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Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan

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Abstract

This study examines the misallocation of credit in Japan associated with the perverse incentives faced by banks to provide additional credit to the weakest firms. We find that Japanese firms are more likely to receive additional bank credit if they are in poor financial condition. This occurs because troubled Japanese banks have an incentive to allocate credit to severely impaired borrowers in order to avoid the realization of losses on their own balance sheets. Furthermore, this evergreening behavior is more prevalent among banks that have reported capital ratios close to the required minimum. This problem is compounded by extensive corporate affiliations, which provide a further incentive for banks to allocate scarce credit based on considerations other than prudent credit risk analysis.
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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 little evidence of returning to the robust health that characterized most of its postwar history. This study investigates an important contributing factor to this economic malaise: the misallocation of credit by banks. Japanese banks have incentives to continue making credit available to the weakest firms, many of which already are economically insolvent, insulating those firms from market forces that otherwise would force the restructuring or bankruptcy of those firms.

In sharp contrast to the bank capital crunch experience in the United States in the early 1990s when troubled banks quickly shrank their loan portfolios in order to increase their capital ratios, domestic bank loans in Japan continued to increase until the mid 1990s. This occurred, in part, because bank regulation and supervision policies in Japan provide banks that have significant nonperforming loans and impaired capital little incentive to be strict with troubled borrowers. Troubled banks effectively are faced with a threat of mutually assured destruction by their unhealthy borrowers. If the banks do not provide additional loans to their weakest borrowers, those borrowers will not be able to make the interest payments required to keep their loans current and may even be forced into bankruptcy, in either case requiring banks to increase their reported problem loans. Thus, it is in the self-interest of troubled 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 reported capital. This leads to a policy of

banks "evergreening" loans, whereby a bank extends additional credit to a troubled firm to enable the firm to make interest payments on outstanding loans in order to 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.

Although banks have an incentive to evergreen loans, their ability to aggressively pursue such policies requires government complicity. The government, faced with a growing budget deficit and a voting public weary of funding bank bailouts, has an incentive to allow, or even encourage, 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.[1] In fact, the evidence of such government complicity is widespread. 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). Similarly, the put options granted to Shinsei and Aozora associated with the purchases of supposedly cleaned up banks were awarded to the buyers of the failed banks 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). Finally, it appears that almost one-half of the public funds injected into the banking system in 1998 and 1999 were allowed to be passed on to troubled construction companies in the form of debt forgiveness (Tett and Ibison 2001). Importantly, government policies that permit the use of accounting gimmicks, in combination with a lack of transparency, have allowed bank supervisors to implement forbearance policies that have allowed banks to understate their problem loans and overstate their capital so that they have appeared to be sufficiently capitalized. Our evidence is consistent with the government being unwilling to force

recognition of asset quality problems in bank portfolios in an attempt to limit costly bailouts of the banking sector and additional firm closures.

Using detailed data on loans from individual lenders to individual firms, we show that the misallocation of bank credit reflects a general problem with the incentives of banks to continue lending to their most troubled borrowers. Additional credit is far more likely for deeply troubled firms, which continue to perform poorly after receiving additional credit. Furthermore, banks with reported capital ratios close to their required ratios are even more likely to make loans to the weakest firms. However, this misallocation of credit is far less prevalent for lenders without strong corporate affiliations with borrowers, as well as for nonbank lenders relative to banks. While resolving this misallocation of credit will result in substantial short-term pain, requiring the realization of losses at banks and asset sales in already depressed markets as well as possibly widespread bankruptcies of listed firms, the resulting wave of creative destruction should finally set the stage for a sustained recovery of the Japanese economy.

The rest of the study is as follows. The next section provides some background on the role of banks in allocating credit in the Japanese economy. The second section discusses the perverse incentives affecting bank lending behavior. The third section describes the data and empirical results. The final section provides our conclusions.

I. The role of banks in allocating credit in Japan

Banking relationships in Japan are far more important than in the United States. While the U.S. is characterized as a market-centered economy, Japan is considered to be a bank-centered economy. Japanese firms rely more on bank debt than firms in the United States, although bond financing in Japan has become increasingly important over the past decade (Hoshi

and Kashyap 1999). But the differences go deeper than simply the relative importance of relationship versus arm's length financing in the two countries. The relationships between banks and firms in Japan are much stronger, being characterized by main bank relationships, as well as, in many instances, additional ties arising from the lending bank being in the same keiretsu group as the firm. Furthermore, Japanese capitalism differs from the style prevalent in the United States, especially when it comes to the allocation of credit. 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). In fact, when foreign-owned Shinsei Bank was not deemed to be behaving properly in supporting troubled firms, Financial Services Agency (FSA) bureaucrats told Shinsei that it was government policy for banks to support category two (troubled but operating) firms, however risky they might be (Tett 2003). Thus, many bank lending decisions are guided by the perceived national duty of banks to support troubled firms, rather than being a result of the careful credit risk analysis that would dominate the decision were a profit maximization motive the primary consideration.

The firm-main bank relationship in Japan is solidified in a number of ways. 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 the affiliated firm's management and alter its board of directors (Kang and Shivdasani 1995; Morck and Nakamura 1999). This oversight provided by the bank can reduce typical information asymmetries, resulting in firms 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 bank-firm affiliations have found significant benefits. These studies emphasized the unique features of Japanese bank affiliations that reduced agency costs (Hoshi, Kashyap, and Scharfstein 1993; Hoshi, Kashyap, and Scharfstein 1990). Banks with intertwined business relationships, shareholding relationships, board of directors relationships, and financing relationships with their loan customers should have substantially more information about those firms 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 the close affiliations of Japanese banks with their borrowers, 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). In particular, if the primary role of bank 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 as a misallocation of credit.

The Sogo Saga: An attempt at business as usual

The events leading up to the Sogo bankruptcy provide a prime example of the misallocation of credit by Japanese banks as they evergreened loans and tried to keep a large insolvent borrower alive so that the banks could continue understating (and thus underreserving for) their problem loans. While the official declaration of bankruptcy by Sogo in 2000 may have come as a surprise to some, that Sogo was in extremely poor health (and likely insolvent) certainly was no surprise. As Table 1 shows, Sogo's annual sales growth had turned negative in 1992 and stayed that way to the end, with the exception of 1997.[2] Still, column 2 of Table 1 shows that banks continued to increase their exposure, either out of perceived obligations from long-term relationships, protecting their own balance sheet from the adverse effects of a Sogo bankruptcy, or from government pressure to prevent bankruptcies, especially of the largest firms.[3] Columns 3 and 4 show that as Sogo's health continued to deteriorate, bank loans to Sogo became even more concentrated among the banks that already had the largest exposures, and thus were in the best position to know the true state of Sogo's health. Given that Sogo eventually wrote off 59 percent of its assets in March 2000, it is hard to believe that these banks thought that they were making positive net present value loans to Sogo over all of these years.

Why did the fiction of a viable Sogo come to an end? Tougher accounting rules came into effect in fiscal year 1999 forcing Sogo to reveal a substantial negative net worth. Consequently, Sogo asked for debt forgiveness, and its main bank, IBJ was able to obtain agreement from nearly all of Sogo's lenders. However, foreign-owned Shinsei, the successor of Long-Term Credit Bank and the number two lender to Sogo, refused to go along with the rescue. Shinsei did not face the same incentives to evergreen loans because the government had granted it the right to put bad loans back to the Deposit Insurance Corporation as part of the LTCB

purchase agreement. Shinsei put the loans back to the government and the Financial Reconstruction Commission, the same organization that had declared Sogo's loans as good enough to transfer to Shinsei when it purchased LTCB, agreed to the debt waiver plan, again showing government complicity in hiding the severity of the banking problems. The plan collapsed, and Sogo was forced into bankruptcy, only after public pressure after it became known that taxpayers would be footing part of the bill due to the Deposit Insurance Corporation forgiving part of the loans transferred to it from Shinsei.

The puzzling response of banks to the capital crisis

As banks came under increasing pressure in meeting capital ratio requirements during the 1990s, 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). Although the domestic Japanese economy was insulated from declining bank loans initially, domestic bank loans began to decline by the mid 1990s.[4]

To the extent that the deteriorating health of Japanese banks during the 1990s impaired their ability to satisfy the credit needs of their loan customers, one might expect that many firms would rely increasingly on alternative sources of credit. In particular, one might expect to observe an acceleration of the shift to bond finance that had occurred in response to the easing of government restrictions on the ability of Japanese firms to issue bonds that began in the mid-1970s (Hoshi and Kashyap 2001). However, the shift to bond finance and away from bank finance by Japanese firms did not continue during the 1990s, even as the bad loan problems at banks intensified.

