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The governance structure of the Japanese financial keiretsu

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Abstract

We rationalize the cross-holdings of debt and equity within the Japanese keiretsu as a contingent governance mechanism through which internal discipline is sustained over time. The reciprocal allocation of control rights supports cooperation and mutual monitoring among managers through a coalition-enforced threat of removal from control. In financial distress this threat is less effective, and the governance mode shifts to hierarchical enforcement under main bank leadership. The model is consistent with the capital structure, the distribution of claims, the extent of intragroup trading, and patterns of investor intervention within the groups.

Key words: Corporate governance; Financial keiretsu; Corporate control

JEL classification: G32; L14

1. Introduction

In the Anglo-American capital market tradition, investors are viewed functionally as specialized outsiders to the firm: shareholders hold only equity and creditors only debt. Suppliers and corporate customers may extend credit to each other, but typically they do not have shareholding relationships. In

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particular, these relationships are rarely reciprocal. On the European continent and in Asia, trading relationships are often cemented with financial ties. Enterprises are part of complex customer and supplier networks where financing patterns and trade are interlinked; financial institutions hold both corporate debt and equity. This article analyses one of the most conspicuous and well-known examples of such networks, the Japanese financial keiretsu.

Most larger firms in Japan are affiliated with a financial keiretsu. The main features of these groupings are extensive intragroup trade and a capital structure with elaborate cross-holdings of debt and equity, a strong domination for the group's main bank in corporate borrowing, and historically high levels of gearing in member firms. Nakatani (1984) states that, out of 859 companies on the first section of the Tokyo stock exchange in 1981, as many as 719 (84 percent) can be considered as members of such a group. This number differs somewhat across sources depending on the criteria used for group classification. According to Nakatani, the six largest financial groupings – Mitsui, Mitsubishi, Sumitomo, Fuji, Dai-Ichi Kangyo, and Sanwa – counted no less than 546 (76 percent) of these firms. Among the 140 companies judged to be more or less independent, only 54 lacked known group connections.

These groupings play an important role in the Japanese economy, and have become a major issue in the Structural Impediments Initiative (SII) negotiations between the U.S. and Japan. In fact, in 1989, the six largest groups accounted for about 16 percent of total sales and 13 percent of total assets in Japanese manufacturing industry (Fair Trade Commission, 1992). Stockholdings among these keiretsu accounted for 26 percent and financing provided for 37 percent of total market volume in 1990 (Oriental Economist, 1991.) Perceived behavioral differences between U.S. and Japanese firms, e.g., in terms of investment horizon, cooperation across firms, and the patterns of corporate reorganizations, have been attributed to the structure of the financial keiretsu (e.g., Dore, 1983, 1986; Jensen, 1989; Kester, 1991). Finally, the Japanese groups serve as models for developing countries and socialist economies in transition to market economy (Bardhan and Roemer, 1992).

This article formalizes the view of the financial keiretsu as a mechanism for effective corporate control and contractual governance. Its focus is on the internal allocation of control implicit in the capital structure of keiretsu firms and on the coexistence of financial interlockings and intragroup trade.

Following Aoki (1990, 1994), our model is based on the interconnectedness between three central features of the Japanese economy: the main bank system, the shareholding interlockings, and the thin managerial labor market. In our view, cross-holdings of debt and equity enforces collaboration and long-term commitment among keiretsu firms, while the main bank provides internal discipline and protects outside investors. The financial keiretsu thus breaks the functional specialization between shareholders and creditors, and between investors and customers/suppliers. This allows valuable information to be

obtained through frequent productive and financial interaction; mutual monitoring among firms serves as an important horizontal complement to bank monitoring. (The term ‘monitoring’ is used here generically, as an *ex ante* solution to adverse selection and as an *ex post* solution to moral hazard. In the formal analysis we focus on *ex post* monitoring.)

In our model, a group of firms operating in different industries, but engaged in long-term relationships, exchange equity stakes in each other, creating reciprocal voting rights. A credible mutual commitment is achieved once a controlling stake in one firm is owned by other firms in the group. By pooling voting rights, the coalition can exercise control over any firm’s strategic decisions, and ensure that a manager acting opportunistically is fired or demoted. In other words, managerial control is held hostage in the keiretsu coalition to ensure commitment to efficient, cooperative behavior.

A self-controlled coalition of managers may potentially degenerate in an inefficient, low-effort, ‘quiet life’ arrangement, where managers protect each other from outside challenges. To avoid collusive arrangements, firms in the coalition fund themselves largely through short-term debt from a financial institution (the main bank). Poor profitability then results in financial default, and control over the firm is shifted to the main lender, moving away from mutual governance by cross-shareholders. As the main bank is in turn funded with short-term demand deposits, it is discouraged from participating in collusive entrenchment schemes. Moreover, other keiretsu competing in the same industries ensure a strong disciplinary challenge.

When a firm is close to financial distress, creditors may soon take over control. As a result, high leverage may undermine the effectiveness of the coalition’s threat to fire management. To limit the associated costs of moral hazard, the coalition needs, therefore, to obtain early warnings about potential insolvency and then to act in a coordinated fashion. To this end, keiretsu members extend to each other trade credits, thus combining trade-related and financial information to assess overall performance. To ensure timely reporting, the main bank provides financial guarantees to trade creditors. The bank assumes the bulk of losses on trade credits, thus encouraging reporting by trading partners. This, in turn, allows bank intervention at an earlier stage of financial distress. As a result of this rapid concentration of lending, the main bank is able to prevent conflicts among creditors in the reorganization process. It also becomes the residual value claimant, thus gaining proper incentives for active involvement.

Our model of the financial keiretsu is close to the state-contingent view of the main bank system developed in parallel work by Aoki (1990) and Aoki, Patrick, and Sheard (1994). They emphasize that banks usually act passively vis-à-vis their borrowers; however, as soon as firms become financially distressed, their main bank takes over control and oversees the restructuring. While main bank relationships also exist in many independent firms, our focus is on the role of

debt and equity cross-holdings in mutual monitoring and enforcement even when firms are not in financial distress.

Empirical investigations show that the costs of financial distress are lower, and profitability is lower and more stable, in keiretsu firms than in independent firms and in firms belonging to more coherent groups than those in looser groups (Nakatani, 1984; Hoshi, Kashyap, and Scharfstein, 1990b; Hoshi and Ito, 1991). Moreover, the evidence indicates that despite the virtual absence of takeovers, managerial turnover is very responsive to poor performance, perhaps even more so than in the U.S. (Kaplan, 1992). In fact, it appears that when a firm's stock market performance is poor but the company is not necessarily in financial distress, both the main bank and other keiretsu member firms tend to appoint external directors to the board of the troubled firm; but when the firm has negative earnings, only the main bank sends external directors (Kaplan and Minton, 1993). The intensity of these monitoring activities is positively correlated with shareholder concentration and keiretsu affiliation. This supports the view held by Prowse (1992) and others that there exist two distinct systems of corporate governance in Japan, one among independent firms and the other for members of financial keiretsu.

