GRADUATE SCHOOL OF BUSINESS ADMINISTRATION
KOBE UNIVERSITY
ROKKO KOBE JAPAN

2003. 28

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Discussion Paper Series

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We would like to thank Yoshitaka Kai, Shigeki Sakakibara, Kenya Fujiwara, and seminar participants at Kobe University and the 2003 Japan Finance Association Annual Conference for their helpful comments.

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Abstract

We provide a simple model for analyzing how debt forgiveness affects the stock price of a lending bank. Our model shows that while debt forgiveness increases the shareholders' wealth of the bank in healthy financial conditions, it decreases the shareholders' wealth of the bank in unhealthy financial conditions. We empirically investigate the announcement effect of debt forgiveness on bank stock prices in Japanese markets. On average, lending banks experience a significant negative announcement effect with respect to debt forgiveness. Consistent with the prediction of the model, we find a negative relationship between the announcement effect and the bad loan ratio as a proxy of the unhealthiness of bank financial conditions.

JEL classification: G21, G31

Keywords: Debt Forgiveness, Bank Stock Price Reaction,
Bad Loan, Japanese Markets

1. Introduction

It has been pointed out that debt renegotiation is often desirable for a firm in financial difficulty, because it resolves the inefficiency caused by suboptimal decisions made by the management of the firm. Since Jensen and Meckling (1976), the risk-taking incentive problem of a firm with a high-level risky loan is one of the best-known examples of this issue.[1] Shareholders of such a highly leveraged firm are likely to prefer a risky project to a safe project, even though a risky project is less valuable than a safe one. The risk-taking incentive of the borrowing firm decreases the value of the bank loan as well. The borrowing firm and the lending bank can avoid this inefficiency by reducing the face value of the loan (debt forgiveness). With this reduced loan, shareholders of the borrowing firm undertake a safe project. Theoretically, such debt forgiveness decreases neither the shareholders' wealth of the borrowing firm nor the loan value of the bank. However, little attention has been paid to the effect of debt forgiveness on the shareholders' wealth of the lending bank.[2]

This paper examines both theoretically and empirically how debt forgiveness affects the shareholders' wealth of the lending banks. We provide a simple model regarding a typical risk-taking incentive problem of a highly leveraged firm in financial difficulty. The model illustrates that debt forgiveness can be agreed upon on the condition that neither the stock price of the firm nor the loan value of the bank decreases. Then, we

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[1] For a discussion of a risk-taking incentive problem, see also Gavish and Kalay (1983), Green (1984), and Green and Talmor (1986).

[2] Several studies, such as those of Smirlock and Kraufold (1987), Grammatikos and Saunders (1990), and Musumeci and Sinkey (1990), examine the impact of debt moratoriums by sovereign borrowers on the equity value of lending banks. The subject of this paper is debt forgiveness between private companies and their lending banks.

explicitly analyze the effect of debt forgiveness on the shareholders' wealth of the lending bank. The model shows that the effect of debt forgiveness on the shareholders' wealth of the bank is dependent upon the financial condition of the bank. When the bank is in an unhealthy financial condition, that is, when the bank itself has relatively large risky debt (deposit), debt forgiveness decreases the shareholders' wealth of the lending bank. On the other hand, when the bank is in a healthy financial condition, that is, when the bank has relatively small risky debt, debt forgiveness has a positive impact on the shareholders' wealth of the bank.

This argument proposes that, as in the case of the borrowing firm, the shareholders of an unhealthy bank with high-level risky debt prefer a risky collection of the loan to a stable collection, because of the limited liability effect. If such an unhealthy bank agrees upon debt forgiveness with the borrowing firm, then the firm undertakes a safe project so that the collection of the loan becomes stable. While a stable collection of the loan increases the value of the bank loan, it decreases the equity value of the bank. That is, debt forgiveness is not desirable from the perspective of the shareholders' wealth of a bank in an unhealthy financial condition. In contrast, for a healthy bank with low-level risky debt, debt forgiveness increases the shareholders' wealth. Shareholders of such a healthy bank can obtain almost all of the increase in the value of the bank loan associated with debt forgiveness.

A major implication of the model is that the stock price reaction of the lending bank in response to debt forgiveness is dependent upon the financial condition of the bank. For a financially unhealthy bank, the stock price goes down in response to debt forgiveness. On the other hand, for a financially healthy bank, debt forgiveness has a non-negative impact on the stock price.

