

# Entrenchment, Team Incentives and Pressure from Shareholders: Explanation of the Adoption or Abandonment of Takeover Defenses

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## Abstract

Some firms adopt takeover defenses while others do not. This paper presents a model that clarifies the mechanism of corporate decision-making on whether to adopt or withdraw takeover defenses. In this model, managers sometimes abandon the adoption of takeover defenses, despite their interest in entrenchment, considering free-rider problem of the management team and/or as a result of pressure from shareholders. By modeling the decision to not introduce takeover defenses, as well as the decision to do so, the underlying mechanisms of the empirical results can be better understood. The differences in outcome between Japan and the US can be explained by a single model.

*JEL Classification:* G34, K22

## 1 Introduction

Some firms adopt takeover defenses while others do not. For example, in Japan, as of June 2007, takeover defenses were in place at approximately 300 firms,<sup>1</sup> which represents a rather small portion of the total number of publicly traded firms. Thus, to understand corporate decisions to adopt takeover defenses, we have to study not only why managers of some firms introduce takeover defenses, but also

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<sup>1</sup> IR Japan, Inc., "Status of the introduction of takeover defenses (In Japanese)," June 2007.

why managers of other firms abandon these defenses. That is, we must study the *costs* of takeover defenses for managers.

About the reasons why managers introduce takeover defenses has been well examined by the previous research. Schleifer and Vishny (1989) and Schnitzer (1995) present a model of entrenchment where incumbent managers lessen the threat of replacement with alternative managers by making “manager-specific investments.” Shleifer and Summers (1987) and Molin (1996), Bebchuk (2002) and Iijima and Ieda (2006) investigated the possibility that the introduction of takeover defenses improves the relationship-specific investment of stakeholders and that of managers, respectively. Brickey *et al.* (1994), Comment and Schwert (1995), and Cotter *et al.* (1997) pointed out that the adoption of takeover defenses increases the bargaining power of managers during a corporate takeover. These researches are referred to by many empirical studies on the introduction of takeover defenses in Japan,<sup>2</sup> as well as those in other countries, and used to interpret their results.

On the other hand, there had not been an explicit theoretical investigation into why managers decide to abandon takeover defenses. Many empirical studies implicitly thought that managers abandon takeover defenses because of strong shareholder pressure. That is, due to pressure from shareholders, managers do not introduce these defenses or, they are in danger of being replaced if they do not withdraw them.

However, how can we explain the fact that takeover defenses are introduced only by a small portion of publicly traded firms? A large number of publicly traded firms abandon takeover defenses in Japan. Are many Japanese firms held by such strong and active shareholders? Are there any other reasons by which managers abandon these defenses?

This paper presents a model where managers sometimes abandon takeover defenses even without strong shareholder pressure. As to the reasons why managers abandon takeover defenses, this paper examines the possibility that managers abandon takeover defenses for consideration of free-rider problems of managers themselves.<sup>3,4</sup>

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<sup>2</sup> A number of empirical studies, including Chishima (2006), Hirose *et al.* (2007), Takizawa *et al.* (2007), Arikawa and Mitsusada (2008) have been carried out. The following two points have been shown. First, the introduction of takeover defenses has a negative effect on share prices, that is, it does not enhance shareholder value, at least in the short run. Second, firms that introduce these defenses tend to have a high proportion of cross shareholding (*mochiai*), making pressure from the shareholders comparatively low.

<sup>3</sup> The team incentive problems pointed out by Holmström (1982), which is followed by many investigations, including more recently work by Che and Yoo (2001). However, no research has been conducted to apply this to takeover defenses.

<sup>4</sup> Akabane's (2000) work on security design and Isagawa's (2002) study on cross shareholding (*mochiai*) by firms are closely related to this paper. In their model, entrepreneurs (in the former paper) or managers (in the latter paper), expose themselves to the danger of replacement as a self-disciplinary measure, although they do not consider the issue of team incentives. Our paper considers both team incentives and shareholder pressure to obtain empirical implications, which are not derived by the previous model.

The intuition of my model is the following. In the case where management operations at the firm are the result of teamwork and there is no recognition of individual effort, then ordinary compensation schemes, which depend on the performance of the entire team, cannot resolve the problem of underperforming, free-riding individuals.<sup>5</sup> In this situation, if managers are under takeover threats, then each individual may display extra productive effort to avoid replacement.

