adviser selection and decision-making is a promising avenue for future research.

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