Given this hypothesis, we empirically examine the announcement effect of debt forgiveness on the lending banks. Our sample consists of 16 cases of out-of-court debt forgiveness agreed upon between Japanese firms and their lending banks in the period

from April 1995 to March 2003. We find that, on average, the stock price of the lending bank decreases in response to the announcement. The lending banks experience an average stock price decline of 1.67% in a two-day period just after the announcement. Several studies, such as those of Cargill (2000), Ueda (2000), and Hoshi and Kashyap (2001, Chapter 8) point out that the financial conditions of Japanese banks have worsened during the 1990s. It seems reasonable to suppose that, in our sample period, Japanese banks were in an unhealthy financial condition. Thus, a negative announcement effect of debt forgiveness on the lending banks agrees with our prediction.

The relationship between the announcement effect and the financial condition of the lending bank is examined in detail. We employ two measures of the unhealthiness of a bank's financial condition. One is the bad loan ratio of a bank, which is the ratio of the amount of the bank's bad loans to the total amount of the bank's loans. The other is the net bad loan ratio of a bank, which is the ratio of the amount of the bank's net bad loans (bad loans minus reserves for loans) to the total amount of the bank's loans. Regression analyses show that the announcement effect of debt forgiveness on a lending bank has a significant negative relationship with both the bank's bad loan ratio and net bad loan ratio. The unhealthier the bank's financial condition is, the smaller the stock price increase the bank experiences in response to debt forgiveness.

We then divide the sample of lending banks into two groups according to the sign of the announcement effect, and examine the differences in the bad loan ratios and net bad loan ratios between the two groups. We find that, on average, lending banks experiencing negative announcement effects have higher bad loan ratios and net bad loan ratios than do banks experiencing negative announcement effects. We also find that banks experiencing relatively small announcement effects are unhealthier than banks experiencing relatively large announcement effects. These empirical results support the hypothesis that there is a negative relationship between the announcement effect of debt

forgiveness and the unhealthiness of the bank's financial condition.

Since a bank diversifies its loans to a great many firms, it is plausible that forgiveness of the debt of any single borrowing firm, or at most a few borrowing firms, has a negligible impact on the lending bank. Several empirical studies, however, have found that an event associated with a single borrowing firm has a significant impact on the lending bank's stock price. Kracaw and Zenner (1996) report that a bank experiences a stock price increase when it plays a major role in a highly leveraged transaction (LBO and leveraged recapitalization) of a single borrower. Dahiya, Saunders, and Srinivasan (2003) have found that the stock price of a lead lending bank drops significantly after the announcement of a major borrower's default.

Our findings support the argument that even a single borrower's financial event has a significant effect on the shareholders' wealth of the lending bank. In the sense that we are studying cases in which the borrowing firm has financial trouble, our subject is similar to that of Dahiya, Saunders, and Srinivasan (2003). However, there is an explicit difference between out-of-court agreements of debt forgiveness and borrower's default. While in the case of borrower's default the lending does not support the firm's out-of-court restructuring, the bank decides to support the firm's restructuring in the case of debt forgiveness. One of the most plausible reasons for a bank to support a borrowing firm in financial difficulty is that the bank believes that the firm will be in a better condition in the future. Nevertheless, as shown theoretically and empirically in this paper, it is possible that such decision-making decreases the shareholders' wealth of the bank.

The remainder of the paper is organized as follows. In Section 2, we provide a simple model to analyze the effect of debt forgiveness on the lending bank. In Section 3, we describe our sample associated with debt forgiveness in Japan. In Section 4, we present empirical results regarding the stock price behavior of the lending bank around the announcement of debt forgiveness. In Section 5, we conclude the paper.

2. A Model of Debt Forgiveness and Stock Price Reaction of a Lending Bank

[INSERT FIGURE 1]

We consider a simple situation in which debt forgiveness resolves the inefficiency caused by the risk-taking incentive of a borrowing firm. There are three dates in the model. At the initial date, date-0, a firm has bank debt with a face value of D. We assume that the firm borrows from only one bank.[3] At date-1, the firm chooses between two mutually exclusive strategies: strategy S and strategy R. Strategy S generates a certain cash flow of Y at the terminal date, date-2. Strategy R generates a stochastic cash flow, i.e., a high cash flow of X with probability p and a low cash flow of zero with probability 1-p at date-2. All agents are risk-neutral and the risk-free rate is zero.

