Information Provision and the Curse of Knowledge

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Abstract

Common wisdom suggests that the "curse of knowledge" (COK), whereby better-informed individuals are unable to ignore their private information when forecasting others' beliefs, reduces the quality of communication. We study how this bias affects costly information provision by a founder who wants to raise financing from an outside investor. When the founder exhibits COK about the content of her communication, there is less information provision and payoffs tend to be lower for both players. However, we show that when the founder exhibits COK about the context of her message, the bias can lead to more information production and better investment decisions. Moreover, this can exacerbate the conflict of interest between the founder and the outsider.

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"The single biggest problem in communication is the illusion that it has taken place." — George Bernard Shaw

"Without context, a piece of information is just a dot. It floats in your brain with a lot of other dots and doesn't mean a damn thing. Knowledge is information-in-context... connecting the dots." — Michael Ventura

1 Introduction

The curse of knowledge refers to the ubiquitous cognitive bias where individuals are unable to ignore their private information when forecasting the others' beliefs.[1] Common intuition suggests that this bias hampers communication quality: a cursed speaker fails to convey her private information effectively because she presumes it must be "obvious" to her audience. For instance, an expert macroeconomist evaluating the impact of supply-chain constraints on potential inflation is likely to overestimate the degree to which policymakers "should see it coming" and so may under-estimate the value of conveying their perspective. Similarly, many academics struggle to present their research in a "simple" or accessible manner, despite being thought leaders in their fields.[2]

In most settings, however, experts are not only responsible for sharing their expertise (e.g., communicating the relevant context) but also for producing information that depends upon this expertise. The macroeconomist making policy recommendations relies not only on her expertise at interpreting existing data, but also on conducting new research and analysis. Likewise, academics spend much of their time "in the weeds," focused on producing novel results, conducting complex analyses, and understanding the nuances of their work. In such settings, the expert's knowledge of the context is critical for interpreting the information she produces: there is a natural bundling of information production and communication.

In a stylized sender-receiver game, we analyze how the curse of knowledge distorts endogenous *provision* of costly information. Specifically, we consider a setting in which a founder at a private firm (the sender, she) has access to a project that requires financing from an outside investor (the receiver, he). The project's net return (r) depends on two components: a component x which is privately known to the founder (e.g., founder-specific human capital), and a component θ, which is initially not known to either party (e.g., future market

[1] The curse of knowledge was coined by Camerer, Loewenstein, and Weber (1989), and is closely related to the notion of "hindsight bias," introduced by Fischhoff (1975), which reflects the inability to correctly remember one's own priors after observing new information.

[2] This struggle often extends to teaching. In his first semester teaching at the University of Bern, Albert Einstein was able to enroll only three students in his thermodynamics course; in his second semester, his class was canceled because only one student signed up (see Grant (2018)).

conditions). By paying a cost, the founder can commit to providing the outside investor with a signal ($s = x + \theta$) that is informative about, though not necessarily perfectly correlated with, the project's return.[3] Given the firm's disclosure policy and the information available to him, the outside investor then chooses whether or not to finance the new project.

We focus on an intuitive class of threshold equilibria in which (i) the founder engages in costly information provision if and only if her private information is sufficiently good (i.e., x is sufficiently high), and (ii) the investor finances the project if and only if the disclosed signal is sufficiently high (i.e., s is sufficiently high). Importantly, given her expertise and access to private information about the firm, we assume that the founder suffers from the curse of knowledge: she mistakenly believes the investor is also informed about x with some probability which affects her incentive to incur the information provision cost.

We show that the impact of the curse of knowledge depends on whether the founder has private information about the content of the message or the context. To see this clearly, we highlight two benchmark scenarios. Suppose the project return is driven completely by human capital i.e., $r = x$. In this case, the founder exhibits the curse of knowledge about the object of interest or the *content* of the communication. We show the likelihood of disclosure decreases in the extent of the curse of knowledge. Intuitively, when the founder believes that the investor is more likely to already know x, she has less of an incentive to incur the cost to generate the signal s. This captures the common wisdom that suggests that the curse of knowledge leads experts to communicate poorly and not exert sufficient effort in "making the case clearly."

In contrast, suppose the project return is driven completely by market conditions i.e., $r = \theta$. In this case, knowledge about x is not directly relevant for the investment decision, per se. However, it does affect one's inference about project returns $r = \theta$ from the signal $s = x + \theta$ i.e., knowledge of x provides valuable *context* for interpreting the firm's disclosure. In this case, we show that the likelihood of disclosure *increases* in the curse of knowledge. When the founder believes that the investor is more likely to already know x, she believes he will be able to better interpret and utilize any disclosed information — as a result, she has a stronger incentive to engage in costly information provision.

More generally, we show that when the return depends upon both x and θ, these two competing channels determine the effect of the curse of knowledge on the founder's disclosure policy. This, in turn, determines the impact of the curse of knowledge on the fraction of expected firm value that accrues to the founder and the outside investor. Importantly, there is a conflict of interest since the outsider's payoff depends on the expected return from the project, while the founder's payoff must also account for the cost of information provision.

[3] In Section 3.1, we provide examples of what this signal represents in practice.

The impact of the curse of knowledge on the founder's payoff and the outsider's payoff is driven by how it affects the extent and nature of disclosure. An increase in the likelihood of disclosure generally leads to better-informed decisions by outside investors, which leads to higher expected returns and an increase in the outsider's payoff. However, more disclosure also leads to higher expected disclosure costs, which tends to decrease the founder's payoff.

We show, for instance, that when $r = x$, an increase in the curse of knowledge decreases both the founder's and outsider's return: the reduced disclosure and, hence, lower payoffs affect both negatively, even after accounting for the reduced cost of disclosure. In this case, the expected firm value is maximized when the founder is unbiased (i.e., the curse of knowledge is zero). However, when the founder's private information is more context-relevant (e.g., when $r = \theta$), an increase in the curse of knowledge tends to increase the outsider's return but decrease the founder's return. Specifically, in this case, a higher curse of knowledge leads to more information provision by the founder. This leads to more informed investment decisions and higher payoffs for the outsider, but higher disclosure costs and lower payoffs for the founder. As such, in these settings, a higher curse of knowledge can exacerbate the conflict of interest between the founder and the outside investor by making the latter better off at the expense of the former. Overall, the firm value is hump-shaped in the curse of knowledge, and the expected firm value is maximized when for an interior level of the bias.

The rest of the paper is as follows. The next section discusses the empirical relevance of the "curse of knowledge" and the related theoretical literature. Section 3 presents the model setup and provides a discussion of the key assumptions. Section 4 provides the main analysis of the model, including a characterization of how the curse of knowledge affects information provision in the benchmark cases. Section 5 discusses the impact of the curse of knowledge on expected returns and firm value, and Section 6 concludes. All proofs and additional analysis are in the Appendix.

2 Empirical relevance and related literature

The curse of knowledge is an aspect of "perspective taking" that has been widely studied by psychologists and anthropologists.[4] The bias has been widely documented and arises at any age, across different cultures, and in a variety of settings and information environments (see the surveys by Hawkins and Hastie (1990), Blank, Musch, and Pohl (2007) and Ghrear, Birch, and Bernstein (2016), and the papers detailed within). There is also ample

[4] As highlighted by Nickerson (1999), an individual engaging in perspective taking (or "putting themselves in someone else's shoes") finds it difficult to imagine that others do not know what he knows. This is what gives rise to the "curse of knowledge."

evidence that a range of communication methods can give rise to the curse of knowledge: while the original research focused on written communication (e.g., Fischhoff, 1975), there is substantial evidence that individuals exhibit the curse of knowledge with respect to oral communication (Keysar, 1994), graphical messages (Xiong, van Weelden, and Franconeri, 2019) and visual illustrations (Bernstein, Atance, Loftus, and Meltzoff, 2004). Importantly, the literature documents that experts are particularly susceptible to curse of knowledge, including doctors (e.g., Arkes, Wortmann, Saville, and Harkness (1981)), judges (e.g., Anderson, Jennings, Lowe, and Reckers (1997)) and professional auditors (e.g., Kennedy (1995)). Moreover, there is substantial evidence that traditional methods of debiasing have limited, if any impact: a series of papers (see Pohl and Hell (1996), Kennedy (1995), and the survey by Harley (2007)) show that even individuals with prior experience, who receive feedback on their performance and are accountable for their actions, and who are provided with direct warnings about the bias still exhibit the curse of knowledge.

Camerer et al. (1989) are the first to explore the implications of the curse of knowledge in economic decision-making. Using an experimental design, they find that this bias is a robust feature of individual forecasts and is not eliminated by incentives or feedback. The authors conclude that the curse of knowledge can help "alleviate the inefficiencies that result from information asymmetries" because better-informed agents do not fully exploit their information advantage in a competitive setting. Our analysis focuses on a different implication of the curse of knowledge. In contrast to the competitive setting studied by Camerer et al. (1989), we consider a cooperative setting in which a biased sender wishes to effectively communicate with a receiver about the payoff of a potential investment opportunity. We characterize conditions under which the curse of knowledge can hamper communication and those under which it enhances information provision.

As such, our paper is most closely related to Madarász (2011). He shows that when the *receiver* exhibits the curse of knowledge (or "information projection") and evaluates the sender's expertise, the sender overproduces information that is a substitute for the receiver's ex-post information and under-produces complementary information.[5] Our analysis complements this work. We show that when the *sender* exhibits the curse of knowledge about the context of the message, there is over-provision of costly information, while when the curse of knowledge is about the content of the message, there is under-provision.[6] Moreover, we characterize conditions under which the curse of knowledge can lead to more efficient decisions.

[5]In another related paper, Madarász (2015) shows that in a persuasion game with costly verification and a biased receiver, the equilibrium may feature credulity or disbelief.

[6]As such, our paper contributes to the broad literature about communication games with costly information acquisition by the sender (e.g., Austen-Smith (1994), Fischer and Stocken (2010), Di Pei (2015)).

3 Model

There are three dates $t \in \{0, 1, 2\}$ and two players: the sender S (she) is a founder at a private firm, and the receiver R (he) is an outside investor.

Payoffs and Timing. The founder has access to a project that requires investment from the outside investor at date 1 and generates (net) returns of $r = \beta\theta + (1-\beta)x$ at date 2.[7] We assume that $\theta, x \sim U[-1, 1]$ and are independently distributed. The timeline of events is as follows:

- At date 0, the founder perfectly observes x and can pay a cost $\tilde{c}$ to commit to verifiably produce and disclose a signal $s = \theta + x$ at date 1 to the outside investor. Let $d(x) \in \{\varnothing, s\}$ denote the outcome of this decision, where $d = \varnothing$ denotes no disclosure to the investor and $d = s$ denotes disclosure of interim cash flows s.

- At date 1, the outside investor observes d and chooses whether or not to invest in the project. Let $I(d) \in \{0, 1\}$ denote the investment decision, where $I = 1$ denotes investment and $I = 0$ denotes no investment.

- At date 2, the firm's total cash-flows $V = I(d) \times r - \tilde{c} \times \mathbf{1}_{d=s}$ are realized. Conditional on investment, the outside investor receives a fraction α of the return from the new project, while the founder receives a fraction $1 - \alpha$.

Preferences and Beliefs. Let $\mathbb{E}_i[\cdot]$ denote the conditional expectation of player $i \in \{S, R\}$, given his or her information set. At date 0, the founder chooses $d\{\varnothing, s\}$ to maximize her expected payoff:

$$\tilde{u}_S(x) = \max_d \mathbb{E}_S[(1-\alpha)I(d) \times r - \tilde{c} \times \mathbf{1}_{d=s}|x]. \tag{1}$$

Letting $c \equiv \frac{\tilde{c}}{(1-\alpha)}$, this is equivalent to maximizing:

$$u_S(x) = \max_d \left(\mathbb{E}_S[I(d) \times r - c \times \mathbf{1}_{d=s}|x]\right) \tag{2}$$

Moreover, at date 1, the outside investor chooses $I \in \{0, 1\}$ to maximize his expected payoff:

$$u_R(d) = \max_I \alpha\mathbb{E}[I(d) \times r|d], \tag{3}$$

i.e., he invests if and only if he believes the net return is positive, irrespective of α.

