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DOES THE JAPANESE STOCK MARKET PRICE BANK RISK? EVIDENCE FROM FINANCIAL FIRM FAILURES

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ABSTRACT

The efficiency of Japanese stock market to appropriately price the riskiness of Japanese firms has been frequently questioned, particularly with respect to Japanese banks which have experienced severe financial distress in recent years. This paper examines the response in the stock market returns of Japanese commercial banks to the failure of four commercial banks and two securities firms between 1995 and 1998. The analysis finds that the stock market responded to new information of the failures and did so rationally. Financially weaker banks were affected more adversely by the failure of other banks and financial institutions than were healthier banks. This suggests that the Japanese stock market is more efficient, even for banks, than often perceived.

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I.   Introduction

Efficient financial markets promote aggregate economic welfare by allocating financial resources to their most potentially productive uses as signaled by market prices. Numerous studies have explored the efficiency of financial markets in the U.S. and other countries. At least for the U.S., the evidence suggests that markets have priced securities reasonably well on the basis of their underlying risk characteristics, particularly where this information is publicly available. A large number of studies have focused on the U.S. banking sector, which experienced severe financial difficulties during the 1980s. In particular, these studies have examined whether the U.S. stock market was able to differentiate among individual institutions with different financial and risk profiles, incorporate new information in the prices of securities quickly and fully, and adjust for the effects of regulatory influences, such as explicit or implicit federal government provided guarantees on some or all of the liabilities of the institutions. On the whole, the evidence suggests that the U.S. market performed all these tasks reasonably efficiently for banks and other industries. [1]

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[1] For example, see Aharony and Swary (1983), Binder (1985a, 1985b), Brewer and Jackson (1998), Cornell and Shapiro (1986), Cornett and Tehranian (1989, 1990), Karafiath and Glascock (1989), Karafiath, Mynatt, and Smith (1991), Madura and Bartunek (1994), Millon-Cornett and Tehranian (1989, 1990), Peterson and Wall (1991), Schwert (1981), Swary (1986), and Wall and Peterson (1990). See Flannery (1998) for a discussion of this literature.

At about the same time as the U. S. banking system started to recover during the early 1990s, the Japanese banking system started to deteriorate. By the late 1990s, many of the larger Japanese banks appeared to be market value insolvent and most of the others barely solvent. In 1998, nonperforming loans at Japanese banks were estimated to be as high as $1 trillion or 20 percent of their on-balance sheet assets and considerably higher at some institutions. Only liberal accounting treatment permitted most Japanese banks to satisfy the Basle capital standards and only conjectural government guarantees permitted most major banks to continue to operate without depositor runs. However, despite the favorable accounting treatment and government guarantees, Japanese financial institutions continued to suffer severe liquidity problems in the interbank markets and several had to be rescued or closed in recent years. At the same time and in response to the problems, the stance of the Japanese regulators towards banking problems and their resolution strategies underwent significant changes. In short, Japanese financial institutions experienced fundamental shifts in their operating environment during the 1990s. In light of these events and the ongoing attempt by the Japanese government to resolve the insolvencies and restructure and recapitalize the banking system, it is of considerable interest to explore whether the Japanese stock market was able to price the securities of Japanese banks efficiently and provide market signals to bank management.

It is often argued that the Japanese capital markets are not as efficient as those in the United States due to differences in regulatory, institutional, accounting, and disclosure practices. For instance, until 1993, Japanese banks did not report the amount of nonperforming loans in their portfolios and it was not until 1998 that they reported nonperforming loans by U.S. standards. The lack of extensive information on bank asset quality is an obvious impediment to

investors' ability to assess and compare the condition of banks. In addition, extensive stable cross-shareholdings among firms, particularly between banks and commercial firms, is a well-known feature of Japanese markets. Because these shareholders hold large blocks of shares and have other ties with Japanese banks, their motivations, and hence their responses, may differ from those of shareholders in the U.S. In addition, Japanese regulators have relied as much on implicit administrative guidance as on explicit regulation of banks; have been reluctant to let financial institutions fail; and have been closely associated with the banks they regulate both during and after their tenure in office. As a result of these differences, actions taken by regulators in response to changes in bank risk, and the investors' responses to regulatory actions, may differ in the two countries.

More recently, however, a number of studies have developed evidence suggesting that Japanese financial markets do, on the whole, price shares efficiently. Peek and Rosengren (1999) found that the interest rates charged large Japanese banks in the international interbank loan markets responded in the expected direction to a number of financial and regulatory events, including the failures of Japanese financial institutions. Bremer and Pettway (1999) found that the Japanese stock market anticipated the rating downgrades of Japanese banks, and Chiou (1999) reported that Japanese affiliates of Daiwa Bank suffered negative excess returns following the announcement of Daiwa's trading scandal in 1995. Lastly, Yamori (1999) reported that the failure of the Hyogo Bank in 1995 had a negative impact on the excess returns of the banking industry and, in particular, of banks in weaker financial condition.

This study expands Yamori's analysis to examine the impact of the failure of six Japanese financial institutions -- four banks and two securities firms – between 1995 and 1998 on the

market valuation of surviving Japanese banks. These failures were likely to signal additional information to investors about the financial state of the Japanese banking industry and the potential responses by the Japanese regulators. Our results indicate that shareholders interpreted the events as significant adverse changes in the risk environment of the surviving banks and that they were able to differentiate among banks when assessing the impact of the events on equity values. These results add to the growing body of evidence which suggests that Japanese investors incorporate news regarding changes in bank risk quickly and efficiently.

II.   The Failures/Nationalizations

The six financial failures examined in this paper are watershed events in the postwar Japanese financial markets. The details of the events surrounding these failures are described below.

A. Hyogo Bank (August 31, 1995)

At the close of business on August 30, 1995, Hyogo Bank became the first commercial bank in Japan to fail since the end of World War II. At the time of its resolution, Hyogo Bank, a mid-sized regional bank with ¥3.75 trillion ($37 billion) in total assets, had ¥1.5 trillion ($14.75 billion) or 40 percent of its assets invested in mostly real-estate related problem loans (see McGill, 1995).[2,3] The resolution of Hyogo Bank represented the first, albeit small, departure from the

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[2] On the same day the Hyogo Bank closure was announced, the Osaka government announced that Kizu Credit Cooperative would suspend its operations. Although Kizu was Japan's largest credit union, it was much smaller than Hyogo Bank (Kizu Credit Cooperative had ¥9 billion in total assets as of March 31, 1995 versus over ¥3.7 trillion in Hyogo Bank's total assets). The closure of Kizu followed several days of depositor runs on the institution and the assisted mergers of several other credit unions in previous years. Therefore, the market impact from the Hyogo announcement is likely to dominate the impact from the Kizu announcement and, at minimum, reinforce it in the same direction.

