Corporate Affiliations and the (Mis)Allocation of Credit

Joe Peek and Eric S. Rosengren*

Abstract

The strong corporate affiliations in Japan have been cited as one of the major impediments to making the fundamental changes necessary to escape the economic malaise that has afflicted the Japanese economy over the past decade. While Japanese corporate affiliations during good economic times were heralded as an effective way to increase credit availability and reduce agency costs, during difficult economic circumstances these same affiliations may impede needed economic restructuring, insofar as they insulate firms from the market discipline that otherwise would be imposed by creditors. This study shows that corporate affiliations have contributed to significant misallocations of credit, since troubled borrowers with strong corporate affiliations with their lenders are more likely to obtain additional credit than their healthier brethren. In contrast, lenders that are not affiliated with the firm are less likely to extend additional credit as firms become more troubled.

Corporate Affiliations and the (Mis)Allocation of Credit

The severe economic crisis in Japan, associated with the collapse of the Japanese stock and real estate markets and the dramatic deterioration in the health of the Japanese banking sector, represents one of the major economic events of the late twentieth century. It is even more striking because the second largest economy in the world remained stagnant for more than a decade, and even today shows no evidence of returning to the robust health that characterized most of its postwar history. One potential source of the difficulty in implementing major corporate restructuring has been the web of corporate affiliations that encourages lenders and affiliated companies to support firms that would have otherwise been restructured, sold, or liquidated. We show that a primary driver of lending to troubled firms has been the strength of corporate affiliations, and that lenders not so affiliated are much less inclined to allocate additional credit to deeply troubled firms. In addition, as banking problems became more severe in the latter half of the 1990s, evidence of lending to support troubled affiliated firms is particularly evident.

Key contributors to the pattern of Japanese lenders supporting troubled firms are two forms of corporate affiliations that have distinguished Japanese bank-firm relationships. The first, the keiretsu, is characterized by firms having substantial cross-shareholding and extensive explicit and implicit business ties. The second is the main bank system, whereby a firm has a strong relationship with its primary bank, the main bank, with the main bank having extensive shareholdings in the client firm, serving as a major source of short- and long-term financing, and, in many instances, having a representative on the firm's board of directors.

Previous work has documented the importance of Japanese corporate affiliations. Many of these studies highlight the potential beneficial effects of these corporate affiliations, including

the ability to reduce agency costs, maintain greater bank debt, and avoid restructuring through costly bankruptcy proceedings. A less benign view of these corporate affiliations is that they subvert corporate governance, insulating firms from the discipline that otherwise would come from outside directors, shareholders, and creditors, resulting in suboptimal business and financial decisions. While previous studies have examined how these corporate affiliations affect investment decisions, stock returns, and corporate governance decisions by comparing affiliated and nonaffiliated firms, they have not directly examined how affiliations impact the allocation of credit.

This study utilizes a unique database that enables us to examine the patterns of firm borrowing from banks and nonbank financial firms to determine the extent to which such lending is affected by corporate affiliations, such as the main bank and keiretsu relationships. Any influence of such corporate affiliations on the allocation of credit should be particularly apparent during times of economic stress, such as has been the case in Japan with the continuing banking crisis and the inability of the macroeconomy to recover from the adverse shocks at the beginning of the 1990s.

While strong corporate affiliations encouraged economic growth during the boom times, for example by making credit more available and investment less sensitive to internal cash flows, these same affiliations may inhibit an economic recovery when the economy is in need of major restructuring. Firms with a tradition of protecting employees and maintaining relationships with affiliated companies clearly benefit from a lender willing to provide more flexibility and support than would be the case in a more market-driven credit allocation process. However, banks placing relationships ahead of sound business practices that rely on credit risk analysis has been an important contributor to the lending policies that have resulted in bank failures, massive loan

charge-offs, and the mountains of problem loans still remaining on Japanese bank balance sheets. Such behavior was reinforced by the perceived national duty of banks to support troubled firms, especially in favored industries. That Japanese banks have duties other than to maximize profits is made clear by the banking laws that require new investors and current owners with more than 20 percent ownership in a bank to obtain regulatory approval, including satisfying a condition that large shareholders "fully understand a bank's social responsibilities" (The Economist 2002b).

Bank regulation and supervision policies in Japan provide banks with significant nonperforming loans and impaired capital little incentive to be strict with troubled borrowers. In fact, it is in the self-interest of banks to follow a policy of forbearance with their problem borrowers in order to avoid pressure on the banks to increase their own loan loss reserves, further impairing their capital. This leads to a policy of banks "evergreening" loans, whereby banks extend additional loans to a troubled firm to enable the firm to make interest payments on outstanding loans and avoid or delay bankruptcy. By keeping the loan current, the bank's balance sheet looks better, since the bank is not required to report such problem loans among its nonperforming loans. Finally, the government, faced with a growing budget deficit and a voting public weary of funding bank bailouts, may prefer banks to continue their policies of forbearance in order to avoid the alternative scenario of massive firm, and perhaps bank, failures and, in particular, the associated costs, both financial and political.

The primary objective of this study is to investigate the impact of main bank and keiretsu affiliations on credit allocation during periods of firm and/or bank distress to determine the extent to which credit has been misallocated due to the pressures emanating from such corporate affiliations. We find that corporate affiliations, both from main banks and strong keiretsu ties,

4

increase the likelihood of a firm receiving additional financing as its health deteriorates. Furthermore, this perverse effect does not occur when the lender is a nonbank without keiretsu ties to the firm. We also find evidence of government pressure on banks to support troubled firms, indirect government support for troubled main banks, and the evergreening of loans by banks. This evergreening is most pronounced in the latter half of the 1990s when financial pressures on banks was most acute.

While many Japanese firms have been insulated from market pressures by their strong relationships with affiliated lenders, this is not necessarily good news for the Japanese economy. If scarce credit is allocated to uncompetitive and troubled firms, Japan will not experience the natural cleansing resulting from the major restructuring that typically occurs in an economic downturn. This will inhibit the ability of the Japanese economy to recover from the current economic malaise, as well as adversely affecting the longer-run growth potential of the economy.

The rest of the study is as follows. The next section provides some background on corporate affiliations and the associated literature that has developed on the potential benefits and costs of such affiliations. The second section discusses the role of corporate affiliations in allocating credit in the Japanese economy. The third section discusses the data and methods The fourth section provides the results. The final section provides our conclusions.

I.   Corporate Affiliations in Japan

Corporate affiliations have received a great deal of attention in descriptions of the Japanese economy and have played a key role in many explanations of Japanese economic performance, both during the Japanese "miracle" characterized by rapid growth following World War II and during the "lost decade" of the 1990s. Prior to World War II, powerful family corporate groups centered on family controlled banks, called zaibatsus, controlled most major

firms. After the war, zaibatsus were broken up. However, to prevent loss of ownership control, Japanese firms began to purchase shares in affiliated financial or industrial firms (Morck and Nakamura 1999; Morck, Nakamura and Shivdasani 2000; Hoshi and Kashyap 2001). These corporate affiliations, cemented with extensive cross-shareholding and interlocking boards of directors, represent direct and indirect business ties termed keiretsus.

A potential benefit of keiretsu affiliations is that management is able to secure long-term financing and business relationships, with the managerial monitoring conducted by firms (including banks) with an equity stake and information about the firm generated by the extensive business relationships. Such relationships can reduce the costs to a firm when it encounters financial difficulties, since financially troubled firms can have difficulty convincing suppliers, customers, and creditors of their viability. Affiliations can reduce the costs of providing information to stakeholders of a firm's true financial condition and improve the ability to renegotiate or to provide terms that allow the firm to remain viable. Because affiliations allow all affiliated firms to share in the costs as well as the benefits associated with the provision of financial support to an affiliated troubled firm, corporate affiliations can avoid some of the problems with the asymmetric nature of the incidence of the benefits and costs associated with the granting of debt relief by creditors, whereby the benefits, but not the costs, are shared with equity holders, suppliers, and customers (Hoshi, Kashyap and Scharfstein 1990). Thus, affiliations can potentially improve information sharing, reduce the asymmetry in information among stakeholders, and more evenly distribute the benefits and costs of providing additional support to a financially troubled firm. Consistent with there being benefits to affiliation relationships, Hoshi, Kashyap and Scharfstein (1990) find that among firms experiencing

6

financial distress, keiretsu firms invest and sell more than those firms that are not members of a keiretsu group.

A second important form of affiliation is provided by the main bank system. The banking relationship in Japan is far more important than in the United States for a number of reasons. First, Japanese firms are more reliant on bank debt than firms in the United States, although bond financing has become increasingly important over the past decade (Hoshi and Kashyap 1999). Second, the main bank typically is a significant equity holder in the firm, and the borrowing firm usually owns shares in its main bank. Third, management and directors of the firm frequently have served in managerial positions at the bank. Fourth, the main bank is expected to take a leading role in restructuring the firm should it experience financial difficulties. Finally, the main bank often provides financing for customers and suppliers of the firm, since many of the firms are often part of the same keiretsu.

The main bank takes primary responsibility for monitoring the firm and can serve as a form of corporate governance (Kaplan and Minton 1994). The main bank is particularly important during times of distress, when it can require changes in management and alter the board of directors (Kang and Shivdasani 1995; Morck and Nakamura 1999). This oversight provided by the bank, both a debt and equity holder, can reduce typical information asymmetries, resulting in firms with a main bank having greater access to external credit, which, in turn, affects firms' investment decisions (Hoshi, Kashyap and Scharfstein 1991). However, there is a dark side to this close lending relationship: If the bank rather than the borrower becomes troubled, the ability of the firm to finance investment may be impeded (Gibson 1995; Kang and Stultz 2000; Klein, Peek and Rosengren 2002).

