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# **Japan's Banking Crisis: Who has the Most to Lose?**

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## **Abstract**

Japan has experienced a deep and prolonged banking crisis in the 1990s. In this paper we attempt to identify the characteristics of companies which have the most to lose from the banks' malaise. Using stock price data, we calculate abnormal returns of non-financial companies around significant dates in the history of the banking crisis, starting in 1995. The events we study include various government actions to address the crisis, downgrading of banks by international rating agencies, and bank mergers. We find that not all companies are equally sensitive to events in the banking sector. The most affected are small companies, with low profits, in low-tech sectors, with high leverage and limited access to bond markets. These findings are consistent with macroeconomic "credit crunch" theories according to which small companies with limited reputation are the most affected when banks reduce lending. Our results are also in line with theories suggesting that bank debt is not very important for financing innovation.

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## **Introduction**

Japan has experienced a deep and prolonged banking crisis. Estimates of the magnitude of the crisis vary (Hoshi and Kashyap, 2001), but it is evident that the problem of non-performing loans is severe, and that the ability of banks to provide capital to corporate clients is substantially impaired. In this paper we argue that the macroeconomic crisis in Japan, and the banks' restricted lending ability, have not affected everybody equally. Some sectors, and some companies, continue to do quite well. At the same time, relatively small companies, with limited access to bond markets and a heavy debt burden, suffer more. We also observe that companies in industries where R&D intensity is relatively high are not very sensitive to the troubles of the banking sector. Our results are therefore consistent with a large macroeconomic literature that identified small companies as being especially sensitive to restrictive monetary policy. Our results are also consistent with the financial economics literature according to which R&D intensive industries are not very dependent on bank finance. An optimistic conclusion that can be drawn from this analysis is therefore that the Japanese banking crisis may lead to some "creative destruction" of weak companies in low-tech sectors, a process, which is not necessarily detrimental to the Japanese economy.

Casual observation of stock price indexes for different industries in Japan suggests that not all sectors have suffered equally (Figure 1). Some industries, such as transportation equipment, electronics, or precision instruments, have fared much better than others (e.g. real estate, construction and textiles). This indicates that industries, and perhaps firms, of different characteristics, exhibit different degrees of sensitivity to a crisis-driven credit crunch. To investigate these issues, we assemble data on stock price

responses of non-financial firms to events related to the banking sector. The events we study include various government actions in relation to the banking sector, downgrading of banks by the two major international rating agencies (Moody's and S&P), and bank mergers (Japan has experienced a consolidation wave in recent years). All these events may affect the ability of banks to offer credit. Around each event, we estimate cumulative five-day abnormal returns for a sample of roughly 800 listed non-financial companies. We then relate the abnormal returns to firm characteristics such as size, profitability (Tobin's  $q$ ), leverage, R&D intensity, bond rating, and measures of the strength of bank-firm ties. This enables us to characterize companies that are most sensitive to the malaise of the banking sector.

The present paper is naturally related to the large literature on bank-firm relationships. More specifically, it is closely tied to the financial economics literature that investigates the stock price response of companies to the distress of banks with which they maintain a relationship, using event study methodology. Notable among these studies are Slovin, Sushka, and Polonchek (1993, US data), Bae, Kang and Lim (2002, Korean data), Djankov, Jindra, and Klapper (2001, data from several Asian countries), and Ongena, Smith, and Michalsen (2002, Norwegian data). Two studies apply this methodology to bank failures in Japan. Yamori and Murakami (1999) study the stock price response of clients of the failed Hokkaido Takushoku Bank. Brewer et al. (2002), which is closest to the present study, examine, in addition to the failure of Hokkaido Takushoku, the responses of client firms to the failures of the LTCM and NCB. The main result that emerges from the literature on bank distress and client firms' stock returns is that (with the exception of Norway), there is usually a negative stock price response of

client firms to bank troubles, which is interpreted as evidence of the importance of bank-firm relationships. With the exception of Brewer et al. (2002), none of these studies attempts to distinguish between the stock price responses of different types of firms. The present paper therefore contributes to this literature in two ways. First, like Brewer et al. (2002), we focus on the differential response of firms with different characteristics. Among the firm characteristics that we examine, R&D intensity and bond rating have not been studied before. Second, the present paper differs from the existing studies of this type in the scope of the events we study. Unlike previous studies, we do not focus on bank failures, but rather include a large number and variety of positive and negative events related to the banking crisis and to the ability of banks to offer new loans.

The paper is also related to another line of research in financial economics, according to which different types of finance are appropriate for different types of economic activities. One conclusion that emerges from this literature, which is supported by our findings that firms in R&D intensive sectors are not very sensitive to bank-related events, is that R&D activity rarely relies on bank finance (Allen and Gale, 2000, Carlin and Mayer, 2002).

The macroeconomic literature on (monetary policy and) “credit crunch” is also related to our work. For our purposes, the main relevant conclusion from this literature is that small firms, as well as firms with limited access to financial markets, are more sensitive to changes in available bank credit (because of shifts in monetary policy) than are bigger and more reputable firms. (See, for example, Gertler and Gilchrist, 1994, or Kashyap, Stein, and Wilcox, 1993). The present paper can therefore be viewed as an

attempt to connect the financial economics and macro schools of thought, and offer some conclusions on the type of firms, which are most sensitive to banking crises.

Finally, the paper is, of course, also related to studies of the Japanese banking crisis and its impact on firm behavior. Gibson (1995 and 1997) estimates the sensitivity of corporate investment in Japan to banking troubles, reaching ambiguous conclusions. Kang and Stulz (2000) argue that firms with strong bank ties were hardest hit by the crisis of the (early) 1990s. Klein, Peek, and Rosengren (2002) show that FDI activity of Japanese firms in the US was affected by the health of the investing firms' banks.