[3] All yen figures are converted to dollars at the time the yen figures were reported. Japanese

traditional Japanese "convoy system." Under this system, regulators would encourage strong banks to merge with the weak institutions in return for favorable regulatory treatment. Depositors, other creditors, and in most instances shareholders, of the insolvent bank would suffer no losses. In Hyogo Bank's case, all deposits (including those above the *de jure* ¥10 million per depositor insurance limit in effect at the time) were protected and paid out. However, the payments to the depositors depleted the existing reserves of the government operated Deposit Insurance Corporation (DIC) and insurance premiums had to be raised subsequently. Importantly, unlike previous failures, losses were imposed on shareholders and nondeposit creditors of the bank. But, the largest creditors and shareholders of Hyogo Bank, who were primarily other financial institutions -- including all three large long-term credit banks, two large city banks, and several trust banks --were encouraged by the government to provide the funds necessary to capitalize a newly-formed bank that would eventually take over Hyogo's operations. Therefore, the resolution of Hyogo Bank did not differ substantially from the traditional convoy system.

At the time of Hyogo's failure, the Ministry of Finance announced that it would not permit any of the country's largest 20 banks to fail before the year 2000 (Reuters News Agency, October 24, 1995). Nevertheless, two years later in 1997, three major institutions failed -- Sanyo Securities, Hokkaido Takushoku Bank, and Yamaichi Securities.

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banks are generally divided into four broad categories -- city, trust, long-term credit, and regional -- according to both size and type of business. Historically, the four types of banks have differed in their size, composition of assets and loans, customer base, funding sources, and regulatory requirements and treatment. Long-term credit and city banks were the larger banks and trust banks the most specialized. Although, over time, deregulation and increased competition among financial institutions have blurred the lines separating the business activities of Japanese banks, in the periods under observation these banks still maintained their traditional characteristics. Genay (1998) documents some of the differences in the operations of city, regional, long-term credit, and trust banks.

B. Sanyo Securities (November 4, 1997)

Sanyo Securities, a relatively small institution, filed for court protection from creditors on November 4, 1997. This was the first failure of a securities firm in the postwar era and had a significant impact on the financial markets. Despite its small size**,** Sanyo's default on its liabilities in the short-term money market appeared to signal that the problems in the financial sector were greater than widely perceived, and caused a number of other financial institutions to experience liquidity difficulties, including both Hokkaido Takushoku Bank and Yamaichi Securities.

C. Hokkaido Takushoku Bank (November 17, 1997)

On November 17, 1997, the Hokkaido Takushoku Bank Ltd. announced that, due to its difficulties in raising funds, it would transfer its operations in the Hokkaido region in northern Japan to the North Pacific Bank. Its operations outside of Hokkaido were eventually sold to Chuo Trust and Banking Co. Hokkaido Takushoku Bank was the smallest city bank, but one of the largest 20 commercial banks in Japan, with more than ¥9.5 trillion ($76.7 billion) in assets. The bank's bad loans were sold to the Deposit Insurance Corporation, and the Bank of Japan extended emergency loans to the bank during the transition period. The problems of the bank were well-known, and its closure followed an aborted government-sanctioned merger attempt with the nearby Hokkaido Bank.[4]

D. Yamaichi Securities (November 24, 1997)

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[4] News articles reported that depositors began to withdraw funds from the bank after it was announced that the planned merger with Hokkaido Bank would not happen. News reports also noted that many of the large stakeholders, e.g., the life insurance companies, refused to inject additional funds into the bank's capital base in the weeks leading up to its closure. The bank's share price, which was ¥222 at the beginning of 1997, had dropped to ¥65 the day before the failure announcement on November 17, 1997. The day after the announcement, shareholders could only receive ¥5 per share.

In the days following Hokkaido Takushoku's failure, the Japanese financial markets experienced significant turbulence. Despite the large amount of liquidity provided to the markets by the Bank of Japan, domestic credit lines to weak companies were cut further and share prices of financial institutions dropped significantly. Yamaichi Securities, one of the four largest security houses, was among the institutions that suffered the most. Its share price dropped sharply, as indications mounted that it was facing a severe liquidity crisis. On November 20, 1997, the company announced that it had asked Fuji Bank, its main creditor and close affiliate, to provide the necessary financial support to ease its liquidity needs and to recapitalize the company. This announcement provided a temporary reprieve to the company. However, in the days following, it became apparent that Fuji was unwilling to provide this support. Following Moody's downgrade of Yamaichi bonds to junk bond status, the Yamaichi board held an emergency meeting over the weekend of November 22, 1997. On Monday, November 24, 1997, the company announced that it would close.

At the time, the failures of Hokkaido Takushoku Bank Ltd. and Yamaichi Securities were viewed by many market participants as the end of the traditional "convoy system" and the beginning of a new era in Japanese financial history. The regulators had allowed two large institutions to fail. The Bank of Japan and the Deposit Insurance Corporation provided funds to ensure the liquidity of the markets and protect senior creditors and clients of the institutions, but shareholders were not rescued. The two failures were taken as a signal that the regulatory authorities -- the Ministry of Finance (MoF) and the Bank of Japan -- were taking stronger actions to resolve insolvent institutions than they had up to that time in order to slow the rapidly spiraling costs of the insolvencies to both other banks and the taxpayers.

E. Long-Term Credit Bank of Japan Ltd. (October 23, 1998)

Following the three failures in November 1997, the government began to inject public funds into banks to assist in their recapitalization. By March 1998, the government had injected a total of ¥1.8 trillion (approximately $13.5 billion) into major banks. Among the banks receiving government funds were the Long-Term Credit Bank of Japan, Ltd. (LTCB) and the Nippon Credit Bank (NCB) -- two very large banks widely perceived to be in serious financial trouble. The debt of Long-Term Credit Bank was downgraded several times and its share price dropped sharply in the first half of 1998. The declines in LTCB's share price came to a halt on June 26, 1998, when it announced that it was in merger talks with Sumitomo Trust Bank, a trust bank in stronger financial condition. However, the president of Sumitomo Trust Bank made it clear that the merger would proceed only after an inspection of LTCB's assets. Sumitomo Trust would not assume the bad loans at LTCB's non-bank affiliates, and expected government assistance to fund the merger. Market participants interpreted the proposed merger as a return to the traditional convoy system, where a weak bank was merging with a stronger bank with government assistance. The merger announcement, however, was not sufficient to bring a turnaround at the bank.

In the following months, LTCB experienced several further downgrades of its debt and announced a major restructuring plan at the end of August. At the same time, the newly-established Financial Supervisory Agency (FSA) began the inspection of LTCB's assets[5]. In addition, the use of public funds to support the merger of Sumitomo Trust and LTCB became a major point of contention between the ruling Liberal Democratic Party and the opposition parties.

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[5] The Financial Supervisory Agency, which assumed supervisory responsibilities for financial

On October 19 1998, news reports indicated that the FSA had informed LTCB earlier in the day that the bank was insolvent on a market-value basis as of the end of September, when it was last inspected. The reports also indicated that LTCB was expected to be nationalized later in the week, when recently adopted banking legislation would take effect.[6] Four days later on October 23, 1998, LTCB applied for nationalization. The government announced that it would guarantee all obligations of LTCB, the DIC would purchase the bank's shares (last traded at ¥2), and the Bank of Japan would provide financial aid to LTCB as necessary to maintain liquidity in financial markets. According to the FSA report, at the end of September, the bank had ¥160 billion in book-value capital, total assets of ¥24 trillion, ¥500 billion in latent losses on its securities portfolio, and problem assets totaling ¥4.62 trillion, or 19 percent. These losses were greater than the bank's reported capital.

