The Fable of the Keiretsu

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Central to so many accounts of post-war Japan, the keiretsu corporate groups lacked economic substance from the start. Conceived by Marxists committed to locating "domination" by "monopoly capital," they found an early audience among western scholars searching for evidence of culture-specific group behavior in Japan. By the 1990s, they had moved into mainstream economic studies, and keiretsu dummies appeared in virtually all econometric regressions of Japanese industrial or financial structure. Yet the keiretsu began as a figment of the academic imagination, and they remain that today. Regardless of the keiretsu definition used, cross-shareholdings within the "groups" were trivial, even during the years when keiretsu ties were supposedly strongest. Neither does membership proxy for "main bank" ties. Econometric studies basing "keiretsu dummies" on the available rosters produce predictably haphazard and unstable results. In the end, the only reliably robust results are the artifacts of the sample biases created by the definitions themselves.

1. Introduction

For many, they are the defining characteristic of the Japanese economy. The keiretsu "have been a key element in Japan's rapid industrial development and transformation since the early 1950s," writes Calder (1993, p. 142). "In sectors as diverse as petrochemicals, telematics, atomic power, real estate development, and Middle East oil exploration, [they] have taken the strategic initiative for Japan."

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Even among those who would not take it quite that far, the keiretsu substantially shape the nature of economic competition. At a macro level, Caves and Uekusa (1976, p. 63) call them "a major and conspicuous force in the Japanese economy." On a more micro level, Hoshi et al. (1991, p. 34) claim that each "coordinates the activities of member firms and . . . finances much of their investment activity." So crucial are they thought to be, virtually no one anymore runs regressions on Japanese industrial organization or corporate structure without a keiretsu dummy.

For scholars eager to show the way parsimonious economic models miss real-world behavior—of whom there has never been a shortage in western Japanological circles—the keiretsu have promised a particularly rich source. Dore (1987, p. 178) describes them as "networks of relational contracting" that are

> a bit like an extended family grouping, where business is kept as much as possible within the family, and a certain degree of give and take is expected to modify the adversarial pursuit of market advantage.

Lincoln et al. (1996, p. 67) claim that

> These complex inter-firm networks reveal the embeddedness of the Japanese economy: the infusion of market exchange with rich social relations of a noneconomic nature.

More extreme still, two years later they (1998, p. 318) assert:

> Firms within a keiretsu are bound to one another in a web of obligation. Some such obligations may derive from assistance the group has rendered in the past. Others stem from a sense of duty to the industry and national economy of which companies are regularly reminded by the ministries and media that monitor their affairs. . . . Opting in or out of keiretsu commitments to troubled corporate kindred on the basis of unilateral calculations of advantage is generally not the Japanese way of business, and companies that try it risk a stern lesson in the importance of team play.

In fact, the keiretsu are and do none of this. They neither shape the Japanese economy nor illustrate anything about relational contracting or social embeddedness. For as a phenomenon with any economic substance, the keiretsu groups do not exist.[1] Invented by

1. Obviously, the firms (some of them are quite large, and some of them do share common trademarks) exist. The question is whether these firms—independently owned and managed as they apparently are—act collectively in ways that have economic substance. On their shared trademarks, see note 12, *infra.*

1960s-vintage Marxist economists and journalists determined to identify domination by "monopoly capital," the keiretsu were a convenient fiction from the start. To identify the keiretsu, modern economists typically rely on the *Research on the Keiretsu (ROK; Keiretsu no kenkyu)*, a roster compiled by the obscure think-tank "Economic Research Institute" (*Keizai chosa kai*).[2] In virtually all cases, the *ROK* merely groups firms by the principal source of their loans—not cross-shareholdings, not trading ties, not personnel exchanges. A few western economists rely on a less complete but English-language roster published occasionally by the Tokyo-based marketing firm Dodwell's.[3] Among the exchange-listed firms, Dodwell's simply reproduces the invitation list of firms whose presidents meet monthly for lunch, and adds others in which they have equity investments. Although the two rosters produce groups of about the same size, only half the firms in the two rosters overlap.

If either *ROK* or Dodwell's captured some otherwise unobservable but real group characteristic, it might be helpful. Neither does. The concept of keiretsu captures nothing about Japanese economic organization today, and captured nothing about Japanese economic organization in the 1960s. The keiretsu are instead a figment of the populist imagination, unwittingly perpetuated as the "keiretsu dummy" in modern econometric studies, but capturing nothing more than the source of some of a firm's debt or the occasional site of its president's lunch.[4]

We begin by placing the keiretsu debate in intellectual context (Sec. 2). We then turn to the principal sources on which empiricists rely for their membership lists (*ROK* in Sec. 3; Dodwell's and the lunch clubs in Sec. 4). We examine the significance of keiretsu affiliation for both debt finance and shareholding arrangements. We close by reexamining the main results scholars claim to have reached in keiretsu studies (Sec. 5). Overwhelmingly, we find the results impossible to reproduce: the only reliably robust results are those that recapture arbitrary sample biases created by the definitions themselves.

2. Anderson and Makhija (1999) (Nakatani); Beason (1998); Fukuda and Hirota (1996); Hanazaki and Horiuchi (2000); Horiuchi et al. (1988); Hoshi et al. (1990, 1991) (Nakatani variation on *ROK*); Kang et al. (2000); Morck et al. (2000) (Nakatani); Morck and Nakamura (1999) (union of Nakatani and the lunch-club lists); Nakatani (1984); Prowse (1990) (intersection of Nakatani and Dodwell); Sheard (1989).

3. Branstetter (2000); Conroy et al. (2000); Dewenter et al. (2001); Faccio et al. (2001); Kang and Shivdasani (1995, 1996, 1997); Kaplan and Minton (1994); Lincoln et al. (1996) (augmented with loan, equity, and trade data); Weinstein and Yafeh (1998). See also Kang and Stultz (2000) (using keiretsu dummy without specifying source).

4. Some discussions concern the "vertical" (manufacturer-centered) groups like automobile assemblers and suppliers. These raise fundamentally different issues, and we address them separately in Miwa and Ramseyer (2000).

2. The Keiretsu in Postwar Japan

Talk of the "keiretsu"—literally, "economic line-ups"—dates mostly from the early 1960s. Marxists overwhelmingly controlled economics departments and newspapers in Japan, and they brought to their work a need to locate in the "contradictions" of modern "bourgeois capitalism" the "domination" by "monopoly capital." In the 1930s, they had located this domination in the "zaibatsu." Market competition during the preceding decades had left several families very rich. These families—most famously, the Mitsui, Iwasaki (of the Mitsubishi empire), Sumitomo, and Yasuda—had then diversified their investments into a variety of industries.

By the 1930s, these successful industrialists faced increasing hostility from populists on both the left and the right. "Zaibatsu" was simply the term muckraking journalists coined to describe them. The word itself meant "financial clique," but the idiomatic connotations resembled nothing so much as "robber baron" (Miwa and Ramseyer, 2002).

Apparently believing that these firms had bankrolled the war, the US occupation officials dispossessed their owners (though the war had largely bankrupted the firms anyway) and banned the old trade names. The companies themselves they mostly left intact. When the Japanese government lifted the ban on the trade names in 1952, many of them retrieved their earlier names (Miwa and Ramseyer, 2001a, 2002).

Faced with this visible display of tradition, leftist journalists and academics saw in the (now independently owned and operated) firms the "monopoly capital" that Marxist theory taught them would dominate bourgeois capitalism. The compilers of the *ROK* shared that ideological need to find monopoly capital, as they explained in their description of the havoc the keiretsu were wreaking on the Japanese economy (Keizai chosa kai, 1960, pp. 3–4): "Monopolistic organizations of giant firms (firms that constitute trusts and industrial-capital combines), the keiretsu have a bank at their apex, and pursue their domination of capital through loans and their consolidation of that domination through equity. . . ."

To detail this "monopolistic" domination, the Institute began in 1960 to identify the loans and equity investments of the offending firms. The result became the annual *ROK*. A roster coupled with basic financial data, by the 1980s it had become the principal source of the "keiretsu dummy" in econometric research.

3. The Keiretsu in "Research on the Keiretsu"

Begin, then, with the definitions behind the principal rosters on which most observers rely: the *ROK* lists (Sec. 3.1). To ask whether the lists capture any group characteristics, consider both debt (Sec. 3.2) and equity (Sec. 3.3). Note that the *ROK* obtains its data from securities disclosure statements, and thus details firms listed on Section 1 of the Tokyo Stock Exchange (in 1965, 625 nonfinancial firms). Because many observers claim keiretsu ties weakened during the capital-market liberalization of the 1980s and the recession of the 1990s, we focus on the supposed heyday of the keiretsu: the mid-1960s [for similar results from 1975, see Miwa and Ramseyer, (2001b)].

3.1 The Definitions

3.1.1 Introduction. Just as none of the "keiretsu" groups has formal members, none has a formal definition. Unfortunately, the *ROK* does not offer *a* definition either. Instead, during the period at issue (the 1960s), it simultaneously used at least four. Through each, it produced substantially different rosters.

All of these definitions did have two things in common. First, they relied almost exclusively on loans rather than shareholdings, personnel exchanges, long-term commercial ties, or any of the other characteristics routinely attributed to the keiretsu. Note the significance of this: in all of the studies relying directly or indirectly on the *ROK* rosters, keiretsu membership in itself says *nothing* about the usual focus on cross-shareholdings or relational contracting. Instead, it merely reflects the amount the firm borrowed from several designated financial institutions.

Second, to determine the debt on which it based its rosters, the *ROK* first allocated the large financial firms among the various keiretsu, and then aggregated all loans made by those firms. To determine the Mitsui keiretsu, for example, it summed the amounts borrowed from the Mitsui Bank, the Mitsui Trust Bank, the Taisho Marine and Fire Insurance Company, and the Mitsui Life Insurance Company. To identify the Mitsubishi keiretsu, it summed the amounts a firm had borrowed from the Mitsubishi Bank, the Mitsubishi Trust Bank, the Tokyo Marine and Fire Insurance Company, and the Meiji Life Insurance Company. In all this, the *ROK* systematically ignored all loans from those major financial institutions with government ties (e.g., the Japan Development Bank and the Export-Import Bank).

3.1.2 Definitions. Depending on the purpose for which it wanted a roster, the *ROK* grouped firms by one of four definitions

(we use the 1966 edition detailing the 1965 roster; we paraphrase the definitions). All definitions rely overwhelmingly on the source of a firm's debt. For its Table 204 ("General Bank-Firm Affiliations"), it used the simplest:

Definition 1: Firms for which keiretsu financial institutions are collectively the largest source of borrowed funds.

With the Mitsui, this definition generated a group of 82 firms (79 Mitsubishi firms). Of those 82, 66 had the Mitsui financial institutions as their largest lender for three years running, and 16 others for only one or two years.

For its Table 206 ("Cross Shareholding Arrangements"), it used a narrower definition:

Definition 2: Firms meeting one of three criteria:

(a) the firm had keiretsu financial institutions as its largest lending source for three years in a row *and* had at least 20 percent of its stock held by other members of the keiretsu;
(b) the firm obtained at least 40 percent of its debt from keiretsu financial institutions, and that amount "significantly" exceeded the amount it borrowed from the next largest lender; *or*
(c) The firm was in the keiretsu "by tradition."

For the Mitsui, this generated a group of 48 firms (46 Mitsubishi firms).

For its Table 201 (giving the ratio of keiretsu lending to gross assets), the *ROK* used a third definition:

Definition 3: All firms falling within Definition 2, *plus* all others for which keiretsu financial institutions were the largest lender for three years in a row, but excluding firms owned at least 30 percent by firms in other keiretsu.

Under this approach, the Mitsui keiretsu had 71 firms (67 Mitsubishi firms).

Alas, the *ROK* did not limit itself to these three definitions. Instead, in its roster of firms by industry (Table 203), it used yet another list, but this time without explanation. In this table, it listed 53 nonfinancial Mitsui firms. Fourteen firms were in the Definition 4 roster but not in the 48-member Definition 2 roster; nine firms were in the latter but not in the former $(53 - 14 + 9 = 48)$. Because scholars generally focus on one the first three rosters, we shall not explore the fourth further. Unfortunately, because we rely on the *ROK* itself for most of our data, we too must sometimes shift from one definition to

another. Generally, we try to rely on the most commonly used Definition 1 or 3 rosters—although the well-known studies by Nakatani (1984, p. 223) and Hoshi et al. (1991, p. 41, note 11) claim to use the more nuanced Definition 2, they apparently use one of the loan-based rosters instead (either Definition 1 or 3). Because the *ROK* collects shareholding data only for the smaller Definition 2 group, for our own discussion of cross-shareholding patterns we too use that roster.

3.1.3 Membership. The group generated by Definition 2 is almost entirely a subset of the exclusively loan-based Definition 1 group. Of the 48 Mitsui firms falling under Definition 2, only 3 are not in the first. Apparently, they fall within the "tradition" catchall of clause (c) (for example, Toyota famously has almost no debt and would not otherwise fit within a keiretsu). Of the 45 other firms, 40 had used the Mitsui financial institutions as their largest lender for at least three years, and 5 had used them for one or two.

The group formed by Definition 3 is even closer to the exclusively loan-based first group. Again, take the Mitsui. Obviously, the Definition 3 group includes the 48 firms in the second group. Of those 48, 40 had used Mitsui financial institutions as their largest lender for three years straight. Since 66 firms had used Mitsui institutions as their largest lender for 3 years, that leaves 26 that were not in the second group. All remaining 23 firms in the third group ($71 - 48 = 23$) came from this group of 26.

The Mitsubishi ownership rosters similarly reflect the way the *ROK* relied overwhelmingly on loan patterns. As noted earlier, by Definition 1, the *ROK* generated a group of 79 Mitsubishi firms. Of these, 67 had the Mitsubishi financial institutions as their largest lender for 3 years. The Definition 2 group included 46 firms, all of which came from the Definition 1 group and 45 of which had Mitsubishi institutions as their principal loan source for 3 years. The group formed by Definition 3 also included 67 firms: all 46 firms in the second group, plus 21 of the 22 firms ($67 - 45 = 22$) that had borrowed the most from Mitsubishi institutions for 3 years but were not in the second group.

