Informational Benefits of Managerial Myopia

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Abstract

We show that managerial myopia has an informational benefit that has been overlooked in the prior research. Compared with managers who care sufficiently about the long-term, a moderately myopic manager incentivizes the proponent of a risky long-term project to produce more information about the project, leading to more informed decision making and higher firm value.

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1 Introduction

It is well documented that managers often act in a myopic manner: they focus on short-term earnings at the expense of long-term value (e.g. Stein 1988, Graham et al. 2005). Scholars have examined the detrimental effects of managerial myopia and proposed solutions to the problem (e.g. Edmans 2009). In this paper, we show that managerial myopia has an informational benefit that has been overlooked in the prior research. Compared with managers who care sufficiently about the long-term, a moderately myopic manager incentivizes the proponent of a risky long-term project to produce more information about the project, leading to more informed decision making and higher firm value.

We illustrate this point by developing a model of persuasion. In the model, the manager of a firm decides whether to invest in a risky long-term project. The project requires an upfront investment and generates uncertain cash flows in the long-term. Contrary to the previous literature, which assumes that the information about the project is exogenous, we assume that the proponent of the project, called Sender, can produce information about the project's long-term benefits. We analyze how Sender's information production strategy is related to managerial objectives.

Compared with managers whose objectives are perfectly aligned with the firm, a myopic manager puts a smaller weight on the long-term benefits of the project and has a higher threshold of doubt about the project. This incentivizes Sender to produce more information about the project, leading to more informed decision making and higher firm value. When the manager becomes sufficiently myopic, he prefers not to invest in the long-term project regardless of the information produced by Sender. In this case, the quality of the manager's decision making is independent of the information produced by Sender and the informational benefit of managerial myopia disappears. Therefore, the informational benefit only exists when the manager is moderately myopic.

2 Model

A firm decides whether to finance a project that takes two periods to finish. The project costs $c > 0$ in period $t = 1$ and brings uncertain benefits to the firm in period

$t = 2$. A type G project is a good fit for the firm and generates a cash flow of x in period $t = 2$, where $x > c$. A type B project is a bad fit for the firm and generates a cash flow of 0 in period $t = 2$. The prior probability that the project is type G is $\mu_0 \in (0, 1)$. If the firm does not invest in the project, it receives a cash flow of 0 in both periods.

The project is supported by an agent, called Sender, who prefers the firm to invest in the project regardless of its type. Sender receives a private benefit of $v > 0$ if the firm invests in the project and receives no benefit otherwise.

At the beginning of period $t = 1$, Sender produces public information about the type of project.[1] Specifically, Sender designs signal π, which consists of a finite realization space S and two distributions over S: $\pi(\cdot|B)$ and $\pi(\cdot|G)$. When the project is type $\omega \in \{G, B\}$, a realization $s \in S$ is drawn from $\pi(\cdot|\omega)$ and publicly observed. Let μ denote the manager's posterior belief that the project is type G. The Bayes' rule implies:

$$\mu \equiv Pr(G|s) = \frac{\mu_0 \pi(s|G)}{\mu_0 \pi(s|G) + (1 - \mu_0)\pi(s|B)}. \tag{1}$$

We ignore discounting of future cash flows, as discounting is irrelevant for our results. Therefore, given posterior belief μ, the manager's expected payoff from investing in the project is:

$$\mu q x - c, \tag{2}$$

where $q \in [0, 1]$ represents the manager's degree of myopia. When $q = 1$, the manager's preference is perfectly aligned with the firm. When $q < 1$, the manager puts a smaller weight on the long-term outcome than the firm and is thus "myopic". The smaller the q, the more myopic the manager is.

3 Equilibrium

In this section, we solve the subgame perfect equilibrium. In equilibrium, the manager invests in the project when his expected payoff from the project is no less

[1] Entrepreneurs often produce information about their projects in order to attract venture capital investment. For example, pharmaceutical companies conduct tests for their new drugs; software start-ups provide trial versions of their software.

than zero:

$$\mu q x - c \geq 0 \Leftrightarrow \mu \geq \frac{c}{qx}, \tag{3}$$

where $c/(qx)$ is the manager's *threshold of doubt*.

