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Cross-shareholding in the Japanese Keiretsu

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Abstract: Although sometimes said to reflect distinctively Japanese modes of economic organization or the general importance of path-dependence and culture, the cross-shareholding patterns within the Japanese keiretsu often display a straightforward economic logic. When keiretsu banks trade on debtor stock, for example, they occasionally seem to be capturing gains from inside information. When manufacturers in the automobile industry buy stock in their suppliers, they apparently do so to protect relationship-specific investments. And when the pre-war predecessors to the keiretsu invested in component firms, they often invested in ways that resembled the ways silicon valley venture capitalists invest today. Economic form may differ between the U.S. and Japan, but the cross-shareholdings themselves reflect a simple economic rationale.

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The Japanese keiretsu groups present something of a puzzle. They include many of Japan's largest and most prominent companies -- the various Mitsubishi firms, for example, or the Sumitomo and Mitsui. At least as usually recounted, these firms both invest heavily in and trade heavily with each other. The puzzle is why.

In the U.S., we cite these intra-group trades and investments for a wide variety of propositions. Implicitly comparing them to spot-market transactions, some observers claim they reflect a distinctively Japanese preference for keeping social contacts within closed groups.¹ Others tie them to the current debates over path-dependence, and claim they prove history matters -- that they illustrate the way Japan's isolated evolution shaped its economic organization. For a time, some observers even called the keiretsu non-tariff trade barriers.²

Yet in many (not all) ways, keiretsu firms invest and trade in ways that reflect a straightforward economic logic. In many ways, keiretsu firms buy and trade stock in each other in ways that represent rational responses either to investment opportunities or to the problems created by the Williamsonian (1985: 61) "fundamental transformation" in contract -- rational responses to the potential for strategic behavior in a world of asymmetric information and relationship-specific investments. Contractual form may differ between the U.S. and Japan, in short, but the basic logic by which firms exploit investment opportunities or solve the problems posed by informational

¹ Sociologist Michael Gerlach (1992: 4) locates the difference between U.S. and Japanese business relations in the "pervasiveness and continuing visibility" of "affiliational ties," "long-term relationships," "multiplexity," "extended networks," and "symbolic signification" within the group networks.

² According to Robert Z. Lawrence (1993: 14), for instance, the keiretsu "typically cut the import share of consumption in [an] industry by half."

asymmetry and asset specificity do not. Different legal and regulatory constraints will differently shape the structures that businesses in different countries adopt, to be sure. But at least between the U.S. and Japan, the evidence on cross-shareholding arrangements provides no evidence that people themselves respond differently to economic forces.³

To explore the ties between keiretsu shareholdings and contractual design, I first describe the groups themselves (Section 1). I then advance three propositions. First, when keiretsu banks trade on group-member stock, they sometimes (not always) trade on inside information (Section 2). If U.S. banks do not do the same, it is only because they cannot legally hold stock. Second, when manufacturers and suppliers exchange stock holdings, they seem to be protecting relation-specific investments (Section 3). If U.S. firms do not do the same, it is often because they have brought their suppliers entirely in-house -- as GM famously did with Fisher Body in 1926. Last, the higher crossholdings before World War II reflected the role that the wealthy families at the center of the groups played as venture capitalists (Section 4). Keiretsu firms no longer buy such large equity stakes, but only because the wealthy families at their core disappeared in the wake of World War II.

³ I do not claim to disprove the influence of culture, history, or path-dependence. Instead, I claim only that several prominent aspects of the cross-shareholding patterns (patterns that many had argued were explicable only through culture or history) are equally consistent with rational economizing behavior in the face of well-known problems of contractual design.

1. Introduction:⁴

1.1. The keiretsu.

The keiretsu are a diverse lot. Depending on the definition used, observers offer widely varied lists of these extremely varied firms (see Sheard, 1996a: 23 for a taxonomy). Most everyone lists six central groups: the Mitsui, Mitsubishi, Sumitomo, Fuji (Fuyo), Daiichi-Kangyo Bank (DKB), and Sanwa. Each of these groups maintains a list of formal members, and the presidents of those member firms regularly meet for lunch (reflecting the day they meet, the Mitsubishi group calls itself simply "The Friday Group").

Typically, the groups include 20-odd members -- from 45 at DKB to 19 at Sumitomo. They cross a wide range of industry lines. The Mitsui group includes two banks, for example, two insurance companies, a trading company, a construction firm, a paper company, an oil company, a steel company, Toshiba, Toyota, and even a real estate firm.

Many observers also use "keiretsu" to refer to larger, looser networks of firms. Often they point to the groups of assemblers, distributors and suppliers in the automobile industry. Toyota is a formal member of the Mitsui keiretsu. Nonetheless, observers commonly also refer to the Honda, Toyota, and Nissan networks as independent keiretsu. To distinguish these intra-industry groups from the diversified groups like the Mitsui, they typically call the former "vertical" keiretsu and the latter "horizontal."

⁴ The figures in this section are calculated from the data given in Toyo keizai (1996: 28-45).

1.2. The shareholdings.

Keiretsu members often do invest in each other. Note, however, three qualifications about the horizontal keiretsu. First, the cross-shareholdings are often quite small. Where some scholars place keiretsu crossholdings at upwards of 70 percent,⁵ among the six core groups the intra-group cross-shareholding (the mean of the amount of any firm's shares held by all other group members combined) instead averages 18 percent. It ranges from a low of 11.7 percent among the 45 DKB group firms to a high of 27.5 percent among the 26 Mitsubishi firms.

Second, these cross-holdings are largely reciprocal pairings. Within a group, firm A will tend to buy stock only in those firms that have in turn bought stock in A. If there is any broader "groupism" within the keiretsu, the cross-shareholdings do not show it. Take the Mitsui. The average Mitsui group member invested in 10.04 other Mitsui firms. If the 25 group members⁶ had invested in each other randomly, the odds that any two firms would invest in each other would be $(10.04/25)^2 = .161$. That figure, in turn, would predict reciprocal crossholdings in $(325)(.161) = 52$ of the 325 possible pairings among the 25 firms. In fact, reciprocal investments appear in 95.

Furthermore, when these Mitsui firms invest in each other, they invest close to the same amount of funds. In a fifth of the reciprocal shareholdings, the economic value of the smaller

⁵ Gerlach (1992: 74) quotes sources putting the percentage of shares held by "stable" shareholders at 70 percent. Although he does not refer to this as the keiretsu cross-holding figure, he does elsewhere characterize the keiretsu as providing group members with "a stable core of long-term shareholders" (*id.*, 4-5). Other observers have been less careful, and conflated the 70 percent figure with keiretsu cross-holdings. In fact, the 70 percent figure simply reflects the percentage of stock held by corporations rather than individuals.

investment was within 25 percent of the larger. In over half, it was within 50 percent.

