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Mixed ownership of industrial firms in Japan: debt financing, banks and vertical keiretsu groups

Masao Nakamura [a,b]

[a] *Faculty of Commerce and Business Administration, University of British Columbia, 2053 Main Mall, Vancouver, BC, Canada V6T 1Z2*

[b] *Institute of Asian Research, Faculty of Applied Science, University of British Columbia, Vancouver, BC, Canada V6T 1Z2*

Abstract

In the 1980s, Japanese bank-driven corporate governance practices were often said to be part of the explanation for Japan's economic success. However, these practices became suspected causes of Japan's continuing recession following the burst of the financial bubble in 1990. Since then Japanese banks have suffered from increasing numbers of non-performing loans. Consequently, banks have become less able to act as the benefactors for Japanese firms. In response to the reduced supply of bank loans, Japanese firms have been exploring issuing corporate bonds and other types of public debt as alternative methods of debt financing. The objective of this paper is to examine empirically how Japanese manufacturers have responded to the deteriorating financial conditions of Japanese banks from a corporate finance perspective. In particular, we are interested in knowing whether Japanese banks' involvement in corporate governance has declined with the increase in public debt issuances. Our empirical results seem to suggest that Japanese banks play a significant role in their client firms' issuances of public debt and hence continue to play a significant role in corporate governance.

JEL classification: G21; G24; G28; G32; G34; L21

Keywords: Japanese banks; Corporate governance in Japan; Debt financing

1. Introduction

The role of banks in corporate governance in Japan has attracted much attention in the literature since the early 1980s. In the 1980s, Japanese bank-driven corporate governance practices were often said to be part of the explanation for Japan's economic success. In the

E-mail address: masao.nakamura@commerce.ubc.ca (M. Nakamura).

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1990s, however, these practices became suspected causes of Japan's continuing recession following the burst of the financial bubble in 1990.[1]

There are certain institutional differences between Japan and the West[2] which are important in comparative analyses of corporate governance practices. For example, Japanese banks continue to be allowed by law to practice universal banking involving both consumer and investment banking. Japanese laws generally allow Japanese banks to own equity in other industrial firms, including their own client firms, up to some pre-specified level. Japanese laws also permit the banks to behave as active investors for control purposes.[3] Such universal banking practices have been abandoned by many Western countries. However, Western countries still differ in their laws governing banks' ownership of their clients' and other firms' shares (e.g. Morck and Nakamura, 2001).[4] Another special characteristic that needs to be taken into account is that many Japanese firms still rely heavily on bank loans, a form of indirect financing, rather than direct debt financing from capital markets such as corporate bonds. These institutional conditions enable Japanese banks to exercise rights as both creditors and shareholders.

The theoretical basis for the favorable role of Japanese bank-based corporate governance is the idea that the presence of a large, informed investor on a firm's corporate board may improve the firm's management (e.g. Shleifer and Vishny, 1986). In the Japanese context, such an investor is a Japanese industrial firm's main bank. The main bank is typically the largest bank investor and also the largest bank creditor of the firm.[5] (Production keiretsu firms also play this type of role. We will discuss this issue later.) The main bank of a firm works as the lead bank of a consortium of Japanese banks to meet the firm's capital needs and stays fully aware of all financial matters concerning the firm. While the firm pays an above-the-market-rate of interest on its loan from the main bank, the main bank is willing to help reorganize the firm's operations in case the firm experiences financial distress.[6] The main bank also protects the firm's management from potential hostile takeovers when the firm's share value becomes excessively low. While hostile takeovers may help the economy by forcing inefficient firms to reorganize, they are also

[1] The massive deflation of Japanese asset prices and the associated stagnation of the Japanese economy throughout the 1990s was a phenomenon the likes of which had not been observed before for a large developed economy. In 2001, the average price of land fell to below than that observed in 1986 and it is still falling as of 2002.

[2] These countries include Anglo-American countries such as the UK, the US, Canada and Australia as well as continental European countries such as France and Germany.

[3] The current limit is 5% of an industrial firm's outstanding shares, which is enough for bank equity holders to legally have a significant say at a firm's general stockholders' meeting. Trust banks, which are main banks to some firms, can have effective ownership of over 5% if the excess shares are in their trust accounts. The 5% limit on banks' ownership is probably not effective in practice, since other financial institutions, including trust banks and the firms which are directly or indirectly related to the banks, may own more shares in the banks' client firms to help the banks exercise control over firm management.

[4] For example, in the US, banks are not allowed to own the equity of their client firms except when debt structuring or workout agreements allow them to do so (James, 1995).

[5] The large investor theory in the literature typically refers to shareholders without conflicts of interest with the firm's share value maximization. It is unclear to what extent the large investor theory could hold for Japanese banks which clearly have conflicts of interest with the shareholders of their client firms.

[6] See, for example, Aoki (1988).

often costly (e.g. costly turnover of personnel and potential breach of trust). The Japanese main bank system is thought to achieve reorganization of inefficient firms without incurring the types of costs often associated with hostile takeovers. Typically, the main bank gets its way in reorganizing the firm using its rights as both a creditor and equity holder of the firm.

However, one important research issue concerning this Japanese bank behavior is the extent to which Japanese banks align themselves with the interests of the shareholders of the firms in which they own both equity and credit. Firms may not be able to maximize profits under the influence of banks that are pursuing their own profit. Such deviations from share value maximization may cause serious inefficiencies in firm operations and in the economy as a whole.[7]

Since the burst of the financial bubble in 1990, non-performing loans have reduced the capacity of banks to act as benefactors of Japanese firms for which they are main banks. As a consequence, firms have been exploring alternative methods of corporate finance. The objective of this paper is to examine empirically how Japanese manufacturers have responded, from a corporate finance perspective, to the deteriorating financial conditions of Japanese banks. In particular, we are interested in how these firms took advantage of new opportunities for issuing corporate bonds introduced by the recent capital market liberalization measures of the Japanese government. According to these new measures Japanese firms are allowed to issue corporate bonds with or without collateral.

