

## The Changing Role of Main Banks in Aiding Distressed Firms in Japan

Joe Peek\*

Gatton Endowed Chair in International Banking and Financial Economics  
437C Gatton Business & Economics Building  
University of Kentucky

### Abstract

The objective of this study is to investigate the consequences of increased bank lending to distressed Japanese firms in order to determine the extent to which increased loans were associated with the improved performance of distressed firms. In particular, a key focus of the study is the extent to which such a relationship in the 1980s persisted into the 1990s after the bursting of the stock market and real estate bubbles when both firms and banks came under increasing stress. The evidence in this study suggests that increases in main bank loans are, in fact, associated with improved firm performance subsequent to entering distress during the 1980s. However, not only did that pattern disappear during the post-bubble period, but increased main bank loans were associated with a deterioration in operating income during the late 1990s and early 2000s. This is consistent with main banks evergreening loans to zombie firms rather than focusing their lending on supporting distressed, but viable, borrowers. The change in bank behavior was likely related to the perverse incentives banks faced as their own health deteriorated sharply. In contrast, no similar change in behavior is observed for secondary lenders to distressed firms, in part because of the weaker relationships and responsibilities of secondary banks compared with main banks.

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## **The Changing Role of Main Banks in Aiding Distressed Firms in Japan**

While it is well established that bank lending to severely impaired (zombie) Japanese firms during the 1990s was detrimental to the Japanese economy, bank lending to troubled, but economically viable, firms still may have had beneficial effects. The objective of this study is to investigate the consequences of increased bank lending to distressed Japanese firms in order to determine the extent to which increased loans were associated with the improved performance of distressed firms. In particular, a key focus of the study is the extent to which such a relationship in the 1980s persisted into the 1990s after the bursting of the stock market and real estate bubbles when both firms and banks came under increasing stress. While traditional main bank relationships may have contributed to a pattern whereby increased lending to a distressed firm was associated with an improvement in the subsequent performance of the firm during the pre-bubble period, perverse incentives faced by banks and firms during the post-bubble period may have been counterproductive, either by encouraging banks to increase loans to nonviable firms (evergreening of loans), or, even if the loans were directed to viable firms, by insulating those firms from the market forces that would have forced the firms to undertake painful, but needed, restructuring. In fact, Hoshi et al. (2009) find that the likelihood that large distressed firms with high debt levels will undergo a major restructuring has declined over time, consistent with the evergreening of loans during the post-bubble period allowing firms to avoid market discipline.

Certainly, bank lending to some severely distressed (zombie) firms did allow those firms to survive for an extended period of time. While such lending has been shown to have contributed to the recent prolonged stagnation of the Japanese economy (for example, Caballero et al. 2008), bank lending to distressed firms has the potential to help, as well as hinder, the recovery of distressed firms. Presumably, an important factor in the ability of troubled firms to

survive and return to health is their ability and willingness to restructure their operations. Insofar as increased bank credit provides a necessary cushion to distressed firms that allows them the opportunity to overcome temporary liquidity problems and/or restructure their operations, one might expect firms receiving increased bank loans to be more likely to improve their subsequent performance, especially to the extent that banks are able to identify and support those firms most likely to be able to recover from a temporary adverse shock. However, increased bank credit also may ease the immediate pressure on management to take actions to ensure the firm's longer-term survival, lessening the incentive (and thus the willingness) of the firm to undertake the painful steps required to accomplish a major restructuring. Certainly, in some instances nonviable firms were kept alive for an extended period of time through support from their lenders, in part due to the perverse incentives banks had to evergreen loans (for example, Peek and Rosengren 2005). However, for other distressed firms that were economically viable, perhaps through undertaking substantial restructuring, the provision of support from their banks or other stakeholders could contribute to the ability of those firms to return to sound financial health, and thus contribute to a shortening of the length of the period of economic stagnation in Japan.

The evidence in this study suggests that increases in main bank loans are, in fact, associated with improved firm performance subsequent to entering distress during the 1980s. However, not only did that pattern disappear during the post-bubble period, but increased main bank loans were associated with a deterioration in operating income during the late 1990s and early 2000s. This is consistent with main banks evergreening loans to zombie firms rather than focusing their lending on supporting distressed, but viable, borrowers. The change in bank behavior was likely related to the perverse incentives banks faced as their own health

deteriorated sharply. In contrast, no similar change in behavior is observed for secondary lenders to distressed firms, in part because of the weaker relationships and responsibilities of secondary banks compared with main banks.

The study proceeds as follows. Section I provides a discussion of relevant previous studies. Section II describes the data and methods. Section III contains the empirical results for firms entering financial distress and operational distress. Section IV concludes.

## I. Background

Main bank and keiretsu 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” following the bursting of the stock market and real estate bubbles. Interestingly, just as these two subperiods provide sharp contrasts in economic performance, the literature on banking relationships in Japan is similarly bifurcated, with most studies based on data prior to the 1990s finding positive benefits for firms with strong bank relationships and studies based on post-bubble data finding such relationships to be less beneficial to firms, as well as (in some cases) to the macroeconomy more generally. This section begins with a description of the historical roles of main banks and keiretsu groups. I then provide a brief survey of the evidence for the pre-bubble period, followed by a brief survey of the more recent evidence for the post-bubble period.

### A. Historical Roles of Main Banks and Keiretsus

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 cross-shareholdings and keiretsu affiliations between the lending bank and 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* 2002). 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 (for example, Hoshi et al. 1991).

Keiretsu group affiliations also play an important role in corporate governance in Japan. Horizontal (bank-centered) keiretsu groups are composed of firms in many different industries that are usually affiliated with the lender at the center of the group and have substantial cross-shareholdings with each other and with the group's primary bank. Three of the major keiretsus (Mitsubishi, Fuyo and Sanwa) grew out of the pre-war zaibatsus, large family-controlled, pyramidal conglomerates that played an extremely powerful role in the Japanese economy, but were outlawed after World War II (see, for example, Yafeh (2003) for a description of Japanese keiretsu groups). Other keiretsu groups also were formed around major banks, including three major groups (Fuyo, Dai-Ichi Kangyo and Sanwa), and two smaller groups (IBJ and Tokai).

Keiretsu group firms exchange information and have "Presidents Clubs" where the top firm managers meet to discuss relevant issues. While group members cooperate and have ownership ties through cross-shareholdings, keiretsus differ from the pre-war zaibatsus in that control of the keiretsu groups is not centralized. Still, firms within a given keiretsu often have extensive business relationships, may exchange managers, and may have risk-sharing, or insurance, relationships that help member firms deal with adverse shocks. Furthermore, the cross-shareholding provides protection against hostile takeovers, insulating managers from market discipline.<sup>1</sup>

While main bank and keiretsu relationships have the potential to provide valuable benefits to Japanese firms, close lending relationships also have a potential dark side. First, if firms become too dependent on a main bank relationship, the firm may become subject to "hold-up" costs, as the main bank exploits its monopoly power over the firm by charging an interest rate that is higher than is justified by the firm's risk profile. Similarly, if the bank, rather than the

borrower, becomes troubled, the consequent reduction in credit availability may impede the ability of the firm to finance investment.

Strong main bank and keiretsu affiliations also have the potential to be detrimental to macroeconomic performance, even as main banks come to the aid of distressed firms. If these corporate affiliations are used to insulate distressed firms from market forces, firm management will be able to avoid the discipline that can be provided by external creditors and investors. As a consequence, 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, or, if the firm is not economically viable, to fail. By directing bank credit to these distressed firms in this way, the consequent misallocation of credit would retard the creative destruction needed to cleanse the system that would reallocate productive resources to their best uses and improve efficiency.

#### B. Pre-Bubble Evidence

Studies based on data from the pre-bubble period have tended to find that Japanese bank-firm affiliations provided significant benefits, especially when firms became distressed. These studies emphasized the unique features of Japanese bank affiliations that reduced agency costs (Hoshi et al. 1990, 1993). 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. Thus, a firm's main bank would play a key role as the delegated monitor for the group of lenders to the firm and other stakeholders in the firm. While a firm's main bank might not play an active role in influencing the management of a firm during good times, when a firm's health deteriorated substantially, the main bank would be expected to step in and provide

guidance and support to the firm, and lead any necessary “rescue” or reorganization of the firm (see, for example, Sheard 1989; Aoki 1990). In addition to managerial guidance, one might expect that a firm would benefit from the cushion provided by its main bank or members of its keiretsu, insofar as they were willing to provide backup financing or other forms of support should the firm become financially troubled.

Most of the pre-bubble evidence appears to be consistent with these hypotheses. For example, Hoshi et al. (1990) find that firms with strong main bank ties perform better than those without such ties after the onset of financial distress, and the performance is improved further if the firm also is a keiretsu member with close ties to its suppliers and customers as well as its main bank. That main banks play an important role in the rescues of troubled firms is confirmed by Kang and Shivdasani (1995), who find that nonroutine turnover of top executives in response to poor earnings is greater for firms with strong ties to a main bank, and by Morck and Nakamura (1999), who find that bankers often are appointed to a troubled firm’s board of directors, presumably to supervise bailouts and/or restructurings. Similarly, Hoshi et al. (2009) find that distressed firms that have a high main bank dependence (have a higher ratio of main bank loans to total loans) are more likely to undergo restructuring.

While Kang and Shivdasani (1997), considering 92 publicly traded Japanese manufacturing firms during the pre-bubble period (1986-90), find that troubled Japanese firms downsize assets less frequently, reduce employees through layoffs to a lesser degree, and are more likely to expand operations than is the case for similar U.S. firms, they also provide evidence that corporate affiliations do not simply insulate distressed firms from undertaking needed restructuring. In fact, corporate affiliations appear to enhance the restructuring activities of distressed firms. Firms with greater equity ownership by their main bank are more likely to

shrink operations, institute employee layoffs, and remove outside directors from the firm's board. Similarly, greater ownership of the firm by blockholders is associated with a higher probability of downsizing of operations and changes in firm management, and a lower probability of acquisitions by the firm. In contrast, Morck and Nakamura (1999) find that firms not in keiretsu groups are more likely to experience downsizing than those firms that are members of a keiretsu, suggesting that main banks tend to insulate their keiretsu firms somewhat from market forces.

Other studies provide evidence that 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 main 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 is able to "hold up" the firm and extract all the rents. Miwa and Ramseyer (2005) go even further, arguing that, based on pre-bubble period data, main banks do not, in fact, rescue distressed borrowers. Closer main bank ties do not increase the probability of increases in main bank loans or of a distressed firm's survival.