Third, within each keiretsu, several financial firms and a few other outliers own most of the cross-held stock.⁷ For example, the two banks and two insurance firms own almost all of the crossheld Mitsui stock. Although the cross-holding within the Mitsui group averages 16.5 percent, if I drop the four financial firms the combined ownership of the other Mitsui firms in each other averages 5.81 percent. Within each group, there remain a few other outliers: Mitsui Real Estate owns nearly 16 percent of Mitsui Construction, for instance, Sumitomo Metals owns 23 percent of Sumitomo Light Metals, and Hitachi Assembly owns over half of Hitachi Chemicals, Hitachi Metals, and Hitachi Electric Wire. If I drop the six Mitsui firms with the highest percentage of shares held by other non-financial members, the total crossholding among Mitsui firms drops to an average of 2.29 percent.⁸ Among the other keiretsu, it drops to a figure ranging from 1.84 and 1.87 at Sanwa and Fuyo to 7.98 and 9.14 at Sumitomo and Mitsubishi.

These cross-held shares do not make group members major shareholders in each other. Indeed, the non-financial firms rarely buy enough stock even to place among a firm's 20 largest shareholders. Consider the Mitsui again. The 26 Mitsui firms invested in each other 271 times, and the 22 non-financial firms

⁶ Actually 26, but one is a mutual insurance company.

⁷ By law, banks can hold only 5 percent of the stock of any given firm (Antimonopoly Act, Law No. 54 of 1947, § 11), but they often own close to that amount.

⁸ I.e., the average of the total percentage of any member firm's stock that is held by all other members of the group combined. It is

invested 177 times. The four financial firms placed in the top-20 list with every investment. The rest placed in that list less than a quarter of the time.

Whether a given investment is large or small obviously depends on the benchmark -- and perhaps even these shareholdings will strike some readers as large. Note, however, that for most of the post-war years, for regulatory reasons Japan had no substantial bond market, no commercial paper market, and extremely low bank deposit interest rates (Ramseyer, 1994; Litt, et al., 1990). Given the investment opportunities available, these corporate shareholdings become less mysterious than they might otherwise seem.

2. The Financial Firms⁹

2.1. Why they hold.

One reason banks hold stock in their debtors seems straightforward: to constrain moral hazard. Once a firm borrows money, it has an incentive to raise the risk level on the projects it undertakes. By holding a large share of a borrower's voting stock, Japanese banks mitigate this problem. Nineteenth-century U.S. banks mitigated moral hazard by loaning primarily to insiders (e.g., directors) over whom they had other formal and

hard to see how shareholdings on this order could be "devices to entrench management," as claimed by Morck & Nakamura (forthcoming: 3).

⁹ Although the discussion that follows takes a different tack from the extensive literature on Japanese "main banks" (see generally Aoki & Patrick, 1994), note that it does suggest an answer to a long-standing problem in the main bank literature: why would any bank want to become a main bank? According to the literature, the main bank seems to bear all the cost of monitoring debtors, but without earning a return for

informal controls (Lamoreaux, 1991). Modern U.S. banks neither buy stock nor limit loans to insiders -- but only because the law prevents them from buying stock and their sheer size prevents them from lending only to directors. To mitigate moral hazard, they negotiate elaborate contractual limits on debtor discretion instead (Smith & Warner, 1979).

Although Japanese antitrust law stops banks from holding more than 5 percent of any debtors' stock (Antimonopoly Act, Law No. 54 of 1947, § 11), keiretsu banks still place among their debtors' largest shareholders. Obviously, a 5 percent interest will not give a bank legal control over its debtor. As Bernard Black (1992: 815-16) has pointed out, however, it does give a shareholder both the means and the incentive to assemble a shareholder coalition large enough to influence managerial direction when necessary. In essence, a 5 percent stake helps make credible a shareholder's threat to intervene if the managers perform at sub-standard levels.¹⁰

Those commentators who insist that Japanese crossholdings serve primarily a culturally embedded symbolic role usually argue that the crossheld shares reflect and cement the trades between the two firms (e.g., Gerlach, 1992: 76-77; 1989: 157). That reflective symbolism, they imply, stems from the way changes in crossholdings correlate with changes in the underlying trades. In fact, for the keiretsu banks, shareholding changes and debt-level changes apparently show no such correlation. Granted,

doing so (see McKenzie, 1998: 168; Sheard, 1996b: 134-35). Insider trading presents a partial answer to that puzzle.

¹⁰ I do not claim that this is the only way Japanese banks mitigate moral hazard. The debt contract itself obviously provides additional constraint. The extent to which overlapping boards among the keiretsu firms and the regular presidents' meetings also constrain moral hazard is, however, something I do not try to measure here.

keiretsu banks do hold a large block of debtor stock. Once they hold enough stock to mitigate debtor moral hazard (or hit the legal limit), however, the stockholding levels do not track debt levels. With the Sakura bank (the main Mitsui bank) and the Mitsui group members, for example, the correlation between shareholding changes and debt level changes during 1986-1994 was a mere 0.011.

2.2. Why they trade.

a. Introduction. -- If the need to mitigate moral hazard explains why banks hold stock, it does not explain why they sometimes trade that stock. Although (as noted above) they do not trade in a way that correlates with changes in debt levels, they do trade. Take the intra-group shareholdings at the six keiretsu banks from 1986 to 1994. During those years, the banks shifted shareholding levels at a firm about 38 percent of the time (541 of the 1432 firm-years involved). In the years with such shifts, the change averaged 13.8 percent.

Consider, therefore, a straightforward explanation: banks trade in debtor stock when they learn undisclosed information in the course of monitoring their loans.¹¹ Because banks regularly monitor debtors, they sometimes have access to more accurate and timely information than other firms. Based on that information, they could potentially trade and profit. If they did, the debtor shareholders would suffer no loss from this. Given inter-bank

¹¹ Insider trading has been illegal during most of the post-war years, but public enforcement has been weak. See Ramseyer & Nakazato (1998: 115).

The absence of a well-organized options market in Japan meant that for most of the post-war period insider trading would generally have had to take the form of direct trades in equity.

competition, these stock market gains would instead lead to offsetting cuts in the interest banks charge.