F. Nippon Credit Bank Ltd. (December 13, 1998)

The semi-annual public financial statements issued by Japanese banks on November 24, 1998 for the six months ending September 30 showed that another large long-term credit bank -- the Nippon Credit Bank (NCB), with assets of ¥7.7 trillion as of September 1998 -- had significant amounts of problem loans and that its earnings had deteriorated significantly since March 1998. However, the bank stated that it was still solvent. On December 9, 1998, it was announced that NCB and Chuo Trust and Banking Co. were abandoning their previously announced merger and would form a looser alliance instead. The abandoned merger plan was

institutions from the Ministry of Finance, was established on June 22, 1998.

[6] The package of eight bills approved by the parliament on October 12, 1998 was aimed at resolving the bad loans of Japanese banks and dealing with the failure of financial institutions. The legislation allowed for recapitalization of banks with public funds and created the Financial Reconstruction Commission (FRC), to, among other duties, administer nationalized insolvent

perceived as a sign of further problems at NCB. Shortly thereafter, news reports indicated that the FSA's examination of the bank showed that as of March 31, 1998, contrary to what NCB had reported, the bank had a capital deficit of ¥94.4 billion and was insolvent. On December 12, the government urged Nippon Credit to apply for nationalization, which it did on the next business day -- December 14. The government provided assurances that the repayment of all of NCB's obligations would be made in full and on time and that the Bank of Japan would provide loans to ensure the liquidity of the markets.

III.   Implications of the Failures

These failures reflect significant shifts in Japanese regulation of financial institutions and markets. First, the three sets of failures – the Hyogo Bank failure in 1995, the three failures in November 1997, and the two nationalizations in 1998 -- indicate a shift in Japanese insolvency resolution policy. In the Hyogo failure, regulators let a commercial bank fail and allowed losses to shareholders. The three failures in November 1997 showed the market participants that size was no longer an insurance against failure or closure. The two nationalizations in 1998 followed a year of frequent changes in the regulators' approach to nonperforming loans and a prolonged debate on the use of government funds to clean up the banking problems. The newly created FSA was given the mandate to resolve the banking sector problems. Hakuo Yanagisawa, Chairman of the Financial Reconstruction Commission, stated that the nationalization of the two long-tem credit banks "demonstrate that the bank regulatory environment in Japan has dramatically changed, and that the government will begin imposing rigorous standards on banks to try to win the confidence of financial markets." (*The Washington Post*, December 14, 1998)

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institutions.

In addition, each of the six failures revealed that the amount of bad loans and valuation losses previously disclosed by the banks had been significantly understated and concealed the extent of the banks' problems. Two months prior to its collapse, Hyogo Bank had reported bad loans amounting to 2.2% of its loan portfolio. The Ministry of Finance later revealed that the bank's losses had actually totaled 55.5% of total loans (*American Banker*, April 12, 1995, p. 38). The bad loans at Hokkaido Takushoku Bank were actually three times the amount stated in its last financial statement. At the time of its failure, Yamaichi Securities revealed that it had ¥264.8 billion off-balance sheet losses that were previously undisclosed. In September 1998, shortly after a Bank of Japan inspection gave LTCB a clean bill of health and indicated that the bank was solvent as of March 1998, the FSA revealed that the bank was insolvent when assets were valued at market value. Three months later in December 1998, the FSA determined that NCB had also been insolvent as of March 31, 1998.

Table 1 compares the financial condition and performance of the three failed banks to the surviving banks using data published in the banks' last full-year financial statements.[7] It is apparent that the failed banks had much lower reported earnings and asset quality than the surviving banks. The reported capital ratios were not lower, however. This reflected their dramatic understating of loan losses and other losses. Similarly, although not shown, Sanyo Securities had lower capital ratios and Yamaichi Securities had lower earnings than their competitors.   In the twelve months leading up to their failure, the three banks also had lower stock market returns than the surviving banks. Although table 1 highlights the weak condition of the failed institutions relative to the average surviving bank in the period before their failure, the

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[7] Because the financial statements of Hyogo Bank were not available to us, we cannot compare

three failed institutions were not the worst ones. At the time of each failure, there were banks that were in worse financial condition, even by the optimistic numbers reported by banks.

Lastly, the six failures revealed a significant change in the institutional and support structure of Japanese financial institutions. Traditionally, weak or troubled institutions could rely on implicit and explicit government support, capital injections and new loans from financially or otherwise affiliated companies, or rescue mergers with a stronger firm. In five of the six failures, there were attempts to rescue the failed institutions through traditional methods, i.e. financial assistance from affiliated healthy firms. For various reasons, these attempts failed and the financial institutions were resolved soon after. The Hokkaido Takushoku Bank failed when its planned merger with Hokkaido Bank, another, smaller institution in Hokkaido, was abandoned. In October 1998, a month before the failure of Sanyo Securities, the government had tried to persuade other companies to provide financial support. However, the requested support did not come through. Similarly, Fuji Bank refused to provide support to its affiliate Yamaichi Securities before its failure. As noted above, a regulator sanctioned and supported merger between LTCB and Sumitomo Trust failed to materialize and NCB and Chuo Trust and Banking Co. abandoned their planned merger a few days before NCB's nationalization.

Both the six failures per se and the changes in regulatory practices that resulted in the official recognition of insolvencies represented important new information for investors in Japanese banks. If Japanese bank shares were priced efficiently, then this new information should have been reflected in share prices quickly and completely. However, the actual price response of individual banks to these events could be ambiguous and difficult to predict. On the one hand, the

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Hyogo's financial condition to surviving banks.

failures could have revealed previously undisclosed or understated problems in the banking system and increaed operating and regulatory costs for the surviving banks. If investors perceived an increase in risk of the banking system, the cost of funds for surviving institutions could increase significantly, eroding their profits and capital. Banks who were perceived to be similarly insolvent could be seen as the next victims of the regulatory agencies' resolution process, or could face increased surveillance and various regulatory actions to restrict their activities.[8] Therefore, the failure announcements could have had a significant negative impact on the share prices of surviving institutions (*the negative revaluation hypothesis*).

On the other hand, investors could perceive the failures as positive signals for the industry. If uncertainty regarding the condition of the banking system or regulators' failure to resolve insolvencies imposed additional costs on financially strong banks, the resolution of the uncertainty or a stronger regulatory posture could benefit surviving institutions. The exit by failure of weak firms may improve the competitive conditions for surviving banks (Lang and Stulz, 1992; and Kaufman, 1994).   In such cases, we would expect a positive share price reaction to the failure announcements (*the positive revaluation hypothesis*).

