GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

KOBE UNIVERSITY

ROKKO KOBE JAPAN

Discussion Paper Series

Cross-Shareholding and Unwinding of Cross-Shareholding

Under Managerial Entrenchment

Abstract

This paper examines corporate strategies regarding cross-shareholding and the unwinding of cross-shareholding, and presents a rationale for corporate managers to unwind cross-shareholding from the perspective of managerial entrenchment. While cross-shareholding enhances managerial entrenchment, the increased agency costs associated with managerial opportunism increase the incentives for a hostile takeover. In order to avoid a takeover, managers have to unwind cross-shareholdings. The unwinding of cross-shareholdings implies that managers will relinquish their entrenchment, and thus will act to increase shareholders' wealth in the future. The model proposed here explains why cross-shareholdings among Japanese firms declined during the 1990s, a decade during which the cost of takeovers decreased due to financial market deregulation.

JEL Classification: G32, G34

Ⅰ. Introduction

Cross-shareholding has long been a prominent feature of Japanese corporate finance, but since the 1990s, cross-shareholdings have been declining among Japanese firms. Kuroki (2001) reported that the proportion of cross-shareholdings in the overall market decreased gradually in the 1990s, from about 17% at the end of 1990 to about 10% at the end of 2000. Ang and Constand (2002) also reported that corporate and financial institution holdings decreased in Japan during the 1990s.

Given the recent decline in cross-shareholdings, this paper provides a simple model in which corporate managers dynamically decide to engage in cross-shareholding and, in particular, decide to liquidate cross-shareholdings. Although several studies have focused on cross-shareholdings among Japanese firms, little attention has been paid to the theoretical implications of the unwinding of cross-shareholdings. This paper is an initial attempt to explore the theoretical issues surrounding the unwinding of cross-shareholding.

In addition, this paper also contributes to the literature on cross-shareholding by providing an analysis of corporate cross-shareholding strategies from the viewpoint of managerial entrenchment. Such an entrenchment approach has recently been developed in both the empirical and theoretical corporate finance literature.[1] The entrenchment approach appears to be appropriate for analyzing large listing firms in which the management is separated from the ownership. Most Japanese firms that have cross-shareholdings share this feature. Previous studies have analyzed cross-shareholding from the viewpoint of maximizing the shareholders' wealth, which is referred to as the efficient approach. In the efficient approach, cross-shareholding is

---

[1] For example, see Morck, Shleifer, and Vishny (1988), Berger, Ofek, and Yermack (1997), Zweibel (1996), Isagawa (2002), and Novaes (2003).

interpreted as a value-increasing financial device. Along these line, Osano (1996) theoretically showed that cross-shareholding plays an important role in motivating the managers of member firms to avoid inefficient myopic behavior. The model of Berglof and Perotti (1994) demonstrated that cross-shareholding provides a reciprocal monitoring mechanism among the member firms, and prevents managerial opportunism.[2]

However, according to Ito (1992) and Morck and Nakamura (1999), one traditional motivation for the formation of cross-shareholdings is to prevent hostile takeovers. In the entrenchment approach, cross-shareholding enhances managerial entrenchment and insulates corporate managers from market interference in corporate control such as occurs in hostile takeovers. As a result, member firms attempt to maximize management and employee utility rather than shareholders' wealth. In the present model, cross-shareholding is interpreted to be an entrenchment device allowing self-interested managers to pursue their own interests. Many empirical studies appear to support the hypothesis that cross-shareholding may dampen the disciplinary effectiveness of the markets for corporate control, and is not desirable from the perspective of firm profitability.[3]

---

[2] Empirically, Ferris, Kumar, and Sarin (1995) and Douthett and Jung (2001) demonstrated that the magnitude of the costs attributable to informational asymmetry is lower for *keiretsu* firms than for independent firms. Since cross-shareholdings among *keiretsu* firms are tighter than those in independent firms, these results are consistent with the hypothesis that cross-shareholding is an effective mechanism for corporate operations.

[3] Nakatani (1984), Prowse (1992), Douthett and Jung (2001), and Ang and Constand (2002) have reported that the profitability of firms in a *keiretsu* group is lower than that of independent firms. Nakatani (1984) and Ang and Constand (2002) also reported that

The present model has several implications regarding cross-shareholding and the unwinding of cross-shareholding among Japanese firms. First, it accounts for why Japanese firms have unwound cross-shareholdings at a time when the Japanese financial markets have experienced substantial deregulation, resulting in a decrease in the cost of corporate control. At first glance, it may appear strange that corporate managers decided to unwind cross-shareholdings at a time when the costs of corporate control were relatively low. The model provides a plausible explanation as to why these decisions were made. Second, the present model suggests that firms tend to unwind cross-shareholdings when their operating performance is poor. This suggestion is consistent with the fact that Japanese firms unwound cross-shareholdings when they experienced very poor performance during the 1990s. The model also predicts that firm profitability will improve following the unwinding of cross-shareholdings. Third, the model presents the possibility that corporate managers prefer cross-shareholding to other anti-takeover devices. The diversification effect, which is a prominent feature of cross-shareholding, distinguishes cross-shareholding from other takeover defenses, such as self-shareholding and poison pills.

Ⅱ. An Entrenchment Model

There are two all-equity firms, firm *a* and firm *b*. Each firm is run by a single entrenched manager (the incumbent manager). The number of outstanding shares of each firm is normalized to one. Without a loss of generality, it is assumed that neither

---

independent firms have higher growth rates than *keiretsu* firms. Nakatani (1984), Brown, Soybel, and Stickney (1994), along with Gibson (2000), have argued that the average compensation for employees of *keiretsu* firms exceeds that for employees of independent firms.

firm has any initial financial slack. All participants are risk-neutral, and the interest rate is zero.