To test this insider-trading hypothesis, one would ideally examine stock prices immediately before and shortly after a bank traded. Unfortunately, although I know the stocks a bank owned each March (the end of each fiscal year), I do not know when during the year it traded on any stock. As a cruder alternative, therefore, I test whether the direction and magnitude of a bank's trades during any given year contains information that helps explain the direction of stock price movements during that year (holding constant general market shifts). Absent any reason to think banks would systematically buy stock after a price increase or sell after a price fall (absent any reason to think banks invest stupidly as a rule), an affirmative result would suggest that the bank traded on undisclosed information.

Accordingly, as the dependent variable I use the price of each keiretsu firm's stock in March (Year 2; EndPr). As explanatory variables, I use (i) the price of the same stock a year earlier (Year 1; StartPr), (ii) the fractional change in the Tokyo Stock Exchange composite index from Year 1 to Year 2 (Index), and (iii) [(the shares the keiretsu bank owned in the firm in Year 2) - (the shares it owned in the firm in Year 1)]/(the shares it owned in the firm in Year 1) (BkInvDec). Using ordinary least squares, I then calculate the equations reported in Tables 5 and 6. Although I investigate trades only for the lead keiretsu banks, I have no reason to think that the trades by other banks with large investments at stake would be any different.

**Table 1: Trading Profits by Keiretsu Banks --
the Mitsui Case**

	I	II	III	IV
BkInvDec	61.36 (2.19)	61.68 (2.20)	54.03 (2.05)	54.34 (2.06)
BkLoanDec		-10.92 (-0.93)		-10.22 (-0.93)
StartPr	0.90 (25.24)	0.90 (25.23)		
Index	946.74 (10.77)	942.79 (10.71)		
StartPr*Index			0.87 (27.59)	0.86 (27.56)
Intercept	-887.104 (-8.09)	-880.60 (-8.01)	136.47 (4.03)	138.82 (4.09)
R ²	0.78	0.78	0.81	0.81
Observations	192	192	192	192

Dependent variable: the price of each keiretsu firm's stock in March of Year 2 (EndPr).

Other notes:

BkInvDec: [(the shares the bank owned in the firm in Year 2) - (the shares it owned in the firm in Year 1)]/(the shares it owned in the firm in Year 1)

BkLoanDec: [(the loans Sakura had outstanding to the firm in Year 2) - (the loans it had outstanding to the firm in Year 1)]/(the loans it had outstanding to the firm in Year 1)

StartPr: the price of the stock in March of Year 1.

Index: the fractional change in the Tokyo Stock Exchange composite index from Year 1 to Year 2.

The regression is ordinary least squares.

The table gives the coefficient, followed by the t-statistic.

The sample includes all Sakura Bank shareholdings in the stock of the core Mitsui keiretsu members from 1986 to 1994.

Sources: **Toyo keizai, ed., Kigyo keiretsu soran [Overview of Firm Keiretsu]** (Tokyo: Toyo keizai shimpo sha, various years); **Toyo keizai, ed., Kabuka soran [Stock Price Overview]** (Tokyo: Toyo keizai shimpo sha, various years).

b. The Mitsui keiretsu. -- For tractability, consider first the Mitsui data on Table 1. Most importantly, the coefficient on the Sakura Bank's (the successor to the Mitsui Bank) investment decisions (BkInvDec) is positive. With a t statistic greater than 2, it is significant at more than the 95 percent level. Apparently, the Sakura Bank's investment decisions did contain information that correlated with the direction the stock price moved that year. Necessarily, the results suggest (tentatively to be sure) that the bank earned modest profits trading on non-public information it acquired in the course of monitoring its loans.

In Equation I, I treated StartPr and Index as separate variables. As one would expect, the coefficient on StartPr is close to 1, and the coefficient on the Index is an approximate average of the stock prices involved. Because the relationship between the two is multiplicative rather than additive, in Equation III I used the product of two as the independent variable. The coefficient on the product is positive and statistically significant, again at the 95 percent level.

Several readers suggested that the positive correlation between a bank's trades and debtor stock price changes might reflect the impact of a new loan rather than insider trading. Suppose, they argued, that the bank bought stock when it loaned additional funds, and sold that stock when the firm repaid the loan. Because a large new loan might signal positive information about the firm's prospects, the firm's stock price would then rise when the bank bought the firm's stock. Crucially, however, it would not rise because the bank was trading on inside information. It would rise because the bank provided new credit.

In fact, this counter-hypothesis does not work. To test it, in equations II and IV I add changes in the Sakura Bank's outstanding loans at a firm (BkLoanDec). As Table 1 illustrates, the coefficient on BkLoanDec shows no statistical significance, while the coefficient on BkInvDec remains positive and significant.

Table 2: Trading Profits by Keiretsu Banks

$$\text{EndPr} = b_0 + b_1\text{BkInvDec} + b_2\text{StartPr} + b_3\text{Index} + e$$

	BkInvDec	StartPr	Index	Intercept	n	R ²
Full Sample	33.8 (1.35)	0.885 (44.88)	937.0 (14.12)	-858.0 (-10.47)	541	.79
Sumitomo	921.4 (3.21)	0.756 (20.29)	614.0 (4.76)	-490.8 (-3.13)	54	.91
Mitsui	66.7 (2.19)	0.834 (14.92)	1187.7 (7.31)	-1089.9 (5.34)	66	.79
Sanwa	26.89 (0.59)	0.914 (23.62)	729.2 (3.91)	-647.0 (-2.86)	116	.83
Mitsubishi	-153.7 (-0.77)	0.867 (18.48)	1076.2 (6.95)	-977.1 (-5.09)	95	.80
DIK	-263.3 (-1.12)	0.919 (16.21)	913.1 (5.22)	-849.8 (-3.72)	110	.71
Fuyo	-146.39 (-1.66)	0.864 (15.30)	959.8 (8.21)	-849.2 (-5.24)	100	.71

$$\text{EndPr} = b_0 + b_1\text{BkInvDec} + b_2(\text{StartPr} * \text{Index}) + e$$

	BkInvDec	(StPr * Ind)	Intercept	n	R ²
Full Sample	31.4 (1.25)	0.77 (44.97)	237.3 (9.35)	541	.79
Sumitomo	1011.8 (3.69)	0.648 (19.75)	260.5 (5.27)	54	.90
Mitsui	59.6 (2.01)	0.791 (15.67)	202.7 (3.10)	66	.80
Sanwa	27.7 (0.58)	0.770 (22.66)	260.9 (4.18)	116	.82
Mitsubishi	-307.1 (-1.67)	0.779 (19.4)	247.7 (4.03)	95	.81
DIK	-184.8 (-0.83)	0.831 (16.72)	205.4 (2.99)	110	.72
Fuyo	-85.6 (-0.94)	0.775 (14.64)	247.8 (4.01)	100	.69

Notes:

EndPr: the price of each keiretsu firm's stock in March of Year 2.

