Scapegoating and Firm Reputation

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Abstract

Firing is a common response to performance failure. I consider an adverse selection model of firing, whereby firms differ in their ability to identify the incompetent workers that cause failure and the market imperfectly observes firms' ability; consequently, firm value is based on reputation – an imperfect assessment of ability. In this context, I examine whether scapegoating, defined as random firing by a low-ability firm, can be an optimal, reputation-saving, value-maximizing strategy. I show that, in equilibrium, high-ability firms efficiently fire incompetent workers. In turn, low-ability firms scapegoat (pool with high-ability firms) with a probability that is increasing in reputation. From the market's perspective, scapegoating represents the likelihood that the firm is poorly informed. I show that the unconditional likelihood of scapegoating is non-monotonic in reputation, while the conditional likelihood of scapegoating decreases in reputation.

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1 Introduction

"A scapegoat is almost as good as a solution." Anonymous

In the 2003-2004 broadcast season, ABC Entertainment Television Group registered a 10% drop in average viewership and a 13% drop in ratings. The Walt Disney Company, ABC's parent, promptly fired the group's chief programmer. A media analyst considered that the chief programmer "could be a scapegoat," and that by firing him, "the company [could] show it's being proactive and trying to fix things" (*Los Angeles Daily News*, April 7, 2004).[1]

Firing is a common response to performance failure. However, firms differ in their ability to identify the incompetent workers that cause failure, and the market imperfectly observes firms' ability. Consequently, firm value is based on reputation – an imperfect assessment of ability.[2] In this context, I define scapegoating as random firing by a firm that is unable to identify the cause of failure, and I examine whether scapegoating can be an optimal, reputation-saving, value-maximizing strategy, and the trade-offs it involves.

To continue with the example, Disney may have realized that ABC's poor performance was the result of the chief programmer's incompetence and the right decision was to fire him. Alternatively, Disney may have been unable to determine the cause of poor performance and faced a strategic situation: scapegoat and try to maintain a reputation of being able to "fix things;" or lose that reputation, but avoid the negative effects of wrongful firing. The trade-off is between a short-term *reputation effect*, when the market is imperfectly informed about the firm's ability, and a long-term *fundamental value effect*, when the market learns the firm's ability and value.

In this paper, I use a simple adverse selection model to analyze this trade-off and provide a rational, reputation-based theory of scapegoating. In the model, the firm consists of competent workers, an incompetent worker who

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[1]Similarly, firing a CEO is often interpreted as scapegoating, whereby the directors of the firm blame the CEO for "the missteps of subordinates and even the board's own failings to make the right strategic choices..." (*Financial Times*, November 27, 2003).

[2]I assume that firms are willing to eliminate the causes of their failures, but they differ in their ability to identify these causes. In other words, the likelihood of eliminating the cause of failure is equivalent to the likelihood of identifying it.

decreases firm value and a manager whose role is to fire the incompetent worker. I assume that the manager/firm is either able or unable to identify the incompetent worker – alternatively, the manager is perfectly or poorly informed – and the market learns the manager's ability only in the long-term. In addition, I assume that the manager's objective is a convex combination of short- and long-term firm value. Given the presence of an incompetent worker, the manager decides whether to fire or not.

I show that, in equilibrium, a perfectly informed manager efficiently fires the incompetent worker. In contrast, a poorly informed manager scapegoats (pools with an informed manager) with a probability that is increasing in reputation, if he cares sufficiently about short-term firm value. Underlying this result is the fact that short-term firm value is determined by the inferences drawn by the market from the manager's firing decision, and that these inferences depend monotonically on the manager's ex ante reputation (*reputation effect*). However, scapegoating decreases firm value since, on average, it results in the loss of a competent worker (*fundamental value effect*). Thus, the manager trades off short-term *reputation gains* for *human capital losses* associated with wrongful firing.

From the market's perspective, scapegoating can be interpreted as either the unconditional or the conditional (on firing) belief that the manager is poorly informed. I show that the unconditional likelihood of scapegoating is non-monotonic in reputation, while the conditional likelihood of scapegoating decreases in reputation. A high reputation manager is likely to be informed, thus, scapegoating is less likely; a low reputation manager is less likely to be informed but also less likely to fire, so scapegoating is again less likely. However, given that a low reputation manager is less likely to be informed, the overall probability of firing is low. Therefore, *conditional on firing*, the probability that the manager is poorly informed is high, so the likelihood of scapegoating is high. An increase in reputation makes firing more attractive for the poorly informed manager, but it also increases the likelihood that the manager is informed, leading to a decrease in the conditional probability that the manager is poorly informed, so the likelihood of scapegoating decreases.

In addition, I derive predictions that relate reputation and other firm characteristics to scapegoating and firm value. Particularly, the model predicts that firing generates a positive market reaction and a short-term trading premium; the market reaction decreases and the premium increases in reputation. Empirical evidence in the context of CEO turnover seems to support these predictions. Lastly, I consider several extensions of the model and focus on the case whereby failure is caused by incompetence *or* bad luck.

■ **Related Literature.** Cabral (2000 & 2003) and Bebchuck and Stole (1993) use adverse selection reputation models to explain brand extensions, corporate diversification and managerial overinvestment. This paper uses a similar set-up to provide a reputation-based explanation of scapegoating.[3,4]

However, alternative theories of scapegoating have been proposed in the economics literature. In a study on the impact of managerial succession on firm performance, Huson, Malatesta and Parrino (2004) develop a moral hazard-based "scapegoat hypothesis." CEOs are assumed to be identical and firm performance is determined by managerial effort and luck. In equilibrium, boards induce CEOs to exert effort by firing them when their firms underperform.[5] Thus, CEOs of underperforming firms are scapegoats who provide effort incentives for other CEOs. In this context, reputation corresponds to an implicit contract between firms' CEOs and the market, whereby CEOs promise to exert effort and the market values firms accordingly.

In contrast, in an adverse selection setting, managers are differentiated according to their *ex ante* unobserved ability; reputation corresponds to the market's beliefs about managerial ability and market beliefs are updated based on managerial action. In this context, Segendorff (2000) addresses the issue of competent managers having incentives to hire incompetent co-workers for insurance purposes: when team output is low, a competent manager can credibly convey his type to the principal by revealing an incompetent co-worker, that is, by scapegoating.

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[3]Kreps and Wilson (1982) and Milgrom and Roberts (1982) developed the framework for the analysis of adverse selection reputation models.

[4]The social-psychology literature on Impression Management also addresses strategic motives for scapegoating in a non-formal framework (Bell & Tetlock, 1989; Douglas, 1995).

[5]The mechanism is the same as in Green and Porter's (1984) collusion model.

I also considers reputation in an adverse selection setting. However, I focus on strategic firing rather than hiring. In contrast to Segendorff, I assume that the market cares not only about the type of the manager, but also about the payoffs associated with each type; and that in the short-term, the manager cannot reveal the competence of the worker that is fired. Consequently, it is the "incompetent" manager who has incentives to scapegoat.

Brandenburger and Polak (1996) develop a model whereby a decision-maker ignores his private information and makes a (sub-optimal) decision according to the audience's beliefs about the state of the world. For example, the board may fire the CEO under shareholder pressure. In contrast, I consider a reputation model whereby beliefs are about the board's type rather than the state of the world.

In a context where firm output exhibits effort complementarities, Cabrales and Calvó-Armengol (2004) show that corporate downsizing can restore co-operation even if the workers who are laid-off are not the ones causing the coordination-breakdown; that is, they are scapegoats. In a somehow similar setting, Winter (2001) addresses the issue of responsibility allocation in hierarchies. He finds that, under some circumstances, in order to provide better incentives for top levels, it is optimal for middle levels of the hierarchy to bear more responsibility – an aspect he labels "scapegoating."

The remainder of the paper is structured as follows. In Sections 2 and 3, I describe the model and derive its equilibria. I investigate comparative statics and derive empirical implications of the model in Section 4. In Section 5, I present empirical evidence from studies on management turnover. I conclude in Section 6 by discussing several extensions of the model.

2 Model

The firm consists of m workers and a manager. Workers can be competent or incompetent, contributing g respectively $g - b$ towards firm value. Failure, defined as the presence of an incompetent worker, is common knowledge. The role of the manager is to fire the incompetent worker, increasing, thus, firm value. The manager's ability to identify the incompetent worker varies,

and his ability is private information. Therefore, the model focuses on the manager's decision to fire a worker or not, depending on his ability.