The rest of the paper is organized as follows. The next offers a brief chronology of the Japanese banking crisis since the mid-1990s. Section III describes our data set, which consists of stock price data, financial reports, measures of bank-firm relationships, and newspaper clips. The event study technique we use is also discussed in this section. The results are presented in Section IV, and Section V concludes.

## **II. A Brief Chronology of the Japanese Banking Crisis, 1995-2000<sup>1</sup>**

In this section we briefly outline some of the major developments in the Japanese banking sector in the second half of the 1990s. The period can be divided into three sub-periods:

### ***Phase I (Mid 1995 - Fall 1997): Banking problems emerged***

Banking problem firstly became serious in the mid of 1995, when two large credit unions and a regional bank failed due to bad loan problems, followed by Daiwa scandal in the fall of this year. How to cope with *Jusen* (the housing loan companies) that had suffered

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<sup>1</sup> This section is based, in part, on Peek and Rosengren (2001), Ito and Harada (2000), Nakaso (2001), unpublished data collected by Jenny Corbett, the on-line archives of the New York Times and several other journals.

from huge non-performing loan due to decline of land price also became political issues in the Diet. Main issue was who should be in charged in the cost of unrecoverable asset. In the process of discussing *Jusen* problem and bailing out weak financial institutions, as Hoshi and Kashyap (2001) stressed, it has been gradually perceived that even health banks would suffer from huge loss, as the convey system came to be seen as meaning the stronger banks would have to bear the reconstruction cost of *Jusen* and weak institutions.

As a result, the “Japan Premium” (on the cost of debt of Japanese banks) first appeared in Euro markets. Bank stock price declined relative to the other stocks since the end on 1995 (see Figure 1). Rating agencies began to downgrade Japanese banks, suggesting the possibility of distress. Credit rating of major banks or long-term banks which was AA or higher in the early 1990s, according to Table 2, down graded after some banks bailout and *Jusen* confusion. For instance, Long Term Credit Bank of Japan (LTCB), Nippon Credit Bank (NCB), *Hokkaido Takushoku* Bank (HTB) and Daiwa hat faced down graded from A to BBB.

The final resolution of *Jusen* problem (the housing loan companies) was a major issue during this period. Government decided to use public funds for solving this problem, however, banking sectors had to contribute was written off funding financial institutions and other lender. Out of 6410 billion yen losses, 55% (3500 billion yen) was allocated to founder banks, 1700 (27%) to lender banks, while just 8% (530 billion yen) to agricultural financial institutions, and the tax payer money covered the rest of 10% (680 billion yen).

In the end of FY 1995, “risk management loan”, published by each bank<sup>2</sup> amounted 21.9 trillion yen, which was almost twice times comparing to the end of 1994. Realizing that non-performing loans were becoming so serious, the Japanese government began to strengthen the supervision over the banking sector; however, during this period, banking supervision was not very strict. Although independent organ for bank supervision was in discussion, MoF was still in charge of supervising the banking sectors in the phase.

### ***Phase II (End of 1997 – Mid 1999): Financial Crisis***

Macroeconomic conditions started to deteriorate in April 1997, when consumer taxes were raised. The first bank failure and the onset of the financial crisis occurred in November 1997. On November 3rd Sanyo Securities was default in the inter-bank loan market, which gave serious shock to the market. Then, Hokkaido Takushoku Bank faced financial distress, which was followed by the collapse of Yamaichi Securities, one four large securities houses. This period witnessed an increase in the Japan Premium and a further decline in bank stock prices. International rating agencies continued to downgrade the Japanese banks, and, as a result, the credit rating of some major banks became as low as BBB, or even BB.

In the face of an imminent financial crisis, the Japanese government took a series of measures. In order to ameliorate the under-capitalization of the banking sector, an injection of capital to the banking sector took place in March 1998. The issues related to capital injection was handled by the newly created Financial Crisis Management

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<sup>2</sup> This is published by each bank. It includes loans failed firms, loans which payment suspended, and loan with relaxed condition. In detail, see Hoshi and Kashyap (2001)



Committee. This capital injection have the effect of calming the market turmoil until May. However, the financial market were not convinced that the problems with banks had been definitely dealt with. Then, financial system was threatened again at the crisis of LTCB, which was the largest bank failure that Japan has ever had in the postwar history.

Starting in mid-1998, the government attempted to pass several reform bills, coping with this crisis. One of them was the Financial Revitalization Act, which intended to deal with the failed financial institutions. Under the law, a failed bank could either be placed under Financial Reorganization Administration (FRA) or temporarily nationalized. Based on this law, the government decided in late 1998 to nationalize LTCB and NCB, which were close to bankruptcy.

The other one was the Financial Function Early Strengthening Law, which replaced the legislation of February 1998 governing capital injection into viable banks using public money. To operate the entire safety net under the new laws, ranging from dealing with bank failures to capital injection, the Financial Reconstruction Commission was established. Under this new framework, it was admitted that available public funds was doubled. Using a sufficient large volume of public funds, the government tried to show its clear commitment to cope with non-performing loans problems.

Thirdly, government supervision of the banking sector seems to have improved during this period. The Financial Supervision Agency (FSA, *Kinyu Kantoku-cho*) was established in June 1998, which implies that financial supervision was finally taken over from MoF. It began to investigate the magnitude of non-performing loans by their own calculation. In addition to that, after half year intensive discussion, an “inspection

manual,” which includes the clear criteria for supervise credit risk of banking sectors was made public in April 1999.