To illustrate loan patterns in the keiretsu, in Appendix A we detail the loans to the firms that the *ROK* assigned to the Mitsubishi keiretsu [Definition 1; for other keiretsu, see Miwa and Ramseyer (2001b, Tables 1–4, 20–21)]. Crucially, note that in placing them in the keiretsu, the *ROK* (1) aggregated the loans from four independent financial institutions, and (2) ignored loans (sometimes very large) from several prominent banks with government ties. These points become important in identifying main-bank affiliation—as we discuss in Section 5.2 below.

3.2 Lending Behavior

3.2.1 Loan amounts. As all these definitions imply, the firms in the *ROK* lists do borrow from keiretsu financial institutions. In Table I, we detail the loans between keiretsu borrowers (using Definition 3, and focusing on the six largest keiretsu) and financial institutions over the course of 1965–1990. Note that the Daiichi Kangyo Bank resulted from the merger of the Daiichi and Kangyo banks in the early 1970s.

For many readers, the surprise will lie in how *little* the keiretsu firms borrowed from keiretsu financial institutions, even in 1965. That year, the Mitsui Bank made 31.0 percent of its loans to Mitsui group borrowers, and the Mitsui Trust Bank lent 24.5 percent to the group. In turn, the Mitsui firms borrowed 14.3 percent of their debt from the Mitsui Bank, and 9.3 percent from the Mitsui Trust Bank. Consistently, keiretsu members seem to have diversified their borrowings broadly, and borrowed from the keiretsu bank only a small portion of the loans they wanted.[5]

Keiretsu firms did not limit their borrowings from the lead keiretsu banks because the banks could not lend more. They easily could have. In 1965, the Mitsubishi Bank lent its largest borrower, Mitsubishi Heavy Industries, 31 billion yen. It lent its next largest borrower 16 billion yen (Tokyo Electric—not a keiretsu member), and its third largest debtor 11 billion (Mitsubishi Electric). If it could lend Mitsubishi Heavy Industries 31 billion, its own scale did not stop it from lending the other keiretsu firms more.

3.2.2 Financial Coordination.

3.2.2.1 Among Group Firms. In evaluating the *ROK* listings, an obvious preliminary question is whether it makes any sense to pool the loans by the various financial institutions. The *ROK* allocated these financial firms among the groups by their lineage to the prewar zaibatsu. Yet by 1965 the firms had been independently owned and operated for nearly two decades. Did they still act cohesively?

5. A fraction that fell steadily over time, as Table 1 shows. Note that the *ROK* does not provide data on loans among the financial institutions themselves. When and why firms borrow from multiple banks is itself an ongoing puzzle—though presumably it depends in substantial part from the need to prevent being held up by a bank. Note that the extent of the reliance on a lead bank varies widely by country. In one study primarily of western Europe, the average number of banks on which firms relied ranged from 15.2 in Italy to 2.3 in Norway. In Germany, the average was 8.1; in the UK it was 2.9 (Ongena, 2000, p. 30). According to one recent US–Italy comparison, 44.5 percent of small US businesses borrowed from only one bank, but only 11.0 percent of small Italian businesses did (Detragiache et al., 2000).

TABLE I.

KEIRETSU LOANS, 1965–1990

				Loans as Percentage of								
				Financial-Institution Lending				Nonfinancial-Firm Borrowing				
Keiretsu[a]	Year	Number of Firms	Borrowings (million yen)	Bank	Trust Bank	Life Insurance	Marine & Fire Ins.	Bank	Trust Bank	Life Insurance	Marine & Fire Ins.	Total
Mitsui	1965	71	1, 224, 259	31.0	24.5	33.3	18.9	14.3	9.3	1.5	0.1	25.2
	1970	71	2, 476, 819	26.6	20.4	32.7	26.4	11.3	9.1	2.1	0.2	22.7
	1975	95	5, 769, 301	20.9	18.1	29.3	2.6	10.9	8.2	2.1	0.0	21.2
	1980	104	9, 649, 457	15.2	15.0	21.5	14.4	8.2	6.4	2.0	0.2	16.8
	1985	104	9, 649, 457	9.9	9.2	13.1	11.2	8.4	5.9	1.5	0.2	16.1
TKM[b]	1990	125	15, 571, 343	3.6	6.9	11.9	9.2	8.3	5.9	2.0	0.4	16.5
Mitsubishi	1965	67	1, 091, 924	24.0	28.2	24.1	20.7	18.2	13.3	2.4	0.3	34.2
	1970	85	2, 708, 868	23.6	24.3	27.4	23.8	12.8	10.6	2.4	0.4	26.2
	1975	117	6, 321, 652	19.9	21.1	27.4	24.2	12.9	10.0	2.6	0.7	26.2
	1980	113	7, 096, 635	11.9	13.2	15.3	13.2	11.9	8.5	2.5	0.5	23.5
	1985	119	8, 130, 014	7.2	7.5	6.4	7.5	12.1	7.6	1.6	0.4	21.7
	1990	130	10, 996, 240	4.5	5.2	6.4	1.5	11.9	6.6	2.2	0.2	20.9
Sumitomo	1965	70	1, 031, 629	24.6	25.8	31.8	10.5	17.8	12.6	3.5	0.1	34.0
	1970	80	2, 144, 086	19.1	10.1	18.4	28.9	13.0	5.4	3.0	0.2	21.6
	1975	115	6, 352, 550	18.1	22.0	17.3	24.6	12.2	9.7	2.5	0.3	24.7
	1980	110	6, 551, 865	10.8	12.6	9.5	11.0	11.9	8.5	2.8	0.2	23.4
	1985	111	8, 353, 332	7.3	8.2	6.2	5.1	12.5	7.8	2.2	0.1	22.6
	1990	112	11, 147, 019	4.1	5.2	3.0	2.4	11.2	6.2	1.7	0.1	19.2

(continued)

TABLE I. (CONTINUED)

				Loans as Percentage of								
				Financial-Institution Lending				Nonfinancial-Firm Borrowing				
Keiretsu[a]	Year	Number of Firms	Borrowings (million yen)	Bank	Trust Bank	Life Insurance	Marine & Fire Ins.	Bank	Trust Bank	Life Insurance	Marine & Fire Ins.	Total
Fuji	1965	62	778, 582	19.6	19.9	11.2	15.6	20.4	8.7	0.6	0.1	29.8
	1970	72	1, 678, 260	17.9	18.3	18.3	14.3	16.6	8.7	1.4	0.3	27.0
	1975	88	3, 960, 073	13.2	18.8	19.6	30.5	14.5	9.3	1.8	0.4	26.0
	1980	98	5, 572, 704	8.7	14.1	13.3	6.7	11.4	8.2	1.8	0.2	21.7
	1985	110	7, 258, 167	6.9	8.0	7.7	2.0	13.7	6.8	1.3	0.1	21.9
	1990	118	8, 766, 278	3.2	5.4	6.6	1.3	10.8	6.3	1.7	0.2	19.0
Daiichi	1965	40	662, 720	16.0		15.7		13.9		2.6		16.5
	1970	27	1, 439, 330	14.5		17.0		9.7		3.2		12.9
DKB[c]	1975	52	3, 094, 127	9.6		12.9		15.4		2.6		18.0
	1980	70	5, 689, 341	8.7		11.4		13.0		2.5		15.5
	1985	77	7, 055, 399	5.7		6.6		13.8		1.7		15.5
	1990	90	7, 943, 649	3.6		4.5		14.4		2.0		16.4
Sanwa	1965	45	752, 188	17.9	20.7	11.5		19.2	7.0	0.3		26.5
	1970	52	1, 577, 623	15.2	18.4	14.7		14.1	7.4	0.4		21.9
	1975	56	3, 699, 606	13.1	15.6	16.6		14.7	6.7	0.4		21.8
	1980	51	5, 158, 696	9.8	12.1	10.5		13.3	6.2	0.5		20.0
	1985	55	6, 118, 586	5.9	8.2	3.8		13.6	6.2	0.2		20.0
	1990	60	6, 393, 342	2.7	4.0	2.8		12.4	5.3	0.5		18.2

[a] Firms are those listed on Section 1 of the TSE. The roster is based on *ROK* Definition 3.
[b] Taiyo Kobe Mitsui Bank.
[c] Daiichi Kangyo Bank.
Source: Keizai chosa kai (1965).

Observers have generally assumed that the financial firms favored group members—presumably, that was why the *ROK* summed the loans to create the group rosters in the first place. If they loaned in parallel, their loans would be positively correlated. One could also argue (though we know of no one who has done so in print) that the groups assign members to one financial institution each. If so, their loans would be negatively correlated.

In Table II we present the correlation among the loans and equity investments within the keiretsu.[6] Because we need the shareholding data from the *ROK*, we use the groups generated by Definition 2. Given that this is the most restrictive definition, presumably it is also the one most likely to generate a cohesive group. Among the Mitsubishi firms, the loans by Meiji Life are significantly positively correlated with those of the Mitsubishi Trust Bank (.344) but significantly negatively correlated with those of the Mitsubishi Bank (−.264). Among the Mitsui, other than the loans by the Mitsui and Mitsui Trust Bank (.471), none of the institutions has loans significantly correlated with those of any other. Among the Sumitomo, only the loans of the life and casualty insurance firms are significantly correlated, and among the Fuji, none are. If the keiretsu financial firms systematically coordinate their loans, that coordination does not appear in these coefficients.

Neither do the data suggest that the institutions coordinate their equity investments. Among the Mitsubishi firms, none of the shareholdings are significantly correlated. Among the Mitsui, shareholdings by the Trust Bank are correlated with those of the Mitsui Bank (.772) and Taisho Marine (.517). Among the Sumitomo, the shareholdings of the casualty-insurance firm are positively correlated with those of the life-insurance firm, but negatively correlated with those of the trust bank. Although the correlation among Fuji financial institutions is high, the actual amounts are low. As we detail in Table V below, the trust bank invests in a mean 0.4 percent of Fuji firm shares, the lowest of the four trust banks. The mean shares held by the casualty-insurance company (1.18 percent) is lower than that of the Mitsui, and the mean share held by the life-insurance company (1.08 percent) is the lowest of all four keiretsu life-insurance companies.

3.2.2.2 Among All Firms. Even these haphazard correlations overstate the extent to which keiretsu lenders coordinate. Recall that we

6. That is, the correlation coefficients for the percentage of loans to a given firm from the various financial institutions, and for the percentage of shares in a given firm held by the various financial institutions. For the comparable correlation coefficients from 1975, see Table 22 of Miwa and Ramseyer (2001b).

TABLE II.

Investment Correlation among Keiretsu Financial Institutions, 1965

(A) Loans

Mitsubishi ($n = 46$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	−.244	1.000		
Cas. Ins.	−.198	−.049	1.000	
Life Ins.	−.264*	.344*	.245	1.000

Mitsui ($n = 48$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	.471**	1.000		
Cas. Ins.	.022	.096	1.000	
Life Ins.	−.160	.128	.234	1.000

Sumitomo ($n = 48$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	.043	1.000		
Cas. Ins.	−.005	−.149	1.000	
Life Ins.	−.115	.297*	−.063	1.000

Fuji ($n = 45$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	−.020	1.000		
Cas. Ins.	.071	−.021	1.000	
Life Ins.	−.233	.099	.193	1.000

Sanwa ($n = 36$)

	Bank	Tr. Bk.	Life Ins.
Bank	1.000		
Tr. Bk.	−.039	1.000	
Life Ins.	.112		1.000

Daiichi ($n = 29$)

	Bank	Life Ins.
Bank	1.000	
Life Ins.	.273	1.000

(B) Share holdings

Mitsubishi ($n = 46$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	.108	1.000		
Cas. Ins.	.083	−.022	1.000	
Life Ins.	.224	.146	.085	1.000

Mitsui ($n = 48$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	.772**	1.000		
Cas. Ins.	−.001	.517**	1.000	
Life Ins.	.147	−.040	−.019	1.000

Sumitomo ($n = 48$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	−.219	1.000		
Cas. Ins.	.124	−.266*	1.000	
Life Ins.	−.130	−.039	.503**	1.000

Fuji ($n = 45$)

	Bank	Tr. Bk.	Cas. Ins.	Life Ins.
Bank	1.000			
Tr. Bk.	.402**	1.000		
Cas. Ins.	.447**	.851**	1.000	
Life Ins.	.861**	.512**	.495**	1.000

Sanwa ($n = 36$)

	Bank	Tr. Bk.	Life Ins.
Bank	1.000		
Tr. Bk.	−.055	1.000	
Life Ins.	.152		1.000

Daiichi ($n = 29$)

	Bank	Life Ins.
Bank	1.000	
Life Ins.	.356*	1.000

Notes: **Significant at the 1-percent level using one-tailed tests; *significant at the 5-percent level. Correlation between Sanwa trust bank and life-insurance company not reported because of extremely small number of investments. Keiretsu affiliation is based on *ROK* Definition 2.
Source: Keizai chosa kai, ed. (1965).

examine investments only in those firms where the aggregate loans from group financial institutions collectively constitute the largest source of borrowed funds. Indeed, because we use Definition 2, we examine investments primarily in firms where the aggregate loans from group firms had been the largest source of debt for 3 years, *and* where group members held at least 20 percent of a firm's stock. Necessarily, a firm that borrows from several such institutions (or whose stock is held by several group members) will more likely fall within the definition than one that borrows from (or issues stock to) only one. Necessarily, the more a group includes firms that borrow from (or issue stock to) multiple group institutions, the more positively correlated loans (and shareholdings) will appear to be.

Crucially, keiretsu financial institutions make loans to a wide variety of firms outside the groups. Take the Mitsubishi Bank. It made less than a fourth of its loans to keiretsu firms (by Definition 3). Of the 168 firms borrowing more than 100 million yen from the bank that year, 61 were in the keiretsu but 107 were not. Of the firms borrowing 1 billion yen or more, 42 were in the keiretsu but 41 were not [for more detail, see Miwa and Ramseyer (2001b, Tables 8, 23)].