Moreover, if investors could differentiate between weak and strong banks, we would expect their reaction to events to differ across banks. In particular, we would expect the share prices of stronger banks to react less negatively to perceived adverse news and more positively to perceived positive news than those of weaker banks. Such response was observed for U.S. banks and thrifts during the crisis of the 1980s (Brewer, 1995; Lang and Stulz, 1992). However, the ability of the market to differentiate among banks is affected by the quality and timeliness of the

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[8] See Grammatikos and Saunders (1990) for a discussion of this point.

information that is publicly disclosed about these institutions. The less accurate, precise, or timely the information, the less likely are security prices to fully reflect the actual financial and risk characteristics of the banks. Thus, even if the failures revealed new information and had a significant impact on the banking sector, their impact on individual bank share prices may still not be highly correlated with the reported condition of the banks (*the pure or noninformational contagion hypothesis*).

Alternatively, the failure announcements could have been anticipated by market participants or viewed as having no impact on the operations of other banks. In such cases, we would expect no significant effect on the share prices of surviving banks as a result of the announcements (*the irrelevance hypothesis*).

In the remainder of the paper, we examine whether and how these events were viewed by the shareholders of surviving banks and test the four hypothesis of market response stated above. More specifically, we examine the stock market reaction to announcements regarding the resolution of the six institutions.

IV. Data and methodology

Our empirical methodology closely follows the methodology widely used in papers examining the response of stock prices to announcements that may be expected to provide additional information about the financial condition of the issuers of the securities and changes in the regulatory environment (e.g. Binder, 1998; and MacKinlay, 1997). The stock returns of each surviving bank were examined to identify any abnormal performance on or around the announcement of the six events. The impact of the events was estimated by employing a multivariate regression model, similar to that used in Binder (1985a, 1985b, 1988), Karafiath

(1988), Karafiath and Glascock (1989), Karafiath, Mynatt, and Smith (1991), Malatesta (1986), Millon-Cornett and Tehranian (1989), and Schipper and Thompson (1983). For each event, the baseline model takes the following form:

$$R_{it} = a_i + \sum_{s=t-2}^{t+2} b_{is} R_{ms} + \sum_{k=-2}^{2} g_k D_k + e_{it},$$ (1)

where R_{it} is the stock return of bank i on day t; a_i is the intercept coefficient for bank i; R_{ms} is the market index for day s ($s \in [t-2, t+2]$); b_{is} is the market risk coefficient for bank i on day s; D_k is a binary variable that captures the impact of an event, and equals 1 if day t is equal to the event day k ($k \in [-2, 2]$), zero otherwise; g_k is the event coefficient for bank i; and e_{it} is a random error term which is assumed to be i.i.d. normal and independent of the market return and the binary variables. Equation (1) was estimated separately for each bank. The estimated parameters g_k capture daily intercept shifts in the interval from day -2 to day +2 returns associated with a failure announcement on day 0 and is an estimate of the excess return.

The announcement dates of the failures were obtained through a search of *the Wall Street Journal*, Reuters news wire, Newscast news service, and from the Knight Ridder business wire. All wire services that were searched included news articles from Japanese and other international news sources. If an announcement was made after the market was closed or over the weekend, we used the next trading date as event date 0. Consequently, event days for each of the six failures were defined as: August 31, 1995 for Hyogo Bank; November 4, 1997 for Sanyo Securities; November 17, 1997 for Hokkaido Takushoku Bank; November 25, 1997 for Yamaichi Securities; October 19, 1998 for the Long-Term Credit Bank; and December 14, 1998 for Nippon

Credit Bank.[9]

Daily stock prices and returns were obtained for more than 100 banks from Bloomberg and the University of Rhode Island's Pacific Basin Capital Markets Research Center (PACAP) 1998 database. The PACAP series on stock prices adjusts for dividends and stock splits, whereas Bloomberg does not. At the time of this analysis, PACAP data were not available for 1998, when the LTCB and NCB were nationalized. However, we statistically analyzed the PACAP and Bloomberg daily series for the 1990-1997 period and for each of the four failures in 1995 and 1997, and found a high degree of correlation. Thus, we use the PACAP daily stock returns for the first four events, and daily returns computed from closing prices provided by Bloomberg for each of the two events in 1998.

Market returns are measured by the TOPIX index, which includes seasoned shares of major companies (First Section) traded on the Tokyo Stock Exchange and is weighted by the number of shares listed. We specify the market return at several leads and lags as an explanatory variable to correct for the possibility of nonsynchronous trading, especially for some of the smaller banks in the sample (Scholes and Williams, 1977).

A potential problem with event study analyses of stock returns is that the event itself could cause a structural change in the parameters of the market model. Kane and Ünal (1988) note that changes in the parameters of the market model may significantly affect the results of studies focusing on time series as well as the cross-sectional responses to a given event or a set of chronologically close events. To minimize this problem, we used different estimation periods to determine the stock market reactions to each failure announcement. However, because the three

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[9] Although the LTCB was officially nationalized on October 23, 1998, the first official news of its

failures in 1997 and the two nationalizations in 1998 were clustered together, we grouped all events in each of these two years together. The estimation periods for the three sets of events are: a 225-trading-day period from November 8, 1994 through October 2, 1995 for the Hyogo Bank announcement; a 225-trading-day period from January 30, 1997 through December 29, 1997 for the announcements of Sanyo Securities, Hokkaido Takushoku Bank Ltd., and Yamaichi Securities; and a 285-trading-day period from November 19, 1998 through January 19, 1999 for the nationalization of the Long Term Credit Bank of Japan Ltd. and Nippon Credit Bank Ltd. To analyze the impact of 1997 and 1998 announcements, we modify equation (1) as follows:

$$R_{it} = \mathbf{a}_i + \sum_e \sum_{s=t-2}^{t+2} P_e \, \mathbf{b}_{is} R_{ms} + \sum_e \sum_{k=-2}^{2} \mathbf{g}_{k,e} D_{k,e} + \mathbf{e}_{it,} \qquad (1')$$

where e is the number of events in 1997 ($e = 3$) or 1998 ($e = 2$). P is an indicator variable that identifies post-event periods within each estimation period and allows the market risk coeficient, $\mathbf{b}$, to shift after each event. For instance, during the 1998 estimation period, P_1 is equal to 1 for the period between the nationalizations of LTCB and NCB, zero otherwise; and P_2 is equal to 1 for the period following the nationalization of NCB, zero otherwise. The omitted period is pre-LTCB nationalization. P is defined analogously for the 1997 estimation period.