Table 2 presents information on the extent to which Japanese firms that are listed on either the first or second section of the Tokyo stock exchange rely on bonds and loans to finance their operations. The numbers in the table are the mean values for each liability category calculated as a percent of firm debt (defined as the sum of bonds and total loans) for each year of our 1993 to 1999 sample period. One of the more striking results in the table is that during this time of severe problems in the banking sector, firms systematically increased their reliance on loans relative to bonds. Panel A contains information on the set of all firms and of the subset of firms with bonds outstanding at the beginning of the year; that is, firms that were "in" the bond market. As one might imagine, the decline in the relative reliance on bonds is less pronounced for firms in the bond market than for the set of all firms.

One possible explanation for the shift from bond finance to bank finance by many firms at a time when banks were under severe pressure from the deteriorating quality of their loan portfolios is that banks were attempting to increase the quality of their loan portfolios by increasing their exposure to firms that had performed well enough to enter the bond market. In particular, by using the superior information acquired from main bank and keiretsu affiliations with the firms, banks could "cherry pick" among the better quality firms that had access to the bond market. However, the patterns exhibited in Panel B are not consistent with such a story. Using each firm's return on assets (ROA), measured as operating income divided by assets, during the prior year as a measure of firm health, we see that the decrease in the relative reliance on bonds was much more dramatic for the worst performing quartile of firms. It is also apparent that the composition of the increase in the relative reliance on loans differs between the top and bottom quartiles of firms. The weakest firms increased their reliance on bank loans, while the

increase in reliance on loans by the healthiest quartile of firms was concentrated primarily in nonbank loans rather than bank loans.

Table 3 presents an alternative perspective on the extent to which banks were cherry picking among the better quality firms. If they were doing so, then one would expect that the set of firms obtaining additional bank loans would tend to outperform the average firm. Table 3 presents evidence on the relationship between a firm obtaining increased bank finance and its subsequent performance. The observations used for this analysis are at the firm level, with loans to a given firm from all lenders of a given category aggregated across lenders so that there is one observation per firm per year per row in the table. Each row indicates the percent of firms that obtained an increase in loans (of that loan category) whose stock returns in the subsequent year fell into each stock return quartile. If the subsequent performance of those firms was randomly distributed, then each quartile should contain 25 percent of the firms obtaining increased loans in the prior year. On the other hand, if banks were cherry picking the best firms as loan customers, then a disproportionately large share of the firms should appear in the top quartile and a disproportionately low share should appear in the bottom quartile.

For each loan category, the table contains two rows. The first row is for the early part of our sample (1994-95) when banks were under relatively less pressure to evergreen loans. The second row is for the 1996-98 period, when a larger proportion of the banks were under severe pressure to improve the quality of their loan portfolios. The most striking pattern in the table is the change that occurs between the two subperiods. During the early subperiod, it appears that firms obtaining additional bank loans are spread relatively evenly across the quartiles. However, during the latter subperiod, a clear pattern emerges whereby those firms obtaining additional bank loans are more likely to be in the lower quartile of stock returns and less likely to be in the

top quartile. The specific subcategories of loans in the remainder of the table show similar contrasts between the two subperiods. Furthermore, this inverse relationship between the likelihood of obtaining increased bank loans and subsequent firm health is strong enough to overcome any positive bias associated with a firm's subsequent performance being improved by access to additional bank loans.

The results in both Tables 2 and 3 are not consistent with banks picking winners, perhaps by exploiting superior information in order to direct lending to those firms with the best prospects. Rather, it appears that banks were basing their lending decisions on supporting troubled firms, many of which may have been returning to bank (relationship) credit as they were priced out of the (arm's length) bond market.

II. Perverse incentives associated with the banking crisis

The primary hypothesis investigated in this study is that it is in the self-interest of banks to follow a policy of forbearance with their problem borrowers in order to avoid having to report impaired loans as nonperforming, as long as bank regulators do not strictly enforce loan quality standards. 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.[5] Consequently, a bank may continue lending to troubled firms to provide sufficient financing to keep otherwise economically bankrupt firms afloat. This "evergreening" of loans benefits the firm because it can avoid (or at least delay) bankruptcy. It also enables the bank to avoid (or delay) a further increase in its reported nonperforming loans, so that the bank does not have to make additional loan charge offs and loan loss provisions, which would reduce the 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.[6] And, 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.

This discussion suggests several related hypotheses about Japanese bank lending behavior during the 1990s. The "evergreening" hypothesis is that Japanese banks acted in their own self interest by making additional loans to weak firms to avoid having to declare existing loans as nonperforming. This hypothesis would be supported by evidence that weaker firms were more likely to obtain additional loans.[7] The "balance sheet cosmetics" hypothesis is that the incentive for a bank to make additional credit available to troubled firms to which the bank already has loans outstanding increases as the bank's reported risk-based capital ratio nears its required capital ratio. That is, it is the appearance rather than the reality of adequate capital that is important, even though it is widely believed that Japanese bank capital ratios are substantially overstated.[8] This hypothesis can be tested by examining the extent to which a bank became more likely to increase loans, especially to the weakest firms, as its reported risk-based capital ratio approached its capital requirement. Such behavior would be in sharp contrast to the typical response of troubled U.S. banks that shrank their loan portfolios in order to increase their (risk-based) capital-to-assets ratio. Finally, we test the "affiliation" hypothesis that corporate affiliations, in the form of main bank and same-keiretsu ties, increase the likelihood that a bank will increase loans, with the probability being greater the weaker the affiliated firm.

The basic equation for the hypothesis tests provides estimates for the contributions of bank and firm health to the probability that a bank increases credit to a firm, controlling for other

firm and bank characteristics, using the following probit equation that is estimated using a firm random effects specification:

$$\Pr(LOAN_{i,j,t}) = a_0 + a_1 FIRM_{i,j,t-1} + a_2 BANK_{i,j,t-1} + a_3 CAPREQ_{i,j,t-1} + a_4 AFFIL_{i,j,t-1} + a_5 TIME_{i,j,t} + u_{i,j,t} \quad (1)$$

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. Thus, for a given firm (i), the regression sample will contain in each year (t) one observation for each bank (j) from which the firm borrows in that year. 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. In addition to total loans, as a robustness test we also consider specifications for the subset of long-term loans.

FIRM is a vector of variables intended to capture firm health and other characteristics of the firm that are unrelated to its corporate affiliations with lenders, including controlling for loan demand. Two of the variables included in this vector, return on assets (FROA) and net working capital (FWORKCAP), are intended to reflect the degree of immediate financial stress under which the firm is operating. These two measures should be related particularly to incentives for firms to request, and banks to grant, evergreening loans to the firm. FROA is measured as the firm's operating income as a percent of its total assets for the prior year. FWORKCAP is

measured as the firm's current assets less current liabilities as a percent of total assets for the prior year.

We also include in FIRM two measures of the stock market's (relative) perception of firm health. We first calculate the percentage return on each firm's equity, including dividend payments, over the prior year.[9] We then create two (0,1) dummy variables: FRETLO, which takes on a value of one if the firm's stock return is in the lowest one-third among all firms in our sample in that year, and zero otherwise; and FRETHI, which takes on a value of one if the firm's stock return is in the highest one-third, and zero otherwise. Thus, the estimated coefficients on these two measures will reflect differential effects relative to the firm being in the middle one-third in firm stock return performance during the prior year.[10]

We also control for other firm characteristics, including the choice of capital structure, firm size and loan demand. To control for capital structure, we use a measure of the firm's leverage (FLEV), calculated as the firm's total (non-equity) liabilities as a percent of the firm's total assets. Firm size is measured as the logarithm of the firm's total real assets (FLASSET). Shifts in the firm's loan demand are measured by the percent change in the firm's sales (FSALES) over the prior year and 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). We also include a set of nine industry dummy variables. While the set of industry dummy variables should help control for shifts in loan demand at a more aggregated level, FSALES and 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.

BANK is a vector of variables intended to capture bank health, the exposure of the bank to the firm, and other bank characteristics not associated with bank-firm affiliations. For bank

health, we again use a relative measure based on each bank's stock return performance. We first calculate the percentage return on each bank's equity over the prior year, including dividend payments. We then create two (0,1) dummy variables: BRETLO, which takes on a value of one if the bank's stock return is in the lowest one-third among all banks in our sample in that year, and zero otherwise; and BRETHI, which takes on a value of one if the bank's stock return is in the highest one-third, and zero otherwise. Thus, the estimated coefficients on these two measures will reflect differential effects relative to the bank being in the middle one-third in stock return performance during the prior year.[11]

BEXPOSE measures the bank's exposure to the firm in the prior year. It is calculated as bank j's loans to firm i as a percent of total loans to firm i by all banks. We also include a set of (0,1) dummy variables for bank type. TRUST takes on a value of one if the bank is a trust bank, and zero otherwise. LTCREDIT takes on a value of one if the bank is a long-term credit bank, and zero otherwise. REGION I takes on a value of one if the bank is a first tier regional bank, and zero otherwise. REGION II takes on a value of one if the bank is a second tier regional bank, and zero otherwise. Thus, the estimated coefficients will reflect differential effects relative to the base group composed of city banks.