The timing of the game (summarized in Table 1) is as follows. In the first period, Nature assigns the identity of the incompetent worker.

Then, Nature draws the manager's ability/type, defined as the probability that he identifies the incompetent worker. For simplicity, I assume that the manager is either perfectly informed (I) or poorly informed (N) about the incompetent worker's identity (to be clarified below). In addition, I assume that, with probability μ, the manager is perfectly informed and the market holds a correct belief. In the context of the present model μ represents the manager's *ex ante* reputation.

In the third period, the manager decides whether to fire (f) a worker or not (n). This decision has signaling effects. Thus, firm value varies both as a result of firing a worker (*fundamental value effect*), and the market's updated assessment of managerial ability (*reputation effect*).

A perfectly informed manager always identifies the incompetent worker and raises firm value to $\pi(f, I) = (m - 1)g$ by firing him. In contrast, I assume that a poorly informed manager identifies the incompetent worker only with probability $p < \frac{g}{b}$ (his type), and decreases firm value to $\pi(f, N) = (m - 1)g - (1 - p)b < mg - b$ by firing him.[6,7] Consequently:

Definition 1 *Within the context of the model, scapegoating is defined as firing by a poorly informed manager.*

I assume that the manager's objective is a convex combination of short- and long-term firm value, realized in the fourth and fifth period, respectively. In particular, I denote by δ the weight attached to the long-term value, and $1 - \delta$ the weight attached to the short-term value of the firm. In other words, δ represents the manager's discount factor.[8]

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[6] The fact that the managerial action has a direct effect on the payoff makes this a signaling rather than reputational cheap talk game as in Ottaviani and Sorensen (2006).

[7] Alternatively, I could have considered a specification whereby the worker that is fired is replaced either with a competent worker, at a cost, or with a worker of average competence. The results would be unchanged; the essential aspect is that firing is a costly action.

[8] Bebchuk and Stole (1993) develop a model with similar features: (i) the manager

In the fourth period (short-term), I assume that the market is unable to verify the type of the worker that is fired. Consequently, short-term firm value is based on the manager's *ex post* reputation – the market's posterior belief that he is perfectly informed, given his ex ante reputation and his decision to fire – and the value associated with each managerial type. Specifically, if the poorly informed manager scapegoats, short-term firm value is

$$\pi\left(f, \beta\left(\mu\right)\right) = \beta\left(\mu\right)\pi\left(f, I\right) + \left(1 - \beta\left(\mu\right)\right)\pi\left(f, N\right), \tag{1}$$

where $\beta\left(\mu\right) = \Pr\left(I|f, \mu\right)$ represents the manager's ex post reputation.[9]

Finally, in the last period (long-term), the market learns the type of the worker that was fired (and implicitly the manager's type). As a result, long-term firm value will be $\pi\left(f, I\right)$ if the manager is informed and $\pi\left(f, N\right)$ if the manager is poorly informed. If no worker was fired, long- and short-term firm value are equal to $\pi\left(n\right) = mg - b$.

Table 1: Timing

$t = 1$	Nature draws the identity of the incompetent worker.
$t = 2$	Nature draws the manager's type – $t \in \{I, N\}$ – where $\Pr\left(I\right) = \mu$.
$t = 3$	Manager decides on his action – $a \in \{f, n\}$ – the only additional "information" that the market has in the short-term.
$t = 4$	Market updates its belief about the manager's type, based on his action and ex ante reputation; short-term firm value is realized.
$t = 5$	Market learns the manager's type; long-term firm value is realized.

A strategy for the manager is the probability that he fires, given his ex ante reputation and his type – $\sigma\left(\mu, t\right)$. The equilibrium concept used is that of Bayesian equilibrium:

is "concerned not only about the long-term value of the firm, but also the market's immediate valuation;" (ii) these are the only components of the manager's payoff; and (iii) the manager's discount factor is exogenous. In addition, they argue that the assumption that managers are concerned about short-term objectives is commonly accepted because managerial compensation is partly tied to short-term performance, and because a higher short-term performance makes it less likely that the manager will lose his position.

[9] In contrast to models of career concerns for experts, in the present model, performance is unobservable in the short-term. As a result, the audience's posterior beliefs and action (the valuation of the firm) are based on the agent's action, rather than performance.

Definition 2 *A Bayesian equilibrium is a pair $\langle \sigma(\mu, t), \beta(\mu) \rangle$ such that: (i) $\sigma(\mu, t)$ is optimal given the market's posterior belief, $\beta(\mu)$; and (ii) $\beta(\mu)$ is consistent with Bayes' rule given the manager's strategy, $\sigma(\mu, t)$.*

Table 2: Model Notation	
$g/g - b$	Contribution of a competent/incompetent worker to firm value.
m	Initial number of workers.
$t \in \{I, N\}$	Manager's type – perfectly or poorly informed.
p	Precision of the poorly informed manager's information.
μ	*Ex ante* reputation/probability of a perfectly informed type.
β	*Ex post* reputation/probability of a perfectly informed type.
$\underline{\mu}$	Threshold value of μ (cf. Proposition 1).
$a \in \{f, n\}$	Manager's action – fire or not.
$\sigma(\mu, t)$	Manager's strategy (probability of firing).
δ	Discount factor.
$\underline{\delta}$	Threshold value of δ (cf. Proposition 1).
π	Firm value.

3 Equilibria

In this section, I derive the equilibria of the game. First, I show that there exists an equilibrium whereby the informed manager always fires the incompetent worker and the poorly informed manager scapegoats with strictly positive probability (for sufficiently low discount factors).

When the market is imperfectly informed, the payoff from firing is

$$\pi(f, \beta(\mu), t) = (1 - \delta) \pi(f, \beta(\mu)) + \delta \pi(f, t). \tag{2}$$

Since $\pi(f, t)$, and consequently $\pi(f, \beta(\mu), t)$, is increasing in t, only one type can employ a mixed strategy. If the informed manager does so and fires, the only Bayesian consistent posterior market belief is $\beta(\mu) = 1$. Consequently,

Remark 1 *The informed manager always fires the incompetent worker.*

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In contrast, the poorly informed manager's decision is based on the marginal effect of scapegoating,

$$\pi\left(f, \beta\left(\mu\right), N\right) - \pi\left(n\right) = \left(pb - g\right) + \left(1 - \delta\right)\beta\left(\mu\right)\left(1 - p\right)b. \qquad (2')$$

The first term denotes the negative *fundamental value effect* of scapegoating. With probability p, the manager fires the incompetent worker and raises value by $b - g$, but with probability $1 - p$ he fires a competent worker and makes a costly mistake, g. Consequently, firm value decreases by $p\left(b - g\right) - \left(1 - p\right)g = pb - g$. The second term denotes the positive, short-term *reputation effect* of scapegoating. This is the value of the market's perception that the manager is informed and avoids mistakes, $\left(1 - \delta\right)\beta\left(\mu\right)\left(1 - p\right)b$. Overall, the marginal effect of firing is increasing in ex-post reputation and decreasing in the discount factor.

If the manager cares sufficiently about long-term firm value, that is, if

$$\delta > \underline{\delta} \equiv \frac{\pi\left(f, I\right) - \pi\left(n\right)}{\pi\left(f, I\right) - \pi\left(f, N\right)} = \frac{b - g}{\left(1 - p\right)b}, \qquad (s)$$

he will not scapegoat even if he would acquire a perfect reputation. In this case, the perceived life-span *human capital gain* from firing by an informed manager, $b - g$, is outweighed by the actual long-term *human capital loss* from being a poorly rather than perfectly informed manager, $\left(1 - p\right)b$.