***Phase III (Mid 1999 - End of 2001): The merger wave***

No outright financial collapse occurred in Japan during this period, despite the prolonged crisis. The Japan Premium declined starting in spring 1999. This was partly due to the government’s capital injections and other measures designed to improve bank health and partly due to some improvement in the performance of the Japanese economy in the forth quarter of 1999.

This phase witnessed a big wave of mergers among major banks, with merger announcements starting in the summer 1999. Mizuho announced large merger plans, which was followed by other large major banks. One of the major forces of this rapid rearrangement in the Japanese banking sector is the Japanese “Big Bang” Plan that aims at thorough deregulation of Japanese financial system. This plan was announced in November 1996 as the last step of deregulation process since late 1970s. Following this plan, the restrictions that separated banking, securities business, and insurance business will be lifted. Then, Japanese banks started to look for appropriate partners to survive the fierce competition in the domestic and international financial market.

Another driving force of this merger-mania is the public funds injected to large banks and the restructuring plan submitted to the government in the phase II. The government has injected public fund mainly by preferred stocks. The government might exert stronger control on each bank’s management if a bank with public fund does not fulfill the restructuring plan or they could not pay dividend to this preferred stocks.

Consequently, for returning the public funds as soon as possible, each bank try to be more profitable by merging with other bank and restructuring the whole organization. For example, Mizuho Holdings plans to reduce cost reduction by reducing 170 domestic branches and 60 overseas branches and so on. Thus, By April 2001, as a result of this merger wave, the 13 “city banks” which existed in early 1993 have been reduced to five.

However, in the end of 2000, when business cycle entered down turn, it became clear that non-performing loan was still high level, and allowance of loan losses was not enough (see Table 1). It was partly because government and banking sectors lost their zeal to cope with non-performing loan, and partly because the continuous deflation in asset prices led to new non-performing loans. Thus, in early 2001 investors and policy makes appear to have realized that the banking sector problems were far from resolved. This concern resulted in a continued increase in the performance difference between bank stocks and the rest of the Nikkei Index. In response, the government resumed its efforts to strengthen banking supervision since spring 2001 again.

### **III. Data and Empirical Approach**

#### *Sample and Data Sources*

Our sample includes about 800 listed firms on the First Section of the Tokyo Stock Exchange. These firms are mostly in manufacturing industries and, in addition, in construction, real estate, and wholesale (which are sectors that are likely to be sensitive to the availability of bank finance). The information we gather on each firm consists of several parts. First, we use daily stock price data drawn from the *Kabuka Soran (Toyo Keizai)*. We use financial statements and information on Tobin’s  $q$  from the Waseda-

Nissei Corporate Governance Database. For each event we collect information from financial statements for the corresponding period.

We identify main bank of each firm as the bank with the largest loan outstanding to a firm, provided that two conditions are satisfied. First, we require that the identity of the largest lender remain unchanged for the past five years. Second, we require that the ratio of borrowing from the main bank to total assets exceed 5.1%, the average rate of main bank dependence for all the sample firms.

R&D intensive industries are identified according to ratio of R&D expenditures to sales, and include chemicals, pharmaceuticals, machinery, electronics, transportation equipment, and precision instruments.

Our measure of credit rating is based on credit rating by any of the major rating agencies. In our data, a company's bond rating is coded on a scale from one to four, where one corresponds to a rating of A or higher, two a rating between BBB and A-, three to a rating of BBB- and 4 to complete absence of rating (not investment grade). (Thus, a low credit rating corresponds to a high code in the data). The variable definitions and basic statistics are summarized in Table 2.

### *Empirical Approach*

Our empirical analysis is based on measurement of abnormal stock returns for our sample of firms around the date of an event related to the banking crisis. As in all event studies, we begin by estimating the "market model." For each firm, stock returns are regressed on (a constant and) the market returns (Tokyo Stock Exchange Price Index, the TOPIX index), using 40 daily observations between dates -60 and -20 (where date zero

is the date of the event in question). The estimated parameters of the regression are then used to generate the predicted return for each firm around the event date. Finally, abnormal returns are defined as the actual stock returns in excess of the model's prediction. Because it is sometimes hard to verify the date on which news might have affected the market, and because some events evolved over several trading days, the analysis that follows will focus on cumulative abnormal returns between dates  $-5$  and  $+5$  for each event.

#### **IV. Hypotheses, Results and Discussion**

We report our findings for three classes of events. The first class of events we examine consists of various government actions designed to address the banking crisis. It is interesting to examine both the type of actions that make a difference for stock markets (see Peek and Rosengren, 2001), and also to observe the interpretation that various actions are given by the market. Actions that are likely to improve the ability of banks to offer new loans should be associated with a positive response in the stock prices of client firms.

The second class consists of cases of downgrading of banks by one of the two major international rating agencies, Moody's and S&P. This class of events is unambiguously bad for banks (resulting in an increased cost of raising funds), and consequently, we assume, for bank clients as well.

Finally, the third class of events we examine consists of three major bank mergers. This class of events is particularly interesting, both because of the large wave of consolidation in the Japanese financial system, and because the effect of bank mergers on

client firms is *a priori* ambiguous. On the one hand, a merger may contribute to bank health and may therefore improve a bank's ability to offer new loans. If this effect is important, the stock price response of client firms will tend to be positive. On the other hand, a merger may endanger the relationship between a firm and its main bank, for example because of a merger could take place between a firm's main bank and the main bank of one of its rival (see some discussion of this point in Yafeh, 2002). Bank mergers could also lead to a negative effect on the stock prices of client companies simply because the combined bank may be forced to sell some of its equity stakes in order not to exceed the legal maximum of 5 percent.