BkInvDec: [(the shares a bank owned in a firm in Year 2) - (the shares it owned in the firm in Year 1)]/(the shares it owned in the firm in Year 1)

StartPr: the price of the stock in March of Year 1.

Index: the fractional change in the Tokyo Stock Exchange composite index from Year 1 to Year 2.

The sample takes all the shareholdings of the six central keiretsu banks in the core member firms in all years from 1986 through 1994 (1432 firm years). It then excludes those firm-years in which the bank's shareholding in a member firm did not change (yielding a net 541 firm years). The Mitsui figures in Table 1 differ because the Table 1 regressions do not exclude those years without net changes. I report both calculations because it is not clear ex ante which model the insider trading hypothesis predicts.

The regression is ordinary least squares.

The table gives the coefficient, with the t-statistic in parenthesis below.

Sources: Toyo keizai, ed., Kigyo keiretsu soran [Overview of Firm Keiretsu] (Tokyo: Toyo keizai shimpo sha, various years); Toyo keizai, ed., Kabuka soran [Stock Price Overview] (Tokyo: Toyo keizai shimpo sha, various years).

c. Other keiretsu. -- Curiously, this evidence of insider trading appears only in the data for the Sumitomo and Mitsui keiretsu. Although the coefficient on BkInvDec is positive and statistically significant for both the Sumitomo and the Mitsui groups, in the other groups it is not (Table 2). Calculated over the full sample, the coefficient on BkInvDec is indeed positive. With a t-statistic of 1.25 to 1.35, however, it is significant only at about the 80 percent confidence level.¹²

This inter-group variation presents a puzzle. I have no reason to think the Sakura and Sumitomo banks would regularly obtain better information than the other banks. At the same time, observers do sometimes claim that the Mitsui, Mitsubishi, and Sumitomo -- as direct descendents of the most closely

integrated pre-war groups -- are tighter organizations than the others. If so, then the only puzzle in the data concern the Mitsubishi.

Note, however, that many of the banks may have engaged so heavily in accounting-driven trades that they fogged the evidence of insider trading. As in most modern countries, the Japanese government regulates banks with a heavy hand and does so with a focus on accounting measures. In response, as the financial press has reported regularly over the past several years, many banks have aggressively liquidated their assets in order to generate gains to hide bad debts. Perhaps, then, those accounting-driven trades simply cloud the data too heavily to obtain significant results over the full sample.¹³

3. Supplier-Manufacturer Cross-holdings

3.1. The theory.

Ronald Gilson and Mark Roe (1993) recently hypothesized that keiretsu firms may be exchanging stock to mitigate contractual opportunism by obtaining control of their trading partners. Drawing on work by Oliver Williamson (1979) and Benjamin Klein, Robert Crawford and Armen Alchian (1978), they argue that firms use the crossholdings to reduce the risk that their partners cheat. If they trade only standard market goods, they need not worry, of course. If they trade idiosyncratic goods, however, they will need to invest in skills, knowledge, and equipment that

¹² To capture firm-specific effects, I also reran the regressions with separate dummy variables for each firm and year. The coefficient on BkInvDec remained positive but statistically insignificant.

¹³ Although Japanese banks have begun to disclose their bad debt histories, as of late 1998 the public data (regularly reproduced in the

are specific to the contract. After the investment -- after the Williamsonian "fundamental transformation" -- they will be locked in to a bilateral monopoly and vulnerable to being held up by their partner (Alchian & Woodward, 1988). Before making the investment, therefore, they may choose to negotiate control over their partner. Before doing so in Japan, suggest Gilson and Roe, they negotiate such control through keiretsu crossholdings.

In part, firms can mitigate these risks through long-term contracts. Before A builds a machine dedicated to products it sells B, it can obtain from B a promise to buy the goods for many years. Yet such contracts introduce a host of problems all their own (Tirole, 1988: 27-29; Joskow, 1985a, 1985b). Often, therefore, A will instead buy a controlling interest in B, B will buy a controlling interest in A, or the firms will merge.

3.2. The evidence from Japan.

Given the small size of the cross-holdings involved (other than by financial firms), the Gilson & Roe hypothesis probably has little to do with the shareholdings among the core horizontal keiretsu. One cannot protect relation-specific investments when one's investment does not even put one among one's contracting partner's top 20 shareholders. Within the automobile industry, however, the theory fits to a tee.¹⁴

Firms in the automobile industry invest almost exactly as the Gilson-Roe theory predicts. Toyota, for example, assembles its standard-sized cars through Toyota Body (Toyota shatai). In

financial press) seemed too heavily aggregated (primarily only cumulative totals) to use to disentangle the stock trading by the banks.

it, Toyota owns 44 percent and with its affiliates 52 percent. Toyota assembles its smaller cars through Kanto Automobile (Kanto jidosha kogyo), in which it owns 48.68 percent alone and 50.1 percent with its affiliates. Nissan assembles its cars through Nissan Body (Nissan shatai), where it owns 43 percent alone and 49.6 percent with its affiliates. And Hino assembles its trucks through Hino Body (Hino shatai), where it owns 40 percent alone and 43 percent with its affiliates.

With a majority interest, Toyota solidly controls its assembler. Since Nissan Body and Hino Body are both Tokyo Stock Exchange listed firms, by holding over 40 percent of their shares Nissan and Hino effectively control them too. With that control, they can eliminate opportunistic contracting schemes as surely as if they merged the firms into themselves.¹⁵

To test the Gilson-Roe theory more directly, I trace the impact of a firm's sales (SALES)¹⁶ and various sectoral dummies on the percentage of equity in a supplier held by the automobile firm that buys the biggest share of the supplier's output (LEADSH%) (Table 3, Equation II). Klein, Crawford and Alchian developed this theory to explain GM's 1926 acquisition of Fisher

¹⁴ Indeed, Gilson & Roe (1993: 894) rightly noted that their "contractual governance story best fits the vertical keiretsu, in which companies tend to be related, such as suppliers to an end-producer."

¹⁵ This does not explain how the subsidiary protects itself from manufacturer opportunism. Toyota, however, is much larger and has far broader trading ties than its subsidiaries. As a result, a subsidiary can more readily rely on Toyota's reputational capital than Toyota can rely on the reputational capital of its subsidiaries.