On the other hand, if the manager cares sufficiently about short-term firm value, $\delta < \underline{\delta}$, and if reputation is sufficiently high, that is, if

$$\mu > \underline{\mu}\left(\delta\right) \equiv \frac{1}{\left(1 - \delta\right)}\frac{\pi\left(n\right) - \pi\left(f, N\right)}{\pi\left(f, I\right) - \pi\left(f, N\right)} = \frac{1}{\left(1 - \delta\right)}\frac{g - pb}{\left(1 - p\right)b} \qquad (p)$$

he will scapegoat with probability $\sigma\left(\mu, N\right) = 1$ to maintain that reputation, $\beta\left(\mu\right) = \mu$. In this case, the short-term *reputation gain* of being perceived as an informed manager, and thus able to avoid losses from mistakes, $\left(1 - \delta\right)\left(1 - p\right)b$, outweighs the life-span *human capital gains* from *not* scapegoating, $g - pb$, that is, economizing on mistakes, $\left(1 - p\right)b$, at the cost of keeping the incompetent worker, $g - b$.

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In contrast, if the manager has a poor reputation, that is, if $\mu < \underline{\mu}(\delta)$, maintaining that poor reputation is not valuable. He will scapegoat only with a probability $\sigma(\mu, N) < 1$, in order to build his reputation. In fact,

$$\sigma(\mu, N) = \frac{\mu(1 - \underline{\mu})}{\underline{\mu}(1 - \mu)} < 1. \tag{ss}$$

so that $\beta(\mu) = \underline{\mu} > \mu$. Specifically, $\sigma(\mu, N)$ is determined by the condition that the manager is indifferent between scapegoating and doing nothing. Proposition 1 summarizes these results (all proofs are in the Appendix):

Proposition 1 (scapegoating) *There exists a unique equilibrium whereby:*
(i) for $\delta > \underline{\delta}$, no scapegoating occurs: the informed manager fires the incompetent worker and the poorly informed manager does not fire: $\sigma(\mu, I) = 1$, $\sigma(\mu, N) = 0$ (separating);
(ii) for $\delta < \underline{\delta}$, scapegoating is optimal:
(a) for $\mu < \underline{\mu}$, the informed manager fires the incompetent worker and the poorly informed manager scapegoats with a strictly positive probability: $\sigma(\mu, I) = 1$, $\sigma(\mu, N) = \frac{\mu(1-\mu)}{\underline{\mu}(1-\mu)}$ (semiseparating);
(b) for $\mu > \underline{\mu}$, the informed manager fires the incompetent worker and the poorly informed manager scapegoats: $\sigma(\mu, I) = 1$, $\sigma(\mu, N) = 1$ (pooling).
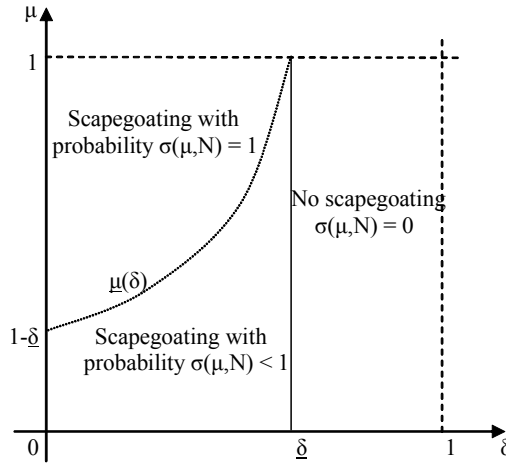
The poorly informed manager's equilibrium strategy.

Proposition 1 provides an answer to the paper's central question: Can scapegoating be an optimal, reputation-saving, value maximizing strategy? As the equilibrium shows, the answer is "Yes," conditional on being sufficiently concerned about the market's short-term perception, and having a sufficiently high reputation.

In fact, Proposition 1 establishes how the manager's optimal strategy depends on his type, given his reputation; and how the manager's optimal strategy depends on his reputation, given his type. For a given reputation, μ, $\pi(f, \beta(\mu), t)$ is increasing in type since a higher type (better informed) manager expects a higher long-term payoff. Thus,

Corollary 1 *The probability of firing increases in the manager's type.*

To see this, note that $\sigma(\mu, I) = 1$, whereas $\sigma(\mu, N) = 0$, $\frac{\mu(1-\mu)}{\underline{\mu}(1-\mu)}$ and 1 for $\delta \in (\underline{\delta}, 1)$, $(\delta(\mu), \underline{\delta})$, respectively $(0, \delta(\mu))$. Therefore, $\sigma(\mu, N) \leq \sigma(\mu, I)$.

A manager of type t fires with strictly positive probability if $\delta < \underline{\delta}(t)$. In that case, $\pi(f, \beta(\mu), t)$ is increasing in ex-ante reputation, since a higher ex-ante reputation makes it more likely that the manager is informed, that is, it increases $\beta(\mu)$. This increases short-term firm value and makes it more attractive for the poorly informed manager to fire. Accordingly,

Corollary 2 *For $\delta < \underline{\delta}$, the probability of firing increases in reputation.*[10]

To see this, note that $\sigma(\mu, N) = \frac{\mu(1-\mu)}{\underline{\mu}(1-\mu)}$ if $\mu \in (0, \underline{\mu}(\delta))$ and $\sigma(\mu, N) = 1$ if $\mu \in (\underline{\mu}(\delta), 1)$. Therefore, $\sigma(\mu, N)$ is weakly increasing in μ.

Next, I show that there exists a pooling equilibrium whereby no firing (and implicitly no scapegoating) is observed.

Proposition 2 (no scapegoating) *For $\delta < \widetilde{\delta}$, there exists a pooling equilibrium whereby a manager never fires, regardless of type and reputation. That is, $\sigma(\mu, t) = 0$ $(\forall)$ t, μ.*

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[10] In a setting with more than two types, one would need an underlying distribution over types and a set of signals (ex-ante reputation) that satisfy the strict monotone likelihood ratio property. The alternative formulation of the result would then be $t(\mu)$ is decreasing.

As in any signalling game, when there are zero probability events, Bayesian equilibria are consistent with any kind of posterior beliefs. Consequently, the pooling equilibrium can be sustained by properly designing the set of beliefs against the high type player. In the present setup, firing is a zero probability event. If the market associates firing with the belief that the manager is poorly informed, then, in equilibrium, nobody fires.

This equilibrium is divine; it survives the Cho-Kreps Intuitive Criterion (IC), since both types of managers would deviate, provided strong enough posterior market beliefs that the informed manager actually fired. However, the equilibrium is not *universally* divine; it does not survive the D1 Condition (Fudenberg and Tirole, 1991), which requires the set of posterior market beliefs for which the poorly informed manager would deviate to be strictly included in the set for which the informed manager would deviate. To see this, fix δ. The poorly informed manager would deviate for β such that $\pi\left(f, \beta\left(\mu\right), N\right) > \pi\left(n\right)$. Since $\pi\left(f, \beta\left(\mu\right), t\right)$ is increasing in t, the informed manager would deviate for a larger set of posterior beliefs.

4   Scapegoating, Market Beliefs and Firm Value

In what follows, I focus on the equilibrium whereby managerial behavior involves scapegoating (Proposition 1 (ii)). I discuss the implications of scapegoating on market beliefs, and show that, unconditionally, the likelihood of scapegoating is non-monotonic in reputation; however, conditional on firing, the likelihood of scapegoating is decreasing in reputation.

In addition, I show that firing generates a positive market reaction and that, in the short-term, firms that fire trade at a premium; the market reaction is decreasing and the premium is increasing in reputation.

Lastly, I investigate the effect of characteristics such as the discount factor δ, the size of failure b and the contribution of a competent worker g, on the probability and likelihood of scapegoating.

■ **Scapegoating and Market Beliefs.** I defined scapegoating as firing by a poorly informed manager. This definition can be interpreted from two perspectives. From the poorly informed manager's perspective scapegoating

represents a business strategy, that is, the probability of firing conditional on reputation – $\sigma(\mu, N) = \Pr(f|N, \mu)$. As Corollary 2 shows, in equilibrium, this probability is increasing in reputation.