[7] We can allow for $r = \beta\theta + (1-\beta)x + \eta$ for an independently distributed, mean zero η to ensure that the net return cannot be perfectly determined at date 1 using available information, but this is not necessary for any of the analysis.

We assume that the outside investor has rational beliefs. Importantly, however, the founder suffers from the **curse of knowledge**: she mistakenly believes that the outside investor shares some of her knowledge about x. In particular, consider a "truth or nothing" signal about x,

$$z = \begin{cases} x & \text{with probability } w \\ \emptyset & \text{with probability } 1-w \end{cases}, \tag{4}$$

where the signal z reveals x perfectly with probability w and nothing otherwise. We model the curse of knowledge by assuming that S believes that R also observes the signal z at date 0 when, in reality, he does not. The parameter $w \in [0, 1)$ measures the degree to which the sender exhibits the curse of knowledge. If $w = 0$, the sender (founder) exhibits rational expectations; otherwise, as w increases, the sender's forecast about the receiver's beliefs is biased toward her own. In particular, note that this implies:

$$\mathbb{E}_S[\mathbb{E}_R[r|d, x]] = (1-w)\mathbb{E}[r|d] + w\mathbb{E}[r|d, x]. \tag{5}$$

This specification is consistent with the notion of "information projection" developed by Madarász (2011) and the characterization of conditional expectations in (5) corresponds to the formulation first utilized by Camerer, Loewenstein, and Weber (1989).

An equilibrium consists of the founder's choice d and investor's choice I such that (i) d maximizes the founder's objective in equation (2) given her conjecture $\hat{I}$ about the investor's action, (ii) I maximizes the investor's objective in equation (3) given his conjecture $\hat{d}$ about the founder's choices, and (iii) each player's conjectures coincide with the other player's choices i.e., $\hat{I} = I$, $\hat{d} = d$. We focus on **threshold equilibria** characterized by thresholds $\{\bar{x}, \bar{s}\}$ in which (i) when there is disclosure, the investor invests if and only if $s \geq \bar{s}$; (ii) the founder discloses if and only if $x \geq \bar{x}$, and (iii) when there is no disclosure, the investor does not invest. We adopt the convention that if the investment threshold is $\bar{s} \leq -2$ ($\bar{s} \geq 2$), then the investor chooses to always (never) invest. Similarly, if the disclosure threshold $\bar{x} \leq -1$ ($\bar{x} \geq 1$), the founder chooses to always (never) disclose.

3.1 Discussion of assumptions

There are two components to the firm's returns: x captures information about which the founder is privately informed, and θ captures as-yet-unrealized determinants of the project's viability. For instance, in a pharmaceutical startup, x might reflect proprietary information about the efficacy of a new drug, which is privately known to the founder, while θ reflects information about longer-term effects, about which founders do not necessarily have private information. For a tech firm, x could reflect founder- or team-specific human capital, while θ captures demand for a heretofore undeveloped application.

The founder can engage in costly information production / provision to generate a signal $s = \theta + x$ which reflects a (normalized) combination of both components. In practice, producing such information in a verifiable manner is likely to be costly, especially for startups and private firms. For instance, in the case of a pharmaceutical startup, this might involve implementing multiple rounds of clinical trials to create observable outputs, such as patents, prototypes, and scientific publications, which can be used to demonstrate progress and potential value to investors. More generally, firms need to set up internal information, auditing, and reporting systems to be able to generate verifiable information about current investments and future opportunities (e.g., interim cash-flows). Additionally, the output of early-stage activities, such as clinical trials, is often required to adhere to standardized reporting protocols, which may limit the extent to which firms can tailor disclosures to reflect firm specific nuances or proprietary context.

Another important application of our model is that of accounting earnings, which can be decomposed into cash flows and accruals. Although earnings are typically reported as the simple sum of these components, empirical research has demonstrated that they differ systematically in their persistence and predictive content for future firm performance, with cash flows generally exhibiting greater persistence than accruals (e.g., Sloan (1996); Richardson, Sloan, Soliman, and Tuna (2005)). This raises the question of whether performance measures (i.e., public reports) should incorporate differential weightings that reflect the relative informativeness of each component — e.g., placing greater weight on cash flows than on accruals. However, one likely reason such reweighting is rarely implemented in practice is that the optimal weights are firm-specific and may vary considerably across firms and over time. As a result, constructing a uniform metric that captures this heterogeneity is operationally challenging and may undermine comparability across firms. Consequently, standard practice favors simple aggregation rules, despite their potential to obscure economically meaningful variation in information content.

This application maps directly onto our framework: the informativeness of the signal $s = x + \theta$ for the fundamental outcome $r = \beta\theta + (1 - \beta)x$ depends critically on the relative contribution of the underlying components. Heterogeneity in these weights across firms implies that a uniform disclosure rule may be suboptimal, even when the signal structure is held constant.

Moreover, this signal structure allows us to tractably capture how the impact of the curse of knowledge varies with the nature of the information being communicated. For instance, when $\beta = 0$, the sender suffers from the curse of knowledge about the *content* of the signal

— in this case, we show that a higher curse of knowledge harms communication. In contrast, when $\beta = 1$, the sender suffers from the curse of knowledge about the *context* of the signal — importantly, in this case, x has no impact on the return per se, but affects how the investor interprets the signal s when making his decision. In this case, we show that a higher curse of knowledge leads to more communication. Of course, our specification also nests the case where $\beta = 1/2$, in which case, the signal s and the return r depend on the components x and θ in the same way. In this case, the signal is directly about the return payoff.

We assume that the fraction α of the project return that the outsider receives if he invests is an exogenous parameter. We do so because the focus of our analysis is to understand how the curse of knowledge affects a founder's incentives to produce costly information. In practice, the fraction α endogenously depends on a number of factors, including the risk-return characteristics of the investment project, the required level of investment, market conditions, the founder's financing constraints, and the relative bargaining power of the two parties. While a complete characterization of the equilibrium level of α is beyond the scope of this paper, in Section 5, we discuss how the expected payoffs of the founder and the outside investor change as we change α.

We assume that the sender is naive about her behavioral bias in that her choices do not "correct" for the fact that she is subject to the curse of knowledge. This is consistent with empirical evidence which implies that individuals continue to exhibit the curse of knowledge even if they are made aware of the fact that they are doing so (see Section 2). It would be interesting to study how a sophisticated sender could commit to an information provision strategy that accounted for, and possibly exploited, her curse of knowledge but we leave this for future work.

Finally, our main analysis focuses on a specific class of threshold equilibria which have a natural form: the sender discloses if her information is sufficiently good and the receiver invests if the disclosed information is sufficiently good. We do so because such equilibria are intuitive and facilitate comparisons with the existing literature. However, as we discuss in Appendix B, there can arise other equilibria in our setting. For instance, when $\beta = 1$, we show there exists a continuum of equilibria in which the sender discloses if and only if x is in an interval. Similarly, when $\beta = 0$, there exists an equilibrium in which the sender discloses if and only if $x < \underline{x}$ for a threshold $\bar{x} \in [-1, 1]$. However, for each of these equilibria, we show in Appendix B that the implications for how the curse of knowledge affects disclosure, expected returns, and expected firm value are identical to those we derive in the threshold equilibria on which we focus.

4 Analysis

Let $D = [\bar{x}, 1]$ denote the region in which the founder chooses to disclose $s = \theta + x$ in equilibrium. Given the conjectured equilibrium and the investor's objective in (3), he optimally decides to invest if and only if the expected net payoff from the project is positive. This can be characterized as:

$$I^*(d) = \mathbf{1}_{\mathbb{E}[r|d]>0} = \begin{cases} \mathbf{1}_{\mathbb{E}[r|x \notin D]>0} & \text{if } d = \varnothing \\ \mathbf{1}_{\mathbb{E}[r|s, x \in D]>0} & \text{if } d = s \end{cases}, \tag{6}$$

where $\mathbf{1}_.$ denotes the indicator function. We begin with a few observations.

- First, note that conditional on $\{s, x\}$, the expected return from the investment is given by

$$\mathbb{E}[r|s, x] = \beta(s - x) + (1 - \beta)x = \beta s + (1 - 2\beta)x. \tag{7}$$

- Second, conditional on the signal $\{s\}$ and given that $x \in D$, the expected return from the investment is given by

$$\mathbb{E}[r|s, x \in D] = \beta s + (1 - 2\beta)\mathbb{E}[x|s, x \in D]. \tag{8}$$

- Third, conditional on x, the expected return from investment is

$$\mathbb{E}[r|x] = (1 - \beta)x. \tag{9}$$

- Fourth, given that $x \notin D$, the expected return from investment is

$$\mathbb{E}[r|x \notin D] = (1 - \beta)\mathbb{E}[x|x \notin D]. \tag{10}$$

Given these observations, we characterize the founder's expected payoffs, where we use subscripts D and ND to denote payoffs from disclosure and no-disclosure, respectively, and R and w to denote expectations under rational and cursed beliefs. Since the founder suffers from the curse of knowledge, she entertains four possible scenarios at date 1:

- The investor is uninformed: in this case, the investor infers that $x \notin D$, and so the founder's expected payoff is

$$u_{ND,R}(x) = \mathbb{E}[r\mathbf{1}_{\mathbb{E}[r|x \notin D]>0}|x] = (1 - \beta)x\mathbf{1}_{\mathbb{E}[x|x \notin D]>0}. \tag{11}$$

In the conjectured equilibrium, there is no investment conditional on no disclosure, and so $u_{ND,R}(x) = 0$. A sufficient condition for this is that $\mathbb{E}[x|x \notin D] \leq 0$, which holds for all $\bar{x} \in [-1, 1]$.

- The investor observes x: in this case, the founder anticipates that the investor invests if and only if $\mathbb{E}[r|x] > 0$, and so the founder's expected payoff is

$$u_{ND,w}(x) = \mathbb{E}[r\mathbf{1}_{\mathbb{E}[r|x]>0}|x] = (1-\beta)x\mathbf{1}_{x>0}. \tag{12}$$

- The investor observes s: in this case, the founder anticipates that the investor invests if and only if $\mathbb{E}[r|s, x \in D] > 0$, and so her expected payoff is

$$u_{D,R}(x) = \mathbb{E}[r\mathbf{1}_{\mathbb{E}[r|s,x\in D]>0}]|x] \tag{13}$$

In the conjectured equilibrium, the investor invests if and only if $s \geq \bar{s}$, or equivalently, $\theta \geq \bar{s} - x$, and so one can express the founder's expected payoff as:

$$u_{D,R}(x) = \Pr(\theta > \bar{s} - x|x) \times (\beta\mathbb{E}[\theta|\theta \geq \bar{s} - x, x] + (1-\beta)x) \tag{14}$$

- The investor observes s and x: in this case, the founder anticipates that the investor invests if and only if $\mathbb{E}[r|s, x] = \mathbb{E}[r|\theta, x] = \beta\theta + (1-\beta)x > 0$, or equivalently, if and only if $\theta > -\frac{1-\beta}{\beta}x \equiv \bar{\theta}$ and so her expected payoff is:

$$\begin{aligned} u_{D,w}(x) &= \mathbb{E}[r\mathbf{1}_{\mathbb{E}[r|\theta,x]>0}|x] && (15)\\ &= \Pr(\theta > \bar{\theta}|x) \times \big(\beta\mathbb{E}[\theta|\theta > \bar{\theta}, x] + (1-\beta)x\big) && (16)\end{aligned}$$

Let $f(x)$ denote the expected benefit from disclosure, where

$$f(x) = w\left(u_{D,w}(x) - u_{ND,w}(x)\right) + (1-w)\left(u_{D,R}(x) - u_{ND,R}(x)\right) - c. \tag{17}$$

where the first term represents the net benefit of disclosure when the founder believes that the investor is informed of x, which occurs with probability w, while the second term captures the net benefit of disclosure when the investor is uninformed about x, which occurs with probability $(1-w)$. Then, in equilibrium, we must have (i) $f(x) \geq 0$ for all $x \in D$, (ii) $f(x) < 0$ for all $x \notin D$, and (iii) $f(\bar{x}) = 0$.