For the parameters of the borrowing firm, we assume that

$$0 < pX < Y < D < X \ . \tag{1}$$

The condition, $pX<Y$, means that strategy S is more valuable than strategy R. The condition, $Y<D<X$, means that, under the current debt level, shareholders of the firm obtain nothing from strategy S, but a positive cash flow from strategy R with a probability p. Throughout the paper, we assume that the borrowing firm acts on behalf of its shareholders' wealth. Then, under the current setting, the borrowing firm has a risk-taking incentive. Formally, let $V_F(D, j)$ denote the value of the equity of the firm,

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[3] We do not consider either the holdout problem, as pointed out by Gertner and Scharfstein (1991), James (1995), Detragiache and Garella (1996), or the asymmetric information problem, as pointed out by Giammarino (1989) and Henikel and Zechner (1993).

which is affected by both the debt level of D and the strategy $j \in \{R, S\}$ chosen at date-1. Since $V_F(D, R)=p(X-D)>0$ and $V_F(D, S)=\max\{Y-D, 0\}=0$ under (1), the firm chooses an inefficient strategy R in order to maximize the shareholders' wealth.

The risk-taking incentive of the firm decreases the value of the bank loan as well as the total value of the firm. The value of the bank loan is pD if strategy R is undertaken, and Y if strategy S is undertaken. Since $pD<pX<Y$ under (1), the firm's risk-taking incentive is not desirable with respect to the value of the bank loan.

It is well-known that debt renegotiation resolves the risk-taking incentive problem of the borrowing firm. We shall concentrate on debt forgiveness in the current setting. Let D^* denote the new face value of the bank loan conditional on debt forgiveness being agreed upon. It is required that debt forgiveness induces the shareholders of the borrowing firm to undertake strategy S. Let $V_F(D^*, j)$ denote the equity value of the firm after debt forgiveness is agreed upon, which is affected by strategy $j \in \{R, S\}$. Since $V_F(D^*, S)=\max\{Y-D^*, 0\}$ and $V_F(D^*, R)=p(X-D^*)$, the firm chooses strategy S if and only if

$$D^* \le (Y - pX)/(1-p). \qquad (2)$$

Since the above condition implicitly requires $D^*<Y$, the value of the loan is given by D^* if debt forgiveness is agreed upon. In the following analysis, we focus our attention on cases in which debt forgiveness increases the value of the bank loan, that is, $pD \le D^*$. Although debt forgiveness increases the value of the bank loan, it is not clear whether debt forgiveness increases the shareholders' wealth of the lending bank. We claim that whether debt forgiveness increases the shareholders' wealth of the lending bank or not is dependent upon the financial condition of the bank.

For the sake of analytical simplicity, we assume that the lending bank has two kinds of assets at date-0: risk-free assets (e.g., Treasury bills or a portfolio of risk-free loans) and the risky loan to the borrowing firm described above. The total value of the risk-free

assets is represented by *A*. The original face value of the risky loan to the firm is represented by *D*. The bank has debt (deposits) with promised payments of *B*, which matures at date-2. Let $C \equiv B-A$, which gives returns from the risky loan that must be realized at date-2 to meet all deposits with certainty (or to avoid bankruptcy). We interpret *C* as a proxy for the unhealthiness of the bank's financial condition. The financial condition of the bank becomes unhealthier as the size of *C* increases.

[INSERT FIGURE 2]

Figure 2 describes the definition of the financial condition of the lending bank as categorized by the size of *C* (C^* is explained below). We first consider two extreme situations, $C<0$ and $D<C$. In the former case of $C<0$, which we refer to as a case of a healthy bank, the bank can meet all debt regardless of the amount of the collection on the risky loan. In this case, the equity value of the bank increases as the value of the loan increases. Then, debt forgiveness increases the stock price of the lending bank.

In the latter case of $D<C$, which we refer to as a case of a distressed bank, the bank cannot meet its liability with certainty. The stock price of the distressed bank is always equal to zero, regardless of whether or not debt forgiveness is agreed upon.

It is interesting to examine situations in which $0<C<D$ holds. Before moving on to the analysis, it is useful to describe the equity value of the lending bank. Let $V_B(D)$ denote the equity value of the bank, which is affected by the face value of the risky loan. When $0<C$, the equity value of the bank under the original loan, and that under debt forgiveness are given by

$$V_B(D) = p\max\{D-C,0\} \tag{3}$$

$$V_B(D^*) = \max\{D^*-C,0\} \tag{4}$$

We separate the situations of $0<C<D$ into three cases.

Case 1: An Unhealthy Bank

First consider the case of $(Y-pX)/(1-p)<C<D$, which we refer to as a case of an unhealthy bank. It follows from (2) that $D^*<C$ holds in this case. Then, $V_B(D)=p(D-C)>0$ and $V_B(D^*)=0$ hold, and the equity value of the bank decreases to zero if debt forgiveness is agreed upon. For an unhealthy bank, while debt forgiveness increases both the equity value of the borrowing firm and the loan value of the lending bank, it decreases the equity value of the lending bank. Note that the unhealthy bank goes into default with certainty if it provides debt forgiveness. The probability of default is $1-p$ if it does not agree upon debt forgiveness.