#### *IV.1 Government Actions*

We divide the events we analyze in this category into three groups. The first, and chronologically the earliest, consists of measures to resolve the *Jusen* problem. In the second category we investigate several government steps to improve banking supervision. Government injections of capital to the banking sectors are discussed in the third group. All together, we examine eleven event dates:

##### The *Jusen* Problem

- (i) Announcement of steps to resolve the *Jusen* problem on March 19, 1995.
- (ii) Diet passes bills on *Jusen* liquidation on June 18, 1996.

##### Measures to Improve Banking Supervision and Reform the Banking Sector

(iii) The Cabinet adopts bill to establish the Financial Supervisory Agency on March 11, 1997.

(iv) The Financial Advisory Agency is established on June 22, 1998.

(v) The Financial Examination Manual is made public on April 8, 1999.

(vi) Emergency package for the banking sector is unveiled on April 6, 2001.

(vii) Banking sector reform plan and timetable published on September 21, 2001.

### Injection of Funds

(viii) Banks apply to the government asking for injection of funds on March 5, 1998.

(ix) The Upper House passes bills to inject funds to the banking industry on October 12, 1998.

(x) Banks apply again, asking the government for funds on March 5, 1999.

(xi) Government approval of the banks' request for funds on March 12 1999.

As noted above, it is not always easy to identify precisely the time at which information on government actions reaches the market. Therefore, rather than focusing on abnormal returns on the announcement date, date 0, we present in Table 3 regression results where the dependent variable is CAR, cumulative abnormal returns, between dates  $-5$  and  $5$ . The results appear to vary considerably across the three event groups. Government actions related to the resolution of the *Jusen* problem seem to have had little impact on stock returns, although we do find some evidence that these actions had a more positive impact on the stock prices of companies in low-R&D sectors. By contrast, measures to improve banking supervision seem to have been far more important. In particular, these

measures seem to have constituted “good news” for bank dependent companies: small firms, with a low  $q$ , in low-tech sectors, with limited access to bond markets and a high degree leverage (although the latter coefficient is not statistically significant).<sup>3</sup> Similarly, the main beneficiaries of government injections of capital to the banking sectors were also low-tech leveraged firms, with limited access to bond finance (low bond rating). We conclude that (a) government actions matters; and (b) that firms which can be characterized as bank-dependent respond more to such government actions.

#### *IV.2. Downgrading of Banks' Credit Rating*

We now turn to several events in which major Japanese banks were downgraded by international rating agencies. In general, in the early 1990s the rating of all Japanese banks was AA or higher. Then some banks were downgraded by one notch, to A+, and only starting in late 1995, Japanese banks were further downgraded to A or even A-. With the on-going financial crisis, some banks were further downgraded to BBB or, in the case of Daiwa Bank, even to BB, see Table 4. The events we study in this section of the paper include some of the most dramatic downgrading announcements:

- (a) Announcement of downgrading of Mitsubishi, Sakura, Sumitomo and DKB by S&P on December 22, 1995.
- (b) Announcement of downgrading of Sakura, LTCB and Daiwa on January 22, 1996.
- (c) Announcement of downgrading of Sakura and Sanwa by S&P on December 29, 1997.

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<sup>3</sup> The last event in this category, the banking sector reform plan of September 2001, seems to have been the least important of these measures. This could perhaps be due to loss of credibility of the government's crisis management policy, or perhaps because the plan was anticipated in advance.



- (d) Announcement of downgrading of Tokyo-Mitsubishi, IBJ, DKB, Sakura and Sumitomo by S&P on May 27, 1998.
- (e) Announcement of downgrading of Daiwa, Sumitomo, DKB, IBJ, Sakura, Sanwa, and Tokai by S&P on December 24, 1998.

The results are presented in Table 5, and appear to differ somewhat across downgrading announcements. Nevertheless, in line with our findings on the stock price response to government actions, downgrading also appears to be particularly harmful to highly leveraged companies, where the coefficient is both statistically significant and of substantial magnitude. (in the pooled sample, firms with leverage two standard deviations above the mean experienced 2 percent lower CAR, although the May 1998 downgrading appears to be an exception). Also sensitive to downgrading are firms in low R&D industries and with low credit rating, although the magnitude of the coefficient implies a smaller effect than that of leverage. There is some indication that profitable firms (with a high Tobin's  $q$ ) seem to suffer less from downgrading of their banks, although the results here are somewhat ambiguous. The dummy variable "main bank involved" (which takes the value one if a firm's main bank was downgraded) offers inconclusive evidence on the impact of downgrading on firms that use the downgraded bank as their main bank. The coefficient in the pooled regression is surprisingly positive, although it is negative in two of the individual regressions. However, it is possible to include additional measures of the strength of a firm's ties to a main bank such as the ratio of loans from the main bank to total debt or main bank shareholding. When these variables are added to the regression,

we do find evidence that main bank client firms suffer more as a result of downgrading (and the coefficient on leverage is no longer significant; results not shown).

#### *IV.3. Bank Mergers*

The Japanese financial system has experienced a wave of mergers and consolidation between 1999 and 2000 (see Appendix). We focus here on the three largest and presumably most important mergers:

- (a) The announcement of the formation of the *Mizuho* Group (consisting of the former banks DKB, Fuji and IBJ) on August 20, 1999.
- (b) The announcement of the formation of the SMBC group (consisting of the former Sumitomo and Sakura banks) on October 14, 1999.
- (c) The (first) announcement of the formation of the UFJ group (consisting of the former Sanwa, Tokai and Asahi banks)<sup>4</sup> on March 14, 2000.