3.2.3 Shareholding Behavior. Key to most discussions of the keiretsu are the cross-shareholding arrangements. Indeed, (at the same time that they code their keiretsu dummy through the loan-based *ROK* roster) Morck and Nakamura (1999, p. 320) even define the keiretsu by the cross-shareholdings: "a group of companies linked by stable intercorporate shareholdings is called a keiretsu." Bergloef and Perotti (1994, p. 260) similarly characterize "elaborate cross-holdings of debt and equity" as one of the "main features" of the keiretsu.[7] Scholars have suggested a variety of reasons for the shareholdings. Gilson and Roe (1993), Bergloef and Perotti (1994; see also Perotti, 1992), and Flath (1996) each see the shares as Williamsonian "hostage exchanges" that promote promissory credibility. Morck and Nakamura (1999) view them as protection from hostile takeovers. Lincoln et al. (1992, p. 564) claim that the "interlocking shareholding binds Japanese firms into cohesive, horizontal communities."

The more basic question is whether cross-shareholding arrangements exist. In fact, among nonfinancial firms the intragroup shareholdings (intragroup shareholdings of any sort, let alone *cross*-shareholdings) are trivial. The financial firms do buy stock in keiretsu

7. See also Kang and Shivdasani (1996, p. 1062) (members "own substantial equity in other keiretsu member firms"). Note that trust-bank shareholdings will sometimes include amounts invested nominally in the name of the trust bank but in trust for others. Securities filings (on which the *ROK* relies) only haphazardly detail such arrangements.

members. Yet since they hold large portfolios of stock, they buy stock in a wide variety of listed firms, keiretsu or no. Among the nonfinancial firms, intragroup shareholdings are the rare exception. At the Mitsubishi (we provide the complete cross-shareholding data in Appendix B), the nonfinancial firm with the most group shares is the trading firm. Of the 28 firms in the group, it holds at least 0.5-percent interests in 24. Like the banks, however, it invests in a broad range of firms. In a 1969 securities disclosure connected with a stock offering it did list 37 Japanese "related firms" in which it had equity investments. Yet it carried them on its books for only 2.68 billion yen, while its entire portfolio of Japanese securities it carried for 33.17 billion. Most of the other nonfinancial firms invest almost nothing in each other.[8]

Nor are other keiretsu very different. Table III(A) gives the frequency with which the nonfinancial keiretsu firms invest in each other.[9] The 46 Mitsubishi nonfinancial firms could each have invested in 45 other firms—for a total of 2070 investment opportunities. Of these, firms had made investments in 219, or 10.6 percent. They had made at least 1-percent investments in 61, or 3.0 percent. According to Table III(A), in the same year Mitsui firms made 1-percent investments in 2.6 percent of the potential cases, Sumitomo firms in 3.7 percent, and Fuji firms in 1.8 percent.

Or consider the total outstanding shares of keiretsu firms held by group members [Table III(B)]. In the Mitsubishi keiretsu, nonfinancial firms held 4.9 percent of all outstanding shares of the Mitsubishi keiretsu. All firms (including the financial firms) held 16.5 percent. In the Mitsui, the nonfinancial firms held 3.5 percent of the shares of member firms, in the Sumitomo 6.1 percent, and in the Fuji 2.0 percent.

Cross-shareholding arrangements are even rarer. Equity investments seem consistently highest at the Sumitomo group, and in 1965 there were 11 pairs of cross-shareholdings involving at least 1-percent there. Among the Mitsui and Sanwa firms there were 6 such pairs, among the Mitsubishi 4 pairs, among the Fuji 3 pairs, and among the Daiichi firms 2.

Note three additional facts. First, the correlation between loans and shareholdings is haphazard. In Table IV, we detail the coefficients

8. For a fuller listing of the intragroup shareholdings, see Table 9 of Miwa and Ramseyer (2001b). The Japanese government owns corporate stock only under unusual circumstances—e.g., in the JR (railroad) companies, NTT (the telephone company), and Japan Air Lines.

9. For equivalent data for 1975, see Tables 25–28 of Miwa and Ramseyer (2001b). Note that no special legal consequences flow from this level of equity investment.

TABLE III.
Intragroup Shareholdings, 1965

(A) Frequency of Shareholdings in Nonfinancial Firms by Other Nonfinancial Firms, by Size of Investment

	Mitsubishi	Mitsui	Sumitomo	Fuji	Sanwa	Daiichi
Any investment	219 (10.6)	222 (10.7)	216 (9.6)	83 (4.2)	80 (6.4)	97 (11.9)
Investment > 0.5%	94 (4.5)	88 (3.9)	120 (5.3)	40 (2.1)	37 (2.9)	48 (5.9)
Investment > 1%	61 (3.0)	58 (2.6)	84 (3.7)	35 (1.8)	26 (2.1)	39 (4.8)
Investment > 5%	11 (0.5)	16 (0.7)	21 (0.9)	11 (0.6)	5 (0.4)	18 (2.2)
Investment > 10%	8 (0.4)	5 (0.2)	13 (0.6)	5 (0.3)	1 (0.1)	7 (0.9)
Total potential intragroup investments	2070	2256	2256	1980	1260	812

(B) Percentage of Nonfinancial Keiretsu Firm Shares Held by Other Keiretsu Members

Held by	Mitsubishi	Mitsui	Sumitomo	Fuji	Sanwa	Daiichi
All firms	16.5	8.6	17.6	9.1	7.6	9.4
Nonfinancial firms	4.9	3.5	6.1	2.0	2.1	4.7

(C) Percentage of Financial Keiretsu Firm Shares Held by Nonfinancial Keiretsu Members

Shares of	Mitsubishi	Mitsui	Sumitomo	Fuji	Sanwa	Daiichi
Bank	19.9	26.8	34.1	19.8	22.4	22.5
Trust bank	20.7	18.6	35.8	21.0	4.4	
Casualty ins.	3.3	16.6	11.6	5.2		

Note: In panel (A), we give the total number of cases in which a member of a group has bought stock in another nonfinancial group member, followed by the number of such investments divided by the total number of potential intragroup investments (in percent). In panel B, we give the fraction of all keiretsu shares held by other keiretsu members. In all panels, keiretsu affiliation is based on *ROK* Definition 2.
Source: Keizai chosa kai, ed. (1965).

TABLE IV.
Correlation Coefficients between Equity and Debt, 1965

Firm Type	Mitsubishi	Mitsui	Sumitomo	Fuji	Sanwa	Daiichi
Bank	0.294*	0.244*	0.031	0.054	−0.018	−0.188
Trust bank	0.105	0.251*	0.012	−0.098	0.379*	None
Casualty ins.	0.010	0.072	0.157	0.274*	None	None
Life ins.	0.373**	0.690**	0.255*	0.110	0.932**	0.273

Notes: **Significant at the 1% level using one-tailed tests;
*significant at the 5% level. Keiretsu affiliation is based on Definition 2.
Source: Keizai chosa kai, ed. (1965).

of the intrakeiretsu loan-shareholding correlation for each keiretsu financial institution. More often than not, the correlation is insignificant. Second, because the *ROK* does not detail shareholdings at the nonkeiretsu firms and those data are not available at the standard sources (e.g., the database used in Sec. 5 below), we cannot contrast the shareholding ties at keiretsu and nonkeiretsu firms. Last, the low levels of intragroup shareholdings do not reflect legal constraints. During the period in question, the law placed no limit on the shares the nonfinancial firms could hold. The Antimonopoly Act did impose a 10-percent ceiling on financial institutions. As Table V shows, the institutions seldom approached it.

4. The Keiretsu in Dodwell's

4.1 Dodwell's

4.1.1 Membership. Among English-speaking scholars, Dodwell Marketing Consultants has presented the stiffest competition to the *ROK*. Every few years since the early 1970s, it has published its own keiretsu roster in the *Industrial Groupings in Japan*. To this work, it brings an enthusiasm that easily matches the *ROK*'s ideological predispositions—"[t]he concentration of economic power in large financial and industrial groups," it proclaimed in 1975 (1975, p. i), "is a unique feature of Japanese commerce and industry." In the discussion below, we focus on that 1975 edition as the earliest we were able to obtain.

Unfortunately, Dodwell's does not clearly explain how it chooses its groups. Apparently, it starts with the invitation list of firms whose presidents meet monthly for lunch. As the Mitsubishi executives met on a Friday, they called theirs the "Friday Club"; the Mitsui called theirs the "Second Thursday Club"; and so forth. To that luncheon list, Dodwell's adds those firms where lunch group invitees appear prominently among the 10 largest shareholders. Like a Michelin guide to industrial organization, it then assigns group members one to four stars based on the size of those shareholdings. Where *ROK* collected information on eight groups (Mitsui, Mitsubishi, Sumitomo, Fuji, Sanwa, Daiichi, Tokai, and Daiwa), Dodwell's lists the first six of those plus Nippon Steel, Hitachi, Nissan, Toyota, Matsushita, Toshiba, and Tokyu. The latter groups are manufacturer-centered (vertical) groups. As such, they raise different issues, and we address them in a separate article (Miwa and Ramseyer, 2000).

4.1.2 ROK and Dodwell's Compared. Back when the US trade representative claimed the keiretsu blocked American products,

TABLE V.
Shareholdings by Financial and Nonfinancial Firms, 1965

Firm	Total Firms in Group	Any Shares	Over 1%	Over 5%	Over 8%	Mean (%)
(A) Shareholdings by Financial Institutions of Nonfinancial Firms						
Mitsubishi:						
Mitsubishi Bank	46	41	41	8	2	2.94
Mitsubishi Tr. B.	46	37	35	13	3	3.49
Tokyo Mar. & F.	46	27	26	3	0	2.19
Meiji Life	46	33	33	10	3	3.00
Mitsui:						
Mitsui Bank	48	33	31	9	2	2.29
Mitsui Tr. B.	48	17	16	0	0	0.53
Taisho Mar. & F.	48	28	27	4	1	0.83
Mitsui Life	48	24	24	2	1	1.43
Sumitomo:						
Sumitomo Bank	48	38	38	15	6	4.24
Sumitomo Tr. B.	48	30	30	12	3	3.93
Sumitomo Mar. & F.	48	22	20	1	0	0.88
Sumitomo Life	48	31	30	11	6	2.38
Fuji:						
Fuji Bank	45	45	44	20	7	4.49
Yasuda Tr. B.	45	15	15	1	0	0.40
Yasuda Marine & F.	45	24	24	3	2	1.18
Yasuda Life	45	18	17	5	1	1.08
Sanwa:						
Sanwa Bank	36	35	35	10	4	3.95
Toyo Tr. B.	36	17	17	5	1	1.42
Daido Life Ins.	36	4	3	0	0	0.08
Daiichi:						
Daiichi Bank	29	23	20	6	3	2.92
Asahi Life	29	13	12	7	4	1.77
(B) Shareholdings by Nonfinancial Firms of Financial Institutions						
Mitsubishi:						
Mitsubishi Bank	46	43	4	0	0	0.43
Mitsubishi Tr. B.	46	35	4	0	0	0.45
Tokyo Mar. & F.	46	9	1	0	0	0.07
Mitsui:						
Mitsui Bank	48	42	10	0	0	0.56
Mitsui Tr. B.	48	30	6	0	0	0.39
Taisho Mar. & F.	48	16	5	0	0	0.39
Sumitomo:						
Sumitomo Bank	48	43	15	0	0	0.71
Sumitomo Tr. B.	48	29	10	0	0	0.75
Sumitomo Mar. & F.	48	11	6	0	0	0.24

(continued)

TABLE V. (CONTINUED)

Firm	Total Firms in Group	Any Shares	Over 1%	Over 5%	Over 8%	Mean (%)
Fuji:						
Fuji Bank	45	41	5	0	0	0.44
Yasuda Tr. B.	45	36	4	0	0	0.47
Yasuda Mar. & F.	45	18	1	0	0	0.12
Sanwa:						
Sanwa Bank	36	35	9	0	0	0.62
Toyo Tr. B.	36	4	0	0	0	0.12
Daiichi:						
Daiichi Bank	29	26	8	0	0	0.23

Note: In panel (A), for each financial institution we give the number of firms in each category in which it has made equity investments of the given size, followed by the mean size (in percent) of the institution's investment. In panel (B), for each financial institution we give the number of firms in each category that have made equity investments of the given size in it, followed by the mean size (in percent) of the investment by the nonfinancial firms in the financial institution. Keiretsu affiliation is based on *ROK*, Definition 2.
Source: Keizai chosa kai, ed. (1965).

Saxonhouse (1991, p. 37) observed that if keiretsu members are to act collusively, "they do have to know with whom they are supposed to be colluding." "This may not be easy," he warned. Indeed not. If the various keiretsu definitions—arbitrary as they seem—proxied for otherwise real but unobservable group characteristics, the *ROK* and Dodwell definitions should produce roughly the same rosters. They do not. Just as the various *ROK* definitions produced Mitsui keiretsu ranging from 48 firms to 82, the *ROK* and Dodwell's produce Mitsui keiretsu in which less than half of the members overlap (Table VI). The fraction of *ROK* members (TSE Sec. 1 firms in the six principal groups; Definition 3) appearing in Dodwell's (TSE Section 1 firms only) ranges from 48 to 65 percent; the fraction of Dodwell members appearing in the *ROK* ranges from 49 to 55 percent.[10]

4.2 The Lunch Clubs

4.2.1 Membership. Focus, then, on Dodwell's four-star firms: the lunch-club members. Given that the members themselves decide with whom to dine, the invitations arguably constitute the least ambiguous membership rosters. Indeed, scholars have sometimes

10. Weinstein and Yafeh (1995: 368) find that the correlation between *ROK* and Dodwell's rosters is .31.

TABLE VI.
***ROK*, DODWELL'S, AND LUNCH-CLUB ROSTERS (TSE SEC. 1 FIRMS)**

(A) *ROK* and Dodwell's (1975)

	No. of Firms			Percentage	
Keiretsu	*ROK* Def. 3	Dodwell's	Both	*ROK* in Dodwell's	Dodwell's in *ROK*
Mitsui	85	83	41	48.2	49.4
Mitsubishi	107	127	68	63.6	53.5
Sumitomo	100	102	55	55.0	53.9
Fuji	82	93	51	62.2	54.8
Sanwa	60	75	39	65.0	52.0
DKB	59	62	33	55.9	53.2

(B) The Lunch Clubs (1975–1976)

Keiretsu	Members
Mitsui	24
Mitsubishi	27
Sumitomo	16
Fuji	29
Sanwa	37
DKB	30

(C) Lunch-Club Membership Changes

	1967–1976		1976–1986		1986–1996	
Keiretsu	Add	Drop	Add	Drop	Add	Drop
Mitsui	5	8	1	0	3	2
Mitsubishi	4	3	2	0	3	3
Sumitomo			5	0	1	2
Fuji	4	0	0	0	1	1
Sanwa	17	3	6	0	2	1
Daiichi (DKB)	18	0	18	1	2	1

Notes: Part (C) gives estimates of the minimum number of changes, based on checks of the members in 1967, 1972, 1976, 1982, 1986, 1991, and 1996. Obviously, additional firms could have entered and left in the intervening years.
Source: Keizai chosa kai, ed. (1975); Dodwell Marketing Consultants (1975); Toyo keizai, ed. (1983).

used them for just that purpose.[11] And many of the firms even share trademarks dating from the zaibatsu days.[12]

11. For example, Flath (1996); Khanna and Yafeh (2000); Lincoln et al. (1996). When scholars cite the *Kigyo keiretsu soran* rosters (see Shukan toyo keizai), they refer to these lunch-club lists.