The view of the structure of the financial keiretsu as a contractual governance mechanism explains their remarkable stability and offers some insight into the structure and composition of the groups. It is consistent with the broad range of functions attributed to the keiretsu in the literature, such as facilitating bilateral trade between member firms and encouraging investment in relation-specific assets (Caves and Uekusa, 1976), allowing credible exchange of information or coordination of research efforts (Goto, 1982), and enforcing coordinated reorganization of firms in financial distress (Sheard, 1986). In addition, the mechanism can support mutual takeover defence and risk-sharing among member firms (Aoki, 1988; Sheard, 1989, 1994). The analysis in Kester (1991) of the long-term relationships within the keiretsu attests to the importance of internal transactions and mutual information exchange (see also Gilson and Roe, 1993). Our contribution is complementary; by analyzing the allocation of control within the keiretsu we provide the 'missing link', an explicit governance mechanism to enforce collaboration. To this purpose the model takes into account the contingent allocation of control implied by the entire capital structure of keiretsu firms: the mutual shareholdings, the historical high level of leverage, and the diffusion of mutual trade credit. It therefore offers a more balanced view of the degree of control exercised on the group by the main bank, which becomes dominant only in financial distress.

We tailor our analysis to explain the historical structure of the financial keiretsu; however, the keiretsu form is constantly evolving. The deregulation of Japan's financial markets in the 1980s, the stricter limitation of the ownership share of banks in corporations, and the increase in corporate liquidity of many Japanese companies have all affected the internal balance of the groups, but

while the keiretsu form has been evolving, the structure has remained remarkably stable. On average, the importance of intragroup borrowings has remained basically the same throughout the decade (Fair Trade Commission, 1992). Over the same period, the number of firms involved in equity cross-holdings increased; the strength of internal shareholdings fell somewhat, particularly in the less cohesive groups.

The article starts out by briefly outlining some stylized facts about the capital structure of the six largest groups, focusing in detail on the Sumitomo group. In Section 3 we outline a simple model of the cross-holding arrangement and the internal lending relationships. In the fourth section we compare the model with the stylized facts. We discuss its empirical relevance, and some implications for our understanding of Japanese business practices and society, in particular, the emphasis on horizontal rather than hierarchical relations, the disciplining effect of peer pressure, and the informational exchange achievable through the coincidence of financial and productive relations. In the conclusion we discuss some open research issues.

2. The financial keiretsu: Some stylized facts

The financial (kinyu) keiretsu has been described extensively in the literature (see, for example, Aoki, 1988; Sheard, 1986, 1989, 1994). Its main feature is the reciprocal shareholdings among member firms. [The Japanese term for reciprocal shareholdings, 'kabushiki mochiai', has a broad meaning of mutual help, shared interdependence, and stability. In the noneconomic literature, reciprocal holdings are seen as expressions of mutual trust (Dore, 1983): '... shareholdings are the mere expression of their relationship, not the relationship itself' (Clark, 1975).]

The groups vary in degree of cohesion. The strongest ties are in three of the keiretsu that originated directly from pre-war zaibatsu – Mitsubishi, Mitsui, and Sumitomo – with less cohesion in the Fuyo, Sanwa, and DKB groups (Hoshi and Ito, 1991). Membership of a particular keiretsu is usually defined by representation in the group's Presidents' Councils (Shacho-kai), the regular meetings of presidents in affiliated companies. The term Shacho-kai is used primarily by outside observers. In some rare cases (six out of 188 firms, but none in Sumitomo's case), companies are represented on more than one Presidents' Council. Occasionally, firms change affiliation. The degree of coordination within the financial keiretsu should not be exaggerated; affiliated firms are large, independent firms, often with world-wide operations; intergroup trading ties are by no means exclusive.

Most zaibatsu originated as family-controlled concerns in the Tokugawa Era (1603–1868); by 1920, most had diversified into many different industries. The oldest, the Sumitomo zaibatsu, has its roots in copper mining in the early 17th

century (Hadley, 1983). Sumitomo was more centralized than other zaibatsu, and the ownership share of the family was higher. When the family holding company was transformed into a joint stock company in 1937, the head of the House of Sumitomo owned 98 percent of the shares. Despite a rapid increase in the number of Sumitomo companies – from 40 to 135 – during World War II, the family head still had 78 percent of the stock by the end of the war, with other family members holding an additional 5 percent. The remaining shares were owned by the three leading financial institutions in the group. The holding company exercised further control over member firms through a virtual monopoly of group financial institutions in lending and extensive coordination of trade through the group trading company.

When the zaibatsu were dissolved in 1945 during the U.S. occupation, the controlling families' equity was confiscated and sold off, while intercorporate cross-holdings were substantially reduced (Hadley, 1970). After a brief period of dispersed shareholdings, during which Japanese firms competed fiercely with each other, the pre-existing interfirm relations gradually reemerged during the 1950s and 1960s through coordination by the previous zaibatsu banks. In addition, new groups were formed around the large city banks.

However, some features have changed markedly. Ownership ties are much weaker; hierarchical control through the holding company has been replaced by horizontal coordination; bank lending and borrowing now occurs across keiretsu lines; and trading companies no longer centralize member companies' purchases and sales.

The Sumitomo group was the first to reemerge as a financial keiretsu; its Presidents' Council, Hokusui-kai, started meeting in April 1951. The Mitsui group had already started another form of gathering, the Monday Club, in 1950 (Ito, 1992). From 16 companies Hokusui-kai expanded to 21 in 1977, and shrank to 20 with the dissolution of Sumitomo Aluminum Smelting. Today the group comprises some 80 firms, 20 of which are represented in the Hokusui-kai. Table 1 lists the firms in the Sumitomo Presidents' Club.