The CAPREQ vector includes a measure related to the deviation of a bank's reported risk-based capital ratio from its required capital ratio. As a bank's reported capital ratio approaches its required capital ratio, the bank comes under more pressure to avoid or delay having additional loans being declared as nonperforming. Thus, the bank has an even stronger incentive to evergreen loans to its current customers. REQ2 is a (0,1) dummy variable that has a value of one if the bank's reported risk-based capital ratio is less than 2 percentage points above the bank's required capital ratio. Each bank's required capital ratio is based on its classification

as an international (8 percent), a domestic (4 percent), or a "switcher" bank by Montgomery (2001).

In addition to including REQ2, the CAPREQ vector also includes REQ2 interacted with the two measures of firm financial stress that are related to the possible need for evergreening loans from its banks: FROA and FWORKCAP. While REQ2 allows for a differential effect emanating from a bank being close to its required capital ratio, the interaction terms allow for any enhanced incentive that banks have to make additional loans to a firm based on the degree to which the firm is under immediate financial stress. It should be noted that the estimated coefficients will be biased against finding a significant effect, insofar as the test relies on reported capital ratios that are known to be an overstatement of the underlying economic capital ratios. The estimated coefficients measure 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.

AFFIL is a vector of variables reflecting group affiliations. The first four measures are related to the firm's main bank. MBANK is a (0,1) dummy variable that has a value of one if the bank is the firm's main bank. The next two variables reflect the relative health of the firm's main bank in the prior year. MBRETLO takes on a value of one if the stock return of the firm's main bank is in the lowest one-third among all banks in our sample in that year, and zero otherwise. MBRETHI takes on a value of one if the stock return of the firm's main bank is in the highest one-third, and zero otherwise. Thus, the estimated coefficients on these two measures will reflect differential effects relative to the main bank being in the middle one-third in stock return performance among all banks in our sample during the prior year. MBEXPOSE

measures the exposure of the main bank to the firm in the prior year. It is calculated as the main bank's loans to firm i as a percent of total loans to firm i by all banks.

The other three variables included in AFFIL are related to a firm's keretsu ties. SAMEK is a (0,1) dummy variable that has a value of one if the lender is in the same keiretsu as the firm. 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 Tokai), and zero otherwise. PK is the percent ownership of the firm by keiretsu members among the top ten equity holders. We also include a set of annual time dummy variables to capture the effects of the macroeconomy. These annual dummy variables will capture the average effect of economic conditions in each year.

III. Data and Empirical Results

We use a rich 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. This linking of individual lenders to individual borrowers is critical for understanding how bank lending behavior can affect the real economy. Such a link cannot be made clearly in many other countries, such as the United States, where bank-borrower relationships are considered private information.

For our tests, we use annual data for March 1993 through March 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 investigate the

factors that impact how banks allocate credit across firms, 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. The data for loans outstanding to individual firms from each lender are obtained from the Nikkei Needs Bank Loan 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 (over 80 percent of listed firms), as well as corresponding to the March balance sheet and income reports of banks. We identify each firm's main bank as the bank with the largest volume of loans outstanding to the firm in the prior year.[12] 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.

Table 4 contains the means, standard deviations, minimum values, and maximum values for the two alternative dependent variables and for the explanatory variables in the base regression for the set of observations for loans from market-traded banks. Because the sample includes multiple observations for each firm in each year, one observation for each bank lender to the firm in that year, correlation among regression errors for a given firm are likely to be present. Thus, we use a firm random effects specification for the probit equation. As discussed above, the dependent variable in the base specification 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 Table 5 provide evidence related to the evergreening and balance sheet cosmetics hypotheses. The first column is 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.[13] The second column contains the results for the subset of firm-bank observations for which the firm has outstanding loans from the bank in the prior year. These are the observations most relevant for the evergreening hypothesis, since these are the observations for which the lender has outstanding loans to the firm to evergreen. The third column contains the results for the same specification as column 2, but with the observations with extreme values excluded from the sample.[14] The estimated coefficients tell essentially the same story across these latter two specifications, indicating that the results are robust, insofar as they are not sensitive to observations with extreme values.[15]

The coefficient estimates provide evidence of the perverse relationship between the probability of increased bank loans and the extent to which a firm is under financial stress. The negative and significant estimated coefficients on FROA and FWORKCAP indicate that the weaker is the firm, the more likely it will receive additional bank loans. This evidence is consistent with the evergreening hypothesis and, furthermore, this finding is reinforced by the similar results for the subsample of observations for banks with loans outstanding to the firm for which evergreening is most relevant.

With respect to firm health, as measured by the firm's stock market return in the prior year, firms in both the lowest one-third and highest one-third of stock return performance are less likely, compared to the middle one-third, to obtain increased loans, although the effect is larger (in absolute value) for the highest one-third of firms. The interpretation of these coefficients is complicated insofar as they may reflect weak bank loan demand or reduced loan supply. For

example, the poorest performing firms may not have increased bank loan demand because of weakness in their economic activity, while the best performing firms may not have increased bank loan demand to the extent that they are able to obtain sufficient credit from the bond market. The significant negative estimated coefficient on FLEV indicates that firms with a higher debt-to-assets ratio are less likely to obtain increased bank loans, other things equal. The significant positive estimated coefficient on FSALES is consistent with firms with stronger sales growth also having increased loan demand.

The estimated coefficients on the three variables associated with banks having reported capital ratios close to their required ratios address the balance sheet cosmetics hypothesis. REQ2 has an estimated coefficient that is positive and highly significant. Thus, banks with reported capital ratios close to their required ratios are more likely to increase loans to firms in general. However, more importantly for the balance sheet cosmetics hypothesis, the estimated coefficients on FROA and FWORKCAP interacted with REQ2 are each negative and statistically significant, indicating that the perverse relationship, whereby a higher probability of increased loans from banks is associated with firms being under more financial stress, is even stronger for those banks with reported capital ratios near the required capital thresholds.

The estimated coefficient on BRETLO is negative and significant, indicating that banks in the lowest one-third of the distribution of bank stock returns are less likely to increase loans to firms relative to the middle one-third of banks. The estimated coefficient on BRETHI also is negative and significant, indicating that banks in the healthiest one-third of the sample of banks are less likely to increase loans to firms. A possible explanation for the nonmonotonic pattern of estimated coefficients is that the very weakest banks may be less able to increase lending to firms, while the healthiest banks are less willing to increase loans to firms because they have less

of an incentive to evergreen loans to firms in order to protect their own balance sheets. The estimated coefficient on BEXPOSE is positive and significant, indicating that a bank is more likely to increase loans to firms the greater the bank's exposure to the firm. This is consistent with the evergreening hypothesis, since the greater is the bank's exposure to the firm, the more the bank has to lose if the firm is unable to make timely interest payments or if the firm declares bankruptcy.

Thus, the evidence presented in this table provides strong evidence consistent with the evergreening hypothesis, insofar as a firm is more likely to obtain additional bank loans the greater is the firm's financial stress and the greater is the bank's exposure to the firm. The evidence also is consistent with the balance sheet cosmetics hypothesis, insofar as those banks with reported capital ratios close to their required minimums are more likely to increase credit to firms, and, more importantly, the likelihood of increased loans to the firm is even greater, compared to other banks, for those firms most under financial stress.

The next block of variables focuses on main bank affiliations. The statistically insignificant coefficient on MBANK suggests that main banks are no more likely to increase loans to firms generally compared to secondary banks, although the negative estimated effect is statistically significant in columns 2 and 3. The coefficient estimates here also indicate that banks are less likely to increase loans to firms with main banks whose stock returns are in the lowest one-third among all banks, and are more likely to increase loans to firms whose main bank is in the top one-third in terms of stock return performance. Such behavior would be consistent with secondary banks being more willing to make loans to a firm if they are confident that the firm's main bank is healthy enough to provide sufficient support to the firm should the firm encounter financial difficulties, thus reducing the credit risk faced by the secondary bank

lender. The significant negative estimated coefficient on MBEXPOSE indicates that banks are less likely to increase loans to a firm the greater is the exposure of the firm's main bank to the firm. This is consistent with main banks having a greater incentive to bail out a weak firm the greater is its exposure to that firm, since the main bank would be hurt more by the firm not being able to make its interest payments. Given this incentive for main banks to shoulder much of the responsibility to aid the firm, secondary banks might then be under less pressure and have less incentive to aid the firm by increasing loans, other things equal.