From the market's perspective, scapegoating represents the unconditional respectively the conditional (on firing) belief that the manager is poorly informed. In particular,

Definition 3 $\Pr(N, f|\mu)$ *and* $\Pr(N|f, \mu)$ *represent the unconditional respectively the conditional likelihoods of scapegoating.*

In equilibrium, $\Pr(f|N, \mu) = \frac{\mu(1-\mu)}{\underline{\mu}(1-\underline{\mu})}$ for $\mu < \underline{\mu}(\delta)$, and $\Pr(f|N, \mu) = 1$ for $\mu > \underline{\mu}(\delta)$.

$$\Pr(N, f|\mu) = \Pr(N|\mu)\Pr(f|N, \mu) = \begin{cases} \frac{(1-\mu)}{\underline{\mu}}\mu & \text{if } \mu \in \left(0, \underline{\mu}(\delta)\right) \\ (1-\mu) & \text{if } \mu \in \left(\underline{\mu}(\delta), 1\right) \end{cases}$$

$$\Pr(N|f, \mu) = \frac{\Pr(N|\mu)\Pr(f|N, \mu)}{\Pr(f)} = \begin{cases} (1-\underline{\mu}) & \text{if } \mu \in \left(0, \underline{\mu}(\delta)\right) \\ (1-\mu) & \text{if } \mu \in \left(\underline{\mu}(\delta), 1\right) \end{cases}$$

Consequently,

Corollary 3 *For $\delta < \underline{\delta}$, the unconditional likelihood of scapegoating is non-monotonic in reputation, and the conditional likelihood of scapegoating is decreasing in reputation.*

The intuition for the first part of this result is as follows. A poorly informed manager scapegoats with a probability that is increasing in reputation. Conditional on having a high reputation, however, the probability that the manager is poorly informed is low and so is the likelihood of scapegoating. In contrast, conditional on having a low reputation, the probability that the manager is poorly informed is high, but the probability that he scapegoats is low and so is the likelihood of scapegoating. Alternatively, scapegoating is more likely when reputation is moderate, that is, when uncertainty about managerial type is high.[11]

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[11] This result is reminiscent of Bar-Isaac (2003) whereby a senior of proven reputation has incentives to exert effort only if uncertainty about the junior's ability is high.

While low reputation implies that the poorly informed manager fires with low probability, so the unconditional likelihood of scapegoating is low, it also implies that the manager is unlikely to be informed, so the overall probability of firing is also low. As a result, the conditional probability that the manager is poorly informed is high. An increase in reputation makes firing more attractive for the poorly informed manager (marginal effect), but it also increases the probability that the manager is informed (inframarginal effect), leading to a decrease in the conditional probability that the manager is poorly informed.
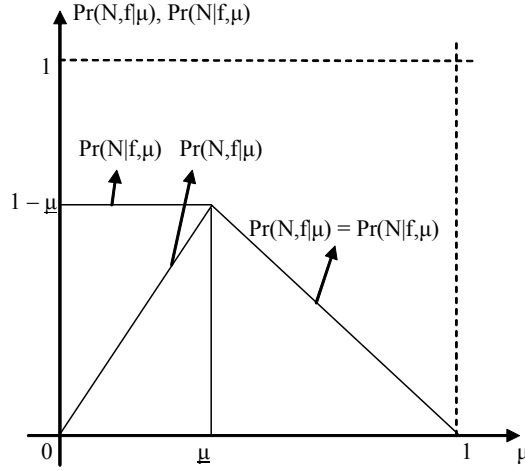
The unconditional and the conditional likelihood of scapegoating –
$\Pr(N, f|\mu)$ and $\Pr(N|f, \mu)$.

∎ **Scapegoating and Firm Value.** Expected firm value is $E(\pi) = \Pr(N, f|\mu)\pi(f, N) + \Pr(N, n|\mu)\pi(n) + \Pr(I, f|\mu)\pi(f, I)$. Upon firing, firm value becomes $\pi(f, \mu) = \Pr(N|f, \mu)\pi(f, N) + \Pr(I|f, \mu)\pi(f, I)$.

$$E(\pi) = \begin{cases} \frac{\mu(1-\underline{\mu})}{\underline{\mu}}\pi(f, N) + \frac{\mu-\underline{\mu}}{\underline{\mu}}\pi(n) + \mu\pi(f, I) & \text{if } \mu \in (0, \underline{\mu}(\delta)) \\ \pi(f, N) + \mu(\pi(f, I) - \pi(f, N)) & \text{if } \mu \in (\underline{\mu}(\delta), 1) \end{cases}$$

$$\pi(f, \mu) = \begin{cases} \pi(f, N) + \underline{\mu}(\pi(f, I) - \pi(f, N)) & \text{if } \mu \in (0, \underline{\mu}(\delta)) \\ \pi(f, N) + \mu(\pi(f, I) - \pi(f, N)) & \text{if } \mu \in (\underline{\mu}(\delta), 1) \end{cases}$$

Consequently,

$$\pi\left(f,\mu\right)-E\left(\pi\right) \;=\; \begin{cases} \delta\left(\underline{\mu}-\mu\right)\left(\pi\left(f,I\right)-\pi\;\left(f,N\right)\right) & \text{if } \mu\in\left(0,\underline{\mu}\left(\delta\right)\right) \\ 0 & \text{if } \mu\in\left(\underline{\mu}\left(\delta\right),1\right) \end{cases} \quad \text{and}$$

$$\pi\left(f,\mu\right)-\pi\left(n\right) \;=\; \begin{cases} \delta\left(\pi\left(n\right)-\pi\;\left(f,N\right)\right) & \text{if } \mu\in\left(0,\underline{\mu}\left(\delta\right)\right) \\ \delta\left(\pi\left(n\right)-\pi\;\left(f,N\right)\right)+ & \text{if } \mu\in\left(\underline{\mu}\left(\delta\right),1\right) \\ \left(\mu-\underline{\mu}\right)\left(\pi\left(f,I\right)-\pi\left(f,N\right)\right) & \end{cases} .$$

The following results summarizes the above,

Corollary 4 *Firing results in a positive market reaction* $-\pi\left(f,\mu\right)-E\left(\pi\right)$. *The market reaction is decreasing in reputation.*

Essentially, the informed manager expects a higher long-term payoff, therefore, firing acts as a positive informative signal. However, as reputation increases, the value of the signal decreases since the poorly informed manager fires with higher probability. In fact, for $\mu\in\left(\underline{\mu}\left(\delta\right),1\right)$, the poorly informed manager pools with the informed manager and the value of the signal is 0.

Corollary 5 *Firms that fire trade at a premium* $-\pi\left(f,\mu\right)-\pi\left(n\right)$. *The premium is increasing in reputation.*

In the scapegoating equilibrium $\pi\left(f,\mu,N\right)\geq\pi\left(n\right)$. However, scapegoating sacrifices long-term firm value $-\pi\left(f,N\right)<\pi\left(n\right)$. Thus, the manager must be "compensated" with a short-term increase in firm value $-\pi\left(f,\mu\right)>\pi\left(n\right)$. The firing premium depends on reputation through $\Pr\left(N|f,\mu\right)$ – the conditional likelihood of scapegoating – which is decreasing in reputation (cf. Corollary 3). The result then follows.

■ **Firm Characteristics and Scapegoating.** In this sub-section I investigate the effect of characteristics such as the discount factor δ, the size of failure b and the contribution of a competent worker g, on the probability and likelihood of scapegoating. To study these effects, recall the following:

$$\underline{\delta} \;=\; \frac{b-g}{\left(1-p\right)b}, \text{ and}$$

$$\underline{\mu}\left(\delta\right) \;=\; \frac{1}{\left(1-\delta\right)}\frac{g-pb}{\left(1-p\right)b}=\frac{1-\underline{\delta}}{1-\delta}.$$

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Recall also that the poorly informed manager's optimal strategy is $\sigma(\mu, N) = \frac{\mu(1-\mu)}{\underline{\mu}(1-\mu)}$ for $\mu < \underline{\mu}(\delta)$, and $\sigma(\mu, N) = 1$ for $\mu \geq \underline{\mu}(\delta)$. As a consequence,

Proposition 3 *The probability, and the unconditional and conditional likelihood of scapegoating are decreasing in δ and g, and increasing in b.*

These results are intuitive. As the short-term reputation-based value of the firm becomes less important, so does the value of maintaining or building a reputation. Consequently, scapegoating becomes less attractive. An increase in the contribution of a competent worker increases the losses from mistakes and makes scapegoating less attractive. An increase in the size of failure increases the added value of eliminating it and the cost of doing nothing. Therefore, scapegoating becomes more attractive.