We are interested in estimating the (reduced form) determinants of firms' debt issuances and the nature of the connections of these debt-issuing firms to their main banks and vertical (capital) production keiretsu groupings.[8] We consider a number of hypotheses put forward in the literature in recent years concerning Japanese bank behavior. For example, do firms take advantage of opportunities to raise debt capital from capital markets without banks' interference? Does firms' direct debt financing lessen the banks' role in corporate governance? Our empirical evidence seems to suggest that, while Japanese industrial firms are taking advantage of opportunities for direct debt financing, Japanese banks continue to play an important role in their client firms' issuances of public debt. We argue that it is premature to conclude that the types of inefficiencies caused by Japanese bank behavior in the Japanese economic system discussed above are fading away.

The organization of the rest of the paper is as follows. In the following Section 2, we discuss the recent financing issues facing Japanese manufacturing firms, and their relationships to corporate governance. We then present our hypotheses. Section 3 discusses empirical results. The paper concludes in Section 4.

[7] For example, this type of problem may cause firms to invest in the projects that satisfy their banks' objectives while sacrificing the firms' share value maximization. It should also be noted that this type of agency problem does not seem to be a problem for German banks which are also investors in their industrial firms. (See, for example, Morck and Nakamura, 2001).

[8] The core assembler (e.g. Toyota Motor Company) of a vertical production keiretsu group (e.g. Toyota group) often owns significant amounts of equity in their keiretsu group suppliers. For example, Toyota Motor owns 20% of Koito and 24.9% of Denso, with Koito and Denso both being first-tier suppliers in the Toyota group.

Table 1
Sources of debt capital: Japanese corporations, 1976–1999[a]

Year	Industrial bonds	Overseas bonds	Bank loans
1976	68,016	5,958	1,217,103
1981	103,067	17,684	1,756,806
1986	184,477	75,390	2,716,043
1991	397,152	325,144	4,353,970
1996	605,161	251,342	4,647,630
1999	583,288	198,805	4,217,597

[a] Source: Bank of Japan, Economic and Financial Data, Tokyo, 2001.

2. Recent debt financing issues facing Japanese firms

2.1. Banks

Throughout the period from the 1950s to the 1980s, Japanese firms relied heavily on bank loans, rather than relying on direct debt raised from capital markets such as secured and unsecured corporate bonds (e.g. Aoki, 1988).[9] As the laws on direct debt financing were relaxed starting in the late 1970s, more Japanese firms became interested in issuing corporate bonds.[10] It has been suggested that the fact that financially highly rated firms are now able to raise funds from external debt markets at least in principle may imply that the historical role of Japanese banks as providers of capital and hence as monitors of corporate governance will eventually shrink (e.g. Hoshi et al., 2001).[11] For this reason it is of interest to empirically examine the role of banks in Japanese firms' efforts to raise debt capital from capital markets in the 1990s.

Table 1 shows the amounts of debt Japanese corporations held from private sources. We see from Table 1 that the amount of debt capital raised by Japanese firms increased significantly throughout the bubble period in the 1980s and 1990s. The amount of overseas bonds, which consist mostly of equity-based bonds such as convertible and warrant bonds, increased significantly as Japanese stock prices exploded during the 1980s. The debt in this

[9] Other types of financing methods include new equity and various types of debt with equity-nature such as convertible bonds and warrant bonds, for which the amounts of new issues were negligible over the 1990s, the time period of our interest. For this reason, our primary focus in this paper will be on bank loans and corporate bonds. See also Campbell and Hamao (1994) and Hoshi et al. (1993) for earlier studies on related issues.

[10] Prior to 1972, Japanese regulations only allowed secured bonds. These bonds were essentially transferable bank loans since banks underwrote them and also purchased most of them. Security firms, having grown in relative power during the 1960s, won the right to underwrite unsecured corporate bonds in 1972, and Mitsubishi Corporation, Hitachi, and Marubeni issued convertible debentures in that year. The Kisai-kai (Bond Floatation Committee), however, consisted mostly of bankers and allowed only very large firms to issue straight bonds. Other firms remained subject to collateral requirements.

[11] Another such liberalization measure which helped develop the Japanese markets for corporate bonds was the Financial System Reform Act of 1993 which allowed banks to set up their own security business subsidiaries. Many Japanese banks responded to this change in the law promptly by establishing their security business subsidiaries. Most of the major banks in Japan had established their security business subsidiaries by early 1996. By 1997, these bank subsidiaries had moved to capture the majority of the market share for Japanese domestic (straight) corporate bond underwriting (Hamao and Hoshi, 2000; Table 2).

category has decreased steadily since then. On the other hand, both secured and unsecured corporate bonds and bank loans continued to increase in value through the latter half of the 1990s. Their value began to decline slightly in 1999.

In this paper, we empirically study the determinants of the amounts of outstanding corporate bonds and bank loans of Japanese manufacturing firms. In the rest of this section, we consider several bank-related factors that may influence firms' issuances of public debt in Japan. We then present our hypotheses. We assume that firms have opportunities to raise debt capital from corporate bonds for given market determined risk-adjusted interest rates.

2.2. Main bank effects

There are several conflicting factors associated with the main bank which affect client firms' corporate bond issuing behavior. We discuss these factors in turn.

2.2.1. Main bank as a benefactor

Since virtually all Japanese firms have main banks which take a special interest in their client firms' financial matters—particularly when the firms are in financial distress—one might expect risk premia on corporate bonds to be affected by the degree of main bank involvement in firm management. If the market perceives firms' main bank connections to increase the security of the bonds, the firms' risk premia may be reduced, enabling firms to borrow more. Thus, the presence of the main banks might be expected to increase the demand for corporate bonds.