12. *Common names:* As the descendents of the prewar zaibatsu (which often, though not always, involved common names), some of these firms share names. The Mitsubishi

As Table VI shows, these groups are much smaller than either the Dodwell or the *ROK* groups. Whereas the Mitsui keiretsu had about 80 members by either Dodwell or *ROK* (albeit fewer than half in common), only 24 were in the lunch club.[13] Of those 24, by definition all were in Dodwell's (as the four-star members), and all of the nonfinancials were in the *ROK* group.

Not only are these lunch clubs small, they also change. None of the groups has changed much since the mid-1980s. Yet, though the Sanwa group had only 23 members in 1967, it added 17 more over the succeeding decade and yet another 6 during the next. Even the putatively stable Mitsui added 5 firms and dropped 8 from 1967 to 1976—this on an original membership of only 27.

4.2.2 Keiretsu Investments. The lunch-club members are little more likely to invest in each other than the members of the *ROK* rosters. As a comparison of Tables II and VII shows, *ROK* Mitsui members borrowed 14.3 percent from the Mitsui Bank, while lunch-club Mitsui members borrowed 17.1 percent. *ROK* Mitsubishi firms borrowed 18.2 percent from the Mitsubishi Bank, while lunch-club Mitsubishi firms borrowed only 16.1 percent. The Sumitomo *ROK* members borrowed less than the lunch-club members, while the Fuji, Daiichi, and Sanwa members borrowed more.

Although the lunch-club members are more likely to buy stock in each other than the *ROK* members, the amounts remain small. Even with the Mitsui and Mitsubishi (1965), the nonfinancial firms bought stakes larger than 1 percent less than a tenth of the time (Table VIII). Again, equity investments were highest at the Sumitomo, where the nonfinancial lunch-club members collectively held 9.1 percent of the member firms' stock. Among the Mitsubishi, however, they held only 4.3 percent, and among the Mitsui 3 percent. Note that we omit shareholdings among the Sanwa, Fuji, and Daiichi groups because not all lunch-club members (six members each for Fuji and Sanwa, one for Daiichi), were in the *ROK* keiretsu.[14]

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club (27 firms in 1967, our earlist available roster) included 19 firms with "Mitsubishi" in the name (still independently owned and operated firms, however). The Mitsui lunch club (27 firms in 1967) included 14 with "Mitsui" in the name, and Sumitomo (16 firms in 1972) included 14 with "Sumitomo." Yet the Fuji group, descended from the Yasuda zaibatsu and sometimes called the Fuyo group, as common-name firms included only three Yasuda financial institutions (the former Yasuda Bank is now the Fuji Bank). The Sanwa and DKB groups included no common-name firms.

13. This the Nimoku-kai. In addition, there was a slightly larger Getsuyo-kai, also involving the Mitsui firms.

14. As a result, the relevant shareholding data were not available. We also omit Hitachi from our data more generally, as it was in both the Fuji and the Sanwa clubs (indeed, it would later join the Daiichi-Kangyo club as well).

TABLE VII.
INTRAKEIRETSU LOANS, 1965—LUNCH CLUBS ONLY

Keiretsu	No. of Members	No. of Firms Counted	Percentage				Total Loans (million yen)
			Bank	Trust Bank	Cas. Insur.	Life Insur.	
(A) As Percentage of Financial-Institution Lending							
Mitsui	27	19	17.1	11.8	20.7	19.0	688,143
Mitsubishi	25	18	16.2	18.3	44.8	19.1	831,943
Sumitomo	17	12	8.9	13.8	0.0	19.8	363,623
Fuji	25	20	14.0	16.0	5.2	5.0	677,431
Daiichi	16	13	6.1	None	None	11.7	307,471
Sanwa	23	19	12.1	16.8	None	6.4	620,922
(B) As Percentage of Nonfinancial-Firm Borrowing							
Mitsui	27	19	16.6	9.2	0.2	1.7	688,143
Mitsubishi	25	18	16.1	11.3	0.3	2.5	831,943
Sumitomo	17	12	18.3	19.0	0.0	6.1	363,623
Fuji	25	20	19.9	8.4	0.0	0.4	677,431
Daiichi	16	13	13.2	None	None	4.9	307,471
Sanwa	23	19	16.3	6.7	None	1.9	620,922

Notes: Loan data are available only for TSE listed firms, and not all lunch-club members are listed firms. The *ROK* treats the Daido Life Insurance company as a Sanwa firm; the lunch-club member is the Nihon Life Insurance company. For purposes of this table, we treat Nihon rather than Daido as the Sanwa life-insurance firm.
Source: Keizai chosa kai, ed. (1965); Shukan toyo keizai, ed.

Nor did the keiretsu financial institutions often hold large stakes in the lunch-club members. In 1965, the Sumitomo Bank held more than 5 percent of six firms, and the Mitsui Bank, of four firms. The Mitsubishi Bank held more than 5 percent of only one.

Cross-shareholding arrangements were rarer still. Among all nonfinancial Sumitomo lunch-club members, 11 pairs of firms held at least 1-percent in each other. Among the Mitsubishi only one pair did, and among the Mitsui, none.

4.2.3 SIGNIFICANCE. In the mid-1960s, the Mitsui, Mitsubishi, and Sumitomo presidents (Fuji, Sanwa, and Daiichi did not begin meeting until about 1967) primarily invited to their lunches only men from the former zaibatsu firms. Before the war, they had worked in family-owned empires. Thus, many knew their peers at the other family firms. Indeed, some were probably friends. With their seniors purged by the US-dominated occupation, by the late 1950s they had climbed to the pinnacle of their firms. Life is lonely at the top, and the monthly lunches presumably gave them a chance to socialize with men who did not always answer yes.

As groups of formerly zaibatsu firms, the clubs included many firms that mattered only in history, if they mattered even then. As of 1967 (the earliest date for which we have an invitation list—*Nihon keizai shimbun*, April 25, 1967), the lunch clubs included the Hokkaido Colliery and Steamship company (1965 market capitalization of 6.9 billion yen; the exchange rate was 360 per dollar, and we include the capitalization of the genuinely large firms immediately below), for example, and the Toshoku trading firm (3.0 billion), Mitsubishi Steel (2.8 billion), Mitsubishi-Edogawa Chemicals (3.1 billion), Sumitomo Coal (3.2 billion), Mitsubishi Mining (3.5 billion), and Mitsubishi Plastics (3.7 billion).

These clubs could not have dominated the Japanese economy if they tried. Not only did they include firms that had gone nowhere; they missed many of the most crucial. Predominantly, they included

TABLE VIII.
INTRAGROUP SHAREHOLDINGS, 1965—LUNCH CLUBS ONLY

	Number (Percentage)		
	Mitsubishi	Mitsui	Sumitomo
(A) Frequency of Shareholdings by Nonfinancial Firms, by Size of Investment			
Any investment	119 (38.9)	51 (32.7)	93 (70.5)
Investment > 0.5%	51 (16.7)	24 (15.4)	61 (46.2)
Investment > 1%	29 (9.5)	12 (7.7)	44 (33.3)
Investment > 5%	2 (0.7)	3 (1.9)	10 (7.6)
Investment > 10%	1 (0.3)	1 (0.6)	2 (1.5)
Potential investments	306	156	132
(B) Percentage of Nonfinancial Keiretsu Shares Held by Other Keiretsu Members			
Held by	Mitsubishi	Mitsui	Sumitomo
All firms	16.3	9.8	24.5
Nonfinancial firms	4.3	3.0	9.1
(C) Percentage of Financial Keiretsu Firm Shares Held by Nonfinancial Keiretsu Members			
Shares of	Mitsubishi	Mitsui	Sumitomo
Bank	13.8	11.1	15.4
Trust bank	14.6	11.4	28.9
Casualty ins.	3.3	12.8	11.1

(continued)

TABLE VIII. (CONTINUED)

(D) Shareholdings by Financial Institutions

	Total Firms in Group	Any Shares	Over 1%	Over 5%	Over 8%	Mean
Mitsubishi:						
Mitsubishi Bank	18	17	17	1	0	2.93
Mitsubishi Tr. B.	18	16	16	4	1	3.47
Tokyo Mar. & Fire	18	14	13	2	1	2.39
Meiji Life	18	18	18	4	1	3.24
Mitsui:						
Mitsui Bank	13	11	10	4	2	2.53
Mitsui Tr. B.	13	9	7	0	0	0.93
Taisho Mar. & Fire	13	9	9	1	0	1.14
Mitsui Life	13	11	11	1	0	2.17
Sumitomo:						
Sumitomo Bank	12	12	12	6	2	5.25
Sumitomo Tr. B.	12	11	11	4	1	5.08
Sumitomo Mar. & Fire	12	8	8	1	0	1.19
Sumitomo Life	12	12	12	4	2	3.66

Note: We omit the information on the Sanwa, Fuji, and Daiichi groups because the nonfinancial lunch-club members were not all in the *ROK* groups. Hence shareholding data were unavailable. In panel (A), we give total number of cases in which a nonfinancial member of a group has bought stock in another nonfinancial member, followed by the number of such investments divided by the total potential number of such intragroup investments (in percent). In panel (B), we give the fraction of all keiretsu shares held by other keiretsu members. In panel (D), for each financial institution we give the number of firms in each category in which it has made equity investments of the given size, followed by the (simple) mean of the size of the institution's investment.
Source: Keizai chosa kai, ed. (1965); Shukan toyo keizai, ed.

firms in industries that had thrived before the war—e.g., finance, mining, fertilizer, real estate, ocean shipping, warehousing, cement—and omitted those that were central to postwar growth. As of 1967, giant firms not in any of the six principal lunch clubs included Toyota (1965 market capitalization 135 billion yen), Toshiba (91 billion), Takeda Pharmaceuticals (61 billion), Kinki Nihon Railway (43 billion), Honda (42 billion), Bridgestone Tire (42 billion), and Kajima Construction (37 billion)—not to mention firms like Matsushita Electric (Panasonic), Sharp, Sony, Kyocera, Suzuki, Cannon, and Nikon. The clubs did not even include Toyo kogyo (Mazda; 1965 capitalization of 71 billion), whose "rescue" by the Sumitomo Bank in the 1970s Pascale and Rohlen (1983) would transform into so famous a tale of keiretsu virtue.

Even collectively, the lunch-club members constituted but a modest organization. Compare, for example, the total employees (1973 data)

of *all* lunch-club firms with those of selected international firms:[15]

Mitsui	259,084	IBM	268,130
Mitsubishi	269,147	Siemens	302,000
Sumitomo	159,395	ITT	433,000
Sanwa	414,731	Philips	386,500
Fuji	345,549	GM	804,571
DKB	546,312	Ford	458,463

If one totaled all the employees at the Mitsubishi lunch-club firms, they collectively constituted a firm about the size of IBM. None of the groups even remotely approached the size of GM.

For scholars who stress the lunch clubs—transformed magisterially through word choice into "President's Councils"—the clubs do solve a theoretical quandary. Although the *ROK* gives long rosters, its "members" have no way to coordinate what they do. Posit regular "councils" of firm presidents, and the problem vanishes.

Yet if the theoretical problem disappears, the empirical one compounds itself, for even scholars who stress their importance have yet to produce a lunch-club decision that much mattered. From time to time, the clubs (particularly the Mitsubishi) have apparently passed on whether to let firms use the old zaibatsu trademark. In the late 1960s, the clubs apparently planned group exhibitions at the 1970 Osaka World's Fair. At one point, the Sumitomo club is said to have tried to stop Sumitomo Metals and Sumitomo Chemicals from expanding their aluminum refining facilities. The Mitsubishi club is said to have tried to stop Mitsubishi Chemicals and Mitsubishi Petrochemicals from expanding ethylene production. In both cases, however, the firms ignored the group pressure and proceeded as planned.

Practice apparently varies broadly among the lunch clubs, but none see themselves as decision-making organizations for CEOs. Although most Japanese firms have one senior executive who focuses on internal firm affairs, many have another who serves as the firm's liaison with the outside. At many firms, it is the latter who attend the lunch clubs—along with Rotary Club functions, trade-association meetings, and chamber-of-commerce dinners. At still other firms, it is the up-and-coming junior executives.[16]

Among these groups, observers usually declare the Mitsubishi the most disciplined. Yet even they meet only once a month for 90-minutes. They hold no other meetings, and enforce the 90-minute

15. Japanese-group data from Shukan toyo keizai (1975, p. 34); foreign-firm data from Tsusho sangyo (1975). In 1973, the Japanese GDP was $415 billion; the US GDP was $1,295 billion (Keizai kikako cho, 1974, p. 266).