The results are presented in Table 6. Overall, the table suggests that bank mergers constituted good news, for some firms. Interestingly, firms with the most positive abnormal returns were not necessarily clients of the merging banks, but rather leveraged companies for which a general improvement in the conditions of the banking industry was “good news.” In this respect, the findings are similar to those reported in Brewer et al. (2002) for three bank failures in Japan, where there is not much difference between clients of the failed banks and other companies. In particular, abnormal returns around the big bank mergers tended to be positive for the following types of firms:

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<sup>4</sup> Despite the initial announcement, Asahi Bank ended up not joining this group.

Highly leveraged firms, presumably because they depend on bank debt. The positive correlation between leverage and abnormal returns holds in the pooled sample, as well as in each of the mergers separately. Similar results are obtained when a measure of bank debt to total liabilities is included in the regressions.

Firms in industries where R&D intensity is relatively low, probably because banks tend to finance more traditional activities, and not so much research and development (Carlin and Mayer, 2002). This finding holds in two of the three mergers and in the pooled sample.

Firms with a low credit rating, that is, firms with restricted access to bond markets, and therefore highly dependent on bank finance (in line with the macroeconomic literature on “credit crunch,” see Kashyap et al., 1993).<sup>5</sup>

Contrary to our initial expectations, firms whose main bank was involved in the merger did not exhibit higher abnormal returns, although the correlation between main bank involvement and abnormal returns is insignificant in the individual regressions. The positive coefficient in the pooled sample on the variable “main bank involved could perhaps be interpreted as evidence that bank mergers tend to destroy relationships, or that an equity sale by the merged bank was expected to drive down the share prices of client firms. However, when we include in the regressions additional measures of bank-firm ties (e.g. main bank shareholding or main bank loans) we find no evidence that the strength of bank-firm ties affected returns: measures of bank debt to assets or of bank shareholding are statistically insignificant.

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<sup>5</sup> There is also some evidence that high-quality firms - as measured by a high “market to book” ratio - experienced higher abnormal returns, especially around the Mizuho merger. We are not certain why this may be so.

It is interesting to examine the economic importance of the various coefficients, using the estimated values in the pooled three-merger regression. The average firm in the sample (with mean values for all variables) experienced zero cumulative abnormal returns during the five-day period surrounding the merger, yet highly leveraged companies (with leverage two standard deviations above the mean) experienced positive returns of about 2 percent. The average firm in low-R&D industries experienced a positive five-day CAR of 0.6 percent, compared with a negative five-day CAR of about the same magnitude for a firm with similar characteristics (size, leverage, etc.) in relatively R&D intensive sectors. CAR of clients of one of the banks involved in the merger were about 1 percent lower than the CAR of other firms. The maximal possible change in credit rating (from unrated to A or better) would raise the five-day returns by about one percent. The estimated economic importance of the coefficient on  $q$  is rather small.

Finally, it is interesting to note that the UFJ merger (with Sanwa bank at its core) seemed to have generated the most positive abnormal returns of the three mergers. This is perhaps because some of the participating banks were perceived as particularly weak prior to the consolidation, and so the news about their survival through constituted more of a positive surprise.

## **V. Concluding Remarks**

Two main conclusions emerge from this study. First, the impact of Japan's banking crisis is far from homogenous, and not all companies more equally affected by events in the banking sector. Second, companies, which we find to be especially sensitive

to the malaise of the banking sector, are the ones that the macroeconomic literature has described as especially sensitive to “credit crunches.” Small, low profit companies, with limited access to bond finance (low rating), high levels of leverage (and bank debt) tend to be more sensitive than other companies to events in the banking sector. We also find that companies in R&D intensive industries are generally less affected by the banking crisis than companies in more traditional sectors. This is in line with the view that bank debt is not a main source of finance to R&D. Our findings imply, then, that the Japanese banking crisis may include a (slow) “cleansing effect,” leading to the survival of better performing companies in high-R&D industries.

## **References**

- Allen, F. and D. Gale (2000), *Comparing Financial Systems* (Cambridge, MA, MIT Press).
- Bae, Kang and Lim (2002), “The Value of Durable Bank Relationships: Evidence from Korean Banking Shocks,” *Journal of Financial Economics*, Vol. 64, pp. 181-214.
- Brewer, E. H. Genay, W. Hunter, and G. Kaufman (2002), “The Value of Banking Relationships during a Financial Crisis: Evidence from Failures of Japanese Banks,” Working Paper, Federal Reserve Bank of Chicago.
- Carlin, W. and C. Mayer (2002), “Finance, Investment and Growth,” *Journal of Financial Economics*, forthcoming.
- Djankov, S., J. Jindra, and L. Klapper (2001), “Corporate Valuation and the Resolution of Bank Insolvency in East Asia,” Working Paper, the World Bank.

- Gertler, M. and S. Gilchrist (1994), "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms," *Quarterly Journal of Economics*, Vol. 109, pp. 309-340.
- Gibson, M. (1995), "Can Bank Health Affect Investment? Evidence from Japan," *Journal of Business*, Vol. 68, pp. 281-308.
- Gibson, M. (1997), "More Evidence on the Link between Bank Health and Investment in Japan," *Journal of the Japanese and International Economies*, Vol. 11, pp. 296-310.
- Hoshi, T. and A. Kashyap (2001), *Corporate Finance and Governance in Japan* (Cambridge, MA, MIT Press).
- Ito, T. and K. Harada (2000), "Japan Premium and Stock Prices: Two Mirrors of Japanese Banking Crises," NBER Working Paper No. 7997.
- Kang, J. and R. Stulz (2000), "Do Banking Shocks Affect Firm Performance? An Analysis of the Japanese Experience," *Journal of Business*, Vol. 73, pp. 1-23.
- Kashyap, A., J. Stein, and D. Wilcox (1993), "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance," *American Economic Review*, Vol. 83, pp. 78-98.
- Klein, M., J. Peek, and E. Rosengren (2002), "Troubled Banks, Impaired Foreign Direct Investment: The Role of Relative Access to Credit," *American Economics Review*, Vol. 92, pp. 664-682.
- Nakaso, H. (2001), "The Financial Crisis in Japan during the 1990s," BIS Discussion Paper No. 6.
- Ongena S., D. Smith, and D. Michalsen (2002), "Firms and their Distressed Banks: Lessons from the Norwegian Banking Crisis (1998-1991)," *Journal of Financial Economics*, forthcoming.