The assumed changes in parameter values have the same effect on the unconditional and conditional likelihood of scapegoating: first, he unconditional likelihood of scapegoating, $\Pr(N, f|\mu)$, is just a rescaling of the probability of scapegoating, $\Pr(f|N, \mu)$, with the probability that the manager is poorly informed, $(1 - \mu)$; and second, since the strategy of the informed manager does not change, the conditional likelihood of scapegoating is monotonic in the probability of scapegoating.
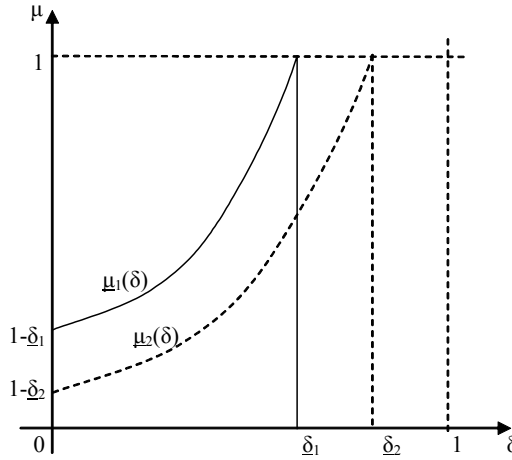
The effect of an increase in b or a decrease in g on $\underline{\delta}$ and $\underline{\mu}(\delta)$.

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5   Empirical Implications and Evidence

The model has several implications for the probability of firing, and the behavior of firm value in reaction to firing. An interesting context for assessing these implications is that of forced CEO turnover.[12] A number of studies in the finance literature address the causes and consequences of CEO turnover, and in particular, the impact of various firm characteristics such as board composition, institutional ownership and managerial entrenchment on the probability of firing, and pre- and post-turnover performance.[13] In what follows, I review the main implications of the model and discuss the evidence from this literature.

■ **Probability of Firing.** Fama and Jensen (1983) posit that "outside directors have incentives to develop reputations as experts in decision control," while Demsetz and Lehn (1985) argue that the free-rider problem in monitoring is alleviated in the case of large shareholders. Therefore, outsider directors and large shareholders should be associated with better monitoring and information, and consequently, higher reputation. The model predicts a positive relationship between reputation and the probability of firing (Corollary 2), and the empirical evidence supports this prediction. In particular, it has been shown that the negative relation between performance and turnover is stronger for firms with outsider-dominated boards (Weisbach (1988)) and firms with an outside blockholder (Denis, Denis and Sarin (1997)).

An additional proxy for reputation could be the firm's degree of managerial entrenchment, measured by the presence of anti-takeover provisions as in the governance or the entrenchment indices developed by Gompers, Ishii and Metrick (2003), and Bebchuk, Cohen and Ferrell (2005). In particular, it has been suggested that entrenchment weakens the disciplinary force

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[12] There are several justifications for this, despite the fact that CEO firing is not random. From a theoretical perspective, the model is, in fact, about making the right decision (cf. footnote 2). From a practical perspective, data limitations on turnover at other levels are severe. Public announcements on turnover below the CEO level are less common and the resulting stock price reaction seems to be very small (Denis and Denis (1995)). Moreover, firms are not required to report performance for separate sub-units.

[13] For example, Boeker (1992), Denis and Denis (1995), Khanna and Poulsen (1995), Huson et al. (2004), Dezső (2006) and references therein.

of internal and external monitoring mechanisms. Consequently, in light of the model's assumption that boards differ only in their ability and not willingness to eliminate the causes of failure (cf. footnotes 2 and 12), a high entrenchment level (a high count of anti-takeover provisions) could be associated with a poor reputation. Fisman, Khurana and Rhodes-Kropf (2005) find that the probability of forced turnover is higher when the entrenchment level is lower, in line with the model's prediction (Corollary 2).[14]

The negative turnover-performance relation alluded to in the above was documented by Coughlan and Schmidt (1985), Warner, Watts and Wruck (1988), Weisbach (1988), and Huson, Parrino and Starks (2001). This is strongly consistent with the model's prediction that the probability of firing increases with the size of failure, b (Proposition 3).

McNeil, Niehaus and Powers (2004) find that, after poor performance, subsidiary manager turnover is significantly more likely than CEO turnover. This is consistent with the model's prediction that the probability of firing decreases with the contribution of the competent worker, g (Proposition 3).

■ **Firm Value.** Evidence based on event studies tends to support the model's prediction of a positive stock price reaction to firing (Corollary 4).[15] Weisbach (1988), Denis and Denis (1995), Huson et al. (2004) and Fisman et al. (2005) find that forced CEO turnover announcements are associated with positive, statistically significant abnormal returns.[16,17]

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[14]Hirshleifer and Thakor (1998) show that takeover threats make a board stricter in firing the CEO, the effect being more pronounced the lower the board's ex-ante reputation for vigilance. This prediction does not seem to be supported by empirical evidence: the probability of firing is higher for firms with outsider dominated boards and firms with low entrenchment levels, both, arguably, proxies for vigilant boards. Their result is driven by the fact that vigilant boards try to differentiate themselves from lax boards that never fire CEOs. The framework developed in this paper models "board quality" as the ability to identify the cause of failure. Consequently, poorly informed boards imitate informed ones by firing, and the incentives to do so are less pronounced when board reputation is low, in line with empirical evidence. (Mailath and Samuelson (1998) discuss the implications of modeling firm behavior as differentiating from a bad rather than imitating a good type.)

[15]Event studies determine only the unanticipated portion of the announcement.

[16]Denis and Denis (1995) suggest that CEO dismissals may actually signal the magnitude of the underperformance, b, a possibility that I do not consider.

[17]In contrast, in their study of a sample of firms that have filed for Chapter 11, Khanna and Poulsen (1995) find that the market does not react positively to the news of dismissal, regardless of whether a replacement comes from inside or outside the firm.

Moreover, Weisbach (1988) and Fisman et al. (2005) show that the stock-price reaction is higher for firms with outsider-dominated boards and high entrenchment levels, respectively. Considering the argument whereby outsider board representation and low entrenchment are associated with higher reputation, the evidence in Weisbach (1988) is contrary to, while the evidence in Fisman et al. (2005) supports the model's prediction that the stock-price reaction is decreasing in reputation (Corollary 4). Outsider dominated boards may be considered to have a high reputation, in that their interests are more aligned with shareholders'. However, from an informational perspective, they may be considered to have a low reputation – outsider dominated boards have less access to information regarding the causes of failure. This informational interpretation would explain the higher stock-price reaction for firms with larger outsider board representation.[18]

Lastly, Weisbach (1988) documents that the stock price reaction to CEO turnover news is lower if pre-turnover stock returns are poorer; in addition, Denis and Denis (1995) show that, compared to top executive (CEO or chairman) changes, the stock price reaction is lower for non-top management changes. This evidence is consistent with the model's predictions that the market reaction is decreasing in the size of the failure, b, and increasing in the contribution of the competent worker, g (as implied by Proposition 3).

There exists no cross-sectional evidence on the difference between the stock performance of firms that fire and firms that retain their CEOs.[19]

I did not discuss the impact of the discount factor, δ. In the context of CEO turnover, a proxy for δ could be the proportion of director compensation that is tied to long-term firm performance. Alternatively, the degree of transparency in an industry/firm could also proxy for δ. I am unaware of studies that examine the impact of these proxies on the variables of interest.

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[18] This discussion highlights the importance of considering quality along multiple dimensions, not necessarily positively correlated.

[19] Huson et al. (2004) provide evidence of a positive and significant difference in accounting performance changes of firms that fire their CEOs, compared to those of firms in the same industry and with the same pre-turnover performance, that retain their CEOs. However, they do not find any statistically significant relationship between board composition or institutional ownership, and the post-turnover performance changes.

■ **Evidence of Scapegoating.** Fisman et al. (2005) and Dezső (2006) document that in the two- and three-year windows following forced CEO turnover, firms characterized by high entrenchment levels exhibit large performance improvements. In contrast, firms characterized by low entrenchment levels do not exhibit significant improvements, suggesting that these firms may scapegoat their CEOs.