If the entire management team is motivated by either monetary or non-monetary rewards, such as fame, then some management teams self-disciplinarily abandon takeover defenses, particularly those in little danger of replacement so long as the team can extract appropriate effort. Management teams face trade-offs between a contraction in team incentives and the danger of being replaced. Though managers are interested in entrenchment, considering free-rider problems of the management team, the team may expose themselves to the danger of replacement.<sup>6</sup>

The paper is organized as follows: Section 2 describes the model, Section 3 provides an equilibrium analysis of the introduction of takeover defenses to which comparative statistics are applied in Section 4. Finally, Section 5 describes our conclusions.

## 2 Model

The model involves two principal parties: the incumbent management team, made up of multiple members, denoted by  $n=1,\dots,N$  ( $N \geq 1$ ); and the shareholders (as a single entity — in other words, the issue of conflicts between shareholders is not addressed here). Both actors are risk-neutral and seek to maximize their expected payoff. To simplify the analysis, the alternative management team and potential buyers appear only in the discussion and are not treated here as independent decision-makers.

The incumbent management team and the shareholders undertake several actions related to the operation of the firm. The sequence of these actions is shown below in Figure 1.

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<sup>5</sup> In principle, it is difficult to commit to a specific level of effort. Since managerial operations are not simple, outsiders cannot even perceive which areas require effort.

<sup>6</sup> In April, 2008, the Japanese leading cosmetics company, Shiseido, decided to abandon its previously introduced takeover defenses. This is the one of the biggest news stories on takeover defenses in this year. After publication of this news, Shiseido's share price rose sharply. The CEO of Shiseido Company said that this decision is to cut-off the retreat of managers and to motivate them. Although this decision is natural and understandable, we had had no model to describe this aspect at all. The model of this paper, can explain the aspect that occurred this spring.

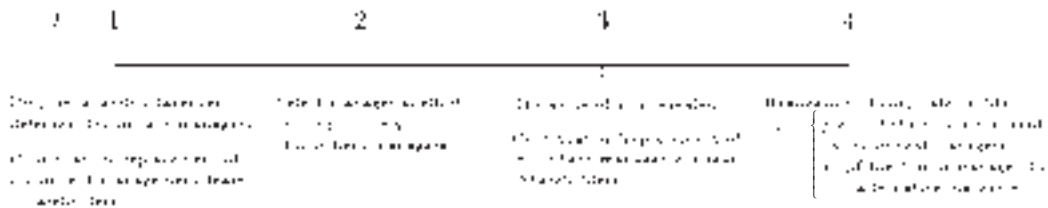


Figure 1: Timeline

At stage 1, the decision on whether to adopt takeover defenses is made. First, the incumbent management team decides whether to propose or to abandon takeover defenses, and the shareholders decide whether to allow the incumbent management team to continue or to replace them with the alternative management team. Here, replacement is the only instrument by which shareholders can effectively oppose the incumbent management team's introduction of takeover defenses.<sup>7</sup> Regarding the extent of opposition by shareholders, the strength (or weakness) of shareholder pressure is modeled and parameterized as shown below (at Assumption 2). Both of these actions—those of the incumbent management team and the shareholders—are observable. In addition, if takeover defenses are successfully introduced, subsequent corporate takeovers (and replacement of the incumbent management team) are completely avoided.<sup>8</sup>

At stage 2, managerial effort when the incumbent management team remains in place is shown. Should the management team be replaced, the process moves directly to stage 4.<sup>9</sup> The members of the incumbent management team each simultaneously set their level of managerial effort,  $e = e_1, \dots, e_N$ . They cannot make commitments regarding other members' levels of effort.<sup>10</sup>

At stage 3, the incumbent management team is once again faced with the threat of replacement. This stage describes the possibility of a corporate takeover. If the incumbent management team continues without introducing takeover defenses, the existing and alternative management teams are in direct competition. (If takeover defenses had been introduced at stage 1, the incumbent management team avoids this situation). The difference in the difficulty of replacing the management team at stage 1 or 3 is modeled below (at Assumption 2).

<sup>7</sup> We exclude the case where shareholders can reject the introduction of takeover defenses without replacing incumbent managers. The reason is that if this were possible, shareholders of any firms rejected the introduction of takeover defenses. (The introduction of such defenses benefiting shareholders may be the exception; however, this contradicts the facts that these defenses negatively affect share prices.)

<sup>8</sup> This assumption is to simplify the analysis. Though this assumption gives us no difficulty in interpreting the results of the empirical studies referred in the Introduction, to understand the results of Bebchuk *et al.* (2002), we need to model some incompleteness in takeover defenses and parameterize the strength of defenses. See Section 5.

<sup>9</sup> This paper explicitly excludes analysis of the determination of effort of alternative managers.