The sequence of events and decisions, described in Figure Ⅰ, are as follows. At date-0, each incumbent manager makes a decision about cross-shareholding. If both managers agree on cross-shareholding, then each firm issues n shares to the other firm. In the current model, the optimal number of shares issued for cross-shareholding is not considered. Instead, as described in Berglof and Perotti (1994) and Osano (1996), it is assumed that each firm holds an $n/(1+n) \equiv \alpha$ $(0<\alpha<1/2)$ fraction of the other firm's shares as a cross-shareholding.

[Figure Ⅰ]

At date-1, it is commonly revealed whether the product market condition for each firm is good (state G) or bad (state B). Although this paper formally discusses the case in which each of the two firms face a different state, cases in which both firms experience the same state would be analyzed similarly. Hereafter, event (B, G) is defined as the date-1 situation, in which firm a faces state B and firm b faces state G. Similarly, firm a faces state G and firm b faces state B in event (G, B).

At date-2, each manager chooses the firm's operating strategy. There are two possible strategies that the incumbent manager could pursue, strategy M or strategy S. Strategy M gives the incumbent manager private benefits, but decreases the shareholders' wealth. In contrast, strategy S increases the shareholders' wealth, but gives no private benefits to the incumbent manager.

At date-3, each firm's operating return is realized. The operating return depends on both the state of the firm at date-1 and the strategy undertaken at date-2. Let X_i denote the operating return conditional on strategy M being undertaken in state $i \in \{G, B\}$, and let Y_i denote the operating return conditional on strategy S being undertaken in state $i \in \{G, B\}$. Let us define $\Delta_i \equiv Y_i - X_i$. It is assumed that

$$0 < \Delta_G < \Delta_B < (2-\alpha)\Delta_G. \tag{1}$$

In assumption (1), $\Delta_i > 0$ ($i=G$, B) indicates that strategy S generates a larger return than strategy M in both states. In this sense, strategy S is more desirable for the shareholders than strategy M, regardless of the state realization. The second inequality, $\Delta_G < \Delta_B$, indicates that the difference between the return generated by strategy S and that generated by strategy M is larger in state B than in state G. This implies that the shareholders' loss due to managerial opportunism (agency cost) in state G is less than that in state B. Therefore, as long as strategy M is undertaken, state G is desirable for the shareholders. The last inequality is assumed for a technical reason that is mentioned below.

An incumbent manager acts in her own interest, in conflict with the shareholders' wealth. She derives utility both from being in the managerial position until the final date (date-3) and completing strategy M. An incumbent manager does not have any utility if she is replaced in a takeover. For an incumbent manager, to undertake strategy M without a takeover is the best outcome, and to undertake strategy S without a takeover is the second best outcome. To be replaced in a takeover is the worst outcome (i.e., the utility of the manager is zero).

The takeover stage occurs every time the firm makes a new decision. As described by Zweibel (1996), a takeover succeeds if its value is larger than its cost. The value of a takeover is given by the difference between the target firm's current stock price and the price conditional upon a takeover being launched.[4] The cost of a takeover depends on whether cross-shareholding exists or not. Cross-shareholding enhances an incumbent manager's entrenchment, which presents additional costs in the event of a takeover. A

---

[4] Since a potential raider can collect one share at the most under conditions of cross-shareholding (the remaining n shares are held by the other firm), the value of a takeover is calculated for one share (stock price).

well-known interpretation of cross-shareholding is that a hostile takeover tends to be more problematic and/or expensive when the target firm engages in cross-shareholding, because the shares in cross-shareholdings are rarely transacted.[5] Formally, the cost of a takeover is E if the target firm's shares are held by another firm; otherwise the cost is zero. Cross-shareholding increases the cost of a takeover by E.

If a takeover succeeds, then a new manager replaces the incumbent manager. A new manager acts in the interest of the shareholders and always undertakes strategy S at date-2. If a new manager is employed after strategy M has already been undertaken, then she can change the firm's strategy to strategy S from strategy M. In such a situation, however, the firm has to bear additional costs to change the operating strategy because of the difficulty of reversing the investment. Alternatively, the firm loses the opportunity to earn money during the period in which the strategy is switched.

Formally, a switching cost, $Z>0$, is required to change the firm's operation to strategy S from strategy M. Since the switching cost decreases the value of the firm, the date-2 value of a takeover decreases, too. In the sense that the incumbent manager can make a takeover less valuable (more difficult) by investing in strategy M, the managerial investment decision is in itself an entrenchment device, as pointed out by Shleifer and Vishny (1989) and Noe and Rebello (1997).

It should be noted that, at the date-1 takeover stage, it is possible that a takeover will succeed for one firm j, but not for the other firm k ($j \neq k$). In this case, a new manager is

---

[5] Ito (1992) and Morck and Nakamura (1999) mentioned that one traditional motivation for the formation of cross-shareholdings is to prevent hostile takeovers. Theoretically, Stulz (1988) has shown that an increase in the fraction of shares controlled by management decreases the probability that a hostile takeover will occur. In the current model, it is assumed that the incumbent manager can (indirectly) control a fraction of her firm's shares by maintaining the cross-shareholding.

hired for firm *j*, and acts in order to maximize the shareholders' wealth. The new manager can reconsider the cross-shareholding between date-1 and date-2 (See Figure Ⅰ). If the new manager of firm *j* decides to liquidate the firm *k* shares, then an additional takeover stage will occur for firm *k* before date-2. The liquidation of cross-shareholding may change the value of a takeover of firm *k*.