16. Information by private correspondence and communication.

limit ruthlessly, given that many make business appointments for the early afternoon. After a quick lunch (curry with rice is the long-time favorite) and a discussion of requests for donations (e.g., the endowed chair at the Harvard Law School, donated in the 1970s and now occupied by Ramseyer) and trademark disputes, the members hear a 60-minute presentation from an outside speaker. Of the eleven presentations during 2000, only two even arguably related to business: May's lecture on "The Japanese Economy in the Age of Globalization," and the December presentation on e-commerce. The rest of the talks were "Tales of London," by the British ambassador to Japan (February); "Thirty years of the Mitsubishi Foundation" (January); "Cloning," by a Ministry of Agriculture and Fisheries official (March); "China, Taiwan, Hong Kong, and Japan," by a university professor (November); long-term care for the elderly, by a medical-school professor; a report on the Russian election from a Japanese diplomat (July); "Issues in Japanese Education," by the former University of Tokyo President (September); a report from the head of an East Asian classics library (April); and a lecture from a language professor on "Angkor Wat and the Japanese" (October).[17]

5. The Keiretsu in Economics

5.1 Introduction

If such are the rosters used, what should we make of the results obtained? They do form a strange melange. Some seem to depend on misspecified equations, others on outlying data points, and many contradict each other flatly. Perhaps, however, that incoherence should not surprise. Why expect anything coherent to come from distinguishing among firms that borrow 15 percent of their debt from one incoherently grouped set of financial institutions rather than another? If a variable captures nothing of relevance, the correctly calculated coefficient will equal zero. Given the editorial bias in favor of significant results, most regressions in print will still have statistically significant coefficients. Given a correctly calculated value of zero, though, those "significant" coefficients will swing in both directions.

In this section we explore the existing studies more fully. Our results confirm what one would expect: for all variables other than size, the coefficients are generally insignificant. The problem, it seems, lies in the way so many scholars prefer to run regressions rather than study the data. In the end, as Zvi Grilliches famously reminded generations of graduate students, no amount of econometric manipulation will substitute for knowing those data.

17. Information by private correspondence and communication.

5.2 Hoshi, Kashyap, and Scharfstein

5.2.1 The Study. By far the best-known of the keiretsu studies is that of Hoshi et al. (1991).[18] Using Nakatani's (1984) *ROK*-based roster, Hoshi et al., sorted Japanese firms (from 1978 to 1985) into keiretsu firms and independents. They then follow the Fazzari-Hubbard-Petersen (1988) model of financing constraints and investment-cash flow sensitivities, and regress investment on cash flow, Tobin's *Q*, and various controls. They find keiretsu firms less liquidity-constrained. This results, they explain, from the fact that keiretsu affiliation proxies for the strength of a firm's ties to its "main bank" (the bank from which it borrows the largest share of its loans).[19] Accordingly, keiretsu firms can more effectively overcome the informational and coordination problems that otherwise plague financially distressed firms.

5.2.2 The Response. Recent work suggests several reasons for doubting the results. First, on theoretical grounds Kaplan and Zingales [1997, 2000; contested by Fazzari et al. (2000)] find the Fazzari-Hubbard-Petersen model implausible a priori. The proposition (1) that the sensitivity of corporate investment to cash flow would reflect financing constraints depends entirely, they (2000, p. 708) show, on the assumption (2) that "investment–cash flow sensitivities increase monotonically in the degree of financing constraints." No reason exists, they then explain, to expect such monotonicity.

Second, Kaplan and Zingales question the way Fazzari et al. partition their sample between financially constrained and nonconstrained firms, and explain why that partitioning is crucial. To partition their own sample, however, Hoshi et al. merely use keiretsu membership by the *ROK* rosters.[20] As noted above, those rosters give no reason to think they would have anything at all to do with financial constraints.

18. In Hoshi et al. (1990), they take 125 financially distressed firms from 1978 to 1985. They then regress investment after the onset of financial distress on keiretsu affiliation [defined by the *ROK*-based roster from Nakatani (1984)] and various controls. They find that keiretsu-affiliated firms invest more than independents. An analogous result appears in Lincoln et al. (1996).

19. Others using a keiretsu dummy to proxy for the strength of a firm's ties to its main bank include Fukuda and Hirota (1996), Hanazaki and Horiuchi (2000), Horiuchi et al. (1988), Hoshi et al. (1990), Morck and Nakamura (1999), and Weinstein and Yafeh (1998). Prowse (1990) limits his study to keiretsu firms "because of the stronger ties these firms have to banks and other lenders"; Nakatani (1984) observes that each keiretsu "has a major commercial bank . . . as the major lender to the member firms"; Sheard (1989, p. 401) describes the *ROK* roster as a "classification of listed Japanese firms into main-bank groupings."

20. On the grounds that the keiretsu are "an important feature in the Japanese economy," Chirinko (1997, p. 202) praises this as a major advance over Fazzari et al. (1988).

Third, on empirical grounds, both Hayashi (2000) and Hall and Weinstein (2000) report Hoshi et al.'s results as fundamentally unstable. Hayashi (2000) finds that the results hinge on four outlying firm-years; remove the outliers, and the results disappear.[21] In turn, Hall and Weinstein (2000) locate no evidence that a firm's lead bank more readily lends to financially distressed keiretsu firms than to nonkeiretsu firms (similarly, Miwa, 1996, pp. 108–109; Anderson and Makhija, 1999).

5.2.3 Keiretsu and Main Banks. Given this recent work by Hayashi (2000) and Hall and Weinstein (2000), we do not replicate Hoshi et al.'s study yet again. Instead, we examine their premise that keiretsu firms have a stronger relationship with their main bank than independent firms. As the discussion above should make clear, the Economic Research Institute sorts firms by lines that have little to do with the "strength" of a firm's ties to its bank. What is less obvious is that firms in a keiretsu often do not even use the keiretsu money-center bank as their main bank.

To see why this result could occur, recall the *ROK* definition: whether the *sum* of the loans from the pooled financial institutions exceeds loans elsewhere. Now consider the Tobu Railroad. In 1975 it had total financial-institution debt of 192,942 million yen. Its largest loans (in million yen) were:

Mitsui Trust Bank	24,059
Mitsubishi Trust Bank	21,844
Yasuda Trust Bank	20,975
Japan Development Bank	16,789
Fuji Bank	15,404

The *ROK* placed Tobu in the Fuji group (it was also in the Fuji lunch club) because the sum of its debt from the Yasuda Trust Bank and Fuji Bank exceeded its total Mitsui or Mitsubishi loans. Notwithstanding that membership in the Fuji group, however, the Fuji Bank was but its fifth-largest lender.

Similarly, the *ROK* placed the Chori firm in the Mitsui group because it borrowed 4,434 million yen from the Mitsui Bank and 9,013 from the Mitsui Trust Bank. Yet Chori borrowed 11,121 million yen from the Fuji Bank, 10,440 from the Daiichi Kangyo Bank, and 9,809 from the Sanwa Bank. The *ROK* placed Nippon TV in the Mitsubishi group because it borrowed 936 million yen from the Mitsubishi Bank and 892 from the Mitsubishi Trust Bank. Yet Nippon

21. Hoshi (2000) argues that the results reappear if one follows a consistent policy toward dropping outliers.

TV borrowed 987 million from the Fuji Bank. And the *ROK* placed Daido Wool in the Sumitomo group because it borrowed 970 million yen from the Sumitomo and 501 from the Sumitomo Trust Bank. Yet Daido borrowed 1,220 million from the Daiichi Kangyo Bank, and another 970 from the Fuji Bank.

More generally, in Table IX we detail the main banks (for 1975; defined as the financial institution from which a firm borrows the largest share of its debt) for firms in each of the keiretsu (we describe the sample and data base immediately below). In Miwa and Ramseyer (2001b), we show that the reliance on the keiretsu money-center bank was, if anything, even lower in 1965. Crucially, in the Mitsui, Mitsubishi, and Sumitomo keiretsu, the *majority* of firms did *not* use the keiretsu money-center bank as their main bank.

5.3 Other Results

5.3.1 Introduction. To reconsider the other results in the literature,[22] we use the Nikkei NEEDS data base to assemble financial data on all Tokyo Stock Exchange Section 1 firms (the largest firms) from 1968 to 1982. After dropping firms with 2 years of data or less and extreme outliers, we obtain a sample of 1015. We add three measures of keiretsu affiliation: the *ROK* roster (Definition 3, for 1975), the lunch-club membership (for 1975; from *Kigyo keiretsu soran*), and main bank affiliation (for 1975; calculated from loan data in *Kigyo keiretsu soran*).

22. *Intragroup trades:* Lincoln et al. (1996) purport to find substantial amounts of intrakeiretsu trading. Given that the source on which they claim to rely [the *Kaisha nenkan*; see Lincoln et al. (1996, p. 74, note 8)] does not provide the volume of trade with various partners, we do not see how they could reach such a result. However, in the early 1990s the Japanese Fair Trade Commission did survey members of the various lunch clubs regarding the volume of their intragroup trades [Kosei (1994, p. 139); the results are reproduced in Miwa (1996, p. 127)]. In 1992, manufacturing firms in the six keiretsu groups *sold* a mean 12.58 percent of their output within the group (2.38 percent, if one excluded the group trading company, which then resold the goods elsewhere). The amounts ranged from 5.57 percent (1.49 percent, excluding the trading company) for the Sanwa group, to 31.67 percent (0.61 percent, excluding the trading company) for the Sumitomo. These same manufacturing firms *acquired* a mean 6.71 percent of their supplies within the group (2.24 percent, excluding the trading company). The amounts ranged from 3.67 percent (1.23 percent, excluding the trading company) for the Fuji to 15.87 percent (5.40 percent, excluding the trading company) for the Mitsubishi. The mean figures appear to reflect a few outliers. For example, in 1988 7.4 percent of the sales of the Mitsubishi trading firm represented Mitsubishi Heavy Industry products, and 5.3 percent represented Mitsubishi Auto sales. The combined sales of Mitsubishi Metals, Mitsubishi Electric, Mitsubishi Petroleum, Mitsubishi Chemicals, and Mitsubishi Paper represented only a bit over 1 percent of the trading company's sales. The combined sales of all other lunch-club members came to 4–5 percent of the trading company's sales (information from unpublished Mitsubishi memorandum).

TABLE IX.
KEIRETSU AFFILIATION AND MAIN-BANK STATUS, 1975

Firm	No. (Percentage) *ROK*	No. (Percentage) LC	Firm	No. (Percentage) *ROK*	No. (Percentage) LC
(A) Mitsui			(B) Mitsubishi		
Mitsui Bank	34 (40.1)	5 (38.5)	Mitsubishi B.	47 (42.7)	4 (40.0)
Mitsui T.B.	19 (22.9)	4 (30.8)	Mitsubishi T.B.	32 (29.1)	4 (40.0)
Japan Dev. B.	6 (7.2)	1 (7.7)	Japan Dev. B.	10 (9.1)	1 (10.0)
Long-Term Cr. B.	5 (6.0)		Ind. B. Japan	3 (2.7)	
Ind. B. Japan	4 (4.8)		DKB	5 (4.5)	
Fuji Bank	1 (1.2)		Fuji Bank	1 (1.0)	
Others	11 (13.3)	3 (23.1)	Others	10 (9.1)	1 (10.0)
None	3 (3.6)		None	2 (1.8)	
Total	83	13	Total	110	10
(C) Sumitomo			(D) Fuji		
Sumitomo B.	49 (47.6)	7 (58.3)	Fuji Bank	44 (56.4)	12 (57.1)
Sumitomo T.B.	21 (20.4)	3 (25.0)	Yasuda T.B.	13 (16.7)	
Mitsubishi T.B.	1 (1.0)		No-chu B.	7 (9.0)	4 (19.0)
Fuji Bank	1 (1.0)		Fudosan B.	4 (5.1)	
DKB	1 (1.0)		DKB	1 (1.3)	
Sanwa Bank	1 (1.0)		Mitsui T.B.	1 (1.3)	1 (4.8)
Mitsui T.B.	1 (1.0)		Sanwa Bank	1 (1.3)	
Others	25 (24.3)	2 (16.7)	Others	6 (7.7)	4 (19.0)
None	3 (2.9)		None	1 (1.3)	
Total	103	12	Total	78	21
(E) Sanwa			(F) DKB		
Sanwa Bank	32 (61.5)	20 (64.5)	DKB	43 (86.0)	13 (54.2)
Toyo T.B.	3 (5.7)	1 (3.2)	Japan Dev. B.	2 (4.0)	1 (4.2)
DKB	1 (1.9)		Exp-Im. B.	2 (4.0)	1 (4.2)
Fuji Bank		1 (3.2)	Long-Term Cr. B.	1 (2.0)	3 (12.5)
Sumitomo T.B.	3 (5.7)		Asahi Life	2 (4.0)	1 (4.2)
Mitsui T.B.	2 (3.8)		Mitsui T.B.		1 (4.2)
Others	10 (19.2)	8 (25.8)	Others		2 (8.3)
None	1 (1.9)	1 (3.2)	None		2 (8.3)
Total	52	31	Total	50	24

Notes: In each case, we give the number of firms (under the *ROK* Definition 3 and lunch-club rosters) in the keiretsu that use a given financial institution as the principal source of borrowed funds, followed in parentheses by the percentage of such firms among group members. The numbers of firms in the groups in this table are lower than the number of actual group members in 1975, because we use the NEEDS database—which drops the records of firms as they disappear (e.g., through merger).

Sources: Nippon keizai shimbun sha, *Nikkei zaimu deeta [Nikkei Financial Data] (NEEDS)*, on line; Shukan toyo keizai, ed. (1975); Keizai chosa kai, ed. (1975).

We use the "oil shock" of the mid-1970s to compare the effect of keiretsu affiliation under different economic environments. During 1968 to 1975, real GNE in Japan rose 54 percent; from 1975 to 1982 it rose only 22 percent (Toyo, 1983). Given this change, we separately report our regressions for the two periods.