Thus, while main banks may extract rents from their borrowers, the pre-bubble period evidence suggests that main bank and keiretsu relationships on the whole are beneficial to firms. These relationships provide support for distressed firms and, at least in the pre-bubble period, rather than impeding restructuring activities, main banks and large blockholders appear to serve an important role in corporate governance for troubled firms by increasing the probability of a restructuring of operations. Furthermore, it appears that the associated downsizing improves subsequent firm performance. A possible explanation for the value of group membership is that the private information derived from the close affiliations between the firm and its main bank and keiretsu group members would tend to provide an earlier signal of problems and enable the

main bank to intervene earlier to help the firm deal with any deterioration in its financial health. Certainly, the relatively low numbers of listed Japanese firms that go bankrupt is consistent with the hypothesis that main banks play an important role in the early recognition of problems and the main bank's ability to rescue a troubled firm from bankruptcy. Alternatively, the relatively low bankruptcy rate may simply be a result of the main bank wanting to preserve its reputation or be due to a sense of loyalty among group members, even if that means bailing out a nonviable firm rather than aiding only those group firms that are viable in the longer term but are suffering from a temporary adverse shock or liquidity problem.

### C. Post-Bubble Evidence

In contrast to the pre-bubble period, much of the evidence from the 1990s has been interpreted in a way that is not necessarily supportive of main bank and keiretsu affiliations benefiting firms, at least in the longer run, and certainly not benefiting the macroeconomy more generally. Rather, while possibly aiding individual distressed firms in the short run, the close affiliations of Japanese banks with their borrowers have been viewed by many as contributing to more than a decade of subpar economic growth. In particular, main bank and keiretsu affiliations may have been used to insulate management from market forces, 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 that could delay both needed restructuring of distressed, but economically viable, firms and the failure of nonviable (zombie) firms, impeding the creative destruction that would contribute to the reallocation of valuable factors of production to their best uses.

In fact, focusing on the immediate post-bubble period (1990-93), Kang and Stultz (2000) find that the stock return performance of firms that were more dependent on bank loans just prior

to the bursting of the stock price and land price bubbles was worse than for firms that were less dependent on bank loans. They also find that keiretsu membership, defined to include both horizontal (bank-centered) and vertical keiretsus, is associated with a worse stock return performance.

Considering the subsequent period from 1993-99, Guo (2007) finds evidence consistent with that of Kang and Stultz (2000). While during the 1978-92 period, distressed firms with a greater reliance on main bank loans had higher sales growth, and that performance was not affected by the main bank's health, during the subsequent 1993-99 period, a greater reliance on main bank loans was associated with slower sales growth, and that sales growth rate was lower the weaker was the main bank's health. Similarly, for the 1993-99 period, a greater reliance on main bank loans and weaker main bank health also were associated with the firm having a lower return on assets. In addition, during this latter period, the duration of distress was longer for firms the greater was their reliance on main bank loans.

However, the fact that the performance of firms with close ties to their main bank suffered is somewhat puzzling, insofar as it appears that many firms increased their reliance on bank loans during the latter half of the 1990s, even as the bond market had been deregulated (for example, Peek and Rosengren 2005; Arikawa and Miyajima 2006). In fact, using data for the 1998 fiscal year, Hori and Osano (2002) find that firms with weaker prospects and a greater likelihood of suffering financial distress relied more on main bank loans. Similarly, Arikawa and Miyajima (2006) found that firms with low growth opportunities increased their reliance on bank loans in the 1990s.

Why would banks have increased loans to some of the weakest firms? Peek and Rosengren (2005) argue that banks did so in response to the perverse incentives they faced due to

the way in which bank regulation and supervision were handled in Japan. Troubled Japanese banks had an incentive to allocate additional loans to their severely impaired borrowers in order to avoid the realization of losses on their own balance sheets. As a bank's reported capital ratio approached the regulatory minimum, banks were more likely to increase loans to the weakest firms. Furthermore, this behavior was more pronounced for firms with strong bank and keiretsu ties.

Caballero et al. (2008) investigate the implications of bank lending to these “zombie” firms for the Japanese macroeconomy. They argue that this evergreening of loans to zombie firms distorted competition and impaired needed restructuring of distressed firms, lowering productivity and increasing excess capacity in the economy. In fact, a number of studies have found that the main bank system impeded needed creative destruction during the prolonged malaise of the 1990s when the Japanese banking sector was in crisis, insofar as greater reliance on main bank loans tended to delay the restructuring of poorly performing firms. For example, Arikawa and Miyajima (2006), Inoue et al. (2007) and Koibuchi (2007) each find that main bank relationships retarded rather than encouraged the restructuring of distressed Japanese firms in the 1990s. Similarly, Hoshi et al. (2009) find that the likelihood that a large distressed firm would undergo restructuring declined during the post-bubble period compared to the pre-bubble period, and that a high reliance on main bank loans was no longer a good predictor that a distressed firm would undergo restructuring during the lost decade period.

Based on estimates of the employment adjustment function, Arikawa and Miyajima (2006) find that while more leverage is associated with a greater shrinkage in employment, the composition of that debt mattered. In particular, a higher ratio of main bank debt to total assets delayed restructuring, again suggesting that the main bank system impeded the needed

restructuring in Japan during the prolonged malaise following the bursting of the stock price and land price bubbles when the banking sector was in crisis. Koibuchi (2007) argues that the traditional main-bank-led corporate restructuring broke down in the 1990s due to the burden of nonperforming loans on the banks. Changes in the restructuring process and the creation of the Industrial Revitalization Corporation of Japan that reduced the disproportionate burdens on main banks relative to other lenders to a distressed firm, rather than voluntary responses by lenders, were required to enhance the attractiveness of financial restructuring by the firm's lenders. Inoue et al. (2007) similarly argue that banks and affiliated firms procrastinated in implementing or imposing needed restructuring on distressed firms. Instead, it was out-of-court restructurings that were led by external sponsors or bank supervisors that were most effective and beneficial, in the sense of increasing the market value of distressed firms. In contrast, Hoshi et al. (2009) find that those firms with restructuring overseen by their main bank restructured more aggressively, although, consistent with Inoue et al. (2007), they find that main banks were less likely to push distressed firms into restructuring during the post-bubble period compared with the pre-bubble period.

Impeding needed restructuring was not the only aspect of the dark side of firms having strong main bank relationships that appeared in the post-bubble period. As the banking crisis took its toll on banks, their ability to fund their customers was impaired, restraining investment by firms that had relied heavily on their main banks for credit. For example, Gibson (1995), using data for the immediate post-bubble period, finds that firms with the lowest rated main banks invested substantially less than firms with higher rated main banks. While Gibson (1995) considered specific firm-bank relationships, Kang and Stultz (2000), again looking at the immediate post-bubble period, provide more general results related to the deterioration of the

health of the banking sector as a whole, finding that firms that relied more on bank loans prior to 1990 reduced investment to a greater degree. Klein et al. (2000) produce a similar result using a different approach. To avoid the endogenous effects of the deteriorating Japanese economy on domestic investment, they investigate foreign direct investment into the U.S. by Japanese firms. Linking individual Japanese firms to their main banks, they find that firms that were reliant on the most troubled Japanese main banks reduced their foreign direct investment the most.

To summarize, compared to the pre-bubble studies, the post-bubble 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. The evidence suggests that, at least during the initial phase of the banking problems, those firms most closely tied to banks were adversely impacted by those relationships. While firms that relied relatively more on bank loans had relatively better stock return performance during the good times of the bubble period, once the bubbles burst, those same firms contracted investment more and suffered worse stock return performance relative to those firms that relied less on bank loans. Thus, in contrast to the findings of most of the pre-bubble studies, once the banking sector began suffering widespread problems in the early 1990s, strong main bank relationships were not particularly beneficial in terms of improving firm performance, suggesting that any main bank assistance to their troubled firms was either not sufficient, or not used appropriately, to enable the firms to recover from their financial distress.

In part, this may be related to main banks insulating many of their distressed borrowers from market forces, allowing them to avoid or delay either major restructuring of their operations or declaring bankruptcy. The inability, or unwillingness, of main banks to push through needed restructuring by their distressed borrowers emanated from the weak supervisory pressures on the

banks themselves. The regulatory forbearance on banks was passed down the chain in the form of forbearance on the borrowers from the banks as the banks responded to the perverse incentives they faced to evergreen loans.

## II. Data and Methods

### A. Data sources

Firm balance sheet and income data are from the Pacific-Basin Capital Market Databases (PACAP), which includes all first- and second-section firms that are traded on the Tokyo stock exchange. We exclude financial firms and regulated utilities. The data are annual and based on the fiscal year-end reports by the firms, with the regression samples covering the period from fiscal year 1980 through fiscal year 2002. The data for loans outstanding to individual firms from each lender are obtained from the Nikkei Needs Bank Loan database. The data are annual, with loan reporting based on the firm's fiscal year. Combining these two databases, individual Japanese firms can be linked to their individual lenders. A firm's main bank is identified as the bank with the largest volume of loans outstanding to the firm in the prior year. Horizontal (bank-centered) keiretsu membership is obtained from various issues of Industrial Groupings in Japan: The Anatomy of the Keiretsu. Because fiscal yearends are not standard in Japan, firms must be allocated to a fiscal year. Firms with fiscal yearend months of July through the following June are allocated to the same fiscal year; for example, July 1990 through June 1991 fiscal yearends are included in fiscal year 1990. Most firms have a fiscal yearend of March, and relatively few have fiscal yearends of June or July.

### B. Identifying distressed firms

While there are a number of possible measures of financial distress, two types of distress are considered: financial distress and operational distress. Financial distress implies that a firm has a, perhaps temporary, cash squeeze. While financial distress certainly indicates a liquidity problem, it does not necessarily indicate more serious structural (operational) problems. On the other hand, operational distress may suggest deeper questions regarding the longer-term viability of the firm. While the operational distress measure encompasses a broader range of potential problems, it still can be considered as a robustness test to indicate the sensitivity of the results to an alternative measure of distress. Such a check may be important in light of developments in financial markets during the post-bubble period such as the extremely low interest rate environment, as well as interest rate concessions and debt forgiveness by lenders to specific distressed firms.

Financial distress is based on a firm's interest coverage ratio, following Hoshi et al. (1990). The interest coverage ratio is calculated as earnings before interest and taxes, divided by interest expense. Having an interest coverage ratio less than one indicates that the firm faces financial distress in the sense that it has an immediate problem in earning enough to cover its interest obligations. To enter financial distress, a firm must have an interest coverage ratio for one year that is greater than one, followed by two consecutive years in which its interest coverage ratio is less than one. The firm is deemed to become distressed in that second consecutive year with a coverage ratio less than one. A given firm may enter distress more than one time during our sample period. In order to qualify as a repeater, a firm must first recover from its earlier episode of distress, where recovery is defined as experiencing three consecutive years with an interest coverage ratio greater than one.