Ⅲ. Cross-Shareholding and the Unwinding of Cross-Shareholding

This section shows that corporate managers dynamically change firms' cross-shareholding strategies in response to the product market conditions. It is assumed that

$$\Delta_G < E < \Delta_B. \tag{2}$$

If the cost of a takeover is too large, that is if $\Delta_B<E$ is satisfied, then the market for corporate control does not work well under conditions of cross-shareholding. In such situations, the incumbent manager will always maintain cross-shareholding and undertake strategy *M*. Conversely, if the cost of a takeover is too small, that is if $E<\Delta_G$ is satisfied, then the cross-shareholding will not play an entrenchment role to prevent pressures from the market for corporate control. In such situations, the incumbent manager has no incentive to possess cross-shareholding, and will always undertake strategy *S*.

For the switching cost of *Z*, it is assumed that

$$\Delta_B - E < Z < (1-\alpha)\Delta_G. \tag{3}$$

It follows from the third inequality of assumption (1) that $\Delta_B\text{-}E<(1-\alpha)\Delta_G$ holds for *E* satisfying (2). The first inequality in (3), which is equivalent to $\Delta_B<E+Z$, means that a takeover will not succeed at date-2 under conditions of cross-shareholding once strategy

M has been undertaken. The second inequality means that a takeover will succeed at date-2 without cross-shareholding, even though strategy *M* has been undertaken.

For the following analysis, it is useful to show how to calculate the stock price of a firm under conditions of cross-shareholding. Let F^j denote the expected operating return of firm $j \in \{a, b\}$, and let P^j denote the stock price of firm $j \in \{a, b\}$. Since firm *a* has *n* shares of firm *b* under conditions of cross-shareholding, the total value of the assets owned by firm *a* is $F^a + nP^b$. Since firm *a* issues $1+n$ shares,

$$P^a = (F^a + nP^b)/(1+n). \tag{4}$$

Similarly,

$$P^b = (F^b + nP^a)/(1+n). \tag{5}$$

By solving (4) and (5) and using $n/(1+n) \equiv \alpha$, the stock price of firm *j* under cross-shareholding is given by

$$P^j = (F^j + \alpha F^k)/(1+\alpha), \quad j,k \in \{a,b\}, j \neq k. \tag{6}$$

Note that equations (4) and (5) are satisfied when both of the two firms decide to liquidate the cross-shareholding. The stock price of firm $j \in \{a, b\}$ just after the unwinding of cross-shareholding is given by equation (6).

Managerial Investment Decision

Suppose that firm *a* faces state *B* and firm *b* faces state *G*, that is, event (*B*, *G*) occurs at date-1. The results in event (*G*, *B*) are symmetric. First, consider what takes place at date-2 under conditions of cross-shareholding. Let $P_2^a(M, M; h)$ denote the date-2 stock price of firm *a* when cross-shareholding exists and when strategy *M* is undertaken by both firms. It follows from (6) that

$$P_2^a(M,M;h) = \frac{X_B + \alpha X_G}{1+\alpha}. \tag{7}$$

Note that the date-2 value of a takeover for firm a is maximized when both firms change their operating strategies from strategy M to strategy S. Let $P_2^a(S, S)$ denote the date-2 stock price of firm a, provided that both firms decided to change their strategies. It follows from (4), (5), and (6) that, regardless of whether cross-shareholding is maintained or not,

$$P_2^a(S,S) = \frac{Y_B + \alpha Y_G}{1+\alpha} - Z. \tag{8}$$

The date-2 takeover value for firm a in the above case is denoted by $V_2^a(M, M; h)$. Then, the following relation is obtained.

$$V_2^a(M,M;h) \le P_2^a(S,S) - P_2^a(M,M;h) = \frac{\Delta_B + \alpha\Delta_G}{1+\alpha} - Z < \Delta_B - Z. \tag{9}$$

The last inequality follows from assumption (1). Since $\Delta_B - Z < E$ holds under assumption (3), no takeover succeeds for firm a. By using a similar argument, it can be shown that a takeover will not succeed for firm b at date-2. These results show that under conditions of cross-shareholding both incumbent managers undertake strategy M at date-2.

Next, consider the managers' investment decision without the entrenchment of cross-shareholding at date-2. Suppose that the manager of firm b undertakes strategy M. Note that each firm has already sold the other firm's shares. Let $P_2^b(M; u)$ denote the date-2 stock price of firm b provided that strategy M is undertaken without cross-shareholding, and let P_1 denote the selling price of the firm a shares. Then,

$$P_2^b(M;u) = \frac{X_G + nP_1}{1+n}. \tag{10}$$

On the other hand, the date-2 stock price, provided that the firm's operating strategy would be changed to strategy S, denoted by $P_2^b(S; u)$, is given by

$$P_2^b(S;u) = \frac{Y_G + nP_1}{1+n} - Z .$$ (11)

Note that the switching cost Z is required in this equation. The date-2 takeover value for firm b in the above case is denoted by $V_2^b(M, u)$. Then, the following relation is obtained:

$$V_2^b(M;u) = P_2^b(S;u) - P_2^b(M;u) = \frac{\Delta_G}{1+n} - Z = (1-\alpha)\Delta_G - Z > 0 .$$ (12)

The last inequality follows from (3). Since the cost of a takeover is zero without cross-shareholding, the manager of firm b is replaced by the date-2 takeover if she undertakes strategy M without cross-shareholding. By using a similar argument, it can be shown that a takeover will succeed for firm a without cross-shareholding at date-2. Predicting this result, the incumbent manager never undertakes strategy M once cross-shareholding is unwound.