Table 2 illustrates the financial and trade links within the six largest financial keiretsu. The most conspicuous feature of the financial keiretsu is the widespread cross-holdings of shares among member firms. Each individual company has only a small share of another member firm's equity base, normally only a few percent; the largest owner is typically a member firm. (This is true for all Sumitomo core companies.) However, the aggregate share of all members is typically large enough to ensure that the group has significant control over each member firm. For the six largest groups, intragroup shareholdings ranged from 19 to 45 percent in 1989, with the highest shares in Mitsubishi and Sumitomo (Fair Trade Commission, 1992). If only the 50 largest equityholders were included, average aggregate group holdings was about 35 percent. Gerlach (1992) estimates that the shares of intragroup holdings for the 20 largest owners range from 33 to 74 percent. Furthermore, when indirect shareholdings are also

Table 1

Composition of Hokusui-kai, the Sumitomo Presidents' Club

The Sumitomo Bank	City bank
The Sumitomo Trust and Banking Co.	Trust bank
Sumitomo Life Insurance	Life insurance
The Sumitomo Marine and Fire Insurance Co.	Hazard insurance
The Sumitomo Corp.	Trading house
Sumitomo Coal Mining	Coal
Sumitomo Construction Co.	Construction
Sumitomo Forestry Co.	Forestry products
Sumitomo Chemical Co.	Chemicals
Sumitomo Bakelite Co.	Specialized chemicals
Nippon Sheet Glass Co.	Glass and ceramics
Sumitomo Cement Co.	Cement and cement products
Sumitomo Metal Industries	Iron and steel
Sumitomo Metal Mining	Mining
Sumitomo Light Metal Industries	Metal products
Sumitomo Electric Industries	Heavy electric equipment
Sumitomo Heavy Industries	Heavy machinery
NEC Corp.	Electronics
Sumitomo Realty and Development Real estate	Construction
The Sumitomo Warehouse Co.	Warehousing

Source: Oriental Economist (1991).

Table 2

Financial and trade links in the six largest financial keiretsu (1989)

	No. of core firms ^a	Intragroup shareholdings ^b (%)	Intragroup borrowings ^c (%)	Intragroup trade ^d (%)
Sumitomo	20	27	27	38 (37)
Mitsubishi	29	35	18	26 (21)
Mitsui	24	19	24	19 (18)
Sanwa	44	16	17	6 (5)
Fuyo	29	16	19	13 (11)
DKB	47	14	12	12 (7)

Source: Fair Trade Commission (1992).

^a Number of firms represented on the group's Presidents' Council (1991).^b Share of a group's total equity held by group members.^c Share of group financial institutions in total borrowing by nonfinancial member firms (excluding discounted notes and trade credits).^d Share of other member firms' purchases over total sales of manufacturing members of the group; in parentheses is the share of group's general trading company.

considered (i.e., firm A's holdings in firm B through firm C), the group's share of total shareholdings is even higher. [Hoshi and Ito (1991) measure group cohesion (including both direct and indirect shareholdings) by $j'A(I - A)^{-1}w$, where A is the matrix of shareholdings, j is a vector of ones, and w is a weighting vector.] In the case of Sumitomo, the share of core firms held by other core firms in the same group ranged from 17 to 47 percent in 1991 (Oriental Economist, 1991). Since the core firms are listed and widely held, such large shares of equity ownership provide the group with effective control as long as members act in concert.

While cross-holdings by nonfinancial firms are much more developed in the most cohesive keiretsu, holdings by group financial institutions are important in all of them (Hoshi and Ito, 1991). Typically, the keiretsu main bank holds from 2 to 5 percent (5 percent being the legal limit). By main bank we mean an enterprise's primary bank, both in terms of its role in coordinating outside funding and of its overall direct lending. 'Usually a member of the City Bank Association, but for some large firms a long-term bank, and for smaller firms a regional bank' (Aoki, 1992).

Equity holdings by other group financial institutions are also substantial. In fact, when indirect holdings are included, group financial institutions account for more than half of intragroup shareholdings. In the case of the Sumitomo Bank, direct holdings of equity in group companies ranged from 2.5 to 4.9 percent in 1991 (Oriental Economist, 1991). Together, group financial institutions, including Sumitomo Life and Sumitomo Trust, controlled between 9.3 and 19.6 percent of the shares of the other core companies.

The holdings of member-firm debt are also strongly dominated by group financial institutions. Group banks extend loans to 98 percent of all member companies in their respective groups (Fair Trade Commission, 1992). In 1989, the shares of group financial institutions in total borrowing (excluding discounted notes and trade credits) of group members ranged from 12 (DKB) to 27 (Sumitomo) percent. The shares are slightly higher for short-term than for long-term borrowing (Fair Trade Commission, 1992). The main bank alone typically accounts for 10 to 20 percent, and the group trust bank for another 5 to 10 percent of total borrowings (Flath, 1990).

In the Sumitomo group, Sumitomo Bank accounted for between 8 and 39 percent of core companies' borrowing in 1991. Collectively, member financial institutions accounted for 12 to 56 percent (the median is 31 percent). The remaining borrowing came from main banks of other keiretsu, independent long-term credit banks, city banks unaffiliated with the groups, and regional banks. Lending by group financial institutions is by no means directed exclusively to group firms. In fact, only three of Sumitomo Bank's 15 largest borrowers were members of the Sumitomo Presidents' Council, and several were affiliated with other financial keiretsu (Oriental Economist, 1991). However, for the Sumitomo core companies, the bank is the largest lender.

Keiretsu firms also rely strongly on intragroup lending through trade credits, which contributed 18 percent of gross financing of nonfinancial enterprises in 1970–1985. The corresponding figures for the United States and West Germany were 8.4 and 2.2 percent, respectively (Mayer, 1990). Unfortunately, there are no available trade credit statistics that distinguish firms affiliated with keiretsu from independent firms.

The companies belonging to the financial keiretsu are on average more highly leveraged than independent companies (Nakatani, 1984). The equity share of the bank in a particular group company normally increases with the size of the bank's outstanding loan (Flath, 1990; Hoshi and Ito, 1991). The size of bank shareholdings also appears to be positively correlated with the degree of leverage in individual firms.

The interdependence of member firms is also reflected in interlocked boards of directors. (In Sumitomo's case, the 20 core members administer three other groups: Past President/Past Chairman's Group, Planning Group of Vice Presidents, and General Affairs Department Manager's Group.) While these boards are predominantly internal, outside directors are allocated in proportion to shareholdings (Flath, 1990). The company's main bank is likely to be represented on the board (Sheard, 1989). Sumitomo Bank has four directors on the board of Sumitomo Coal Mining, three on the board of Sumitomo Construction, and two on the board of Sumitomo Cement. Sumitomo Coal Mining is represented on Sumitomo Cement's board and Sumitomo Corporation on that of Sumitomo Construction. In addition, main banks often send their employees to important managerial positions in group firms.

The groups are represented in a wide range of industries. Interestingly, a group seldom has more than one member in the same industry. For instance, among the 16 nonfinancial core companies in the Sumitomo group, there are three companies in industries classified as nonferrous metals (Sumitomo Metal Mining, Sumitomo Light Metal Industries, and Sumitomo Electric Industries) and two in chemicals (Sumitomo Chemicals and Sumitomo Bakelite). However, in terms of the main product lines there is no overlap.