All three of the keiretsu variables have statistically significant effects. The positive estimated coefficient on KEIR indicates that firms in a keiretsu are more likely to obtain additional loans from banks generally, other things equal. Furthermore, the positive estimated coefficient on SAMEK indicates that firms are even more likely to obtain increased loans from banks in the same keiretsu as the firm. The negative estimated coefficient on PK, the percent ownership of the firm by other members of its keiretsu among the firm's top ten equity holders, indicates 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 other keiretsu members to provide financing during difficult times, perhaps through trade credit from suppliers or from nonbank lenders.

Table 6 provides additional results from alternative specifications to both establish that the Table 5 results are robust and to shed more light on the mechanism underlying the evergreening and balance sheet cosmetics behavior of banks. Each of the three specifications considers only those bank-firm observations for which the firm has outstanding loans from the bank in the prior year. The first column of the table considers an alternative dependent variable. It is again a (0,1) dummy variable, but here it takes on a value of one if the firm has obtained an

increase in long-term loans from the bank, rather than an increase in total loans. This specification is of interest insofar as increasing long-term loans to the firm might be viewed as a stronger commitment by the bank to aid the firm to the extent that the firm is in financial difficulty. Again, the results show support for the evergreening and balance sheet cosmetics hypotheses, with FROA, FWORKCAP, FRETHI, REQ2*FWORKCAP and BRETHI each having negative and significant estimated coefficients, and BEXPOSE having a positive and significant estimated coefficient.

The second and third columns of the table contain results for two subsets of the sample, but using the original dependent variable. Column 2 contains results for those firms not in the bond market, defined as not having any outstanding bonds at the end of the prior year. Column 3 contains results for those firms that are in the bond market, defined as having outstanding bonds at the end of the prior year. Such a sample split is interesting for at least two reasons. First, firms not in the bond market tend to be smaller, on average, and government pressure to aid financially weak firms was likely weaker the smaller was the firm, given the smaller costs of a bankruptcy, both financial and in terms of reduced employment. Thus, the pressures and incentives to evergreen loans to these firms may not have been as intense. Second, it is likely that the bank evergreening behavior may have been more pronounced for a firm that is in the bond market as the firm's financial health deteriorated. To the extent that such firms had difficulty raising additional funds from the (arm's-length) bond market, they may have migrated back to the (relationship) bank loan market for their financing needs, where they could obtain additional funding at lower cost by exploiting long-term relationships and the incentives for financially weak banks with exposure to the firms to make additional loans in order to prevent existing loans from being downgraded.

In fact, more of the estimated coefficients associated with the evergreening and balance sheet cosmetics hypotheses are of the predicted sign and statistically significant for the subset of firms with bonds outstanding compared to those firms not in the bond market. Thus, the evidence is consistent with banks providing even more support for those firms being priced out of the bond market due to their deteriorating health.

Table 7 addresses the question of the extent to which corporate affiliations between banks and their borrowers magnify the evergreening behavior of banks. To the extent that lenders feel an obligation to come to the aid of affiliated troubled firms, main banks and same-keiretsu lenders may have additional incentives to keep weak or insolvent firms alive. However, the direction of the same-keiretsu effect is ambiguous, insofar as a same-keiretsu 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. In this way, even secondary banks in the same keiretsu as the firm might feel added pressure to make credit available to troubled firms. In contrast, one might expect the absence of corporate affiliations to allow secondary lenders not in the same keiretsu as the firm 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 any firm rescue, nonaffiliated lenders may still aid such firms, although any correlation between increased lending and increased firm financial stress would be weaker than for affiliated lenders.

By allowing for differential effects for main banks and for same-keiretsu relationships, we can deduce whether these affiliations magnify the tendency for banks to increase loans the more troubled is a firm. To test this affiliation hypothesis, the base specification is extended to include differential effects emanating from corporate affiliations in the following manner:

$$\Pr(LOAN_{i,j,t}) = b_0 + b_1 FIRM_{i,j,t-1} + b_2 BANK_{i,j,t-1} + b_3 CAPREQ_{i,j,t-1} + b_4 AFFIL_{i,j,t-1} + b_5 MB*X1_{i,j,t-1} + b_6 SK*X2_{i,j,t-1} + b_7 TIME_{i,j,t} + u_{i,j,t} \quad (2)$$

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 same-keiretsu ties (SK*X2). The interactive variables for the main bank ties are interacted with MBANK, the (0,1) dummy variable that has a value of one if the bank is the firm's main bank. The differential effects of keiretsu ties are obtained by using SAMEK, the (0,1) dummy variable that has a value of one if the lender is in the same keiretsu as the firm. The variables in the set of interaction terms include those in the base specification that are intended to measure strength of affiliation, firm financial distress and health, and bank health. The set of main bank interaction variables (X1) includes MBANK, in addition to MBANK interacted with each of the following measures: FROA, FWORKCAP, FRETLO, FRETHI, REQ2, BRETLO, BRETHI, BEXPOSE, KEIR, PK, and SAMEK. The set of keiretsu interaction variables (X2) includes SAMEK, in addition to SAMEK interacted with the following variables: FROA, FWORKCAP, FRETLO, FRETHI, REQ2, MBANK*REQ2, BRETLO, BRETHI, BEXPOSE, MBRETLO, MBRETHI, MBEXPOSE, and PK. Note that we did not include MBRETLO, MBRETHI and MBEXPOSE in the set of main bank interaction variables, since they have already been interacted with

MBANK. Similarly, SAMEK is not interacted with KEIR, since SAMEK and SAMEK*KEIR are perfectly collinear. We have also included SAMEK interacted with MBANK*REQ2 to allow for the REQ2 effect being different from the simple sum of the SAMEK and MBANK effects for a firm having both affiliations.

With this specification, 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 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 than is the case for nonaffiliated lenders to measures of the strength of affiliations, firm financial stress and health, and bank health.

Table 7 contains the estimated coefficients for the expanded specification for the subset of firm-bank observations for which the bank has loans outstanding to the firm in the prior year. The estimated coefficients for the variables in the base specification tell essentially the same story for the lending behavior of nonaffiliated secondary banks as do the estimates in Table 5. The two additional sets of estimated coefficients indicate the differential responses of main banks (the interactive variable names that begin with MBANK) and of banks in the same keiretsu as the firm (the interactive variable names that begin with SK) measured relative to secondary banks not in the same keiretsu as the firm. This specification accomplishes two goals. First, it allows one to better understand the extent to which main bank and same keiretsu affiliations enhance the perverse bank lending behavior shown in the previous tables. Second, this specification does an even better job controlling for any variations in loan demand.

The estimates in column 1 of Table 7 show that main banks are more likely than secondary banks to provide additional loans to affiliated firms, and the positive and significant estimated coefficient on MBANK*SK indicates that the effect is even stronger if the main bank is in the same keiretsu as the firm. Furthermore, main banks are even more likely to increase loans to firms the weaker is firm health, as measured by FROA. This is consistent with main banks feeling a stronger obligation to come to the aid of their troubled firms than is the case for nonaffiliated secondary lenders. On the other hand, main banks are less likely than nonaffiliated secondary banks to increase loans to a firm the greater is the bank's exposure to that firm.

Six of the same-keiretsu differential effects are statistically significant. Banks in the same keiretsu as the firm are more likely, compared to nonaffiliated secondary banks, to increase loans to firms. In addition, banks in the same keiretsu as the firm are more likely to evergreen loans, insofar as they are more likely to increase loans to firms with returns in the lowest one-third among all firms (SK*FRETLO). Similarly, banks with capital ratios within two percentage points of the required minimum and that are in the same keiretsu as the firm are more likely to increase loans to the firm. On the other hand, the negative estimated coefficient on SK*MBANK*REQ2 roughly offsets the positive effect of MBANK*SK. At the same time, banks that are in the same keiretsu as the firm that have the greatest exposures to the firm (SK*BEXPOSE) are less likely to increase loans to the firm, perhaps because they can rely on other members of the keiretsu to provide any needed credit to the firm. Finally, banks in the same keiretsu as the firm are less likely to increase loans to those firms whose main bank has a return placing it in the top one-third among all bank returns.

The remaining three columns in Table 7 can be considered robustness tests. Column 2 indicates that the results are not sensitive to the presence or absence of extreme observations.

Consistent with the results in Table 6, columns 3 and 4 indicate that firms with bonds outstanding provide stronger evidence consistent with both the evergreening hypothesis and the balance sheet cosmetics hypothesis, compared to firms not in the bond market. Furthermore, firms with bonds outstanding provide stronger evidence consistent with the affiliation hypothesis.