Case 2: A Moderately Unhealthy Bank

Next, consider the case of $C^*<C<(Y-pX)/(1-p)$, which we refer to as a case of moderately unhealthy bank. The value of C^* is given by

$$C^* = \frac{Y - pX}{(1-p)^2} - \frac{pD}{1-p} \tag{5}$$

In contrast to the case of the unhealthy bank (Case 1), the equity value of the bank is positive if the bank agrees upon debt forgiveness on the condition that the new face value of the loan, D^*, satisfies $C<D^*<(Y-pX)/(1-p)$. For such debt forgiveness, the following relation holds.

$$\begin{aligned} & V_B(D) - V_B(D^*) = p(D-C) - (D^* - C) \\ & > C + p(D-C) - (Y - pX)/(1-p) = (1-p)(C - C^*) \\ & > 0 \end{aligned} \tag{6}$$

The first inequality follows from $D^*<(Y-pX)/(1-p)$, and the second inequality follows from $C^*<C$. Therefore, as in the case of an unhealthy bank, the equity value of the moderately unhealthy bank decreases in response to debt forgiveness. Note that the

moderately unhealthy bank never goes into bankruptcy if it agrees upon debt forgiveness satisfying $C<D^*$.

Case 3: A Moderately Healthy Bank

Lastly, consider the case of $0<C<C^*$, which we refer to as a case of a moderately healthy bank. In this case, it is possible for the bank to provide debt forgiveness that increases the bank equity value. In order to demonstrate this claim, we set

$$D^* = \frac{Y - pX}{1-p} - \varepsilon, \quad 0 < \varepsilon < (1-p)(C^* - C) \tag{7}$$

Then, we obtain

$$\begin{aligned} & V_B(D^*) - V_B(D) = (D^* - C) - p(D - C) \\ & = \frac{Y - pX}{1-p} - \varepsilon - C - p(D - C) = (1-p)(C^* - C) - \varepsilon \\ & > 0 \end{aligned} \tag{8}$$

The second equality follows from (7), the third equality follows from (5), and the last inequality follows from (7).

In addition, for D^* satisfying (7), the loan value under the new face value, D^*, is larger than the loan value under the original face value, pD. In fact,

$$\begin{aligned} & D^* - pD = \frac{Y - pX}{1-p} - \varepsilon - pD \\ & > \frac{Y - pX}{1-p} - (1-p)(C^* - C) - pD \\ & = (1-p)C \\ & > 0 \end{aligned} \tag{9}$$

From (8) and (9), we find that the lending bank and the borrowing firm can agree upon debt forgiveness, which increases both the equity value and the loan of the lending bank, when the bank is in a moderately healthy financial condition. In such a situation, we predict that the stock price of the bank increases in response to debt forgiveness.

The next Proposition and Table 1 summarize the above arguments.

Proposition. When the financial condition of the lending bank is either healthy ($C<0$) or moderately healthy ($0<C<C^*$), the stock price of the bank increases in response to debt forgiveness. When the financial condition of the bank is either moderately unhealthy ($C^*<C<(Y-pX)/(1-p)$) or unhealthy ($(Y-pX)/(1-p)<C<D$), the stock price of the bank decreases if the bank agrees to debt forgiveness. For a distressed bank ($D<C$), debt forgiveness does not affect the stock price of the bank.

[INSERT TABLE 1]

As the Proposition and Table 1 show that when the lending bank is under either a moderately unhealthy or an unhealthy financial condition, debt forgiveness is not desirable for the bank shareholders' wealth. In such situations, shareholders of the bank prefer a risky collection of the original loan to a stable collection of the renewal loan. In this sense, the lending bank has a risk-taking incentive, too. If the management of the lending bank acts on behalf of its shareholders' wealth, then the bank does not agree to debt forgiveness. As a result, the borrowing firm will choose the risky strategy R. It is notable that the lender's risk-taking incentive cannot resolve the borrower's risk-taking incentive.[4]

However, there exists a possibility that the lending bank agrees upon debt forgiveness that is not desirable for the shareholders' wealth. Conceptually, if managerial shareholding is very small, then the management of the bank would regard

[4] John, John, and Senbet (1991) and Goldberg and Harikumar (1991) theoretically argued with regard to the relationship between bank risk-taking incentive and the design of deposit insurance.

the value of its firm-specific human capital as more important than the shareholders' wealth. Such management may prefer a stable loan collection to a risky collection in order to avoid bankruptcy in which the management will lose its position.[5] In the current setting, bank management can decrease the probability of default from 1-*p* to zero by providing debt forgiveness, when the financial condition of the bank is either moderately healthy or moderately unhealthy. For a moderately unhealthy bank, debt forgiveness decreases its shareholders' wealth.