Although trading relationships are weaker than in the zaibatsu, many members of the financial keiretsu transact with each other extensively and on a regular basis. In 1989, an average 43 percent of all bilateral relationships within groups involved some nonfinancial transaction; in the case of Sumitomo this ratio was 64 percent (Fair Trade Commission, 1992). Intragroup transactions accounted for 7 percent of sales and 8 percent of purchases (12 and 13 percent in Sumitomo); these levels used to be much higher, but have decreased during the 1980s. The significance of intragroup trading is higher in manufacturing, in particular in iron and steel (39 percent) and in nonferrous metals (31 percent). Chemical products and transport equipment also had higher-than-average shares of intragroup trading. For instance, Sumitomo Chemical cooperates closely with Sumitomo Bakelite (of which it owned 22.7 percent

in 1989); Sumitomo Heavy Industry buys much of its rolled aluminum from Sumitomo Light Metal Industries, which in turn prefers to buy its machinery from Sumitomo Heavy Industry, even if an outside manufacturer can offer a similar product. Gerlach (1992) reports that Mitsubishi Aluminum sold 75 percent of its output to other group firms and bought all of its input from group firms. According to the Fair Trade Commission, 46 percent of all the main frame computers in the Sumitomo group were manufactured by Nippon Electric Company (NEC), a Sumitomo member. In the insurance field, as in banking, where rates are often regulated and the products are virtually identical, group orientation is also particularly strong (Ito, 1992).

A large part of these intragroup transactions involves the group general trading company; in manufacturing these shares were 80 percent of sales and 70 percent of purchases in 1989 (Fair Trade Commission, 1992). The trading companies have transaction relationships with virtually all group member companies. In the Sumitomo group, the group trading company, Sumitomo Corporation, is involved in almost 90 percent of all intragroup sales and purchases.

3. The collective enforcement mechanism

We provide a model of a governance structure that captures most of the historical features of the keiretsu. In particular, the model rationalizes the extensive cross-holdings of debt and equity and the central role for main bank lending, and relates these features to the pattern of intragroup trade and intervention.

We provide a stylized representation of a collective enforcement mechanism, with features resembling the financial keiretsu, and then develop a formal model of a cross-shareholding coalition. The arrangement supports efficient investment among trading firms, relying on mutual monitoring complemented by a threat of control loss. We demonstrate that this collaborative equilibrium dominates arm-length collective enforcement through reputation (Perotti, 1992).

As in all infinitely repeated games, multiple equilibria, some of which are inefficient, may occur. In the described arrangement, mutual equity holdings may fail to impose discipline, and instead produce mutual entrenchment. We show how a sufficiently high level of leverage, concentrated in the hands of a financial intermediary, can rule out inefficient entrenchment equilibria. [This third party acts as the budget-breaker in the solution to moral hazard in teams offered by Holmstrom (1982).] Finally, we consider the case when poor financial performance of the firm makes liquidation or restructuring very likely, reducing expected control benefits and thus the effectiveness of the disciplinary threat. We describe informally a mechanism in which group members use interfirm debt to obtain early information about poor performance (Harris and Raviv, 1990).

Once default has revealed the need for restructuring, the concentrated debt holdings by the financial intermediary and its role in the syndication of smaller claims lead to a swift reorganization, mitigating the free-rider problem among creditors.

3.1. *Mutual enforcement through cross-holdings of equity*

Consider a set of $N + 1$ firms, indexed by $i = 1, \dots, N + 1$, and n agents, indexed by $j = 1, \dots, n$, where $n > N + 1$ (so there are more potential managers than firms). A firm is characterized by specific assets, with its capital structure defining the allocation of revenues and control rights. We distinguish here between managerial and corporate control. Managerial control is defined as the entitlement to make production decisions regarding the use of the firm's assets. Corporate control is the right, exercised by a coalition of shareholders that own a majority of the shares, to assign control over assets to a manager of its choice.

In the spirit of the recent literature on residual control rights (Grossman and Hart, 1986), we assume that managerial control confers some noncontractible private benefit, which is related to the amount of assets managed. Specifically, the exercise of managerial control offers the manager a benefit equal to a fraction $\sigma > 0$ of output. We can think of either psychological or material benefits, such as large expense accounts, golf club memberships, and social prestige, as associated with being in charge of the corporation. For simplicity, we assume that these benefits of control are the main component of the manager's compensation scheme. (Another interpretation is that such benefits represent efficiency wages, i.e., above-average wages aimed at promoting effort.) We also assume that the firm's manager is not a shareholder.

Managing the firm and transacting with other firms requires specific effort investments by the manager. Working costs c , while shirking is costless. Agents' utility functions are linear in return and effort. The payoff to a manager in charge, when π indicates the profit from the firm's assets, equals

$$U(\pi(c), c) = \sigma\pi(c) - c \quad \text{when effort is expended,}$$

$$U(\pi(0), 0) = \sigma\pi(0) \quad \text{when no effort is expended}$$

A shareholder, indexed by i , who enjoys no benefit from control and exerts no effort, earns the return $U(\pi, 0) = \mu_{ij}(1 - \sigma)\pi$ from her stake μ_{ij} in the j th firm. All agents discount future payoffs at the rate δ per period.

A firm may produce independently or in collaboration with another firm; firms are matched with a probability η in each period. (For now, we assume for simplicity that $\eta = 1$. Later, we offer a more general treatment). When the firm operates independently and the manager applies effort, its profits are Θ ; if no effort is expended, its return is zero. It is assumed that $\sigma\Theta > c$, so that managers

like to be in control even if they incur effort costs. Collaborative ventures are more profitable, as they permit trading partners to specialize or coordinate the use of their assets. The value of such transactions is enhanced by joint relation-specific investment, described as the combined effort by the two managers: effort by both produces 2α , effort by one produces 2β , and no effort on either side produces zero, where $\alpha > \theta > \beta$. Payoffs, while observable, are not contractible, i.e., it is not possible to agree *ex ante* on a state-contingent allocation.

The basic stage game repeated in each period as illustrated in Fig. 1. At first, managers decide whether to enter in joint transactions; if they do, they choose whether to expend transaction-specific effort. After output has been realized, profits net of private benefits are distributed. Finally, shareholder meetings are held for each firm to decide whether to confirm or dismiss incumbent management by a voting majority.

The two managers' investment decisions are taken simultaneously; both managers observe the outcome afterwards. However, since effort is not verifiable by public courts, it cannot be made part of an enforceable contract. This seems reasonable, since complex transactions require specific investment decisions which may be hard to describe *ex ante*. Because of the incompleteness of the original contracts, trading firms must bargain for a division of collaboration benefits. For simplicity, we assume that the two firms split the payoff evenly. Coalition members outside the transaction can either observe the actions taken or may establish them through inspection. Later, we will make explicit use of the notion that frequent trading partners have access to better information than outsiders.