During the 1980s and early 1990s, most studies of Japanese corporate affiliations found significant benefits. These studies emphasized the unique features of Japanese corporate affiliations that reduced agency costs (Hoshi, Kashyap, and Scharfstein 1993; Hoshi, Kashyap, and Scharfstein 1990). Firms with intertwined business relationships, shareholding relationships, board of directors relationships, and financing relationships with other firms should have substantially more information about that firm than do external monitors. Furthermore, to the extent that a firm's main bank or members of its keiretsu would be willing to provide backup financing should the firm become financially troubled, firms were able to maintain a higher ratio of bank debt relative to their total assets. However, the benefits of close firm-main bank ties may be limited. For example, while Weinstein and Yafeh (1998) find that a close relationship with a firm's bank increases the availability of credit, this does not lead to higher profitability or growth for the firm, perhaps because the bank discourages the firm from investing in high risk, high expected return projects, or because the bank extracts all the rents.

More recently, studies have been more critical of Japanese corporate affiliations, viewing such affiliations as a problem that has contributed to a decade of subpar economic growth, rather than as an alternative market model (Kang and Stultz 2000; Morck and Nakamura 1999). If the primary role of corporate affiliations is to insulate management from market forces by enabling firms to avoid the discipline that can be provided by external creditors and investors, this limiting of outside corporate governance would manifest itself in a misallocation of credit. Strong corporate affiliations would allow weak firms to sustain their operations relatively unchanged, rather than being forced by external creditors and shareholders to make the tough restructuring choices necessary to recover. This pernicious effect is coupled with the strong incentive for banks with asset quality and capital problems to avoid pushing troubled firms into bankruptcy,

and thus forcing a balance sheet recognition by the bank of losses on its problem loans. The unwillingness of the government to force recognition of asset quality is also a factor, as the government sought to avoid further bailouts of the banking sector and sought to avoid closure of firms that would result in employment losses. Effectively, the government guarantees the forbearance on troubled firms by its policies of forbearance on banks and the pressure on banks to support troubled firms.

Still another view suggests that the debate about the positive and negative contributions of keiretsu and main bank relationships is misguided, insofar as keiretsus do not even exist and main banks do not play any meaningful role (Miwa and Ramseyer 2001a, 2001b). While Japan cannot be characterized as a bank-centered economy prior to its buildup for World War II, the view that keiretsu and main bank relationships played no role in the postwar Japanese economy is quite suspect (for example, Hoshi and Kashyap 2001; Milhaupt 2001a, 2001b). However, with the recent financial deregulation, the role of keiretsu and main bank relationships is waning, with the emergence of an active bond market, the erosion of cross-shareholding ties, the continued weakening of both firms and banks, and increasing market pressures on both firms and banks. Thus, the Japanese financial structure appears to be moving back in the direction of its prewar environment, when financial markets played a much more important role in corporate governance and in the allocation of equity and credit (for example, Hoshi and Kashyap 2001; Milhaupt 2001b).

II.   Corporate Affiliations and Weakened Banks: Implications for Lending Behavior

The Japanese main bank system has been a key distinguishing feature of the Japanese financial system. While relationship lending has been found to be important in the United States

(Petersen and Rajan 1994), banks and borrowers in Japan frequently have interlocking

directorates, cross shareholdings, and affiliated companies that make their lending relationships

much stronger. With Japanese banks having both equity and debt relationships with their

borrowers, and sometimes even sharing personnel, it is generally assumed that a close bank-firm

relationship provides the bank with very good information about the financial condition of the

firm, significantly reducing monitoring costs and potential agency problems. Similarly, close

ties among keiretsu members should also result in informational advantages about other

members relative to outside lenders.

Improved information flows are an important potential advantage of the main bank and

keiretsu systems, with the improved information flows to affiliated lenders becoming particularly

valuable during periods of economic distress, when asymmetric information problems worsen.

At such times, the interests of managers may not be aligned with those of shareholders and debt

holders. In particular, managers worried about their jobs may not have a strong incentive to fully

disclose the extent of emerging problems at the firm. Furthermore, the continuing economic

malaise and the persistent declines in land prices throughout the 1990s, following the sharp

declines in land and stock prices at the beginning the decade, produced an environment

characterized by generally increased levels of uncertainty and sometimes rapid changes in the

health of individual firms. Under these conditions, corporate affiliations that improve

information flows to lenders have the potential to allow affiliated lenders to allocate credit more

efficiently.

The combination of the severe problems at many individual firms and the crisis in the

banking system during the 1990s produces a natural experiment that can be exploited to

distinguish between alternative hypotheses about the role played by main banks and other

affiliated lenders. As banks came under increasing pressure in meeting capital ratio requirements, they faced difficult choices about how best to shrink their balance sheets. One option is for banks to shrink their foreign operations, which will typically affect foreign borrowers with a weaker banking relationship than is typical of long-standing domestic borrowers. Indeed, this seems to be the path initially followed by Japanese banks beginning in the early 1990s (Peek and Rosengren 1997, 2000). The reductions in lending were initially focused on loans to firms in the United States and Europe, followed later by reductions in lending to firms in Southeast Asia. Although the domestic Japanese economy was insulated from declining bank loans initially, by 1995 Japanese banks came under increased pressure to shrink domestic assets to maintain capital-to-asset ratios as the continuing deterioration in real estate prices, and the Japanese economy more generally, resulted in lowered bank ratings, as well as the failure of some banks, and significant increases in the Japan premium (Peek and Rosengren 2001).

These factors increased the need for Japanese banks to rethink how they were utilizing their scarce capital. Thus, faced with the necessity to shrink domestic lending, capital-constrained Japanese banks were forced to make choices about which firms would continue to receive scarce loans. How were banks to trade off their responsibilities to finance firms with strong main bank and keiretsu ties, even though many of these firms had poor prospects, with the need to make sound business decisions that would direct credit to the most creditworthy borrowers, even if they were not closely affiliated with the bank? At the same time, banks faced growing pressure from government entities to continue lending to troubled firms in order to avoid a credit crunch and sharp increases in the unemployment rate and the number of firm bankruptcies. For example, it appears that almost half of the public funds injected into the

11

banking system in 1998 and 1999 was used to provide debt forgiveness to construction companies (Tett and Ibison 2001). Such pressures have come out into the open recently with reports that Shinsei Bank, perhaps the only bank in Japan that has seriously applied credit risk analysis in its lending decisions, has been pressured by the FSA to continue lending to severely troubled firms, with FSA Commissioner Shoji Mori quoted as saying, "Shinsei should behave in line with other Japanese banks" (Singer and Dvorak 2001).

The primary hypothesis investigated in this study is that main banks and keiretsu relationships contributed to the misallocation of credit during the 1990s, as banks came under pressure to improve capital ratios. If main banks exploit superior knowledge about firms that borrow from them derived from their affiliations with those firms, the probability that a main bank increased its exposure to a troubled firm would be low for affiliated firms that experienced particularly poor performance. The bank would use its access to superior information about the highest expected returns among alternative borrowers to allocate its shrinking pool of funds in a way that eliminated marginal credits, so that the bank's loan portfolio would become increasingly weighted toward firms with the best prospects. If, instead, the consequences of affiliations were to protect the entrenched management of the firm, and, by enabling the firm to make interest payments and avoid or delay bankruptcy, mitigate the damage to the bank's reported balance sheet information, the probability that an affiliated troubled firm would receive additional credit from its main bank would be enhanced by poor firm performance, as both the main bank and the firm's management sought to forestall the realization of losses.

Forbearance by bank regulators provided both the opportunity and the incentive for troubled banks to behave in their own self-interest by continuing to provide credit to severely troubled firms based on the severity of the bank's own health and on its current exposure to those

firms. In order to prevent further disclosure of problem loans at a troubled bank that would

increase its reported nonperforming loans and require the bank to make additional loan loss

provisions and loan charge-offs, a bank may continue lending to troubled firms to provide

sufficient financing to keep otherwise economically bankrupt firms afloat. For example, banks

might provide funds to firms to enable them to make the interest payments on their outstanding

loans from the bank to prevent the bank having to classify the loans as nonperforming. While

this "evergreening" of loans benefits the firm, it also improves the bank's reported balance sheet

data. To the extent that additional loans allow a firm to avoid bankruptcy, the bank avoids a

further increase in its reported nonperforming loans (that includes loans to bankrupt firms as well

as loans that are not current on interest payments), as well as avoiding a further write down of its

capital. In fact, some banks have even gone to the extreme of taking on loans called in by other

banks, for example, Dai-ichi Kangyo Bank with Mycal loans, or buying loans from Shinsei Bank

to avoid a repeat of the Sogo bankruptcy keyed in part by Shinsei putting its Sogo loans back to

the government, thus increasing their own exposure to severely troubled firms in order to delay

inevitable bankruptcies by their borrowers. However, while such a strategy may improve the

appearance of the bank's balance sheet in the short run, in the long run, such a strategy could

result in far greater losses to the bank and scarce credit being allocated to firms with the least

productive investment opportunities.