Takeover Strategies of the Market for Corporate Control

This subsection analyzes what takes place at the date-1 takeover stage under conditions of cross-shareholding. Since each of the two firms faces a different state, it is possible that a takeover succeeds for one firm but does not succeed for the other firm. The following Lemma shows that both firms undertake strategy S in such situations.

Lemma 1. *Both firms will undertake strategy S if a takeover succeeds for either firm at date-1.*

Proof. See Appendix.

In the following analysis, it is assumed that there are two potential raiders. One raider

(hereafter raider *a*) watches for an opportunity to execute of a takeover of firm *a*, and the other raider (raider *b*) watches for the same opportunity for firm *b*. Each raider makes the takeover decision independently. Lemma 2 below characterizes the equilibrium outcomes of the date-1 takeover stage under conditions of cross-shareholding, which is dependent on the magnitude of the cost of a takeover, *E*. Let us define

$$\delta = \frac{\Delta_B + \alpha \Delta_G}{1 + \alpha}. \tag{13}$$

Lemma 2. *Suppose that event (B, G) is realized, and cross-shareholding is maintained at date-1. When $\delta<E<\Delta_B$ is satisfied, no takeover occurs. When $(\Delta_G+\alpha\Delta_B)/(1+\alpha)<E<\delta$ is satisfied, a takeover occurs for only firm a. When $\Delta_G<E<(\Delta_G+\alpha\Delta_B)/(1+\alpha)$ is satisfied, a takeover occurs for both firms.*

Proof. See Appendix.

Lemma 2 says that when the cost of a takeover is relatively large ($\delta<E<\Delta_B$), no takeover occurs under conditions of cross-shareholding. In this case, neither of the two managers ever sells the other firm's shares in order to maintain the cross-shareholding.

On the other hand, when the cost of a takeover is relatively small ($\Delta_G<E<\delta$), at least one manager will be replaced by the date-1 takeover if cross-shareholding is maintained. This would be the worst possible outcome for the incumbent manager of the target firm.

Managerial Strategies regarding Cross-Shareholding

In order to avoid a takeover, an incumbent manager of the target firm has to commit to undertaking strategy *S* by unwinding the cross-shareholding and relinquishing her

entrenchment. The results given in the previous subsection show that the unwinding of cross-shareholding is a credible signal that both firms will choose strategy S. Predicting that strategy S will be undertaken, there is no reason for raiders to launch a takeover at date-1. Thus, the targeted manager can avoid a hostile takeover by dissolving cross-shareholding.

To dissolve cross-shareholding, the targeted manager has to make the other manager liquidate her cross-held shares. As shown in the next Lemma, the targeted manager can unwind cross-shareholding by selling her own shares of the other firm on the market. More precisely, the decision of one manager to sell the other firm's shares makes it optimal for the other manager to do the same.

Lemma 3. *When $\Delta_G<E<\delta$ is satisfied, the manager can unwind the cross-shareholding by selling the other firm's shares on the market.*

Proof. See Appendix.

When $\Delta_G<E<\delta$ is satisfied, the target manager wants to liquidate the cross-shareholding. Lemma 3 says that, in such situations, cross-shareholding is unwound as a result of individual rationality.

When $\delta<E<\Delta_B$ is satisfied, no takeover occurs under conditions of cross-shareholding. It is optimal for both incumbent managers to maintain cross-shareholding and to undertake strategy M at date-2. These results are summarized in the following Proposition.

Proposition 1. *Suppose that event (B, G) is realized. When $\delta<E<\Delta_B$ is satisfied, cross-shareholding is maintained, and both firms undertake strategy M. When $\Delta_G<E<\delta$ is satisfied, cross-shareholding is unwound, and both firms undertake strategy S.*

In event (G, G), in which both firms experience the good condition at the same time, it follows from (6) that the takeover value is given by Δ_G. Since the takeover value is smaller than its cost, E (at date-1) and $E+Z$ (at date-2), no takeover occurs under conditions of cross-shareholding. Then, both incumbent managers maintain cross-shareholding and undertake strategy M.

When event (B, B) occurs, cross-shareholding is unwound at date-1. The following scenario is likely. Suppose that cross-shareholding is maintained and strategy M has been undertaken at date-2. It follows from (6) that the date-2 value of a takeover is given by Δ_B, which is smaller than its cost, $E+Z$. Then, the incumbent manager will undertake strategy M without fear of being replaced.

In contrast to event (G, G), however, the incumbent manager is replaced by the date-1 takeover under the conditions of cross-shareholding, because the value of a takeover, Δ_B, is larger than its cost, E, at date-1. In order to avoid a takeover, the incumbent manager decides to unwind the cross-shareholding. The unwinding of cross-shareholding is a credible signal that the manager will choose strategy S.

Formation of Cross-Shareholding

Given the above results, this subsection shows that the two firms agree on cross-shareholding at date-0. Suppose that event (G, G) occurs with probability θ_{GG}, event (B, B) occurs with probability θ_{BB}, event (G, B) occurs with probability θ_{GB}, and event (B, G) occurs with probability θ_{BG}.