<sup>10</sup> See footnote 6.

At stage 4, the firm's profit is determined. Profit depends on past events, including replacement of the managers and the level of management effort. It is formulated as described below.

**Assumption 1.** *If the incumbent management team remains in place, corporate profit,  $y$ , which is observable is given by  $y = \frac{1}{N} \{f(e_1) + \dots + f(e_N)\}$ , where  $f \geq 0$ ,  $f' > 0$ ,  $f'' < 0$ . The disutility level of each member is  $\frac{1}{N} e_n$ . Neither  $e_n$  nor  $f(e_n)$  is observable for anyone other than the individual member,  $n$ .*

**Assumption 2.** *If the incumbent management team is dismissed at stage 1, the alternative management team is brought in and the corporate profit is  $x$ . If the replacement occurs at stage 3, profit is  $x$ .  $0 < \alpha \leq 1$ .*

**Assumption 3.** *The  $x$  in Assumption 2 is a random variable with a uniform distribution over  $[0, \bar{x}]$  ( $\bar{x} > 0$ ). The value of  $x$  is revealed at stage 3.*

The  $\alpha$  of Assumption 2 reflects the difference in the difficulty of replacing the management team at stages 1 or 3. Replacing the team at stage 1 (by shareholder pressure) may be more difficult than replacing the management team at stage 3 (upon corporate takeover). Managers cannot easily be replaced by shareholder pressure without a corporate raider in some countries, such as Japan. This situation is formalized in the higher frictional cost, small value of  $\alpha$ . When  $\alpha = 1$ , there is no frictional cost, and shareholder pressure is assumed to be strong. The parameter  $\alpha$  defines the social obstacles to replacing incumbent managers.<sup>11</sup>

Shareholders obtain a proportion of corporate profit,  $sy$ . It is assumed that this ratio,  $s$ , is exogenous and does not change, regardless of whether the incumbent management team remains or is changed. The management team acquires the remaining profit  $(1-s)y$ , explaining the incumbent management team's interest in the corporate profit.<sup>12</sup> Each member's compensation is defined by  $\frac{1}{N} (1-s)y$  ( $= \frac{1}{N} (1-s) \{f(e_1) + \dots + f(e_N)\}$ ) when the incumbent management team remains. When the incumbent management team is replaced, they receive no share of the profit. The reservation utility level of the incumbent management team for the external market is normalized to zero.

The model can be summarized in the game tree shown in Figure 2.

<sup>11</sup> Section 4 presents comparative statistics with respect to  $\alpha$ .

<sup>12</sup> We think that the management team (1) has bargaining power and obtains a portion of the corporate profit (their bargaining power is  $1-s$ ), (2) received performance-based compensation, or, (3) is interested in the fame associated with high corporate profit.

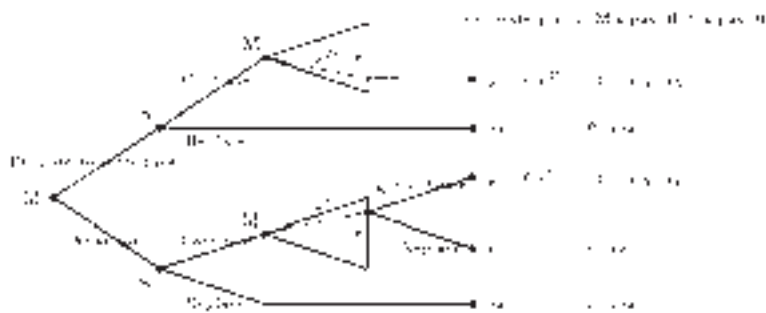


Figure 2: Model expressed as a game tree  
 $M$  is the incumbent management team,  $M'$  represents the alternative team

### 3 Equilibrium

The following section identifies the equilibrium (backward induction solution) of the above model. Comparative statistics and implications for research are provided in the next section. This section serves to prepare for that discussion.

#### 3.1 Shareholder response to a corporate takeover

The shareholder decision at stage 3 is simple.<sup>13</sup> At this point, the value of  $x$  (the abilities of the alternative management team) become apparent. For  $y \geq x$ , the shareholders will allow the incumbent management team to continue, and for  $y < x$ , they will be replaced with the alternative management team. Note that the shareholder payoff is  $sy$  if the incumbent management team are retained and is  $sx$  if they are replaced with the alternative management team. In short, the incumbent management team will be replaced if and only if an alternative management team that earns higher profits is available (and, in that case, if the buyer makes a high offer).