　Keiretsu ties may also affect main bank lending, although the direction of the effect is

ambiguous. To the extent that a main bank in the same keiretsu as the firm feels a stronger

obligation to come to the aid of a troubled firm, the bank would increase credit availability to the

firm. Alternatively, the main bank might reduce its exposure to the firm (or increase it by less)

while other members of the keiretsu shouldered more of the burden of the bailout. In that case,

secondary banks and nonbanks in the same keiretsu as the firm would tend to increase the availability of credit to the firm in order to offset the increased exposure of the main bank that otherwise would occur. Similarly, for secondary lenders not in the same keiretsu as the firm, one might expect the absence of corporate affiliations to allow such lenders to base their lending decisions on the prospects of the borrowing firm, so that their lending would be positively related to firm health. However, to the extent that nonaffiliated lenders are subjected to pressure from either the government or the firm's main bank (as organizer of support for a troubled firm) to participate in the rescue, nonaffiliated lenders may still aid such firms, although any correlation between increased lending and deteriorating firm health would be weaker than for affiliated lenders.

III.   Data and Methods

We use a rich new panel data set to examine bank lending patterns in order to determine how Japanese banks reacted to the economic problems in the 1990s, and how these reactions affected credit availability to Japanese firms. By using Japanese firm-level data, we are able to link individual Japanese firms to their individual lenders. By identifying the main bank and keiretsu relationships, differences in the magnitudes of changes in a firm's borrowing from different categories of lenders, particularly as firms become more troubled and the financial health of lenders deteriorates, can be used to better understand the effects of corporate affiliations on the allocation of credit to affiliated and nonaffiliated firms. This linking of individual lenders to individual borrowers is critical for understanding how lending disruptions created by problems at financial institutions can be transmitted to the real economy. Such a link

14

cannot be made clearly in many other countries, such as the United States, where bank-borrower relationships are considered private information.

For our tests that focus on the patterns of lending by main banks, secondary banks, and nonbank lenders, we use annual data for a sample period from 1993 through 1999. The starting date of our sample corresponds to when the Basle Accord risk-based capital requirements were fully implemented in Japan. We then focus on the rest of the decade as banks came under increasing pressure to maintain capital ratios above minimum capital requirements. To test whether credit is allocated based in part on the strength of corporate ties, we examine the pattern of loans obtained by all firms included in the Pacific-Basin Capital Market Databases (PACAP), which includes all first- and second-section firms that are traded on the Tokyo stock exchange. The PACAP database includes the balance sheet and income statements of firms based on their fiscal year-end reports. We identify each firm's main bank as the first listed reference bank in the Japan Company Handbook. The identification of keiretsu membership and the share of ownership of keiretsu firms among their top 10 equity holders by firms in the same keiretsu are obtained from Industrial Groupings in Japan: The Anatomy of the Keiretsu by Dodwell Marketing Consultants. Bank capital and nonperforming loan data are obtained from Bankscope, produced by Fitch-IBCA. The data for loans outstanding to firms by each lender are obtained from the Nikkei Needs database, with loan reporting based on the firm's fiscal year. To avoid timing problems, we limit our sample to those firms with a fiscal year that ends in March, which is by far the date most commonly used by Japanese firms, as well as corresponding to the March balance sheet and income reports by banks.

We first estimate the probability that a bank increases credit to a firm, controlling for firm and bank characteristics. By allowing for differential effects for main banks and for keiretsu

15

relationships, we can deduce whether troubled banks tend to increase lending to a firm based on the strength of corporate ties between the bank and the firm, or, instead, base the decision primarily on superior information about the investment prospects of affiliated firms. By distinguishing between the lending behavior of affiliated lenders and unaffiliated lenders, we can deduce whether keiretsu and/or main bank ties affect credit availability to firms, and whether any differences between credit availability to affiliated and unaffiliated firms are sensitive to the health of the firm or the health of the bank.

We investigate the contribution of main bank and keiretsu affiliations in determining the allocation of credit to firms by capital-constrained banks by estimating the following logit equation:

$$\Pr(\text{LOAN}_{i,j,t}) = a_0 + a_1\text{AFFIL}_{i,j,t-1} + a_2\text{FIRM}_{i,j,t-1} + a_3\text{BANK}_{i,j,t-1} + a_4\text{MB*X1}_{i,j,t-1} + a_5\text{SK*X2}_{i,j,t-1}$$

$$+ \quad a_6\text{TIME}_{i,j,t} + u_{i,j,t} \tag{1}$$

The dependent variable has a value of one if loans to firm i by bank j increased from year t-1 to year t, and zero if the bank's loans to firm i were unchanged or decreased from year t-1 to year t. We focus on increases in loans, since that requires the lender to take action. The reasons underlying a decline in loans outstanding to a firm are much more heterogeneous, since such an outcome could result passively from the amortization of an outstanding loan or the loan maturing, as well as from a lender making the decision to call a loan, to refuse to renew a loan, or even to forgive a loan. For a given firm, the regression sample will contain in each year one observation for each bank from which the firm borrows in that year.

AFFIL is a vector of four variables reflecting group affiliations. KEIR is a (0,1) dummy variable that has a value of one if the firm is in one of the eight bank-centered financial (horizontal) keiretsus (Mitsubishi, Mitsui, Sumitomo, Fuyo, Dai-Ichi Kangyo, Sanwa, IBJ and

Sakura), and zero otherwise. PK is the percent ownership of the firm by keiretsu members among the top ten equity holders. The other two variables are associated with the main bank ties of the firms, reflecting the strength of the tie and the health of the firm's main bank. MBLFD is measured as main bank loans to the firm as a percent of the firm's total debt. MBPCPR is the percent change in the equity price of the firm's main bank over the prior year.

FIRM is a vector of variables intended to capture firm health and other characteristics of the firm, including controlling for loan demand. The variables considered include the firm's return on assets (FROA) during the prior year, the percent change in the firm's equity price over the prior year (FPCPR), the firm's liquid assets as a percent of its total assets (FLIQA) for the prior year, and the percent change in the firm's sales (FSALES) over the prior year. We also control for other firm characteristics by including the logarithm of the firm's total real assets (FLASSET), a set of (0,1) dummy variables indicating whether a firm just entered the bond market (FENBMKT), is in the bond market (FINBMKT), or just left the bond market (FEXBMKT), and a set of nine industry dummy variables.

While the estimated coefficients on FROA, FLIQA, and FSALES reflect firm health, these variables also may serve as proxies for the strength of the firm's loan demand. This issue is discussed below. The reported regressions do not include FPCPR, since it was dominated as a measure of firm health by the other measures, never having a significant estimated coefficient. This may not be surprising, since once a Japanese firm's health has deteriorated substantially, its stock price movements are often dominated by news concerning the likelihood that the firm's lenders will rescue (bailout) the firm and the magnitude of any assistance the firm is likely to receive from its lenders, rather than the firm's own economic performance.

BANK is a vector of variables intended to capture bank health. These variables include the percent change in the bank's equity price over the past year (BPCPR), the bank's risk-based capital ratio (BRBC), and the bank's nonperforming loans as a percent of its total assets (BNPLA). The reported regressions focus on BPCPR, which dominated the other two measures. This is not surprising, given the widely held views that bank capital ratios in Japan are substantially overstated and that the nonperforming loan ratios substantially understate the severity of the deterioration in the quality of loans in bank portfolios. To the extent that analysts are able to penetrate the veil of reported capital and nonperforming loan ratios, stock prices should reflect the best estimates of bank health.

In order to isolate the differential effects of corporate affiliations, we include two sets of interaction terms, one for main bank ties (MB*X1) and one for keiretsu ties (SK*X2). The interactive variables for the main bank ties are interacted with a (0,1) dummy variable that has a value of one if the bank is the firm's main bank (MBANK). The differential effects of keiretsu ties are obtained by using a (0,1) dummy variable that has a value of one if the lender is in the same keiretsu as the firm (KSAME). The variables in the set of interaction terms include those in the base specification that are intended to measure strength of affiliation, firm health, and bank health. The set of main bank interaction variables (X1) include MBANK, in addition to MBANK interacted with each of the following measures: KSAME, KEIR, PK, MBLFD, FROA, FLIQA, FSALES, and BPCPR. The set of keiretsu interaction variables (X2) includes KSAME, in addition to KSAME interacted with the following variables: PK, MBLFD, MBPCPR, FROA, FLIQA, FSALES, and BPCPR. Note that we did not include both BPCPR and MBPCPR in the set of main bank interaction variables, since once they are multiplied by MBANK, the two

interactive variables are identical. Similarly, KSAME is not interacted with KEIR, since

KSAME and KSAME*KEIR are perfectly collinear.

We include a set of annual time dummy variables to capture the effects of the

macroeconomy. We use this specification rather than using a set of continuous macroeconomic

variables because most Japanese macroeconomic variables are known to have significant

measurement issues. These annual dummy variables will capture the average effect of economic

conditions in each year.

While the annual time dummy variables and the set of industry dummy variables control

for loan demand at the aggregate level, the set of dummy variables for a firm entering, exiting, or

being in the bond market should help control for shifts in loan demand at the individual firm

level. However, as mentioned above, the measures of firm health included in the equation are

likely to be correlated with the firm's need for external finance. By focusing only on the

differential effects associated with the behavior of the firm's main bank and those lenders in the

same keiretsu as the firm compared to the effects associated with unaffiliated lenders, we hope to

avoid the difficulty of controlling for shifts in loan demand at the firm level. Insofar as a change

in a firm's condition that affected its general loan demand is captured by the base regression, we

should be able to avoid shifts in loan demand contaminating the measurement of the differential

effects associated with affiliated lending.