The analysis proceeds in two parts. In the first part, we examine the distribution of individual banks' excess returns for each event. If the failures have unanticipated implications for the banking industry, we would expect the stock returns of the sector to adjust accordingly. Under the positive revaluation hypothesis, we would expect the average excess return during the event window to be positive and statistically significant. If, on the other hand, events reveal previously unanticipated adverse news for the banking industry (the negative revaluation

nationalization was reported on October 19, 1998 and this is used as the event date.   18

hypothesis), we would expect the average industry reaction to be statistically negative. Alternatively, the events may reveal no new information or be considered irrelevant by the shareholders of surviving banks. In that case, the average industry excess return would be statistically indistinguishable from zero. To determine, which one of these cases holds, we test the following hypothesis:

$$H_0^1 : \frac{1}{N} \sum_{i=1}^{N} g_{k,e} = 0, \qquad (2)$$

for each event e and event day k, where N is the number of surviving banks. We also test whether the cumulative excess returns, averaged across banks, over the [-1, 1] and [-2, 2] windows are equal to zero; that is, we test

$$H_0^2 : \frac{1}{N} \sum_{i=1}^{N} \sum_{k=-s}^{s} g_{k,e} = 0. \qquad (3)$$

A failure to reject H_0^1 or H_0^2 for a given event, however, does not necessarily indicate that the event had no impact on the stock returns of surviving banks. It is conceivable that while the average impact on the stock returns of surviving banks might be statistically indistinguishable from zero, the impact on some banks' stocks is significant. To explore this possibility, we also examined other characteristics of the distribution of excess returns (e.g. the median, the minimum, and the maximum excess return) and report a number of test statistics.

In the second part of the analysis, we explored whether there was evidence of cross-sectional variation in the responses of the Japanese banks to the failures. We relate the individual bank reactions (g) on the event date (day 0) to measures of individual bank strength and estimate the following equation:

$$\boldsymbol{g}_{,0} = a + \boldsymbol{f}COND_i + b_1 REGIONAL_i + b_2 TRUST_i + \boldsymbol{h}_i \qquad (4)$$

for each of the six events. $COND_i$ is a variable that describes the financial condition of bank i at the time of the event; $REGIONAL_i$ is an indicator variable that equals one if bank i is a regional bank, zero otherwise; and, $TRUST_i$ is an indicator variable that equals one if bank i is a trust bank. We include the indicator variables TRUST and REGIONAL in our specification of equation (4) to control for any systematic differences across various types of Japanese banks that are not captured by our other variables.

The financial condition of banks at each event date is measured by four descriptive variables: the ratio of loan loss reserves to total book value of equity capital (LLR), the ratio of nonperforming loans to total book value of equity capital (NPL), the ratio of domestic loans to firms in the construction industry, real estate sector, and finance and insurance industries to total domestic loans (RISKY), and Moody's Bank Financial Strength Rating (RATING), which is a measure of a bank's intrinsic safety and soundness.[10] Banks with higher ratios of LLR, NPL, and RISKY are assumed to be in weaker financial condition and have lower quality assets than other banks. RATING is a cardinal measure of Moody's Bank Financial Strength Rating and was constructed such that banks with lower ratings have a higher value of the measure. The data were obtained from the December 1997, September 1998, and February 1999 disks of the Fitch IBCA's

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[10] During our sample period, the regulatory definition of nonperforming loans was changed twice to be more inclusive and to give a broader measure of bad loans. We use the amount of nonperforming loans as reported by the banks. Hence, the measure of nonperforming loans changes over time. However, since the changes are in effect for all banks and we estimate equation (4) separately for the different events, the change in definition should not affect our results. As a robustness check, we also estimated equation (4) using the older, narrower definition of nonperforming loans. The results were qualitatively similar to those reported.

Bankscope database. We estimated equation (4) separately for each measure of *COND* to minimize multicollinearity problems among the four variables.

If shareholders differentiate between weak and strong banks as measured by *COND* in their assessment of the impact of events on bank value, then we would expect f to be statistically negative. If the events reveal adverse news, the excess returns of banks in weaker (stronger) financial condition with higher values of *COND* would be relatively more negative (positive). Similarly, if the events represent good news for the surviving banks and shareholders differentiate across banks, the returns of stronger banks would respond more positively to the events. Hence, a statistically significant and negative estimate for f would be consistent with shareholders providing potential market discipline on the management of financially weak banks. On the other hand, if an event reveals adverse news for the banking sector, but shareholders do not differentiate among banks of different financial strength, there would be no statistical relationship between *COND* and excess returns, consistent with the pure contagion hypothesis. To explore these possibilities, we test the hypothesis

$$H_0^3 : f = 0, \tag{5}$$

for each of the six events and the four alternative measures of *COND*.

V. Empirical results

Table 2 reports the estimated average excess returns for the banking industry and the distribution of excess returns for individual banks on and around each of the six events. The first five rows of each panel describe the excess returns for each day in the five-day event window. The last two rows report statistics on the cumulative returns over the [-1, 1] and [-2, 2] windows,

respectively. The cumulative returns are calculated as the sum of excess returns in each day in the relevant event window.

The first column of table 2 reports the mean of individual banks' excess returns, weighted equally, for an event day or window.[11] The second column reports the p-values associated with the t-tests for testing whether the excess returns differ from zero as given by hypotheses H_0^1 and H_0^2 in equations (2) and (3). The t-ratios are calculated by dividing the average parameter estimates for each excess return by the sample cross-sectional standard deviation, and assuming that each parameter estimate is an independent drawing from the same (normal) distribution.

Columns 3 through 6 of table 2 provide additional information on the distribution of individual banks' excess returns. Column 3 reports the total number of banks that had negative excess returns on each event day and over the three and five day event windows. Column 4 reports the median excess returns and the results of the Wilcoxon signed-rank z-statistic test for evaluating whether the median values of excess returns equal zero (see Deshpande, Gore, and Shanubhogue, 1995). Because the average excess returns associated with an event may be statistically indistinguishable from zero, but most banks have a negative or positive excess return, or the cross-sectional mean of excess returns is influenced by a few outliers, the statistics in the last four columns provide additional useful information.

The results in table 2 indicate that the average and the median excess returns for surviving banks on the event day (day 0) were mostly negative and statistically significant. Of the six

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[11] These averages of more than 100 regression coefficients estimated for individual banks can be interpreted as excess returns for an equally-weighted portfolio of the sampled banks. The model was estimated for individual banks in order to obtain the distribution of bank-specific excess returns.

average returns on the event day, four are negative, but only three are significant at the 5 percent level. Only the average return for the announcement of the nationalization of NCB is, on average, positive and significant. Likewise, the median excess returns for the event dates were negative and statistically significant for four of the six failures. Although the mean excess return for the LTCB nationalization is statistically indistinguishable from zero, the median return is negative and significant, suggesting that the mean is influenced by a few large positive returns. In addition, 76 out of 106 of sample banks had negative excess returns on the announcement of LTCB's nationalization.

An examination of excess returns both in the two days following the announcements and cumulatively over the [-1, 1] and [-2, 2] windows indicates that the impact from the failure announcements was relatively stronger in the two days following the failures. Of the six average cumulative returns over the [-1, 1] window, five are significant and four are negative. Only the average cumulative return associated with the Sanyo Securities event is insignificant. Again, the impact of NCB's nationalization on surviving banks appears to be different from the previous events. The average cumulative excess return over both the [-1, 1] and [-2, 2] windows are positive and statistically significant. In addition, of the 18 average excess returns over the three days 0 to 2, 13 are significantly different from zero and 11 of the 13 are negative. Except for the nationalization of the NCB, this is consistent with the negative revaluation hypothesis.