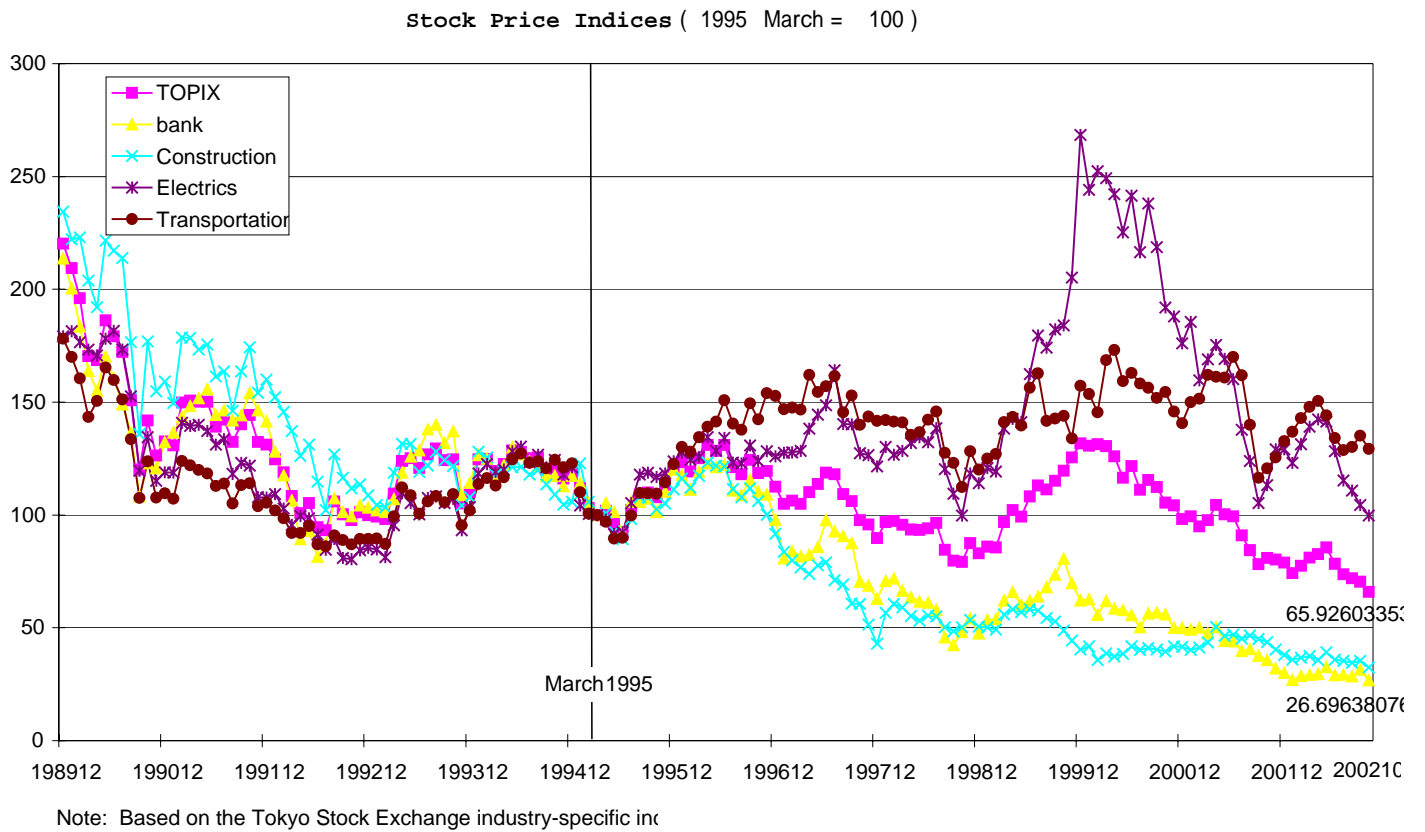
Peek, J. and E. Rosengren (2001), "Determinants of the Japan Premium: Actions Speak Louder than Words," *Journal of International Economics*, Vol. 53, pp. 283-305.

Slovin, M., M. Sushka and J. Polonchek (1993), "The Value of Bank Durability: Borrowers as Stakeholders," *Journal of Finance*, Vol. 48, pp. 247-266.

Yafeh, Y. (2002), "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, forthcoming (also appeared as NBER Working Paper No. 9386).

Yamori, N. and A. Murakami (1999), "Does Bank Relationship have an Economics Value? The Effect of Main Bank Failure on Client Firms," *Economics Letters*, Vol. 65, pp. 115-120.