For the first specification, only firm-lender observations for lenders that are market-

traded banks are included in order to be able to control for bank health. The base group of

lenders is secondary banks that are not members of the same keiretsu as the firm. This includes

all observations of firms that are not members of a keiretsu, as well as all observations of loans

to a firm by lenders that are either in a different keiretsu or not members of a keiretsu. The

19

estimated coefficients on the interactive terms are then interpreted as measures of the extent to which lending by the firm's main bank or by banks in the same keiretsu as the firm responds differently to measures of the strength of affiliations, firm health, and bank health. Does affiliated lending decline as firm health deteriorates, or is the effect perverse, suggesting that corporate affiliations tend to protect the entrenched management of troubled firms? Similarly, is lending inversely related to bank health, suggesting that banks may be lending to weakened firms in order to protect their own balance sheets from a further increase in reported nonperforming loans that might require them to make additional provisions for their problem loans?

The second major specification enlarges the set of lenders to include not only market-traded banks, but also nonbank lenders and government-controlled lenders. Again, the focus will be on the differences in the estimated coefficients on the proxies for strength of affiliations, firm health, and main bank health across the various categories of lenders. The underlying hypothesis is that the various groups of lenders will have different motivations that determine how they allocate credit to firms. Additional results show more directly that increased loans to a firm is inversely related to the subsequent performance of the firm's stock price and address why banks have an incentive to continue lending to the most troubled firms, even though many are not economically viable.

IV.   Empirical Results

As a preliminary to the estimation results, Table 1 presents information on the extent to which our sample of firms relies on bonds and loans to finance their operations. The numbers in the table are based on values for each category calculated as a percent of firm assets for both the beginning of our sample, 1993, and the end of the sample, 1999, and separately for firms that are and are not members of a keiretsu. The table contains the mean values for those percentages

over the relevant set of firms. One of the more striking results in the table is that during this time of severe problems in the banking sector, firms decreased their reliance on bonds, with the percent decline in the bonds-to-assets ratio for non-keiretsu firms (35) being about one and one-half times that for keiretsu firms (23). Furthermore, the timing of the declines differs. For example, between 1993 and 1997, the keiretsu firm ratio declines by 20 percent, while that for non-keiretsu firms declines only by 15 percent (not shown separately in the table). Thus, most of the decline in the bonds-to-assets ratio for non-keiretsu firms came between 1997 and 1999 (from 8.26 to 6.34), while that for keiretsu firms was much more moderate (from 8.57 to 8.28).

Given the substantial decline in bond finance during the 1993 to 1999 period, it is not surprising that both keiretsu and non-keiretsu firms increased their reliance on loans. Keiretsu firms, which tend to rely more heavily on loans than do non-keiretsu firms, obtained most of the increase in loans from members of their keiretsu (103 of the 145 basis point increase in the share), from banks (135 basis points), and, in particular, from their main bank (113 basis points). Although keiretsu firms rely much more heavily on nonbanks than do non-keiretsu firms, that share increased only slightly during the period. Perhaps surprisingly, keiretsu firms rely much more heavily than do non-keiretsu firms on government-controlled banks, although that share increased only slightly during the period. For non-keiretsu firms, loans increased as a share of assets by 151 basis points. Bank loans accounted for a 170 basis point increase, yet only about one-half of the increase came from the firm's main bank (87 basis points). Reliance of non-keiretsu firms on both nonbanks and government-controlled banks declined during the sample period. Thus, the primary differences between keiretsu and non-keiretsu firms over the 1993 to 1999 period are the sharper decline in the reliance on bonds by non-keiretsu firms, especially from 1997 to 1999, and the pattern whereby the increase in loans for keiretsu firms was

accounted for primarily by main banks. Non-keiretsu firms, in contrast, relied on secondary banks for more than one-half of their increase in loans and their reliance on both nonbanks and government-affiliated banks fell, even as keiretsu firms increased (slightly) their reliance on such lenders.

Table 2 contains the means, standard deviations, minimum values, and maximum values for the explanatory variables in the base regression for the set of observations for loans from market-traded banks. Those variables, both individually and interacted with the main bank and same-keiretsu dummy variables, are used to obtain the results contained in Table 3 from estimating the logit specification shown in equation 1. Because including aggregate regressors in the equation, such as the set of annual time dummy variables, suggests a likely correlation among regression errors within a particular year, we compute robust coefficient standard errors that allow for dependence of regression errors within years. As discussed above, the dependent variable is a (0,1) dummy variable having a value of one if the bank increased lending to the firm, and zero otherwise.

The estimates in the first column of Table 3 are based on the panel of firm-lender observations that includes all first- and second-section firms on the Tokyo stock exchange and market-traded banks for which all required data are available. Later specifications are expanded to include nonbank and government-controlled lenders, as well as this set of market-traded banks. The second column contains the results for the same specification as column 1, but with the observations with extreme values excluded from the sample. Extreme observations are defined as those for which any one of the regressors, other than the (0,1) dummy variables, has a value that is more than four standard deviations from its mean value. The removal of observations with extreme values reduces the sample size by about 3 percent.

The table contains three sets of estimated coefficients. The first eight coefficients are for the base group of lenders, banks that are neither the firm's main bank nor in the same keiretsu as the firm. The second set of nine estimated coefficients, each associated with a variable name that begins with MB, captures the differential response of main banks, measured relative to that of the base group. The final set of eight coefficients, each associated with a variable name that begins with S, captures the differential response of banks in the same keiretsu as the firm, measured relative to that of the base group.

The first two explanatory variables capture the effect of the keiretsu affiliation on the probability that banks extend additional credit to firms. KEIR, which has a value of one if the firm is a member of a keiretsu, has an estimated coefficient that is positive, but insignificant. The estimated coefficient on PK, the percent ownership of the firm by other members of its keiretsu among the firm's top ten equity holders, is negative and statistically significant, indicating that the more closely the firm is tied to its keiretsu affiliates through equity ownership, the less likely are banks to increase loans to the firm. This result might reflect keiretsu firms relying more heavily on members of its keiretsu for providing financing during difficult times, perhaps through trade credit from suppliers or from nonblank lenders.

The next two explanatory variables capture the effect of main bank relationships on the probability that secondary banks not in the same keiretsu (the base group) provide additional loans to the firm. The estimated coefficient for MBLFD, main bank loans to the firm as a percent of the firm's total debt, is positive, but not significant. MBPCPR, the percent change in the stock price of the firm's main bank over the prior year, has an estimated coefficient that is negative, but not significant.

The next three variables capture the impact of the firm's health on the probability that nonaffiliated secondary banks will extend additional credit to the firm. The estimated coefficient on the firm's return on assets is negative and significant, indicating that the lower the firm's return on assets, the more likely that these banks will provide additional financing. The estimated coefficient on the firm's liquid assets as a percent of its total assets is negative and significant, indicating that the worse is the firm's liquidity, the more likely that these banks will provide additional financing. The estimated coefficient on firm sales growth is positive and significant, indicating that the stronger is a firm's sales growth, the greater is the probability that nonaffiliated secondary banks will provide additional financing.

Each of these three effects is likely to reflect, at least in part, the strength of the firm's loan demand. Of particular interest for this study is which category of lenders, if any, satisfy the surge in distress borrowing as a firm's low return on assets weakens its capital position and as its deteriorating liquidity position pushes the firm closer to failure should it be unable to secure additional funding. While the differential effects to be discussed below are the key to answering this question, the estimates for the base group indicate that even nonaffiliated secondary banks provide some additional credit as a firm's health deteriorates. Perhaps this is a response to government pressure on banks to keep troubled firms alive, or to pressure from the firm's main bank, as it orchestrates the bailout of a severely troubled firm, for each lender to provide its proportional share of any funds advanced to the firm.

BPCPR, the percent change in the equity price of the bank over the prior year, is intended to capture the effect of the lender's deteriorating health on the probability that it is willing to provide additional credit to the firm. While its estimated coefficient is positive, the effect is not

significant. Thus, for nonaffiliated secondary banks, there is no evidence that as banks weaken they are more likely to increase loans to firms in order to protect their own balance sheets.

The next set of variables captures the extent to which main banks react differently than nonaffiliated secondary banks in providing additional credit to firms. The estimated coefficient on MBANK is positive and significant, indicating that main banks are more likely than nonaffiliated secondary banks to provide additional credit to firms, other things equal. However, if the main bank is in the same keiretsu as the firm, that is, MB*KSAME has a value of one, the bank is slightly less likely than main banks not in the same keiretsu (0.859 vs. 0.713 = 0.859 − 0.616 + 0.470) to provide additional credit to the firm, since the estimated coefficient is negative and significant, perhaps because the firm has a network of other keiretsu members from which it is able to obtain any required additional credit. The estimated coefficients on both MB*KEIR and MB*PK are positive, but not significant. The estimated coefficient on MB*MBLFD is positive, but not significant. The estimated coefficients on both MB*FROA and MB*FLIQA are negative and significant, indicating that main banks are even more likely to extend additional credit to the weakest firms, compared to the base group of lenders. This is consistent with main banks feeling a stronger obligation to come to the aid of its troubled firms than is the case for nonaffiliated secondary lenders. However, while MB*FSALES does have a negative estimated coefficient, it is not significant, indicating no evidence that main banks react differently than nonaffiliated secondary banks to a firm's sales growth rate. The estimated coefficient on MB*BPCPR is negative, but not statistically significant.