Operational distress is based on a firm's net income. To enter operational distress, a firm must experience a year of positive net income followed by two consecutive years in which its net income is negative. The firm is deemed to become operationally distressed in that second consecutive year with negative net income. In order to qualify as a repeater, a firm must first recover from its earlier episode of distress, where recovery is defined as experiencing three consecutive years with positive net income.

Table 1 provides some preliminary evidence on the numbers of Japanese firms becoming distressed during each year of the 1980-2002 sample period. For comparison, the first three columns of the table indicate the number of firms entering financial distress, the number entering operational distress, and the number of firms that are neither financially nor operationally distressed in that year. The next three columns show the percent of each category of firms that experienced an increase in loans over the three-year period that includes the last "good" year before the firm enters distress (t-2), the first "bad" year (t-1), and the second "bad" year (t) in which the firm formally enters distress; that is, the change in loans is calculated as:  $\text{loans}(t) - \text{loans}(t-3)$ .

The table shows that both types of distress produce very similar numbers of firms entering distress in each year, with several waves of firms becoming distressed. The number of firms entering distress rises temporarily in the early 1980s, the mid-1980s, the early 1990s, and the late 1990s. While the numbers tend to cycle, the sharp jump in 1993 suggests a discrete change in the level of that cycle as the effects of the bursting of the stock market and real estate bubbles begin to bite. After a brief respite in the mid-1990s, the number of firms entering distress again jumps to even higher levels.

Columns 4 and 5 show a similar break in the share of distressed firms receiving increased bank loans soon after the bubbles burst. While the percentages are somewhat noisy due to the small numbers of firms entering distress in some years, the table suggests that a larger share of firms entering distress received increased bank loans during the 1980s before the widespread deterioration in the health of the Japanese banking sector, as well as the macroeconomy more generally. Thus, even as the numbers of firms entering distress increased markedly, their probability of obtaining increased bank loans during the 1990s fell, and fell precipitously at the beginning of the 2000s. Furthermore, not only was entering distress more widespread in the post-bubble era, firms entering distress suffered a more persistent decline in their coverage ratio and net income than in the pre-bubble period, in the sense that more time elapsed, on average, before the firms' distress measures hit bottom and began to recover (not shown in table).

#### C. Firm Performance, Horizons and Changes in Loans

A number of important issues arise in specifying the relationship between bank lending and the recovery of distressed firms. Once firms entering distress have been identified, one must then determine the variables to be used to measure subsequent firm performance, as well as investigating the appropriate horizon to be considered for the recovery period. In addition, increases and decreases in loans, as well as main bank loans compared to secondary bank loans, may have different impacts on firm performance.

Two alternative measures for firm performance are considered: earnings before interest and taxes (EBIT), divided by total assets, and operating income divided by total assets. These measures provide different perspectives on firm performance. EBIT and operating income, rather than net income, are used as the performance measures because net income includes potentially distorting items. For example, EBIT abstracts from differences across firms in their

capital structure. Furthermore, using EBIT to measure the extent to which a firm recovers from distress avoids the impact of interest concessions from the firm's lenders and the effects of making use of deferred tax assets accrued during the "bad" years, both of which would increase net income and paint a rosier picture of a firm's recovery. Similarly, operating income has the advantage over net income of providing a better indicator of the ongoing viability of the firm because operating income does not include items such as extraordinary gains and losses and other revenues and expenses unrelated to the firm's basic operations, such as capital gains from sales of cross-shareholdings or income associated with a lender forgiving the firm's debt.

Determining the appropriate horizon for subsequent firm performance involves issues associated with the length of the lag between a firm obtaining increased bank loans and the effect (and the persistence of the effect) on firm performance from putting the additional funds to work. Because there is no obvious answer on theoretical grounds, alternative horizons for subsequent performance are considered in the empirical specifications. This also allows for an investigation into the extent to which improvements in firm performance associated with changes in bank loans persist; that is, are not merely short-term fixes that may have little lasting impact on the firm's operations.

The effects of increases and decreases in bank loans are separated because of the decisions underlying the changes in loans. An increase in loans reflects active decisions by the firm to request additional loans and by the lender to grant the request. On the other hand, no change or a decline in loans outstanding can occur actively or passively, and, furthermore, may be difficult to interpret. For example, a decline in loans can occur passively as existing loans amortize. Alternatively, a decline in loans may occur due to a decline in loan demand by the firm or, if the firm requests additional loans, by the lender not agreeing to supply additional loans

or even to rollover maturing loans to the firm. In contrast, a decline in loans outstanding also may result from the lender helping the firm by forgiving loans or doing a debt-for-equity swap with the firm. Thus, a decline in loans outstanding to a firm may reflect weak loan demand on the part of the firm, toughness on the part of the lender as it cuts loan supply to the firm, or even softness on the part of the lender as it forgives outstanding loans to the firm. Because of the ambiguity of the interpretation of declines in bank loans, it is essential to allow increases and decreases in loans to have different effects.

A further distinction is made with respect to the source of the loans to a firm, allowing the effects of changes in loans to a firm from its main bank to differ from the effects of changes in loans from its other (secondary) banks. Differences in the effects might arise due to the potential differences in both the information available to the two sets of lenders and the incentives faced by the lenders. Because the main bank tends to have a closer relationship with the firm and may serve as the delegated monitor for the other lenders, the main bank likely has better information about the health and prospects of the firm, as well as playing a bigger role in any restructuring or bailout of the firm. In addition, given the main bank's closer relationship with the firm, it likely has a stronger incentive to aid a distressed firm than do secondary lenders.

#### D. Empirical Specification

In order to investigate the effects of changes in bank loans on the subsequent performance of firms entering distress, the empirical specification must control for relevant firm characteristics, the macroeconomic environment, and industry performance. The basic specification is:

$$DPERFORM_{t+i,t+j} = a_0 + a_1FIRM_t + a_2BANK_t + a_3DLOAN_t + a_4YEAR_t + \varepsilon_t, \quad (1)$$

where DPERFORM is the change in the performance measure for the firm during period  $(t+i)$  through  $(t+j)$ , where period  $t$  is the year in which the firm enters distress (i.e., the second “bad” year). FIRM is a vector of firm characteristics, BANK is a vector of main bank characteristics, DLOAN is a vector of measures of the change in bank loans, and YEAR is a set of annual (1,0) dummy variables. Because the dependent variables are measured over periods subsequent to the firm entering distress at time  $t$ , the explanatory variables are measured as of time  $t$ ; that is, they are measured at the time that the firm enters distress, which is just prior to the (potential) recovery period over which firm performance is measured. In order to control more precisely for industry effects, each variable (other than the measures of keiretsu group membership and main bank health) are constructed as deviations from the median value for all firms in the focus firm’s industry in the given year.<sup>2</sup> For example, a variable  $X$  is measured as  $X$  minus the median value of  $X$  for that year for the firms in the same industry as the focus firm, and the change in a variable  $X$  is measured as the change in the firm’s value of  $X$  minus the change in the median value for  $X$  for the firms in the focus firm’s industry in the given year.

The change in the two alternative firm performance variables, EBIT and operating income (OPIN), are calculated as the difference between the values calculated as a percentage of the firm’s total assets and are measured over four alternative time horizons: during the year after the firm enters distress (D1EBIT and D1OPIN), the two-year period after the firm enters distress (D12EBIT and D12OPIN), the subsequent two-year period (D34EBIT and D34OPIN), and the four-year period after the firm enters distress (D14EBIT and D14OPIN). Using  $t$  as the year in which the firm enters distress, the measures are constructed as:  $(t+1) - t$ ,  $(t+2) - t$ ,  $(t+4) - (t+2)$ , and  $(t+4) - t$ , respectively. The benefit of using the multiple horizons arises from the fact that the exact length of the lag with which changes in bank loans impact firm performance is

unknown a priori. In addition, comparisons across the four alternative time horizons can provide a sense of the extent to which any effects on subsequent firm performance persist.

The set of firm characteristics includes the logarithm of firm assets (LASSET); the firm's leverage ratio (LEV), defined as total debt / total assets; bonds outstanding / total assets (BONDA); four equity ownership measures indicating the ownership shares of the firm held by financial institutions (OWNFIN), securities companies (OWNSEC), corporations (OWNCORP), and foreigners (OWNFOR), with the ownership shares held by government and individual investors omitted to avoid multicollinearity problems; and a (1,0) dummy variable, KEIR, with a value of 1 if the firm is a member of a horizontal (bank-centered) keiretsu, and zero otherwise. We include membership in eight separate keiretsu groups: Mitsubishi, Mitsui, Sumitomo, Fuyo, Dai-Ichi Kangyo, Sanwa, IBJ, and Tokai. The first three groups were reconstituted from the zaibatsu groups that were outlawed after World War II. The other groups were formed by the banks at their center after World War II. Although the first six groups are the largest keiretsu groups, the IBJ and Tokai groups are included for completeness.

BANK includes three main bank characteristics, where the main bank is designated as the bank with the largest volume of loans outstanding to the firm in that year.<sup>3</sup> The first measure reflects the health of the main bank (BKHLTH), and is measured as the book-to-market ratio of the main bank. In order to have a higher value of BKHLTH correspond to better health, the negative of the book-to-market value is used. The second measure is the share of total loans outstanding to the firm provided by the firm's main bank (MBLNSH). The third measure is the change in MBLNSH during the two "bad" years (i.e., calculated as the time t value minus the value at time (t-2)). These two lender concentration measures may be important because increased concentration of borrowing can make it easier for a distressed firm to renegotiate or

restructure its loans. A main bank that holds a greater share of a firm's loans has a stronger incentive to provide managerial and other support to a distressed firm and to make needed loan concessions, insofar as it captures a greater share of the resulting benefits to the various stakeholders of the firm.