Toyota could also, hypothetically, protect itself by retaining title to the specific asset. This is less workable when the asset is integrated into the subsidiary's factory -- or, indeed, is the factory itself.

¹⁶ According to Asanuma (1989: 5), in the automobile industry "The core firm and its suppliers share the effects of business upswings and downswings as long as the life of the model continues."

Body -- and consistent with the theory, the coefficient on the sectoral dummy BODY is positive and statistically significant: manufacturing firms are likely to own large blocks of shares in their coach assemblers. None of the other sectoral dummies is significant. Presumably, these sectors involve less asset specificity.¹⁷

To study the relation between asset specificity and firm shareholdings more directly, I looked for measures of relationship-specific investments. Toward that end, I hypothesize that the percentage of sales from a supplier to a automobile manufacturer will correlate (however imperfectly) with the size of relationship-specific investments involved in the trade. In general, a manufacturer will prefer to buy its supplies from multiple vendors (a common practice in the Japanese automobile industry; Asanuma, 1989: 4; Miwa, 1996: 232). First, doing so protects the manufacturer from finding its production held up by problems at any one firm. Second, the competition among the suppliers introduces all the benefits usually associated with market transactions: lower costs, faster product innovation, and less opportunism. Precisely because it too prefers to avoid the risk that its sales will be held up by problems at any manufacturer, suppliers will prefer to diversify their sales among multiple manufacturers (again, a common practice in Japan; Miwa, 1996: 16-17, 71-72).

Diversifying sales or procurement imposes high costs, however, if producing an item requires large specific

¹⁷ The mean LEADSH% and BUYER% values for the various sectors are, respectively, BRAKES (4.7, 24.3), STEEL (15.6, 42.3), MACH TOOL (5.3, 23.3), LIGHTING (14.5, 36), OTHER ELEC (14.1, 28.7), BODY (37.5, 86.7), GUAGES (9.5, 38.2).

investments. When production involves such model-specific investments, firms face incentives to reduce their diversification. All else equal, moreover, if a manufacturer buys an item from fewer suppliers, then those suppliers will in turn sell a higher percentage of their output to that manufacturer. The correlation is imperfect to be sure, but the resulting intuition is simple: the larger the relationship-specific investment needed to produce an item, the fewer the suppliers from which the manufacturer will buy it and the bigger the share of a supplier's output the manufacturer will buy.

Tentatively to be sure, the equations in Table 3 confirm this connection between asset specificity and crossholdings. In Equation I, I trace the impact on shareholdings of trading percentages. More precisely, I trace the impact on LEADSH% of (i) the percentage of the supplier's output bought by the firm in the automobile industry buying the biggest share of that output (BUYER%) and (ii) SALES. The results confirm the statistical and economic significance of BUYER%. With a t-statistic of 8.34, the coefficient on BUYER% is more than significant at the 99 percent level. At 0.44, the coefficient implies that an increase in the manufacturer's share of a supplier's output by 10 percentage points will lead to a corresponding increase in the manufacturer's shareholdings of 4.4 percentage points.

In Equation III, I regress both trading percentages and sectoral dummies on shareholdings. The coefficient on BUYER% continues to be both statistically significant and economically significant. The collinearity drowns out the sectoral effect

(the correlation between BUYER% and BODY is .51), however, and the coefficient on BODY loses its statistical significance.¹⁸

3.3. The Residual Puzzle.

The associated puzzle is why (a) U.S. firms more often seem to integrate their trading partners completely, where (b) Japanese manufacturers more often seem to stop with a simple controlling interest. Klein, Crawford & Alchian claimed their theory explained why GM acquired Fisher Body in 1926. Yet G.M. already owned a majority stake in Fisher by 1919 (Sloan, 1963: 15). It gained no greater control by merging it into GM in 1926. Why did it do so? More generally, if Japanese firms can deal with the problems posed by asset specificity through controlling interests, why do U.S. firms seem to think they need 100 percent?¹⁹

One hypothesis (albeit one I do not purport to test here) goes to corporate law. Despite the formal similarity between U.S. and Japanese corporate law, U.S. courts seem

¹⁸ Because the relation between asset-specificity and shareholding arrangements is probably not linear (after all, a shareholder generally gains little additional control of substance in increasing his shareholdings from 51% to 99%), I tried several transformations: (i) using the log of SALES and the log of BUYER% raised the importance of sales to a statistically significant positive level but produced no other change of substance; (ii) adding a term squaring the BUYER% variable resulted in a positive coefficient on BUYER% and a negative coefficient on its square, but the latter was not statistically significant; and (iii) censoring BUYER% at 50% produced no improvement in the results.

¹⁹ Sheard (1996a: 27-32) makes the point that the proper comparison to the keiretsu is to the vertically integrated U.S. firm rather than spot market transactions.

This greater degree of vertical integration in the U.S. may help explain the otherwise puzzling size difference between the U.S. and Japanese firms: Japanese firms are simply much smaller than their U.S. competitors (Miwa, 1996: 10; Patrick & Rohlen, 1987: 335).

more aggressively to try to protect minority shareholders. Recall that G.M. merged Fisher Body into itself shortly after the Dodge brothers used their minority interest in the Ford Motor Company in a strategic legal ploy. Claiming that Henry Ford was not trying to maximize profits, they sued to force Henry Ford (who wanted to use the earnings to expand capacity) to pay enormous dividends.²⁰

The court agreed, and ordered Ford to pay the dividends. Given the post-World War I tax regime (by 1920, the top marginal bracket was 73 percent), most of those dividends probably went straight to the U.S. treasury. Like other rich shareholders, the Dodge brothers presumably paid their dividends over to the Treasury too. Still, as makers of a competing car (and given the absence of any organized market for the Ford stock), they probably preferred to have the earnings there than in the new radically expanded production facility Henry Ford had planned to build with the funds. Perhaps, therefore, G.M. bought out the minority interests in Fisher simply to protect itself from a similar debacle.

More broadly, perhaps U.S. firms vertically integrate to avoid the overly zealous attempts by the courts to protect minority shareholders. In trying to protect minority shareholders, U.S. courts have effectively transformed trades between parent and controlled subsidiaries into a legal mine field. If a trade involves

For a very different explanation of the GM-Fisher Body acquisition that goes to intra-firm flexibility, see the abstract to Helper, et al. (1998).

goods for which the market price is clear, it presents no problem. If it involves goods without a clear market price -- as idiosyncratic automobile components made by a parts manufacturer for a given assembler generally do -- it virtually invites minority subsidiary shareholders to file a duty-of-loyalty claim.