5.3.2 VARIABLES. We introduce the following variables.

- *Profitablity.* To measure profitability, we divide ordinary income (income after interest expenses; NEEDS #110) by stockholders' equity (NEEDS #78). We use the mean value of the ratio over the relevant period.
- *Volatility.* To measure the volatility of a firm's performance, we take the variance in the firm's profitability over the period (we follow Nakatani (1984) in using variance to measure volatility).
- *Interest rates.* To estimate the interest rate on a firm's loans, we divide its interest charges (interest on loans and bonds plus discounts on notes; NEEDS #103) by total debt (excluding non-interest-bearing short-term debt; NEEDS #46–48, 62–64, 142), averaged over the relevant period.
- *Controls.* For controls, we use total assets (we also use it as a dependent variable, averaged over the relevant period, in billion yen) and eight industry dummies.

We include summary statistics in Table X.

5.3.3 VOLATILITY.

5.3.3.1 The Hypothesis. If (following Hoshi et al.) keiretsu firms have better access to funds during financial distress, they should exhibit lower profit variability than independents. Nakatani (1984) so finds (he attributes it to a mutual insurance arrangement among the keiretsu firms), as do Khanna and Yafeh (2000).

5.3.3.2 Other Studies. This lower-variability result prominently contradicts other strands in the literature. If keiretsu firms exhibited less variable performance, all else equal they should pay interest at lower rates. Yet Caves and Uekusa (1976) and Weinstein and Yafeh (1998) find that keiretsu firms pay *higher* rates. Fukuda and Hirota (1996) conclude that higher-variance firms disproportionately borrow from keiretsu banks. Hall and Weinstein (2000) find no evidence that independent firms face an interest premium on their bond issues. And when Beason (1998) regresses stock-price volatility on keiretsu affiliation, he obtains no significant results.

TABLE X.
KEIRETSU CHARACTERISTICS: SUMMARY STATISTICS

	(A) 1968–1975			
	n	Minimum	Mean	Maximum
Ordinary income/equity	1015	−2.60	.250	4.22
Variance in ord. inc./equity	1015	0	.594	264
Total assets (billion yen)	1015	.019	70.1	2264
Interest rate	1003	.022	.086	.468
Keiretsu—by *ROK* (Definition 3)				
Mitsui	1015	0	.081	1
Mitsubishi	1015	0	.108	1
Sumitomo	1015	0	.099	1
Fuji	1015	0	.077	1
DKB	1015	0	.049	1
Sanwa	1015	0	.051	1
Keiretsu—by Lunch-Club Affiliation				
Mitsui	1015	0	.013	1
Mitsubishi	1015	0	.010	1
Sumitomo	1015	0	.012	1
Fuji	1015	0	.021	1
DKB	1015	0	.024	1
Sanwa	1015	0	.031	1
Keiretsu—by Main-Bank Affiliation				
Mitsui	731	0	.056	1
Mitsubishi	731	0	.071	1
Sumitomo	731	0	.082	1
Fuji	731	0	.078	1
DKB	731	0	.093	1
Sanwa	731	0	.063	1
Industries				
Construction	1015	0	.100	1
Trade	1015	0	.100	1
Service & finance	1015	0	.038	1
Utilities & transportation	1015	0	.084	1
Light industry	1015	0	.124	1
Chemicals	1015	0	.158	1
Metals	1015	0	.118	1
Machinery	1015	0	.277	1

(continued)

TABLE X. (CONTINUED)

	(B) 1976–1982			
	n	Minimum	Mean	Maximum
Ordinary income/equity	1115	−11.2	.129	1.53
Variance in ord. inc./equity	1115	0	2.90	1040
Total assets (billion yen)	1115	.295	129	4899
Interest rate	1094	.000	.091	.463
Keiretsu—by *ROK* (Definition 3)				
Mitsui	1114	0	.070	1
Mitsubishi	1114	0	.098	1
Sumitomo	1114	0	.089	1
Fuji	1114	0	.070	1
DKB	1114	0	.044	1
Sanwa	1114	0	.047	1
Keiretsu—by Lunch-Club Affiliation				
Mitsui	1114	0	.011	1
Mitsubishi	1114	0	.009	1
Sumitomo	1114	0	.011	1
Fuji	1114	0	.019	1
DKB	1114	0	.021	1
Sanwa	1114	0	.027	1
Keiretsu—by Main-Bank Affiliation				
Mitsui	723	0	.051	1
Mitsubishi	723	0	.072	1
Sumitomo	723	0	.084	1
Fuji	723	0	.079	1
DKB	723	0	.093	1
Sanwa	723	0	.064	1
Industries				
Construction	1115	0	.097	1
Trade	1115	0	.120	1
Service & finance	1115	0	.053	1
Utilities & transportation	1115	0	.080	1
Light industry	1115	0	.126	1
Chemicals	1115	0	.151	1
Metals	1115	0	.109	1
Machinery	1115	0	.265	1

Note: The numbers of firms in the keiretsu groups are lower than the number of actual group members in 1975, because we use the NEEDS database—which drops the records of firms as they disappear (e.g., through merger).
Sources: Nippon keizai shimbun sha, *Nikkei zaimu deeta [Nikkei Financial Data] (NEEDS)*, on line; Shukan toyo keizai, ed. (1975); Keizai chosa kai, ed. (1975).

Perhaps most basic, no one has suggested a plausible mechanism by which keiretsu affiliation would let firms reduce volatility. Equity holdings would not work to reallocate earnings among firms: shareholdings are too trivial. Trade ties will not work: the ties are too haphazard. And debt does not work: while all firms obviously borrow, no one has shown that interest charges move countercyclically for keiretsu firms.

5.3.3.3 Replication. So, do keiretsu firms have less volatile performance? According to our data, they do not. Fundamentally, they do not show lower volatility than the independents, for either period and under any of the three definitions [Table XI, panel (A)]. The only consistent exception concerns the DKB group, which shows higher volatility for the first period. The Sumitomo group shows higher volatility for the first period under the lunch-club roster, and the combined Sumitomo-DKB effect apparently pulls up the coefficient for the general keiretsu dummy as well [panel (B)]. Yet the Sumitomo effect disappears under the other rosters, and even the DKB effect vanishes for the second period.

5.3.4 Interest Rates.

5.3.4.1 The Hypothesis. Do keiretsu firms pay higher interest rates? As noted above, Caves and Uekusa (1976) and Weinstein and Yafeh (1998) claim keiretsu banks charge higher interest. The keiretsu banks can do so, they explain, by using their bargaining power to extract rents from their borrowers.[23] Although nothing in the literature to date contradicts this result, there is a problem in the logic.

First, firms and banks choose their loan contracts by mutual agreement. Many firms do find it advantageous to borrow their largest sums from the Mitsui Bank. But most do not. So long as banks and firms equalize on the margin, the observed returns to borrowing from one bank rather than another should equal zero (Alchian and Demsetz, 1972; Demsetz and Lehn, 1985).

Second, the banks have no bargaining power to translate into higher rates. Keiretsu firms borrow widely. Given that a firm relies on its lead bank for only 10–15 percent of its loans (Table I), that

23. Others have suggested that the interest charges for keiretsu firms might include an implicit insurance premium for the bank's promise to rescue it in times of distress. Note that our own analysis here does not address any effect that compensating balances (said sometimes to have been demanded by banks) might have had. We omit that here because this is a exercise in replicating existing studies—and the existing studies ignore compensating balances. We explore the question of compensating balances in Miwa and Ramseyer (2001c).

TABLE XI.

KEIRETSU VOLATILITY: OLS REGRESSIONS

	Dependent Variable—Variance of Ordinary Income/Equity					
	1968–1975			1976–1982		
Keiretsu	*ROK*	Lunch Club	Main Bank	*ROK*	Lunch Club	Main Bank
			(A) Specific Keiretsu			
ROK:						
Mitsui	.019 (.02)			−.733 (.15)		
Mitsubishi	−.202 (.21)			1.40 (.33)		
Sumitomo	.449 (.45)			−1.59 (.36)		
Fuji	.465 (.42)			−3.93 (.81)		
DKB	5.00 (3.70)			−2.67 (.45)		
Sanwa	−.194 (.15)			2.78 (.48)		
Lunch club:						
Mitsui		.415 (.16)			−2.07 (.18)	
Mitsubishi		.791 (.27)			−3.17 (.24)	
Sumitomo		5.58 (2.10)			−7.88 (.67)	
Fuji		.048 (.02)			−.973 (.11)	
DKB		10.9 (5.86)			−3.57 (.42)	
Sanwa		−.290 (.18)			−.213 (.03)	
Main bank:						
Mitsui			.210 (.12)			−4.51 (.59)
Mitsubishi			−.187 (.12)			−5.34 (.82)
Sumitomo			.418 (.29)			−1.82 (.30)
Fuji			−.190 (.13)			−4.74 (.76)
DKB			4.36 (3.19)			−4.07 (.70)
Sanwa			−.001 (.00)			−4.10 (.60)

(continued)

TABLE XI. (CONTINUED)

	Dependent Variable—Variance of Ordinary Income/Equity					
	1968–1975			1976–1982		
Keiretsu	*ROK*	Lunch Club	Main Bank	*ROK*	Lunch Club	Main Bank
Total assets	−.001 (.65)	−.002 (1.15)	−.001 (.41)	−.002 (.56)	−.001 (.37)	−.003 (.69)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.00	.03	.00	.00	.00	.00
n	1014	1015	731	1114	1114	723
			(B) General Keiretsu			
Any Keiretsu:						
ROK	.640 (1.09)			−.768 (.31)		
Lunch club		3.31 (3.35)			−2.46 (.57)	
Main bank			.980 (1.23)			−4.01 (1.19)
Total assets	−.001 (.63)	−.003 (1.62)	−.001 (.44)	−.002 (.55)	−.001 (.39)	−.003 (.69)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	−.01	.00	−.01	.01	.01	.01
n	1015	1015	731	1114	1114	723

Note: Coefficients, followed by the absolute value of the *t*-statistic in parentheses. All equations include a constant term.
Sources: See Table X.

bank could hardly "hold up" a borrower for higher rates. Nor could the lead banks use their shareholdings to induce a borrower to pay higher-than-market rates. The shareholdings are simply too low.[24] As Table V shows, financial institutions generally held less than 5 percent of a firm's stock even before the 5 percent legal limit took effect. As Table IV shows, those shareholdings were only loosely correlated with loans anyway.

5.3.4.2 Replication. In fact, according to our data keiretsu firms do not pay interest at higher rates (Table XII). The coefficient on the DKB keiretsu is positive for the main bank roster for 1968–1975, but not for the other rosters or for the other period. All other keiretsu-specific coefficients are insiginificantly different from zero. The coefficient on the combined keiretsu dummy is nonetheless significantly negative for the 1968–1975 lunch-club membership, but not under other definitions or for the later period.

5.3.5 Size. Ask the following: if (following the *ROK* definition) keiretsu firms are those that borrow the largest part of their funds from multiple money-center financial institutions, what might we expect to find? Obviously, big banks do lend to more than big firms. Yet if the biggest firms tended to borrow heavily from several large financial institutions, then the *ROK* keiretsu firms might (the point is only speculative) be disproportionately large. And so they are. As Table XIII shows, the *ROK* keiretsu members are indeed the larger firms. Curiously, lunch-club members are also big. We have no explanation for this result, other than to suggest that perhaps senior executives of big firms like to eat lunch with senior executives of other big firms. In any event, note that the result is definition-dependent: by the main-bank rosters, the keiretsu firms are not bigger than the independents, for either period.

5.3.6 Profitability. The biggest puzzle in the data concerns profitability. Caves and Uekusa (1976, p. 76) and Uekusa (1974a, 1974b) claimed that keiretsu firms earned lower profits than independents. Although the study itself is highly suspect on data grounds (it included only 16 nonrandomly selected independents), several scholars have since made similar claims with better data. Nakatani (1984) obtained the same result, for example, as did Khanna and Yafeh (2000), Lincoln et al. (1996), and Weinstein and Yafeh (1998). And as Table XIV shows, for 1968–1975 our *ROK* rosters too show

24. Weinstein and Yafeh (1995, 1998) produce models in which the shareholdings of the financial institutions allow them to dominate a debtor firm in ways that cause it to skew its objectives in directions advantageous to the lender.

TABLE XII.

KEIRETSU INTEREST RATES: OLS REGRESSIONS

	Dependent Variable—Interest Rate					
	1968–1975			1976–1982		
Keiretsu	*ROK*	Lunch Club	Main Bank	*ROK*	Lunch Club	Main Bank
	(A) Specific Keiretsu					
ROK:						
Mitsui	−.0005 (.15)			.006 (1.23)		
Mitsubishi	−.001 (.38)			−.001 (.18)		
Sumitomo	.004 (1.24)			−.002 (.48)		
Fuji	.002 (.59)			−.003 (.52)		
DKB	.001 (.24)			−.008 (1.35)		
Sanwa	−.004 (1.08)			−.003 (.54)		
Lunch club:						
Mitsui		−.003 (.34)			−.006 (.48)	
Mitsubishi		−.009 (1.03)			.008 (.60)	
Sumitomo		−.007 (.91)			−.008 (.65)	
Fuji		−.008 (1.28)			.000 (.00)	
DKB		−.006 (1.01)			−.007 (.83)	
Sanwa		−.004 (.79)			−.008 (1.02)	
Main bank:						
Mitsui			.002 (.33)			.002 (.35)
Mitsubishi			.0003 (.08)			.002 (.46)
Sumitomo			−.003 (.65)			−.000 (.03)
Fuji			.002 (.41)			−.000 (.05)
DKB			.009 (2.36)			−.005 (1.09)
Sanwa			−.001 (.21)			−.003 (.48)

Total assets ($\times 10^7$)	−1.44 (.03)	40.9 (.77)	15.6 (.31)	−12.0 (.33)	−8.00 (.21)	−3.58 (.11)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.02	.02	.04	.01	.00	.00
n	1003	1003	730	1093	1093	723
			(B) General Keiretsu			
Any Keiretsu:						
ROK	−.0004 (.23)			−.001 (.49)		
Lunch club		−.006 (2.00)			−.005 (1.14)	
Main bank			.002 (.83)			−.001 (.33)
Total assets ($\times 10^7$)	−.059 (.21)	38.3 (.75)	13.4 (.27)	−12.6 (.35)	−1.25 (.03)	−3.63 (.12)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.00	.03	.04	.01	.01	.01
n	1010	1003	730	1093	1093	723

Note: Coefficients, followed by the absolute value of the t-statistic, in parentheses. All equations include a constant term.
Sources: See Table X.