These results suggest that shareholders of Japanese banks viewed most of the failures as adverse news for the surviving banks and incorporated the new information into share prices quickly and efficiently. These findings are consistent with the results in Peek and Rosengren

(1999), Bremer and Pettway (1999), Chiou (1999), and Yamori (1999).[12] To determine whether the response of shareholders was based on the financial characteristics of the individual banks, we relate the individual banks' excess returns on the event day to measures of the banks' financial strength, as modeled in equation (4). The results are reported in table 3.

As can be seen in the table, financially weaker banks were, on the whole, affected more adversely by the failure announcements. The higher a surviving bank's ratio of loan loss reserve or nonperforming loans to its equity capital and the higher its ratio of loans to firms in the riskier construction, real estate, and finance and insurance industries relative to its total loans, the more negative were its excess returns. Likewise, the higher rated banks were affected less by the failure announcements than were the lower rated banks. That is, the failures were perceived by the market as relatively "good news" for the financially sounder banks and as "bad news" for the more precarious banks.

The results are particularly strong for the three failures in 1997. Although most of the coefficient have negative signs, for the Hyogo failure in 1995 and the two nationalizations in 1998, they are not statistically significant. Again the nationalization of the NCB produces results that are inconsistent with those for the other failures, but are not, in general, statistically

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[12]Although the overall results in Peek and Rosengren (1999) are similar to our results, there are some differences in the impact of individual events. These differences in the results of the two studies can be due to (1) differences in the response of different claimholders in question (shareholders in this paper versus unsecured creditors in Peek and Rosengren); or (2) differences in the samples (all banks that trade in the Tokyo Stock Exchange in our sample versus three to eight banks that have interbank quotations in London in the Peek and Rosengren sample). We re-estimated equation (1) with the sample of banks in Peek and Rosengren. The response of the shareholders of the smaller sample of banks was roughly similar to the response of these banks' unsecured creditors. Hence, any differences with respect to individual events that exist between the results in Peek and Rosengren and the results of this paper appear to be due to differences in bank samples, rather than differences in the structure of the claims under study.

significant. Thus, the evidence provides little support for the pure contagion hypothesis. Rather, investors responded to the failures rationally according to the financial condition of the surviving bank. Weaker banks were more adversely affected than stronger banks. In future work, we will examine the responses for longer event windows. We will also adjust our methodology for potential cross-sectional and time-series correlation in excess returns of individual banks.

VI.   Summary and Conclusions

This paper examined the ability of the Japanese stock market to price Japanese bank shares according to their risk characteristics during the country's banking crisis and to incorporate new information into the share prices. The failure of four domestic commercial banks of various sizes between 1995 and 1998, and of two security firms in 1997 were events that signaled information that could affect the perceived risk environment of the surviving banks and trigger responses in their share prices. The sample examined consists of more than one hundred banks, whose shares traded on the Tokyo Stock Exchange during the 1990s.

Two sets of hypotheses were tested -- the first concerns the average response of the overall bank share prices to the failures and the second concerns the response of individual bank share prices. The failures represented new information that affected equity returns. Returns in the industry as a whole responded negatively to five of the six failures. The average abnormal returns were negative on or around the failure of all but the Nippon Credit Bank. The negative response is consistent with the negative revaluation hypothesis and implies that the failures were perceived to be bad news for other banks as a whole, possibly signaling either or both increased public recognition of the weak financial condition of the industry and/or feared stronger responses to bank problems by the regulatory agencies.

The response of individual banks to these failures was for the most part related to the financial condition of the bank. Abnormal returns tended to be more negative for banks in weaker financial condition as reflected in higher ratios of loan loss reserves, nonperforming loans, risky loans, and in lower Moody's credit ratings, and less negative and even positive for banks in better financial condition. This suggests that the market was able to differentiate among banks in its response to the failures, so that any contagion from the failures was rational and information-based.

The evidence presented in the paper suggests that the Japanese stock market priced the relative risk characteristics of banks even in periods of severe banking crisis and incorporated new information quickly and reasonably efficiently. Thus, there is little reason to suspect that market monitoring and discipline cannot be used by bank regulators in Japan more extensively to supplement regulatory discipline and to promote a safer and more efficient banking system.

References

Aharony, Joseph and Itzhak Swary, 1983, "Contagion Effects of Bank Failure: Evidence from Capital Markets," *Journal of Business* 56(3), 305-322.

Binder, John J., 1985a, "Measuring the Effects of Regulation with Stock Price Data," *Rand Journal of Economics* 16(2), 167-183.

Binder, John J., 1985b, "On the Use of the Multivariate Regression Model in Event Studies," *Journal of Accounting Research* 23(1), 370-383.

Binder, John J., 1988, "The Sherman Antitrust Act and the Railroad Cartels," *Journal of Law and Economics* 31(2), 443-467.

Binder, John J., 1998, "The Event Study Methodology Since 1969," *Review of Quantitative Finance and Accounting* 11(2), 111-37.

Bremer, Marc and Richard H. Pettway, 1999, "Does the Market Discipline Japanese Banks?" University of Missouri manuscript.

Brewer III, Elijah, 1995, "The Impact of Deposit Insurance on S&L Shareholders' Risk/Return Trade-Offs," *Journal of Financial Services Research* 9(1), 65-89.

Brewer III, Elijah and William E. Jackson III, 1998, "Requiem for a Market Maker: The Case of Drexel Burnham Lambert and Below-Investment-Grade Bonds," unpublished manuscript, Federal Reserve Bank of Chicago, December.

Chiou, Ingyu, 1999, "Daiwa Bank's Reputational Crisis: Valuation Effects on Bank-Firm Relationships," manuscript, New York University.

Cornell, Bradford and Alan Shapiro, 1986, "The Reaction of Bank Stock Prices to the International Debt Crisis," *Journal of Banking and Finance* 10(1), 55-73.

Deshpande, J.V., A.P. Gore, and A. Shanubhogue, 1995, *Statistical Analysis of Nonnormal Data*, New Delhi, India: Wiley Eastern Limited.

Flannery, Mark J., 1998, " Using Market Information in Prudential Bank Supervision: A Review of the U.S. Empirical Evidence," *Journal of Money, Credit and Banking* 30, 273-305.

Genay, Hesna, 1998, "Assessing the condition of Japanese banks: How informative are accounting earnings?" Federal Reserve Bank of Chicago *Economic Perspectives*, Fourth Quarter, 12-34.

Grammatikos, Theoharry and Anthony Saunders, 1990, "Additions to Bank Loan-Loss Reserves: Good News or Bad News?" *Journal of Monetary Economics* 25(2), 289-304.

Kane, Edward J. and Haluk Ünal, 1988, "Change in Market Assessments of Deposit Institution Riskiness," *Journal of Financial Services Research* 1(3), 207-29.

Karafiath, Imre, 1988, "Using Dummy Variables in the Event Methodology Structure," *Financial Review* 23(3), 351-358.

Karafiath, Imre and John Glascock, 1989, "Intra-Industry Effects of a Regulatory Shift: Capital Market Evidence from Penn Square," *Financial Review* 24(1), 123-134.

Karafiath, Imre, Ross Mynatt, and Kenneth L. Smith, 1991, "The Brazilian Default Announcement and the Contagion Effect Hypothesis," *Journal of Banking and Finance* 15(3), 699-716.