Consider now a manager's incentives to provide effort in a one-period joint transaction. Each manager receives a benefit equal to a fraction σ of the value received by his firm, and has to invest personal resources, c , to achieve efficient production. Since collaboration is valuable, both managers would like to commit themselves to extra effort. However, in the absence of credible precommitment, individual incentives are poor when $\sigma\alpha - c < \sigma\beta$. In this situation, we have a classic Prisoner's Dilemma: both agents prefer to shirk regardless of what the other does. In equilibrium, this behavior is anticipated and both earn

Fig. 1. Timing of events in the stage game.

a payoff of zero. As a result, managers prefer to engage in their own production (which yields them a net positive return $\sigma\Theta - c$), and potential gains from interfirm transactions are lost.

Once a stage game is repeated an infinite number of times, cooperation may be sustained through the threat of loss of reputation. All coalition members could refuse to trade with a deviant firm in order to discourage opportunism. However, this threat could be insufficient when the agents' discount factor for future payoffs falls short of a critical level (Fudenberg and Maskin, 1986), in which case a stronger deterrent is necessary to support collaboration.

We now describe how a coalition of managers may credibly commit to collaborate through a redistribution of voting rights.

Consider the following arrangement. Assume that in an initial stage, each firm, i , exchanges its own shares for minority stakes μ_{ij} , $j \neq i$, in the other N companies, to the point where self-control (the amount of voting rights in the firm controlled by its manager) is zero, i.e., $\mu_{ii} = 0$ for all i . (This assumption is not crucial, as long as the degree of self-control is sufficiently low.) For simplicity, let $\mu_{ij} = 1/N$ for all j different from i ; each firm gets the same minority share. A first effect of this exchange is profit sharing, so that all members internalize to some extent the profitability of other firms in the coalition. The incentive effect of profit sharing is unclear in our context. However, reciprocal holdings not only redistribute claims to residual income, but also, more importantly, reallocate control rights; mutual stakes carry voting power in each firm's shareholders meeting.

The crucial feature of this voting rights allocation is that it makes each manager vulnerable to a control shift arranged by the other N managers. The share exchange is complemented by some rules on voting behavior: following any deviation by a manager from collaboration with other members, the rest of the coalition will oust the manager from the control position at the next shareholders' meeting. To make this punishment credible, another provision stipulates that if the coalition fails to dismiss a deviating manager, or if, alternatively, it removes a manager from control without just cause, the arrangement collapses. As a result, members would not be bound by an obligation to collaborate, which leads to a loss of gains from trade.

We next examine the conditions under which the threat of expulsion by the rest of the coalition can enforce collaboration. The manager will not find it in his interest to act opportunistically if the one-period net gain from shirking in transactions with other firms is less than the capitalized value of future control benefits. By collaborating in the future the manager will earn

$$\frac{\delta[\sigma\alpha - c]}{1 - \delta}$$

from his control benefits in the firm he manages. If he deviates, the manager saves the cost of effort, c , minus his share of lower profits. Thus, it does not pay to deviate and be dismissed as long as

$$\frac{\delta(\sigma\alpha - c)}{1 - \delta} > c + \sigma(\beta - \alpha)$$

$$\Rightarrow \sigma > \sigma^* \equiv \frac{c}{\delta\alpha + (1 - \delta)(\alpha - \beta)} = \frac{c}{\alpha - (1 - \delta)\beta}.$$

Note that the lower the payoff for shirking, the larger the managerial control benefit σ . There are two reasons. The first is a direct effect: since the control benefit is proportional to total profits, a loss of joint profits also affects these benefits. The second is that a dismissal implies the loss of higher future benefits. Thus the coalition holds hostage a significant control benefit, one which is very effective in mitigating moral hazard.

3.1.1. The credibility of the cross-holding arrangement

For such punishment threats to be credible, it must be in the interest of a majority of shareholders to agree to dismiss the manager following a deviation. We examine here the necessary conditions for credibility of cross-holding punishment. The choice for each shareholder at the meeting of the firm is a vote of confidence or dismissal for its manager. Since the cross-holding equilibrium relies on a collective vote, we need to rule out the possibility of deviations from majority subcoalitions. We do so by verifying under what conditions a majority subcoalition does less well in a deviation than in the collaborative equilibrium.

First, we establish whether a deviant manager can block dismissal by bribing a majority of shareholders. We allow a deviating manager to negotiate with other shareholders, and side transfers might take place. When n^* cross-shareholders are necessary to enforce the transfer of control, a number of members $n \geq n^*$ must have the incentive to do so. By stipulation of the arrangement, failure to punish a deviation will lead to a dissolution of the coalition, resulting in a loss of benefits from trade. Consequently, for punishment to be the optimal choice by the majority subcoalition, the loss of future collaboration gains must outweigh the gain from deviation (including possible side payments by the deviant manager).

The maximum bribe that a manager will be willing to pay to avoid removal and still gain from shirking is given by the gain from deviation, plus the private control benefit the manager stands to lose from dismissal, minus the share of loss of collaboration profits due to the collapse of the arrangement:

$$MB \equiv \sigma(\beta - \alpha) + c + \delta[\sigma\Theta - c]/(1 - \delta) - \delta[\sigma\eta(\alpha - \Theta)]/(1 - \delta).$$

A blocking subcoalition must be sufficiently large to ensure that their pooled votes can form a majority at the shareholders' meeting; it must contain at least n^* members, where

$$n^*[1/N] \geq \frac{1}{2} \Rightarrow n^* = (N + 1)/2.$$

If this majority subcoalition blocks punishment, its members lose their share of the loss of future trading gains. This is preferred when

$$\sigma(\beta - \alpha) + c + \frac{\delta[\sigma\Theta - c]}{1 - \delta} - \frac{\delta\sigma\eta(\alpha - \Theta)}{1 - \delta} \leq \frac{\delta n^*\sigma\eta(\alpha - \Theta)}{1 - \delta},$$

which can be rewritten as a constraint on the size of σ :

$$\sigma > \sigma^{**} \equiv \frac{2c}{\delta(N + 3)\eta(\alpha - \Theta) - \delta\Theta - (1 - \delta)(\beta - \alpha)}.$$

Thus, a minimum size of the private benefit of control is necessary to support collaboration. Note that this value is decreasing in N . The intuition is that the larger the control rent, the larger the required bribe to the majority subcoalition. An increased coalition size N in general contributes to support the cross-holding equilibrium, because it increases the number of agents necessary for a majority subcoalition and thus the total loss of individual trading profits arising from a disruption of the enforcement scheme. It also follows that a minimum size of the coalition is necessary to support collaboration.