TABLE XIII.

KEIRETSU FIRM SIZE: OLS REGRESSIONS

	Dependent Variable—Total Assets					
	1968–1975			1976–1982		
Keiretsu	*ROK*	Lunch Club	Main Bank	*ROK*	Lunch Club	Main Bank
	(A) Specific Keiretsu					
ROK:						
Mitsui	68.7 (3.22)			114.2 (2.75)		
Mitsubishi	52.5 (2.75)			88.1 (2.44)		
Sumitomo	76.6 (3.88)			145.4 (3.88)		
Fuji	43.5 (1.97)			86.3 (2.07)		
DKB	66.5 (2.48)			126.5 (2.46)		
Sanwa	71.2 (2.71)			140.1 (2.80)		
Lunch club:						
Mitsui		361.7 (7.76)			581.9 (6.14)	
Mitsubishi		497.9 (9.38)			860.7 (8.30)	
Sumitomo		216.8 (4.44)			409.5 (4.29)	
Fuji		205.9 (5.58)			372.7 (5.17)	
DKB		115.1 (3.34)			223.3 (3.24)	
Sanwa		141.9 (4.66)			283.7 (4.69)	
Main bank:						
Mitsui			−9.9 (.28)			−12.2 (.17)
Mitsubishi			−20.6 (.66)			−42.1 (.67)
Sumitomo			−9.2 (.31)			−20.7 (.36)
Fuji			−27.9 (.92)			−46.3 (.77)
DKB			−26.2 (.94)			−35.7 (.64)
Sanwa			−10.2 (.31)			−5.1 (.08)

Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.05	.19	.03	.06	.15	.04
n	1015	1015	731	1114	1114	723
			(B) General Keiretsu			
Any Keiretsu:						
ROK	62.6 (5.46)			114.4 (5.37)		
Lunch club		213.0 (12.21)			390.7 (11.49)	
Main bank			−18.1 (1.12)			−28.7 (.88)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.05	.15	.04	.05	.13	.05
n	1015	1015	731	1114	1114	723

Note: Coefficients, followed by the absolute value of the *t*-statistic in parentheses. All equations include a constant term.
Sources: See Table X.

TABLE XIV.

KEIRETSU PROFITABILITY: OLS REGRESSIONS

	Dependent Variable—Ordinary Income/Equity					
	1968–1975			1976–1982		
	ROK	Lunch Club	Main Bank	*ROK*	Lunch Club	Main Bank
	(A) Specific Keiretsu					
ROK:						
Mitsui	−.079 (2.46)			−.107 (1.26)		
Mitsubishi	−.068 (2.40)			−.213 (2.90)		
Sumitomo	−.013 (.43)			−.077 (1.00)		
Fuji	−.133 (4.04)			−.028 (.32)		
DKB	−.081 (2.06)			−.136 (1.30)		
Sanwa	−.077 (1.97)			−.273 (2.68)		
Lunch club:						
Mitsui		.026 (.34)			−.013 (.06)	
Mitsubishi		.031 (.35)			.026 (.11)	
Sumitomo		.279 (3.49)			.131 (.63)	
Fuji		−.010 (.16)			.018 (.11)	
DKB		−.101 (1.81)			−.015 (.10)	
Sanwa		−.053 (1.06)			−.109 (.83)	
Main bank:						
Mitsui			−.004 (.09)			.194 (1.47)
Mitsubishi			−.013 (.36)			.149 (1.32)
Sumitomo			−.028 (.80)			.089 (.85)
Fuji			−.042 (1.16)			.123 (1.13)
DKB			−.076 (2.28)			.058 (.57)
Sanwa			−.043 (1.08)			.070 (.59)

Total assets ($\times 10^7$)	−70.2(.15)	−471.0 (.93)	48.8 (.11)	539 (.88)	249 (.38)	856 (1.27)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.04	.04	.02	.03	.02	.03
n	1015	1015	731	1114	1114	723
			(B) General Keiretsu			
Any Keiretsu:						
ROK	−.072 (4.12)			−.133 (3.05)		
Lunch Club		−.008 (.27)			−.020 (.27)	
Main bank			−.037 (1.93)			.107 (1.83)
Total assets ($\times 10^7$)	−21.3 (.05)	−301 (.60)	59.8 (.14)	538 (.88)	296 (.46)	855 (1.27)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.04	.02	.02	.03	.02	.03
n	1022	1022	731	1114	1114	723

Note: Coefficients, followed by the absolute value of the *t*-statistic, in parentheses. All equations include a constant term.
Sources: See Table X.

lower keiretsu profitability: for five of the six keiretsu, the coefficients are significantly less than zero.

Fundamentally, however, the result is unstable. At least one other study raises doubts: when Morck et al. (2000) recently regressed Tobin's *Q* and operating income on, *inter alia*, keiretsu affiliation (by Nakatani's *ROK* roster), they found no significant effect. And even in our data, the result is both time- and definition-dependent. Although five of the six *ROK* keiretsu members are significantly less profitable than independents for 1968–1975, only two of the six are in 1976–1982. Even within 1968–1975, none of the lunch-club keiretsu members are significantly less profitable than the independents, and the Sumitomo firms are significantly *more* profitable. Of the main-bank keiretsu members, only DKB firms are significantly less profitable in 1968–1975, and none are in 1976–1982.

5.3.7 The Lawrence Hypothesis. During the trade dispute of the early 1990s, Lawrence (1991, 1993) claimed that keiretsu excluded foreign products. Regressing sectoral trade data on sector-based keiretsu shares and various controls, he argued that the presence of keiretsu firms in an industry depressed imports but did not affect exports. He concluded that the keiretsu were exclusionary.

When Saxonhouse (1991, 1993) respecified Lawrence's trade model to solve simultaneity problems, the effect of keiretsu affiliation on trade disappeared. As Saxonhouse then explained, if US firms could not sell in industries dominated by keiretsu firms, that fact more plausibly showed stiff competition than collusion. When Weinstein and Yafeh (1995) examined the issue more closely, they found exactly that result: keiretsu firms had profit/cost margins if anything lower than those of the independents. Given these results, we do not pursue this issue further. For a further discussion of the issues involved, see Evenett and Suslow (2000).

6. Conclusions

Contrary to the financial press, the keiretsu are not losing economic power, for they had no power to lose. Never cohesive, they are not unraveling. Never significant, they are not in demise. Creatures of the academic and journalistic imagination, from the start they existed only because we collectively willed it thus.

As committed Marxists, Japanese journalists and economists in the 1960s had faced a quandary. According to theory, "monopoly capital" should have been "dominating" the "bourgeois capitalist" world in which they found themselves. Yet the domination seemed nowhere to be found.

Enter the Economic Research Institute. It grouped the biggest financial institutions by their prewar affiliation, and summed the loans they made to listed firms. If the total at any firm exceeded the amount it borrowed from the next largest source, the Institute called it a "keiretsu" member and defined it into one of its monopoly capital empires. In time, other scholars came to focus on groups of presidents who met monthly for lunch. Still others added firms in which these presidents' firms held equity positions.

The Marxists are mostly gone now, but the mischief they do lives after them. The *ROK* roster has made the keiretsu dummy almost mandatory in econometric studies of Japan. Specialists on Japan use it for evidence of culture-specific group behavior and the "socially embedded" nature of commercial transactions. Theorists in economics use it for evidence of the beneficial effects of relationship banking on information asymmetries. And the Economic Research Institute happily sells them all the annual paperback at 43,000 yen (about $400) a volume.

The result has been a motley econometric corpus. Predictably, some of the significant results depend on misspecified equations, some on outlying data points, some on one roster rather than another, some on one period rather than another. When we try to replicate the results, other than for size, we largely obtain insignificant results. By standard economic theory, this is exactly the right result: if a dummy captures nothing of substance, the correct coefficient is zero. And zero is what the data yield.

There is a lesson here, and it goes both to Grilliches' law "know thy data," and to the importance of good theory for good empirics. A glance at the data would have shown both the absence of any informational link among the banks and the keiretsu members, and the absence of any mechanism for enforcing collective action among the members. Absent any link for conveying information, standard economic theory predicts no informational benefit. Absent any enforcement mechanism, standard theory predicts no cooperation or collusion. A bit more careful empirical inquiry and a bit more attention to basic theory, and we might have avoided this morass entirely.

Appendix A

Table XV shows loans to firms that the *ROK* assigned to the Mitsubishi keiretsu (Definition 1).

Appendix B

Table XVI shows the data on cross-shareholding in the Mitsubishi keiretsu.

TABLE XV.
LOANS IN THE MITSUBISHI GROUP, 1965

		Mitsubishi Lenders (%)					Other Lenders (%)								
	Borrowings (million yen)	Mitsubishi Bank	Mitsubishi Trust Bank	Tokyo Mar & Fire Ins.	Meiji Life Ins.	Total	Japan Dev. Bk.	Export-Imp. Bank	Industrial Bank Jpn.	Long-Term Credit Bk.	Nippon Life Ins.	Daiichi Life Ins.	Mitsui Life Ins.	Sumitomo Life Ins.	Total
Nichiro Fisheries	24,655	7.21	10.14	2.94	3.18	23.47	0.67		8.60	9.25	3.06	2.32			47.35
Mitsubishi Mining	24,056	7.58	7.87		3.57	19.02	31.14	0.86	5.92	4.50					61.44
Yubetsu Coal Mining	4,626	12.58	22.78		0.86	36.23	29.68		10.74						76.65
Mitsubishi Petroleum Rfg.	20,665	14.95	16.80	1.09	4.72	37.56	0.22		11.71	4.48					53.97
Mitsubishi (Non-Steel) Metals	18,122	15.45	24.25		3.20	42.89	3.64	9.35	10.91		3.06				69.85
Showa Mining	1,038	8.96	38.05			47.01			19.85						66.86
Mitsubishi Steel	13,074	30.82	20.87		9.62	61.32	1.70		2.49	1.77		6.30		1.19	74.77
Miyaji Metal Works	1,246	33.31	10.83		0.80	44.94				7.78		8.03		0.48	61.24
Dainichi Nihon Elec. Wire	9,930	22.31	24.28			46.59				21.46					68.05
Mitsubishi Heavy Ind.	304,846	12.38	10.12	0.20	1.64	24.34	0.57	22.73	5.67	3.62	0.33			0.33	57.58
Honda	19,365	31.55	18.47			50.02		0.54	6.80						57.36
Mitsubishi kakoki	2,393	40.24	29.67		3.01	72.92				3.59					76.51
Chiyoda Engineering	6,963	20.25	30.33		3.46	54.04	0.33			0.66		10.70			65.73
Shimazu Manufacturing	8,494	13.87	18.72	0.12	5.79	38.50	1.78			4.50	4.09	1.14			50.00
Nikon	4,655	31.49	18.47		1.07	51.04	4.83			3.33					59.21
Mitsubishi Electric	91,793	17.26	11.70		2.87	31.83		0.31	0.58	9.13	1.90				43.76
Nihon Batteries	4,920	23.05	30.04		8.13	61.22			3.82		3.58	2.03		2.03	72.68
Nihon Construction Steel	1,909	35.94	19.75		1.31	56.99				17.97					74.96
Mitsubishi Chemicals	61,215	10.55	8.40	0.08	3.54	22.57	1.62		8.11	7.02	1.43				40.75
Nihon Carbide	12,997	13.54	9.12		3.20	25.86	1.15		6.56	9.43	4.35	0.10	2.68	1.93	52.07
Mitsubishi Edogawa Chem.	7,207	26.40	33.80		1.39	61.59	1.68		6.51						69.78

Mitsubishi Plastics	7,833	17.07	25.67	0.19	8.48	51.41			10.16						61.57
Lion Petrochemicals	3,750	34.11	9.15		4.40	47.65			9.07						56.72
Dainihon Paints	3,227	10.23	45.55		9.61	65.39			3.10						68.48
Asahi Glass	14,208	13.31	10.53			23.84		6.56	7.71	7.59					45.70
Noritake	7,225	44.51	20.76		2.77	68.04						1.94			69.98
Toyo Toki	4,350	38.30	15.03			53.33				9.20					62.53
NGK Insulators	8,416	22.74	10.04			32.78	0.06	2.07		3.74		0.27			38.93
NGK Sparkplugs	418	43.06				43.06	44.98								88.04
Inax	1,770	8.81	29.55		9.94	48.31	10.62			19.55					78.47
Tokai Carbon	5,580	25.11	21.51		1.36	47.97	1.45			3.58		2.69			55.70
Morinaga (Candies)	3,784	13.21	45.75			58.96	1.22		22.54						82.72
Kirin Brewery	20,987	43.84	16.92		2.86	63.61				7.43					71.04
Kikkoman	5,483	40.05	5.95			46.00									46.00
Ajinomoto	9,253	21.53	17.86			39.39	1.89	5.66							46.95
Fuji Spinning	9,051	20.95	21.72	0.49	5.35	48.50		3.54		10.84					62.88
Mitsubishi Rayon	27,713	14.68	9.52	0.23	5.08	29.51		0.64	10.72	8.51		0.18			49.55
Tokai Pulp	6,272	18.13	0.70		6.57	25.40			10.30				6.57		42.27
Mitsubishi Paper	7,140	14.64	18.45		6.16	39.24		0.66		7.62					47.52
Mitsubishi (Trading) Corp.	115,134	26.99	8.33			35.32		7.17	1.99	0.66					45.14
Kinsho Mataichi Trading	5,589	31.42	7.19	0.91		39.52		2.76							42.28
Isetan Dept. Store	2,192	100.00				100.00									100.00
Mitsubishi Real Estate	35,915	19.60	25.13	3.06	9.94	57.73			1.39	1.80		0.42			61.34
NYK Shipping	55,894	4.92	1.30	0.23	0.30	6.74	73.42	0.10	4.59	3.91					88.75
Mitsubishi Warehouse	3,748	33.56	33.80		8.19	75.56	3.68	0.32		10.54					90.10
Yokkaichi Warehouse	2,850	13.37	20.07	1.26	4.98	39.68	4.67								44.35
Total borrowings; % distribution	1,011,951	17.33	12.34	0.30	2.49	32.46	5.47	8.13	4.62	4.39	0.59	0.29	0.08	0.15	56.18

Notes: We give the borrowing firm in the first column; the lending financial institutions along the top of the table. The figures in the table give the total amount borrowed by the firm in 1965 (first column), together with the percentage borrowed by that firm from the financial institution given at the top of the table (in the other columns). The roster is based on *ROK* Definition 2.
Source: Keizai chosa kai, ed. (1965).