Proposition 2. *Both incumbent managers agree on cross-shareholding at date-0.*

Proof. See Appendix.

Under the current setting, two firms possess cross-shareholdings at the beginning of the process. In response to the external conditions, they decide whether to maintain the cross-shareholding or to unwind the cross-shareholding. Although cross-shareholding and the unwinding of cross-shareholding can both help prevent a hostile takeover, the mechanisms by which they accomplish this are different. On the one hand, cross-shareholding helps prevent a takeover by increasing the cost of the takeover. On the other hand, the unwinding of cross-shareholding helps prevent a takeover by decreasing the value of the takeover.

Ⅳ. Implications

Costs of Corporate Control and the Unwinding of Cross-Shareholding

Cross-shareholdings among Japanese firms declined during the 1990s. During the same period, Japanese financial markets experienced substantial deregulation, resulting in a decrease in the cost of corporate control. Among the series of deregulations that took place, the one that most affected the potential of corporate control was probably the liberalization of commissions on stock transactions. In 1994, commissions on stock transactions over 1 billion yen were freed, and in 1998, those on transactions over 50 million yen were freed. In 1999, fixed brokerage commissions were freed on stock transactions of all amounts. The liberalization of commissions on equity transactions directly lowered the cost of takeovers. In addition, many other restrictions on the financial markets were removed during the Japanese "Big Bang". According to an argument presented by Gibson (2000, p.309), Big Bang deregulation could push the Japanese financial system in the right direction by focusing on strengthening corporate governance. Thus, in the 1990s, it was becoming easier for outside shareholders to exert corporate control through financial markets.

At first glance, it may appear strange that corporate managers decided to unwind

cross-shareholdings at a time when the costs of corporate control were relatively low. The current model provides a plausible explanation as to why these decisions were made. That is, entrenched managers have no choice but to unwind cross-shareholdings (i.e., relinquish their entrenchment) in order to keep their positions when the cost of a takeover is smaller than the value of a takeover. As shown in Section Ⅲ, the unwinding of cross-shareholding is a commitment by managers that they will not pursue their own interests at the expense of the shareholders' wealth. This commitment decreases the value of a takeover, so that no takeover occurs and managers can retain their positions. Thus, the present model suggests that the lower the cost of a takeover, the more frequently cross-shareholdings are unwound.

To represent this point formally, let us introduce the cost of a takeover without cross-shareholding, represented by C.[6] First, suppose that both $0<C<\Delta_G$ and $\Delta_B<C+E$ are satisfied. Since the cost of the takeover, $C+E$, is larger than the maximum value of the takeover, Δ_B, no takeover occurs under conditions of cross-shareholding.[7] In such situations, both incumbent managers always maintain cross-shareholding, and choose strategy M at date-2.

Next, suppose that the deregulation of financial markets decreases C to the extent that $\delta<C+E<\Delta_B$ is satisfied. The results in Section Ⅲ show that, under such parameters, cross-shareholding is unwound in event (B, B). Furthermore, if C decreases to a level such that $\Delta_G<C+E<\delta$ is satisfied, then cross-shareholding is unwound in three events (G, B), (B, G), and (B, B). As the cost of a takeover decreases, cross-shareholding is likely to be gradually unwound. This scenario seems to be consistent with the fact that cross-shareholdings among Japanese firms have declined at a time when the deregulation of financial markets has been promoted.

---

[6] In the previous analysis, it is implicitly assumed that $C=0$.

[7] The value of a takeover is maximized in event (B, B).

Firm Characteristics and the Unwinding of Cross-Shareholding

In the present model, cross-shareholding is likely to be unwound by a firm facing state *B*, in which the agency costs of managerial opportunism are relatively large. If all other things are equal, the profitability of a firm decreases as the agency costs increase. Thus, the model implies that a firm with low profitability will tend to have a stronger incentive to unwind cross-shareholding than a firm with high profitability. Japanese firms experienced a sharp decline in their profitability during the 1990s. It can be argued that, in addition to the decrease in the cost of takeovers, low profitability forced Japanese firms to unwind cross-shareholdings during this period.

Regarding the relationship between managerial entrenchment and the unwinding of cross-shareholding, Proposition 1 implied that managers with low *E* tend to unwind cross-shareholdings more often than managers with high *E*. Berger, Ofek, and Yermack (1997) suggest several characteristics of managerial entrenchment, including the length of a manager's career in the firm, managerial ownership, board composition, and so on. The current model then predicts that cross-shareholding will tend to be unwound by a manager who has a short career in the firm and who owns a small fraction of the firm's shares. Nissan Motors' Revival Plan is a good example of this scenario. The current CEO, Carlos Ghosn, decided to dissolve the traditional *keiretsu* and sell the shares of *keiretsu* firms just after joining Nissan as CEO. Cross-shareholding will also tend to be unwound by a firm that has a relatively large number of outside directors.

The present model also suggests that firm profitability will improve following the unwinding of cross-shareholding. The unwinding of cross-shareholding is a signal that the manager relinquishes her entrenchment and will act in support of the shareholders' wealth in the future.