The result, as Roberta Romano (1991) has shown, has been a steady stream of largely meritless shareholder suits -- suits that settle for little or no corporate (or shareholder) recovery but with significant fees for the plaintiffs' bar. Partly because of the substantive corporate law, partly because of civil procedural rules (West, 1994), Japanese firms have largely avoided such suits. Perhaps, then, the difference between U.S. and Japanese patterns of vertical integration simply reflects this solicitude U.S. courts show toward minority shareholder claims.

Despite the economic advantages that courts can bring by protecting minority shareholders -- advantages that Andrei Shleifer and others have nicely demonstrated -- in this as in most of life one can have too much of a good thing. Perhaps Japanese firms stop with a controlling interest in their trading partners because that interest (i) solves the contracting problem posed by asset specificity but (ii) preserves the stock market pressure (one aspect of Williamson's [1985] "high-powered" market incentives) on the subsidiary. Perhaps U.S. firms more often integrate completely because the courts have dramatically increased

²⁰ Dodge v. Ford Motor Co., 204 Mich. 459, 170 N.W. 668 (1919).

the costs parents incur by trading idiosyncratic goods with less-than-fully-owned subsidiaries.

**Table 3: Cross-Shareholding
in the Automobile Industry**

	I	II	III
BUYER%	0.44 (8.34)		0.44 (6.90)
SALES	0.01 (0.77)		0.01 (0.73)
Brakes		-10.94 (-1.27)	-3.38 (-0.50)
Steel		-0.11 (-0.02)	-0.53 (-0.13)
Mach Tool		-10.40 (-1.38)	-2.16 (-0.36)
Lighting		-1.13 (-0.13)	0.74 (0.11)
Other Elec		-1.59 (-0.25)	4.32 (0.87)
Body		21.78 (3.20)	-0.55 (-0.08)
Guages		-6.17 (-0.91)	1.32 (0.25)
Intercept	-2.99 (-1.23)	15.67 (6.98)	-3.36 (-1.00)
R ²	0.52	0.19	0.53

Dependent variable: LEADSH% -- the percentage of stock in the firm held by the lead purchaser within the automobile industry of the firm's products.

BUYER%: The percentage of the firm's products bought by the lead purchaser within the automobile industry of the firm's products.

SALES: The firm's (i.e., the subcontracter's) total sales, in ¥ billion.

Other notes: The sample consists of all firms in the **Kigyo keiretsu soran** with data on customers. The regression is ordinary least squares. The table gives the coefficient, followed by the t-statistic.

Sources: **Toyo keizai, ed., Kigyo keiretsu soran [Firm Keiretsu Overview]** (Tokyo: Toyo keizai shimposha, 1998); **Nihon keizai shimbun, ed., Nikkei kaisha joho [Nikkei Company Information]** (Tokyo: Nihon keizai shimbun sha, 1996 IV).

4. The Zaibatsu.

Consider a final puzzle, one raised by the cross-shareholding patterns among the pre-war predecessors to the keiretsu (known as the zaibatsu). Where the modern keiretsu maintain mean cross-holdings of 10-20 percent, their pre-war predecessors maintained crossholdings that averaged 50-60 percent (Takahashi, 1930; Mochikabu, 1951). That mean, moreover,

disguised a large fraction of firms owned entirely (or nearly entirely) by other members of the group.

The logic to these higher pre-war levels lies in the way the rich families at the core of the zaibatsu invested in high-risk modern ventures. Like venture capital firms (or perhaps, more precisely, KKR-style-turnaround specialists) today, they heavily invested in high-risk technologies. They were rich -- each family (such as the Mitsui) included a large number of very wealthy individuals. Rather than invest separately, these family members pooled their wealth in a family partnership. They then hired professional managers from outside the family to invest that pooled wealth in industrial ventures.

Although historians sometimes dismiss them as "conservative," the zaibatsu families invested heavily in new and (within Japan) untried technologies. Bernard Black and Ronald Gilson (1998) describe venture capital firms as those that invest in "high-growth, high-risk, often high-technology firms that need capital to finance product development or growth" So too the pre-war zaibatsu.

To take new and untried technology to the market, the zaibatsu families supplied extensive and expensive technical and managerial expertise (again as modern venture capital firms often do -- see Sahlman, 1990; Gompers, 1995: 1464-65). Because they did so single-handedly, they had little incentive to share the returns with anyone else. Because they provided most of the skills that mattered, they demanded near-total equity stakes.

Granted, modern venture capitalists use securities other than stock to adjust the relative incentives of the venture capitalists and the startup's managers. Typically, for example,

venture capital firms today will prefer convertible securities for the advantages they offer in solving the various agency and informational problems the new venture presents (see Gompers, 1998). Lacking the developed securities markets necessary for such tactics, Japanese zaibatsu investors in the late 19th century instead simply took all or most of the equity (and often debt, too). Presumably, they then motivated the startup's managers through a heavily performance-based compensation contract.

As investors specializing in high-risk, high-return projects (and exactly as Black and Gilson predict), the zaibatsu often moved much of their money out of a firm once it succeeded. At that point, they earned only market returns on the shadow price of the stock. Rather than earn market returns on non-diversified investments, they sold the stock. Then, they either moved the funds into new high-risk ventures or parked it in diversified portfolio investments.

Exceptions notwithstanding,²¹ the zaibatsu story is thus one of rich investors (i) pooling their assets within family-based partnerships, (ii) hiring professional managers who used this pooled wealth to take big stakes in and transform high-risk, high-technology ventures, and then (iii) moving their assets to new ventures once a firm succeeded. When the Mitsui bought the Miike coal mines in 1888, the mines were inefficient and dangerous affairs tied to traditional technologies and convict and outcaste labor. The Mitsui placed the mines under a young

²¹ Obviously, there were exceptions. The zaibatsu invested heavily in some industries where they took only modest fractional interests. Although both the Mitsubishi and the Mitsui invested in railroads, for instance, they usually bought only minor equity percentages (Ramseyer & Rosenbluth, 1995: 127). Although the Mitsui dominated the giant Kanebo cotton spinning firm, as of the late 1920s the Mitsui held less than 10 percent of Kanebo stock (id., at 146).