The vector DLOAN includes measures of the change in bank loans over the three-year period that includes the last "good" year and the two "bad" years as the firm enters distress, scaled by the previous year's total assets; that is,  $(\text{loans}(t) - \text{loans}(t-3))/\text{assets}(t-3)$ . The annual changes in loans are aggregated over the three-year period rather than being included separately for each year because of their strong correlations with each other that make it difficult to isolate the effects for individual years. The change in total bank loans is disaggregated into four components. For the reasons discussed above, the change in loans from the firm's main bank is considered separately from the change in loans from the firm's secondary banks, and then a distinction is made between increases and decreases in loans. Note that this refers to whether the raw change in loans is positive or negative, not whether the transformed loan measures that are deviations from median industry values are positive or negative. Thus, the equation includes four separate change-in-loans variables: DLNMB\_POS, the positive change in main bank loans; DLNMB\_NEG, the negative change in main bank loans; DLNSB\_POS, the positive change in secondary bank loans; and DLNSB\_NEG, the negative change in secondary bank loans. Finally, each regression includes a set of year (0,1) dummy variables to further control for general macroeconomic activity.

Table 2 contains the summary statistics for the eight alternative dependent variables and the set of explanatory variables used in the regressions based on the set of firms entering financial distress. The summary statistics for the set of observations used in the regressions

based on operational distress are similar. For each variable, outliers have been removed, where outliers are defined as values that are more than four standard deviations away from the mean value of the variable. The first four columns contain the mean, standard deviation, minimum and maximum values for the more familiar untransformed variables, meaning the values of the variables before the industry median values are subtracted. The last four columns show the same information for the variables after being transformed by subtracting the industry median values. These latter variables are the ones used in the regression analysis. The missing values for KEIR and BKHLTH in the transformed variables columns reflect the fact that they have not been transformed by subtracting the industry median values. With respect to the performance measures, note that most of the performance improvement, on average, occurs during the first year after firms enter distress. Also, as will be seen in the regression tables, the number of observations for the performance measures that include the fourth year after a firm enters distress is reduced due to the delay in the availability of data from PACAP.

### III. Empirical Results

#### A. Financial Distress

Table 3 presents the results for the basic specification for firms entering financial distress for all four time horizons for the EBIT dependent variable. Only four of the control variables have statistically significant estimated coefficients. A higher leverage ratio (debt/assets) is associated with improved firm performance initially, having a positive estimated coefficient for both the first-year horizon (column 1) and the first two-year horizon (column 2). However, that effect turns negative during the third and fourth year horizon (column 3), resulting in an effect that is reduced in both magnitude and statistical significance (now significant only at the 10

percent level) over the entire four-year horizon compared to the initial effects. A higher bond-to-assets ratio is associated with improved firm performance for three of the four horizons, although the effect for the entire four-year horizon is significant only at the 10 percent level. The positive effects of both LEV and BONDA may be related to firms with greater leverage and that rely more heavily on bond finance having been relatively healthy firms prior to entering distress (i.e., earlier having been healthy enough to issue bonds) and thus, other things equal, being more solid firms that are more able to weather a temporary adverse shock.

Among the equity ownership measures, a greater ownership by nonfinancial corporations (for the first two-year horizon) and by foreigners (for the first-year horizon and the overall four-year horizon) are associated with improved performance (relative to ownership by government plus individuals). A possible explanation for the corporate ownership share effect is that it reflects cross-shareholdings by stakeholders in the firm that provide support when the firm becomes distressed. A higher degree of foreign ownership may indicate that a firm is more subject to market discipline, and thus is quicker to take remedial actions, such as a major restructuring if needed.

Among the change-in-loans measures, increases in main bank loans (DLNMB\_POS) consistently have a positive effect on firm performance, although only those for the first-year horizon and the full four-year horizon are statistically significant. This result is consistent with main banks coming to the aid of distressed firms and helping them overcome financial distress. Increases in secondary bank loans similarly have positive estimated coefficients, although they tend to be smaller in magnitude and are not statistically significant. In contrast, decreases in both main bank loans and secondary bank loans tend to have negative estimated coefficients (meaning that a larger decrease in those loans is associated with improved firm performance), with four of

the seven negative estimated coefficients being statistically significant. However, as noted in the earlier discussion, it is difficult to interpret the meaning of the estimated coefficients on decreases in loans because such decreases could be due to a weakening in loan demand by the firm, a reduction in credit availability from the firm's lenders, or debt forgiveness by the firm's lenders. Certainly, improved firm performance could be associated with greater reductions in loans if the reductions were due to loan forgiveness. Another possible explanation for the significant negative effects of a decrease in secondary bank loans is that the decreases reflect the distressed firm increasing the concentration of its borrowing with its main bank in order to make any negotiations for debt relief or loan restructuring less complicated. However, the specification already controls for the change in the main bank share of total loans (DMBLNSH). Although that variable tends to have a positive estimated coefficient, it is never even close to being statistically significant.<sup>4</sup>

Table 4 presents results for the Table 3 specification for three subperiods: 1980-92, 1993-97 and 1998-2002. Based on the earlier discussion, strong reasons exist to expect different bank and firm behavior during the post-bubble period compared to the pre-bubble period. The stock market peaked at the end of 1989, while real estate prices peaked about a year later. Allowing a brief period for the effects to start impacting bank and firm behavior, the sample is split between 1992 and 1993, consistent with the 1993 jump in the number of firms entering distress shown in Table 1. The remaining 10 years of the sample are evenly split, although the specific split can be justified by the timing of the jump in the number of firms entering distress in 1998, as well as by the finding by Spiegel and Yamori (2003) of a structural break in the main bank-firm relationship in late 1997.

Because the Japanese economic problems were less widespread and less long-lasting in the 1980s, and bank health was not as precarious, one might expect to observe main banks supporting their distressed firms during the pre-bubble period in an effort to help them achieve recovery. Once banking and firm problems became more widespread in the 1990s following the bursting of the bubbles, but before the banks came under serious regulatory pressure, one might expect to find that main banks became somewhat constrained, and perhaps overwhelmed, and did a poorer job of aiding their distressed, but viable, borrowers. Then during the late 1990s and early 2000s, with the economy still weak and the banking crisis having intensified, banks faced even stronger perverse incentives to evergreen loans rather than to allocate credit to those firms with the best prospects. Thus, during this latter subperiod, it is even less likely that a positive relationship between increased main bank loans and improved firm performance will be found.

In order to save space, Table 4 (and subsequent tables) shows the estimated coefficients only for the variables of particular interest: the measures related to keiretsu and main bank relationships, and the four measures of the change in loans to the firm. With most of the estimated coefficients on KEIR being negative, it is hard to argue that keiretsu membership helped distressed firms recover. In fact, for the two post-bubble subperiods, seven of the eight estimated coefficients are negative, although none is statistically significant. On the other hand, most of the estimated coefficients on main bank health are positive, including seven of the eight for the post-bubble subperiods, but with only one being statistically significant even at the 10 percent level. This evidence is suggestive that having a (relatively) healthy main bank may have contributed to the recovery of a distressed firm, especially during the post-bubble period when unhealthy main banks may have been focusing their lending on the least viable firms due to the perverse incentives they faced to evergreen loans.

Surprisingly, obtaining a larger share of its bank loans from its main bank inhibits a firm's recovery during the pre-bubble period, with the negative estimated coefficients being statistically significant for both the first two-year horizon and for the full four-year horizon. One might have expected to observe a positive effect, insofar as concentrating borrowing with the firm's main bank reduces free rider and holdup problems when a distressed firm needs to renegotiate or restructure its debt, or needs managerial help from its stakeholders. Interestingly, MBLNSH does have a consistently positive coefficient at all horizons for the two post-bubble subperiods when firm problems became more widespread and banks came under increasing stress. However, only that for D12EBIT in the 1998-2002 subperiod is statistically significant, although that for D12EBIT in the 1993-97 subperiod is significant at the 10 percent level. Thus, once the crisis hit, firms that entered distress with borrowing more concentrated with their main bank were better able to improve their subsequent performance. In fact, although the estimated coefficients are mixed, firms that increased the concentration of their loans with their main banks during the two "bad" years as they entered distress may have benefited somewhat. Eight of the estimated coefficients on DMBLNSH are positive, although only that for D1EBIT for the 1993-97 subperiod is significant even at the 10 percent level.

As expected, increases in main bank loans have a positive effect on firm performance during the 1980-92 subperiod, with three of the four estimated coefficients being statistically significant. Increases in loans by secondary banks also have positive coefficients, although they are smaller, and none is statistically significant. Thus, for the pre-bubble period, it appears that increased main bank loans are associated with improved performance by firms subsequent to entering distress, with most of the contribution occurring immediately after the firms entered distress. Furthermore, the fact that increases in main bank loans have a larger impact than do

increases in secondary bank loans is consistent with main banks playing a more important role in rescuing troubled firms. On the other hand, decreases in both main bank and secondary bank loans tend to have negative coefficients, indicating that larger decreases in loans are associated with improved firm performance, although only the coefficient for decreases in secondary bank loans for D1EBIT is statistically significant.

For the two post-bubble subperiods, the results for the change in loans variables present a different picture. Once we enter the “lost decade,” we also lose the significant positive coefficients on the increase in main bank loans. In fact, five of the eight coefficients are negative, although none is statistically significant. Thus, once firm problems became widespread and the banks came under increasing stress, the benefits to distressed firms from increased main bank loans disappear. In part, such a result could reflect evergreening behavior by main banks, whereby the banks were increasing loans to their weakest borrowers in order to prevent, or at least delay, firm bankruptcy and the associated need for the bank to recognize, and provision for, the loans as nonperforming loans. Thus, rather than allocating loans to the firms with the best prospects for recovery, main banks were responding to the perverse incentives they had to misallocate credit by evergreening loans to their weakest borrowers. With respect to decreases in main bank loans, the results in the post-bubble subperiods are similar to those for the pre-bubble period: a mixture of positive and negative effects with no estimated coefficients being statistically significant.

Interestingly, unlike the positive effects of increases in main bank loans, those for increases in secondary bank loans do not disappear once we move to the post-bubble period, with seven of the eight coefficients being positive, although only that for the four-year horizon in the 1998-2002 subperiod is significant even at the 10 percent level. What might be the explanation

for the disparity between the effects of increases in main bank and secondary bank loans during the post-bubble period? One possible explanation is that secondary banks did not have the same incentive, or feel the same obligation, to aid distressed firms as did main banks. Because secondary banks were less likely to evergreen loans to the weakest firms, perhaps they tended to increase loans primarily to distressed firms that they thought were only temporarily distressed and had a good chance of recovery. On the other hand, given the perverse incentives faced by main banks, they were more likely to make negative net present value loans to avoid the mutually assured destruction that would occur if their weakest borrowers were not able to make the interest payments on their existing loans, throwing the firms into default and forcing the lenders to recognize the poor quality of the existing loans. With respect to decreases in secondary bank loans, the results for the post-bubble subperiods are similar to those for the pre-bubble period: mostly negative coefficients, with three of the four coefficients for the 1993-97 subperiod being statistically significant.