#### 3.2 Managerial incentives

The level of effort on the part of the incumbent management team depends on whether or not takeover defenses are introduced. The proper management of the decision regarding takeover defenses can benefit the entire team.

This can be formalized as follows:

<sup>13</sup> The analysis of this subsection applies when takeover defenses are not adopted. If they are adopted, there is no decision-making at stage 3.

**Proposition 1.** Consider the incumbent management team's level of effort. The symmetric equilibrium  $e_1 = e_2 = \dots = e_N$  is assumed.

1. When the maximization of the incumbent management team's overall benefit are considered as a benchmark, the solution  $e^*$  is satisfied

$$(1 - s) f'(e^*) = 1. \quad (1)$$

if it is an interior solution. However, as long as each member cannot commit his/her level of effort, the level  $e^*$  cannot be attained. When takeover defenses are introduced, the level of effort  $e^D$  is satisfied

$$\frac{1}{N} (1 - s) f'(e^D) = 1. \quad (2)$$

Therefore, the entire incumbent management team benefits when the incentives of each member are increased.

2. When takeover defenses are abandoned:

$$\begin{cases} \frac{2f(e^*)}{\bar{x}} : \frac{1}{N} (1 - s) f'(e^*) = 1 & \text{if } \bar{x} > f(e^*), \\ \frac{1}{N} (1 - s) f'(e^*) = 1 & \text{if } \bar{x} < f(e^*). \end{cases} \quad (3)$$

For example, for  $\bar{x} \geq f(e^*)$ , effort incentives are roughly twice as in the case of the introduction of takeover defenses, if  $\bar{x}$  is assumed to be slightly larger than  $f(e^*)$  (that is, if the possibility of replacing the management team is not zero, but the probability is also not as high).

Proof: The payoff to the entire incumbent management team is

$$(1 - s) \frac{1}{N} \sum_{n=1}^N f(e_n) - \sum_{n=1}^N \frac{1}{N} e_n. \quad (4)$$

The first-order condition for the maximization of this payoff can be written as  $(1 - s) f'(e^*) = 1$ .

In contrast, the payoff to each individual manager becomes

$$\frac{1}{N} (1 - s) \frac{1}{N} \sum_{n=1}^N f(e_n) - \frac{1}{N} e_n \quad (n = 1, 2, \dots, N) \quad (5)$$

when takeover defenses are introduced. Note that the payoff to each member  $\frac{1}{N}$  of the payoff to the entire management team. The first-order condition for the maximization can be written as  $\frac{1}{N} (1 - s) \times f'(e^D) = 1$ .

When takeover defenses are introduced, the expected payoff to each manager is

$$\min\left\{\frac{1}{N} \sum_{n=1}^N f(e^n), 1 + \frac{1}{N} (1-s) \sum_{n=1}^N f(e^n)\right\} - \frac{1}{N} e^n \quad (n = 1, 2, \dots, N). \quad (6)$$

(Here,  $\min\left\{\frac{1}{N} \sum_{n=1}^N f(e^n), 1\right\}$  is the probability that the incumbent management team will remain in place. When  $\frac{1}{N} \sum_{n=1}^N f(e^n) \geq x$ , they cannot be replaced. We suppose that  $x$  has a uniform distribution, so the probability can be obtained as shown). The first-order conditions for the maximization of expected payoff are as follows: When  $\bar{x} \geq f(e^U)$ , it is  $\frac{df}{dx} = \frac{1}{N} (1 - sf'(e^U)) = 1$ . When  $\bar{x} < f(e^U)$ , it is  $\frac{d}{dx} (1-s)f'(e^U) = 1$ .<sup>14</sup>

### 3.3 Shareholder response to the proposed introduction of takeover defense

We introduce the following two notations:

$$V^D = sf(e^U). \quad (7)$$

$$V^X = \frac{s^2 f}{2}. \quad (8)$$

The first equation represents the expected shareholder payoff when takeover defenses are introduced, while the second equation represents the expected shareholder payoff for rejecting takeover defenses and bringing in alternative management.

Using this notation, we can express the shareholder response to proposed introduction of takeover defenses by incumbent managers through the following equations. The shareholders will agree to the adoption of takeover defenses when  $V^D \geq V^X$ , or, in other words, when  $\bar{x} \geq \frac{sf(e^U)}{2}$ . They will reject the introduction of takeover defenses when  $V^D < V^X$ , or, in other words, when  $\bar{x} < \frac{sf(e^U)}{2}$ . In short, if the abilities of the alternative management team,  $\bar{x}$ , are sufficiently large, takeover defenses will not be permitted.