MIT-trained engineer named Takuma Dan. Dan bought lavishly expensive western technology. In the process, he cost the Mitsui huge amounts of money, but it was money well spent. Within a few years Miike earned huge returns: profits rose from ¥80,782 in 1889 to ¥310,310 for the second half of 1893, to ¥733,704 in the second half of 1908.²²

Once they had brought their firms to success, the zaibatsu firms often cashed in some of their investment. Once the Mitsui had transformed Miike into a profitable modern mine, it earned only market returns on Miike's shadow price. So long as it had more profitable places to park its money, it had an obvious incentive to sell some of its Miike interest. It did just that. In 1933 it sold two Miike subsidiaries, and by 1945 had sold a third of Mitsui Mining itself.²³

Among the zaibatsu, the Mitsui and Mitsubishi most aggressively sold the firms they had built. Unfortunately, we lack extensive, annually updated data on pre-war cross-holdings. We do, however, have surveys from 1928 and 1945. Based on that data, Table 4 compares the Mitsui and Mitsubishi interests in several firms. The story is simple: after introducing sophisticated modern methods and earning huge returns for that risk, the Mitsui and Mitsubishi sold the stock at market prices.

Although the zaibatsu owned 50-60 percent interests in some firms, in many they owned 100 percent; in others they owned small portfolio interests. In effect, the average spanned firms at

²² See Roberts (1989: 130-35); Yasuoka (1979: 198). Production at Miike went from 574,000 tons in 1891 to 1.1 million tons in 1903, 1.5 million tons in 1907, and 2.1 million tons in 1912. Takeda (1992: 65).

different stages along that chronological process: new firms still owned 100 percent by the zaibatsu, firms the zaibatsu had recently transformed into modern successes, and firms they had long-ago transformed and partially sold to the public.

The keiretsu no longer play the venture-capitalist function that the pre-war zaibatsu played, but only because the occupation-era legal reforms destroyed the extraordinarily wealthy families at their core. After the war, the U.S.-controlled occupation officers -- rightly or wrongly -- placed much of the blame for Japanese aggression on the largest and most visible firms in the economy. Most particularly, they blamed the zaibatsu families like Mitsui, the Sumitomo, and the Iwasaki (who ran the Mitsubishi group). In order to "democratize" the economy, they ordered those families to sell off their shares. Given the state of the stock market, by ordering the families to sell their shares they effectively dispossessed them.

The lower contemporary shareholding levels follow straightforwardly. The zaibatsu families held large interests because they were heavily involved in transforming high-technology ventures. Investing most of the effort, they demanded most of the returns. With the wealthy families gone, the post-war keiretsu no longer play that role. No longer playing such a role, they no longer take large equity stakes in affiliated ventures.²⁴

²³ Table 3; Mochikabu (1970: 29). The officially articulated reason for the sell-offs in the 1930s was to share the economic wealth of the conglomerates with the public.

²⁴ How technological innovation has been funded in post-war Japan is obviously an important issue. It is, however, peripheral to the question at stake here: what do we make of the cross-shareholding relationships among the keiretsu.

Table 4: Mitsui and Mitsubishi Sell-offs

	Intra-group shareholding (%)	
	1928	1945
A. Mitsui		
Mitsui Trading	100.0	53.3
Mitsui Mining	100.0	65.8
Toyo Rayon	100.0	44.9
Mitsui Trust Bank	50.8	16.0
B. Mitsubishi		
Mitsubishi Paper	100.0*	35.8
Higashiyama Agriculture	100.0*	63.8
Mitsubishi Heavy Industry (Shipbuilding)	99.4	42.2
Mitsubishi Trading	97.8	48.9
Mitsubishi Warehousing	97.4	60.6
Mitsubishi Electric	88.3	53.3
Mitsubishi Bank	64.4	39.7
Mitsubishi Mining	64.2	48.6
Mitsubishi Trust	50.4	39.7

* Estimates, by Takahashi.

Sources: 1928 figures are from **Kamekichi Takahashi, Nippon zaibatsu no kaibo [A Dissection of the Japanese Zaibatsu]** (Tokyo: Chuo koron sha, 1930); 1945 figures are from **Mochikabu gaisha seiri iinkai, Nihon zaibatsu to sono kaitai [The Japanese Zaibatsu and Their Dissolution]** (Tokyo: Hara shobo, 1970 [1951 ed.]).

5. Conclusions

Notwithstanding the common economic logic, corporate shareholding patterns in the U.S. and Japan look very different. Despite those apparent differences, however, the analytic forces behind the shareholdings in Japan track the forces behind them here. To illustrate this point, I suggest three principal hypotheses. First, the modern keiretsu banks invest in the stock of their debtors to mitigate debtor moral hazard. They occasionally trade in the stock because in monitoring those debtors they obtain material nonpublic information. The non-

financial keiretsu firms invest in each other only at trivial levels. Second, firms in the same industry invest in each other when relationship-specific investments make contractual opportunism a problem. Last, the zaibatsu families held large interests in firms before the war because they were venture capital financeers. As such, they behaved much the way their silicon valley peers behave today.

Bibliography

- Alchian, Armen A. & Susan Woodward. 1988. "The Firm is Dead; Long Live the Firm: A Review of Oliver Williamson's The Economic Institutions of Capitalism." *Journal of Economic Literature*, 26: 65-79.
- Aoki, Masahiko & Hugh T. Patrick, eds. *The Japanese Main Bank System: Its Relevance for Developing and Transforming Economies* 231. Oxford: Oxford University Press.
- Asanuma, Banri. 1989. "Manufacturer-Supplier Relationships in Japan and the Concept of Relation-Specific Skill." *Journal of Japanese & International Economies*, 3: 1.
- Black, Bernard S. 1992. "Agents Watching Agents: The Promise of Institutional Investor Voice." *UCLA Law Review*, 39: 811.
- & Ronald J. Gilson. 1998. "Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets." *Journal of Financial Economics*, 47: 243.
- Furubotn, Eirik G. & Rudolf Richter. 1997. *Institutions and Economic Theory: The Contribution of the New Institutional Economics*. Ann Arbor: University of Michigan Press.
- Gerlach, Michael. 1989. "Keiretsu Organization in the Japanese Economy: Analysis and Trade Implications," in Chalmers Johnson, Laura D. Tyson & John Zysman, eds., *Politics and Productivity: How Japan's Development Strategy Works* 141. New York: Harper Business.
- . 1992. *Alliance Capitalism: The Social Organization of Japanese Business*. Berkeley: University of California Press.
- Gilson, Ronald & Mark Roe. 1993. "Understanding the Japanese Keiretsu: Overlaps Between Corporate Governance and Industrial Organization." *Yale Law Journal*, 102: 871.
- Gompers, Paul A. 1995. "Optimal Investment, Monitoring, and the Staging of Venture Capital." *Journal of Finance*, 50: 1461.
- . 1998. "Ownership and Control in Entrepreneurial Firms: An Examination of Convertible Securities in Venture Capital Investments" (manuscript, January 1998).
- Helper, Susan, John Paul MacDuffe & Charles F. Sabel. 1998. "The Boundaries of the Firm as a Design Problem." In *Corporate Governance Today*. New York: Columbia Law School, May 1998.
- Joskow, Paul L. 1985a. "Vertical integration and long-term contracts: The Case of Coal-Burning Electric

Generating Plants." *Journal of Law, Economics & Organization*, 1: 33-80.