Among the interactive variables intended to distinguish the behavior of banks in the same keiretsu as the firm from nonaffiliated secondary banks, only four estimated coefficients are statistically significant. The dummy variable for the firm and the bank being in the same

keiretsu has an estimated coefficient that is positive and significant, indicating that banks in the same keiretsu as the firm are more likely to extend additional credit to a firm relative to nonaffiliated secondary banks. The negative estimated coefficient on SK*PK indicates that banks in the same keiretsu are less likely to increase lending to the firm the larger the share of the firm owned by its keiretsu members. The negative estimated coefficient on SK*FSALES indicates that banks in the same keiretsu are more likely, relative to nonaffiliated secondary banks, to increase lending to firms the weaker the firm's sales growth. The negative estimated coefficient on SK*BPCPR indicates that banks in the same keiretsu as the firm, compared to nonaffiliated secondary banks, are more likely to extend additional credit to the firm the weaker has been the bank's stock price performance over the previous year, suggesting that banks in the same keiretsu may practice the evergreening of loans to affiliate firms.

The estimates in the second column of the table indicate that the results are robust to removing extreme observations. Of the 11 estimated coefficients in column 1 that are statistically significant, only two, MB*FLIQA and SK*BPCPR, lose their significance when observations with extreme values for the regressors are removed. On the other hand, two additional variables, MBLFD and MB*KEIR, now have estimated coefficients that are statistically significant, indicating that banks are more likely to increase loans to firms that rely more heavily on their main banks for credit and that main banks are more likely to increase loans to firms that are members of a keiretsu, relative to nonaffiliated secondary banks.

Although not shown in the table in order to conserve space, each regression includes a measure of firm size, a set of three bond market variables, a set of annual dummy variables, and a set of industry dummy variables, as described above. The logarithm of the firm's real assets always has a significant negative estimated coefficient, both here and in later specifications.

26

Among the bond market variables, the dummy variable that has a value of one when a firm enters the bond market always has a significant negative estimated coefficient, as would be expected, both here and in later specifications. Similarly, the dummy variable that has a value of one when a firm exits the bond market always has a significant positive estimated coefficient, as would be expected, both here and in later specifications. Including a separate dummy variable for each time period should control for the average state of the economy in each period. The set of industry dummy variables should control for any systematic differences in loan demand across industries.

The results in Table 3 imply that the weaker is a firm's health, the more likely are secondary banks not in the same keiretsu as the firm to increase lending to the firm, and main banks are even more likely than nonaffiliated secondary banks to increase lending to the most troubled firms. This perverse result may be due to several factors. First, Japanese banks may be responding to significant government pressure to avoid a credit crunch or a precipitous decline in economic conditions that might occur if they were to reduce credit to troubled firms. In fact, Shinsei Bank, which was acquired by foreign investors, has taken the unusual step of complaining publicly about government pressure to support troubled credits. This pressure has reportedly been to provide additional financing to non-keiretsu as well as keiretsu members, consistent with our results that even nonaffiliated banks are more likely to increase loans the weaker is the firm.

A second possibility is that Japanese banks, which are well known for their practice of evergreening loans, may be providing additional loans to troubled borrowers in order to allow the firms to make interest payments to keep the loans current. Banks under pressure to maintain capital ratios have an incentive to minimize reported problem loans, defined as loans that are not

current, have been restructured, or were made to firms that have declared bankruptcy, so that they do not have to make additional loan loss provisions, which would reduce a bank's earnings, and thus capital. Such practices, particularly during a time of reduced bank lending, would appear as increases in loans to the most troubled firms.

The second major finding is that the likelihood of a firm obtaining additional credit from its main bank does differ significantly from that of obtaining additional credit from its nonaffiliated secondary banks, although that difference is slightly smaller if the main bank is in the same keiretsu as the firm. Furthermore, the column 2 results indicate that heavy reliance by a firm on its main bank for credit increases the probability of nonaffiliated secondary banks increasing loans to the firm, presumably because it signals main bank support for the firm.

The third major result is that a bank in the same keiretsu as the firm is more likely to increase lending to the firm, compared to a nonaffiliated bank. Furthermore, the stronger are the ownership ties of other keiretsu members to the firm, the less likely it is that banks will increase lending to the firm. A possible explanation for these results is that keiretsu members have access to alternative financing through affiliated suppliers, customers, and nonbank lenders, such as life insurance companies, and, to the extent that the firm needs to expand its debt, it may be able to do so through such alternative sources, with the ability of the firm to access this alternative source of funding being positively related to the ownership stake that these affiliated firms have in the firm.

Table 4 contains results that are based on an expanded sample of lenders that includes nonbank financial firms, such as insurance companies, and government-controlled banks, as well as the market-traded banks that formed the sample for the previous table. As with the sample of bank lenders, we differentiate between nonbank financial firms that are and are not in the same

keiretsu as the firm. The result is an equation specification with seven lender categories, with each column in the table containing the estimated effects for one lender category. These distinctions are important, since they provide insights into how nonbank keiretsu members might support troubled firms, how government-controlled banks support troubled firms, and whether nonbank lenders not in the same keiretsu as the firm differ in the degree to which they support troubled firms.

All four of the estimated coefficients on KEIR are positive, with three being significant. (Recall that SAMEK and SAMEK*KEIR are identical, so that KEIR cannot be included for the same-keiretsu lenders.) This suggests that lenders not in the same keiretsu as the firm are more likely to increase loans to firms that are keiretsu members, relative to those firms not in a keiretsu. Thus, there appears to be a benefit to a firm being in a keiretsu in terms of obtaining credit, even from lenders outside the firm's keiretsu. The estimated coefficients on PK are consistently negative, with six of the seven effects being significant. This indicates that the larger the share of the firm owned by its other keiretsu members, the less likely are these lenders to increase lending to the firm. This is consistent with the results in Table 3 for bank lenders. However, since the nonbank financial institutions and government-controlled banks also appear less likely to increase lending, then keiretsu firms with concentrated same-keiretsu ownership must either receive additional credit from nonfinancial firms, such as in the form of trade credit from suppliers, rely more on bond finance, or perhaps have a lower demand for credit relative to other firms.

Six of the seven estimated coefficients on MBLFD are positive, with three being significant. This indicates that the greater the reliance of the firm on its main bank for credit, the more likely are lenders, at least for main banks not in the same keiretsu and both types of

29

secondary banks, to increase loans to the firm. This is consistent with the result in column 2 of Table 3. Perhaps secondary banks feel that such loans are less risky, insofar as the main bank is more likely to bailout the firm, and thus other lenders, if the firm's health deteriorates substantially.

Six of the seven estimated coefficients on MBPCPR are negative, although only two are significant. A negative effect indicates that the worse the stock price performance of the firm's main bank during the prior year, the more likely that a lender will increase loans to the firm. In this particular case, it appears that both nonbank lenders in the same keiretsu as the firm and government-controlled lenders may be supporting firms with troubled main banks.

The results for the three firm health proxies are of particular interest, since they indicate a strong and widespread inverse relationship between firm health and the likelihood of obtaining increased loans. All seven of the estimated coefficients on FROA are negative, with six being significant. It is striking that the lone exception is for nonbank lenders not in the same keiretsu as the firm, the lender type with the weakest incentive to aid a distressed firm. In fact, the estimated coefficient is about one-third the value of the next lowest estimated effect, that for government-controlled banks, and one-sixth that for main banks.

Main banks have the strongest estimated inverse relationship, presumably because of their strong ties to the firm and their obligation to come to the aid of troubled firms for which they serve as a main bank. However, even secondary banks display the inverse relationship, whereby a firm is more likely to obtain increased loans the weaker is its financial health, as indicated by a lower return on assets. The point estimates indicate that secondary banks in the same keiretsu as the firm are slightly more likely to increase loans to the firm compared to secondary banks not in the same keiretsu as the firm, although the difference is not statistically

30

significant. The extent to which even secondary banks are more likely to make credit available

to the weakest firms is consistent with reports of governmental pressure on banks to support

troubled firms to prevent a credit crunch or an even sharper rise in firm bankruptcies. In fact,

government-controlled banks also are more likely to increase loans to firms with the lowest

ROAs.

Finally, the difference between the responses of nonbank financial lenders that are and

are not in the same keiretsu as the firm is quite striking. The same-keiretsu effect is strong,

although the estimated effect is slightly less than that for secondary banks in the same keiretsu,

perhaps because nonbanks are not under as much governmental pressure as are banks to support

troubled firms. Strikingly, for nonbank lenders not in the same keiretsu as the firm, the least

affiliated lender category, FROA has an estimated coefficient that is only about one-fourth the

size of that for nonbank lenders in the same keiretsu, and that estimated coefficient, alone among

all the lender types, is not statistically significant. Thus, there is no evidence that a nonaffiliated

nonbank lender feels an obligation to support troubled firms by being more likely to increase

lends to the weakest firms.

The results for FLIQA are similar to those for FROA. All seven estimated coefficients

are negative, with all but that for nonbanks not in the same keiretsu being significant. Thus,

lenders are more likely to increase loans to the firms with the weakest liquidity position. This

effect is strongest for main banks not in the same keiretsu as the firm. The effect is somewhat

weaker for main banks in the same keiretsu, both types of secondary banks, and government-

controlled banks. While still statistically significant, the estimated effect for nonbanks in the

same keiretsu as the firm is about one-third as large as that for main banks not in the same

keiretsu. Finally, while the effect for nonbank lenders not in the same keiretsu is of the same

magnitude as that for nonbanks in the same keiretsu as the firm, the effect is not statistically significant. The estimated coefficients for FSALES are mostly positive, but only two are significant. It is likely that the positive effects are a consequence of loan demand being positively correlated with sales growth.