TABLE XVI.

Cross-Shareholding in the Mitsubishi Group, 1965

No.	Firm	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	Mitsubishi Bank			4.10	4.85		0.18	0.14	0.09	0.48		0.20	0.05	0.21	4.41	0.45	0.07	0.14
(2)	Mitsubishi Trust bank	2.00		1.50	8.64	0.30	0.80	0.80	0.32	0.40	0.02	0.72		0.26	3.00		0.16	0.50
(3)	Tokyo Marine	3.33	4.41		3.33		0.01	0.01										
(4)	Meiji Life																	
(5)	Nichiro Fisheries		3.60	3.00														
(6)	Mitsubishi Mining	2.03		2.68	3.38			1.30		0.93							0.06	
(7)	Yubetsu Coal Mining	3.82	2.63	7.04			6.94			29.10								
(8)	Mitsubishi Petroleum Rfg.	1.00	1.29	3.38	3.00		0.20											
(9)	Mitsubishi (Non-Steel) Metals	1.85	4.68		6.20		0.54	0.36						0.68			0.04	
(10)	Showa Mining									11.35								
(11)	Mitsubishi Steel	4.36	2.24	1.81	2.95		0.27	0.20							5.07			
(12)	Miyaji Metal Works	1.80			2.00													
(13)	Dainichi Nihon Elec. Wire	2.76		2.71	2.31					27.31								
(14)	Mitsubishi Heavy Ind.	3.08	4.13	1.38	2.88	0.02	0.09	0.01		0.09		0.12					0.01	
(15)	Honda	3.58	2.54															
(16)	Mitsubishi kakoki	4.17	3.77	2.50	5.00		0.67								3.75			
(17)	Chiyoda Engineering	2.59	8.69	4.17	2.50				4.06						8.43			
(18)	Shimazu Manufacturing	3.13	5.02	2.08	6.88		0.10			0.10								
(19)	Nikon	8.13	1.88	2.21	1.78													
(20)	Mitsubishi Electric	1.32	1.40		1.34		0.07			0.08				0.04				
(21)	Nihon Batteries	3.50	2.65	2.50	10.00													
(22)	Nihon Construction Steel	4.82	0.50							0.50								
(23)	Mitsubishi Chemicals	3.54	3.63	3.30	4.89		2.16	0.02		0.20							0.05	
(24)	Nihon Carbide	4.15		3.99	5.90													
(25)	Mitsubishi Edogawa Chem.	5.00	4.34		5.00													
(26)	Mitsubishi Plastics	1.67	9.23	0.95	1.59		0.24								0.95			

(27)	Lion Petrochemicals	1.50		3.75	1.50													
(28)	Dainihon Paints	5.10	5.12	2.70	9.44					1.85							0.01	0.01
(29)	Asahi Glass	4.91	6.46	4.51	2.99										0.69			
(30)	Noritake	5.00	3.72															
(31)	Toyo toki	6.17	9.46	2.00														
(32)	NGK Insulators	4.75	6.75		2.15													
(33)	NGK Sparkplugs	5.86	9.14															
(34)	Inax	2.78	1.90		1.46													
(35)	Tokai Carbon	3.13	5.66															
(36)	Morinaga (Candies)	2.00	8.00															
(37)	Kirin Brewery		3.30		2.90													
(38)	Kikkoman		4.19															
(39)	Ajinomoto		6.23															
(40)	Fuji Spinning	2.22	1.56		3.47													
(41)	Mitsubishi Rayon	4.44	3.83	2.25	6.59					0.33					2.35			
(42)	Tokai Pulp	8.20			3.70													
(43)	Mitsubishi Paper	3.26	6.08	3.70	9.12													
(44)	Mitsubishi (Trading) Corp.	5.20	4.22	6.95	4.00	0.20	0.70		0.60	0.33		0.03	0.01	0.05	3.48		0.15	0.13
(45)	Kinsho Mataichi Trading	4.14	0.93	2.34						2.06								
(46)	Isetan Dept. Store	4.17			3.00													
(47)	Mitsubishi Real Estate	4.04	3.72	4.55	3.64		0.56	0.03	0.06	0.15		0.03			1.01			
(48)	NYK Shipping	1.48		3.32	1.15		0.25	0.10	0.14			0.05			2.77			
(49)	Mitsubishi Warehouse	3.84	6.14	5.11	7.23													
(50)	Yokkaichi Warehouse	1.67	1.59	2.22	1.67													
	T1	2.78	3.27	2.24	3.18	0.02	0.30	0.06	0.08	0.43	0.00	0.05	0.00	0.04	0.85	0.02	0.02	0.02
	T2	2.94	3.49	2.19	3.00	0.02	0.30	0.05	0.08	0.53	0.00	0.03	0.00	0.03	0.63	0.00	0.02	0.01

(continued)

TABLE XVI. (CONTINUED)

No.	Firm	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)
(1)	Mitsubishi Bank	0.45	0.14	1.36	0.32		1.36	0.11	0.27	0.11	0.05	0.24	0.91	0.57	0.25	0.48	0.29	0.11	0.20	0.18	0.57
(2)	Mitsubishi Trust bank	0.40	0.05	1.24	0.35	0.05		0.10	0.48	0.10			0.96	0.10		0.32	0.05	0.10	0.60	0.24	0.60
(3)	Tokyo Marine						0.45		0.05				1.12		0.004						
(4)	Meiji Life																				
(5)	Nichiro Fisheries																				
(6)	Mitsubishi Mining						4.83														
(7)	Yubetsu Coal Mining																				
(8)	Mitsubishi Petroleum Rfg.			0.12																	
(9)	Mitsubishi (Non-Steel) Metals			0.12								0.07									
(10)	Showa Mining																				
(11)	Mitsubishi Steel				0.09																
(12)	Miyaji Metal Works																				
(13)	Dainichi Nihon Elec. Wire																				
(14)	Mitsubishi Heavy Ind.			0.12		0.00	0.06			0.01		0.02	0.36								
(15)	Honda																				
(16)	Mitsubishi kakoki			1.33			2.17														
(17)	Chiyoda Engineering																				
(18)	Shimazu Manufacturing				0.31							1.08									
(19)	Nikon												3.13								
(20)	Mitsubishi Electric	0.10					0.24		0.07			0.05				0.07					
(21)	Nihon Batteries	0.63										0.63									
(22)	Nihon Construction Steel			25.03			0.84					0.25	11.67								
(23)	Mitsubishi Chemicals			0.33				0.10	0.25	0.03			0.37			0.05					
(24)	Nihon Carbide						15.76		3.04												
(25)	Mitsubishi Edogawa Chem.						1.67			0.21			1.67								
(26)	Mitsubishi Plastics						41.41		0.24												

(27)	Lion Petrochemicals																				
(28)	Dainihon Paints	2.00			0.75																
(29)	Asahi Glass		0.13	0.28			0.27	0.06	0.15							0.13					
(30)	Noritake														0.38	0.58	0.12				
(31)	Toyo toki												0.50			0.50	0.25				
(32)	NGK Insulators												0.38	0.25			0.08				
(33)	NGK Sparkplugs												0.21	0.36	0.21						
(34)	Inax																				
(35)	Tokai Carbon																				
(36)	Morinaga (Candies)																				
(37)	Kirin Brewery																				
(38)	Kikkoman																				
(39)	Ajinomoto																				
(40)	Fuji Spinning																				
(41)	Mitsubishi Rayon	0.19					2.13					0.53									
(42)	Tokai Pulp																				
(43)	Mitsubishi Paper		0.11						0.22												
(44)	Mitsubishi (Trading) Corp.			1.60			0.80	0.07	0.03		0.01	0.14	0.80			0.02					0.25
(45)	Kinsho Mataichi Trading																				
(46)	Isetan Dept. Store																				
(47)	Mitsubishi Real Estate			0.56	0.01	0.16	1.09		0.03				2.66					0.00			
(48)	NYK Shipping																				
(49)	Mitsubishi Warehouse												3.71								
(50)	Yokkaichi Warehouse																				
	T1	0.06	0.02	0.34	0.03	0.01	0.82	0.02	0.08	0.01	0.00	0.05	0.46	0.04	0.02	0.05	0.02	0.01	0.02	0.01	0.05
	T2	0.03	0.01	0.27	0.01	0.01	0.81	0.01	0.06	0.00	0.00	0.04	0.41	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.02

(continued)

TABLE XVI. (CONTINUED)

No.	Firm	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	S1	S2
(1)	Mitsubishi Bank	0.18	0.73	0.45	0.73	0.07	0.57	1.04	0.11	0.14	0.45	0.67	0.32	0.03	28.83	19.88
(2)	Mitsubishi Trust bank		0.32	1.20	0.82		0.58	3.40	0.28			0.70	0.36		32.82	20.68
(3)	Tokyo Marine						0.12	0.70			0.68		0.13		14.34	3.27
(4)	Meiji Life															
(5)	Nichiro Fisheries							2.29					0.57		9.46	2.86
(6)	Mitsubishi Mining							1.43			1.39	1.00			19.02	10.93
(7)	Yubetsu Coal Mining											1.58	0.36		51.46	37.97
(8)	Mitsubishi Petroleum Rfg.							1.05	0.20			0.46	0.08		10.77	2.10
(9)	Mitsubishi (Non-Steel) Metals				0.24			0.77	0.30						15.85	3.12
(10)	Showa Mining														11.35	11.35
(11)	Mitsubishi Steel							1.44							18.43	7.07
(12)	Miyaji Metal Works														3.80	0.00
(13)	Dainichi Nihon Elec. Wire							1.05							36.13	28.36
(14)	Mitsubishi Heavy Ind.	0.02			0.20		0.08	0.56			0.14	0.04	0.05		13.45	1.99
(15)	Honda							0.00							6.12	0.00
(16)	Mitsubishi kakoki							4.17							27.52	12.08
(17)	Chiyoda Engineering							4.63							35.06	17.11
(18)	Shimazu Manufacturing				0.30										18.99	1.89
(19)	Nikon						0.31	2.50							19.92	5.94
(20)	Mitsubishi Electric							0.38	0.01		0.17		0.08		5.41	1.34
(21)	Nihon Batteries														19.90	1.25
(22)	Nihon Construction Steel							3.38			15.85				62.82	57.50
(23)	Mitsubishi Chemicals				0.50		0.02	0.56	0.05		0.51	0.21	0.09		20.84	5.49
(24)	Nihon Carbide				3.20			2.82							38.86	24.81
(25)	Mitsubishi Edogawa Chem.						0.42								18.30	3.96
(26)	Mitsubishi Plastics							1.52							57.81	44.37

(27)	Lion Petrochemicals							3.75							10.50	3.75
(28)	Dainihon Paints							1.10							28.08	5.72
(29)	Asahi Glass				0.13			0.35			0.35		0.28		21.68	2.81
(30)	Noritake														9.81	1.08
(31)	Toyo Toki														18.88	1.25
(32)	NGK insulators							0.50							14.85	1.20
(33)	NGK Sparkplugs														15.78	0.79
(34)	Inax														6.15	0.00
(35)	Tokai Carbon							0.95							9.73	0.95
(36)	Morinaga (Candles)								1.23						11.23	1.23
(37)	Kirin Brewery	0.08						0.23							6.51	0.31
(38)	Kikkoman														4.19	0.00
(39)	Ajinomoto														6.23	0.00
(40)	Fuji Spinning														7.26	0.00
(41)	Mitsubishi Rayon						0.59	1.45					0.06		24.74	7.63
(42)	Tokal Pulp						4.03	2.22							18.16	6.25
(43)	Mitsubishi Paper				0.22	1.40		1.09							25.18	3.03
(44)	Mitsubishi (Trading) Corp.				0.50		0.40		0.04		0.67	1.49	0.82		33.68	13.31
(45)	Kinsho Mataichi Trading							4.11							13.58	6.17
(46)	Isetan Dept. Store														7.17	0.00
(47)	Mitsubishi Real Estate							0.58				0.34	0.28		23.49	7.55
(48)	NYK Shipping												0.23		9.48	3.53
(49)	Mitsubishi Warehouse							2.03							28.07	5.74
(50)	Yokkaichi Warehouse												0.89		8.03	0.89
	T1	0.02	0.04	0.04	0.18	0.02	0.12	0.69	0.03	0.01	0.23	0.20	0.15	0.00	17.20	5.74
	T2	0.01	0.00	0.00	0.15	0.02	0.09	0.63	0.03	0.00	0.21	0.17	0.14	0.00	16.47	4.85

Notes: The identification number along the top row is keyed to the firm named in the first column. Within the table, we place the firm holding the stock along the top of the table, and the firm whose stock is being held in the left column. Thus, the number in row *i* column *j* gives the percentage of outstanding stock of the row *i* firm that is held by the firm in column *j*. The rightmost two columns give the total outstanding stock of each row firm held either by all other keiretsu members (S1) or by all other nonfinancial members of the keiretsu (S2). The two rows along the bottom of the table give the fraction of stock held by the firm in that column of the outstanding shares either of all keiretsu firms (T1) or of all nonfinancial keiretsu firms (T2). The life-insurance company is a mutual, and thus has no oustanding shares. All figures are simple (unweighted) means. The roster is based on *ROK* Definition 2.
Source: Keizai chosa kai, ed., (1965).

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