2.2.2. Bank involvement in bond underwriting: transfer of the bank debt default risk to public investors

Historically, Japanese banks were quite successful in preserving their advantaged positions as the main providers of debt capital to Japanese industrial firms.[12] One of the most serious threats to the banks' interests has been the growing capacity of industrial firms to directly access capital markets. In Japan, markets for corporate bonds developed very slowly, primarily because of strong opposition by Japanese banks. Bank lobbying was successful in blocking the formation of bond markets until the late 1970s (Karp and Koike, 1990). Until the 1980s, Japanese banks lobbied successfully to preserve the Foreign Exchange Law's ban on issuing bonds abroad (Karp and Koike, 1990).

Since 1993, Japanese banks have been able to underwrite client firms' corporate bonds using security business subsidiaries. Bond underwriting by banks is likely to result in conflicts of interest, since banks are, almost without an exception, providers of bank loans to the firms for which they underwrite corporate bonds. Thus, banks have an incentive to transfer the (fairly priced) default risk on bank loans from themselves to general investors by forcing their client firms to issue corporate bonds which they underwrite. The proceeds from bond issues are then used to pay back the bank loans (Hamao and Hoshi, 2000). This type of conflict of interest is expected to reduce the market demand for the corporate

[12] See, for example, Morck and Nakamura (1999, p. 321), for a discussion on how this bank behavior relates to Japanese corporate governance.

bonds issued.[13] This is a demand factor, contributing negatively for firms' public debt issuing.

2.2.3. Banks' interest in maintaining bank loans

To a large extent money lending is still a lucrative business for Japanese banks. Bank loans to good, low risk companies are particularly profitable. For this reason, the banks have an incentive to oppose good firms' initiatives to borrow directly from the capital markets. This is a supply factor contributing negatively to firms' public debt issuance.

The various effects discussed above imply that the net effect of firms' main bank connections on their use of bond financing is ultimately an empirical matter.[14] Nevertheless, we expect that the "benefactor effects" dominate the other effects of main banks on corporate finance. Consequently, firms with greater main bank equity ownership are able to issue more public debt.

In our empirical specifications we also include dummy variables for six major bank-based horizontal keiretsu groups. These dummies are included to control for factors that are not controlled for by the bank-related explanatory variables discussed above.

2.3. Vertical keiretsu ownership

In production keiretsu groups, firms have long-term equity stakes in other firms within the group.[15] (For example, Toyota Motor, the core assembly firm of the Toyota production group, owns 25% of Denso, a large auto parts supplier.) Unlike bank investors, production keiretsu firms have real business interests in equity investment: in particular, they have an interest in maintaining secure and efficient delivery of parts. Thus, the core assembler firms often provide the financing that is needed to maintain smooth intra-group production operations. Such collaborative financing, provided at low cost, may alleviate the liquidity constraints of firms in production keiretsu groups.[16] For this reason we expect keiretsu supplier firms whose shares are held in large quantities by a core assembler firm[17] to issue

[13] Hamao and Hoshi (2000) present some evidence for this type of conflict of interest. They also find evidence that bank subsidiaries discount the extra premiums to attract investors for the bonds they underwrite. Hamao and Hoshi (2000) question whether this discounting strategy is sustainable over time, as is evidenced by the withdrawals by a number of banks from the bond underwriting business. Termination of this discounting practice by banks' security subsidiaries may result in a more significant risk premium for the corporate bonds underwritten by them.

[14] In the reduced form framework of this paper, the impacts of these different factors cannot be separately estimated. An extension of this framework to a structural equation system is under way.

[15] Significant transactions of the equity held by production keiretsu group firms have taken place during the 1990s since the burst of the bubble, but the dust has not settled yet. While Nissan and Mazda, facing bankruptcy, are said to have reduced (or totally abandoned) their reliance on their production keiretsu group suppliers under the new management control, respectively, by Renault and Ford, Toyota seems to be strengthening its grip on its suppliers such as Denso. Unlike the financial (bank-based, horizontal) keiretsu, the vertical production keiretsu group has some proven efficiency advantages over strictly price-based assembler–supplier relationships.

[16] Also the presence of a long-term production keiretsu group investor may allow the firm to borrow more from their banks. For example, it is expected that a keiretsu supplier (e.g. Koito in the Toyota group, 20% of which Toyota owns) has a larger debt capacity than similar independent suppliers. This type of assembler–supplier financing relationships exists between the core assembler and its first-tier suppliers, between the first-tier supplier and second-tier suppliers, and so on.

[17] More precisely, the down-stream assembler firm located one step below the supplier firms in the supply chain.

less public debt than their independent counterparts.[18] This is a supply factor contributing negatively to firms' issuance of public debt.

2.4. Other factors

Although our primary objective is to study the interactions between a main bank and its client firms' debt financing decisions, previous studies in the literature have found that a number of factors have systematic effects on firms' choices between bank loans (private debt) and public debt. We briefly list these factors here.

2.4.1. Debt size

Because there is a large fixed cost of issuing public debt, firms are likely to find large-scale public debt financing relatively more attractive at the margin (e.g. Blackwell and Kidwell, 1988; Easterwood and Kadapakkam, 1991). In our specifications we include log of sales revenue (ln (sales)) to measure the effects of firm size which is used as a proxy for a firm's debt size.[19]

2.4.2. High quality firms[20]

While private debt involves monitoring by banks of their client firms, monitoring is not available with public debt financing; and hence high quality firms which do not need to be closely monitored are more likely to have an access to public debt financing (Diamond, 1984, 1989, 1991; Rajan, 1997). In our specifications we include firms' R&D-to-sales ratios, advertising expenditure-to-sales ratios and foreign ownership share as proxies for firms' quality variables.

2.4.3. Flexible liquidation policy

In the event of financial distress, private debt is preferred to public debt because private debt agreements are easier to renegotiate and imply a more flexible liquidation policy (e.g. Berlin and Loeys, 1988; Chemmanur and Fulghieri, 1994; Detragiache, 1994). In practice, the costs of liquidation are often measured by the number of parties involved in the legal liquidation process and the amount of time required to complete the proceedings.

Empirically, we find that the quantity of public debt issued by firms is positively correlated with the quantity of bank loans and the quality of the firms. These results are consistent with the interpretation of the variables given above. We will not consider the flexible liquidation policy effect in this paper.