The results in Table 4 strongly suggest that main bank and keiretsu affiliations are an important source of support as a firm's financial health deteriorates. In particular, lenders are more likely to increase loans to the firm the weaker is firm health, as measured by either the firm's return on assets or its liquidity ratio. Thus, lenders appear to be meeting some obligation, perceived or imposed, to support troubled firms, rather than allocating credit in a way that directs loans primarily to those firms with the best prospects. Main bank ties appear to be the strongest, insofar as main banks are the most likely to increase loans to firms as firm health deteriorates. Similarly, the effects of deteriorating firm health tend to be stronger for lenders in the same keiretsu as the firm, relative to lenders not in the same keiretsu. However, a comparison of columns 1 and 2 suggests that there is something about a main bank being in the same keiretsu as the firm that reduces its incentive to support a troubled firm, relative to a main bank not in the same keiretsu. Perhaps it is that the burden of supporting a troubled firm can be spread across the other keiretsu members, rather than the firm having to rely primarily on its main bank for support.

The widespread evidence of the increased likelihood of lenders increasing loans to a firm the weaker is the firm's health suggests that even secondary banks not in the same keiretsu as the firm feel an obligation to support troubled firms. This may be a result of pressure from main banks for other lenders to participate proportionately in any bailout of a troubled firm, pressure from the government for banks to support troubled firms, or some combination of such pressures.

Certainly, there is reason to believe that banks have come under pressure from government entities to come to the aid of troubled firms by increasing loans, or at least rolling over loans or not calling loans.

The results in Table 4 also indicate that even government-controlled banks are more likely to increase loans to a firm the weaker is the firm's health. Furthermore, in addition to this direct assistance to troubled firms, government-controlled banks also provide indirect support of troubled main banks, insofar as government-controlled banks are more likely to increase loans to a firm the weaker is the health of the firm's main bank. Finally, the results indicate the extent to which nonaffiliated nonbanks may apply different criteria than other lenders in deciding to supply additional credit to firms. Other things equal, the weaker is a firm's health, as measured either by its return on assets or by its liquidity, nonbanks not in the same keiretsu are not more likely to increase loans to the firm, in sharp contrast to each of the other categories of lenders.

Our results provide strong evidence that affiliated lenders in Japan, especially banks, have not acted on their superior information about the prospects of affiliated firms to allocate credit to those firms with the best prospects. However, one might still not be fully convinced by these results, since they were based on publicly available measures of firm health that were not forward-looking. In order to address such concerns, we supplement our evidence with an additional specification. For this test, the dependent variable is the percent change in the firm's stock price from period t-1 to period t. The set of explanatory variables includes (0,1) dummy variables that have a value of one if the lender category increased loans to the firm during the previous year, that is, from period t-2 to t-1. Note that to the extent that an increase in loans enables the firm to improve its subsequent performance beyond what it otherwise would have been in the absence of additional lending, the test will be biased in favor of finding a positive

estimated coefficient. The specifications also include a set of annual time dummy variables and a set of industry dummy variables to control for average changes in stock prices and the general macroeconomy from year to year and differences across industries.

The first column of Table 5 contains the results for the relationship between an increase in total loans to a firm and the subsequent change in the firm's stock price for annual stock price changes for the 1994-98 period. The observations are now at the firm level, with loans to the firm from all lender types aggregated across lenders so that there is only one observation per firm per year. Consistent with our earlier evidence, an increase in total loans to the firm is associated with a decline in the firm's stock price of about three-quarters of a percent during the subsequent year, other things equal. While the estimated effect is negative, it is not statistically significant. This may reflect the fact that during the early part of our sample period, even though Japanese banks were in poor health, most were not yet under severe pressure to meet capital requirements and to support troubled firms. For example, banks only began to report nonperforming loans in March 1993, with the values reported representing a very substantial understatement of the extent of the problems. Similarly, bank capital ratios were substantially overstated. Even those banks that eventually failed or were nationalized tended to report capital ratios above required capital ratios until the very end.

However, as the decade progressed, banks came under increased pressures. For example, it was only in the second half of 1995 that Japan experienced its first commercial bank failure in the postwar period and the Japan premium emerged in the interbank loan market (Peek and Rosengren 2001). By the end of 1995, actions began to be taken to strengthen bank supervision. While the pressures on banks ebbed and flowed, and reported measures of bank health still diverged by varying amounts from reality, certainly after 1995 Japanese banks were under more

pressure to maintain required capital ratios. Consequently, additional bankruptcies by their borrowers would have had particularly adverse consequences on the banks' reported capital ratios. Thus, banks had a stronger perverse incentive to continue the flow of credit to unhealthy firms to prevent or delay their bankruptcies, even if the firms were not ultimately economically viable.

Because we are aggregating across all lenders to a given firm, the inverse relationship between increased loans to a firm and the firm's subsequent stock price performance should be more evident as a larger share of the firm's lenders comes under severe pressure to maintain their capital ratios by supporting troubled firms to prevent or delay firm bankruptcies. As the decade progressed, banks came under increased pressures, for example, as evidenced by the emergence of the Japan premium in late 1995. Column 2 presents estimates of the stock price equation for the 1996-98 period when a larger proportion of the banks were under severe pressure to accommodate the credit needs of unhealthy firms. The estimated coefficient is now three times as large as in column 1, and statistically significant. Thus, during this period, an increase in total loans to a firm is associated with a decline in the firm's stock price of about 2.4 percent during the subsequent year, after controlling for the average change in stock prices. Furthermore, the significant negative estimated coefficient indicates that any positive bias embedded in the estimated coefficient associated with a firm's subsequent performance being improved by access to additional credit is overcome. This result suggests that lenders were not picking winners.

The results in column 3 are more to the point with respect to affiliated lenders possibly exploiting access to superior information about affiliated firms to identify those with the best prospects when making decisions to increase loans. This specification distinguishes between those banks with and without main bank relationships, as well as distinguishing between those

with and without keiretsu ties. The estimated coefficients for main banks indicate an increase in loans by these banks corresponds with a subsequent decline in firm stock prices in excess of 3 percent. The estimated effect for main banks in the same keiretsu as the firm is somewhat larger, and both estimated coefficients are statistically significant. The estimated effects for secondary lenders are much weaker, as would be expected. The estimated decline for secondary banks in the same keiretsu as the firm is less than half that for main banks and is not significant. The estimated coefficient for unaffiliated secondary banks is actually positive, although it is not significant. These results are consistent with our earlier findings, strongly suggesting that main banks were basing their lending decisions on supporting troubled affiliated firms, rather than exploiting superior information in order to direct lending to those firms with the best prospects. Furthermore, it appears that lenders in the same keiretsu tend to be more likely to support troubled firms compared to unaffiliated lenders.

The final table is intended to address why banks felt pressure to increase loans to severely impaired firms, even if the firms were not economically viable and the loans were unlikely to be profitable to the lender. The focus is on the bank supervision and regulation framework in Japan and the substantial forbearance that occurred. In particular, political concerns with addressing the undercapitalized banking system and the consequences of banks severely limiting credit to troubled firms, in terms of a surge in unemployment and firm bankruptcies, provided bank supervisors with the incentive to continue forbearance policies. The lack of transparency and the use of accounting gimmicks allowed the forbearance policies to be implemented. In particular, banks were allowed to understate their nonperforming loans and make loan loss provisions that were insufficient, resulting in bank income, and thus bank capital, being overstated, which allowed banks to continue to appear to be sufficiently capitalized. There is much evidence of

government complicity with banks in the understatement of problem loans. For example, the put options granted to Shinsei and Aozora associated with the purchases of supposedly cleaned up banks was because the government prevented the bidders from inspecting the banks' books so that the exposures of other banks with loans to the same firms would not be exposed (The Economist 2002b).

A bank is forced to classify a loan as nonperforming when the borrower has failed to make interest payments for more than three months, the loan is restructured, or the firm declares bankruptcy. Thus, the bank can avoid a mandatory increase in its reported nonperforming loans as long as it makes sufficient credit available to the firm to enable it to make interest payments on the outstanding loans from the bank and to avoid declaring bankruptcy. However, given the low interest rate environment in Japan, it does not require substantial amounts of new credit to enable troubled firms to make their interest payments so as to remain alive. Of course, this is only a short-term fix, insofar as the firm is not economically viable and eventually defaults on the loan.

As a bank's reported risk-based capital ratio nears the required capital ratio (8 percent for internationally active banks and 4 percent for domestic banks), the incentive for the bank to make credit available to troubled firms to prevent, or at least delay, their bankruptcy increases. Thus, we would expect to observe banks with capital ratios just above their required capital ratio to be more likely to make loans to troubled firms. This hypothesis can be tested by examining the extent to which banks became more likely to increase loans as their reported risk-based capital ratio approached their capital requirement. Such behavior would be in sharp contrast to the more typical response of a bank shrinking loans in order to increase its capital-to-assets ratio by reducing its risk-weighted assets.