Kaufman, George G., 1994, "Bank Contagion: A Review of the Theory and Evidence," *Journal of Financial Services Research* 8(2), 123-150.

Lang, Larry H. and Rene M. Stulz, 1992, "Contagion and Competitive Intra-industry Effects of Bankruptcy Announcements: An Empirical Analysis," *Journal of Financial Economics* 32(1), 45-60.

MacKinlay, A. Craig, 1997, "Event Studies in Economics and Finance," *Journal of Economic Literature* 35(1), 13-39.

Madura, Jeff and Kenneth Bartunek, 1994, "Contagion Effects of the Bank of New England's Failure," *Review of Financial Economics* 4(1), 25-37.

Malatesta, Paul, 1986, "Measuring Abnormal Performance: The Event Parameter Approach Using Joint Generalized Least Squares," *Journal of Financial and Quantitative Analysis* 21(1), 27-38.

McGill, Peter, 1995, "Japan: Has the MOF Muffed it?" *Euromoney*, 97.

Millon-Cornett, Marcia H. and Hassan Tehranian, 1989, "Stock Market Reactions to the Depository Institutions Deregulation and Monetary Control Act of 1980," *Journal of Banking and Finance* 13 (1), 81-100.

Millon-Cornett, Marcia M. and Hassan Tehranian, 1990, "An Examination of the Impact of the Garn-St Germain Depository Institutions Act of 1982 on Commercial Banks and Savings and Loan," *Journal of Finance* 45(1), 95-111.

Peek, Joe and Eric S.Rosengren, 1999, "Determinants of the Japan Premium: Actions Speak Louder than Words," *The Journal of International Economics*, forthcoming.

Peterson, Pamela P. and Wall, L. D., 1991, "Valuation Effects of New Capital Issues by Large

Bank Holding Companies," *Journal of Financial Services Research* 5(1), 77-87.

Reuter's News Service, 1995, "Moody's Says Weak Japan Banks Will Need Help," October 24, 1995.

Schipper, Katherine and Rex Thompson, 1983, "The Impact of Merger-Related Regulations on the Shareholders of Acquiring Firms," *Journal of Accounting Research* 21, 184-221.

Scholes, Myron and Joseph Williams, 1977, "Estimating Betas from Nonsynchronous Data," *Journal of Financial Economics* 5(3), 309-327.

Schwert, G. William, 1981, "Using Financial Data to Measure the Effects of Regulation," *Journal of Law and Economics* 24(1),121-158.

Swary, Itzhak, 1986, "Stock Market Reaction to Regulatory Action in the Continental Illinois Crisis," *Journal of Business* 59(3), 451-473.

Wall, Larry D. and David R. Peterson, 1990, "The Effect of Continental Illinois' Failure on the Financial Performance of Other Banks," *Journal of Monetary Economics*, 26(1), 77-99.

Yamori, Nobuyoshi, 1999, "Stock Market Reaction to the Bank Liquidation in Japan: A Case for the Information Effect Hypothesis," *Journal of Financial Services Research* 15:1, 57-68.

Table 1. A Comparison of Failed and Surviving Institutions
This table presents a comparison of the accounting and stock market performance of the three banks that failed in 1997 and 1998 to the performance of surviving banks. Market-adjusted stock returns are calculated as the daily stock return of a bank minus the return on the value-weighted index for the Tokyo Stock Exchange, and, for surviving banks, are averaged across banks. The sample periods for stock returns are 185 trading days between January 30, 1997 and October 29, 1997 for the 1997 failure; and the 221 trading days between November 18, 1997 and October 14, 1998 for the 1998 failures.

A.   Banks

	1997 Failures			1998 Failures		
	Hokkaido Takushoku	Surviving Banks (N=106)		Long-Term Credit Bank	Nippon Credit Bank	Surviving Banks (N=104)
Accounting earnings (three-year average, in percent)						
Return on average equity	-6.70	-2.58		-13.87	-54.30	-6.55
Return on average assets	-0.20	-0.05		-0.46	-0.94	-0.19
Asset Quality (as of last financial statement before failure, in percent)						
Loan loss reserves / Gross loans	4.90	1.74		4.78	9.06	2.80
Nonperforming loans / Gross loans	13.31	3.29		6.52	16.04	3.42
Risky loans / Total domestic loans	34.65	25.76		46.47	62.01	26.28
Capital and Size (as of last financial statement before failure)						
BIS ratio (%)	9.35	9.39		10.32	8.25	10.01
Total assets (trillion yen)	9.05	7.56		25.08	12.23	5.56
Market-adjusted Stock Returns						
Mean	-0.351	-0.043		-0.926	0.331	0.071

B. Securities Firms

	Sanyo Securities	Yamaichi Securities	All other (N= 19)	The "Big Three*"
Total assets (trillion ¥)	0.26	1.93	0.72	3.65
Equity / Assets (%)	63.08	225.12	178.42	271.71
ROA (%)	-0.83	-8.75	-3.48	-4.74
ROE (%)	-3.96	-31.52	-18.8	-14.82
Liquid assets / Short-term funding (%)	49.49	88.08	71.52	69.14

* The "Big Three"are Nomura Securities, Nikko Securities, and Daiwa Securities.

Table 2. Excess Returns of Surviving Banks
This table describes the distribution of excess returns across surviving banks in the five-day window surrounding the seven events. Excess returns are defined as γ_{ik} in the equation:

$$R_{it} = a_i + \sum_{s=t-2}^{t+2} b_{is} R_{ms} + \sum_{k=-2}^{2} g_k D_k + e_{it,}$$

which is estimated for each bank in the sample. The column labeled "Mean" reports the cross-sectional averages of excess returns for each day in the event window, as well as the cumulative excess returns over the [-1, 1] and [-2, 2] windows. The column labeled "P-value: mean = 0" reports the p-values for the hypothesis test $H_0^1 : \frac{1}{N} \sum_{i=1}^{N} g_k = 0$. The column labeled "Percent negative" reports the percent of total excess returns that are negative, and the column labeled "Median" reports the median value of excess returns and its statistical significance. The columns labeled "Minimum" and "Maximum" report the minimum and maximum values of the excess returns. '**' and '*' indicate statistical significance at the 1% and 5% levels, respectively.