Before proceeding with the full characterization of the model, we first analyze the investor's belief updating process and identify the conditions under which investment occurs.

Lemma 1. *Consider the case where investor observes s and x. If $\beta = 0$, the investor invests if and only if $x > 0$ and doesn't invest otherwise. Suppose $\beta > 0$:*

- *If $\frac{\beta-1}{\beta}x \in (-1, 1)$, investor invests if and only if $s > \frac{2\beta-1}{\beta}x$.*
- *If $\frac{\beta-1}{\beta}x \geq 1$, investor never invests.*
- *If $\frac{\beta-1}{\beta}x \leq -1$, investor always invests.*

This lemma follows from the observation that the investor invests if and only if $r = \beta\theta + (1-\beta)x = \beta s + (1-2\beta)x > 0$. The next lemma characterizes the conditions under which there is investment when the investor only observes s (and conditions on the fact that there is disclosure).

Lemma 2. *Consider the case where investor observes s and $x \in D$.*

- *If $\beta > 0.5$, investor invests iff*

$$s > \bar{s} = (2\beta - 1)\frac{1 + \bar{x}}{2\beta}$$

- *If $\beta \leq 0.5$,*
  1. *investor invests for all signals iff $\bar{x} > \frac{\beta}{1-\beta}$*
  2. *otherwise, the investor invests for signals*

$$s > \bar{s} = (2\beta - 1)(1 + \bar{x})$$

In order to characterize the above investment rule, we need to characterize the distribution of x given s and $x \in D$. One can show that this is given by:

$$x|s, x \in D \sim U[\max\{-1, s-1, \bar{x}\}, \min\{1, s+1\}].$$

Characterizing the conditional expectation based on this distribution for different ranges of s gives us the above result.

4.1 Benchmarks

In this section, we highlight three benchmarks that highlight how the impact of the curse of knowledge on communication depends critically on whether it is about the content of the communication or the context.

4.1.1 Curse of knowledge about content (i.e., $\beta = 0$)

When $\beta = 0$, the return on the project is pinned down by x alone. As such, the founder's curse of knowledge is about the content of the communication. Note that the founder's expected payoff, given that she believes the investor observes both s and x is given by

$$u_{D,w}(x) = (1-\beta)x\mathbf{1}_{x>0}, \tag{18}$$

and the net benefit from disclosure in this case simplifies to:

$$f(x) = \begin{cases} (1-w)x\frac{1+x-\bar{s}}{2} - c & \text{if } \bar{x} < 0 \\ (1-w)x - c & \text{if } \bar{x} \geq 0 \end{cases} \tag{19}$$

This follows from Lemma 2, which establishes that, for $\beta = 0$, if $\bar{x} > 0$, the investor always chooses to invest. Conversely, if $\bar{x} < 0$, the investor invests only when the signal satisfies $s > \bar{s} \equiv -(1+\bar{x})$. Notably, the investment threshold decreases with the disclosure threshold: as the founder becomes more conservative about when she discloses information, the outside investor becomes more willing to invest since he is more certain that x is higher.

The following proposition characterizes the unique threshold equilibrium.

Proposition 1. *Suppose $\beta = 0$. Then, there exists a unique threshold equilibrium such that (i) the founder communicates s if and only if $x \geq \bar{x}$, (ii) conditional on no disclosure, the investor does not invest (i.e., $I(\varnothing) = 0$), and (iii) conditional on disclosure, the investor always invests, where*

$$\bar{x} = \begin{cases} \frac{c}{1-w} & \textit{if } c < 1-w \\ 1 & \textit{otherwise,} \end{cases} \tag{20}$$

Furthermore, the likelihood of disclosure (weakly) decreases with the curse of knowledge w.

Intuitively, if the founder believes that the investor knows x with some probability, she has less of an incentive to incur the cost to produce and disclose this information. The more biased the founder, the lower the perceived benefit from disclosure, and consequently, the likelihood of disclosure decreases with the curse of knowledge. This result is in line with the narrative from the psychology literature, which suggests that cursed experts tend to communicate poorly and do not exert much effort in "making the case clearly" because they over-estimate the extent to which their audience is "on the same page."

4.1.2 Curse of knowledge about context (i.e., $\beta = 1$)

When $\beta = 1$, $r = \theta$, and so x is irrelevant for the project return, per se. However, x captures the context of the communication — knowing x improves the inference about θ that one can make from the signal $s = \theta + x$.

In this case, one can show that the net benefit from disclosure is given by:

$$f(x) = \frac{-(1-w)}{4}x^2 + \frac{1-\bar{s}^2(1-w)}{4} + \frac{(1-w)\bar{s}}{2}x - c \tag{21}$$

Moreover, given that $\beta = 1$, lemma 1 implies that the outside investor invests if and only if $\mathbb{E}[s - x|s, x \geq \bar{x}] = s - \frac{1+\bar{x}}{2} \geq 0$, or equivalently, if and only if $s \geq \bar{s} = \frac{1+\bar{x}}{2}$. In this case, the investment threshold increases with the disclosure threshold. As the disclosure threshold increases, a disclosure by the founder signals that x is higher on average, but this makes the investor more pessimistic about $\theta = s - x$ — as a result, the threshold for investment increases.

The following result characterizes the unique threshold equilibrium in this setting.

Proposition 2. *Suppose that $\beta = 1$. Then there exists a unique threshold equilibrium such that (i) the founder communicates s if and only if $x \geq \bar{x}$, (ii) conditional on no disclosure, the investor does not invest (i.e., $I(\varnothing) = 0$), and (iii) conditional on disclosure, the investor invests if and only if $s \geq \bar{s} \equiv \frac{1+\bar{x}}{2}$, where*

$$\bar{x} = \begin{cases} -1 & \text{if } \frac{w}{4} > c \\ 1 - 2\sqrt{\frac{1-4c}{1-w}} & \text{if } \frac{w}{4} < c < \frac{1}{4} \\ 1 & \text{if } c \geq \frac{1}{4}. \end{cases} \tag{22}$$

Furthermore, the likelihood of disclosure is increasing in the curse of knowledge w.

In this case, the founder suffers from the curse of knowledge about the context of the communication. Intuitively, if she believes that the investor already knows x, then the marginal benefit of producing and disclosing a signal $s = \theta + x$ to the investor increases because the founder mistakenly believes the investor will be able to infer the net return $r = \theta$ more easily. As a result, counter to common wisdom, communication improves when the curse of knowledge is with respect to the context of the message.

To better understand the underlying economics, it helps to first understand the founder's incentive to limit disclosure. Whether x is high or low does not affect the investment return, and so, at first glance, it may not be clear why the founder's disclosure should depend upon x. Effectively, by limiting her disclosure, the founder reduces the amount of noise in the signal - as $\bar{x}$ increases, the outside investor is able to infer a more precise estimate of the return from s. In equilibrium, a founder does not want to pay the cost to disclose the signal when $x < \bar{x}$ because the outside investor will mistakenly attribute the lower-than-expected signal to a lower-than-expected θ. Because of the curse of knowledge, however, the founder believes that there is some chance that the outside investor knows x already and will not attribute the lower s to θ. This makes her willing to lower the threshold for disclosure, i.e., increase the provision of information.

4.1.3 Communicating about the return (i.e., $\beta = 1/2$)

When $\beta = 1/2$, the return on the investment can be expressed as $r = (\theta + x)/2 = s/2$. As a result, conditional on disclosure, the investor invests if and only if $s \geq 0$ (i.e., $\bar{s} > 0$). This implies that, from the founder's perspective, the net benefit of disclosure can be expressed as:

$$f(x) = \frac{1}{8}\left(x^2 + 2x + 1 - 4xw\mathbf{1}_{x>0}\right) - c. \tag{23}$$

The following result characterizes the unique threshold equilibrium in this case.

Proposition 3. *Suppose $\beta = 1/2$. Then, there exists a unique threshold equilibrium such that (i) the founder communicates s if and only if $x \geq \bar{x}$, (ii) conditional on no disclosure, the investor does not invest (i.e., $I(\varnothing) = 0$), and (iii) conditional on disclosure, the investor invests if and only if $s \geq 0$ (i.e., $I(s) = \mathbf{1}_{s\geq 0}$), where*

$$\bar{x} = \begin{cases} -1 + \sqrt{8c} & \text{if} \quad c < \frac{1}{8} \\ 2w - 1 + \sqrt{8c - 4(1-w)w} & \text{if} \quad \frac{1}{8} < c < \frac{1-w}{2} \\ 1 & \text{otherwise} \end{cases}. \tag{24}$$

Furthermore, the likelihood of disclosure decreases with the curse of knowledge w when the disclosure cost lies in the intermediate range $c \in \left(\frac{1}{8}, \frac{1-w}{2}\right)$, and is independent of the curse of knowledge otherwise.

Unlike the earlier benchmarks, since s is an unbiased signal about the return r, the investor's threshold $\bar{s}$ does not depend on the founder's disclosure threshold $\bar{x}$. As a result, the curse of knowledge only affects the founder's expected payoff if the disclosure threshold is positive (i.e., $\bar{x} > 0$ — see the expression for $f(x)$ above). When disclosure costs are sufficiently low, the threshold $\bar{x} < 0$, and so the curse of knowledge has no effect on the equilibrium. When disclosure costs are high enough, $\bar{x} > 0$ and in this case, a higher curse of knowledge leads to *less* disclosure. Intuitively, this is because the founder believes that the investor observes x, and invests with some probability, even when nothing is disclosed.

Though the contributions of x and θ are the same in this benchmark, the effect of the curse of knowledge closely resembles the setting in which x is the content, (i.e., when $\beta = 0$) about which the outside investor is trying to learn. This is because the founder is not worried about the outside investor mistakenly attributing lower levels of x to θ, as is the case when x is purely context (i.e., $\beta = 1$). We discuss this in more detail in the general case, which we analyze next.

4.2 General Case

The results from the benchmark analysis imply that the impact of the curse of knowledge on disclosure depends on the type of information that the founder privately observes. We have shown that when the founder is privately informed about the content of the communication, a higher curse of knowledge leads to less information provision. However, when the founder's private information is *sufficiently* context-relevant, then the curse of knowledge can induce her to provide more information.

The following result establishes that this result arises more generally.

Proposition 4. *There exists a* $\bar{\beta} > \frac{1}{2}$ *such that when* $\beta > \bar{\beta}$ *and* $\frac{w}{4\beta} < c + (1-\beta)w < \frac{1}{4\beta}$, *the likelihood of disclosure increases with the curse of knowledge in the threshold equilibrium i.e.,* $\bar{x}$ *is decreasing in* w.

To gain some intuition for this result, note that the disclosure threshold $\bar{x}$ is pinned down by the solution to $f(x) = 0$, where $f(x)$ is the net benefit from disclosure. Now, one can express $f(x)$ as:

$$f(x) = f_R(x) + w\left(\Delta_D(x) - \Delta_{ND}(x)\right), \tag{25}$$

where $f_R(x) = u_{D,R}(x) - u_{ND,R}(x) - c$ denotes the net benefit from disclosure for a rational founder, $\Delta_D(x)$ denotes the incremental perceived payoff from disclosure due to the curse of knowledge is

$$\Delta_D(x) \equiv u_{D,w}(x) - u_{D,R}(x) = \frac{\left(\beta\bar{s} - 2\beta x + x\right)^2}{4\beta} \geq 0, \tag{26}$$

and $\Delta_{ND}(x)$ denotes the incremental perceived payoff from non-disclosure due to the curse of knowledge is

$$\Delta_{ND}(x) \equiv u_{ND,w}(x) - u_{ND,R}(x) = (1-\beta)x\mathbf{1}_{x>0} \geq 0. \tag{27}$$

The last inequality follows since in equilibrium, there is no investment when there is no disclosure i.e., $u_{ND,R}(x) = 0$.