Cross-Shareholding as an Anti-Takeover Device

This subsection compares cross-shareholding and self-shareholding in terms of their effectiveness as an anti-takeover device. Suppose that the incumbent manager of firm a can use self-shareholding as an anti-takeover device by holding an α fraction of her own firm's shares. By using an argument similar to that used in Section Ⅲ, it can be shown that the manager maintains self-shareholding in state G, but relinquishes it in state B. Therefore, if the manager of firm a chooses self-shareholding, then she can achieve her best outcome, undertaking strategy M without a takeover, with a probability of $\theta_{GG}+\theta_{GB}$. On the other hand, if the manager chooses cross-shareholding, then she can achieve the best outcome with a probability of $\theta_{GG}+\theta_{GB}+\theta_{BG}$ when $\delta<E<\Delta_B$ is satisfied, and with a probability of θ_{GG} when $\Delta_G<E<\delta$ is satisfied. Cross-shareholding is a better anti-takeover device in the case of $\delta<E<\Delta_B$, and self-shareholding is a better one in the case of $\Delta_G<E<\delta$.

In order to examine why cross-shareholding is a better anti-takeover device than self-shareholding in the case of $\delta<E<\Delta_B$, suppose that event (B, G) is realized at date-1. While the manager of firm a must give up self-shareholding to commit to undertaking strategy S, she can undertake strategy M under conditions of cross-shareholding. This is because the value of the date-1 takeover under conditions of cross-shareholding, $(\Delta_B+\alpha\Delta_G)/(1+\alpha)$, is smaller than that under self-shareholding, Δ_B. In other words, the stock price under cross-shareholding is larger than that under self-shareholding. The manager of firm a can avoid an extreme stock price decline by investing in the shares of firm b.

This effect can be interpreted as the diversification effect, which is a prominent feature of cross-shareholding. [8] The diversification effect distinguishes cross-shareholding from other takeover defenses, such as those of self-shareholding and

---

[8] Nakatani (1984) and Douthett and Jung (2001) have found that *keiretsu* firms perform in a more stable manner than independent firms.

poison pills. It is reasonable to assume that the lower the correlation between the operating performances of the two firms, the larger the diversification effect will be. The above argument suggests that cross-shareholding is a desirable anti-takeover device in situations in which the diversification effect works well.

Ⅴ. Conclusion

This paper proposes a motivation for corporate management to possess cross-shareholdings and, in particular, to unwind cross-shareholdings. While cross-shareholding enhances managerial entrenchment and insulates corporate management from the potential threat of a takeover, the increased agency costs associated with managerial entrenchment increase the incentives for a hostile takeover. In particular, when the cost of a takeover is relatively small compared to its value, maintaining cross-shareholdings leads to managerial opportunistic behavior, and a hostile takeover can then occur. In order to avoid a takeover, corporate management must commit to not behaving opportunistically by unwinding cross-shareholdings. Since the unwinding of cross-shareholdings is a credible signal that management will pursue shareholders' wealth in the future, the stock price of a firm will increase, and a takeover will not occur.

The present model has several implications. First, it accounts for why Japanese firms have unwound cross-shareholdings at a time when the Japanese financial markets have experienced substantial deregulation, which resulted in a decrease in the cost of corporate control. Second, the model predicts that firms tend to unwind cross-shareholdings when they experience poor performance, and that firm profitability will improve following this unwinding. The current model also predicts that cross-shareholdings will tend to be unwound by a manager who has a short career and a small fraction of the firm's equity. Third, the model gives insights into what conditions

must exist for entrenched managers to choose cross-shareholdings over other anti-takeover devices. The diversification effect, which is a prominent feature of cross-shareholding, is an important factor in this choice.

[2006.2.9   742]

References

Ang, J., and R. Constand, 2002, The Portfolio Behavior of Japanese Corporations' Stable Shareholders, *Journal of Multinational Financial Management* 12, 89-106.

Berger, P., E. Ofek, and D. Yermack, 1997, Managerial Entrenchment and Capital Structure Decisions, *Journal of Finance* 52, 1411-1438.

Berglof, E., and E. Perotti, 1994, The Governance Structure of the Japanese Financial Keiretsu, *Journal of Financial Economics* 36, 259-284.

Brown, P., V. Soybel, and C. Stickney, 1994, Comparing U.S. and Japanese Corporate Level Operating Performance Using Financial Statement Data, *Strategic Management Journal* 15, 75-83.

Douthett, E., and K. Jung, 2001, Japanese Corporate Groupings (Keiretsu) and the Informativeness of Earnings, *Journal of International Financial Management and Accounting* 12, 133-159.

Ferris, S., R. Kumar, and A. Sarin, 1995, The Role of Corporate Groupings in Controlling Agency Conflicts: The Case of Keiretsu, *Pacific-Basin Finance Journal* 3, 319-335.

Gibson, M., 2000, Big Bang Deregulation and Japanese Corporate Governance: A Survey of the Issues, in T. Hoshi and H. Patrick ed., *Crisis and Change in the Japanese Financial System*, Kluwer Academic Publishers.

Isagawa, N., 2002, Callable Convertible Debt under Managerial Entrenchment, *Journal of Corporate Finance* 8, 255-270.

Ito, T., 1992, *The Japanese Economy*, MIT Press.

Kuroki, F., 2001, The Present Status of Unwinding of Cross-shareholding: The Fiscal 2000 Survey of Cross-shareholding, NLI Research Paper No. 157, NLI Research Institute.

Morck, R., and M. Nakamura, 1999, Banks and Corporate Control in Japan, *Journal of Finance* 54, 319-339.

Morck, R., A. Shleifer, and R. Vishny, 1988, Management Ownership and Market Valuation: An Empirical Analysis, *Journal* of *Financial Economics* 20, 293-315.

Nakatani, I., 1984, The Economic Role of Financial Corporate Grouping, in M. Aoki ed., *Economic Analysis of the Japanese Firm*, Elsevier, New York.