Note that when the incumbent management team does not propose the introduction of takeover defenses, shareholders never replace the incumbent management team at this stage regardless of the size of  $\bar{x}$ . Shareholder payoff when the incumbent management team remains is  $E[\max\{sx, sf(e^U)\}]$ , which will definitely be higher than the payoff if they replace management at this stage,  $E[sx]$ . In sum, if takeover defenses are not introduced, then the decision of replacing the incumbent management team is made after the abilities of the alternative management team are known at stage 3.

<sup>14</sup> Not all functions are convex. Even if function A is larger than B, the derivative of A is not always larger than the derivative of B.



### 3.4 Introduction of takeover defenses

In the model given in this paper, team incentives and shareholder pressure impede the introduction of takeover defenses by the incumbent management team. First, management teams face trade-offs between a contraction in team incentives and the danger of being replaced. For managers who are interested in profits of the firm, improved management can outweigh the costs of replacing managers. In addition, the danger that the introduction of takeover defenses could trigger the dismissal of the incumbent management team is present. When the incumbent management team's abilities are relatively lower than those of the alternative management team, the incumbent management team will hesitate to introduce takeover defenses.

These intuitions are expressed formally as follows. First, we consider the cancellation of takeover defenses as a self-disciplinary measure taken due to the concern about team incentive. The incumbent management team's entire expected payoff is defined as follows:

$$W^D = (1 - \delta) f(V^D) - c^D \quad (9)$$

$$W^U = \frac{f(V^U)}{r} (1 - \delta) f(V^U) - c^U \quad (10)$$

Equation 9 represents the payoff when takeover defenses are introduced, and Equation 10 represents the payoff when the introduction of takeover defenses is cancelled. Using these notations, it is clear that takeover defenses will be introduced when  $W^D > W^U$  and will be cancelled when  $W^U \geq W^D$ . When  $W^U \geq W^D$ , the management team will voluntarily abandon the introduction of takeover defenses, even without shareholder pressure.

Next, we describe the cancellation of the introduction of takeover defenses due to shareholder pressure. In Subsection 3.3, we described the conditions for shareholders to dismiss the incumbent management team. Under these conditions, the incumbent management team will definitely abandon the introduction of takeover defenses because their payoff in the case of dismissal is zero, while the chance of receiving positive payoff remains if the measures are withdrawn.

**Proposition 2.** *The incumbent management team will abandon the introduction of takeover defenses under either of the following two conditions.*

- $W^U \geq W^D$  (then managers are forced to withdraw the introduction of takeover defenses by pressure from shareholders), or
- $V^D < V^X$  (then managers take self-disciplinary action to abandon takeover defenses considering free-rider problem of the management team) (11)

## 4 Comparative statistics and empirical implications

As shown above, there are two aspects to the abandonment of the introduction of takeover defenses: abandonment due to concern about team incentive and by shareholder pressure. This section presents comparative statistics with respect to three parameters,  $\bar{x}$ ,  $\alpha$ , and  $N$ , in order to derive the empirical implications of our model.

### 4.1 Corporate business prospects under incumbent managers and the decision to introduce or abandon takeover defenses

First, let us consider the comparative statistics with respect to  $\bar{x}$ . This paper interprets the value of  $\bar{x}$  as the relative weakness of a firm's business prospects under the incumbent managers. Firms with a high  $\bar{x}$  value have a propensity to obtain an alternative management team with relatively high abilities, that is, the abilities of its incumbent management team are low.

Intuitively, when the firm's business prospects are weak (i.e., the value of  $\bar{x}$  is high), shareholders do not allow the introduction of takeover defenses with credible threats to replace incumbent managers for alternative ones if they introduce takeover defenses. On the other hand, when the firm's business prospects are strong (i.e., the value of  $\bar{x}$  is low), the incumbent managers are inclined to abandon the introduction. In short, the generally monotonic correlation between business prospects and the decision to introduce or abandon takeover defenses is not observed. Figure 3 summarizes the results shown in this subsection.

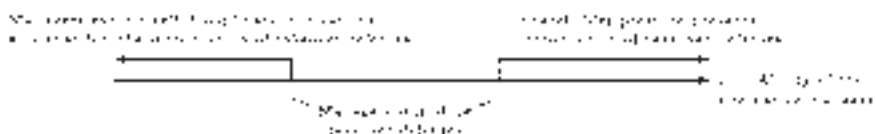


Figure 3: The introduction or abandonment of takeover defenses

As shown in Subsection 3.3, when  $V^D < V^X$ , the shareholders will not permit the introduction of takeover defenses. Clearly, the outcome will be more certain for larger values of  $\bar{x}$ . When the alternative management team is highly capable, shareholders replace the incumbent management team if they propose to introduce takeover defenses.