This decomposition implies that relative to the "rational" benchmark, when $\Delta_D(x) > \Delta_{ND}(x)$, an increase in the curse of knowledge (w) should lead to more disclosure. Note that $\Delta_D(x)$ captures the founder's perceived incremental benefit of the outsider knowing both s and x relative to s only, while $\Delta_{ND}(x)$ captures the founder's perceived benefit of the outsider knowing x (relative to the outside investor being uninformed).

When $\beta = \frac{1}{2}$, $\Delta_D(x) = 0$, i.e., there is no incremental benefit to knowing both s *and* x since the outside investor's object of interest is $r = s$. Thus, the curse of knowledge does not affect the founder's expected incremental payoff from disclosure. On the other hand, when $\beta = 1$, $\Delta_{ND}(x) = 0$, i.e., there is no benefit to knowing x only since the outside investor's object of interest is $r = \theta$. Thus, there exists a unique β between these two benchmarks above which the founder's private information is sufficiently context-relevant so that the curse of knowledge increases disclosure.

Figure 1: Optimal disclosure threshold as a function of the curse of knowledge
The figure plots the choice of disclosure threshold $\bar{x}$ as a function of the curse of knowledge for different values of β. The other parameters of the model are $\tilde{c} = 0.05$ and $\alpha = 0.4$.

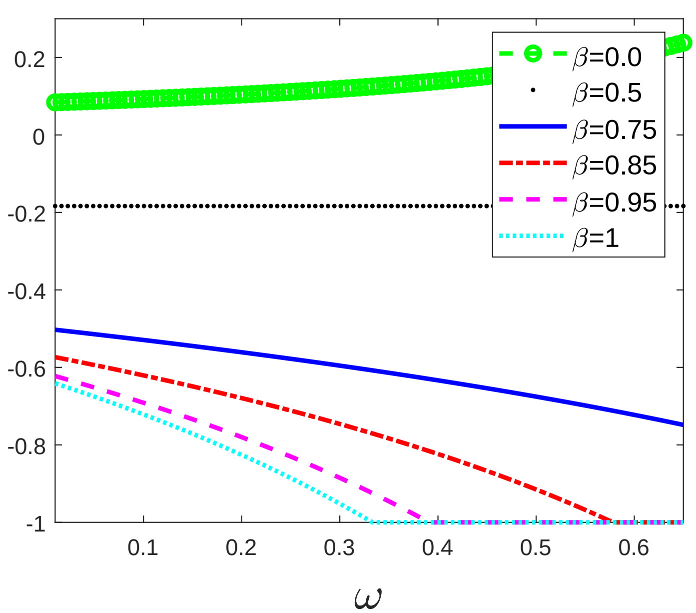


Figure 1 provides an illustration of this result. Specifically, the figure plots the disclosure threshold $\bar{x}$ for different β's as a function of the curse of knowledge w. When β is low, an increase in the curse of knowledge w leads to an increase in $\bar{x}$ and, consequently, a decrease in the likelihood of disclosure. However, when β is sufficiently high, an increase in w leads to a decrease in $\bar{x}$, and consequently, an increase in the likelihood of disclosure.

5 Expected firm value and the curse of knowledge

A natural measure of the efficiency of communication in our setting is the expected value of the firm, net of communication costs. We can decompose this into the fraction V_f of firm value that accrues to the founder and the fraction V_o that accrues to the outsider. Specifically, we have:

$$EV = \mathbb{E}[I(d) \times r - \tilde{c} \times I_{d=s}] = V_f + V_o, \quad \text{where} \tag{28}$$

$$V_f \equiv (1-\alpha)\mathbb{E}[I(d) \times r - c\mathbf{1}_{d=s}], \quad \text{and} \tag{29}$$

$$V_o \equiv \alpha\mathbb{E}[I(d) \times r]. \tag{30}$$

This decomposition highlights the conflict of interest between the founder and the outsider: the outsider's payoff V_o is proportional to the expected return $\mathbb{E}[I(d) \times r]$ from the project, ignoring the cost of disclosure, while the founder's payoff V_f depends on both the expected return and expected disclosure costs.

The following result characterizes how the curse of knowledge can affect the founder's and outsider's payoffs differently across the benchmark cases.

Proposition 5. *(1) Suppose $\beta = 0$. Then both the founder's payoff V_f and the outsider's payoff V_o decrease in the curse of knowledge w. The overall value of the firm decreases with the curse of knowledge w.*
(2) Suppose $\beta = 1$. Then the founder's payoff, denoted by V_f, is strictly decreasing in the curse of knowledge parameter w. In contrast, the outsider's payoff, V_o, is strictly increasing in w. The total firm value exhibits a non-monotonic relationship with the curse of knowledge: it increases with w for sufficiently small values of w, but decreases when w becomes large.
(3) Suppose $\beta = 1/2$. Then, (i) if $c \leq 1/8$ or $c \geq \frac{1-w}{2}$, neither the founder's payoff nor the outsider's payoff depend on the curse of knowledge w; and (ii) if $\frac{1-w}{2} > c > 1/8$, both the founder's payoff and the outsider's payoff decrease with the curse of knowledge. The overall value of the firm weakly decreases with the curse of knowledge w.

An increase in the curse of knowledge impacts the range over which the founder discloses the signal, which in turn affects the outside investor's investment decision and the expected disclosure costs incurred by the firm. The proposition shows that these two channels can impact expected returns and expected firm value differently depending on the nature of the information being communicated.

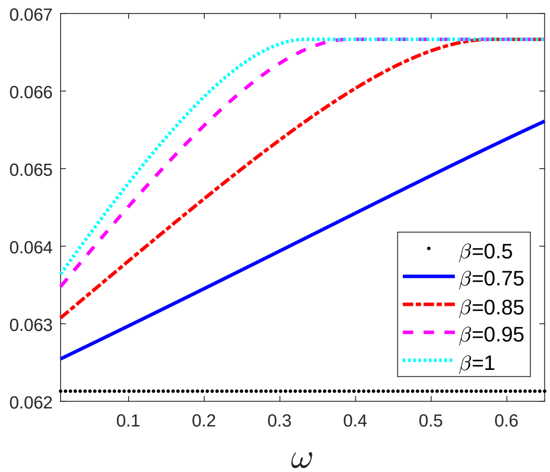
When the founder is cursed about the content of communication (i.e., $\beta = 0$ or $r = x$), an increase in the curse of knowledge leads to less communication (i.e., $\bar{x}$ increases with w). Since this reduces the amount of information available to the outsider, his payoff is lower. Furthermore, we show that the associated reduction in disclosure costs is insufficient to offset the decline in payoffs for the founder. As a result, both the founder's payoff and the outsider's payoff decline with the severity of the curse of knowledge.

In contrast, when the founder is cursed about the context of communication (i.e., $\beta = 1$ or $r = \theta = s - x$), an increase in the curse of knowledge leads to more disclosure. Naturally, this leads to more informed investment decisions and consequently, higher expected returns from investment, which increase the outsider's payoff V_o.[8] However, we show that the resulting increase in disclosure costs dominates this increase in expected returns, and so the founder's payoff V_f always decreases with the curse of knowledge. In this case, firm value is non-monotonic in w, peaking at an interior level.

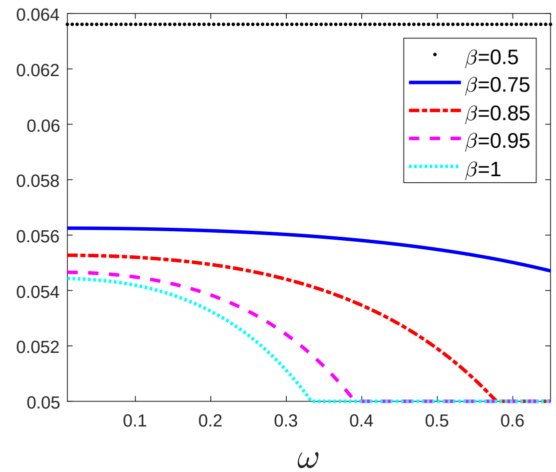
Finally, when the communication provides a direct signal about the return (i.e., $\beta = 1/2$), there are two cases to consider. First, when the cost of disclosure is sufficiently high (i.e., $c > 1/8$), an increase in the curse of knowledge leads to less disclosure in equilibrium (i.e., $\bar{x}$ increases in w). We show that this leads to a decrease in the expected return, since the investor has less information on average. Moreover, we find that the decrease in disclosure costs is not sufficient to overcome the decrease in expected returns, and so, both the founder's payoff and the outsider's payoff decrease with the curse of knowledge. On the other hand, when the cost of disclosure is sufficiently low, the likelihood of disclosure is independent of the curse of knowledge and, consequently, so are the payoffs.

[8] Note that when the disclosure threshold $\bar{x}$ decreases, the outsider's expectation of x decreases and consequently, his conditional expectation of the project's return increases.

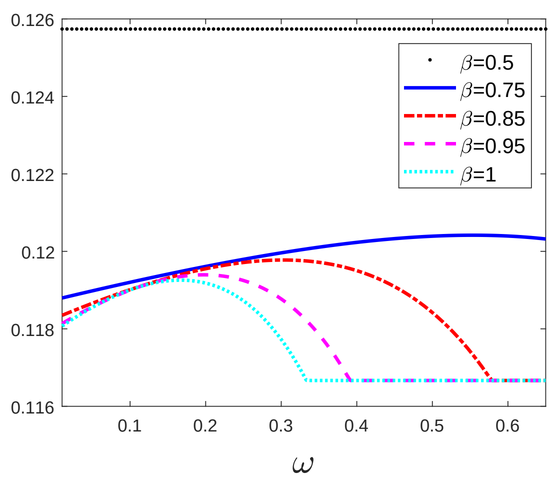
Figure 2: Outside investor & founder's payoff and total firm value as a function of w
The figure plots the outsider's payoff V_o, the founder's payoff V_f and the total firm value $EV = V_f + V_o$ as a function of the curse of knowledge w for different values of β. The other parameters of the model are $\tilde{c} = 0.05$ and $\alpha = 0.4$.



(a) V_o vs w



(b) V_f vs w

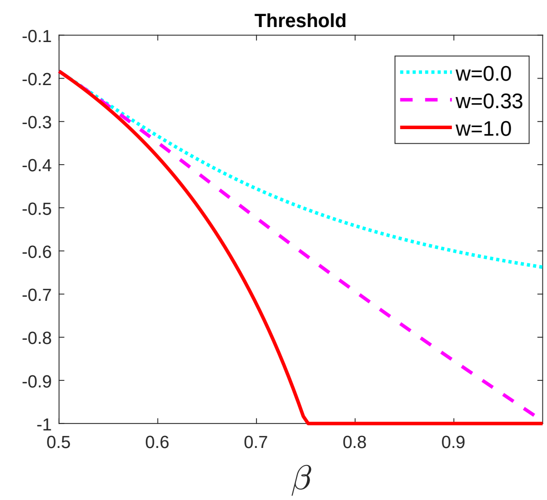


(c) EV vs w

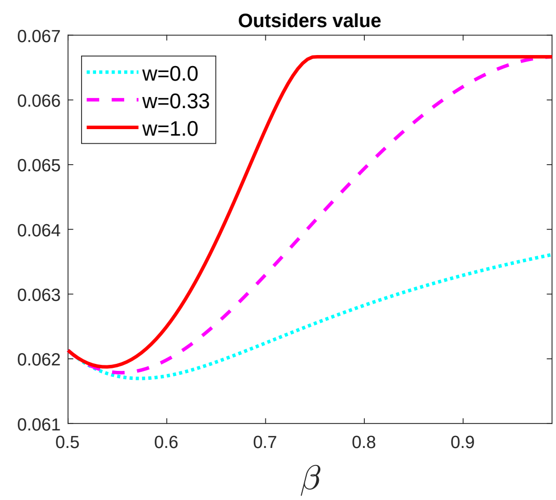
Figure 2 illustrates how the founder's and outsider's returns change with the curse of knowledge for these benchmarks and for other values of β. We focus on the interesting region when $\beta \geq 0.5$. When β is sufficiently high, the curse of knowledge increases the outsider's payoff V_o, since it increases the likelihood of disclosure. However, in general, the corresponding increase in disclosure costs tends to decrease the founder's payoff V_f. This suggests that in settings when the founder is privately informed about the context of communication (i.e., β is high), the curse of knowledge exacerbates the conflict of interest between the founder and the outsider: an increase in w increases the outsider's payoff at the expense of the founder.