Noe, T., and M. Rebello, 1997, Renegotiation, Investment Horizons, and Managerial Discretion, *Journal of Business* 70, 385-407.

Novaes, W., 2003, Capital Structure Choice When Managers Are in Control: Entrenchment versus Efficiency, *Journal of Business* 76, 49-82.

Osano, H., 1996, Intercorporate Shareholdings and Corporate Control in the Japanese Firm, *Journal of Banking and Finance* 20, 1047-1068.

Prowse, S., 1992, The Structure of Corporate Ownership in Japan, *Journal of Finance* 47, 1121-1140.

Shleifer, A., and R. Vishny, 1989, Management Entrenchment, The Case of Manager-Specific Investment, *Journal of Financial Economics* 25, 123-139.

Stulz, R., 1988, Managerial Control of Voting Rights: Financial Policies and the Market for Corporate Control, *Journal of Financial Economics* 20, 25-54.

Zwiebel, J., 1996, Dynamic Capital Structure under Managerial Entrenchment, *American Economic Review* 86, 1197-1215.

Appendix

Proof of Lemma 1. Consider what takes place if the incumbent manager of firm a is replaced in a takeover, but the manager of firm b is still in control after date-1. From the results given in the previous subsection, the manager of firm b will undertake strategy M if her entrenchment is maintained. In order to increase the shareholders' wealth, the new manager of firm a will sell the firm b shares between date-1 and date-2. As a result, the manager of firm b has no entrenchment, so that she cannot but undertake strategy S at date-2. By using a similar argument, it can be concluded that if one of the two managers is replaced, then both firms will undertake strategy S at date-2.

Proof of Lemma 2. As shown by Lemma 1, if either manager is replaced, then both firms will undertake strategy S at date-2. In such cases, the stock price of firm a just following a takeover is given by $P^a=(Y_B+nP^b)/(1+n)$, and that of firm b is given by $P^b=(Y_G+nP^a)/(1+n)$. By solving these equations, the stock price of firm a is $(Y_B+\alpha Y_G)/(1+\alpha)$ and that of firm b is $(Y_G+\alpha Y_B)/(1+\alpha)$. If both of the managers are replaced in takeovers at date-1, then both firms will undertake strategy S. It can be shown easily that, in this case, the stock price of firm a is $(Y_B+\alpha Y_G)/(1+\alpha)$, and that of firm b is $(Y_G+\alpha Y_B)/(1+\alpha)$.

If no takeover occurs at date-1, then both incumbent managers undertake strategy M under conditions of cross-shareholding. In this case, it follows from (6) that the stock price of firm a is $(X_B+\alpha X_G)/(1+\alpha)$, and that of firm b is $(X_G+\alpha X_B)/(1+\alpha)$. Therefore, the takeover value for firm a is given by $(\Delta_B+\alpha\Delta_G)/(1+\alpha)$, and that for firm b is given by $(\Delta_G+\alpha\Delta_B)/(1+\alpha)$.

Figure Ⅱ presents a date-1 payoff matrix of the two raiders under conditions of

cross-shareholding. The first term in each cell represents a payoff of raider a, and the second term is a payoff of raider b. It is assumed that the raider obtains the net value of the takeover (the takeover value minus its cost) if he launches a takeover; otherwise he obtains zero. By using Figure Ⅱ, the date-1 takeover strategies are analyzed.

[Figure Ⅱ]

（ⅰ）. When $\delta<E<\Delta_B$ is satisfied, the cost of a takeover is always larger than its value. In this case, no takeover will occur at date-1 under conditions of cross-shareholding. Both incumbent managers maintain cross-shareholdings and undertake strategy M at date-2.

（ⅱ）. When $(\Delta_G+\alpha\Delta_B)/(1+\alpha)<E<\delta$ is satisfied, the takeover value for firm a is larger than its cost, but the takeover value for firm b is smaller than its cost. In this case, a takeover will occur for firm a.

（ⅲ）. When $\Delta_G<E<(\Delta_G+\alpha\Delta_B)/(1+\alpha)$ is satisfied, a takeover is successful for both firms. Each of the two raiders launches a takeover simultaneously.

Proof of Lemma 3. Suppose that the manager of firm a wants to dissolve the cross-shareholding with firm b. Consider what happens if the manager of firm b continues to hold firm a shares, when the manager of firm a liquidates firm b shares. In this case, the entrenchment of the manager of firm b is lost, so that firm b will always undertake strategy S. On the other hand, the entrenchment of the manager of firm a remains, so that firm a will undertake strategy M if no takeover occurs. If a takeover of firm a occurs, then the new manager of firm a will undertake strategy S. If a takeover of firm b occurs, then the new manager of firm b will liquidate the firm a shares before date-2. As a result, firm a will undertake strategy S because the manager of firm a loses her entrenchment. Thus, the managerial opportunism of firm a can be disciplined by a

24

takeover of firm *b* as well as a takeover of firm *a*.

It follows from the above arguments that the stock price of firm *a* conditional on a takeover being launched for at least one firm, $P^a(t)$, is given by $\{Y_B+nP_0\}/(1+n)$, where P_0 represents the selling price of firm *b* shares. On the other hand, the current stock price of firm *a* without a takeover, $P^a(n)$, is given by $\{X_B+nP_0\}/(1+n)$. The takeover value for firm *a* is then given by $P^a(t)-P^a(n)=\Delta_B/(1+n)=(1-\alpha)\Delta_B$, and the takeover cost is E as long as firm *b* keeps its firm *a* shares.