3.1.2. Reputation – an alternative enforcement mechanism

We contrast now the effectiveness of the cross-holding arrangement with an alternative punishment device – loss of reputation. For the general result, see Perotti (1992). Consider a continuum of possible economies indexed by their discount factor δ , where $\delta \in [0, 1]$. We show below that the minimum value of δ required to sustain a reputation equilibrium (denoted δ_{RE}) is higher than the corresponding minimum value necessary to sustain a collaboration equilibrium (denoted δ_{CO}). We have the following proposition:

Proposition. The cross-holding mechanism dominates the public reputation mechanism, in the sense that it can sustain efficient transacting in some economies where the threat of reputation loss fails to discipline management.

Proof. The condition for the threat of reputation loss to be effective is that

$$\begin{aligned} \sigma(\beta - \alpha) + c + \delta\sigma\Theta/(1 - \delta) - \delta[\sigma\Theta + \sigma\eta(\alpha - \Theta)]/(1 - \delta) &< 0 \\ \Rightarrow \delta_{RE} &> \frac{\sigma(\beta - \alpha) + c}{\sigma(\beta - \alpha) + c + \sigma\eta(\alpha - \Theta)}. \end{aligned}$$

From the earlier analysis we can derive the minimum discount rate such that cross-holding arrangements can support collaboration as long as

$$\Rightarrow \delta_{CO} > \frac{\sigma(\beta - \alpha) + c}{\sigma(\beta - \alpha) + \sigma(\Theta + \eta(\alpha - \Theta))}.$$

Comparing the two expressions, we see that δ_{CO} is lower than δ_{RE} when

$$\sigma[\Theta + \eta(\alpha - \Theta)] - c > \sigma\eta(\alpha - \Theta) \Rightarrow \sigma\Theta > c,$$

which is always true under our assumption that the net benefit from control over an independent firm net of effort cost, i.e., the control rent, is positive. (If this were not true, no one would want to be a manager.)

Thus, there will be a subset of economies $[\delta_{RE}, \delta_{CO}]$ such that the cross-holding mechanism can support collaboration while the threat of loss of reputation cannot. The intuition is that since the potential sanction is stronger, cross-holdings can support collaboration in a broader set of circumstances than arm-length transacting. If he loses his reputation, a deviating manager is shut out of intergroup trading. However, there is no mechanism to displace the manager from the firm, so he maintains control over the firm indefinitely, earning its net control rent $\sigma\Theta - c$ even in a punishment period. Conversely, the cost of shirking is higher when the manager faces loss of control.

Mutual monitoring may enforce cooperation without any visible mechanism for control. In equilibrium, there is no need for frequent shareholders' meetings to enforce control changes; no manager would have an interest in deviating, and no forced control change will be observed. Thus an outside observer would see the resulting consensual behavior, but could not detect the implicit threats on which cooperation relies. The principle is well illustrated by the Japanese proverb 'Deru kugi wa utareru': the nail that sticks out will be hammered down.

3.2. *The role of leverage and main bank disciplining*

A limitation of the all-equity mechanism described is that in the context of infinitely repeated exchange, just about any equilibrium better than the Nash stage game can be sustained, provided that agents are sufficiently patient (Fudenberg and Maskin, 1986). Therefore, the allocation of control described in the model has also a multiplicity of equilibria, some of which are inefficient.

Unlike other coordination games, such as collusion in repeated oligopoly, firms in our model can legally coordinate actions; the coalition of firms may agree at the initial share exchange on behavioral rules that support collaboration. Since this arrangement maximizes the value of all firms, it is a natural focal point. However, there remains the possibility of a subsequent cooperative deviation by all managers within the keiretsu. The control that the coalition

enjoys over itself may lead to a pure entrenchment equilibrium, where no manager exerts effort and all vote their firms' cross-holdings to protect the current managerial appointments. Furthermore, cross-holdings of equity (or debt) provide no net contribution of capital; when member firms need outside finance, the threat of entrenchment may make investors reluctant to contribute funding. Thus, coalitions may not be stable without some additional self-controlling device.

We identify two major sources of discipline: competition across similarly structured groups and the role of the main bank. We submit that coalition members can credibly rule out entrenchment by raising debt capital from the group's main bank. When debt repayments are not met, control rights are transferred to the creditors and managers lose their control benefits. This ensures that managers have a strong incentive to perform. This reflects the recent literature on capital structure as a state-contingent allocation of control (Aghion and Bolton, 1992; Hart, 1989).

Assume that the coalition designates one of its members as a financial intermediary, and that the intermediary provides an amount of credit equal to D . The amount of debt coming due in each productive cycle, i.e., the rate of interest $1/\delta$ times D , may be set sufficiently high to make the firm insolvent when the managers choose to shirk or avoid collaboration altogether, but not when they collaborate, i.e.:

$$(1 - \sigma)\alpha > 1/\delta D > (1 - \sigma)\theta > (1 - \sigma)\beta.$$

This leverage ensures that a deviating coalition would be soon unable to meet its debt payments. Control would be shifted away from current managers to the intermediary, which can then install new management teams.

This interpretation raises the question of supervision of the intermediary. If its liabilities were entirely from within the coalition, the arrangement would provide no additional commitment. For the intermediary to represent a source of commitment, the ultimate financial obligations have to be to claimants outside the coalition. Since equity financing does not demand a periodic remuneration, it is less effective as a control device, particularly when partial ownership of the intermediary remains within the group. Thus the enforcer of last resort must be highly leveraged. Similarly, the more short-term the debt claim held by the intermediary, the tighter the discipline.

We identify this intermediary with the main bank. While it may be owned by, and own shares in, other group members, it is distinct in that it funds itself with deposits from outside investors in order to provide a reliable commitment for group firms. Thus, while the coalition of firms may solve the problem of individual discipline in solvent states through mutual monitoring, the main bank emerges as a 'monitor of last resort' in insolvent states, acting on behalf of ultimate investors (cf. Diamond, 1984). Ultimately, the main bank is

also monitored by the cross-holding arrangement, by its depositors, and, as a deposit-taking institution, by the regulatory authorities as well.

Throughout the analysis we have assumed that shirking in bilateral transactions is observable to the transacting parties and to the rest of the coalition. In the next section, we discuss informally the role of the coalition in situations where the potential loss of control benefits is insufficient to deter a deviation.

3.3. Mutual monitoring and cross-holdings of debt

Any incentive scheme that relies on the threat of loss of control will become less effective when the firm is unprofitable and the manager anticipates losing his control benefits. As a result, in distress, long-term incentives are weakened. The manager may avoid acknowledging default, maintaining liquidity at the expense of long-term investment, or may gamble in the hope of restoring profitability. Since the damage will be greater, the longer the manager remains in charge, it is crucial for the coalition to identify and correct, as early as possible, any underperforming firm.