Table 5 repeats the specifications shown in Table 4 using operating income measures rather than EBIT for the dependent variables. In many ways, the results simply confirm those in the previous table. However, the negative effect of keiretsu membership now comes through stronger, especially in the post-bubble subperiods, with two of the negative coefficients during the 1998-2002 subperiod being statistically significant, and two more during the 1993-97 subperiod being significant at the 10 percent level.

Furthermore, the effects of an increase in main bank loans now differ from those in Table 4 in meaningful ways. The positive effect for the pre-bubble period occurs only for D34OPIN and D14OPIN, with only the latter being statistically significant, suggesting that any improvement in operating income occurs later than for EBIT. In part, this may be related to the

fact that operating income would not be affected in the same way as EBIT by extraordinary gains and losses, perhaps from the sale of assets or even emanating from debt forgiveness by the firm's lenders. But even more striking are the results for the final subperiod where the negative estimated effect for D14OPIN is now statistically significant, and that for D34OPIN is negative and significant at the 10 percent level. That is, increased main bank loans are associated with a deterioration in firm performance measured by operating income during the late 1990s and early 2000s subperiod. This is even more suggestive of widespread evergreening of loans to distressed firms by main banks. On the other hand, the table continues to show positive coefficients for increases in secondary bank loans during the post-bubble subperiods, with the effect again being significant at the 10 percent level in the 1998-2002 subperiod for the D14OPIN specification.

While the estimated effects of the change in main bank loans in Tables 4 and 5 are statistically significant, to what extent are they economically meaningful? In Table 4, the increase in main bank loans has a statistically significant effect at the one-year, two-year, and four-year horizons for the pre-bubble subperiod. Applying the estimated coefficients to a one standard deviation increase in DLNMB\_POS (an increase of 0.034) results in increases in EBIT/assets after one, two, and four years of 57, 36, and 34 percent, respectively, of the relevant mean value of EBIT/assets for each horizon. Turning to Table 5, during the pre-bubble period, a one standard deviation increase in DLNMB\_POS would result in an increase in operating income/assets after four years equal to 45 percent of its mean value, and a decline of 32 percent after four years during the 1998-2002 subperiod, representing a dramatic swing of 77 percent of the mean value of operating income/assets between the two subperiods for the effect of a one standard deviation increase in DLNMB\_POS.

To summarize, the results in Tables 4 and 5 indicate that main banks did change their behavior after the bubbles burst, while it appears that secondary banks continued behaving in much the same way as they had in the pre-bubble period. One explanation for the change in main bank behavior is the changed economic environment and the associated change in incentives that confronted banks as they faced increasing numbers of troubled borrowers and as the banks' own health deteriorated sharply so that they, too, faced the prospect of bankruptcy. Main banks reacted by increasing loans not only to viable firms, but to the many zombie firms that were allowed to continue to operate, in large part, due to the banks evergreening some loans and forgiving others.

#### B. Operational Distress

Tables 6 and 7 repeat the specifications shown in Tables 4 and 5 for the set of firms entering operational distress. Overall, the results for firms entering operational distress parallel those for firms entering financial distress. Main banks clearly show the same change in behavior after the bubbles burst, although Table 7 does not show the same significant negative effect emanating from increases in main bank loans in the final column that occurred in Table 5. Furthermore, the positive effect of increases in secondary bank loans in the 1998-2002 subperiod in Table 6 is more apparent than in the corresponding Table 4, with the effect being statistically significant in the final column and significant at the 10 percent level for the D12EBIT specification. Finally, the puzzling significant negative coefficients on decreases in secondary bank loans have now disappeared, except in the first column of Table 6.

#### C. Manufacturing Firms

As a final check, all of the equations were reestimated for the subset of manufacturing firms. To save space, only two representative tables are included: those for firms entering

financial distress. The subset of manufacturing firms provides an interesting robustness check because the manufacturing sector had a smaller proportion of zombie firms, and those firms were exposed to international competition to a greater degree than nonmanufacturing firms (Caballero et al. 2008). As a consequence, distortions to bank lending in the form of debt forgiveness and loan evergreening would be expected to be less prevalent, because main banks would not be as able to insulate such firms from market forces. Still, Tables 8 and 9 tell much the same story as do the corresponding Tables 4 and 5 that contain the results for the full set of firms. Two specific differences are that the positive coefficient on increases in main bank loans for the D34EBIT specification during the 1993-97 subperiod in Table 8 is now statistically significant, and the statistically significant negative effect of increases in main bank loans in the last column of Table 5 is no longer significant in Table 9.

#### IV. Conclusions

Previous evidence suggests that Japanese banks were misallocating credit in the 1990s, especially during the latter half, by evergreening loans to zombie firms. Still, it may have been the case that at the same time, Japanese banks were helping distressed, but viable, firms. Increased loans to zombie firms would have allowed them to continue to operate and delay the creative destruction that was needed to reallocate resources to more productive uses. However, to the extent that Japanese banks were able to identify distressed, but viable, firms and provide the credit needed for them to restructure their operations to enable them to recover, banks still could have contributed to a shortening of the economic malaise suffered in Japan during the lost decade.

While main banks do appear to have contributed to the recovery of distressed firms during the 1980s, behavior changed after the bursting of the stock market and real estate bubbles. During the post-bubble period, increased main bank loans are no longer associated with improved performance of distressed firms. In fact, during the 1998-2002 subperiod, increased main bank loans are associated with a deterioration in the operating income of distressed firms over the four-year horizon subsequent to entering distress. Yet no similar switch is observed for secondary bank lending.

The difference can be explained by the differing incentives and perceived obligations faced by main banks relative to secondary banks. Historically, main banks have served as delegated monitors for other lenders to the firm and have played the major role in orchestrating rescues of troubled firms. However, during the post-bubble period, with their own survival in jeopardy, main banks faced perverse incentives to increase loans to nonviable, zombie firms in order to protect their own balance sheets from a further surge in nonperforming loans. Thus, rather than focusing their lending on helping distressed but viable firms recover, main banks evergreened loans, misallocating credit in an effort to avoid their own demise.

Table 1: Number of Firms Entering Distress and the Percentage Receiving Increased Bank Loans for the Prior Three-Year Period

Year	Financial Distress	Operational Distress	Undistressed	Financial Distress Percent with Increased Loans	Operational Distress Percent with Increased Loans	Undistressed Percent with Increased Loans
1980	5	5	1102	80	80	43
1981	7	8	1139	71	63	51
1982	32	34	1159	81	82	52
1983	33	34	1152	85	82	44
1984	7	11	1187	86	82	37
1985	12	12	1186	75	75	37
1986	15	17	1175	93	94	36
1987	17	18	1209	76	72	33
1988	1	1	1256	100	100	25
1989	4	3	1305	25	33	25
1990	5	5	1383	80	80	27
1991	12	14	1425	33	36	32
1992	25	24	1429	56	63	37
1993	83	84	1337	63	61	33
1994	62	73	1280	53	49	26
1995	29	31	1263	62	61	25
1996	21	21	1286	43	43	23
1997	21	22	1316	43	45	27
1998	67	65	1321	58	57	30
1999	100	98	1360	47	49	22
2000	65	60	1365	26	27	11
2001	97	88	1324	11	9	5
2002	107	115	1244	6	6	5

Table 2: Summary Statistics for Regression Sample: Financial Distress

	Untransformed Variables				Transformed Variables			
	MEAN	STDDEV	MIN	MAX	MEAN	STDDEV	MIN	MAX
D1EBIT	3.210	6.998	-30.855	32.699	3.133	6.990	-30.489	33.076
D12EBIT	3.795	7.196	-27.966	33.587	3.798	7.040	-25.647	32.472
D34EBIT	0.812	6.703	-26.630	29.110	0.731	6.363	-24.130	29.290
D14EBIT	4.521	7.258	-23.920	34.470	4.627	6.870	-21.460	32.650
D1OPIN	1.831	3.286	-9.068	18.808	1.675	3.198	-9.225	18.673
D12OPIN	2.717	4.501	-13.618	30.183	2.504	4.398	-11.935	30.160
D34OPIN	0.596	4.004	-15.767	24.053	0.572	3.660	-15.370	22.933
D14OPIN	3.319	4.781	-10.141	24.937	3.273	4.629	-9.764	25.325
LASSET	4.723	0.574	3.259	6.658	0.004	0.548	-1.501	1.868
LEV	0.712	0.183	0.123	1.261	0.113	0.165	-0.471	0.503
BONDA	0.060	0.087	0	0.406	0.034	0.087	-0.133	0.383
OWNFIN	0.284	0.143	0	0.662	-0.023	0.146	-0.374	0.398
OWNSEC	0.014	0.015	0	0.095	0.006	0.014	-0.023	0.076
OWNCORP	0.327	0.182	0.027	0.824	0.065	0.179	-0.310	0.605
OWNFOR	0.029	0.045	0	0.314	0.001	0.044	-0.087	0.271
KEIR	0.448	0.498	0	1				
BKHLTH	-0.631	0.472	-2.100	-0.066				
MBLNSH	0.202	0.174	0	1	0.033	0.161	-0.306	0.737
DMBLNSH	-0.016	0.112	-0.553	0.522	0.011	0.115	-0.504	0.637
DLNMB_POS	0.019	0.032	0	0.251	0.019	0.034	-0.065	0.252
DLNMB_NEG	-0.012	0.031	-0.260	0	-0.007	0.029	-0.233	0.065
DLNSB_POS	0.069	0.085	0	0.543	0.056	0.086	-0.089	0.514
DLNSB_NEG	-0.012	0.036	-0.436	0	-0.018	0.048	-0.446	0.098