The factors discussed above are summarized in the following hypotheses:

[18] The potential investor firms locked in vertical keiretsu groups have the advantage that their markets and supply chains are predictably organized, but also the disadvantage that they are not able to be as flexible in responding to unpredicted business opportunities. Such effects are expected to be small in the Japanese context and are not considered in this paper.

[19] As in other empirical studies we use the natural log of firm's sales rather than sales itself in our specifications.

[20] High quality firms are typically defined to be firms with high credit ratings. This implies that the probabilities that firms repay debt are close to one.

(*H1*) In the 1990s, Japanese manufacturers became more dependent on public debt than on bank loans (Table 1). Large firms with stronger main bank connections and weak vertical keiretsu ownership were able to issue more public debt.
(*H2A*) During the 1990s, Japanese firms have been switching from bank loans to public debt. The firms' main bank connections facilitated this transition.
(*H2B*) Japanese firms issued public debt without interference from their main banks. Japanese banks' role in corporate governance has diminished in the 1990s as firms became less dependent on bank loans.

3. Empirical results

Our data consists of firms in the manufacturing industries that are listed in the first section of the Tokyo Stock Exchange.[21]

Tables 2 and 3 show that the fraction of firms with non-zero public debt ("dummy_public_debt")[22] increased from 38% in 1991 to 49% in 1996. Over the same time period, the public debt-to-total assets ratio ("public debt") and the bank debt-to-total assets ratio ("bank loan") both increased, from 2 to 4% and from 12 to 14%, respectively. We see also that bank debt loans increased for both firms with and without public debt. Firms with public debt are also much larger in terms of sales ("sales" in million yen) and spend more on R&D than firms without public debt. "R&D" denotes the R&D expenditure-to-total assets ratio. The average sales revenue for firms without public debt declined by one-third between 1991 and 1996 while the average sales revenue remained almost unchanged for firms with public debt over the same time period. This is consistent with the notion that stronger firms have become more able to access public bond markets during the early 1990s.

The remaining variables shown in Tables 2 and 3 are as follows. The ownership shares (in percent) held by the main bank, the top vertical keiretsu (up-stream) group firm shareholder, and the foreign investors are denoted by "main b. share," "vert. keiretsu share" and "foreign ownership," respectively. Also, "adv" denotes the advertising and marketing expenditures-to-total assets ratio. The horizontal bank keiretsu group dummies for the Mitsui, Mitsubishi, Sumitomo, Fuji, Daiichi-Kangyo group, and Sanwa, are denoted, respectively, by "bank_mitsui," "bank_mitsubishi," and so forth. Finally, "bank_other" denotes the dummy variable for main banks that are not members of the above six bank groups.

Table 4 shows probit estimation results for the probability that a Japanese manufacturer had some amount of outstanding public debt in the years of 1991 and 1996. The effects

[21] We have used the Japan Development Bank financial database for creating our database. Firms listed in the first section of the Tokyo Stock Exchange are typically larger and more established than firms listed in the second section. The manufacturing industries included in our sample are auto, chemicals, electrical machinery, food, general machinery, metals, pharmaceuticals, precision, and pulp and paper. The industry dummy variables are denoted by "ind_auto," "ind_chem.," and so forth. Firms' financing needs vary considerably from one industry to another, and hence it is of empirical interest to include industry dummies to control for the factors which are not captured by other included explanatory variables.

[22] The corresponding variable names used in the Tables 2–6 are given in parentheses.

Table 2
Descriptive statistics (means and standard deviations): Japanese manufacturers, 1991

	1991			
	All	Public debt > 0	Public debt = 0	Public debt > bank loan
dummy_pub_debt	0.383	1	0	1
public debt	0.019 (0.035)	0.049 (0.042)	0	0.068 (0.050)
bank loan	0.125 (0.137)	0.119 (0.108)	0.128 (0.152)	0.023 (0.035)
main b. share	4.65 (1.24)	4.89 (1.14)	4.51 (1.28)	4.93 (0.988)
vert. keiretsu share	13.4 (14.6)	9.70 (11.5)	15.7 (15.8)	7.48 (9.17)
foreign ownership	5.41 (8.11)	5.28 (5.30)	5.50 (9.46)	5.88 (5.11)
sales	239706 (610139)	365788 (683676)	161421 (546333)	275704 (639654)
r&d	0.016 (0.022)	0.019 (0.024)	0.014 (0.022)	0.021 (0.024)
adv	0.022 (0.048)	0.020 (0.045)	0.023 (0.050)	0.025 (0.050)
ind_auto	0.079	0.089	0.072	0.031
ind_chem	0.177	0.210	0.157	0.187
ind_elec. mach	0.226	0.226	0.225	0.281
ind_food	0.111	0.084	0.127	0.078
ind_general_mach	0.171	0.163	0.176	0.187
ind_metals	0.099	0.095	0.101	0.031
ind_pharmac	0.060	0.047	0.069	0.109
ind_precision	0.040	0.037	0.042	0.094
ind_pulp	0.036	0.047	0.029	0.000
bank_mitsui	0.125	0.142	0.114	0.109
bank_mitsubishi	0.149	0.137	0.159	0.109
bank_sumitomo	0.171	0.174	0.170	0.203
bank_dkb	0.109	0.110	0.108	0.109
bank_fuji	0.109	0.158	0.075	0.172
bank_sanwa	0.032	0.053	0.020	0.109
bank_other	0.306	0.226	0.356	0.187
no. obs.	496	190	306	64