Next, we use the concavification approach developed by Kamenica and Gentzkow (2011) to find Sender's optimal signal. The concavification approach builds on two key observations. First, we can remain agnostic about Sender's optimal signal and focus exclusively on the Bayes-plausible distribution of posterior beliefs induced by Sender's optimal signal.[2] Second, the concavification of Sender's expected payoff function represents the highest expected payoff that Sender can achieve given prior belief μ_0.[3] These observations imply that in order to find Sender's optimal signal, we just need to find the Bayes-plausible distribution of posterior beliefs that gives Sender an expected payoff equal to the concavification of her payoff function. We divide the following analysis into three cases, depending on the value of q.

Case 1: $c/(\mu_0 x) \leq q \leq 1$

Note that Case 1 is feasible only when $c/(\mu_0 x) < 1$ or $\mu_0 > c/x$. In this case, the manager puts a sufficiently large weight on the firm's long-term benefits and his threshold of doubt $c/(qx)$ is less than one. Sender's expected payoff $Eu_S(\mu)$ and its concavification $V(\mu_0)$ take the following form:

$$Eu_S(\mu) = \begin{cases} v & \text{if } \frac{c}{qx} \leq \mu \leq 1 \\ 0 & \text{if } 0 \leq \mu < \frac{c}{qx} \end{cases} \tag{4}$$

$$V(\mu_0) = \begin{cases} v & \text{if } \frac{c}{qx} \leq \mu_0 \leq 1 \\ \frac{qxv}{c}\mu_0 & \text{if } 0 \leq \mu_0 < \frac{c}{qx} \end{cases} \tag{5}$$

In Case 1, the manager's threshold of doubt $c/(qx)$ is below the prior belief μ_0. This means that the manager is ex ante in favor of the project and Sender does not benefit from information production. No information production always leads to posterior belief $\mu = \mu_0$, which ensures that the manager invests in the project and gives Sender expected payoff equal to the concavification $V(\mu_0) = v$.

[2] A distribution of posterior beliefs is Bayes-plausible if the expected value of the distribution is equal to the prior belief μ_0.

[3] The concavification (i.e. concave closure) of function f is the smallest concave function that is everywhere (weakly) larger than f.

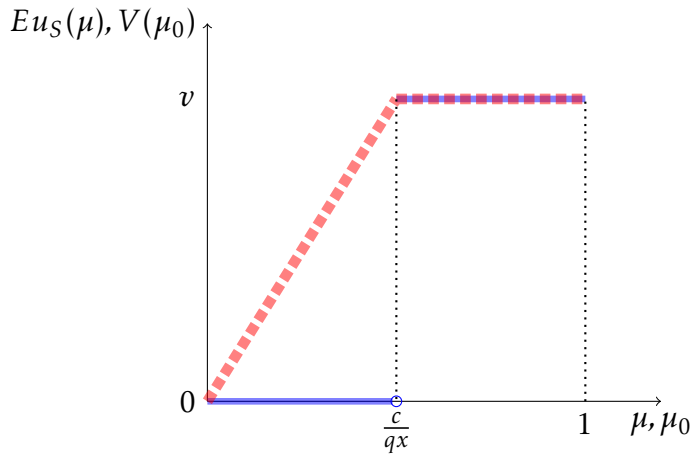

Figure 1: $Eu_S(\mu)$ (solid line) and its concavification $V(\mu_0)$ (dotted line) in Case 1 and Case 2.

Case 2: $c/x \leq q < \min\{c/(\mu_0 x), 1\}$

In Case 2, the manager's threshold of doubt $c/(qx)$ is still less than one, implying that Sender's expected payoff Eu_S and its concavification $V(\mu_0)$ are the same as in Case 1. The only difference between the two cases is that in Case 2, the manager becomes more myopic and his threshold of doubt $c/(qx)$ is larger than the prior belief μ_0.

In Case 2, Sender has a unique optimal signal that generates the following distribution of posterior beliefs:

$$\tau = \begin{cases} 0 & \text{with probability } 1 - \frac{qx\mu_0}{c} \\ \frac{c}{qx} & \text{with probability } \frac{qx\mu_0}{c} \end{cases} \tag{6}$$

We can easily verify that distribution τ is Bayes-plausible and it gives Sender an expected payoff equal to the concavification $V(\mu_0)$.

In Case 2, Sender's optimal signal is closely related to the manager's degree of myopia. The smaller the q, the larger the posterior belief $c/(qx)$ and the more "spread out" the distribution τ. It is well known that that in a decision problem with binary states, the mean-preserving spread of a posterior belief distribution corresponds to a more (Blackwell) informative signal.[4] Therefore, distribution τ corresponds to a more informative signal when q becomes smaller

[4]This observation is used in Boleslavsky and Cotton (2018). Ganuza and Penalva (2010) develop other signal informativeness measures based on this idea.