Table 3: Financial Distress: Effects on Firm Performance

Dep. Var.	D1EBIT	D12EBIT	D34EBIT	D14EBIT
Constant	-0.144 ( 0.925 )	1.579 ( 0.287 )	3.100* ( 0.045 )	5.130** ( 0.002 )
LASSET	-1.116 ( 0.147 )	-1.006 ( 0.179 )	0.418 ( 0.573 )	-0.653 ( 0.417 )
LEV	7.689** ( 0.000 )	8.786** ( 0.000 )	-4.281* ( 0.023 )	3.344 ( 0.100 )
BONDA	9.107* ( 0.022 )	8.770* ( 0.023 )	-0.007 ( 0.999 )	7.972 ( 0.053 )
OWNFIN	-2.847 ( 0.403 )	2.975 ( 0.369 )	-1.921 ( 0.568 )	-0.863 ( 0.813 )
OWNSEC	-28.861 ( 0.198 )	-2.998 ( 0.891 )	-18.667 ( 0.367 )	-8.994 ( 0.688 )
OWNCORP	1.910 ( 0.436 )	6.328** ( 0.008 )	-2.190 ( 0.357 )	2.688 ( 0.297 )
OWNFOR	15.460* ( 0.048 )	12.024 ( 0.114 )	5.278 ( 0.500 )	17.546* ( 0.039 )
KEIR	0.029 ( 0.963 )	-0.996 ( 0.099 )	-0.443 ( 0.463 )	-1.086 ( 0.097 )
BKHLTH	0.559 ( 0.599 )	-0.091 ( 0.93 )	1.536 ( 0.229 )	1.782 ( 0.198 )
MBLNSH	1.092 ( 0.663 )	2.909 ( 0.233 )	0.266 ( 0.913 )	1.551 ( 0.556 )
DMBLNSH	-0.277 ( 0.935 )	0.871 ( 0.793 )	1.549 ( 0.674 )	1.596 ( 0.689 )
DLNMB_POS	26.193* ( 0.025 )	6.305 ( 0.578 )	14.626 ( 0.197 )	25.473* ( 0.038 )
DLNMB_NEG	-7.780 ( 0.525 )	10.039 ( 0.400 )	-34.740* ( 0.019 )	-5.155 ( 0.747 )
DLNSB_POS	2.503 ( 0.546 )	7.179 ( 0.075 )	0.012 ( 0.998 )	7.148 ( 0.101 )
DLNSB_NEG	-24.361** ( 0.000 )	-14.041* ( 0.026 )	-8.704 ( 0.157 )	-14.899* ( 0.026 )
Adj. R sq.	0.082	0.093	0.055	0.041
Observations	586	586	508	508

Table 4: Financial Distress: Effects on Firm Performance

Subperiod Dep. Var.	1980-92				1993-97				1998-2002			
	D1EBIT	D12EBIT	D34EBIT	D14EBIT	D1EBIT	D12EBIT	D34EBIT	D14EBIT	D1EBIT	D12EBIT	D34EBIT	D14EBIT
KEIR	0.352 ( 0.778 )	-1.985 ( 0.155 )	0.200 ( 0.868 )	-1.333 ( 0.315 )	-0.511 ( 0.544 )	-1.498 ( 0.160 )	-0.153 ( 0.894 )	-1.519 ( 0.152 )	0.263 ( 0.806 )	-0.408 ( 0.657 )	-1.091 ( 0.244 )	-0.603 ( 0.591 )
BKHLTH	2.374 ( 0.524 )	-0.074 ( 0.986 )	-1.907 ( 0.594 )	-2.494 ( 0.524 )	1.181 ( 0.725 )	-2.339 ( 0.581 )	4.808 ( 0.298 )	3.267 ( 0.440 )	0.926 ( 0.501 )	0.481 ( 0.682 )	1.522 ( 0.287 )	3.004 ( 0.081 )
MBLNSH	-3.357 ( 0.495 )	-12.882* ( 0.020 )	-0.449 ( 0.927 )	-12.368* ( 0.023 )	4.332 ( 0.217 )	7.825 ( 0.078 )	0.803 ( 0.869 )	6.315 ( 0.158 )	2.041 ( 0.639 )	7.686* ( 0.040 )	0.388 ( 0.918 )	6.194 ( 0.171 )
DMBLNSH	3.062 ( 0.756 )	3.088 ( 0.778 )	9.489 ( 0.336 )	8.293 ( 0.442 )	11.511 ( 0.052 )	5.648 ( 0.448 )	-5.915 ( 0.485 )	-4.914 ( 0.527 )	-2.195 ( 0.656 )	-1.592 ( 0.706 )	1.421 ( 0.775 )	3.751 ( 0.530 )
DLNMB_POS	52.491** ( 0.004 )	39.816* ( 0.050 )	10.065 ( 0.562 )	45.987* ( 0.017 )	-5.983 ( 0.738 )	-26.770 ( 0.237 )	34.569 ( 0.162 )	19.395 ( 0.391 )	11.902 ( 0.595 )	-13.216 ( 0.490 )	-0.460 ( 0.982 )	-11.815 ( 0.635 )
DLNMB_NEG	-12.263 ( 0.758 )	48.082 ( 0.280 )	-73.481 ( 0.058 )	-29.678 ( 0.480 )	36.934 ( 0.104 )	27.365 ( 0.338 )	-36.806 ( 0.220 )	10.671 ( 0.698 )	-20.482 ( 0.256 )	7.041 ( 0.648 )	-22.125 ( 0.328 )	0.769 ( 0.977 )
DLNSB_POS	4.827 ( 0.479 )	0.921 ( 0.903 )	0.413 ( 0.950 )	1.188 ( 0.869 )	4.176 ( 0.526 )	9.559 ( 0.250 )	-4.224 ( 0.640 )	1.932 ( 0.815 )	0.444 ( 0.953 )	8.414 ( 0.191 )	4.474 ( 0.505 )	14.541 ( 0.072 )
DLNSB_NEG	-41.808** ( 0.000 )	-1.244 ( 0.919 )	-5.026 ( 0.634 )	-3.736 ( 0.746 )	-22.061** ( 0.008 )	-25.530* ( 0.015 )	-6.891 ( 0.528 )	-23.447* ( 0.020 )	-14.911 ( 0.237 )	-4.326 ( 0.688 )	-14.703 ( 0.219 )	5.482 ( 0.702 )
Adj. R sq.	0.348	0.277	0.172	0.142	0.107	0.087	-0.028	0.050	0.029	0.019	-0.038	0.008
Observations	131	131	128	128	183	183	181	181	272	272	199	199

p-values in parentheses

\* indicates significance at the 5% level

\*\* indicates significance at the 1% level

Table 5: Financial Distress: Effects on Firm Performance

Subperiod	1980-92				1993-97				1998-2002			
Dep. Var.	D1OPIN	D12OPIN	D34OPIN	D14OPIN	D1OPIN	D12OPIN	D34OPIN	D14OPIN	D1OPIN	D12OPIN	D34OPIN	D14OPIN
KEIR	0.386 ( 0.597 )	0.072 ( 0.942 )	-0.140 ( 0.872 )	-0.135 ( 0.900 )	0.107 ( 0.804 )	-1.118 ( 0.065 )	-0.223 ( 0.668 )	-1.167 ( 0.094 )	-0.002 ( 0.996 )	-0.435 ( 0.365 )	-1.564** ( 0.006 )	-2.349** ( 0.000 )
BKHLTH	1.050 ( 0.639 )	-1.720 ( 0.570 )	-2.540 ( 0.334 )	-2.701 ( 0.406 )	1.041 ( 0.543 )	-1.682 ( 0.485 )	1.151 ( 0.577 )	-0.298 ( 0.914 )	0.262 ( 0.570 )	-0.286 ( 0.632 )	1.041 ( 0.180 )	0.886 ( 0.318 )
MBLNSH	-2.252 ( 0.439 )	-8.214* ( 0.039 )	-0.478 ( 0.897 )	-9.056* ( 0.049 )	0.828 ( 0.642 )	4.013 ( 0.110 )	-2.730 ( 0.214 )	1.637 ( 0.577 )	0.839 ( 0.576 )	4.411* ( 0.024 )	0.094 ( 0.968 )	1.808 ( 0.502 )
DMBLNSH	7.800 ( 0.154 )	-2.481 ( 0.736 )	-8.098 ( 0.262 )	0.028 ( 0.997 )	2.477 ( 0.409 )	3.270 ( 0.438 )	-2.609 ( 0.470 )	0.475 ( 0.922 )	0.178 ( 0.917 )	-2.415 ( 0.275 )	3.276 ( 0.317 )	7.136 ( 0.058 )
DLNMB_POS	-8.201 ( 0.457 )	-4.821 ( 0.747 )	14.619 ( 0.255 )	43.015** ( 0.008 )	5.889 ( 0.517 )	-0.250 ( 0.984 )	7.293 ( 0.508 )	10.803 ( 0.463 )	1.185 ( 0.870 )	-11.357 ( 0.227 )	-19.243 ( 0.078 )	-30.571* ( 0.015 )
DLNMB_NEG	-46.603* ( 0.049 )	28.841 ( 0.364 )	-25.042 ( 0.374 )	-5.439 ( 0.876 )	2.642 ( 0.813 )	-5.741 ( 0.715 )	16.405 ( 0.226 )	6.796 ( 0.707 )	2.927 ( 0.635 )	7.800 ( 0.330 )	-2.405 ( 0.882 )	-16.683 ( 0.367 )
DLNSB_POS	2.215 ( 0.586 )	0.448 ( 0.935 )	-3.167 ( 0.514 )	-7.117 ( 0.237 )	1.406 ( 0.675 )	5.200 ( 0.270 )	2.054 ( 0.612 )	6.736 ( 0.214 )	3.097 ( 0.251 )	4.671 ( 0.181 )	2.654 ( 0.498 )	7.485 ( 0.096 )
DLNSB_NEG	8.534 ( 0.189 )	-7.035 ( 0.423 )	-13.918 ( 0.191 )	-4.370 ( 0.739 )	-0.253 ( 0.950 )	-2.474 ( 0.665 )	-0.072 ( 0.988 )	-2.469 ( 0.706 )	2.493 ( 0.562 )	3.041 ( 0.586 )	-4.348 ( 0.562 )	8.266 ( 0.335 )
Adj. R sq.	0.169	0.171	0.095	0.042	-0.016	0.061	-0.035	0.035	0.008	0.030	0.066	0.150
Observations	132	132	129	129	184	184	181	181	279	279	168	168