The variables used in this study are defined as follows: dummy_pub_debt (a dummy variable set equal to one if firm has outstanding corporate bonds; zero otherwise); public debt (actual amount (in million yen) of firm's outstanding corporate bonds); bank loan (actual amount (in million yen) of firm's outstanding bank loan); main b. share (main bank's ownership share in its client firm, in %); vert. keiretsu share (ownership share in the firm by the top keiretsu down-stream firm, in %); foreign ownership (firm's shares held by foreigners, in %); sales (sales revenue (in million yen)); r&d (firm's R&D expenditure-to-total assets ratio); adv (firm's advertising and marketing expenditures-to-total assets ratio); ind_auto, ind_chem., ind_elec.mach, ind_food, ind_general_mach, ind_metals, ind_pharmacy, ind_precision, and ind_pulp (industry dummies for auto, chemicals, electrical machinery, food, general machinery, metals, pharmaceuticals, precision, and pulp); bank_mitsui, bank_mitsubishi, bank_sumitomo, bank_dkb, bank_fuji, bank_sanwa, and bank_other (bank-based horizontal keiretsu group dummies for Mitsui group, Mitsubishi group, Sumitomo group, Daiichi-Kangyo group, Fuji group, Snawa group, and others). Numbers in parentheses are standard deviations.

of main bank shares on the probability is found to be positive and statistically significant for both years, suggesting that firms with larger main bank shares are more likely to issue public debt. This is consistent with the "benefactor effects" of main banks. On the other hand, vertical keiretsu ownership depresses issuances of public debt, as expected, although its numerical impact is much smaller than that of the main bank ownership. We also see that

Table 3
Descriptive statistics (means and standard deviations): Japanese manufacturers, 1996

	1996			
	All	Public debt > 0	Public debt = 0	Public debt > bank loan
dummy_pub_debt	0.492	1	0	1
public debt	0.040 (0.061)	0.089 (0.062)	0	0.062 (0.076)
bank loan	0.144 (0.164)	0.135 (0.131)	0.151 (0.187)	0.022 (0.041)
main b. share	4.55 (1.11)	4.71 (0.975)	4.41 (1.16)	4.57 (0.956)
vert. keiretsu share	12.9 (14.4)	10.2 (12.3)	15.1 (15.3)	12.4 (13.9)
foreign ownership	8.50 (9.91)	9.00 (7.80)	8.10 (11.3)	10.5 (10.7)
sales	216926 (593340)	362766 (851459)	100360 (157623)	268625 (796896)
r&d	0.015 (0.022)	0.017 (0.021)	0.013 (0.022)	0.012 (0.021)
adv	0.016 (0.044)	0.019 (0.048)	0.014 (0.041)	0.021 (0.051)
ind_auto	0.079	0.096	0.066	0.070
ind_chem.	0.176	0.173	0.179	0.167
ind_elec. mach	0.227	0.219	0.233	0.254
ind_food	0.107	0.091	0.120	0.130
ind_general_mach	0.176	0.183	0.171	0.157
ind_metals	0.099	0.109	0.091	0.108
ind_pharmac	0.061	0.046	0.073	0.054
ind_precision	0.038	0.041	0.036	0.049
ind_pulp	0.034	0.041	0.029	0.011
bank_mitsui	0.103	0.105	0.102	0.095
bank_mitsubishi	0.153	0.169	0.137	0.146
bank_sumitomo	0.200	0.183	0.217	0.263
bank_dkb	0.112	0.109	0.115	0.087
bank_fuji	0.097	0.114	0.080	0.073
bank_sanwa	0.038	0.050	0.026	0.051
bank_other	0.297	0.269	0.323	0.285
no. obs.	445	219	226	185

The variables used in this study are defined as follows. dummy_pub_debt (a dummy variable set equal to one if firm has outstanding corporate bonds; zero otherwise); public debt (actual amount (in million yen) of firm's outstanding corporate bonds); bank loan (actual amount (in million yen) of firm's outstanding bank loan); main b. share (main bank's ownership share in its client firm, in %); vert. keiretsu share (ownership share in the firm by the top keiretsu down-stream firm, in %); foreign ownership (firm's shares held by foreigners, in %); sales (sales revenue (in million yen)); r&d (firm's R&D expenditure-to-total assets ratio); adv (firm's advertising and marketing expenditures-to-total assets ratio); ind_auto, ind_chem., ind_elec.mach, ind_food, ind_general_mach, ind_metals, ind_pharmacy, ind_precision, and ind_pulp (industry dummies for auto, chemicals, electrical machinery, food, general machinery, metals, pharmaceuticals, precision, and pulp); bank_mitsui, bank_mitsubishi, bank_sumitomo, bank_dkb, bank_fuji, bank_sanwa, and bank_other (bank-based horizontal keiretsu group dummies for Mitsui group, Mitsubishi group, Sumitomo group, Daiichi-Kangyo group, Fuji group, Snawa group, and others). Numbers in parentheses are standard deviations.

the larger the firm is, the more likely it is to have issued public debt. Foreign ownership, R&D and advertising have statistically insignificant effects.

It is also interesting to note that the industry and bank group effects, which were often significant in 1991, became much less significant in 1996.[23]

[23] We do not have good explanations for this.

Table 4
The determinants of firms' decisions to issue public debt: probit estimates

	1991[a]	1996[a]
constant	−4.66 (5.66)***	−4.37 (4.97)***
main b. share	0.152 (2.73)***	0.147 (2.17)**
vert. keiretsu share	−0.017 (3.26)***	−0.015 (2.92)**
foreign ownership	−0.013 (1.21)	−0.006 (0.707)
ln (sales)	0.326 (5.08)***	0.352 (5.09)***
r&d	5.13 (1.37)	3.78 (0.945)
adv	−1.19 (0.767)	−0.949 (0.557)
ind_auto	−0.020 (0.071)	−0.142 (0.496)
ind_chem	0.060 (0.263)	−0.169 (0.711)
ind_elec. mach	−0.041 (0.192)	−0.263 (1.19)
ind_food	−0.409 (1.45)	−0.295 (0.925)
ind_general_mach	−0.102 (0.455)	−0.092 (0.394)
ind_pharmacy	−0.670 (1.72)*	−0.847 (2.20)
ind_precision	−0.358 (0.998)	−0.233 (0.632)
ind_pulp	–	–
bank_mitsui	0.202 (0.969)	−0.087 (0.378)
bank_mitsubishi	0.017 (0.084)	0.110 (0.537)
bank_sumitomo	0.180 (0.910)	−0.108 (0.557)
bank_dkb	0.391 (1.79)*	0.116 (0.522)
bank_fuji	0.740 (3.44)***	0.418 (1.79)*
bank_sanwa	0.986 (2.72)***	0.507 (1.49)
log likelihood	93.8	130.7
no. obs.	496	493