Moreover, when β is sufficiently high, the overall value of the firm exhibits a hump-shaped relationship with w, increasing at low levels of w and declining thereafter. Thus, the firm's value is maximized at an interior level of the curse of knowledge. This result suggests that, under certain conditions, some degree of bias (cursedness) on the part of the founder may be desirable from the perspective of overall firm value.

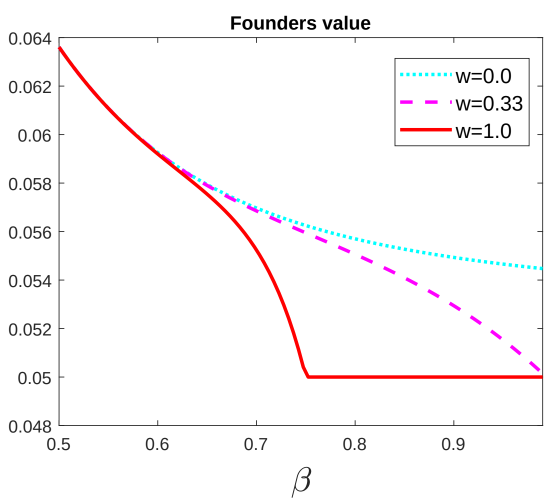
Figure 3: Outside investor & founder's payoff and total firm value as a function of β
The figure plots the outsider's payoff V_o, the founder's payoff V_f, and the total firm value $EV = V_f + V_o$ as a function of β. The other parameters of the model are $\tilde{c} = 0.05$ and $\alpha = 0.4$.



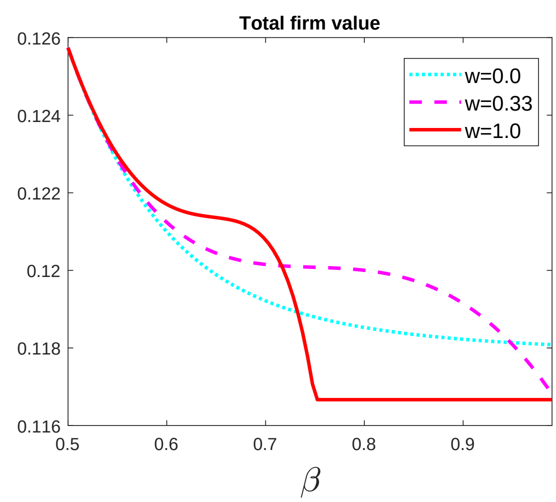
(a) $\bar{x}$ vs β



(b) V_o vs β



(a) V_f vs β



(b) EV vs β

Impact of β. Unfortunately, analytically characterizing the impact of β on payoffs and firm value is intractable. Nevertheless, Figure 3 provides insights into these relations. Recall that the signal takes the form $s = \theta + x$, while the project return is given by $r = \beta\theta + (1-\beta)x$. As β increases from 0.5, the founder's curse of knowledge implies that the marginal benefit of disclosing s is higher. Intuitively, because she believes that the investor knows x (with some probability), she incorrectly expects that s will be a more useful signal about r as β increases. Panel (a) illustrates that, for a fixed level of the curse of knowledge, higher values of β are associated with increased disclosure.

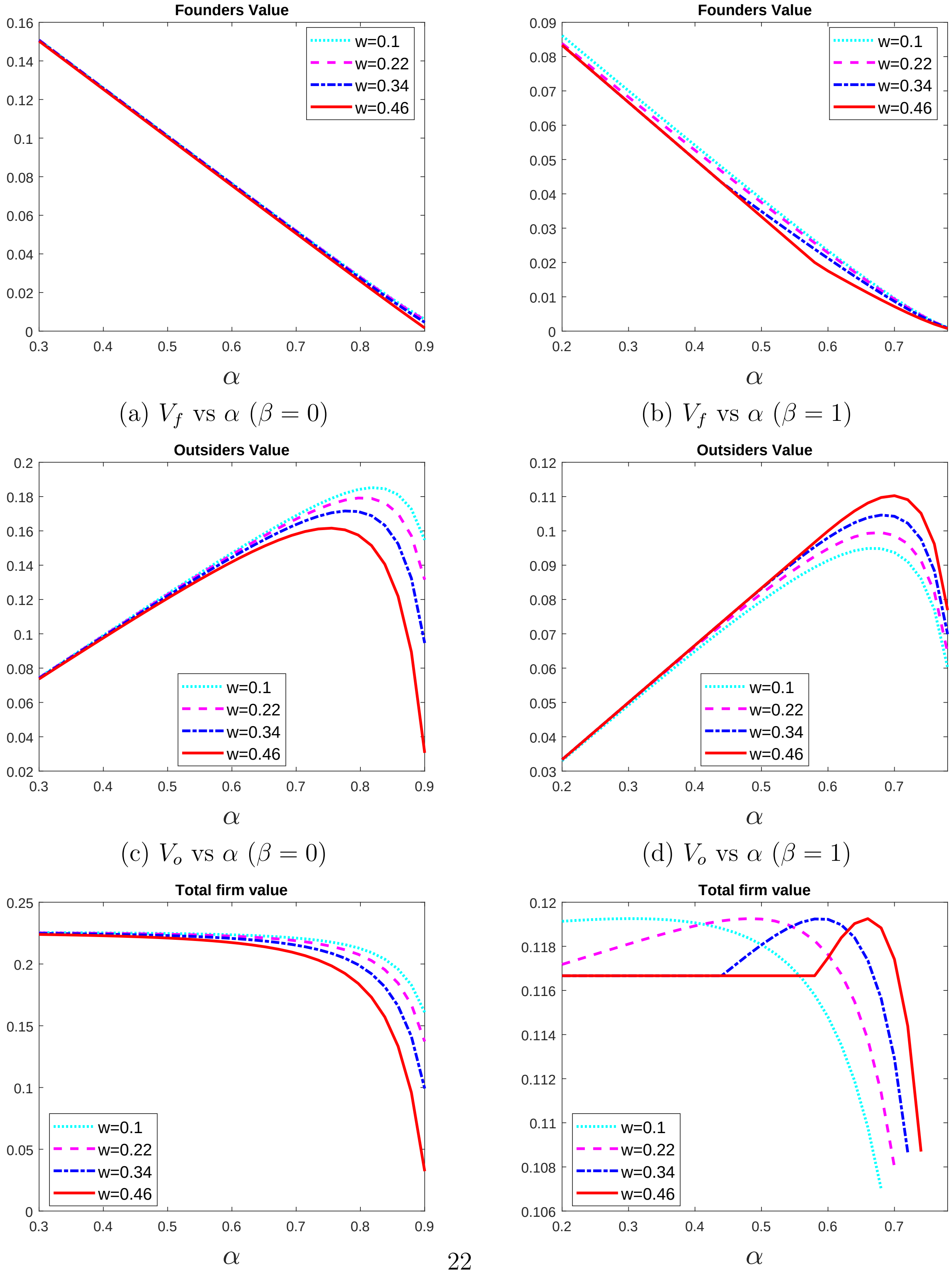
The outsider's payoff is influenced by two opposing forces as β rises: on the one hand, the informativeness of the signal deteriorates, reducing the outsider's expected value; on the other hand, the likelihood of communication increases, enhancing the outsider's expected value. When β is near 0.5, the reduction in signal informativeness dominates, leading to a decline in the outsider's payoff. However, as β approaches 1, the increase in communication becomes the dominant force, resulting in a higher payoff for the outsider. In addition to these forces, the founder's payoff is also affected by the (expected) cost of communication. This channel always dominates, and hence, the founder's value always decreases as β increases. Consequently, total firm value is maximized at $\beta = 0.5$ and declines as β increases beyond this point.

Impact of α. Figure 4 illustrates how the outsider's and founder's payoffs change as a function of the outsider's stake α of the project return, for different β and w. Panels (a), (c) and (e) consider the case when the founder has private information about the content of the message i.e., $\beta = 0$, while panels (b), (d) and (f) consider the case when the founder has private information about the context i.e., $\beta = 1$. Not surprisingly, in both scenarios, the expected payoff to the founder V_f decreases with the fraction of the returns α that the outsider receives (see panels (a) and (b)).

However, the payoff to the outsider V_o is hump-shaped in α (see panels (c) and (d)). This is because an increase in α has two effects on the outsider's payoffs. On the one hand, a higher α implies that the outsider receives a larger fraction of the project's net return, which increases V_o. On the other hand, a higher α implies that the founder's incentives to produce costly information are lower (since she receives a smaller share), and so the expected investment return is lower. As such, there is an intermediate level of α which maximizes V_o, all else equal.

Consistent with our earlier results, the plots in panels (c) and (d) also imply that for a given α, V_o is decreasing in the curse of knowledge w when $\beta = 0$, but increasing in w when $\beta = 1$. Moreover, these plots suggest an interesting interaction between α and w. When the founder has private information about the content (i.e., $\beta = 0$), the V_o-maximizing level of α is decreasing in the curse of knowledge w. On the other hand, when the founder has private information about the context (i.e., $\beta = 1$), the V_o-maximizing level of α increases

Figure 4: Outside investor's and founder's payoff as a function of the outsider's fraction α The figure plots the outsider's payoff V_o, the founder's payoff V_f, and the total firm value as a function of the outsider's stake α for different values of w and β. The left 3 figures correspond to $\beta = 0$ and the right ones correspond to $\beta = 1$. The other parameter of the model is $\tilde{c} = 0.05$



(a) V_f vs α $(\beta = 0)$

(b) V_f vs α $(\beta = 1)$

(c) V_o vs α $(\beta = 0)$

(d) V_o vs α $(\beta = 1)$

(e) EV vs α $(\beta = 0)$

(f) EV vs α $(\beta = 1)$

in the curse of knowledge.

Even though the impact of α on the payoffs to founders and investors are qualitatively similar across the two benchmarks, the following result shows that the impact of α on firm value is very different across the two cases.

Proposition 6. *(1) Suppose $\beta = 0$. The overall value of the firm decreases with α.*
(2) Suppose $\beta = 1$. The total firm value exhibits a non-monotonic relationship with α: it increases with α for sufficiently small values of α, but decreases when α becomes large. The firm value is maximized at

$$\alpha^* = \frac{wG}{1 + wG}$$

where $G = \frac{1-4\tilde{c}}{4\tilde{c}}$.

Panels (e) and (f) of Figure 4 illustrate this result. When $\beta = 0$, the total firm value declines monotonically with the outside investor's equity share α. In this case, increasing the investor's ownership stake weakens the founder's incentives, resulting in a reduction in overall firm value. By contrast, when $\beta = 1$, the relationship between firm value and α is non-monotonic.[9] The optimal equity share for the outside investor that maximizes expected firm value lies in the interior of the unit interval and is characterized in Proposition 6. Moreover, as the founder's curse of knowledge parameter (w) increases, the optimal equity share allocated to the outside investor rises, while the founder's corresponding share declines.