The estimated equation is based on the equation (1) specification, with the addition of interactive explanatory variables that allow for a differential effect when a bank's reported capital ratio is near its required capital ratio. Two risk-based capital thresholds are considered. REQ1 is a (0,1) dummy variable that has a value of one if the bank's risk-based capital ratio is less than 1 percentage point above the bank's required capital ratio. REQ2 is a (0,1) dummy variable that has a value of one if the bank's risk-based capital ratio is between 1 and 2 percentage points above the bank's required capital ratio. Each bank's required capital ratio, either 4 or 8 percent, is based on the classifications of Japanese banks as international, domestic, or "switcher" banks by Montgomery (2001).

To conserve space, Table 6 shows only the results for the REQ1 and REQ2 interaction variables, rather than for the full set of explanatory variables. Both for the full sample and for the sample omitting the observations with extreme values of the regressors, both REQ1 and REQ2 have estimated coefficients that are highly significant. As expected, banks with reported capital ratios close to the required ratios are more likely to increase loans to firms, with the estimated coefficients on REQ1 being larger than those on REQ2. Furthermore, for the full sample, the estimated coefficients on FROA and FLIQA interacted with REQ1 and REQ2 are each negative, with REQ1*FLIQA and REQ2*FLIQA being significant at the 5 percent level and REQ1*FROA being significant at the 10 percent level, indicating that the perverse relationship with weaker firm performance being associated with a higher probability of increased loans from banks is even stronger for those banks with reported capital ratios near the required capital thresholds. This is consistent with increased evergreening of loans by banks with reported capital ratios close to the required threshold.

For the sample omitting the observations with extreme values, both REQ1 and REQ2 have estimated coefficients that are highly significant, with the REQ1 effect again being larger than that for REQ2. However, the evidence that the perverse relationship between the likelihood of increased bank loans and firm health is even stronger for these lenders is weaker, with the estimated coefficients on REQ1*FROA, REQ1*FLIQA, and REQ2*FSALES being significant only at the 10 percent level. Still, this table provides strong evidence that the cosmetic balance sheet effect is quite strong, insofar as those banks with reported capital ratios close to the required minimums are more likely to increase credit to firms, with somewhat weaker evidence that they are more likely than other banks to increase credit to firms the weaker is firm health.

The results in Table 6 are striking, insofar as any test relying on accounting data, given the well-known overstatement of bank capital ratios in Japan, has to be a weak test. The estimated coefficients are measuring a differential effect relative to all other banks, even though we know that many of the banks with reported capital ratios that are more than 2 percentage points above their required capital ratio are economically undercapitalized. Banks are able to overstate their capital by understating the problems in their loan portfolios. For example, a study by the Nikkei newspaper found that nearly 75 percent of loans to Japanese firms that declared bankruptcy in 2000 had been classified as sound or merely in need of monitoring (The Economist 2001).

Of course, the substantial overstatement of Japanese bank capital ratios is not news. Bank of Japan Governor Masaru Hayami told parliament that the capital ratios of Japanese banks in March 2001 would have been only 7 percent rather than the reported 11 percent had they been held to the U.S. standards of capital adequacy (Dvorak 2001). An even lower, and likely more prudent, estimate of the state of capitalization of Japanese banks is that the reported 10 percent

capital ratios of the big banks represents a capital ratio of only about 2 percent once the public

funds injected into the banks, the value of deferred taxes, and the "profits" from the revaluation

of real estate holdings are subtracted from the banks' capital (The Economist 2002).

It appears that the FSA may be getting tougher on banks, given the results of the recent

FSA inspections of banks and their problem borrowers. Based on the inspections, 34 of the 149

firms were reclassified as being "in danger of bankruptcy," requiring banks to make loan loss

provisions equal to 70 percent of the value of the loans rather than only 15 percent for loans "in

need of monitoring." As a result, banks have had to substantially increase their loan loss

provisions, yet the required provisions were not large enough to reduce the capital ratios of any

of the top 13 financial institutions below the required capital ratio (Pilling 2002). Thus, even

now, it appears that the accounting games continue.

V.   Conclusions

This study has presented strong evidence that main bank and keiretsu affiliations have

affected the allocation of credit in Japan during the 1990s, when both firms and banks were

severely troubled. However, rather than lenders exploiting their superior information about

affiliated firms to make additional loans to those firms with the best prospects, they were more

likely than nonaffiliated lenders to provide additional loans to firms as firm health deteriorated.

In addition, the results indicate that banks have practiced the evergreening of loans, particularly

to affiliated borrowers. It also appears that Japanese banks may have been responding to

government pressure to avoid a credit crunch or a precipitous decline in economic activity by

extending credit to troubled firms. By supporting the weakest firms rather than those with the

best prospects, these lenders have misallocated credit.

Just as forbearance by bank regulators has allowed the banks to be slow to restructure, bank support for troubled and noncompetitive firms has prevented the needed restructuring of nonfinancial firms. Thus, while the strong corporate affiliations in Japan insulated many severely troubled Japanese firms from market forces and may have prevented a capital crunch, those same relationships nonetheless exacerbated economic problems for the economy by promoting the allocation of an increasing share of bank credit to many of the firms least likely to use it productively. To the extent that corporate affiliations led to credit being allocated to firms with poor prospects, the economic recovery would be hampered. Thus, by insulating troubled (and perhaps insolvent) firms from market forces that would force either a major restructuring or bankruptcy of the firms, the misallocation of credit would severely hinder the economic recovery and prolong the malaise, consistent with the lost decade of the 1990s. Furthermore, such a misallocation of credit, by inhibiting the needed restructuring of the economy, would adversely impact the long-run growth prospects of the Japanese economy.

REFERENCES

Dvororak, Phred. 2001. "Japan's Banks Face Debate on What Counts as Capital." The Wall Street Journal, November 20, C1.

Gibson, Michael S. 1995. "Can Bank Health Affect Investment? Evidence from Japan." Journal of Business, 68, July, 281-308.

Hall, Brian J. and David E. Weinstein. 2000. "Main Banks, Creditor Concentration, and the Resolution of Financial Distress in Japan." In Masahiko Aoki and Gary R. Saxonhouse, eds., Finance, Governance, and Competitiveness in Japan. New York: Oxford University Press, 64-80.

Hoshi, Takeo and Anil Kashyap. 1999. "The Japanese Banking Crisis: Where Did It Come From and How Will It End?" in Ben Bernanke and Julio Rotemberg, eds., NBER Macroeconomics Annual 1999. Cambridge: MIT Press.

Hoshi, Takeo and Anil Kashyap. 2001. Corporate Financing and Governance in Japan. Cambridge, MA: The MIT Press.

Hoshi, Takeo, Anil Kashyap and David Scharfstein. 1990. "The Role of Banks in Reducing the Costs of Financial Distress in Japan." Journal of Financial Economics, 27, 67-88.

Hoshi, Takeo, Anil Kashyap and David Scharfstein. 1991. "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups." Quarterly Journal of Economics, 106, 33-60.

Hoshi, Takeo, Anil Kashyap and David Scharfstein. 1993. "The Choice Between Public and Private Debt: An Analysis of Post-Deregulation Corporate Financing in Japan." Manuscript.

Kang, Jun-Koo and Anil Shivdasani. 1995. "Firm Performance, Corporate Governance, and Top Executive Turnover in Japan." Journal of Financial Economics, 38, 29-58.

Kang, Jun-Koo and Anil Shivdasani. 1997. "Corporate Restructuring During Performance Declines in Japan." Journal of Financial Economics, 46, 29-65.

Kang, Jun-Koo and Rene M. Stultz. 2000. Do Banking Shocks Affect Borrowing Firm Performance? An Analysis of the Japanese Experience." Journal of Business, 73, 1-23.

Kaplan, Steven N. and Bernadette Minton. 1994. "Appointments of Outsiders to Japanese Corporate Boards: Determinants and Implications for Managers." Journal of Financial Economics, 36, 225-58.

Klein, Michael W., Joe Peek, and Eric S. Rosengren. 2002. "Troubled Banks, Impaired Foreign Direct Investment: The Role of Relative Access to Credit." The American Economic Review, June, forthcoming.

Milhaupt, Curtis J. 2001a. "Creative Norm Destruction: The Evolution of Nonlegal Rules in Japanese Corporate Governance." University of Pennsylvania Law Review, 149, 2083-2129. Milhaupt, Curtis J. 2001b. "On the (Fleeting) Existence of the Main Bank System and Other Japanese Economic Institutions." The Center for Law and Economic Studies, Columbia University, Working Paper No. 194, November.

Miwa, Yoshiro and J. Mark Ramseyer. 2001a. "The Fable of the Keiretsu." The Harvard John M. Olin Center Discussion Paper No. 316, March.

Miwa, Yoshiro and J. Mark Ramseyer. 2001b. "The Myth of the Main Bank: Japan and Comparative Corporate Governance." The Harvard John M. Olin Center Discussion Paper No. 333, September.

Montgomery, Heather. 2001. "The Effect of the Basel Accord on Bank Portfolios in Japan." Manuscript presented at NBER Japan Group meeting, Tokyo, September.

Morck, Randall and Masao Nakamura. 1999. "Banks and Corporate Control in Japan." Journal of Finance, 54, 319-39.

Morck, Randall, Masao Nakamura, and Anil Shivdasani. 2000. "Banks, Ownership Structure and Firm Value in Japan." Journal of Business, 73, 539-67.

Peek, Joe and Eric S. Rosengren. 1997. "The International Transmission of Financial Shocks: The Case of Japan." The American Economic Review, 87, September, 495-505.

Peek, Joe and Eric S. Rosengren. 2000. "Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States." The American Economic Review, 90, March, 30-45.