The variables used in this study are defined as follows: dummy_pub_debt (a dummy variable set equal to one if firm has outstanding corporate bonds; zero otherwise); public debt (actual amount (in million yen) of firm's outstanding corporate bonds); bank loan (actual amount (in million yen) of firm's outstanding bank loan); main b. share (main bank's ownership share in its client firm, in %); vert. keiretsu share (ownership share in the firm by the top keiretsu down-stream firm, in %); foreign ownership (firm's shares held by foreigners, in %); ln (sales) (log of sales); r&d (firm's R&D expenditure-to-total assets ratio); adv (firm's advertising and marketing expenditures-to-total assets ratio); ind_auto, ind_chem., ind_elec.mach, ind_food, ind_general_mach, ind_metals, ind_pharmacy, ind_precision, and ind_pulp (industry dummies for auto, chemicals, electrical machinery, food, general machinery, metals, pharmaceuticals, precision, and pulp); bank_mitsui, bank_mitsubishi, bank_sumitomo, bank_dkb, bank_fuji, bank_sanwa, and bank_other (bank-based horizontal keiretsu group dummies for Mitsui group, Mitsubishi group, Sumitomo group, Daiichi-Kangyo group, Fuji group, Snawa group, and others).

[a] *, **, and *** denote, respectively, significance at 90, 95 and 99% levels. Probit regressions excluding statistically insignificant explanatory variables provide similar results and are not reported here.

As discussed above, vertical keiretsu ownership by assembler (up-stream) firms potentially alleviate firms' need to resort to public debt.[24] This is consistent with our probit results in Table 4, which show that firms with higher ownership by their up-stream keiretsu firms are less likely to issue public debt.[25]

[24] For example, other keiretsu firms may be able to provide some financing and/or absorb some of the excess workforce.

[25] While such keiretsu connections were often thought to be a strength until the mid-1990s, many Japanese manufacturers now believe that vertical keiretsu relationships impede the flexibility that is important for securing parts from the lowest cost suppliers in the global market. That may increase the firms' risk premiums and hence reduce their capacity to issue public debt. This issue is not considered in this paper.

Table 5
The determinants of the amounts of firms' public debt: Tobit estimates

	1991[a]	1991[a]	1996[a]	1996[a]
constant	−0.181 (3.80)***	−0.173 (3.55)***	−0.332 (4.76)***	−0.327 (4.48)***
main b. share	0.007 (2.12)**	0.007 (2.13)**	0.013 (2.18)**	0.013 (2.16)**
vert. keiretsu share	−0.001 (3.08)***	−0.001 (3.08)***	−0.001 (2.12)**	−0.001 (2.14)**
foreign ownership	−0.001 (1.84)*	−0.001 (1.89)*	0.000 (0.357)	0.000 (0.360)
ln (sales)	0.010 (2.93)***	0.010 (2.62)***	0.026 (5.15)***	0.026 (4.74)***
r&d	–	0.235 (1.12)	–	0.125 (0.391)
adv	–	−0.068 (0.711)	–	−0.027 (0.188)
ind_auto	0.012 (0.711)	0.013 (0.750)	−0.031 (1.29)	−0.031 (1.28)
ind_chem..	0.014 (1.05)	0.012 (0.858)	−0.006 (0.336)	−0.008 (0.399)
ind_elec. mach	0.014 (1.07)	0.012 (0.917)	−0.025 (1.35)	−0.026 (1.39)
ind_food	−0.020 (1.30)	−0.014 (0.778)	−0.037 (1.58)	−0.034 (1.23)
ind_general_mach	0.008 (0.631)	0.008 (0.579)	−0.008 (0.428)	−0.009 (0.459)
ind_pharmacy	−0.012 (0.644)	0.023 (0.998)	−0.070 (2.55)**	−0.076 (2.28)**
ind_precision	−0.006 (0.285)	−0.010 (0.472)	0.016 (0.540)	0.014 (0.466)
ind_pulp	–	–	–	–
bank_mitsui	0.012 (0.924)	0.012 (0.925)	−0.015 (0.979)	−0.016 (0.987)
bank_mitsubishi	0.008 (0.653)	0.007 (0.585)	−0.001 (0.089)	−0.002 (0.122)
bank_sumitomo	0.024 (2.01)**	0.024 (2.02)**	−0.017 (1.33)	−0.017 (1.32)
bank_dkb	0.031 (2.31)**	0.030 (2.30)**	0.006 (0.383)	0.006 (0.380)
bank_fuji	0.056 (4.47)***	0.056 (4.44)***	0.018 (1.17)	0.018 (1.15)
bank_sanwa	0.058 (2.83)***	0.059 (2.89)***	0.016 (0.725)	0.017 (0.758)
log likelihood	86.1	87.0	48.8	48.9
no. obs.	496	496	493	493

The variables used in this study are defined as follows. dummy_pub_debt (a dummy variable set equal to one if firm has outstanding corporate bonds; zero otherwise); public debt (actual amount (in million yen) of firm's outstanding corporate bonds); bank loan (actual amount (in million yen) of firm's outstanding bank loan); main b. share (main bank's ownership share in its client firm, in %); vert. keiretsu share (ownership share in the firm by the top keiretsu down-stream firm, in %); foreign ownership (firm's shares held by foreigners, in %); ln (sales) (log of sales); r&d (firm's R&D expenditure-to-total assets ratio); adv (firm's advertising and marketing expenditures-to-total assets ratio); ind_auto, ind_chem., ind_elec.mach, ind_food, ind_general_mach, ind_metals, ind_pharmacy, ind_precision, and ind_pulp (industry dummies for auto, chemicals, electrical machinery, food, general machinery, metals, pharmaceuticals, precision, and pulp); bank_mitsui, bank_mitsubishi, bank_sumitomo, bank_dkb, bank_fuji, bank_sanwa, and bank_other (bank-based horizontal keiretsu group dummies for Mitsui group, Mitsubishi group, Sumitomo group, Daiichi-Kangyo group, Fuji group, Snawa group, and others).