To further investigate the role of corporate affiliations on lending behavior, we expand the sample of lenders to include nonbank financial firms, such as insurance companies, and government-controlled banks in addition to the market-traded banks that formed the sample for the previous tables. This allows us to isolate the extent to which private bank lending behavior differs from that of other types of lenders. 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. Table 8 contains the results for this specification, with each column in the table containing the estimated effects for one of the seven lender categories. These distinctions are important, since they provide insights into how nonbank keiretsu members might support troubled firms, how government-controlled banks might 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.

The results for the firm financial stress and health proxies are of particular interest, since they indicate a strong and widespread inverse relationship between firm health and the likelihood of obtaining additional loans. All seven of the estimated coefficients on FWORKCAP are negative and statistically significant at the 1 percent level. Interestingly, among all lender groups, only nonbank lenders not in the same keiretsu as the firm, the lender type with the weakest incentive to aid a distressed firm, has a significant positive estimated coefficient on FROA, signaling that healthier firms are more likely to obtain increased loans from these

lenders. Consistent with these results, only the nonaffiliated lenders (nonbanks not in the same keiretsu and secondary banks not in the same keiretsu) are less likely to increase loans to the set of firms in the lowest one-third in terms of equity returns.

Government lenders also appear to behave in a way similar to market-traded banks. They are more likely to increase loans to a firm the greater the firm's financial stress, as measured by net working capital. They also are less likely to increase loans to the healthiest firms, that is, those with equity returns among the top one-third among all firms in the previous year. It also appears that government lenders may indirectly aid unhealthy main banks, insofar as government lenders are more likely to increase loans to firms with main banks that have equity returns in the lowest one-third among all banks. However, government lenders behave similarly to firms with main banks among the top one-third in equity returns.

The results in Tables 5 through 8 make four key points. First, widespread evergreening of loans by banks has been occurring in Japan, with banks being more likely to increase loans to a firm the greater is the financial stress faced by the firm and the weaker is the firm's health. 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. This is true even for nonaffiliated secondary banks, perhaps due to pressure from main banks on 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. Second, corporate affiliations, in the form of main bank or keiretsu ties, make it even more likely that a lender will increase loans to a firm the weaker is that firm's health. Third, government-controlled banks also are more likely to increase loans to a firm the greater is the financial stress faced by the firm. Furthermore, in addition to this direct assistance to troubled

firms, government-controlled banks 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 equity return, the less likely are nonbanks not in the same keiretsu as the firm to increase loans to the firm, in sharp contrast to the other categories of lenders. Thus, nonaffiliated nonbank lenders appear to be different from these other lender types, insofar as they do not appear to have the same incentives or pressures to evergreen loans.

While our estimates provide clear evidence supporting all three hypotheses, one still might question whether the magnitudes of the effects are economically meaningful. Table 9 addresses this important question. Using the coefficient estimates from column 1 in Table 7, we have calculated the probabilities across four dimensions: bank exposure, firm health, main bank vs. secondary bank, and firm keiretsu status. Panel A contains the probabilities for banks that have reported capital ratios within 2 percentage points of their required capital ratio (REQ2 = 1), while Panel B provides the same information for banks with reported capital ratios more than 2 percentage points above their required capital ratio (REQ2 = 0).

The calculations are done for a representative manufacturing firm in 1999 with bonds outstanding. The main bank of the representative firm and the representative bank (assumed to be a city bank) have stock returns in the middle one-third of all bank stock returns for the prior year. A firm is designated to be "Sick" if the firm's stock return is in the lowest one-third of all firm stock returns in the prior year, the ROA of the firm is in the lowest quartile of all manufacturing firms in the prior year, and the firm's net working capital is in the lowest quartile

of all manufacturing firms in the prior year. If the firm's stock return is in the upper one-third, its ROA is in the highest quartile, and its net working capital is in the highest quartile, then we denote the firm as "Healthy." Low Bank Exposure means that BEXPOSE takes the value of the lowest quartile for that category of bank (main bank or secondary bank), while High Bank Exposure corresponds to the highest quartile. Not in K means that the firm is not in a keiretsu. For Same K observations, PK is taken to be the mean of the nonzero observations. The remaining continuous variables, FLASSET, FLEV and FSALES, are measured at their sample means for all manufacturing firms in 1999. As a point of reference, for manufacturing firms that had bonds outstanding, the average probability of receiving increased loans from a city bank in 1999 was 34.88 percent.

The pattern of probabilities in Table 9 is quite striking. In each category, sick firms are more likely to receive increased loans than is the case for healthy firms, consistent with the evergreening hypothesis. Furthermore, consistent with the affiliation hypothesis, main banks are more likely than secondary banks to increase loans to firms, and firms in the same keiretsu as their bank are more likely to receive increased loans than are firms not in a keiretsu. Interestingly, only main banks in the same keiretsu as the firm do not exhibit a higher probability of increasing loans to sick firms the greater is their exposure to those firms, perhaps because they count on other keiretsu members to take on more of the responsibility for bailing out the sick firms. Finally, consistent with the balance sheet cosmetics hypothesis, the difference in the probabilities of receiving increased loans between sick and healthy firms is greater for banks with capital ratios close to the required minimum in all but one instance, that for main banks not in the same keiretsu as the firm.

IV. Conclusions

This study investigates empirically how banks responded to incentives 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. Some of these incentives were internal to the banks, emanating from financially weak banks attempting to limit the growth in reported problem loans on their balance sheets in order to maintain required capital ratios, as well as perceived obligations to come to the aid of firms affiliated with the bank through either main bank or keiretsu relationships. Other incentives were external to the banks, emanating from government pressure on banks to continue lending to financially weak firms in order to avoid an even larger surge in unemployment and firm bankruptcies, as well as limiting the financial costs associated with massive bank bailouts or failures. The political concerns associated with having to deal with the official recognition that the banking system was severely undercapitalized and the consequences of banks severely limiting credit to troubled firms provided bank supervisors with the incentive to continue their forbearance policies toward banks. The continuing 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, allowing banks to continue to appear to be sufficiently capitalized.[16]

In particular, we test three specific hypotheses: (1) that banks acted in their own self interest by evergreening loans to the weakest firms; (2) that balance sheet cosmetics were important, insofar as the incentive for banks to evergreen loans increased as their reported capital ratio approached their required capital ratio; and (3) that corporate affiliations had the effect of increasing the availability of loans to affiliated firms, insulating those firms from market

discipline, rather than directing credit to firms with the best prospects had affiliated lenders exploited the superior information obtained from that affiliation. The empirical results provide strong support for each of these three hypotheses. Banks have practiced the evergreening of loans, particularly if the bank had a reported capital ratio close to its required capital ratio and 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. However, in sharp contrast to banks, nonaffiliated nonbanks do not appear to have had the same incentives to engage in the widespread evergreening of loans.

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 evergreening of loans in Japan insulated many severely troubled Japanese firms from market forces and may have prevented a bank capital crunch, that behavior 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 banks reacting to perverse incentives 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.

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Table 1

Sales and Bank Loans for SOGO

	Sales Growth	Bank Loan Growth	Main Bank Share	Share of Second and Third Banks	Share of Other Banks
1990	11.68	3.76	7.25	13.16	79.59
1991	7.12	14.37	6.34	11.51	82.15
1992	-0.92	18.37	5.35	9.72	84.92
1993	-9.83	15.43	4.64	8.42	86.94
1994	-9.18	18.86	10.47	11.05	78.48
1995	-8.53	44.35	21.59	17.02	61.38
1996	-34.51	-1.65	23.89	16.04	60.06
1997	16.80	4.24	27.45	16.45	56.10
1998	-5.38	-0.02	27.44	16.44	56.11
1999	-8.28	12.20	34.51	15.93	49.56
2000	-6.16	-13.40	27.32	15.75	56.93

Table 2 Firm Debt Composition

Mean of values for individual firms; measured as a percent of bonds plus total loans

Panel A

	All Firms				*Firms with Bonds Outstanding*			
	Bonds	Total Loans	Bank Loans	Main Bank Loans	Bonds	Total Loans	Bank Loans	Main Bank Loans
1993	27.51	72.49	55.65	16.92	38.85	61.15	46.78	13.36
1994	27.68	72.32	55.39	16.96	38.06	61.94	45.25	12.94
1995	26.07	73.93	56.82	17.53	37.35	62.65	46.41	13.07
1996	22.96	77.04	59.68	17.70	36.26	63.74	47.56	12.86
1997	21.76	78.24	61.00	19.21	35.89	64.11	47.75	14.08
1998	20.06	79.94	61.69	20.06	34.41	65.59	47.31	14.27
1999	19.62	80.38	62.44	20.92	35.31	64.69	45.99	14.51