Since firm *b* always undertakes strategy *S*, the stock price of firm *b* conditional on a takeover being launched for either firm, $P^b(t)$, is given by $\{Y_G+nP^a(t)\}/(1+n)$, and that without a takeover, $P^b(n)$, is given by $\{Y_G+nP^a(n)\}/(1+n)$. The value of a takeover for firm *b* is then given by $n\{P^a(t)-P^a(n)\}/(1+n)=\alpha(1-\alpha)\Delta_B$. Note that the takeover value for firm *b* is dependent on the managerial opportunism of firm *a*. The cost of a takeover is zero for firm *b*, because firm *a* has already sold its form *b* shares.

[Figure Ⅲ]

Figure Ⅲ presents a payoff matrix of the two raiders in the above case. The first term in each cell represents a payoff of raider *a*, and the second term is a payoff of raider *b*. It follows from Figure Ⅲ that to launch a takeover is a dominant strategy for raider *b*. That is, the incumbent manager of firm *b* is replaced in a takeover as long as she keeps her firm *a* shares. In order to avoid a takeover, the manager of firm *b* rationally decides to liquidate her shareholding of firm *a*. As a result, the cross-shareholding is completely unwound.

By using similar arguments, it can be shown that the manager of firm *b* can liquidate cross-shareholding with firm *a* by selling firm *a* shares on the market.

Proof of Proposition 2. Let V_0^j denote the date-0 value of a takeover of firm $j \in \{a, b\}$. When $\Delta_G < E < \delta$ is satisfied, both incumbent managers undertake strategy M in event (G, G), and strategy S in the other three events. The date-0 takeover increases the firm's value only when event (G, G) occurs. Then the date-0 takeover value for firm j is given by $\theta_{GG}\Delta_G$. Since $0 < V_0^j = \theta_{GG}\Delta_G < E$ holds under $\Delta_G < E < \delta$, a takeover cannot succeed under cross-shareholding. On the other hand, without cross-shareholding, a takeover can succeed because its cost is zero. Therefore, both managers must agree on cross-shareholding in order to avoid a takeover at date-0.

When $\delta < E < \Delta_B$ is satisfied, both incumbent managers undertake strategy S in event (B, B) and strategy M in the other three events. Then, for firm a,

$$V_0^a = \theta_{GG}\Delta_G + \theta_{BG}\frac{\Delta_B + \alpha\Delta_G}{1+\alpha} + \theta_{GB}\frac{\Delta_G + \alpha\Delta_B}{1+\alpha} < (1-\theta_{BB})\delta < E . \tag{14}$$

Similarly, $0 < V_0^b < E$ holds for firm b. For reasons similar to those given for the above case, both managers agree on cross-shareholding at date-0.
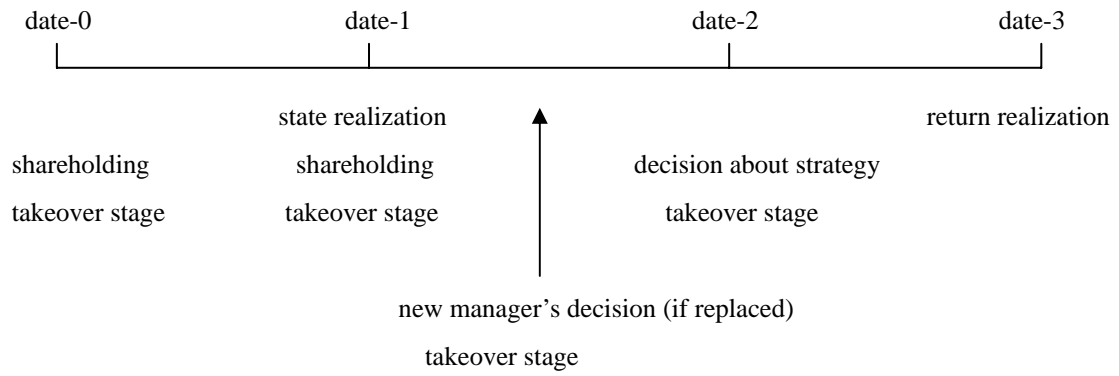
date-0	date-1	date-2	date-3

state realization   return realization

shareholding   shareholding   decision about strategy

takeover stage   takeover stage   takeover stage

new manager's decision (if replaced)

takeover stage

Figure Ι . Sequence of Events and Decisions

Raider b (state G)

	Takeover	No takeover
Takeover	$(\Delta_B+\alpha\Delta_G)/(1+\alpha)-E=\delta-E$	$(\Delta_B+\alpha\Delta_G)/(1+\alpha)-E=\delta-E$
Raider a (state B)	$(\Delta_G+\alpha\Delta_B)/(1+\alpha)-E$	0
No Takeover	0	0
	$(\Delta_G+\alpha\Delta_B)/(1+\alpha)-E$	0

Figure Ⅱ. Raiders' Payoff Matrix at Date-1 under Cross-shareholding

Raider b (state G)

	Takeover	No takeover
Takeover	$(1-\alpha)\Delta_B-E$	$(1-\alpha)\Delta_B-E$
Raider a (state B)	$\alpha(1-\alpha)\Delta_B$	0
No Takeover	0	0
	$\alpha(1-\alpha)\Delta_B$	0

FigureⅢ. Raiders' Payoff Matrix at Date-1 Takeover Stage

when Firm a Sold Firm b Shares but Firm b Holds Firm a Shares