**Figure 1: Co-movement of Industry-specific Stock Price Indexes and Bank Stock Prices, 1995-2002**





**Table 1: The Japanese Economy and Banking System, 1995-2001: Basic Indicators**

Fiscal Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Inflation rate	1.4	0.5	-0.1	-0.5	-0.8	0.7	-0.5	-1.6	-1.9	-1.2
Nominal GDP growth rate	1.8	0.9	1.0	2.0	2.6	0.9	-1.3	0.3	-0.2	-2.5
NIKKEI Index (end of March)	18,591	19,111	16,139	21,406	18,003	16,527	15,836	20,337	12,999	11,024
ROA in manufacturing <sup>a</sup>	3.3	2.5	2.8	3.0	3.5	3.2	2.5	3.1	4.2	N/A
ROA of major banks <sup>b</sup>	0.20	0.12	0.03	- 0.54	- 0.16	- 2.01	- 3.71	0.16	N/A	N/A
“Risky” loans <sup>c</sup>	12.8	13.6	12.5	21.9	16.4	22.0	20.3	19.8	19.3	27.6
Losses due to non-performing loans	1.6	3.9	5.2	11.1	6.2	10.8	10.4	5.4	4.3	7.7
Allowance for loan losses	3.7	4.5	5.5	10.3	9.4	13.6	9.3	7.7	6.9	8.7
Cumulative direct write-off since 1992	0.4	2.5	5.3	10.8	14.5	18.0	22.3	25.9	28.5	31.9
Amount of Loans (?)	0.0	0.0	0.0	0.0	0.0	365.9	320.2	316.5	313.6	293.2

(a) Average for all non-financial companies listed on the Tokyo Stock Exchange.

(b) Average for all city banks and the LTCB.

(c) UNITS?

**Table 2: Data Sources and Variable Definitions**

Variable	Source	Definition	Mean UFJ Merger Sample	Std. Deviation UFJ Merger Sample
Assets	Waseda-Nissei Corporate Governance Database	Total assets in [UNITS x 1,000,000]	0.27	0.55
Tobin's $q$	Waseda-Nissei Corporate Governance Database	Ratio of market value to book value	1.09	1.27
Leverage	Waseda-Nissei Corporate Governance Database	Total liabilities to assets	0.26	0.20
High R&D sector	Waseda-Nissei Corporate Governance Database	Chemicals, pharmaceutical s, machinery, electronics, transportation equipment, and precision instruments.	0.49	N/A
Bond Rating	Waseda-Nissei Corporate Governance Database	On a range from 4 (lowest, unrated) to 1 (rated A or higher)	2.95	1.12
Main Bank information (loans, shareholding, etc.)	Waseda-Nissei Corporate Governance Database	Largest lender, and loans exceed 5.1 % of assets and relationship unchanged for 5 years	[% companies with MB?]	

**Table 3: The Effects of Government Actions to Address the Banking Crisis on Cumulative Abnormal Returns of Non-Financial Firms on Days (-5, +5)**

	<b>Actions related to the Jusen Problem</b>	<b>Improved Banking Supervision</b>	<b>Injections of Capital</b>
Constant	<b>-0.001</b> <b>(0.006)</b>	<b>0.023</b> <b>(0.007)</b>	<b>-0.030</b> <b>(0.009)</b>
Assets	<b>0.001</b> <b>(0.002)</b>	<b>-0.013***</b> <b>(0.002)</b>	<b>0.002</b> <b>(0.003)</b>
Tobin's q	<b>-0.000</b> <b>(0.004)</b>	<b>-0.012***</b> <b>(0.003)</b>	<b>0.001</b> <b>(0.005)</b>
Leverage	<b>-0.001</b> <b>(0.009)</b>	<b>0.018</b> <b>(0.016)</b>	<b>0.078***</b> <b>(0.013)</b>
High-R&D	<b>-0.009***</b>	<b>-0.005*</b>	<b>-0.023***</b>
Sector dummy	<b>(0.003)</b>	<b>(0.002)</b>	<b>(0.004)</b>
Bond rating	<b>-0.001</b> <b>(0.001)</b>	<b>0.003**</b> <b>(0.001)</b>	<b>0.009***</b> <b>(0.002)</b>
N	<b>1603</b>	<b>5144</b>	<b>3340</b>
Adjusted R <sup>2</sup>	<b>0.01</b>	<b>0.02</b>	<b>0.05</b>

**Table 4: Bond Rating of Major Banks**

Based on the most conservative rating of the four rating companies (S&P, Moody's, JCRI, IBCA)

									Phase I		Phase II		Phase III		
Old Name	New Name	3/89	3/90	3/91	3/92	3/93	3/94	3/95	3/96	3/97	3/98	3/99	3/00	3/01	3/02
IBJ	IBJ	AAA	AAA	AAA	AA	AA-	A+	A+	A	A	A-	BBB	BBB+	BBB+	A
LTCB	Shinsei	AA	AA	AA	AA-	A	A-	A-	BBB+	BBB+	BBB-	BB-	BBB-	BBB-	BBB-
NCB	Aozora	.	AA+	AA+	AA	A	A	A	BBB-	BB+	BB+	BB-	BB-	BB	BBB-
DKB	Mizuho	AAA	AA	AA	AA-	AA-	A+	A+	A	A	BBB+	A	A	A	BBB
Sakura	Sakura	AAA	AA+	AA+	AA+	AA-	AA-	AA-	A-	A-	A-	BBB	BBB	A-	A-
Fuji	Mizuho	AA	AA	AA	AA-	A+	A+	A+	A-	A-	BBB+	A	A+	A+	BBB
Mitsubishi	Tokyo-Mitsubishi	AA+	AA+	AA+	AA	AA-	AA-	AA-	A+	A+	A	A-	A-	A-	BBB+
Asahi	Asahi	AA+	AA+	AA+	AA	A+	A	A	A	A	A	BBB	BBB	BB+	BB+
Sanwa	UFJ	AA	AA	AA	AA	AA-	AA-	AA-	A	A	A	BBB+	BBB+	BBB+	BBB
Sumitomo	SMBC	AA+	AA+	AA+	AA	AA-	A+	A+	A	A	A-	BBB	BBB	BBB+	BBB
Daiwa	Daiwa	AA+	AA+	AA+	A+	A+	A-	A-	BBB+	BBB+	BBB-	BB+	BB+	BB+	BB+
Tokai	Tokai	AAA	AAA	AAA	AA+	AA-	A	A	A	A	A	BBB-	BBB-	BBB	A
Hokkaido-Takushoku	-	AA	AA	AA	AA	A	A	.	BBB-	BBB-	BBB-	.	.	.	.
Tokyo	-	AA+	AA+	AA+	AA+	AA+	AA+	.	AA+	AA+	.	.	.	.	.