Under the interpretation that low entrenchment is associated with high reputation, this evidence runs against the model's prediction that the conditional likelihood of scapegoating is decreasing in reputation (Corollary 3). However, the argument proposed in the case of outsider boards could be invoked here as well. Entrenched boards may be considered to have a poor reputation, in that their interests are less aligned with shareholders'. However, from an informational perspective, they may be considered to have a high reputation – by being less concerned about takeover threats, they either insulate poor CEOs, as documented in Dezső (2006), or "buy time" to assess the quality of the incumbent CEO. This informational interpretation would then explain the prevalence of scapegoating among low-entrenchment firms.

Further evidence on scapegoating can be found in the sociology literature. Gamson and Scotch (1964) and Brown (1982) document that managerial changes in sports teams are preceded by declines in team winning percentage and result in improvements. However, controlling for prior team performance, there is no evidence of a "succession effect."

6   Discussion

In this paper, I use a concise adverse selection model of firing, to provide a rational, reputation-based theory of scapegoating. In this section, I discuss several ways of extending the model and analyze one in more detail.

■ **Infinite Period Model.** The model features only two periods: the short- and long-term. I could have considered an infinite period dynamic model of the following form. In every period, with some probability, the firm encounters an adverse shock that changes the type of a worker from com-

petent to incompetent. A state of the world with two incompetent workers is a clear signal that the manager is poorly informed, whereas a state with no incompetent workers is a strong signal that the manager is informed. However, a state with one incompetent worker can be either a signal of an informed manager that encountered an adverse shock, or a poorly informed manager that did not eliminate the incompetent worker, but was lucky and did not to encounter an adverse shock. I believe that the main results of the model still hold: in equilibrium, a poorly informed manager's optimal strategy is to fire with probability 1 when reputation is high, and to use a mixed strategy when reputation is low. Eventually, however, the poorly informed manager's true type is revealed; scapegoating cannot go on forever.[20]

■ **Continuous Types Model.** The model features only two types of managers: perfectly and poorly informed. I could have considered a continuous-type model in which the market holds a correct prior $G\left(.\right)$ over managerial types $p \in \left[\underline{p}, \overline{p}\right]$, and the manager's reputation μ, is assumed to come from a distribution with cdf $F\left(.|p\right)$. Upon observing the act of firing, the market forms a posterior $H\left(p|\mu, f\right)$.

In this setting, I conjecture that there exists an equilibrium whereby for every reputation level μ, the probability of firing is strictly positive. This is intuitive. There is no reason why an informed manager should not fire, even if his reputation is poor, in particular since firing also signals confidence. In fact, in equilibrium, a manager fires with probability 1 if and only if $p > p^*\left(\mu\right)$ and does not fire otherwise.

Moreover, I posit that for each reputation level μ, there exists a threshold $\widetilde{\delta}\left(\mu\right)$ such that if $\delta < \widetilde{\delta}\left(\mu\right)$, then $p^*\left(\mu\right)$ is decreasing in μ. The intuition for this result is that if a manager cares sufficiently about short-term firm value, a higher reputation induces lower-type managers to fire. Consequently, the firing premium result is preserved: in equilibrium, the lower-type manager must be compensated for the higher long-term losses from mistakes.

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[20] See Bar-Isaac (2003) for an infinite period model of a monopolist selling a good whose quality is learned slowly, and where selling signals the seller's type. The equilibrium has the same features as the one I posited for the infinite version of my model: a bad quality seller plays a mixed strategy equilibrium below some threshold level of reputation and sells for sure if reputation is high; ultimately, however, the bad seller drops out.

In addition, the non-monotonicity result that relates the likelihood of scapegoating to reputation is also preserved. The argument is as follows. A high reputation induces lower-type managers to fire – the equilibrium threshold-type, $p^*(\mu)$, is low. However, a high reputation manager is likely to be of high type. Therefore, scapegoating is less likely. In the other extreme, a low reputation manager is likely to be of low type. However, a low reputation induces higher-type managers to fire – the equilibrium threshold type is high. Therefore, scapegoating is again less likely. The argument relies on the crucial assumption that the density $f(\mu|p)$ has the strictly monotone likelihood ratio property, which implies that a higher-type manager is more likely to generate a higher reputation. Alternatively, a higher reputation is "good news" regarding managerial type (Milgrom, 1981).

■ **Bad Luck vs Incompetent Worker.** In what follows, I extend the model by assuming that failure can be caused by Bad Luck (L) or incompetence (H), with probabilities λ and $1 - \lambda$, and managers can distinguish between these causes. I continue to assume that managers are either perfectly or poorly informed about the incompetent worker's identity, and that the market holds a correct prior belief μ that the manager is perfectly informed. Thus, there are three "meta-types," $t \in \{(L), (N), (I)\}$, and

$$\pi(f, L) < \pi(f, N) < \pi(n) < \pi(f, I).$$

In this setting, there exist two forms of scapegoating: one performed by a poorly informed manager who fires randomly when failure is caused by incompetence, and one performed by both types of managers who fire a competent worker when failure is caused by bad luck. The reasons for each form of scapegoating are different, however. The former involves a manager trying to exploit and protect his reputation of being informed; the latter involves a manager that ignores his better information to cater to the market's belief. I label this latter form *"sacrificial scapegoating."* This extends the Brandenburger and Polak (1996) model by allowing for the existence of managerial types, and therefore adding reputational concerns. I characterize, next, the scapegoating equilibrium of this extended game.

Proposition 4 *There exists an equilibrium whereby:*

(i) for $\delta > \underline{\delta}_1$, there is no scapegoating: in state H the informed manager fires the incompetent worker; in state L there is no firing: $\sigma(\mu, \lambda, I) = 1$, $\sigma(\mu, \lambda, N) = 0$, $\sigma(\mu, \lambda, L) = 0$ (fully separating);

(ii) for $\delta < \underline{\delta}_1$, scapegoating is optimal:

(a) for $\mu < \underline{\mu}_1$, in state H the informed manager fires the incompetent worker and the poorly informed manager scapegoats with some probability; in state L there is no firing: $\sigma(\mu, \lambda, I) = 1$, $\sigma(\mu, \lambda, N) = \frac{\mu(1-\mu)}{\underline{\mu}(1-\underline{\mu})}$, $\sigma(\mu, \lambda, L) = 0$ (semiseparating on types).

(b) for $\mu \in \left(\underline{\mu}_1, \min\left(\underline{\mu}_2, 1\right)\right)$, in state H the informed manager fires the incompetent worker and the poorly informed manager scapegoats; in state L there is no firing: $\sigma(\mu, \lambda, I) = \sigma(\mu, \lambda, N) = 1$, $\sigma(\mu, \lambda, L) = 0$ (pooling on types);

(c) for $\mu \in \left(\underline{\mu}_2, \min\left(\underline{\mu}_3, 1\right)\right)$, in state H the informed manager fires the incompetent worker and the poorly informed manager scapegoats; in state L both types scapegoat with some probability: $\sigma(\mu, \lambda, I) = \sigma(\mu, \lambda, N) = 1$, $\sigma(\mu, \lambda, L) = \frac{(1-\lambda)}{\lambda} \frac{\delta\left(\mu - \underline{\mu}_2\right)}{\underline{\mu}_2 - (1-\delta)\underline{\mu}_1}$ or $\sigma(\mu, \lambda, L) = \frac{\mu - \underline{\mu}_2}{\underline{\mu}_3 - \underline{\mu}_2}$ if $\underline{\mu}_3 < 1$ (semiseparating on states);

(d) for $\mu > \underline{\mu}_3$, in state H the informed manager fires the incompetent worker and the poorly informed scapegoats; in state L both types scapegoat: $\sigma(\mu, \lambda, t) = 1$ (pooling on states).
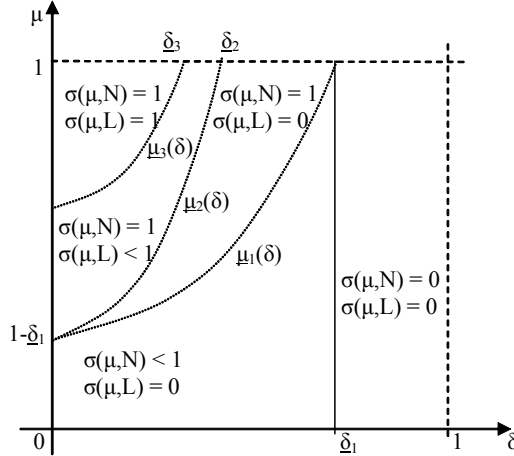
The poorly informed and L-type managers' equilibrium strategies.