Another possibility is that a bank having close ties to the borrowing firm may make it a top priority to help the firm in financial difficulty. A good example is main bank in Japan. The main bank of a firm holds considerable shares of the firm, and sometimes places its employees (often executives) in the board of directors of the firm. If there exist reasons to prop up a weak borrowing firm, for example to improve the firm's productivity or to increase the loan value, then the bank is likely to provide debt forgiveness with little concern for its own shareholders' wealth.[6]

Our model predicts that, in such situations, the effect of debt forgiveness on the bank stock price depends upon the financial condition of the bank. Debt forgiveness decreases the stock price of the bank if the bank is in a relatively unhealthy financial condition. On the other hand, the stock price of the bank increases as a result of debt forgiveness if the bank is in a relatively healthy financial condition.

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[5] Gilson (1989) and Gilson and Vetsuypens (1993) empirically find that default is costly for corporate managers. Saunders, Strock, and Travlos (1990), Demsetz and Strahan (1997), and Anderson and Faster (2000) find empirical evidence that bank managers tend to act on behalf of shareholders' wealth as managerial shareholdings increase.

[6] Hoshi, Kashyap, and Scharfstein (1990) and Morck and Nakamura (1999) empirically find that Japanese main banks prop up their group firms in financial distress.

In order to examine the relationship between the bank stock price reaction and the financial condition of the bank more formally, we use the rate of return defined as:

$$R_B = \frac{V_B(D^*)}{V_B(D)} - 1 \tag{10}$$

We consider a lending bank under three non-extreme financial conditions (unhealthy, moderately unhealthy, and moderately healthy). For an unhealthy bank, the rate of return is -1 because $V_B(D)>0$ and $V_B(D^*)=0$. For a moderately unhealthy bank and a moderately healthy bank, by differentiating R_B with respect to C, we obtain

$$\frac{\partial R_B}{\partial C} = \frac{(D^* - D)}{p(D-C)^2} < 0 \tag{11}$$

The magnitude of the bank stock price reaction to debt forgiveness has a negative relationship with the unhealthiness of the financial condition of the bank.

3. Sample Description

Using Japanese data, we examine the stock price reaction of the lending bank in response to debt forgiveness. We collected information on out-of-court debt forgiveness that was agreed upon in the period between April 1995 and March 2003 from the *Nihon Keizai Shimbun*, which is the most popular economic press in Japan. Since a small amount of debt forgiveness is not likely to have an economic impact on the lending banks, we restricted our attention to debt forgiveness of more than 100 billion yen (about 9 billion US dollars). During the sample period, we identified 16 events involving large debt forgiveness. Some of our analysis requires financial information on both the borrowing firms and lending banks. We collected this kind of information from the *Toyo Keizai Data Bank* and the financial statements of individual firms and banks.

Table 2 presents the sample description. In Panel A, we provide the distribution of

the sample by year and by the industry to which the borrowing firms belong. Industry groups are based on the Tokyo Stock Exchange's industry classifications. It is well-known that land values have declined during the 1990s in Japan, resulting in a sharp decline in the performance of the construction and real estate industries in the late 1990s. The sample distribution by industry of the borrowing firm reflects this phenomenon. More than half of the borrowing firms belong to either the construction or real estate industry.

Panel B of Table 2 presents statistics on the debt forgiveness transactions. The lead bank is the lead lending bank which has the largest loan to the borrowing firm among all lending banks. The second bank is the lending bank which has the second largest loan to the firm. We do not focus on the third lending bank and below because in most cases they make little contribution to debt forgiveness. On average, 253 billion yen was forgiven by the group of lending banks. Because of data restrictions, we could not obtain the complete information on the value of the loans that each lending bank forgave. In 9 cases, we obtained the amount of loans forgiven by the lead lending banks, and in 6 cases we obtained the amount of loans forgiven by the second lending banks. On average, the lead lending banks forgave loans worth 152 billion yen. In all of the 9 cases, the lead lending banks forgave loans of more than 50 billion yen. Panel B also shows that the lead lending banks contributed about 65 percent of the loan reduction.