[a] *, **, and *** denote, respectively, significance at 90, 95 and 99% levels. Tobit regressions excluding statistically insignificant explanatory variables provide similar results and are not reported here.

The following Tables 5 and 6 present Tobit estimation results for equations explaining the amounts of public debt and bank loans held by Japanese manufacturers in 1991 and 1996.

As expected, the patterns for the determinants of firms' outstanding public debt are similar to those found for our probit models in Table 4. Comparison of the determinants of public debt in Tables 5 and 6 reveal the following: (1) firms with more main bank ownership tend to have larger public debt and less bank loans in both 1991 and 1996; (2) the main bank effects increased in absolute value from 1991 to 1996 for both public debt and bank loans; (3) the significant decline in bank loans outstanding is observed especially for firms with

Table 6
The determinants of the amounts of firms' bank loans: Tobit estimates

	1991[a]	1991[a]	1996[a]	1996[a]
constant	0.224 (2.56)***	0.190 (2.13)**	0.453 (4.31)***	0.373 (3.44)***
main b. share	−0.007 (1.18)	−0.008 (1.31)	−0.027 (3.07)***	−0.026 (3.05)***
vert. keiretsu share	0.000 (0.114)	0.000 (0.032)	−0.000 (0.305)	−0.000 (0.322)
foreign ownership	−0.002 (2.26)**	−0.002 (2.38)**	−0.004 (4.24)***	−0.004 (4.37)***
ln (sales)	0.001 (0.131)	0.004 (0.597)	−0.007 (0.910)	−0.000 (0.025)
r&d	–	0.380 (0.920)	–	−0.224 (0.447)
adv	–	−0.842 (4.36)***	–	−0.839 (3.49)***
ind_auto	−0.094 (2.91)***	−0.088 (2.76)***	−0.085 (2.24)**	−0.079 (2.12)**
ind_chem..	−0.039 (1.57)	−0.036 (1.41)	−0.031 (0.999)	−0.021 (0.683)
ind_elec. Mach	−0.106 (4.38)***	−0.101 (4.19)***	−0.110 (3.79)***	−0.100 (3.43)***
ind_food	−0.092 (3.25)***	−0.022 (0.687)	−0.104 (2.85)***	−0.024 (0.579)
ind_general_mach	−0.070 (2.74)***	−0.067 (2.65)***	−0.046 (1.48)	−0.039 (1.28)
ind_pharmacy	−0.174 (4.81)***	−0.156 (3.51)***	−0.149 (3.61)***	−0.105 (2.05)**
ind_precision	−0.096 (2.44)**	−0.095 (2.41)**	−0.105 (2.13)**	−0.094 (1.90)*
ind_pulp	–	–	–	–
bank_mitsui	−0.014 (0.595)	−0.018 (0.785)	0.018 (0.737)	0.006 (0.262)
bank_mitsubishi	0.020 (0.895)	0.022 (1.00)	0.030 (1.44)	0.035 (1.68)*
bank_sumitomo	−0.054 (2.39)**	−0.052 (2.32)**	−0.030 (1.51)	−0.032 (1.59)
bank_dkb	0.014 (0.578)	0.018 (0.748)	0.038 (1.64)*	0.041 (1.78)*
bank_fuji	0.001 (0.055)	−0.002 (0.085)	0.017 (0.700)	0.014 (0.567)
bank_sanwa	−0.063 (1.45)	−0.064 (1.51)	−0.066 (1.76)*	−0.064 (1.72)*
log likelihood	102.9	113.0	65.7	72.2
no. obs.	496	496	493	493

The variables used in this study are defined as follows. dummy_pub_debt (a dummy variable set equal to one if firm has outstanding corporate bonds; zero otherwise); public debt (actual amount (in million yen) of firm's outstanding corporate bonds); bank loan (actual amount (in million yen) of firm's outstanding bank loan); main b. share (main bank's ownership share in its client firm, in %); vert. keiretsu share (ownership share in the firm by the top keiretsu down-stream firm, in %); foreign ownership (firm's shares held by foreigners, in %); ln (sales) (log of sales); r&d (firm's R&D expenditure-to-total assets ratio); adv (firm's advertising and marketing expenditures-to-total assets ratio); ind_auto, ind_chem., ind_elec.mach, ind_food, ind_general_mach, ind_metals, ind_pharmacy, ind_precision, and ind_pulp (industry dummies for auto, chemicals, electrical machinery, food, general machinery, metals, pharmaceuticals, precision, and pulp); bank_mitsui, bank_mitsubishi, bank_sumitomo, bank_dkb, bank_fuji, bank_sanwa, and bank_other (bank-based horizontal keiretsu group dummies for Mitsui group, Mitsubishi group, Sumitomo group, Daiichi-Kangyo group, Fuji group, Snawa group, and others).

[a] *,** and *** denote, respectively, significance at 90, 95 and 99% levels. Tobit regressions excluding statistically insignificant explanatory variables provide similar results and are not reported here.

larger main bank ownership in 1996; (4) vertical keiretsu ownership depresses the amounts of public debt issued, but its numerical impact is very small; (5) vertical keiretsu ownership does not affect the size of the bank loans; (6) foreign ownership is increasingly negatively correlated with the size of bank loans from 1991 to 1996[26]; and (7) firm size is an important

[26] Main bank and vertical keiretsu ownership shares, foreign ownership shares and firm size are relatively constant over time and can be considered as givens, at least in the short run, in the firms' decision making on debt financing. Nevertheless, potential endogeneity econometric issues may occur when the restructuring efforts by firms facing bankruptcy involve reorganizing the ownership shares among large shareholders such as banks and vertical keiretsu firms. Foreign investors are less likely to be affected by these sorts of restructuring, but because of their lack of influence on the outcomes of restructuring efforts, foreign investors tend to dislike firms with large bank loans.

determinant of firms' public debt but is an insignificant determinant of the size of their bank loans. In addition, as of 1996, bank loans are negatively correlated with firms' efforts in advertising and marketing.