If the manager cares sufficiently about long-term firm value, that is, if

$$\delta > \underline{\delta}_1 \equiv \frac{\pi(f,I) - \pi(n)}{\pi(f,I) - \pi(f,N)}$$

he will not scapegoat even if he would acquire a perfect reputation. Furthermore, when failure is caused by bad luck, he will not sacrifice a competent worker even if market beliefs indicate that he should fire.

On the other hand, if the manager cares sufficiently about short-term firm value, $\delta < \underline{\delta}_1$, and if reputation is sufficiently low, that is, if

$$\mu < \underline{\mu}_1(\delta) \equiv \frac{1}{(1-\delta)} \frac{\pi(n) - \pi(f,N)}{\pi(f,I) - \pi(f,N)},$$

he will scapegoat with probability $\sigma(\mu, \lambda, N) < 1$, in order to build his reputation. When his reputation is above $\underline{\mu}_1(\delta)$, he will scapegoat with probability $\sigma(\mu, \lambda, N) = 1$ to maintain that reputation.

When reputation is above $\underline{\mu}_1(\delta)$, the "$L$-type" manager may also scapegoat, if reputation is high enough. Specifically, when

$$\delta \;<\; \underline{\delta}_2 \equiv \frac{\pi(f,I) - \pi(n)}{\pi(f,I) - \pi(f,L)},$$

$$\mu \;>\; \underline{\mu}_2(\delta) \equiv \frac{1}{(1-\delta)} \frac{\pi(n) - \pi(f,L)}{\pi(f,I) - \pi(f,N)} - \frac{\pi(f,N) - \pi(f,L)}{\pi(f,I) - \pi(f,N)}, \text{ and}$$

$$\mu \;<\; \min\left(\underline{\mu}_3(\delta,\lambda) \equiv \frac{1}{(1-\delta)(1-\lambda)} \frac{\pi(n) - \pi(f,L)}{(\pi(f,I) - \pi(f,N))} - \frac{\pi(f,N) - \pi(f,L)}{\pi(f,I) - \pi(f,N)}, 1\right)$$

he will scapegoats with probability

$$\sigma(\mu, \lambda, L) = \frac{\mu - \underline{\mu}_2}{\underline{\mu}_3 - \underline{\mu}_2}, \text{ respectively } \sigma(\mu, \lambda, L) = \frac{(1-\lambda)}{\lambda} \frac{\delta\left(\mu - \underline{\mu}_2\right)}{\underline{\mu}_2 - (1-\delta)\underline{\mu}_1};$$

and with probability $\sigma(\mu, \lambda, L) = 1$ for $\mu > \underline{\mu}_3(\delta,\lambda)$, that is, when market's belief that failure is caused by incompetence is sufficiently strong

$$\lambda < \underline{\lambda} = \frac{\pi(f,I) - \pi(n)}{\pi(f,I) - \pi(f,L)}.$$

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The positive stock-price reaction result is robust to this extension. By firing, the informed manager expects a higher long-term payoff compared to the poorly informed manager, and all types of managers expect a higher long term payoff when failure is caused by incompetence rather than bad luck. Thus, firing acts as a positive informative signal. The trading premium results is also robust. Since scapegoating sacrifices long-term firm value, the manager scapegoats only when he is compensated for long-term losses.

However, the relationship between reputation and the stock-price reaction and the trading premium needs to be amended. In particular, the stock-price reaction exhibits a zigzag relationship to reputation: it decreases when the equilibrium is semiseparating on types, then it plateaus when the equilibrium is pooling on types; it exhibits a jump and decreases when the equilibrium is semiseparating on states, and it plateaus again when (and if) the equilibrium is pooling on states. The trading premium exhibits a step relationship to reputation: it is constant when the equilibrium is semiseparating on types, then it increases when the equilibrium is pooling on types; it is constant when the equilibrium is semiseparating on states, and it increases again when (and if) the equilibrium is pooling on states.

■ **Future Research.** There are several ways in which the model could be extended. I considered board "quality" (firm types) along a single dimension – boards' ability to identify the cause of failure. However, in light of the empirical evidence from CEO turnover, the board's alignment with shareholders' interests is another dimension along which boards could differ. Moreover, it is not obvious that aligned boards are also better informed. Consequently, a model with multi-dimensional types, possibly negatively correlated, could provide a better explanation of the empirical evidence.

Another extension would be to consider a model whereby team members contribute differently to firm value. In this setup, one could explore whether there is a bias towards firing members with higher or lower contribution. This setup could be further extended by allowing team members both to contribute to and damage firm value differently. Particularly, members with larger contributions (top managers) could also cause larger failures. It is unclear how equilibrium behavior would change under these circumstances.

Appendix

Proof of Proposition 1. Given that $\sigma(\mu, I) = 1$, I focus on the poorly informed manager's equilibrium strategy. His payoff from scapegoating is

$$
\begin{aligned}
\pi(f, \beta(\mu), N) &= (1 - \delta)(\beta(\mu)\pi(f, I) + (1 - \beta(\mu))\pi(f, N)) + \delta\pi(f, N) \\
&= \pi(f, N) + (1 - \delta)\beta(\mu)(\pi(f, I) - \pi(f, N)),
\end{aligned}
$$

and the marginal effect of scapegoating is

$$
\pi(f, \beta(\mu), N) - \pi(n) = (pb - g) + (1 - \delta)\beta(\mu)(1 - p)b.
$$

$\max_{\beta}[\pi(f, \beta(\mu), N)] = \pi(f, 1, N)$. Thus, $\sigma(\mu, N) = 0$ if

$$
\pi(f, 1, N) < \pi(n), \quad \text{or} \tag{sep}
$$

$$
\delta > \underline{\delta} \equiv \frac{\pi(f, I) - \pi(n)}{\pi(f, I) - \pi(f, N)} = \frac{b - g}{(1 - p)b}.
$$

In contrast, if (sep) is violated, $\sigma(\mu, N) \leq 1$. If $\sigma(\mu, N) = 1$, then $\beta(\mu) = \mu$, so that the condition for a pooling equilibrium is

$$
\pi(f, \mu, N) > \pi(n), \quad \text{or} \tag{pool}
$$

$$
\mu > \underline{\mu}(\delta) \equiv \frac{1}{(1 - \delta)} \frac{(\pi(n) - \pi(f, N))}{(\pi(f, I) - \pi(f, N))} = \frac{1}{(1 - \delta)} \frac{g - pb}{(1 - p)b}.
$$

Lastly, when both (sep) and (pool) are violated, $\sigma(\mu, N) < 1$, since $\pi(f, \mu, N) < \pi(n) < \pi(f, 1, N)$. In equilibrium,

$$
\pi(f, \beta(\mu), N) = \pi(n). \tag{semisep}
$$

However, by definition, $\pi(f, \underline{\mu}, n) = \pi(n)$, so that $\beta(\mu) = \underline{\mu}$. Moreover,

$$
\beta(\mu) = \frac{\mu}{\mu + (1 - \mu)\sigma(\mu, N)} = \underline{\mu}, \quad \text{so that } \sigma(\mu, N) = \frac{\mu(1 - \underline{\mu})}{\underline{\mu}(1 - \mu)}.
$$

Uniqueness of the equilibrium comes from the monotonicity of the payoff function in the parameters δ, and $\beta(\mu)$. This concludes the proof. ∎

Proof of Proposition 2. $\min_{\beta} [\pi (f, \beta (\mu), I)] = (1 - \delta) (f, N) + \delta \pi (f, I)$.
Let $\left(1 - \widetilde{\delta}\right) \pi (f, N) + \widetilde{\delta} \pi (f, I) \equiv \pi (n)$. Since $(1 - \delta) (f, N) + \delta \pi (f, I)$ is increasing in δ, the informed manager fires the incompetent worker whenever $\delta > \widetilde{\delta}$, regardless of the posterior beliefs generated.