Panel B Firms with Bonds Outstanding

	Firms in Lower 25% of ROA				*Firms in Upper 25% of ROA*			
	Bonds	Total Loans	Bank Loans	Main Bank Loans	Bonds	Total Loans	Bank Loans	Main Bank Loans
1993	20.54	79.46	58.64	17.48	49.14	50.86	39.00	12.02
1994	18.72	81.28	61.85	19.14	52.89	47.11	35.66	9.92
1995	16.25	83.75	63.95	21.07	56.30	43.70	31.55	8.50
1996	13.24	86.76	66.10	21.99	48.07	51.93	40.03	9.27
1997	11.09	88.91	68.65	23.34	48.17	51.83	37.75	11.60
1998	9.12	90.88	70.47	23.66	44.09	55.91	39.58	12.42
1999	9.84	90.16	71.27	24.77	42.03	57.97	40.36	12.60

Table 3
Loan Increases and the Subsequent Change in Stock Returns

Loan Category	Period	Quartile of Stock Returns			
		1	2	3	4
Total Bank Loans	1994-1995	26.32	24.30	24.30	25.08
	1996-1998	28.58	25.41	23.65	22.36
Main Bank Same Keiretsu	1994-1995	23.46	22.31	31.92	22.31
	1996-1998	28.73	25.79	24.21	21.27
Main Bank Not Same Keiretsu	1994-1995	25.05	26.10	21.50	27.35
	1996-1998	28.94	25.08	23.47	22.51
Secondary Bank Same Keiretsu	1994-1995	21.37	20.61	32.06	25.95
	1996-1998	30.63	26.80	23.20	19.37
Secondary Bank Not Same Keiretsu	1994-1995	25.72	23.88	24.23	26.18
	1996-1998	29.02	25.50	23.35	22.13

Note: Each row considers the set of firms that obtained an increase in that category of loans during the year. The number in the cell indicates the percent of those firms whose stock return in the subsequent year placed them in each stock return quartile.

Table 4
Descriptive Statistics for Variables, Market-Traded Bank Sample, 1994-1999.

	Mean	Std. Dev.	Min	Max
Total Loans Up	0.235	0.424	0	1
Long-Term Loans Up	0.133	0.339	0	1
FROA	2.970	3.292	-27.291	26.193
FWORKCAP	10.283	17.431	-133.592	89.354
FSALES	0.627	11.355	-65.281	249.673
FLEV	69.804	17.759	3.065	189.296
FLASSET	4.366	1.606	-0.242	8.860
FENBMKT	0.026	0.158	0	1
FINBMKT	0.598	0.490	0	1
FEXBMKT	0.051	0.220	0	1
REQ2	0.714	0.452	0	1
BEXPOSE	5.870	9.877	0	100
MBANK	0.065	0.247	0	1
MBEXPOSE	25.383	14.672	0	100
KEIR	0.466	0.499	0	1
PK	11.211	16.428	0	88.300
SAMEK	0.057	0.232	0	1

Table 5

The Effects of Evergreening and Balance Sheet Cosmetics on Increased Bank Loans
Random Effects Probit Specification

		$Loans_{i,j,t-1} > 0$	
	Full Sample	All Observations	Extreme Obs. Eliminated
FROA	-0.0075**	-0.0085**	-0.0102**
	(0.0028)	(0.0031)	(0.0032)
FWORKCAP	-0.0097**	-0.0120**	-0.0114**
	(0.0006)	(0.0007)	(0.0007)
FRETLO	-0.0392**	-0.0273**	-0.0280**
	(0.0064)	(0.0070)	(0.0071)
FRETHI	-0.0624**	-0.0645**	-0.0656**
	(0.0060)	(0.0066)	(0.0067)
FLEV	-0.0094**	-0.0140**	-0.0127**
	(0.0005)	(0.0006)	(0.0007)
FSALES	0.0024**	0.0020**	0.0022**
	(0.0005)	(0.0003)	(0.0004)
REQ2	0.0582**	0.0223	0.0218
	(0.0157)	(0.0177)	(0.0182)
REQ2*FROA	-0.0095*	-0.0080*	-0.0083*
	(0.0034)	(0.0039)	(0.0041)
REQ2*WORKCAP	-0.0030**	-0.0032**	-0.0032**
	(0.0006)	(0.0007)	(0.0007)
BRETLO	-0.1163**	-0.0682**	-0.0676**
	(0.0126)	(0.0139)	(0.0142)
BRETHI	-0.0697**	-0.0317*	-0.0285
	(0.0133)	(0.0149)	(0.0150)
BEXPOSE	0.0180**	0.0191**	0.0211**
	(0.0006)	(0.0007)	(0.0008)
MBANK	-0.0601	-0.0732*	-0.1137**
	(0.0326)	(0.0348)	(0.0354)
MBRETLO	-0.0209**	-0.0266**	-0.0262**
	(0.0075)	(0.0082)	(0.0083)
MBRETHI	0.0529**	0.0464**	0.0535**
	(0.0081)	(0.0087)	(0.0088)
MBEXPOSE	-0.0015**	-0.0061**	-0.0039**
	(0.0004)	(0.0005)	(0.0006)
KEIR	0.1389**	0.1160**	0.1324**
	(0.0222)	(0.0254)	(0.0261)
PK	-0.0050**	-0.0035**	-0.0037**
	(0.0008)	(0.0008)	(0.0009)
SAMEK	0.1831**	0.1581**	0.1499**
	(0.0234)	(0.0244)	(0.0248)
Number of Observations	95,566	78,028	76,696
Number of Firms	1,215	1,185	1,169
Mean of Dependent Variable (%)	23.83	25.49	25.52
Correctly Predicted (%)	99.43	99.25	99.10
Average Likelihood (%)	61.83	60.70	59.84

Notes: The estimated equations also include FLASSET, FENBMKT, FINBMKT, FEXBMKT, a set of industry dummy variables, a set of annual dummy variables, and a set of bank-type dummy variables. Standard errors are in parentheses.

* Significant at the 5 percent level.

** Significant at the 1 percent level.

Table 6

The Effects of Evergreening and Balance Sheet Cosmetics on Increased Bank Loans
Random Effects Probit Specification: $Loans_{i,j,t-1}>0$

	Long-Term Loans Full Sample	All Loans $Bonds_{i,t-1}=0$	All Loans $Bonds_{i,t-1}>0$
FROA	-0.0162**	-0.0010	-0.0132**
	(0.0039)	(0.0055)	(0.0039)
FWORKCAP	-0.0166**	-0.0083**	-0.0145**
	(0.0008)	(0.0014)	(0.0009)
FRETLO	-0.0141	-0.0007	-0.0231**
	(0.0088)	(0.0149)	(0.0090)
FRETHI	-0.0667**	0.0431**	-0.1203**
	(0.0086)	(0.0152)	(0.0078)
FLEV	-0.0092**	-0.0111**	-0.0077**
	(0.0007)	(0.0014)	(0.0007)
FSALES	0.0016**	0.0027**	0.0003
	(0.0004)	(0.0006)	(0.0004)
REQ2	0.0161	-0.0073	0.0454**
	(0.0210)	(0.0314)	(0.0221)
REQ2*FROA	-0.0063	-0.0042	-0.0143**
	(0.0045)	(0.0069)	(0.0051)
REQ2*WORKCAP	-0.0041**	-0.0019	-0.0033**
	(0.0008)	(0.0013)	(0.0009)
BRETLO	-0.0460**	-0.0974**	-0.0580**
	(0.0172)	(0.0249)	(0.0173)
BRETHI	-0.0660**	-0.0476	-0.0247
	(0.0187)	(0.0265)	(0.0182)
BEXPOSE	0.0257**	0.0183**	0.0199**
	(0.0007)	(0.0012)	(0.0010)
MBANK	-0.1328**	-0.0359	-0.0892
	(0.0327)	(0.0551)	(0.0478)
MBRETLO	-0.0524**	-0.0219	-0.0359**
	(0.0104)	(0.0191)	(0.0101)
MBRETHI	0.0224*	0.0956**	0.0143
	(0.0107)	(0.0161)	(0.0118)
MBEXPOSE	-0.084**	-0.0089**	-0.0061**
	(0.0006)	(0.0011)	(0.0007)
KEIR	0.1792**	0.0049	0.0540
	(0.0354)	(0.0658)	(0.0314)
PK	-0.0091**	-0.0016	0.0007
	(0.0011)	(0.0019)	(0.0011)
SAMEK	0.1437**	0.1603**	0.1583**
	(0.0259)	(0.0457)	(0.0306)
Number of Observations	78,028	26,202	51,826
Number of Firms	1,185	686	845
Mean of Dependent Variable (%)	15.12	27.53	24.46
Correctly Predicted (%)	99.62	98.71	99.04
Average Likelihood (%)	69.18	58.03	60.90

Notes: The estimated equations also include FLASSET, FENBMKT, FINBMKT, FEXBMKT, a set of industry dummy variables, a set of annual dummy variables, and a set of bank-type dummy variables. Standard errors are in parentheses.