----- . 1985b. Long Term Vertical Relationships and the Study of Industrial Organization and Government Regulation." *Journal of Institutional and Theoretical Economics*, 141: 586-93.

----- . 1988. "Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence." *Journal of Law, Economics & Organization* __: 95.

Klein, Benjamin. 1988. "Vertical Integration as Organizational Ownership: The Fisher Body-General Motors Relationship Revisited." *Journal of Law, Economics & Organization*, 4: 199.

-----, Robert Crawford & Armen Alchian. 1978. "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," 21 *Journal of Law & Economics* 297.

Lamoreaux, Naomi R. 1991. "Information Problems and Banks' Specialization in Short-Term Commercial Lending: New England in the Nineteenth Century." In Peter Temin, ed., *Inside the Business Enterprise: Historical Perspectives on the Use of Information* 161. Chicago: University of Chicago Press.

Lawrence, Robert Z. 1993. "Japan's Different Trade Regime: An Analysis with Particular Reference to Keiretsu," *Journal of Economic Perspectives*, 7(3): 3.

Litt, David G., Jonathan R. Macey, Geoffrey P. Miller & Edward L. Rubin. 1990. "Politics, Bureaucracies, and Financial Markets: Bank Entry into Commercial Paper Underwriting in the United States and Japan." *University of Pennsylvania Law Review*, 139: 369.

McKenzie, Colin. 1998. Book Review. *Journal of Japanese and International Economies*, 12: 167-170.

Miwa, Yoshiro. 1996. *Firms and Industrial Organization in Japan*. Houndmills, U.K.: Macmillan.

Mochikabu gaisha seiri iinkai. 1970. *Nihon zaibatsu to sono kaitai [The Japanese Zaibatsu and Their Dissolution]*. Tokyo: Hara shobo, (1951 ed.) (principal volume).

Monteverde, K. & D.J. Teece. 1982. "Supplier Switching Costs and Vertical Integration in the Automobile Industry." *Bell Journal of Economics*, 13: 206-13.

Morck, Randall & Masao Nakamura. Forthcoming. "Banks and Corporate Control in Japan." *Journal of Finance*, __: __.

- Nihon keizai shimbun, ed. 1996. *Nikkei kaisha joho [Nikkei Company Information]*. Tokyo: Nihon keizai shimbun sha, 1996 IV.
- Patrick, Hugh & Thomas Rohlen. 1987. "Small-Scale Family Enterprises." In Kozo Yamamura & Yasukichi Yasuba, eds., *The Political Economy of Japan: Vol. 1, The Domestic Transformation*, p. 331. Stanford: Stanford University Press.
- Ramseyer, J. Mark. 1994. "Explicit Reasons for Implicit Contracts: The Legal Logic to the Japanese Main Bank System," in Aoki & Patrick (1994: 231).
- & Minoru Nakazato. 1999. *Japanese Law: An Economic Approach*. Chicago: University of Chicago Press
- & Frances M. Rosenbluth. 1995. *The Politics of Oligarchy: Institutional Choice in Imperial Japan*. Cambridge: Cambridge University Press.
- Roberts, John G. 1989. *Mitsui: Three Centuries of Japanese Business*. New York: Weatherhill, 2d ed.
- Roe, Mark J. 1994. *Strong Managers, Weak Owners: The Political Roots of American Corporate Finance*. Princeton: Princeton University Press.
- Romano, Roberta. 1991. "The Shareholder Suit: Litigation without Foundation?" *Journal of Law, Economics & Organization*, 7: 55.
- Sahlman, William A. 1990. "The Structure and Governance of Venture-Capital Organizations." *Journal of Financial Economics*, 27: 473.
- Sheard, Paul. 1996a. "Keiretsu and Market Access: An Economics of Organisation Approach." In Sheard (1996c: 3).
- . 1996b. "Reciprocal Delegated Monitoring in the Main Bank System." In Sheard (1996c: 124).
- , ed. 1996c. *Japanese Firms, Finance and Markets*. Melbourne: Addison Wesley.
- Sloan, Alfred P., Jr. 1963. *My Years with General Motors*. Garden City: Doubleday & Co.
- Smith, Clifford W., Jr. & Jerold B. Warner. 1979. "On Financial Contracting: An Analysis of Bond Covenants." *Journal of Financial Economics*, 7: 117.
- Takahashi, Kamekichi. 1930. *Nippon zaibatsu no kaibo [A Dissection of the Japanese Zaibatsu]*. Tokyo: Chuo koron sha.

- Takeda, Haruhito. 1992. "Tagakuka jigyo bumon no teichaku to kotsuerun soshiki no seibi [The Consolidation of Conglomerate Organization and the Establishment of Diversified Business Sections]." In Juro Hashimoto & Haruhito Takeda, eds., *Nihon keizai no hatten to kigyo shudan [Japanese Economic Growth and Enterprise Groups]* 53. Tokyo: University of Tokyo Press.
- Tirole, Jean. 1988. *The Theory of Industrial Organization*. Cambridge: MIT Press.
- Toyo keizai, ed. Various years. *Kigyo keiretsu soran [Overview of Firm Keiretsu]*. Tokyo: Toyo keizai shimpo sha.
- Toyo keizai, ed. Various years. *Kabuka soran [Stock Price Overview]*. Tokyo: Toyo keizai shimpo sha.
- West, Mark. 1994. "The Pricing of Shareholder Derivative Actions in Japan and the U.S." *Northwestern University Law Review*, 88: 1436.
- Williamson, Oliver E. 1979. "Transactions-Cost Economics: The Governance of Contractual Relations." *Journal of Law & Economics*, 22: 3.
- . 1985. *The Economic Institutions of Capitalism*. New York: Free Press.
- Yasuoka, Shigeaki. 1979. *Mitsui zaibatsu shi: kinsei, Meiji hen [The History of the Mitsui Zaibatsu: Early Modern and Meiji]*. Tokyo: Kyoiku sha.