**Table 5: The Effects of Bank Downgrading on Cumulative Abnormal Returns of Non-Financial Firms on Days (-5, +5)**

	<b>All</b>	<b>DG -1995</b>	<b>DG-1996</b>	<b>DG-1997</b>	<b>DG-5/98</b>	<b>DG-12/98</b>
Constant	<b>0.002</b> (0.006)	<b>0.008</b> (0.010)	<b>0.013</b> (0.008)	<b>-0.007</b> (0.019)	<b>0.024</b> (0.013)	<b>0.025</b> (0.008)
Assets	<b>-0.002</b> (0.002)	<b>-0.002</b> (0.002)	<b>-0.001</b> (0.003)	<b>0.012*</b> (0.007)	<b>-0.015***</b> (0.005)	<b>0.002</b> (0.003)
Tobin's q	<b>0.006**</b> (0.003)	<b>-0.007</b> (0.007)	<b>-0.004</b> (0.005)	<b>0.033**</b> (0.011)	<b>-0.037***</b> (0.009)	<b>0.003</b> (0.004)
Leverage	<b>-0.055***</b> (0.010)	<b>0.000</b> (0.015)	<b>0.013</b> (0.013)	<b>-0.249***</b> (0.028)	<b>0.084***</b> (0.016)	<b>-0.097***</b> (0.014)
High-R&D sector dummy	<b>0.008***</b> (0.003)	<b>-0.009**</b> (0.004)	<b>0.008*</b> (0.004)	<b>0.009</b> (0.008)	<b>0.018***</b> (0.005)	<b>0.013***</b> (0.005)
Bond rating	<b>-0.002*</b> (0.001)	<b>0.003</b> (0.002)	<b>-0.002</b> (0.002)	<b>-0.011***</b> (0.004)	<b>0.006**</b> (0.002)	<b>-0.009***</b> (0.002)
MB involved dummy	<b>0.011***</b> (0.003)	<b>-0.010**</b> (0.004)	<b>-0.011*</b> (0.007)	<b>0.011</b> (0.012)	<b>0.003</b> (0.005)	<b>0.003</b> (0.005)
N	<b>4011</b>	<b>790</b>	<b>801</b>	<b>820</b>	<b>824</b>	<b>776</b>
Adjusted R <sup>2</sup>	<b>0.02</b>	<b>0.02</b>	<b>0.01</b>	<b>0.17</b>	<b>0.12</b>	<b>0.12</b>

**Table 6: The Effects of Bank Mergers on Cumulative Abnormal Returns of Non-Financial Firms on Days (-5, +5)**

	<b>All Mergers</b>	<b>Mizuho</b>	<b>SMBC</b>	<b>UFJ</b>
Constant	<b>-0.022</b> (0.007)	<b>-0.036</b> (0.011)	<b>-0.058</b> (0.012)	<b>0.018</b> (0.013)
Assets	<b>-0.000</b> (0.003)	<b>0.004</b> (0.005)	<b>0.002</b> (0.006)	<b>-0.008</b> (0.007)
Tobin's <i>q</i>	<b>0.005*</b> (0.003)	<b>0.014**</b> (0.006)	<b>0.001</b> (0.006)	<b>0.001</b> (0.003)
Leverage	<b>0.051***</b> (0.012)	<b>0.037**</b> (0.015)	<b>0.068***</b> (0.017)	<b>0.057***</b> (0.024)
High-R&D sector dummy	<b>-0.013***</b> (0.004)	<b>-0.024***</b> (0.006)	<b>0.012***</b> (0.006)	<b>-0.025***</b> (0.007)
Bond rating	<b>0.004*</b> (0.002)	<b>0.000</b> (0.003)	<b>0.005*</b> (0.003)	<b>0.006*</b> (0.003)
MB involved dummy	<b>-0.012***</b> (0.004)	<b>0.006</b> (0.006)	<b>0.002</b> (0.007)	<b>-0.006</b> (0.012)
N	<b>2606</b>	<b>862</b>	<b>862</b>	<b>882</b>
Adjusted R <sup>2</sup>	<b>0.02</b>	<b>0.04</b>	<b>0.03</b>	<b>0.04</b>

**Appendix: The Consolidation of the Banking Industry in Japan  
 Press Announcements of Mergers and other Cooperation Agreements  
 Source: [should we include all the events in the printout you gave me?]**

Merging Parties	Date of 1 <sup>st</sup> Announcement
IBJ, Nomura Securities	May 13, 1998
Dai-Ichi Securities, J.P. Morgan	October 1, 1998
IBJ, Dai-Ichi Life Insurance	October 2, 1998
DKB Trust, Fuji Trust, Yasuda Trust	November 6, 1998
Fuji Bank, Yasuda Trust	January 28, 1999
Announcement, DKB, Fuji, IBJ	August, 1999
Sakura, Sumitomo	October, 1999
TMB, Mitsubishi Trust with holding	April 19, 2000
companies (announcement)	
Sanwa, Tokai, Toyo Trust (	July 4, 2000
Merger, Sumitomo & Sakura	April 1 2001
Merger, Sanwa, Tokai, Toyo Trust	Jan. 2002
DKB, Fuji, IBJ	April 2002