**Lemma 1.** *Considering the replacement of the managers with the alternative one, managers choose to abandon takeover defenses when the value of  $\bar{x}$  is likely to be high.*

In contrast, when the ability of the alternative management team,  $\bar{x}$  is high, the probability of

replacement increases and (1) the incumbent management team's incentives to work are weakened, because, even if they are diligent, there is a high probability that they will be replaced; (2) the cost of abandoning these defenses, or the disutility of replacement is greater. In either case, the incumbent management team will prefer to introduce the takeover defenses.

**Lemma 2.** *Considering the team incentives, managers choose not to adopt takeover defenses when the value of  $\bar{x}$  is likely to be low.*

1. *If  $\bar{x} \leq f(e^U)$  (the value of  $\bar{x}$  is so small that there is no chance of management being replaced), the incumbent management team abandons the introduction of takeover defenses. If  $\bar{x} \geq 2f(e^U)$ , the incumbent management team introduces takeover defenses. In short, the threshold value for the abandonment or adoption of takeover defenses is within the interval defined as  $f(e^U) < \bar{x} < 2f(e^U)$ .*
2. *In the interval  $f(e^U) < \bar{x} < 2f(e^U)$ , the incumbent management team's payoff,  $W^U$ , following abandonment of the introduction of takeover defenses, monotonically decreases with respect to the relative abilities,  $\bar{x}$ , of the alternative managers. From this, we can see that as  $\bar{x}$  decreases, the incumbent managers tend to abandon takeover defenses.*

Proof: If  $\bar{x} \leq f(e^U)$ , there is no chance that managers will be replaced and  $W^U \geq W^D$ . In this case, the incumbent managers abandon takeover defenses. On the other hand, when  $\bar{x} \geq 2f(e^U)$ , even if managers abandon the introduction of takeover defenses, the incentives of the incumbent management team will not increase (Proposition 1) and only the risk of dismissal is increased. The incumbent managers, thus, introduce takeover defenses.

To understand whether the latter part of this proposition is valid, we differentiate  $W^U$  with respect to  $\bar{x}$ . (Since  $W^D$  does not depend on the value of  $\bar{x}$ , for monotonically decreasing  $W^U$ , we can conclude that the proposition is true.) This is the sum of the direct effects of the changes in the value of  $\bar{x}$ ,  $\frac{\partial W^U}{\partial \bar{x}}$ , and the indirect effects of the changes in the value of  $e^U$ , are expressed by  $\frac{\partial W^U}{\partial e^U} \cdot \frac{\partial e^U}{\partial \bar{x}}$ . The direct effects are clearly negative. For the indirect effects, an increase in the value of  $\bar{x}$  decreases the value of  $e^U$  (Proposition 1), and in turn, a decrease in the value of  $e^U$  reduces the team's payoff,  $W^U$ . (Note that the level of effort  $e^U$  is shorter than the teams' optimal level  $e^*$ .) Thus, the above-mentioned conclusion can be obtained.

In this manner, the introduction or withdrawal of takeover defenses by a firm is generally not monotonically related to its business prospects. (See Figure 3.) Firms that do not introduce takeover defenses may enjoy relatively strong business results by providing team incentives. Furthermore, the incumbent management team that predicts strong business results will be inclined to abandon the

introduction of takeover defenses. However, there are firms that have not introduced takeover defenses due to shareholder pressure. Therefore, it does not necessarily follow that because a firm has not introduced takeover defenses, its business prospects under incumbent managers are good.

#### 4.2 Weakness of shareholder pressure and patterns in the introduction or abandonment of takeover defenses

In this paper, weak shareholder pressure is expressed by a low value of  $\bar{x}$ , which means that shareholders will not replace the incumbent management team with an alternative one unless their abilities are exceedingly low. Obviously, the lower the value of  $\bar{x}$ , the easier it will be for the incumbent management team to introduce takeover defenses. In extreme cases, the only thing that may prevent the adoption of takeover defenses is the concern about team incentives of incumbent managers.