Peek, Joe and Eric S. Rosengren. 2001. "Determinants of the Japan Premium: Actions Speak Louder Than Words." Journal of International Economics, 53, 285-305.

Petersen, Mitchell A. and Raghuram G. Rajan. 1994 "The Benefits of Lending Relationships: Evidence from Small Business Data." Journal of Finance, 49, March, 3-38.

Pilling, David. 2002. "Japanese Banks in 'Intensive Care,' says FSA." Financial Times, April 13-14.

Singer, Jason and Phred Dvorak. 2001. "Shinsei Bank Pressured to Keep Shakey Loans." The Wall Street Journal, September 26, C1.

Tett, Gillian and David Ibison. 2001. "Tokyo 'May Have to Support Banks'." Financial Times, September 14.

The Economist. 2001. "Mere Fiddling." June 30, 69.

The Economist. 2002a. "Surreal." April 20, 74.

The Economist. 2002b. "Nationalized Once, Nationalized Again?" July 6, 71.

Weinstein, David E. and Yishay Yafeh. 1995. "Japan's Corporate Groups: Collusive or Competitive? An Empirical Investigation of Keiretsu Behavior." Journal of Industrial Economics, 43, December, 359-76.

Weinstein, David E. and Yishay Yafeh. 1998. "On the Costs of a Bank-Centered Financial System: Evidence from the Changing Main Bank Relations in Japan." Journal of Finance, 53, 635-72.

Table 1
Bonds and Loans as a Percent of Assets, Mean Values

	All Firms		Keiretsu Firms		Non-Keiretsu Firms	
	1993	1999	1993	1999	1993	1999
Bonds	10.12	7.11	10.70	8.28	9.71	6.34
Loans	18.44	19.87	21.79	23.24	16.12	17.63
Same-Keiretsu Loans			7.04	8.07		
Bank Loans	15.03	16.55	17.48	18.83	13.33	15.03
Main Bank Loans	4.46	5.43	4.98	6.11	4.10	4.97
Nonbank Loans	1.37	1.36	1.71	1.79	1.14	1.08
Government Loans	2.04	1.96	2.60	2.63	1.65	1.52

Table 2
Descriptive Statistics for Regressors, Market-Traded Bank Sample, 1993-99

	Mean	Std Dev	Min	Max
KEIR	0.513	0.500	0	1
PK	12.073	16.443	0	88.300
MBLFD	7.135	6.435	0	75.265
MBPCPR	-7.283	23.862	-55.915	57.783
FROA	2.842	2.923	-18.644	24.022
FLIQA	34.061	15.082	0.823	96.198
FSALES	1.708	10.230	-82.763	155.572
BPCPR	-7.464	22.871	-64.746	128.835
MBANK	0.073	0.260	0	1
SAMEK	0.066	0.249	0	1
FLASSET	7.356	1.513	2.750	11.202
FENBMKT	0.014	0.118	0	1
FINBMKT	0.731	0.443	0	1
FEXBMKT	0.037	0.189	0	1

Table 3
Factors Affecting the Probability of Increased Bank Lending
Logit Specification

	Full Sample	Extreme Observations Eliminated
KEIR	0.051	0.054
	(0.045)	(0.051)
PK	-0.005**	-0.006**
	(0.002)	(0.002)
MBLFD	0.007	0.019**
	(0.005)	(0.007)
MBPCPR	-0.001	-0.001
	(0.001)	(0.001)
FROA	-0.060**	-0.063**
	(0.011)	(0.011)
FLIQA	-0.014**	-0.013**
	(0.003)	(0.003)
FSALES	0.008**	0.009**
	(0.002)	(0.002)
BPCPR	0.001	0.002
	(0.003)	(0.003)
MBANK	0.859**	0.816**
	(0.074)	(0.084)
MB*KSAME	-0.616**	-0.600**
	(0.146)	(0.152)
MB*KEIR	0.270	0.290*
	(0.153)	(0.147)
MB*PK	0.002	0.002
	(0.003)	(0.003)
MB*MBLFD	0.003	0.004
	(0.005)	(0.006)
MB*FROA	-0.031**	-0.029**
	(0.010)	(0.007)
MB*FLIQA	-0.005*	-0.004
	(0.002)	(0.002)
MB*FSALES	-0.002	-0.004
	(0.002)	(0.003)
MB*BPCPR	-0.002	-0.003
	(0.001)	(0.002)
SAMEK	0.470**	0.493**
	(0.115)	(0.114)
SK*PK	-0.003**	-0.003**
	(0.001)	(0.001)
SK*MBLFD	-0.003	-0.001
	(0.003)	(0.004)
SK*MBPCPR	0.002	0.001
	(0.001)	(0.001)
SK*FROA	0.003	-0.002
	(0.014)	(0.013)
SK*FLIQA	0.002	0.001
	(0.003)	(0.002)
SK*FSALES	-0.007*	-0.007*
	(0.003)	(0.003)
SK*BPCPR	-0.005*	-0.004
	(0.002)	(0.002)
Number of Observations	99976	97358
Log Likelihood	-53576	-52133

Notes: The estimated equations also include FLASSET, FENBMKT, FINBMKT, FEXBMKT, a set of industry dummy variables, and a set of annual dummy variables. The set of estimated coefficients for secondary banks not in the same keiretsu is the base, with the estimated coefficients for all other types of

lenders representing differential effects. Below each estimated coefficient, we report the associated robust standard error calculated by relaxing the assumption of independence of the errors for a given year.

*   Significant at the 5 percent level.
** Significant at the 1 percent level.

Table 4
Factors Affecting the Probability of Increased Lending, By Type of Lender
Logit Specification; Omitting Extreme Observations

	Main Bank Same K	Main Bank Not same K	Secondary Same K	Secondary Not same K	Nonbank Same K	Nonbank Not same K	Government
Intercept	0.299	0.275	-0.064	-0.696**	-0.261	-0.950**	-0.961**
	(0.261)	(0.245)	(0.323)	(0.225)	(0.320)	(0.313)	(0.282)
KEIR		0.449**		0.007		0.383**	0.410**
		(0.133)		(0.041)		(0.140)	(0.081)
PK	-0.005*	-0.008	-0.009**	-0.005**	-0.012**	-0.012*	-0.008**
	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)	(0.005)	(0.003)
MBLFD	0.020	0.029**	0.026**	0.022**	0.011	0.005	-0.008
	(0.011)	(0.005)	(0.007)	(0.007)	(0.009)	(0.007)	(0.006)
MBPCPR	-0.004	-0.002	-0.001	0.000	-0.008**	-0.002	-0.004*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.002)
FROA	-0.090**	-0.097**	-0.074**	-0.061**	-0.063*	-0.016	-0.045**
	(0.025)	(0.009)	(0.017)	(0.011)	(0.026)	(0.010)	(0.012)
FLIQA	-0.011*	-0.018**	-0.012**	-0.011**	-0.006*	-0.005	-0.010**
	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
FSALES	-0.000	0.005	0.001	0.009**	0.008*	0.007	0.003
	(0.007)	(0.004)	(0.003)	(0.002)	(0.003)	(0.005)	(0.003)
Number of Observations				142518			
Log Likelihood				-74864			

Notes: The estimated equations also include FLASSET, FENBMKT, FINBMKT, FEXBMKT, a set of industry dummy variables, and a set of annual dummy variables. Below each estimated coefficient, we report the associated robust standard error calculated by relaxing the assumption of independence of the errors for a given year.

* Significant at the 5 percent level.
** Significant at the 1 percent level.

Table 5
Loan Increases and the Subsequent Change in Stock Prices
Ordinary Least Squares Estimation

	1994-98	1996-98	1996-98
	-0.775	-2.433**	
Total Loans	(1.224)	(0.760)	
Main Bank-Same Keiretsu			-3.463*
			(1.390)
Main Bank-Not Same Keiretsu			-3.042**
			(1.011)
Secondary Bank-Same Keiretsu			-1.489
			(2.060)
Secondary Bank-Not Same Keiretsu			0.684
			(1.158)
Number of Observations	4783	2887	2887
R^2	0.422	0.478	0.479

Notes: Each equation also includes a set of annual time dummy variables and a set of industry dummy variables. Below each estimated coefficient, we report the associated robust standard error calculated by relaxing the assumption of independence of the errors for a given year.

* Significant at the 5 percent level.
** Significant at the 1 percent level.

Table 6
The Role of Balance Sheet Cosmetics on Bank Lending
Logit Specification

	Full Sample	Extreme Observations Eliminated
REQ1	0.346**	0.356**
	(0.124)	(0.128)
REQ2	0.224**	0.211**
	(0.071)	(0.072)
REQ1*FROA	-0.024	-0.023
	(0.014)	(0.013)
REQ2*FROA	-0.002	0.003
	(0.007)	(0.011)
REQ1*FLIQA	-0.006*	-0.006
	(0.003)	(0.003)
REQ2*FLIQA	-0.003*	-0.003
	(0.002)	(0.002)
REQ1*FSALES	0.002	0.001
	(0.002)	(0.003)
REQ2*FSALES	-0.002	-0.005
	(0.003)	(0.003)
Number of Observations	96565	94074
Log Likelihood	-52040	-50635

Notes: The estimated equation also includes the set of explanatory variables included in the Table 3 specification. Below each estimated coefficient, we report the associated robust standard error calculated by relaxing the assumption of independence of the errors for a given year.

*   Significant at the 5 percent level.
**   Significant at the 1 percent level.