As we discuss in Section 3.1, we interpret α as an exogenous parameter in our analysis since in practice it is driven by a number of (unmodeled) factors (e.g., competition for founders, relative bargaining power, interest rates and equity risk premia). However, the above results suggest that the allocation of ownership can have a qualitatively different impact on firm value, depending on the type of information that the manager is endowed with. Importantly, not only is there misalignment between the founder's and investor's preferred allocation of α (founders always prefer $\alpha = 0$, while outsiders tend to prefer a strictly positive α), but there is also misalignment between these and the efficient allocation. Firm value is maximized for $\alpha = 0$ when the founder's information is about the content, but may be maximized for an interior α when her information is more about the context. Moreover, the plots suggest that, all else equal, outside investors should prefer to increase their fraction of ownership (α) with more biased managers when β is high, and with less biased managers when β is low. A more complete exploration of how the *endogenous* choice of α (e.g., as a result of bargaining between the founder and outside investors) affects real efficiency and firm value is beyond the scope of the current paper and left for future work.

[9] For low α, founder discloses for all x i.e., $\bar{x} = -1$ and hence the firm value is flat.

6 Conclusion

We study how the curse of knowledge affects costly information provision in an investment setting. Importantly, we show that the impact of the curse depends on whether it is about the content of the message or the context. When the founder is cursed about the content of the message (e.g., the return on the new project), then the extent of communication decreases with the curse of knowledge. Intuitively, this is because the founder believes that the investor already knows the relevant information with some probability and so the marginal benefit of producing this information is lower. In contrast, when the founder is cursed about the context of the message (e.g., she knows information that is not directly payoff relevant per se, but affects the investor's interpretation of the communication), then the extent of communication can increase with the curse of knowledge. In this case, because the founder believes the investor can better interpret her messages, she has a stronger incentive to produce such information. Further, we characterize conditions under which the curse of knowledge can improve firm value by (i) improving the type of information that is communicated in equilibrium and (ii) reducing the expected cost of communication.

We consider a stylized model to ensure tractability and expositional clarity. However, our analysis of how the curse of knowledge affects information provision suggests a number of directions for future work. In the context of intra-firm communication, it would be interesting to study whether one could design an internal reporting system or optimal compensation structure which mitigates the negative effects on communication quality, but amplifies the benefits of more precise information acquisition. In a multi-firm setting with strategic complementarities and public information, one would expect the curse of knowledge to affect not only communication within a given firm, but also investment decisions across firms in the economy. We hope to explore these ideas in future work.

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A Proofs

A.1 Proof of Lemma 1

If the investor observes s and x, the founder anticipates that the investor invests if and only if $\mathbb{E}[r|s,x] = \mathbb{E}[r|\theta,x] = \beta\theta + (1-\beta)x > 0$.

If $\beta = 0$, this reduces to $x > 0$. If $\beta \neq 0$, the condition is true iff

$$\theta > \frac{\beta - 1}{\beta}x \iff s > \frac{2\beta - 1}{\beta}x.$$

A.2 Proof of Lemma 2

Note that, conditional on s and $x \in D$,

$$\begin{aligned}
\mathbb{E}[r|s, x \in D] &= \beta s + (1-2\beta)\mathbb{E}[x|s, x \geq \bar{x}] && (31)\\
&= \beta s + (1-2\beta)\frac{\max\{-1, s-1, \bar{x}\} + \min\{1, s+1\}}{2} && (32)\\
&= \begin{cases} \beta s + (1-2\beta)\frac{s}{2} = \frac{s}{2} & \text{if } s > 1 + \bar{x} \\ \beta s + (1-2\beta)\frac{1+\bar{x}}{2} & \text{if } 0 < s < 1 + \bar{x} \\ \beta s + (1-2\beta)\frac{(s+1)+\bar{x}}{2} & \text{if } \bar{x} - 1 < s < 0 \end{cases} && (33)
\end{aligned}$$

If $\bar{x} > 1 + s$, then the expectation is undefined. The investor will invest iff $\mathbb{E}[r|s, x \in D] > 0$. There are three cases to consider:

1. If $s > 1 + \bar{x}$, investor will always invest
2. If $0 < s < 1 + \bar{x}$, investor will invest iff

$$\beta s + (1-2\beta)\frac{1+\bar{x}}{2} > 0. \tag{34}$$

   This is always true if $\beta \leq 0.5$ (since both terms in above equation are positive).

3. If $\bar{x} - 1 < s < 0$, investor will invest iff

$$s + (1-2\beta)(1+\bar{x}) > 0. \tag{35}$$

   Investor will always invest (i.e., $\forall s$) iff

$$\bar{x} - 1 + (1-2\beta)(1+\bar{x}) > 0. \tag{36}$$

- If $\beta > 0.5$, the above condition (36) is never true and hence for $s < 0$, investor never invests. Equation (34) implies that, for $s > (2\beta - 1)(1 + \bar{x})$, investor invests and investor doesn't invest otherwise.
- If $\beta < 0.5$, the above condition (36) reduces to $\bar{x} > \frac{\beta}{1-\beta}$. So, for $\bar{x} > \frac{\beta}{1-\beta}$, investor always invests. For $\bar{x} < \frac{\beta}{1-\beta}$, investor invests iff $s > (2\beta - 1)(1 + \bar{x})$.

A.3 Proof of Proposition 1

If the founder does not disclose, she believes that her expected return is

$$U_{ND} = x \left(w \mathbf{1}_{x>0} + (1 - w) \mathbf{1}_{\mathbb{E}[x|x \notin D] > 0} \right). \tag{37}$$

If the founder discloses, she believes that her expected payoff is

$$U_D \equiv \begin{cases} w 1_{x>0} x + (1 - w) x \Pr(s > \bar{s}|x) & \text{if } \bar{x} < 0 \\ w 1_{x>0} x + (1 - w) x & \text{if } \bar{x} \geq 0 \end{cases}$$

In a threshold equilibrium, the indifference condition reduces to

$$0 = f(x) \equiv \begin{cases} (1 - w) x \frac{1 + x - \bar{s}}{2} - c & \text{if } \bar{x} < 0 \\ (1 - w) x - c & \text{if } \bar{x} \geq 0 \end{cases}$$

First, conjecture that $\bar{x} < 0$. Note that the LHS of the indifference condition is U-shaped. For the threshold equilibrium, we need the following conditions:

$$f(\bar{x}) = 0 \quad \text{and} \quad f'(\bar{x}) > 0 \quad \text{and} \quad \bar{x} < 0. \tag{38}$$

The possible solutions to the indifference condition are

$$\bar{x} = \frac{1}{2} \left(\bar{s} - 1 \pm \sqrt{(1 - \bar{s})^2 + \frac{8c}{1 - w}} \right) \tag{39}$$

But, imposing $f'(\bar{x}) > 0$ implies that

$$\bar{x} = \frac{1}{2} \left(\bar{s} - 1 + \sqrt{(1 - \bar{s})^2 + \frac{8c}{1 - w}} \right) \tag{40}$$

Note that $\bar{s} = -(1 + \bar{x})$. Substituting this into the equation of $\bar{x}$ and solving, we get

$$\bar{x} = \frac{1}{2}\left(-1 + \sqrt{1 + \frac{4c}{1-w}}\right) > 0 \tag{41}$$

Since $\bar{x} > 0$, our conjecture is wrong, so this cannot be an equilibrium.

Next, conjecture that $\bar{x} > 0$. In this case the indifference condition is linear and the solution is

$$\bar{x} = \begin{cases} \frac{c}{1-w} & \text{if } c < 1 - w \\ 1 & \text{otherwise,} \end{cases}$$

which satisfies $f'(\bar{x}) > 0$. It is easy to see that the disclosure region (weakly) decreases with w.

□

A.4 Proof of Proposition 2

If the founder does not disclose, she believes that her expected return is

$$U_{ND} = 0. \tag{42}$$

If the founder discloses, she believes that her expected return is

$$U_D \equiv w\frac{1}{4} + (1-w)\frac{1 - (\bar{s} - x)^2}{4}$$

In the threshold equilibrium, the indifference condition $U_D - U_{ND} = c$ reduces to

$$f(x) \equiv \frac{-(1-w)}{4}x^2 + \frac{1 - \bar{s}^2(1-w)}{4} + \frac{(1-w)\,\bar{s}}{2}x - c = 0 \tag{43}$$

This function is inverted U shaped and hence $\bar{x}$ is characterized by $f(\bar{x}) = 0$ and $f'(\bar{x}) > 0$. The roots are

$$x = \bar{s} \pm \sqrt{\frac{1-4c}{1-w}} \tag{44}$$

In a threshold equilibrium, $\bar{s} = \frac{1+\bar{x}}{2}$. Substituting this into the above equation and imposing the condition that $f'(\bar{x}) > 0$ implies

$$\bar{x} = 1 - 2\sqrt{\frac{1-4c}{1-w}} \tag{45}$$

Since we need $\bar{x} \in (-1, 1)$, the above solution only applies when $w/4 < c < 1/4$. It is easy to see that the disclosure region(i.e., $x \in (\bar{x}, 1)$) increases with w.

$\square$

A.5 Proof of Proposition 3

In this case, from lemma 2, $\bar{s} = 0$. For the founder, conditional on no disclosure, her expected payoff is

$$U_{ND} = \frac{x}{2}(w1_{x>0} + (1-w)0)$$

and conditional on disclosure, her expected payoff is

$$U_D = \mathbb{E}[\frac{s}{2}1_{s>0}|x]$$

Note that conditional on x, the distribution of s is given by: $s \sim U[x-1, x+1]$. This implies

$$U_D = \frac{1}{2}\frac{1+x}{2}\Pr(s > 0|x) = \frac{1}{8}(1+x)^2$$

The indifference condition $U_D - U_{ND} = c$ simplifies to

$$f(x) \equiv x^2 + 1 + 2x - 4xw\mathbb{I}_{x>0} - 8c = 0 \tag{46}$$

The indifference condition is U shaped and we need $f(\bar{x}) = 0$ and $f'(\bar{x}) > 0$. the solution is

$$\bar{x} = \begin{cases} 2w - 1 + \sqrt{8c - 4(1-w)w} & \bar{x} > 0 \\ -1 + \sqrt{8c} & \bar{x} < 0 \end{cases} \tag{47}$$

The top case is only possible if $c > \frac{1}{2}w * (1-w)$ and $c > \frac{1}{8}$; and bottom case is only possible when $c < \frac{1}{8}$. In the top case, $c > \frac{1}{8}$ implies that $c > \frac{1}{2}w * (1-w)$ and the only condition needed is $c > \frac{1}{8}$.

Finally, we need to make sure that, the other root in top (bottom) case is indeed below 0 (-1). In this bottom case, if $c < \frac{1}{8}$, this is always the case.