**Proposition 3.** *The non-monotonic relationship between the relative abilities of incumbent managers,  $\bar{x}$ , and whether to adopt takeover defenses is observed. Firms that do not introduce takeover defenses may enjoy relatively strong business results by providing team incentives. Furthermore, the incumbent management team that predicts strong business results will be inclined to abandon the introduction of takeover defenses. However, there are firms that have not introduced takeover defenses due to pressure from shareholders. These firms will have relatively weak business prospects under the incumbent management team.*

Proof: The value of  $\bar{x}$  is not related to the self-disciplinary abandonment applied by the incumbent management team. The value is related only to the extent of shareholder pressure applied to prevent the introduction of takeover defenses. When  $V^D \geq V^X$ , that is when  $\bar{x} \leq \bar{x}^*$ , the shareholder will permit the introduction of takeover defenses. Takeover defenses are easier to introduce for smaller values of  $\bar{x}$ .

Moreover, if  $\bar{x}$  is low, the firms that do not introduce takeover defenses either have a low value of  $\bar{x}$  or have an extraordinarily high value of  $\bar{x}$ . In intermediate ranges, the tendency for firms not to introduce takeover defenses increases for lower values of  $\bar{x}$ .

In the previous subsection, the abandonment of takeover defenses was shown to not necessarily indicate good business prospects under incumbent managers. However, when the value of  $\bar{x}$  is low, the tendency for firms which abandon takeover defenses tend to have good business prospects, and this becomes more pronounced because shareholder pressure is not effective in preventing the introduction of takeover defenses. Only a self-disciplinary force by the incumbent management team can prevent the introduction (see also Figure 4).

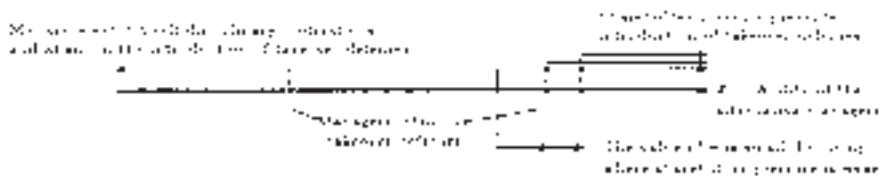


Figure 4: Patterns in weakness of shareholder pressure and the introduction or abandonment of takeover defenses

The results of our model, which are summarized in Figure 4, suggest the following three empirical implications. First, the average business prospects of the firm which abandon (or introduce) takeover defenses are influenced by the social strength of shareholder pressure. In a country with weak shareholder pressure, like Japan for example, concern about a contraction in team incentives is the primary reason for the abandonment of the introduction of takeover defenses. Firms that do not introduce such defenses are expected to have good business prospects under incumbent managers, while the prospects for firms that introduce these defenses are discouraging. (See Figure 4.) Thus, the average business prospects for a firm that introduces takeover defenses significantly lower than that of a firm that does not. In contrast, in countries with strong shareholder pressure, like the US, this concern also contributes to the abandonment of the introduction of takeover defenses. Whether the average business prospects are better for a firm that introduces takeover defenses or for a firm that does not remains undefined.

Empirical studies so far showed different outcomes in Japan and the US. In Japan, it is clearly observed that the introduction of takeover defenses has a negative effect on share prices.<sup>15</sup> In contrast, the results of empirical research in the US have not been as apparent.<sup>16</sup> This paper explains these different outcomes using a single model. By the difference in the strength of shareholder pressure between Japan and the US, different outcomes are obtained. From this insight, reviewing team incentive problems with consideration of shareholder pressure is useful.<sup>17</sup>

The second point concerns the interpretation of the empirical results. If an empirical study shows the negative effects of the introduction of takeover defenses on share prices, in general, it can be explained by the following two possible interpretations: First, the decreases in share price are caused by an (expected) decline in incentives of entrenched managers and, second, the managers who have inherently weak prospect introduce these defenses. (See also Coates(2000).) The above Proposition shows

<sup>15</sup> See footnote 2.

<sup>16</sup> For example, Linn and McConnell (1983) conclude empirically that the use of anti-takeover provisions is benefiting share prices. In contrast, Malatesta and Walkling (1988) and Ryngaert (1988) derive negative effects on share prices. Furthermore, Gompers *et al.* (2003) studied the relationship between the protection on shareholder rights and returns on stocks and discovered that corporate returns for a company with a weak protection (with many takeover defenses) are low. However, Core *et al.* (2006) came to the opposite conclusion by performing the same analysis over a different period.

that, in the situation where firms are held by weaker or more passive shareholders, the second possibility is enlarged. Therefore, in the country where shareholders are passive, the results of empirical studies should be evaluated carefully not to overlook the second possibility. (This may be the case in Japan.)<sup>17</sup>

Finally, suppose temporarily that the pressure from shareholders is the only factor which prevents the introduction of takeover defenses. Then, it is concluded that only firms with relatively poor business prospect under the incumbent management team abandon takeover defenses. However, this conclusion contradicts the empirical result especially in Japan (mentioned soon later in detail), which shows that the introduction of takeover defenses has a negative effect on share price. Hence, to understand the corporate decision of introduction of takeover defenses, considering the other factors, such as the concern on team incentive, may be important and useful.