Panel C of Table 2 provides information on the relationship between the borrowing firms and their main lending banks. The first two rows show the ratio of loans owned by each individual bank to the total debt of the firm. It follows from Panel B and Panel C that both the lead lending banks and the second lending banks take disproportionate responsibility for the firms' bad loans. In particular, the lead lending banks play a much more important role in debt forgiveness than do the other lending banks. The last two rows of Panel C show that both the lead lending banks and the second lending banks own considerable shares of the borrowing firms. Although not reported in the paper, we

find that in 15 cases the lead lending banks are the largest shareholders among bank shareholders of the firms. Furthermore, we find that, in all of the 16 cases, more than one director of the borrowing firms was dispatched from the lead lending banks. In 14 cases, the CEOs of the firms were dispatched from the lead lending banks. We conclude that the borrowing firms had very close relationships with their lead lending banks prior to debt forgiveness.

Lastly, Panel D of Table 1 provides our measures of the unhealthiness of the banks' financial conditions. We use two measures: One is the ratio of bad loans to the total loans of the bank (the bad loan ratio), and the other is the ratio of net bad loans to the total loans of the bank (the net bad loan ratio). Net bad loan refers to bad loans minus reserves for loans. We collected information on the two ratios from the financial statements of each bank. The bad loans used in this paper are so-called risk management loans, which include loans to failed enterprises, loans on which payments are suspended for more than three months, and loans with relaxed conditions (restructured).[7] Other things being equal, the difference between the liabilities and risk-free assets of the bank (C in the model) increases as the bad loan ratio rises. In this sense, we think that these two measures are appropriate proxies for the unhealthiness of the bank's financial conditions for the purpose of our empirical study.

4. Empirical Results

A. Stock Price Reaction of Lending Bank to Announcement of Debt Forgiveness

[7] For more details on bad loans made by Japanese banks, see Hoshi and Kashyap (2001, Chapter 8). Risk management loans are the only loans for which we could have complete information regarding the annual bad loans of individual banks during our sample period.

In order to examine the announcement effects of debt forgiveness on the stock prices of the lending banks, we employ a standard event study methodology. In all cases, the event date is the first date on which an announcement regarding the agreement of debt forgiveness is released by *Nihon Keizai Shimbun*.

We calculate daily stock returns by using the closed price taken from *Stock Price CD-ROM* of the *Toyo Keizai Data Bank*. In accordance with Musumeci and Sinkey (1990), Kracaw and Zenner (1996), and Dahiya, Saunders, and Srinivasan (2003), we calculate the announcement abnormal return for a lending bank on any given date by using the market model methodology. We use TOPIX as a proxy of the market portfolio. The parameters of the market model are estimated over a 200-day period between day -220 and day -21. Throughout the paper, day *-t* means *t* days before the announcement date (day 0), and day *t* means *t* days after the announcement date. The abnormal return is computed as the difference between the actual return and the estimated return from the market model. The cumulative abnormal return is the sum of the abnormal returns for the days in the relevant event window.[8]

First, we examine the announcement effect of debt forgiveness on a bank portfolio consisting of both the lead lending banks and the second lending banks. Panel A of Table 3 presents the daily abnormal returns of the bank portfolio in a 3-day event window. Since we do not have the complete stock price data for one of the second lending banks, the number of our sample banks is 31 (16 lead banks and 15 second banks). On average, debt forgiveness has a significant negative abnormal return of -1.01% on the announcement day for the bank portfolio. In Panel B of Table 3, we report cumulative abnormal returns in three event windows of (-1, 1), (-1, 0), and (0, 1).

[8] We also used the market-adjusted return model to calculate the abnormal returns, and observed no significant difference in the results.

In the windows of (-1, 1) and (0, 1), the cumulative abnormal returns of the bank portfolio are significantly negative. Thus, we conclude that the average stock price of the lending banks significantly decreases in response to the announcement of debt forgiveness. [9]

Next, we separate the bank portfolio into two portfolios (a lead bank portfolio and a second bank portfolio) and examine the announcement effect for each portfolio. Panel A of Table 4 presents the average daily abnormal returns of each portfolio, and Panel B of Table 4 presents the cumulative abnormal returns of each portfolio. The results show that debt forgiveness has a significant negative announcement effect for the lead bank portfolio. For the second bank portfolio, the announcement effect is negative but insignificant. The difference in announcement effect between the two portfolios may be due to the difference in the contribution to debt forgiveness. As shown in Panel B of Table 2, the lead lending banks made much larger contributions to debt forgiveness than did the second leading banks.

Our model developed in Section 2 predicts that the stock price of the lending bank decreases due to debt forgiveness under two assumptions; one is that the management of the bank is not concerned with the shareholders' wealth, and the other is that the financial condition of the lending bank is not healthy. These two assumptions appear to be appropriate for our sample of Japanese banks for the following reasons.