In top case, we need $\bar{x} > 0$ i.e.,

$$2w - 1 + \sqrt{8c - 4(1-w)w} > 0 \iff c > 1/8. \tag{48}$$

We also need $\bar{x} < 1$ i.e.,

$$2w - 1 + \sqrt{8c - 4(1-w)w} < 1 \iff c < \frac{1-w}{2}. \tag{49}$$

To summarize, we have

$$\bar{x} = \begin{cases} -1 + \sqrt{8c} & \text{if } c < 1/8 \\ 2w - 1 + \sqrt{8c - 4(1-w)w} & \text{if } 1/8 < c < \frac{1-w}{2} \\ 1 & \text{otherwise} \end{cases} \tag{50}$$

□

A.6 Proof of Proposition 4

For the founder, conditional on no disclosure, her expected payoff is

$$U_{ND} = x(1-\beta)(w 1_{x>0} + (1-w)0).$$

Note that, for $\beta > 0.5$, $\frac{1-\beta}{\beta} x \in (-1, 1)$ and lemma 1 implies that the threshold is always interior. Conditional on disclosure, her expected payoff is

$$U_D = (1-w)\frac{1-\bar{s}+x}{2}\left[\beta\frac{1+\bar{s}-x}{2} + (1-\beta)x\right] + w\frac{1-\bar{\theta}}{2}\left[\beta\frac{1+\bar{\theta}}{2} + (1-\beta)x\right]$$

where $\bar{\theta} = -\frac{1-\beta}{\beta}x$ and the indifference condition $U_D - U_{ND} = c$ reduces to

$$\begin{aligned} \frac{w\frac{(1-\beta)^2}{\beta} + (1-w)(2-3\beta)}{4}x^2 + \beta\frac{1-\bar{s}^2(1-w)}{4} + \frac{1-\beta+(1-w)(2\beta-1)\bar{s}}{2}x \\ -(1-\beta)xw\mathbb{I}_{x>0} - c = 0 \end{aligned} \tag{51}$$

For a general $\beta > 0.5$, Lemma 2 implies that $\bar{s}$ is given by $\bar{s} = -\frac{(1-2\beta)}{\beta}\frac{1+\bar{x}}{2}$. Substituting this into the above indifference condition, we get

$$\begin{aligned} f(x;\bar{x}) = &-\frac{16\beta wx(1-\beta)\mathbf{1}_{x>0} - 4\beta + 16\beta c + (1-2\beta)^2(-w)(\bar{x}+1)^2 + (1-2\beta)^2\bar{x}(\bar{x}+2) + 1}{16\beta} \\ &+ \frac{x\left(2(\beta-1)\beta - (1-2\beta)^2 w(\bar{x}+1) + (1-2\beta)^2\bar{x} + 1\right)}{4\beta} \\ &+ \frac{1}{4}x^2\left(-3\beta + \left(4\beta + \frac{1}{\beta} - 4\right)w + 2\right) \end{aligned} \tag{52}$$

For $\bar{x}$ to be an indifference point, we need $f(\bar{x};\bar{x}) = 0$ and $f(1,\bar{x}) > 0$. First, note that

$$H(\bar{x}) \equiv f(\bar{x};\bar{x}) = \frac{4\beta + (1-2\beta)^2 w - 1}{16\beta} - c \tag{53}$$

$$+ \frac{(3 - 4\beta + (1-2\beta)^2 w)}{16\beta}\bar{x}^2 + \frac{(1-(1-2\beta)^2 w)}{8\beta}\bar{x} - w(1-\beta)\bar{x}\mathbf{1}_{\bar{x}>0} \tag{54}$$

$$H(-1) = \frac{w}{4\beta} - c + (\beta - 1)w \tag{55}$$

$$H(1) = \frac{1}{4\beta} - c + (\beta - 1)w \tag{56}$$

$$\tag{57}$$

If $\frac{w}{4\beta} < c + (1-\beta)w < \frac{1}{4\beta}$, then there exists at least one solution $\bar{x} \in [-1, 1]$ to $H(\bar{x}) = 0$. Second, note that

$$f(1;\bar{x}) = -c - \frac{(1-2\beta)^2(1-w)}{16\beta}\bar{x}^2 + \frac{(1-2\beta)^2(1-w)}{8\beta}\bar{x} + \frac{3 + 4(1-\beta)\beta - 20(1-\beta)\beta w + w}{16\beta} \tag{58}$$

Taking limit, $\lim_{\beta\to 1} f(1,\bar{x}) > 0$. Hence, for β high enough, the threshold equilibrium exists. Next, we study how the disclosure region changes with w.

Case 1: $\bar{x} < 0$ In this case,

$$H(\bar{x}) = \frac{-4\beta(4c + w - 1) + 4\beta^2 w + w - 1}{16\beta} + \frac{(3 - 4\beta + (1-2\beta)^2 w)}{16\beta}\bar{x}^2 + \frac{(1-(1-2\beta)^2 w)}{8\beta}\bar{x} \tag{59}$$

$$\equiv C + A\bar{x}^2 + B_n\bar{x} \tag{60}$$

Note that in this case, taking partial of $H(.)$ with respect to w, we get $H_x x_w + H_w = 0$, which implies $\frac{\partial \bar{x}}{\partial w} = -\frac{H_w}{H_x}$, where:

$$\frac{\partial \bar{x}}{\partial w} = -\frac{H_w}{H_x} \tag{61}$$

$$= -\frac{(1-2\beta)^2\,(1-\bar{x})^2}{2 - 2(1-2\beta)^2 w\,(1-\bar{x}) + (6-8\beta)\bar{x}} \tag{62}$$

Note that $\lim_{\beta\to 1} \frac{\partial \bar{x}}{\partial w} = -\frac{1-\bar{x}}{2(1-w)} < 0$ i.e., disclosure increases with w .

Case 2: $\bar{x} > 0$ In this case,

$$H(\bar{x}) = \frac{-4\beta(4c + w - 1) + 4\beta^2 w + w - 1}{16\beta} + \frac{\bar{x}^2\left(-4\beta + (1-2\beta)^2 w + 3\right)}{16\beta} + \frac{\bar{x}((4(\beta - 1)\beta - 1)w + 1)}{8\beta} \tag{63}$$

$$\equiv C + A\bar{x}^2 + B_p\bar{x} \tag{64}$$

Again, we have

$$\frac{\partial \bar{x}}{\partial w} = -\frac{H_w}{H_x} \tag{65}$$

$$= -\frac{4\beta^2\left(\bar{x}+1\right)^2 - 4\beta\left(\bar{x}+1\right)^2 + \left(\bar{x}-1\right)^2}{8\beta^2 w\left(\bar{x}+1\right) - 8\beta\left(w\bar{x} + \bar{x} + w\right) + 2w\left(\bar{x}-1\right) + 6\bar{x} + 2} \tag{66}$$

Note that $\lim_{\beta\to 1} \frac{\partial \bar{x}}{\partial w} = -\frac{1-\bar{x}}{2(1-w)} < 0$ i.e., disclosure increases with w .

$\square$

A.7 Proof of Proposition 5

1. When $\beta = 0$, recall that the disclosure region is $(\bar{x}, 1)$ where

$$\bar{x} = \begin{cases} \frac{c}{1-w} & \text{if } c < 1 - w \\ 1 & \text{otherwise} \end{cases} \tag{67}$$

and the investor always invests iff there is a disclosure. In this case,

$$V_f \equiv (1-\alpha)\mathbb{E}[I(d) \times r - c\mathbf{1}_{d=s}] \tag{68}$$

$$= (1-\alpha)\left[\frac{1 - \frac{c}{1-w}}{2}\frac{1 + \frac{c}{1-w}}{2} - c\frac{1 - \frac{c}{1-w}}{2}\right] \tag{69}$$

$$= (1-\alpha)\frac{1 - \frac{c}{1-w}}{2}\left[\frac{1 + \frac{c}{1-w}}{2} - c\right] \tag{70}$$

$$= (1-\alpha)\frac{1 - \frac{c}{1-w}}{2}\left[\frac{1 + \frac{c}{1-w} - 2c}{2}\right] \tag{71}$$

This is decreasing in w.

$$V_o \equiv \alpha \mathbb{E}[I(d) \times r] \tag{72}$$
$$= \alpha \frac{1 - \frac{c}{1-w}}{2} \left[\frac{1 + \frac{c}{1-w}}{2} \right] \tag{73}$$

This is decreasing in w. The sum is

$$EV \equiv \mathbb{E}[I(d) \times r - \tilde{c}\mathbf{1}_{d=s}] \tag{74}$$
$$= \frac{1 - \frac{c}{1-w}}{2} \left[\frac{1 + \frac{c}{1-w}}{2} - c(1-\alpha) \right] \tag{75}$$

Obviously, the sum also decreases in w. Moreover, EV decreases in c.

2. When $\beta = 1$ we have that $\bar{x} = 1 - 2\sqrt{\frac{1-4c}{1-w}}$ and $\bar{s} = \frac{1+\bar{x}}{2}$. In this case, we have:

$$V_f \equiv (1-\alpha)\mathbb{E}[I(d) \times r - c\mathbf{1}_{d=s}] \tag{76}$$
$$= (1-\alpha) \left[\int_{\bar{x}}^{1} \frac{1 - (\bar{s} - x)^2}{4} \frac{1}{2} dx - `c \frac{1 - \bar{x}}{2} \right] \tag{77}$$
$$= (1-\alpha) \left[\frac{1}{8} \int_{\bar{x}}^{1} \left(1 - (\bar{s} - x)^2 \right) dx - c \frac{1 - \bar{x}}{2} \right] \tag{78}$$
$$= (1-\alpha) \left[\frac{1}{8} \left(1 - \bar{x} - \bar{s}^2(1 - \bar{x}) + \bar{s}(1 - \bar{x}^2) - \frac{1}{3}(1 - \bar{x}^3) \right) - c \frac{1 - \bar{x}}{2} \right] \tag{79}$$
$$= (1-\alpha)(1-\bar{x}) \left[\frac{1}{8} \left(1 - \bar{s}^2 + \bar{s}(1 + \bar{x}) - \frac{1}{3}(1 + \bar{x} + \bar{x}^2) \right) - \frac{c}{2} \right] \tag{80}$$
$$= (1-\alpha)(1-\bar{x}) \left[\frac{1}{8} \left(1 - \frac{1}{3}(\bar{s}^2 - \bar{x}) \right) - \frac{c}{2} \right] \tag{81}$$
$$= \frac{1-\alpha}{12}(2 - 3w) \left(\frac{1-4c}{1-w} \right)^{3/2} \tag{82}$$

V_f always decreases in the curse of knowledge (w) since

$$\frac{\partial V_f}{\partial w} = -\frac{w(1-\alpha)}{8(1-w)} \left(\frac{1-4c}{1-w} \right)^{3/2} < 0.$$

Moreover, we have:

$$V_o \equiv \alpha \mathbb{E}[I(d) \times r] \tag{83}$$

$$= \alpha \frac{(4c - 3w + 2)\sqrt{\frac{1-4c}{1-w}}}{12(1-w)} \tag{84}$$

$$\frac{\partial V_o}{\partial w} = \alpha \frac{(4c - w)\sqrt{\frac{4c-1}{w-1}}}{8(w-1)^2} > 0 \tag{85}$$

which implies V_o is increasing in w. The total firm value is $EV = V_f + V_o$ and

$$Sign\left[\frac{\partial EV}{\partial w}\right] = Sign\left[-\frac{w(1-\alpha)}{8(1-w)}\left(\frac{1-4c}{1-w}\right)^{3/2} + \alpha \frac{(4c-w)\sqrt{\frac{4c-1}{w-1}}}{8(w-1)^2}\right] \tag{86}$$

$$= Sign\left[4\alpha c(1-w) - w(1-4c)\right] \tag{87}$$

This implies that EV increases in w for small w and decreases for large w.