* Significant at the 5 percent level.

** Significant at the 1 percent level.

Table 7

Corporate Affiliations and the Probability of Increased Bank Loans
Random Effects Probit Specification: $Loans_{i,j,t-1}>0$

	Full Sample	Extreme Obs. Eliminated	$Bonds_{i,t-1}=0$	$Bonds_{i,t-1}>0$
FROA	-0.0099**	-0.0103**	-0.0006	-0.0112**
	(0.0032)	(0.0035)	(0.0059)	(0.0041)
FWORKCAP	-0.0124**	-0.0124**	-0.0063**	-0.0149**
	(0.0007)	(0.0007)	(0.0014)	(0.0010)
FRETLO	-0.0488**	-0.0405**	-0.0225	-0.0321**
	(0.0089)	(0.0091)	(0.0187)	(0.0115)
FRETHI	-0.0634**	-0.0658**	0.0324	-0.1069**
	(0.0082)	(0.0082)	(0.0195)	(0.0097)
FLEV	-0.0145**	-0.0129**	-0.0074**	-0.0083**
	(0.0007)	(0.0006)	(0.0013)	(0.0008)
FSALES	0.0020**	0.0022**	0.0026**	0.0003
	(0.0003)	(0.0004)	(0.0006)	(0.0004)
REQ2	0.0103	0.0089	-0.0141	0.0338
	(0.0186)	(0.0190)	(0.0333)	(0.0235)
REQ2*FROA	-0.0066	-0.0065	-0.0035	-0.0134*
	(0.0041)	(0.0043)	(0.0072)	(0.0053)
REQ2*FWORKCAP	-0.0031**	-0.0033**	-0.0019	-0.0034**
	(0.0007)	(0.0008)	(0.0014)	(0.0009)
BRETLO	-0.0804**	-0.0798**	-0.1162**	-0.0670**
	(0.0152)	(0.0151)	(0.0265)	(0.0190)
BRETHI	-0.0270	-0.0249	-0.0499	-0.0186
	(0.0161)	(0.0161)	(0.0292)	(0.0199)
BEXPOSE	0.0311**	0.0348**	0.0301**	0.0324**
	(0.0009)	(0.0010)	(0.0015)	(0.0012)
MBRETLO	-0.0223*	-0.0236*	-0.0180	-0.0330**
	(0.0100)	(0.0102)	(0.0222)	(0.0121)
MBRETHI	0.0486**	0.0485**	0.0985**	0.0195
	(0.0101)	(0.0102)	(0.0192)	(0.0136)
MBEXPOSE	-0.0012*	0.0002	-0.0053**	-0.0004
	(0.0006)	(0.0006)	(0.0013)	(0.0008)
KEIR	0.0564*	0.1568**	0.0282	0.1092**
	(0.0266)	(0.0260)	(0.0679)	(0.0337)
PK	-0.0006	-0.0037**	-0.0043*	0.0008
	(0.0009)	(0.0010)	(0.0020)	(0.0012)
MBANK	0.5963**	0.5962**	0.6154**	0.5983**
	(0.0998)	(0.1061)	(0.1597)	(0.1409)
MBANK*FROA	-0.0202**	-0.0217**	-0.0197	-0.0185
	(0.0066)	(0.0080)	(0.0101)	(0.0096)
MBANK*FWORKCAP	0.0006	0.0001	-0.0002	0.0014
	(0.0013)	(0.0014)	(0.0020)	(0.0019)
MBANK*FRETLO	0.0472	0.0469	0.0654	0.0322
	(0.0533)	(0.0540)	(0.0852)	(0.0732)
MBANK*FRETHI	0.0322	0.0247	0.0339	0.0053
	(0.0545)	(0.0545)	(0.029)	(0.0707)
MBANK*REQ2	-0.0170	0.0013	-0.0298	0.0019
	(0.0659)	(0.0664)	(0.0921)	(0.1084)
MBANK*BRETLO	0.1140*	0.1258*	0.0523	0.1501
	(0.0576)	(0.0580)	(0.0902)	(0.0793)
MBANK*BRETHI	-0.0464	-0.0430	-0.0489	-0.0265
	(0.0636)	(0.0649)	(0.1034)	(0.0835)
MBANK*BEXPOSE	-0.0292**	-0.0326**	-0.0273**	-0.0314**
	(0.0017)	(0.0019)	(0.0028)	(0.0024)

Table 7, continued

Corporate Affiliations and the Probability of Increased Bank Loans
Random Effects Probit Specification: $Loans_{i,j,t-1}>0$

	Full Sample	Extreme Obs. Eliminated	$Bonds_{i,t-1}=0$	$Bonds_{i,t-1}>0$
MBANK*KEIR	-0.0117	-0.0120	0.0109	-0.0220
	(0.0138)	(0.0139)	(0.0239)	(0.0192)
MBANK*PK	0.0029	0.0031	0.0023	0.0016
	(0.0019)	(0.0018)	(0.0030)	(0.0029)
MBANK*SK	0.4162**	0.4619**	0.2513	0.5111*
	(0.1604)	(0.1596)	(0.2616)	(0.2335)
SAMEK	0.1815*	0.1793*	-0.1004	0.3219**
	(0.0879)	(0.0887)	(0.1859)	(0.1113)
SK*FROA	0.0066	0.0029	0.0230	-0.0097
	(0.0081)	(0.0091)	(0.0128)	(0.0119)
SK*FWORKCAP	-0.0016	-0.0015	-0.0002	-0.0013
	(0.0017)	(0.0017)	(0.0030)	(0.0024)
SK*FRETLO	0.1340**	0.1273*	0.1326	0.1357*
	(0.0479)	(0.0487)	(0.0855)	(0.0633)
SK*FRETHI	-0.0391	-0.0441	0.0844	-0.0929
	(0.0468)	(0.0471)	(0.0958)	(0.0591)
SK*REQ2	0.1107*	0.1144*	0.1021	0.1426
	(0.0570)	(0.0577)	(0.1005)	(0.0792)
SK*MBANK*REQ2	-0.3993**	-0.4252**	-0.2389	-0.4751*
	(0.1480)	(0.1465)	(0.2390)	(0.2177)
SK*BRETLO	0.0176	0.0146	0.1489	-0.0292
	(0.0614)	(0.0624)	(0.1130)	(0.0794)
SK*BRETHI	-0.0192	-0.0326	0.0795	-0.0652
	(0.0665)	(0.0679)	(0.1256)	(0.0839)
SK*BEXPOSE	-0.0098**	-0.0106**	-0.0090	-0.0097**
	(0.0028)	(0.0029)	(0.0049)	(0.0037)
SK*MBRETLO	-0.0401	-0.0404	-0.0400	-0.0588
	(0.0514)	(0.0519)	(0.0947)	(0.0665)
SK*MBRETHI	-0.1205*	-0.1220*	-0.1516	-0.1125
	(0.0596)	(0.0611)	(0.1026)	(0.0798)
SK*MBEXPOSE	0.0030	0.0036	0.0051	0.0017
	(0.0021)	(0.0022)	(0.0042)	(0.0027)
SK*PK	-0.0030	-0.0031	-0.0007	-0.0048*
	(0.0016)	(0.0016)	(0.0028)	(0.0023)
Number of Observations	78,028	76,696	26,202	51,826
Number of Firms	1,185	1,169	686	845
Mean of Dependent Variable (%)	25.49	25.52	27.53	24.46
Correctly Predicted (%)	98.97	99.11	98.70	98.86
Average Likelihood (%)	60.41	60.95	58.36	61.49

Notes: The estimated equations also include FLASSET, FENBMKT, FINBMKT, FEXBMKT, a set of industry dummy variables, a set of annual dummy variables, and a set of bank-type dummy variables. Standard errors are in parentheses.

* Significant at the 5 percent level.