Regarding the first assumption, managerial shareholdings have been traditionally very small in major Japanese banks. We find that the average managerial shareholding of the lead banks is about 0.015% in our sample, which is negligibly small.[10] In

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[9] In our sample, the borrowing firms do not experience any significant announcement effects of debt forgiveness.

[10] Managerial Shareholding is defined as the aggregate percent of shares held by all officers and directors of the bank.

addition, as shown in Panel C of Table 2, there are very close relationships between the borrowing firms and their lead lending banks. In 2001, the Japanese Bankers Association provided a guideline for out-of-court workouts, which says that the lending bank provides debt forgiveness in order to help in the restructuring of the borrowing firms and to increase the collection of loans made to the firms. Taking these facts into account, it seems reasonable to suppose that the management of our sample banks agrees to debt forgiveness with little concern for the shareholders' interests.

Regarding the second assumption, as pointed out by Cargill (2000), Ueda (2000), and Hoshi and Kashyap (2001, Chapter 8), the financial conditions of Japanese banks steadily worsened during the 1990s. Since Japanese economic performance has worsened and Japanese land prices have gone down since the beginning of the 1990s, Japanese banks experienced both poor performance and steady increases in bad loans during the 1990s.[11] Several Japanese banks failed in the late 1990s. In 1998 and 1999, the Japanese Government injected public funds into many private Japanese banks in order to improve their financial condition. We can say that, on average, our sample banks were in a relatively unhealthy financial condition during our sample period.

B. Bank Financial Condition and Announcement Effect

Our model predicts that the announcement-period stock return of the lending bank is negatively related to the unhealthiness of the bank's financial condition. This subsection examines this prediction in detail. In the following analysis, we use both the lead lending banks and the second lending banks in our sample of lending banks in order to improve the stability of the tests. The total number of banks observed is 31.

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[11] The average after-tax net income of Japanese City banks has been negative since 1995 except in 2000.

First, the 2-day (0, 1) cumulative abnormal return of each lending bank is regressed on its bad loan ratio (BLR) and net bad loan ratio (NBLR). We use the 2-day (0, 1) cumulative abnormal return as a proxy for the magnitude of the announcement effect because it is the most significant.[12]

The regression result associated with BLR is given by

$$CAR=1.04-0.40\ (\text{BLR}),\ R^2=0.13. \qquad (12)$$

The *t*-value of the coefficient of BLR is -2.14, which is significant at the 5% level. The regression result associated with NBLR is

$$CAR=3.17-0.34\ (\text{NBLR}),\ R^2=0.19. \qquad (13)$$

The *t*-value of the coefficient of NBLR is -2.57, which is also significant at the 5% level. Consistent with our prediction, the announcement effect of debt forgiveness on the stock price of the lending bank is negatively related to BLR and NBLR, both of which are appropriate proxies for the unhealthiness of the banks' financial conditions.

As summarized in Table 1, our model says that the lending bank experiencing a positive announcement effect is in a relatively healthy financial condition, while the bank experiencing a negative announcement effect is in a relatively unhealthy financial condition. We separate the whole bank sample into two groups according to the sign of the announcement effect, and examine the difference in the unhealthiness of the financial conditions between the two groups. The negative-CAR group consists of 22 lending banks (11 lead banks and 11 second banks) that experience negative announcement effects in the 2-day event window of (0, 1). The positive-CAR group consists of 9 lending banks (5 lead banks and 4 second banks) that experience positive announcement effects.

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[12] The results are not essentially different when we use other event windows of (-1, 1) and day 0.

Table 5 shows that both the bad loan ratio (BLR) and the net bad loan ratio (NBLR) are significantly higher for the negative-CAR group than for the positive-CAR group. The lending banks experiencing positive announcement effects are in healthier financial condition than the banks experiencing negative announcement effects.

We also separate the whole bank sample into two groups according to the magnitude of the announcement effect, and examine the difference between the two groups in the unhealthiness of their financial condition. The low-CAR group consists of 16 lending banks (11 lead banks and 5 second banks) with relatively small cumulative abnormal returns, and the high-CAR group consists of 15 lending banks (5 lead banks and 10 second banks) with relatively large cumulative abnormal returns. Table 6 shows that both the bad loan ratio (BLR) and the net bad loan ratio (NBLR) are significantly higher for the low-CAR group than for the high-CAR group. On average, the lending banks experience relatively small announcement effects when their financial conditions are relatively unhealthy.