We now discuss the hypotheses put forward earlier in view of our empirical results.

3.1. Hypothesis (H1)

We have found that the Japanese firms most likely to issue public debt are large, invest in advertising and are popular with foreign investors. Main bank connections play a significant role in increasing issuances of public debt. These finding are consistent with hypothesis (H1).

3.2. Hypothesis (H2A)

In order to consider H2A we compare effects of main bank share on public debt and bank loans. The coefficients of main bank share in Tables 5 and 6 are: 0.007 and 0.007 in Table 5 versus −0.007 and −0.007 in Table 6 for 1991; and 0.013 and 0.013 in Table 5 versus −0.027 and −0.026 in Table 6 for 1996. During this period the main bank share changed little (Tables 2 and 3). This seems to suggest that bank loans were indeed called or unloaded faster than the issuances of new public debt. This is consistent with the above H2A that the firms have shifted their main borrowing source, at the margin, from bank loans to public debt. We also observe from the regression coefficients for the main bank shares in Tables 5 and 6 that, the larger the main bank ownership shares, the larger the increase in the firms' outstanding public debt over our sample period. The increase in the impact of main bank ownership from 1991 to 1996 most likely reflects the 1993 law that allowed banks to be the underwriters of their client and other firms' corporate bonds. These results are consistent with hypothesis (H2A).

3.3. Hypothesis (H2B)

The relationship of our empirical results to hypothesis (H2B) requires careful interpretation. It has been argued in the literature[27] that Japanese banks use their enormous loans to their client firms, combined with their equity shares in these firms, to influence the firms' corporate governance. In particular, Japanese banks may promote their own positions as creditors using the power obtained from their investor–creditor positions.[28] As their client firms' bank loans decrease, Japanese banks may lose some of their bargaining power relative to other investors and creditors. However, according to our empirical analysis the client firms' relationships to the main banks (measured in terms of the main banks' equity

If this is the case, foreign ownership should be negatively correlated with firms' outstanding bank loans. Since foreign ownership shares are small in magnitudes and, as individual investors, foreign shareholders have virtually no influence on Japanese firms' corporate governance, we don't expect the interpretations of our empirical results to be affected by them.

[27] See, for example, Morck et al. (2000).

[28] Banks with such power may force their client firms to invest in no-risk and no-growth projects (Morck and Nakamura, 2001).

ownership shares) positively contribute to the firms' capacity to raise public debt. In fact, firms with public debt have somewhat larger main bank-owned equity shares than firms without public debt (Tables 2 and 3). This result is consistent with the "benefactor effect" discussed above. It is not consistent with the notion in H2B that Japanese banks are losing control over their client firms. Banks may retain their influence on the firms' corporate governance so long as firms need strong bank relationships to issue public debt.

4. Concluding remarks

Japanese banks have played an important role in the corporate governance of Japanese firms throughout the post World War II period. Their power in Japanese corporate governance is based on their ownership of equity in client firms, their loans to client firms and their association with other financial institutions and industrial firms. One change observed in the 1990s in the behavior of Japanese banks, which have been suffering from large numbers of non-performing loans, has been a reduction in the amount of loans they provide to client firms. It has been suggested in the business press and elsewhere that this change in Japanese banks' lending behavior will lead to the replacement of bank loans with capital market-based corporate bonds as a means of debt financing for Japanese industrial firms. This change will, in turn, imply that Japanese banks' role in corporate governance will diminish. We have argued in this paper that this scenario is only possible if Japanese industrial firms are able to raise debt capital directly from capital markets without relying on connections to main banks.

Using Japanese firm data for 1991 and 1996 we have found that firms which issue public debt have relatively close connections to their main banks. For these firms, we also see evidence that significant amounts of bank loans are being replaced by public debt. This process is most pronounced for firms that have close ties to their main banks (in terms of equity ownership). This may lead to serious conflicts of interest for banks that are underwriting public debt to repay their own loans. As corporate insiders, banks are in a position to encourage their client firms to issue corporate bonds, allowing banks to transfer their default risk as creditors to public investors.

We also note that, while Japanese industrial firms' increasing reliance on public debt reduces the size of the corporate lending business (e.g. Hoshi et al., 2001), there has not been a significant shift in the savings patterns of Japanese households towards capital market investments such as corporate bonds and equity. One possible reason that such a migration has not taken place is that Japanese households are not yet convinced that the behavior of Japanese banks is compatible with Japanese industrial firms' share value maximization. Furthermore, Japanese households may be concerned about adverse selection in capital markets given the information asymmetries between the banks and the public, and the bank's incentive to "dump" bad debt.

4.1. So what?

Many agree that Japanese corporate governance must become more transparent and security-market based for the Japanese economy to recover from the current long-standing

recession. We have argued that in order for such a transparent corporate governance system to emerge, Japanese banks' behavior must become compatible with share value maximization and the protection of public investors. Our empirical evidence suggests that such a change in the Japanese bank behavior is not occurring.

The final verdict on the role of Japanese banks in corporate governance is still out. Until Japanese households are convinced that investment in securities issued by Japanese corporations is protected by proper corporate management, the majority of Japanese household savings will continue to take the form of bank deposits.[29] Unfortunately, so long as the majority of Japanese household savings are kept in savings accounts, Japanese banks will continue to have significant power over corporate governance.

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[29] In fact, the fraction of securities in the portfolio of the Japanese household sector has declined significantly in the last 25 years. The fractions of the Japanese savings that are kept in bank and postal savings accounts (in securities accounts) are as follows: 59% (17%) in 1975; 55% (20%) in 1985; 49% (23%) in 1990; 56% (13%) in 1995; and 58% (11%) in 2000. (Source: Japanese Prime Minister's Office, 2002.)

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