p-values in parentheses

\* indicates significance at the 5% level

\*\* indicates significance at the 1% level

Table 6: Operational Distress: Effects on Firm Performance

Subperiod Dep. Var.	1980-92				1993-97				1998-2002			
	D1EBIT	D12EBIT	D34EBIT	D14EBIT	D1EBIT	D12EBIT	D34EBIT	D14EBIT	D1EBIT	D12EBIT	D34EBIT	D14EBIT
KEIR	-0.714 ( 0.566 )	-1.545 ( 0.259 )	-0.245 ( 0.835 )	-1.471 ( 0.245 )	-0.493 ( 0.527 )	-1.179 ( 0.228 )	-0.854 ( 0.413 )	-1.958* ( 0.045 )	-0.467 ( 0.666 )	-0.651 ( 0.491 )	-0.957 ( 0.362 )	-0.906 ( 0.458 )
BKHLTH	0.553 ( 0.878 )	-0.529 ( 0.894 )	-0.711 ( 0.835 )	-1.916 ( 0.601 )	0.949 ( 0.762 )	-0.293 ( 0.940 )	2.267 ( 0.590 )	2.510 ( 0.521 )	0.021 ( 0.988 )	0.225 ( 0.854 )	1.235 ( 0.454 )	2.601 ( 0.176 )
MBLNSH	-2.750 ( 0.566 )	-12.301* ( 0.021 )	-1.320 ( 0.776 )	-13.138** ( 0.009 )	4.889 ( 0.135 )	7.400 ( 0.071 )	2.792 ( 0.527 )	8.278* ( 0.045 )	2.390 ( 0.577 )	5.011 ( 0.180 )	1.521 ( 0.704 )	2.871 ( 0.538 )
DMBLNSH	-7.581 ( 0.420 )	4.202 ( 0.684 )	5.509 ( 0.548 )	6.303 ( 0.522 )	13.124* ( 0.017 )	6.559 ( 0.340 )	-5.593 ( 0.465 )	-3.326 ( 0.640 )	-3.300 ( 0.518 )	-2.412 ( 0.587 )	4.614 ( 0.401 )	7.366 ( 0.249 )
DLNMB_POS	50.892** ( 0.004 )	38.519* ( 0.044 )	7.593 ( 0.641 )	41.881* ( 0.018 )	-3.764 ( 0.822 )	-19.972 ( 0.341 )	28.037 ( 0.212 )	18.308 ( 0.380 )	2.558 ( 0.906 )	-10.725 ( 0.569 )	-7.169 ( 0.739 )	-9.182 ( 0.714 )
DLNMB_NEG	45.449 ( 0.360 )	-4.512 ( 0.934 )	-27.334 ( 0.560 )	-29.854 ( 0.553 )	10.946 ( 0.555 )	22.497 ( 0.333 )	-41.492 ( 0.090 )	-8.020 ( 0.724 )	-2.343 ( 0.898 )	14.333 ( 0.370 )	-23.497 ( 0.357 )	-0.577 ( 0.984 )
DLNSB_POS	2.215 ( 0.718 )	0.783 ( 0.907 )	1.772 ( 0.760 )	2.793 ( 0.654 )	3.011 ( 0.601 )	9.453 ( 0.192 )	-4.455 ( 0.563 )	2.283 ( 0.750 )	6.617 ( 0.382 )	12.575 ( 0.057 )	7.413 ( 0.304 )	19.821* ( 0.019 )
DLNSB_NEG	-36.060** ( 0.001 )	-4.794 ( 0.674 )	-1.611 ( 0.869 )	-3.961 ( 0.705 )	-11.24 ( 0.111 )	-13.895 ( 0.116 )	-3.059 ( 0.740 )	-10.900 ( 0.204 )	-16.914 ( 0.146 )	-6.117 ( 0.545 )	-1.479 ( 0.893 )	11.189 ( 0.382 )
Adj. R sq.	0.323	0.250	0.160	0.175	0.091	0.063	-0.018	0.057	0.007	0.026	-0.051	0.033
Observations	139	139	135	135	196	196	194	194	256	256	186	186

p-values in parentheses

\* indicates significance at the 5% level

\*\* indicates significance at the 1% level

Table 7: Operational Distress: Effects on Firm Performance

Subperiod	1980-92				1993-97				1998-2002			
Dep. Var.	D1OPIN	D12OPIN	D34OPIN	D14OPIN	D1OPIN	D12OPIN	D34OPIN	D14OPIN	D1OPIN	D12OPIN	D34OPIN	D14OPIN
KEIR	0.629 ( 0.375 )	0.640 ( 0.493 )	-0.150 ( 0.857 )	0.632 ( 0.535 )	0.318 ( 0.417 )	-0.543 ( 0.333 )	-0.781 ( 0.107 )	-1.292* ( 0.043 )	-0.259 ( 0.490 )	-0.589 ( 0.224 )	-1.143 ( 0.058 )	-2.266** ( 0.001 )
BKHLTH	1.066 ( 0.618 )	-2.240 ( 0.426 )	-1.700 ( 0.489 )	-2.551 ( 0.397 )	2.175 ( 0.170 )	0.007 ( 0.998 )	-0.198 ( 0.919 )	0.493 ( 0.847 )	0.174 ( 0.710 )	-0.270 ( 0.655 )	1.009 ( 0.247 )	0.854 ( 0.375 )
MBLNSH	-2.963 ( 0.288 )	-8.677* ( 0.019 )	0.421 ( 0.903 )	-9.107* ( 0.033 )	1.169 ( 0.476 )	3.708 ( 0.116 )	-2.597 ( 0.210 )	0.605 ( 0.823 )	-1.819 ( 0.223 )	-0.043 ( 0.982 )	1.121 ( 0.623 )	-2.716 ( 0.281 )
DMBLNSH	6.954 ( 0.174 )	-1.627 ( 0.808 )	-5.618 ( 0.404 )	7.179 ( 0.384 )	2.578 ( 0.348 )	3.252 ( 0.409 )	-2.155 ( 0.523 )	0.829 ( 0.851 )	0.412 ( 0.815 )	-1.208 ( 0.595 )	3.813 ( 0.260 )	8.449* ( 0.025 )
DLNMB_POS	-6.461 ( 0.532 )	0.910 ( 0.947 )	10.389 ( 0.380 )	42.463** ( 0.004 )	3.676 ( 0.661 )	1.359 ( 0.910 )	9.680 ( 0.352 )	17.882 ( 0.190 )	8.057 ( 0.274 )	-0.769 ( 0.936 )	-12.708 ( 0.276 )	-8.896 ( 0.490 )
DLNMB_NEG	-53.636 ( 0.059 )	-13.476 ( 0.717 )	-39.738 ( 0.251 )	-88.170* ( 0.039 )	7.762 ( 0.400 )	9.034 ( 0.494 )	3.236 ( 0.775 )	10.684 ( 0.472 )	3.828 ( 0.533 )	8.136 ( 0.305 )	-1.287 ( 0.938 )	-19.384 ( 0.288 )
DLNSB_POS	1.403 ( 0.698 )	-1.728 ( 0.717 )	-0.432 ( 0.918 )	-5.132 ( 0.317 )	2.074 ( 0.474 )	5.944 ( 0.154 )	0.332 ( 0.926 )	4.937 ( 0.292 )	2.766 ( 0.300 )	5.184 ( 0.133 )	2.092 ( 0.601 )	8.041 ( 0.071 )
DLNSB_NEG	9.312 ( 0.126 )	-6.198 ( 0.437 )	-17.293 ( 0.065 )	-4.559 ( 0.689 )	2.942 ( 0.393 )	0.982 ( 0.842 )	-1.338 ( 0.752 )	-0.630 ( 0.909 )	0.048 ( 0.990 )	-1.060 ( 0.837 )	4.046 ( 0.528 )	5.488 ( 0.438 )
Adj. R sq.	0.169	0.158	0.099	0.079	0.016	0.057	-0.029	0.044	0.012	0.005	0.015	0.103
Observations	141	141	137	137	198	198	194	194	266	266	158	158

p-values in parentheses

\* indicates significance at the 5% level

\*\* indicates significance at the 1% level

Table 8: Financial Distress: Manufacturing Firms: Effects on Firm Performance

Subperiod Dep. Var.	1980-92				1993-97				1998-2002			
	D1EBIT	D12EBIT	D34EBIT	D14EBIT	D1EBIT	D12EBIT	D34EBIT	D14EBIT	D1EBIT	D12EBIT	D34EBIT	D14EBIT
KEIR	-1.426 ( 0.314 )	-1.377 ( 0.451 )	-1.079 ( 0.475 )	-2.017 ( 0.227 )	-0.632 ( 0.471 )	-1.096 ( 0.363 )	-0.342 ( 0.802 )	-1.025 ( 0.417 )	-0.369 ( 0.780 )	-0.514 ( 0.652 )	-2.878** ( 0.005 )	-1.886 ( 0.155 )
BKHLTH	1.031 ( 0.785 )	-0.247 ( 0.959 )	-2.401 ( 0.553 )	-3.309 ( 0.460 )	1.874 ( 0.563 )	-3.687 ( 0.407 )	5.748 ( 0.262 )	3.198 ( 0.498 )	0.052 ( 0.977 )	0.625 ( 0.686 )	2.976 ( 0.082 )	2.839 ( 0.208 )
MBLNSH	-5.180 ( 0.299 )	-15.042* ( 0.021 )	-0.485 ( 0.931 )	-14.219* ( 0.024 )	4.844 ( 0.160 )	7.973 ( 0.093 )	-3.125 ( 0.569 )	2.850 ( 0.573 )	6.144 ( 0.247 )	9.043* ( 0.049 )	-0.584 ( 0.880 )	5.397 ( 0.293 )
DMBLNSH	-0.761 ( 0.942 )	10.415 ( 0.445 )	2.239 ( 0.853 )	6.698 ( 0.615 )	14.337* ( 0.027 )	9.506 ( 0.280 )	-7.836 ( 0.442 )	1.031 ( 0.913 )	-4.735 ( 0.451 )	-4.292 ( 0.428 )	8.403 ( 0.114 )	2.632 ( 0.706 )
DLNMB_POS	57.639** ( 0.002 )	44.884 ( 0.061 )	11.124 ( 0.572 )	51.003* ( 0.021 )	-3.307 ( 0.865 )	-24.783 ( 0.353 )	61.501* ( 0.048 )	40.777 ( 0.154 )	15.262 ( 0.576 )	-31.357 ( 0.183 )	-2.583 ( 0.913 )	-35.801 ( 0.252 )
DLNMB_NEG	26.571 ( 0.609 )	-3.186 ( 0.962 )	-23.190 ( 0.679 )	-29.108 ( 0.638 )	70.639* ( 0.024 )	35.818 ( 0.399 )	-87.452 ( 0.078 )	-39.672 ( 0.384 )	-17.470 ( 0.503 )	-0.979 ( 0.965 )	-59.199* ( 0.022 )	-0.242 ( 0.994 )
DLNSB_POS	2.357 ( 0.743 )	-0.303 ( 0.974 )	-5.175 ( 0.504 )	-5.691 ( 0.506 )	2.800 ( 0.662 )	10.452 ( 0.236 )	-6.706 ( 0.509 )	1.237 ( 0.895 )	8.488 ( 0.346 )	12.237 ( 0.116 )	-10.454 ( 0.136 )	9.486 ( 0.305 )
DLNSB_NEG	-23.763 ( 0.170 )	8.924 ( 0.688 )	7.428 ( 0.689 )	17.663 ( 0.390 )	-14.026 ( 0.520 )	-22.799 ( 0.446 )	-16.535 ( 0.557 )	0.886 ( 0.973 )	-0.442 ( 0.978 )	-9.446 ( 0.503 )	-4.163 ( 0.755 )	20.743 ( 0.240 )
Adj. R sq.	0.165	0.113	0.015	0.094	0.186	0.070	-0.023	-0.023	0.011	0.021	0.041	-0.015
Observations	108	108	105	105	139	139	138	138	197	197	146	146