3. When $\beta = 1/2$, we have $\bar{s} = 0$ and

$$\bar{x} = \begin{cases} -1 + \sqrt{8c} & \text{if } c < 1/8 \\ 2w - 1 + \sqrt{8c - 4(1-w)w} & \text{if } 1/8 < c < \frac{1-w}{2} \\ 1 & \text{otherwise} \end{cases} \tag{88}$$

When $c < 1/8$ or $c > \frac{1-w}{2}$, then founder's and outsider's value does not depend on w. When $1/8 < c < \frac{1-w}{2}$, we have:

$$V_f = \frac{1}{6}\left(-6c + (3-4w)w^2 + 1\right) + \frac{1}{12}\left(4c - 4w^2 + w\right)\sqrt{8c - 4(1-w)w} \tag{89}$$

$$\frac{\partial V_f}{\partial w} = -\frac{w\sqrt{8c - 4(1-w)w}(8c - 8(1-w)w + 1)}{8(2c - (1-w)w)} + w - 2w^2 \tag{90}$$

But given that $c > 1/8$, the above is always negative. Moreover,

$$V_o = \frac{1}{6}\left(-6cw + (3-4w)w^2 + 1\right) + \frac{1}{12}\left(-2c - 4w^2 + w\right)\sqrt{8c - 4(1-w)w} \tag{91}$$

$$\frac{\partial V_o}{\partial w} = -\frac{2c(6w-1) + 8(w-1)w^2 + w}{4\sqrt{2c + (w-1)w}} - c - 2w^2 + w < 0 \tag{92}$$

□

A.8 Proof of Proposition 6

1. When $\beta = 0$, the firm value is

$$EV \equiv \mathbb{E}[I(d) \times r - \tilde{c}\mathbf{1}_{d=s}] \tag{93}$$

$$= \frac{1 - \frac{c}{1-w}}{2}\left[\frac{1 + \frac{c}{1-w}}{2} - c(1-\alpha)\right] \tag{94}$$

where $c = \frac{\tilde{c}}{1-\alpha}$. Note that

$$\frac{\partial EV}{\partial \alpha} = -\frac{\tilde{c}^2(\alpha(1-w)+w)}{2(1-\alpha)^3(1-w)^2} < 0$$

2. When $\beta = 1$, the firm value is

$$EV = V_f + V_o \tag{95}$$

$$= \frac{1-\alpha}{12}(2-3w)\left(\frac{1-4c}{1-w}\right)^{3/2} + \alpha\frac{(4c-3w+2)\sqrt{\frac{1-4c}{1-w}}}{12(1-w)} \tag{96}$$

Note that

$$\frac{\partial EV}{\partial \alpha} = \frac{\tilde{c}((1-\alpha)(1-4\tilde{c})w - 4\alpha\tilde{c})}{2(1-\alpha)^3(1-w)^2\sqrt{\frac{1-\alpha-4\tilde{c}}{(1-\alpha)(1-w)}}}$$

Note that this term is positive for small α and negative for large α. Moreover, EV is maximized at

$$\alpha = \frac{wG}{1+wG}$$

where $G = \frac{1-4\tilde{c}}{4\tilde{c}}$

B Alternate equilibria

In this appendix, we characterize the other equilibria when $\beta = 0$ and $\beta = 1$. Moreover, we show that the impact of the curse of knowledge on information provision is the same as in the threshold equilibria that we focus on in the paper.

B.1 Curse of knowledge about content (i.e., $\beta = 0$)

Proposition 7. *Suppose $\beta = 0$. Then, there exist two equilibria.*

- *In the first equilibrium, (i) the founder communicates s if and only if $x \geq \bar{x}$, (ii)* *conditional on no disclosure, the investor does not invest (i.e., $I(\varnothing) = 0$), and (iii) conditional on disclosure, the investor always invests, where*

$$\bar{x} = \begin{cases} \frac{c}{1-w} & \text{if } c < 1 - w \\ 1 & \text{otherwise,} \end{cases} \tag{97}$$

- *In the second equilibrium, (i) the founder communicates s if and only if $x \leq \underline{x}$, (ii) conditional on no disclosure, the investor invests (i.e., $I(\varnothing) = 1$), and (iii) conditional on disclosure, the investor never invests, where*

$$\underline{x} = \begin{cases} \frac{-c}{1-w} & \text{if } c < 1 - w \\ -1 & \text{otherwise,} \end{cases}$$

Furthermore, in both equilibria, the likelihood of disclosure decreases with the curse of knowledge w.

Proof: Conjecture an equilibrium in which the firm discloses if $x \in (-1, \underline{x})$. If the founder does not disclose, she believes her expected return is

$$x \left(w \mathbf{1}_{x>0} + (1-w) \mathbf{1}_{\mathbb{E}[x|x \notin D]>0} \right). \tag{98}$$

If the founder discloses, she believes that her expected payoff is

$$U_D \equiv \begin{cases} w 1_{x>0} x + (1-w) x \frac{x(1-\bar{s})+x^2}{2} & \text{if } \bar{x} > 0 \\ w 1_{x>0} x & \text{if } \bar{x} \leq 0 \end{cases}$$

In equilibrium, the indifference condition reduces to

$$f(x) \equiv \begin{cases} (1-w) \frac{x(1-\bar{s})+x^2}{2} - x(1-w) \mathbf{1}_{\mathbb{E}[x|x \notin D]>0} - c = 0 & \text{if} \quad \bar{x} > 0 \\ -x(1-w) \mathbf{1}_{\mathbb{E}[x|x \notin D]>0} - c = 0 & \text{if} \quad \bar{x} \leq 0 \end{cases}$$

In the conjectured equilibrium, $\mathbf{1}_{\mathbb{E}[x|x \notin D]>0} = 1$. If $\bar{x} > 0$, the indifference condition is

$$x^2 - x(1+\bar{s}) - \frac{2c}{1-w} = 0$$

Note that this is U shaped and hence for the disclosure region to be $(-1, \underline{x})$, we need the following conditions:

$$f(\underline{x}) = 0 \quad \text{and} \quad f'(\underline{x}) < 0.$$

In this case,

$$\underline{x} = \frac{1 + \bar{s} - \sqrt{(1+\bar{s})^2 + \frac{8c}{1-w}}}{2}$$

Suppose the disclosure region is $(-1, \underline{x})$, then $\bar{s} = 1 - \underline{x}$. Substituting this, we get

$$\underline{x}^2 - \underline{x} - \frac{c}{1-w} = 0$$

and the solution is

$$\underline{x} = \frac{1}{2}\left(1 - \sqrt{1 + \frac{4c}{1-w}}\right)$$

So, the equilibrium is a disclosure region $(-1, \underline{x})$ where

$$\underline{x} = \begin{cases} \frac{1}{2}\left(1 - \sqrt{1 + \frac{4c}{1-w}}\right) & \text{if } c < 2(1-w) \\ -1 & \text{if } c \geq 2(1-w) \end{cases} \tag{99}$$

But, this $\bar{x} < 0$ and hence a contradiction. Conjecture that $\bar{x} < 0$. In this case, the indifference condition is

$$-x\,(1-w) - c = 0$$

and hence the solution is

$$\underline{x} = \begin{cases} \frac{-c}{1-w} & \text{if } c < 1 - w \\ -1 & \text{otherwise,} \end{cases}$$

which satisfies $f'(\bar{x}) > 0$. Conditional on disclosure, the investor does not invest. It is easy to see that the disclosure region (weakly) decreases with w.

Expected firm value

The expected value of the firm, net of communication costs is

$$EV = \mathbb{E}[I(d) \times r - \tilde{c} \times I_{d=s}] \tag{100}$$

Proposition 8. *Expected firm value is the same in both equilibria.*

Proof. Suppose the disclosure region is (x_l, x_h). There are two cases:

1. Sender discloses s. This happens if $x \in (x_l, x_h)$ and the firm value is

$$\left[\beta \frac{1-(\bar{s}-x)^2}{4} + (1-\beta)\frac{x(1-\bar{s})+x^2}{2} - \tilde{c}\right]$$

   Note that, the sender incurs a cost $\tilde{c}$ in this case.

2. Sender doesn't disclose. In this case, the expected firm value is $(1-\beta)\, x\mathbb{I}_{x_l+x_h<0}$

So, the overall firm value is

$$\int_{x_l}^{x_h}\left[\beta \frac{1-(\bar{s}-x)^2}{4} + (1-\beta)\frac{x(1-\bar{s})+x^2}{2} - \tilde{c}\right] dF(x) + \int_{x\notin(x_l,x_h)} (1-\beta)x\mathbb{I}_{x_h+x_l<0}dF(x)$$

$$\int_{x_l}^{x_h}\frac{1}{2}\left(\beta\frac{1-\bar{s}^2}{4} - \tilde{c} + \frac{\beta\bar{s}+(1-\beta)(1-\bar{s})}{2}x + \frac{2-3\beta}{4}x^2\right)dx + \frac{\mathbb{I}_{x_h+x_l<0}}{2}(1-\beta)\int_{x\notin(x_l,x_h)} x dx$$

$$\frac{\beta(1-\bar{s}^2)-4\tilde{c}}{8}(x_h-x_l) + \frac{(2\beta-1)\bar{s}+1-\beta}{8}(x_h^2-x_l^2) + \frac{2-3\beta}{24}(x_h^3-x_l^3) + \frac{\mathbb{I}_{x_h+x_l<0}(1-\beta)(x_l^2-x_h^2)}{4} \tag{101}$$

If the disclosure region is $(\bar{x}, 1)$, then the firm value assuming $\beta = 0$ is

$$EV = \frac{-\tilde{c}}{2}(1-\bar{x}) + \frac{-\bar{s}+1}{8}(1-\bar{x}^2) + \frac{1}{12}(1-\bar{x}^3) \tag{102}$$

$$= \frac{-\tilde{c}}{2}(1-\bar{x}) + \frac{2+\bar{x}}{8}(1-\bar{x}^2) + \frac{1}{12}(1-\bar{x}^3) \tag{103}$$

If the disclosure region is $(-1, \underline{x})$, then the firm value is

$$EV = \frac{-\tilde{c}}{2}(\underline{x}+1) + \frac{-\bar{s}+1}{8}(\underline{x}^2-1) + \frac{1}{12}(\underline{x}^3+1) + \frac{(1-\underline{x}^2)}{4} \tag{104}$$

$$= \frac{-\tilde{c}}{2}(\underline{x}+1) + \frac{\underline{x}}{8}(\underline{x}^2-1) + \frac{1}{12}(\underline{x}^3+1) + \frac{(1-\underline{x}^2)}{4} \tag{105}$$

$$= \frac{-\tilde{c}}{2}(\underline{x}+1) + \frac{2-\underline{x}}{8}(1-\underline{x}^2) + \frac{1}{12}(\underline{x}^3+1) \tag{106}$$

Since $\bar{x} = -\underline{x}$ in Proposition 7, firm value is the same in both equilibria.

B.2 Curse of knowledge about context (i.e., $\beta = 1$)

Proposition 9. *Suppose that $\beta = 1$. Then there exists a continuum of equilibria characterized by $\bar{s} \in (-1+\sqrt{\frac{1-4c}{1-w}}, 1-\sqrt{\frac{1-4c}{1-w}})$ such that (i) the founder communicates s if and only if*

$x \in (\bar{s} - \sqrt{\frac{1-4c}{1-w}}, \bar{s} + \sqrt{\frac{1-4c}{1-w}})$, (ii) conditional on no disclosure, the investor invests if $\bar{s} > 0$, and (iii) conditional on disclosure, the investor invests if and only if $s \geq \bar{s}$. Furthermore, the likelihood of disclosure is increasing in the curse of knowledge w and the expected firm value is the same across all equilibria.

Proof. In this case, the indifference condition is

$$\frac{-(1-w)}{4}x^2 + \frac{1-\bar{s}^2(1-w)}{4} + \frac{(1-w)\bar{s}}{2}x = c \tag{107}$$

This is inverted U shaped and hence the disclosure region is of the type (x_l, x_h). The indifference condition simplifies to

$$x^2 - 2\bar{s}x + \bar{s}^2 = \frac{1-4c}{1-w} \tag{108}$$

The roots are

$$x = \bar{s} \pm \sqrt{\frac{1-4c}{1-w}} \tag{109}$$

The equilibrium is not pinned down uniquely. If the roots are between -1 and 1, then the disclosure region is (x_l, x_h) where

$$x_h - x_l = 2\sqrt{\frac{1-4c}{1-w}} \tag{110}$$

and hence disclosure decreases in c and increases in w.

Note that, because the distance between x_h and x_l is the same in all equilibria, the likelihood of disclosure, both unconditionally and conditional on θ is the same. As a result, the likelihood of investment, conditional on θ is the same and the expected cost of disclosure is the same. Together, this implies that the expected firm value is constant across all equilibria.