The main bank can frequently update its information about the financial health of member firms through their debt repayments; default signals low profitability. However, a purely financial investor has only limited ability to evaluate such information. In particular, an investor may not be able to determine whether the firm in default is viable or not. In contrast, managers in trading firms have a comparative information advantage; they can observe each others' performance and effort through timeliness of delivery, product quality, level of investment, etc. Moreover, their specific industry knowledge allows them to distinguish between poor market conditions and incompetence. We suggest here that frequent trading partners are effective monitors, and that a combination of financial and production information obtained in constant interaction may allow better performance evaluation than centralized monitoring. This generates a rationale for extensive cross-lending along trade lines.

In general, the problem with diffuse debt is that managers of insolvent firms have incentives to keep paying creditors to postpone bankruptcy, even at the cost of long-term value. An informed trade creditor may collude with the manager in exchange for the immediate payment of its claim (Bulow and Shoven, 1978). This is a particularly delicate issue for junior trade creditors, for whom bankruptcy would result in large losses. On the other hand, a main bank that serves as the dominant lender for all group firms has a particular incentive to mitigate this free-rider problem. One solution is for the main bank to guarantee trade claims, thus improving incentives for early reporting of insolvency and poor performance.

To some extent, cross-lending in financially distressed states replicates the allocation of control rights achieved by equity cross-holdings in profitable states. However, the relative dominance of the main bank in lending ensures that

in default, control becomes more concentrated. Moreover, syndication of trade and other junior financial debt strengthens the bank control necessary to coordinate the process of restructuring of the firm. Thus, another role of the main bank is to provide coordination in financial distress.

4. Discussion

Next, we discuss some empirical evidence on the Japanese keiretsu groups and examine the implications and predictions of the model.

The group financing patterns in the model correspond well to the historical structure of the keiretsu: the elaborate cross-holdings of debt and equity, the predominance of main bank lending, the high level of leverage, and the link between financial and trading relationships.

The model rationalizes the structure of the keiretsu as an alternative governance to the outlawed hierarchical zaibatsu. The combined use of debt and equity creates a state-contingent governance structure that alternates between mutual and hierarchical enforcement. Individual managers monitor each other through cross-holdings of equity and trade credit. Once the firm is in financial distress, control over the firm switches to bank-led monitoring.

This arrangement could be viewed as intermediate between the delegation of decision rights to one of the contracting parties (control rights) and assigning them to a third party (arbitration). By exchanging control rights among themselves, managers effectively turn themselves over as hostages to the coalition, thus creating a collective solution enforcing cooperation (Williamson, 1983).

This governance structure relies on the existence of opportunities for long-term trading and joint ventures between member firms, and of significant managerial control rents. Unfortunately, information on intragroup trade is limited and the quality of official statistics is poor. However, the Fair Trade Commission data presented in Table 2 clearly suggests a preference by keiretsu firms for trading with firms that are members of the same group. The reliance on intragroup trade is particularly important in the manufacturing industry, and very strong in certain other industries. There is overwhelming evidence of a preference for intragroup trade in financial services. More importantly, the cross-holding scheme and the frequent information exchanges may be used to enforce any contractual relationships between member firms, including superior corporate governance.

The feature that distinguishes this governance mode from a pure reputation mechanism among long-term trading partners is the implicit threat of loss of managerial control. (Expulsion may seem an excessively powerful and blunt instrument; a more fine-tuned mechanism may be preferable, particularly if member firms succeed in intervening early. Indeed, the evidence suggests that managers are most often being demoted and transferred to subsidiaries or

affiliated companies.) Therefore, its efficiency should be compared with other governance arrangements that rely on the threat of control loss, such as the takeover market in the U.S. and U.K. The advantages of the mutual monitoring form of corporate governance are its early warning system, supported by frequent interaction and informational exchange among trading/financial partners, the internal process of substitution of management, which is likely to be less costly and disruptive than control changes by external investors with limited specific information, and the degree of coordination among creditors in the reorganization process.

The disciplinary effectiveness of this internal governance system should not be underestimated. Although there is no takeover market in Japan, Kaplan (1992) shows that managerial turnover in Japanese companies is in fact very sensitive to poor performance. In Japan, demotion, and possibly expulsion, is certainly very costly for an individual manager; the difference between the compensation to keiretsu managers (including private benefits) and spot market wages is substantial. Salary levels are generally higher in keiretsu firms than in independent firms (Nakatani, 1984); and the nonpecuniary benefits associated with top management positions in the keiretsu are certainly not trivial (Clark, 1975). More importantly, Japanese managers typically stay in the same corporation for their entire careers, so their skills become distinctly firm-specific. Kato and Rockel (1992) show that there is a strong monetary disincentive for managers to change firms. Finally, the mid-career managerial labor market is virtually nonexistent. Indeed, this feature, which is often invoked to explain the financial keiretsu as risk-sharing arrangements (Aoki, 1988; Sheard, 1994), highlights the enforcement power of the threat of expulsion.

The model has implication for group composition as well as the size of the groups. The coalition should first include the firms most likely to benefit from cooperation, i.e., firms with the most profitable and longest time horizon for joint investment transactions, or those with more vulnerable firm-specific investments. The coalition should be large enough to allow repeated interaction among member firms, but small enough to remain cohesive. New firms would be added only if the expected benefits of mutual collaboration outweigh the internal costs of adding another member. Adding a firm active in an already represented industry reduces the chances of internal cooperation for an existing member, and may cause internal conflicts. Thus, each keiretsu should include at most one member firm from each industry. In addition, the keiretsu should prefer to add member firms of comparable size, e.g., medium-size to large firms, to support an *inter pares* relationship rather than an hierarchical relation.

These features are consistent with the keiretsu structure. Core companies are typically large firms on the first list of the Tokyo Stock Exchange. The groupings are represented in a wide range of industries, but only rarely is more than one keiretsu firm represented in a particular industry.

Commitment to a coalition is facilitated when the group is well defined, and insiders and outsiders are easily distinguished. While there are fringe members for which affiliation is ambiguous, core companies are always clearly identified. Interestingly, detailed statistics on ownership and lending patterns within the groups are published yearly, ensuring that changes in the allocation of control do not go unnoticed. In addition, recurrent campaigns promote the name of each keiretsu (Gerlach, 1992). [Hadley (1970) has argued that the ‘brand name’ associated with group affiliation is the main rationale for the existence of the groups.] The enforcement mechanism we have described may also explain why explicit contracts within the groups are very brief and short-term, leaving matters not stipulated to ‘amicable’ resolution (Ballon and Tomita, 1988).