p-values in parentheses

\* indicates significance at the 5% level

\*\* indicates significance at the 1% level

Table 9: Financial Distress: Manufacturing Firms: Effects on Firm Performance

Subperiod	1980-92				1993-97				1998-2002			
Dep. Var.	D1OPIN	D12OPIN	D34OPIN	D14OPIN	D1OPIN	D12OPIN	D34OPIN	D14OPIN	D1OPIN	D12OPIN	D34OPIN	D14OPIN
KEIR	0.165 ( 0.860 )	0.611 ( 0.593 )	-0.945 ( 0.380 )	-0.276 ( 0.836 )	0.523 ( 0.297 )	-1.242 ( 0.068 )	-0.687 ( 0.296 )	-1.628 ( 0.067 )	-0.036 ( 0.939 )	-0.218 ( 0.726 )	-1.483* ( 0.046 )	-2.073* ( 0.012 )
BKHLTH	0.702 ( 0.787 )	-2.592 ( 0.416 )	-3.072 ( 0.292 )	-2.444 ( 0.500 )	0.947 ( 0.613 )	-3.053 ( 0.229 )	3.709 ( 0.129 )	0.882 ( 0.787 )	-0.439 ( 0.482 )	-0.149 ( 0.856 )	0.999 ( 0.392 )	0.546 ( 0.673 )
MBLNSH	-1.029 ( 0.761 )	-8.287* ( 0.047 )	-1.940 ( 0.628 )	-10.003* ( 0.048 )	0.717 ( 0.716 )	4.249 ( 0.113 )	-3.088 ( 0.239 )	0.951 ( 0.787 )	0.562 ( 0.767 )	4.412 ( 0.077 )	-0.893 ( 0.765 )	-0.139 ( 0.967 )
DMBLNSH	6.109 ( 0.356 )	-1.285 ( 0.873 )	-5.240 ( 0.543 )	5.348 ( 0.618 )	8.057* ( 0.032 )	9.003 ( 0.076 )	-4.467 ( 0.359 )	4.114 ( 0.529 )	0.656 ( 0.772 )	-2.871 ( 0.333 )	3.660 ( 0.409 )	7.349 ( 0.136 )
DLNMB_POS	-15.802 ( 0.228 )	-12.189 ( 0.446 )	16.208 ( 0.254 )	43.421* ( 0.016 )	-0.382 ( 0.973 )	-6.087 ( 0.689 )	13.280 ( 0.372 )	14.658 ( 0.464 )	5.225 ( 0.593 )	-13.963 ( 0.276 )	-7.137 ( 0.667 )	-20.531 ( 0.266 )
DLNMB_NEG	-52.121 ( 0.131 )	-14.890 ( 0.722 )	-36.993 ( 0.361 )	-71.249 ( 0.160 )	5.551 ( 0.758 )	7.910 ( 0.745 )	19.252 ( 0.418 )	16.874 ( 0.598 )	-3.708 ( 0.693 )	-1.498 ( 0.903 )	-0.156 ( 0.994 )	-10.539 ( 0.667 )
DLNSB_POS	4.671 ( 0.343 )	1.428 ( 0.812 )	-3.843 ( 0.491 )	-7.493 ( 0.282 )	4.795 ( 0.197 )	8.307 ( 0.099 )	0.578 ( 0.905 )	7.983 ( 0.221 )	5.145 ( 0.137 )	7.271 ( 0.109 )	-0.409 ( 0.935 )	7.236 ( 0.192 )
DLNSB_NEG	6.515 ( 0.570 )	2.984 ( 0.831 )	-17.984 ( 0.169 )	-6.022 ( 0.710 )	3.985 ( 0.699 )	-12.750 ( 0.361 )	-4.777 ( 0.721 )	-15.919 ( 0.378 )	3.638 ( 0.537 )	-0.411 ( 0.957 )	-8.907 ( 0.407 )	6.716 ( 0.573 )
Adj. R sq.	0.092	0.197	0.089	0.065	0.048	0.172	-0.006	0.043	0.001	0.004	0.004	0.044
Observations	109	109	107	107	140	140	137	137	199	199	124	124

p-values in parentheses

\* indicates significance at the 5% level

\*\* indicates significance at the 1% level

## References

- Aoki, Masahiko. 1990. "Toward an Economic Model of the Japanese Firm." *Journal of Economic Literature*, 28, March, pp. 1-27.
- Arikawa, Yasuhiro, and Hideaki Miyajima. 2006. "Relationship Banking in Post-Bubble Japan: The Coexistence of Soft- and Hard-Budget Constraints," unpublished manuscript, June.
- Caballero, Ricardo, Takeo Hoshi, and Anil Kashyap. 2008. "Zombie Lending and Depressed Restructuring in Japan," *American Economic Review*, 98(5), December, pp. 1943-77.
- Dewenter, Kathryn L. 2003. "The Risk-Sharing Role of Japanese Keiretsu Business Groups: Evidence from Restructuring in the 1990s." *Japan and the World Economy*, 15, pp. 261-274.
- Gibson, Michael S. 1995. "Can Bank Health Affect Investment? Evidence from Japan." *Journal of Business*, July, 68, pp. 281-308.
- Guo, Shourun. 2007. "Distress Firms, Main Banks, and Group Affiliations in Japan." Unpublished manuscript, February.
- Hori, Keiichi, and Hiroshi Osano. 2002. "Financial Relations between Banks and Firms: New Evidence from Japanese Data." Unpublished manuscript, October 27.
- 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, pp. 129-201.
- \_\_\_\_\_. 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*, September, 27(1), pp. 67-88.
- \_\_\_\_\_. 1991. "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups." *Quarterly Journal of Economics*, February, 106(1), pp. 33-60.

- \_\_\_\_\_. 1993. "The Choice between Public and Private Debt: An Analysis of Post-Deregulation Corporate Financing in Japan." Unpublished manuscript.
- Industrial Groupings in Japan: The Changing Face of Keiretsu*. Tokyo: Brown & Company, Ltd., various issues.
- Hoshi, Takeo, Satoshi Koibuchi, and Ulrike Schaede. 2009. "Changes in Corporate Restructuring Processes in Japan, 1981-2007," this volume.
- Inoue, Kotaro, Hideaki Kiyoshi Kato, and Marc Bremer. 2007. "Corporate Restructuring in Japan: Who Monitors the Monitor?," unpublished manuscript, February 26.
- Japan Company Handbook*. Tokyo: Toyo Keizai, Inc., various issues.
- Kang, Jun-Koo and Anil Shivdasani. 1995. "Firm Performance, Corporate Governance, and Top Executive Turnover in Japan." *Journal of Financial Economics*, 38, pp. 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, pp. 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, pp. 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, 92(3), pp. 664-82.
- Koibuchi, Satoshi. 2007. "Debt Forgiveness during the 'Lost Decade': Impacts of the Industrial Revitalization Corporation of Japan," unpublished manuscript, December 27.
- Miwa, Yoshiro, and J. Mark Ramseyer. 2005. "Conflicts of Interest in Japanese Insolvencies: The Problem of Bank Rescues." *Theoretical Inquiries in Law*, 6(2), July, pp. 301-339.

- Morck, Randall and Masao Nakamura. 1999. "Banks and Corporate Control in Japan." *Journal of Finance*, February, 54(1), pp. 319-39.
- NEEDS-MT Bank Loan Data. 2004. Tokyo: Nihon Keizai Shimbun, Inc.
- Pacific-Basin Capital Markets Databases. 2004. Sandra Ann Morsilli Pacific-Basin Capital Markets Research Center, University of Rhode Island, Kingston, RI.
- Peek, Joe, and Eric Rosengren. 2005. "Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan," *American Economic Review*, 95(4), September, 1144-66.
- Sheard, Paul. 1989. "The Main Bank System and Corporate Monitoring and Control in Japan," *Journal of Economic Behavior and Organization*, May, 11(3), pp.399-422.
- Spiegel, Mark, and Nobuyoshi Yamori. 2003. "Financial Turbulence and the Japanese Main Bank Relationship," *Journal of Financial Services Research*, 23(3), pp. 205-223.
- The Economist*. 2002. "Nationalized Once, Nationalized Again?" July 6, p. 71.
- 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, pp. 635-72.
- Yafeh, Yishay. 2003. "Japan's Corporate Groups: Some International and Historical Perspectives," in M. Blomström, J. Corbett, F. Hayashi and A. Kashyap (eds.) *Structural Impediments to Growth in Japan*, University of Chicago Press, Chicago, pp. 259-284.

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## Endnotes

<sup>1</sup> A number of studies provide detailed discussions of the characteristics of keiretsu groups and the roles that keiretsu firm relationships play; see, for example, Aoki 1990; Weinstein and Yafeh 1998; Dewenter 2003; and Yafeh 2003.

<sup>2</sup> PACAP includes 33 separate industry codes. We omit financial firms (four codes), and regulated utilities (two codes: communications; electric power and gas). In addition, in order to ensure that the median industry values are not noisy because of small sample size, we combined some industries to increase the number of firms in our industry groups. We combined the three PACAP industries of agriculture and forestry, fishery, and mining into a single industry; petroleum and rubber into a single industry; and shipping and air transportation into a single industry. The result was a set of 23 separate industries.

<sup>3</sup> To induce stability in main bank relationships over time, given that these are deemed to be long-term relationships, the main bank series for a firm is smoothed in instances in which the main bank switches back and forth between banks by requiring a bank to exceed the loans to the firm of the previous main bank by at least 10 percent in order to become the new main bank.

<sup>4</sup> When the Table 3 specifications are reestimated with only a constant term and the four change-in-loans variables, the pattern of estimated coefficients is very similar. All four of the coefficients on the increase in main bank loans are positive, with three being statistically significant (only the effect on D12EBIT is insignificant). The increase in secondary bank loans variable has a positive coefficient in columns 1, 2 and 4, with the effects on D12EBIT and D14EBIT now being statistically significant. Six of the eight coefficients on decreases in bank loans are negative, with only those for decreases in secondary bank loans for D1EBIT and D14EBIT being significant.