Proposition 1 *When $c/x \leq q < \min\{c/(\mu_0 x), 1\}$, Sender designs a more informative signal in equilibrium when the manager becomes more myopic (i.e. as q becomes smaller).*

When q takes smaller values, the manager puts a smaller weight on the future benefits of the project and thus has a greater threshold of doubt for the project. This means that the manager requires "stronger" evidence in favor of the project. In response, Sender produces more information about the project in equilibrium. When q equals c/x, which is the smallest possible value in Case 2, distribution τ corresponds to a fully informative signal: it sometimes reveals that the project is type B (leading to posterior belief 0) and sometimes reveals that the project is type G (leading to posterior belief 1).

Case 3: $q < c/x$

In Case 3, the manager puts a sufficiently small weight on the project's payoff in period $t = 2$ and has a threshold of doubt larger than one. This implies that equation (3) is violated for any feasible posterior belief. Therefore, the manager never invests in the project in equilibrium, regardless of the information produced by Sender. Case 3 illustrates the cost of managerial myopia that has been found in the prior research: a sufficiently myopic manager may forgo long-term projects with positive expected value, reducing firm value.

4 Firm value

In equilibrium, the firm's expected value Eu_F is

$$Eu_F = \begin{cases} \mu_0 x - c & \text{in Case 1} \\ \mu_0 x(1-q) & \text{in Case 2} \\ 0 & \text{in Case 3} \end{cases} \tag{7}$$

As shown in Figure 2, the firm's expected value is decreasing in q when q is between c/x and $\min\{c/(\mu_0 x), 1\}$. This is due to the informational benefits of managerial myopia illustrated in Proposition 1: when q deceases, Sender designs a more informative signal in equilibrium. A more informative signal allows the manager to make more informed decisions and leads to higher expected value for the firm. When $q = c/x$, Sender's signal becomes fully informative, maximizing firm value.

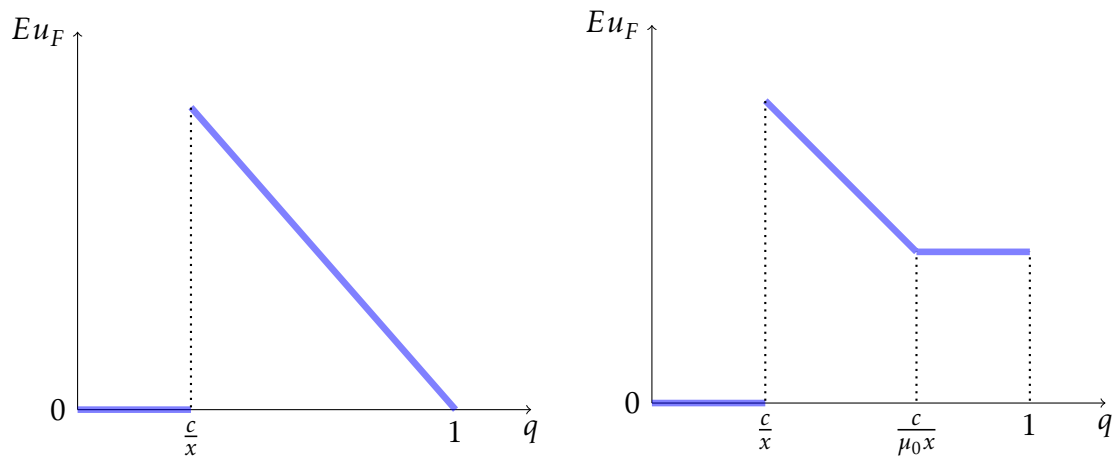

Figure 2: The firm's expected value Eu_F as a function of q. On the left, μ_0 is no greater than c/x and Case 1 becomes infeasible. The right figure shows the case when $\mu_0 > c/x$.

Proposition 2 *When $c/x \leq q < \min\{c/(\mu_0 x), 1\}$, the expected firm value is decreasing in q. When $q = c/x$, the expected firm value is maximized.*

5 Conclusions

We acknowledge that our model is stylized and our paper should not be viewed as a comprehensive analysis of managerial myopia. Our goal is to highlight an unrecognized informational channel through which managerial objectives affect firm value. Since managerial objectives are affected by manager compensation, our results imply that manager compensation may affect firm value through the informational channel highlighted in our paper. Future work may examine the optimal compensation scheme for managers when the firm's information environment is endogenously determined as in our paper.

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