The collective enforcement model clearly relies on an ownership structure that is stable over a long period of time; sustained interaction is necessary for the cooperative mechanism to sustain itself. This is consistent with the exchange of equity, a voting claim without a terminal date, and with the remarkable stability of the structure of keiretsu shareholdings. During the 1960s and 1970s the arrangements were progressively reinforced. In the Sumitomo group, average intragroup cross-holdings increased from 21 percent in 1955 to 29 percent in 1970 and 37 percent in 1981. Despite substantial changes in Japanese financing patterns during the 1980s, particularly in large firms, cross-holdings have decreased only marginally, from 25 percent in 1981 to 22 percent in 1989.

Similarly, the arrangement requires procedures for maintaining the allocation of voting rights in the event of an equity issue or the sale of group shareholdings by a keiretsu firm. Indeed, the observed use of discounted equity issues with preemption rights targets existing shareholders and is consistent with the goal of maintaining a stable control structure. In addition, the main bank often intervenes when a firm has to sell off its holdings in other member firms. It does so by allocating these holdings proportionately among group members (Sheard, 1986). Since maintaining a stable allocation of control is valuable to keiretsu affiliates, outsiders may be tempted to extract some of this surplus. Indeed, share-cornering and blackmail attempts by speculators against keiretsu firms are important features of Japanese stock markets (Sheard, 1994).

While the model suggests that the group’s combined holdings in each member firm should provide the coalition with firm control, in the financial keiretsu, combined group holdings seldom exceed 50 percent. However, since firms are very large and residual shareholdings are widely dispersed, effective control can be achieved with less than a majority of the shares. When only the largest shareholders are considered, group firms typically have solid majorities. In particular, no firm has so much self-control that it can outvote the rest of the coalition, and no firm has a controlling interest in another member firm.

The emphasis of the model on the allocation of voting control should not lead to exaggerate the role of the high-ranking group meetings, such as the Presidents’ Council. (The Presidents’ Councils have no independent staff, and the

meetings tend to focus on general topics of group interest rather than on specific issues where formal decisions are taken. The Sumitomo Hokusui-kai meets for one hour once a month.) In reality, interaction among keiretsu firms takes place at all managerial levels, and there are well-documented networks among keiretsu firms' middle managers. Coordination and monitoring are mutual, rather than imposed from above. However, the model captures certain functions attributed to the Councils. Aoki (1988) suggests that these councils perform, among other things, arbitration in conflicts between group members, and obviously arbitration requires an enforcement mechanism. While the boards of individual keiretsu firms are dominated by management, the composition of external directors, sent out to oversee restructuring of troubled firms, does reflect the distribution of shareholdings.

Our interpretation of the financial keiretsu may explain some behavioral features of the groups. The model suggests that only rarely should one see shareholders intervening in member companies, whereas large creditors would be very active in default. Shareholder interventions are indeed rare, although they have been documented. For example, despite an ownership share of merely 4 percent, Nissan Motor effectively took over control of Fuji Heavy Industries without any stock or debt changing hands (Kester, 1991); both companies are members of Fuyo group. This 'takeover' could not have happened without the consent of the rest of the group. Similarly, Mitsubishi Electric, with a small ownership share, led the restructuring of Akai Electric, a major supplier and purchaser within the Mitsubishi group. Restructuring of distressed firms by main banks is commonplace and well-documented; Sumitomo Bank has been responsible for some of the most publicized cases (Sheard, 1989; Pascale and Rohlen, 1983).

Finally, we suggest that the bank guarantees intragroup trade credits to ensure early reporting. In fact, the main bank traditionally absorbs the bulk of the losses and usually leads the reorganization process (Sheard, 1991). Defaulted trade credits are transferred to the main bank, whose claims are voluntarily subordinated to all other claims in reorganizations (Aoki, 1992). The high interest rates ordinarily charged by main banks can be seen as a compensation for its insurance and monitoring services. The reorganization of member firms in financial distress may be the single most important aspect of the financial keiretsu; evidence suggests that formal bankruptcy is virtually nonexistent within the groups, whereas it is common among independent companies (Hoshino, 1984). This also suggests some costs of the arrangement: the mix of financial ties and trading relationships may introduce a bias to maintain unprofitable firms because of the value of established links and dedicated specific investment.

The predictions of the model are in general agreement with the empirical findings of Hoshi, Kashyap, and Scharfstein (1990b, 1991). Firms belonging to the financial keiretsu appear to be less liquidity-constrained and have lower

costs of financial distress than independent firms. On average, keiretsu firms invested 46 percent more after the onset of financial distress than their unaffiliated counterparts. Hoshi, Kashyap, and Scharfstein explain their observations as the result of monitoring by the main bank. Interestingly, independent firms with close bank relationships have better access to outside finance than independent firms without such ties, but less so than keiretsu members. Hoshi and Ito (1992) find that the most cohesive groups have lower and more stable profits. In addition, variation in performance among the six largest groups is best explained by the extent of cross-holdings of equity. This is consistent with our argument that hierarchical main bank monitoring and mutual monitoring that are based on reciprocal holdings of debt and equity are both important to control agency costs. In conclusion, the cross-holding arrangement among frequently transacting firms may provide both better incentives and superior information than the standard, widely held firm with outside investors.

5. Conclusion

We have offered an interpretation of the governance structure of the financial keiretsu as a mechanism to support cooperative behavior among member firms. The groupings could be viewed as an example of the role of groups in Japanese society; cooperation is achieved by a coalition of self-interested individuals under implicit threats of expulsion. [Kandel and Lazear (1989) model the influence of peer pressure on the effort exerted by members of an organization. They show how a discontinuous punishment scheme, such as exclusion, under certain conditions may be as effective as an elaborate nonlinear incentive scheme.]

The costs associated with this arrangement are an open research issue. One possibility is that open-ended mutual commitment may result in excessive rigidity. Two successful industries, car and consumer electronics, are very lightly represented, suggesting perhaps that rapidly expanding sectors require greater flexibility. In fact, the recent loosening of the keiretsu ties may suggest that increased global competition demands greater flexibility in corporate alliances. Moreover, the keiretsu structure may introduce a continuation bias, i.e., non-viable firms may be kept alive longer than they should be. Since creditors are also long-term suppliers and/or customers (as well as shareholders), they may have sunk interests in the firm different from those of a 'pure' creditor. Such a bias is hard to document, but numerous casual accounts indicate that it may be prevalent in Japan.

Another unresolved issue is the question of 'who monitors the monitors', namely, the governance structure of the main banks. Aoki, Patrick, and Sheard (1994) describe a complex system of mutual monitoring among main banks and

potential intervention by the Bank of Japan and the Ministry of Finance. But the ultimate external discipline imposed on the groups may derive in no small degree from the presence of other groups with a similar internal structure who are engaged in fierce competition in the same industries. Intense domestic competition is viewed by many (e.g., Porter, 1990) as a decisive factor in explaining efficiency and comparative advantage. The promotion of competition across groupings may be the reason why diversified groups have been more successful in Korea and Japan than elsewhere.

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