** Significant at the 1 percent level.

Table 8

Factors Affecting the Probability of Increased Loans, by Type of Lender
Random Effects Probit Specification: $Loans_{i,j,t-1}>0$

	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	0.5779**	0.4100**	0.1078	-0.2766**	0.1161	-0.2988**	-0.3972**
	(0.1489)	(0.1159)	(0.1273)	(0.0854)	(0.1496)	(0.0891)	(0.0932)
FROA	-0.0119	-0.0448**	-0.0097	-0.0187**	-0.0045	0.0067*	0.0009
	(0.0127)	(0.0065)	(0.0098)	(0.0016)	(0.0131)	(0.0028)	(0.0045)
FWORKCAP	-0.0163**	-0.0136**	-0.0162**	-0.0139**	-0.0175**	-0.0103**	-0.0163**
	(0.0027)	(0.0013)	(0.0021)	(0.0004)	(0.0026)	(0.0006)	(0.0008)
FRETLO	0.1417	0.0227	0.1000	-0.0341**	-0.0033	-0.1132**	-0.0498
	(0.0750)	(0.0557)	(0.0571)	(0.0088)	(0.0771)	(0.0206)	(0.0325)
FRETHI	-0.1250	-0.0051	-0.0818	-0.0803**	-0.0703	-0.1031**	-0.0788*
	(0.0779)	(0.0574)	(0.0606)	(0.0082)	(0.0767)	(0.0177)	(0.0318)
EXPOSE	0.0014	0.0024	0.0241**	0.0388**	0.0052	0.0041	0.0167**
	(0.0024)	(0.0016)	(0.0040)	(0.0008)	(0.0059)	(0.0022)	(0.0010)
MBRETLO	-0.1476	-0.0933	-0.0261	-0.0446**	0.0675	0.1062**	0.1076**
	(0.0824)	(0.0658)	(0.0646)	(0.0096)	(0.0850)	(0.0228)	(0.0358)
MBRETHI	-0.0013	0.0402	-0.0411	-0.0029	0.2023**	0.0702**	0.0963**
	(0.0820)	(0.0588)	(0.0609)	(0.0097)	(0.0758)	(0.0206)	(0.0347)
MBEXPOSE			0.0004	0.0008**	-0.0016	-0.0028**	-0.0063**
			(0.0022)	(0.0006)	(0.0034)	(0.0010)	(0.0012)
KEIR		0.1010		0.0779**		0.2881**	0.3462**
		(0.1386)		(0.0221)		(0.0313)	(0.0366)
PK	-0.0026	-0.0014	-0.0051**	-0.0023**	-0.0064**	-0.0071**	-0.0087**
	(0.0024)	(0.0042)	(0.0017)	(0.0008)	(0.0021)	(0.0013)	(0.0013)

Number of Observations	111,577
Number of Firms	1,200
Mean of Dependent Variable (%)	24.23
Correctly Predicted (%)	99.00
Average Likelihood (%)	61.31

Notes: The estimated equations also include FLASSET, FENBMKT, FINBMKT, FEXBMKT, FLEV, FSALES, a set of industry dummy variables, and a set of annual dummy variables. The standard errors are in parentheses.
* Significant at the 5 percent level.
** Significant at the 1 percent level.

Table 9

Estimated Probability of Increased Loans for Representative Manufacturing Firm in 1999

Panel A: REQ2 = 1

		Low Bank Exposure			High Bank Exposure		
		Sick firm	*Healthy firm*	***Difference***	*Sick firm*	*Healthy firm*	***Difference***
Main	*Not in K*	44.9	24.5	20.4	45.3	24.8	20.5
Bank	*Same K*	55.3	28.0	27.3	51.8	25.1	26.7
Secondary	*Not in K*	28.3	14.2	14.1	32.3	16.9	15.4
Bank	*Same K*	42.0	19.6	22.4	45.1	21.9	23.2

Panel B: REQ2 = 0

		Low Bank Exposure			High Bank Exposure		
		Sick firm	*Healthy firm*	***Difference***	*Sick firm*	*Healthy firm*	***Difference***
Main	*Not in K*	45.6	24.5	21.1	46.0	32.2	13.8
Bank	*Same K*	65.2	45.0	20.2	61.9	41.5	20.3
Secondary	*Not in K*	28.5	19.3	9.2	32.5	22.6	9.9
Bank	*Same K*	38.6	22.9	15.7	41.7	25.4	16.3

Notes: In this exercise, the representative firm is a manufacturing firm in 1999 that has bonds outstanding. The main bank of the representative firm and the representative bank (assumed to be a city bank) have stock returns in the middle one-third of all bank stock returns for the prior year. A firm is designated to be "Sick" if the firm's stock return is in the lowest one-third of all firm stock returns in the prior year, the ROA of the firm is in the lowest quartile of all manufacturing firms in the prior year, and the firm's net working capital is in the lowest quartile of all manufacturing firms in the prior year. If the firm's stock return is in the upper one-third, its ROA is in the highest quartile, and its net working capital is in the highest quartile, then we denote the firm as "Healthy." Low Bank Exposure means that BEXPOSE takes the value of the lowest quartile for that category of bank (main bank or secondary bank), while High Bank Exposure corresponds to the highest quartile. Not in K means that the firm is not in a keiretsu. For Same K observations, PK is taken to be the mean of the nonzero observations. The remaining continuous variables, FLASSET, FLEV and FSALES, are measured at the sample means for all manufacturing firms in 1999. The calculations are based on the estimated coefficients from column 1 of Table 7.

[1] 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 Financial Services Agency (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).

[2] In 1993, two of its top lenders, IBJ and LTCB, had become concerned enough that they sent officials to help manage Sogo (Tett 2003).

[3] The small number of bankruptcies of listed firms in Japan during the period following the bursting of the stock market and real estate bubbles is quite striking (see, for example, Hoshi and Kashyap 2001; Hamao, Mei and Xu 2004).

[4] The continuing deterioration in real estate prices, and of 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, the additional risk premium Japanese banks paid in the interbank lending market (Peek and Rosengren 2001).

[5] A bank must 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.

[6] 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, these banks would be increasing their own exposure to severely troubled firms in order to delay inevitable bankruptcies by their borrowers.

[7] Certainly, banks do make risky loans. The key issue is whether banks are charging an appropriate risk premium to compensate them for the risk exposure. However, the evidence is that Japanese banks, for the most part, were not charging differential interest rates tied to the riskiness of loans. In fact, Smith (2003) finds that Japanese banks charge less on syndicated loans to Japanese borrowers than do foreign banks, with Japanese banks varying pricing less across risks than do foreign banks. Consistent with this evidence, both Tables 2 and 3 suggest that firms were leaving the bond market, an arm's length market where they would be charged an appropriate risk premium, and returning to relationship loans from banks, and, furthermore, that firms receiving additional bank loans in the late 1990s had stock returns that tended to underperform the market during the subsequent year.

[8] For example, 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 2002b).

[9] We calculate the annual return using the average dividend-adjusted price for the last month of the current fiscal year and the average dividend-adjusted price for the last month of the prior fiscal year, rather than the prices on the last day of the current and prior fiscal years, in order to avoid excessive noise in the series.

[10] We use these relative measures rather than a continuous measure of stock market returns, 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. By grouping the firms in this way, we minimize the effects on estimated coefficients of extreme movements in stock prices associated with factors other than changes in the firm's own economic performance.

[11] To the extent that analysts are able to penetrate the veil of reported capital and nonperforming loan ratios, widely viewed as deviating substantially from the true extent of bank problems, stock returns should reflect the best estimates of bank health. However, as with firm stock returns, we use the (0,1) dummy variables that group the banks into thirds based on stock returns rather than the continuous measure of bank stock returns due to the concern that movements in stock returns, especially extreme movements, may reflect announcements of government policy that indicate changes in the likelihood of government support for banks rather than changes in the bank's own economic performance or health.

[12] In case of ties in terms of the volume of loans to the firm in a given year, we select as the main bank the first listed reference bank in the Japan Company Handbook. To avoid erratic switching between banks in a few instances, perhaps related to the relative timing of loan maturation or of the issuance of new loans, we impose a rule that in order to switch the designated main bank, the loans from the candidate main bank to the firm must exceed the volume of loans from the current designated main bank by at least 10 percent.

[13] Although not shown in the table in order to conserve space, each regression includes the measure of firm size, the set of three bond market variables, the set of annual dummy variables, and the set of industry dummy variables, as described above.

[14] 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 away from its mean value. The removal of observations with extreme values reduces the sample size by less than 2 percent.

[15] One might be concerned that the results are sensitive to changing patterns among the lenders to a given firm. For example, if a firm had five lenders and four of them increased loans to the firm while the fifth decreased loans to the firm sufficiently to more than offset the increases by the other four lenders, then we would have four out of five observations indicating increased loans to

the firm even though total loans to the firm declined. To address this concern, we aggregated loans from all lenders to each individual firm. We then estimated specifications for three alternative (0,1) dependent variables: (1) equal to one if total loans to the firm increased; (2) equal to one if main bank loans to the firm increased; and (3) equal to one if total secondary bank loans increased. Because we no longer used individual bank loan data, the set of explanatory variables was also condensed and we were able to test only the evergreening hypothesis. We obtain results consistent with our more detailed specification reported in the tables. In particular, both FROA and FWORKCAP have estimated coefficients in each of the specifications that are statistically significant at better than the 1 percent level, strongly supporting the evergreening hypothesis.

[16] 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. However, the required provisions still were not large enough to reduce the capital ratios of any of the top 13 financial institutions below the required capital ratio (Pilling 2002).