### 4.3 The number of managers in the management team and the introduction of takeover defenses

No clear relationship between the number of managers ( $N$ ) in the management team and the introduction of takeover defenses was found. Increasing the number of managers increases the distortion of team incentives, contributing to the cancellation of the introduction of takeover defenses. However, this increases the probability of dismissal, also promoting measures to strengthen entrenchment.

To confirm this intuition, we differentiate  $W^U - W^D$  (the difference between the payoff to the incumbent management team when takeover defenses are adopted and when they are abandoned) by  $N$ .

$$\frac{\partial(W^U - W^D)}{\partial N} = \frac{f(e^U)}{s} \frac{\partial W(e^U)}{\partial e^U} \frac{\partial e^U}{\partial N} - W(e^D) \frac{f'(e^D)}{s} \frac{\partial e^D}{\partial N} - \frac{\partial W(e^D)}{\partial e^D} \frac{\partial e^D}{\partial N} \quad (12)$$

Here,  $W(e) = (1-s)f(e) - e$ .  $\frac{\partial e^U}{\partial N}$  shows the increasing distortion of incentives as the value of  $N$  increases.

For example, assume  $e^U = e^*$  (this assumption is fulfilled when  $\bar{x} = f(e^U)$  and  $N=2$ ). At this

<sup>17</sup> In this paper, we concentrate on explaining that the firms that abandon (introduce) takeover defenses correspond to types with strong (weak) business prospects under incumbent managers when shareholder pressure is weak. However, if these business prospects are commonly perfectly known, the decision to adopt takeover defenses has no effect on stock price: no difference in return of stocks is observed. Thus, to complete our analysis, we must construct a model with asymmetric information.

Under asymmetric information, agents act considering signaling effects: managers with weak business prospects may abandon the introduction of takeover defenses for seeking instantaneous increases in price; thus, the conclusions of this paper are inappropriate. However, we can point out that the probability of being replaced is definitely different between the managers with good business prospects and those with weak business prospects: that is, signaling cost is clearly different. Thus, to avoid complication, this paper does not provide any explicit analyses, which will be left for a future paper.

<sup>18</sup> This remark on empirical results is derived by considering two factors which prevent the introduction of takeover defenses. If one considered only the pressure from shareholders as a factor which prevents the introduction of takeover defenses, the second possibility was never derived.

point,  $\frac{\partial \pi}{\partial x} = 0$ , and we can ignore the first term. Under these circumstances, whether the result is positive or negative will depend on the magnitude of the second and third terms, and either result is possible.

However, if there is only a single member of the management team (or there are several members who rarely work as a team), takeover defenses can be introduced more easily. In this case, shareholder pressure is the only means of preventing the adoption of takeover defenses.<sup>19</sup> We would expect to see that firms that do not introduce these defenses have poor business prospects under the incumbent management (high  $\bar{x}$ ).

## 5 Conclusions

To understand corporate decisions to adopt takeover defenses, especially in Japan, we have to study not only why managers of some firms introduce takeover defenses, but also why managers of other firms abandon these defenses.

As to the reasons why managers (sometimes) abandon takeover defenses, we consider the following two aspects.

1. Managers are forced to withdraw the introduction of takeover defenses by pressure from shareholders, as implicitly considered by some empirical studies.
2. Managers self-disciplinarily abandon takeover defenses considering free-rider problems of managers themselves. If they are under the danger of replacement, each individual exerts extra productive effort to avoid replacement.

Moreover, our model includes the aspect of the entrenchment of the incumbent management team, which explains the introduction of these defenses.

The non-monotone relationship between the relative ability of the incumbent management team and the introduction of takeover defenses is observed. This relationship is influenced by the changes in passiveness of shareholders. This prediction may be useful for explaining the difference in empirical results between in Japan and in the US.

This paper assumes that the introduction of takeover defenses will completely prevent any takeover. However, we can present a model where takeover can occur with some probabilities even under takeover defenses without having essential changes in the results.

Moreover, in our paper, takeover defenses are not abandoned for interest of shareholders. This is only for simplification of the analysis. If one includes this aspect, takeover defenses will be abandoned more frequently than this paper implies.

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<sup>19</sup> Note that when  $N=1$ , the level of effort which managers choose maximizes the payoff of the entire team, even if takeover defenses are introduced (see also Proposition 1).

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