HYOGO FAILURE (August 31, 1995; N=100)

	Mean	P-value: mean = 0	Percent negative	Median	Minimum	Maximum
-2	-0.422	0.0006	70	-0.38**	-5.50	4.31
-1	0.006	0.9658	48	0.18	-7.25	3.04
0	-0.793	0.0002	71	-0.19**	-8.03	3.41
1	-0.926	0.0001	71	-0.62**	-6.19	5.66
2	0.154	0.4271	44	0.24	-9.50	6.89
[-1, 1]	-1.713	0.0001	74	-1.10**	-15.35	1.46
[-2, 2]	-1.982	0.0001	75	-0.99**	-19.47	3.62

SANYO FAILURE (November 4, 1997; N=102)

	Mean	P-value: mean = 0	Percent negative	Median	Minimum	Maximum
-2	0.389	0.0554	46	0.30	-7.79	4.45
-1	1.147	0.0001	31	0.84**	-5.61	9.04
0	-0.684	0.0006	68	-0.66**	-7.88	3.88
1	-0.326	0.1480	54	0.00	-6.71	7.26
2	-0.965	0.0002	68	-0.43**	-14.22	3.84
[-1, 1]	0.136	0.6996	50	0.14	-10.28	17.80
[-2, 2]	-0.439	0.4259	48	0.38	-28.67	21.52

HOKKAIDO TAKUSHOKU FAILURE (November 17, 1997; N=102)

	Mean	P-value: mean = 0	Percent negative	Median	Minimum	Maximum
-2	-0.360	0.1997	63	-0.26*	-11.20	7.38
-1	-1.026	0.0013	66	-0.43**	-18.27	9.51
0	0.232	0.5862	55	0.00	-23.48	14.05
1	-1.107	0.0060	66	-0.50**	-19.55	9.89
2	-2.175	0.0001	68	-0.79**	-30.75	7.70
[-1, 1]	-1.901	0.0035	68	-1.18**	-26.97	14.50
[-2, 2]	-4.436	0.0001	77	-2.74**	-47.50	16.68

Table 2. Excess Returns of Surviving Banks, continued

YAMAICHI FAILURE (November 25, 1997; N=102)

	Mean	P-value: mean = 0	Percent negative	Median	Minimum	Maximum
-2	-0.548	0.2645	57	-0.02	-23.38	15.82
-1	0.239	0.5484	58	-0.34	-17.91	21.30
0	-2.639	0.0001	63	-0.89*	-24.80	5.79
1	-4.525	0.0001	71	-1.58**	-37.55	7.67
2	1.810	0.0333	48	0.08	-30.39	35.04
[-1, 1]	-6.925	0.0001	82	-3.20**	-63.29	20.40
[-2, 2]	-5.663	0.0001	73	-3.31**	-70.00	29.34

The LTCB Nationalization (October 19, 1998; N=106)

	Mean	P-value: mean = 0	Percent negative	Median	Minimum	Maximum
-2	-0.398	0.0737	59	0.00	-8.69	5.32
-1	-1.032	0.0016	80	-0.87**	-10.07	7.53
0	-0.345	0.1293	76	-0.41**	-8.84	9.06
1	-0.541	0.0069	76	-0.45**	-7.44	5.33
2	0.495	0.1300	60	-0.01	-5.54	13.62
[-1, 1]	-1.918	0.0002	74	-1.02**	-18.67	8.56
[-2, 2]	-1.821	0.0039	65	-0.85*	-19.15	16.97

The NCB Nationalization (December 14, 1998; N=106)

	Mean	P-value: mean = 0	Percent negative	Median	Minimum	Maximum
-2	0.765	0.0001	43	0.25	-2.37	6.50
-1	0.617	0.0013	44	0.27	-3.65	7.22
0	0.643	0.0003	39	0.35*	-3.77	6.73
1	-0.559	0.0078	59	0.00	-14.16	4.04
2	-0.349	0.0398	78	-0.26**	-5.36	6.84
[-1, 1]	0.701	0.0251	46	0.20	-8.57	13.30
[-2, 2]	1.117	0.0035	41	0.80*	-9.52	19.23

Table 3. Excess returns and Financial Strength

This table presents estimates of the correlation between selected measures of banks' financial condition and their excess returns on the event dates, estimated by the following model:

$$g_{,0} = a + fCOND_i + b_1REGIONAL_i + b_2TRUST_i + h_i$$

The dependent variable is the day 0 abnormal return calculated from a market model as specified in equation (1). The variable COND is, alternatively, the ratio of loan loss reserves to total book value of equity (LLR); the ratio of nonperforming loans to total book value of equity (NPL); the ratio of risky loans (defined as loans to real estate, construction, and finance sectors) to total domestic loans; or a cardinal measure of Moody's financial strength rating (RATING), where higher numbers correspond to lower ratings. RATING is unavailable for the Hyogo failure sample. The sample statistics for the four measures of financial condition are reported in the last two rows of each panel. The standard errors of coefficient estimates are adjusted for heteroskedasticity. All equations include unreported coefficients for bank type, REGIONAL and TRUST. '**' and '*' indicate statistical significance at the 1% and 5% levels, respectively.

Hyogo Bank Failure

	LLR	NPL	RISKY
f	-1.073	-1.316	-0.032
St. error	1.847	1.159	0.061
Adj. R^2	-0.016	-0.008	-0.055
F-statistic	0.488	0.754	0.237
N	98	98	45
Financial condition			
Sample mean	0.210	0.246	26.618
St. deviation	0.161	0.285	7.074

Sanyo Securities Failure

	LLR	NPL	RISKY	RATING
f	-1.196**	-0.607**	-0.208**	-0.814**
St. error	0.174	0.082	0.040	0.230
Adj. R^2	0.196	0.216	0.426	0.326
F-statistic	9.035	10.104	11.622	8.587
N	100	100	44	48
Financial condition				
Sample mean	0.449	0.886	25.577	4.313
St. deviation	0.721	1.490	7.662	1.504

Hokkaido Takushoku Bank Failure

	LLR	NPL	RISKY	RATING
f	-2.114**	-1.261*	-0.174*	-0.793*
St. error	0.734	0.530	0.084	0.343
Adj. R^2	0.200	0.261	0.210	0.173
F-statistic	9.236	12.642	4.816	4.273
N	100	100	44	48
Financial condition				
Sample mean	0.449	0.886	25.577	4.313
St. deviation	0.721	1.490	7.662	1.504

Table 3. Excess returns and Financial Strength, continued

Yamaichi Securities Failure

	LLR	NPL	RISKY	RATING
f	-2.897*	-1.685*	-0.315*	-2.753**
St. error	1.401	0.726	0.124	0.779
Adj. R^2	0.094	0.143	0.031	0.207
F-statistic	4.426	6.502	1.457	5.095
N	100	100	44	48
Financial condition				
Sample mean	0.449	0.886	25.577	4.313
St. deviation	0.721	1.490	7.662	1.504

LTCB Nationalization

	LLR	NPL	RISKY	RATING
f	-0.619	-0.424*	-0.185	-0.119
St. error	0.363	0.187	0.105	0.249
Adj. R^2	0.001	0.008	-0.007	-0.066
F-statistic	1.028	1.269	0.907	0.090
N	104	104	43	45
Financial condition				
Sample mean	0.689	1.214	26.285	4.711
St. deviation	0.650	1.052	6.391	1.547

NCB Nationalization

	LLR	NPL	RISKY	RATING
f	-0.049	0.031	-0.035	0.377*
St. error	0.217	0.138	0.078	0.143
Adj. R^2	-0.021	-0.022	-0.040	0.041
F-statistic	0.289	0.270	0.457	1.625
N	104	104	43	45
Financial condition				
Sample mean	0.689	1.214	26.285	4.711
St. deviation	0.650	1.052	6.391	1.547