Assume $\delta < \widetilde{\delta}$, so that the informed manager's decision is driven by the posterior beliefs of the market. Since in the pooling equilibrium firing is a zero probability event, we can assign any posterior belief upon observing firing. For example, let the market belief be that $\sigma (\mu, t) > 0$ iff $t = N$. This induces the posterior $\beta (\mu) = 0$. The result, then, follows. ∎

Proof of Proposition 3. The discount factor δ affects only the threshold value of reputation:

$$\frac{\partial \underline{\mu} (\delta)}{\partial \delta} > 0.$$

Thus, the range of reputation levels for which the equilibrium is semiseparating decreases. Moreover,

$$\frac{\partial \left(\frac{\mu (1 - \underline{\mu})}{\underline{\mu} (1 - \mu)} \right)}{\partial \delta} < 0,$$

so that the probability of scapegoating increases. The same is true for the range of levels for which the equilibrium becomes pooling, since the probability of scapegoating jumps to 1.

The size of failure and the contribution of the competent worker affect the threshold values of both the discount factor and reputation:

$$\frac{\partial \underline{\delta}}{\partial b} > 0 \text{ and } \frac{\partial \underline{\mu} (\delta)}{\partial b} < 0; \text{ while } \frac{\partial \underline{\delta}}{\partial g} < 0 \text{ and } \frac{\partial \underline{\mu} (\delta)}{\partial g} > 0.$$

A higher b or a lower g lead to an increase in $\underline{\delta}$, expanding the range of discount factors for which scapegoating is optimal. Moreover, $\underline{\mu} (\delta)$ is decreasing, and the same argument as above applies: the range of reputation levels for which the equilibrium is pooling (semiseparating) increases (shrinks).

$\Pr (N, f | \mu) = \Pr (N) \Pr (f | N, \mu)$ is monotonic in $\Pr (f | N, \mu)$, since $\Pr (N) > 0$. Moreover, $\Pr (N | f, \mu) = \frac{\Pr(N) \Pr(f | N, \mu)}{\Pr(I) \Pr(f | I, \mu) + \Pr(N) \Pr(f | N, \mu)}$ is also monotonic in

$\Pr\left(f|N,\mu\right)$ since $\Pr\left(f|I,\mu\right)$ is not affected by the changes in parameters. Consequently, these changes in parameters affect $\Pr\left(N,f|\mu\right)$ and $\Pr\left(N|f,\mu\right)$ in the same direction as they affect $\Pr\left(f|N,\mu\right)$. ∎

Proof of Proposition 4. For part (i) and (iia), the proof proceeds along the lines of the one for Proposition 1. Specifically, for the separating equilibrium we have the condition $\delta > \underline{\delta}_1$, while for the semiseparating equilibrium on types we have $\delta < \underline{\delta}_1$, and $\mu < \underline{\mu}_1\left(\delta\right)$.

When $\mu > \underline{\mu}_1\left(\delta\right)$, the "$L$-type" manager may also scapegoat, but only if reputation is sufficiently high. In fact, he will not scapegoat if

$$\pi\left(f,\mu,L\right) =$$
$$\pi\left(f,L\right) + \left(1-\delta\right)\left(\mu\left(\pi\left(f,I\right) - \pi\left(f,N\right)\right) + \pi\left(f,N\right) - \pi\left(f,L\right)\right) < \pi\left(n\right),$$
$$\text{or } \mu < \underline{\mu}_2\left(\delta\right) \equiv \frac{1}{\left(1-\delta\right)}\frac{\pi\left(n\right) - \pi\left(f,L\right)}{\pi\left(f,I\right) - \pi\left(f,N\right)} - \frac{\pi\left(f,N\right) - \pi\left(f,L\right)}{\pi\left(f,I\right) - \pi\left(f,N\right)}.$$

Thus, the pooling equilibrium on types occurs for $\delta > \underline{\delta}_2 \equiv \frac{\pi\left(f,I\right)-\pi\left(n\right)}{\pi\left(f,I\right)-\pi\left(f,L\right)}$, or $\delta < \underline{\delta}_2$, and $\mu \in \left(\underline{\mu}_1\left(\delta\right),\underline{\mu}_2\left(\delta\right)\right)$, where $\underline{\mu}_2\left(\delta\right) = \underline{\mu}_1\left(\delta\right) + \frac{\delta}{\left(1-\delta\right)}\frac{\pi\left(f,N\right)-\pi\left(f,L\right)}{\pi\left(f,I\right)-\pi\left(f,N\right)}$.

When $\delta < \underline{\delta}_2$, and $\mu > \underline{\mu}_2\left(\delta\right)$ an "L-type" manager will scapegoat with strictly positive probability (while the poorly informed manager always scapegoats, $\sigma\left(\mu,\lambda,N\right) = 1$). Specifically, when

$$\pi\left(f,\mu,L\right) =$$
$$\pi\left(f,L\right) + \left(1-\delta\right)\left(1-\lambda\right)\left(\mu\left(\pi\left(f,I\right) - \pi\left(f,N\right)\right) + \pi\left(f,N\right) - \pi\left(f,L\right)\right) < \pi\left(n\right),$$

that is, as long as

$$\mu < \min\left(\underline{\mu}_3\left(\delta,\lambda\right) \equiv \frac{1}{\left(1-\delta\right)\left(1-\lambda\right)}\frac{\pi\left(n\right) - \pi\left(f,L\right)}{\left(\pi\left(f,I\right) - \pi\left(f,N\right)\right)} - \frac{\pi\left(f,N\right) - \pi\left(f,L\right)}{\pi\left(f,I\right) - \pi\left(f,N\right)}, 1\right),$$

the "L-type" manager scapegoats with probability

$$\sigma\left(\mu,\lambda,L\right) = \frac{\mu - \underline{\mu}_2}{\underline{\mu}_3 - \underline{\mu}_2}, \text{ respectively } \sigma\left(\mu,\lambda,L\right) = \frac{\left(1-\lambda\right)}{\lambda}\frac{\delta\left(\mu - \underline{\mu}_2\right)}{\underline{\mu}_2 - \left(1-\delta\right)\underline{\mu}_1},$$

where the equilibrium strategies come either from

$$\underline{\mu}_3 \left(\pi\left(f,I\right) - \pi\left(f,N\right)\right) + \pi\left(f,N\right) - \pi\left(f,L\right) =$$
$$\frac{\mu\left(\pi\left(f,I\right) - \pi\left(f,N\right)\right) + \pi\left(f,N\right) - \pi\left(f,L\right)}{\lambda\sigma\left(\mu,\lambda,L\right) + \left(1-\lambda\right)}, \text{ or from}$$
$$\underline{\mu}_2 \left(\pi\left(f,I\right) - \pi\left(f,N\right)\right) + \pi\left(f,N\right) - \pi\left(f,L\right) =$$
$$\left(1-\lambda\right)\frac{\mu\left(\pi\left(f,I\right) - \pi\left(f,N\right)\right) + \pi\left(f,N\right) - \pi\left(f,L\right)}{\lambda\sigma\left(\mu,\lambda,L\right) + \left(1-\lambda\right)}.$$

Thus, the semiseparating equilibrium on states occurs for $\delta < \underline{\delta}_2$, and $\mu \in \left(\underline{\mu}_2\left(\delta\right), \min\left(\underline{\mu}_3\left(\delta\right), 1\right)\right)$, where $\underline{\mu}_3\left(\delta,\lambda\right) = \frac{\underline{\mu}_2(\delta)}{(1-\lambda)} + \frac{\lambda}{(1-\lambda)}\frac{\pi(f,N)-\pi(f,L)}{\pi(f,I)-\pi(f,N)}$.

Lastly, when $\underline{\mu}_3\left(\delta,\lambda\right) < \mu < 1$, the "$L$-type" manager always scapegoats, $\sigma\left(\mu,\lambda,L\right) = 1$. Taking into account that $\pi\left(f,\mu,L\right)$ is increasing in μ and decreasing in δ, $\max\left[\pi\left(f,\mu,L\right)\right] = \left(1-\lambda\right)\pi\left(f,I\right) + \lambda\pi\left(f,L\right)$. Therefore, an additional condition for this latter pooling equilibrium is $\pi\left(f,1,L\right) > \pi\left(n\right)$, that is,

$$\lambda < \underline{\lambda} = \frac{\pi\left(f,I\right) - \pi\left(n\right)}{\pi\left(f,I\right) - \pi\left(f,L\right)}.$$

If the above condition fails, there exists no pooling equilibrium on states. The only equilibrium in which the "L-type" manager scapegoats is the semiseparating one. ∎

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