The results shown in Table 5 and Table 6 support the prediction that there is a negative relationship between unhealthiness of the financial conditions of the lending banks and the announcement effect of debt forgiveness on the banks.

5. Conclusion

This paper examined how debt forgiveness affects the stock price of a lending bank. Our theoretical model suggests that whether the stock price of the lending bank increases in response to debt forgiveness depends upon the bank's financial condition. When the financial condition of the bank is relatively healthy, debt forgiveness has a positive effect on the bank's stock price. On the other hand, debt forgiveness has a negative effect on the bank's stock price when the bank's financial condition is relatively unhealthy. Our model predicts a negative relationship between the

announcement effect of debt forgiveness on the lending bank and the unhealthiness of the bank's financial condition.

Using Japanese data, we empirically examined the stock price behavior of lending banks surrounding the announcements of out-of-court debt forgiveness in the period between 1995 and 2003. We found that, on average, the lead lending banks experience a negative announcement effect to debt forgiveness. Taking into account the fact that the financial conditions of Japanese banks worsened in the late 1990s, the negative announcement effect on the lending banks is consistent with the prediction of the model.

We also examined the relationship between the announcement effect of debt forgiveness on the lending bank and the bank's financial condition. We found that the magnitude of the announcement effect becomes smaller as the bank's bad loan ratio rises. We also found that the lending banks experiencing negative announcement effects have relatively higher bad loan ratios than do the banks experiencing positive announcement effects. These results support the prediction of a negative relationship between the announcement effect on the bank and the unhealthiness of the bank's financial condition.

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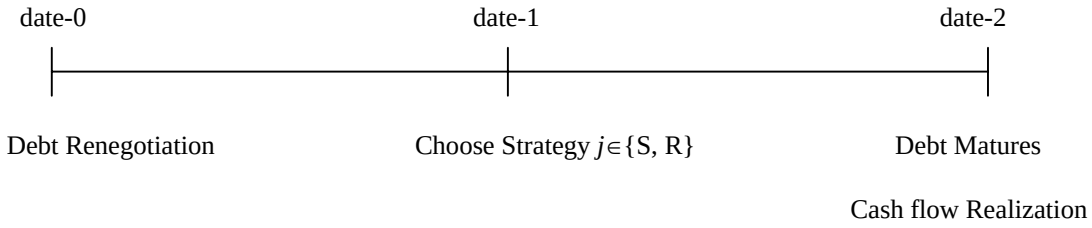

Figure 1: Sequence of Events

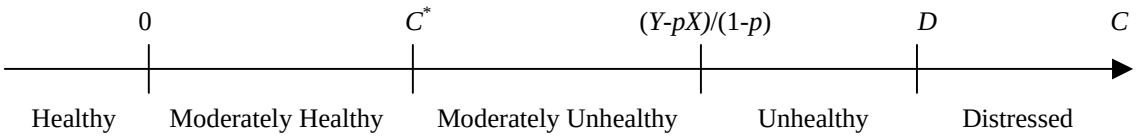

Figure 2: Definition of Financial Conditions of the Bank

Financial Condition	Loan Value	Equity Value of the Bank	Probability of Default
Healthy	increase	increase	no change (zero)
Moderately Healthy	increase	increase	decrease to zero
Moderately Unhealthy	increase	decrease	decrease to zero
Unhealthy	increase	decrease to zero	increase to one
Distressed	increase	no change (zero)	no change (one)

Table 1: Effects of Debt Forgiveness to the Lending Bank

Table 2: Descriptive Statistics of the Sample

The sample contains 16 cases of out-of-court debt forgiveness totaling more than 100 billion yen that were agreed to in Japan from 1995 to 2003. The lead (second) bank is the bank which has made the largest (second largest) loan to the borrowing firm among the lending banks that have made loans to the firm. In panel C, the loan ratio is the ratio of the loans owned by each individual bank to the total debt of the borrowing firm. Bank equity holding is the percentage of shares of the borrowing firm held by each individual bank. In Panel D, the bad loan ratio is the ratio of bad loans to the total loans of each bank, and the net bad loan ratio is the ratio of bad loans less loan reserves to the total loans of each bank. The bad loan figure is the sum of loans to failed enterprises, loans on which payments have been suspended for more than three months, and loans with relaxed conditions (restructured).

Panel A: Distribution of the Sample by Year and Industry

Industry / year	1995-1997	1998-1999	2000-2001	2002-2003	Total
Construction	1	4	3	0	8
Real Estate	0	1	0	2	3
Retail & Wholesale Trade	0	1	1	2	4
Other Financing Business	1	0	0	0	1
Total	2	6	4	4	16

Panel B : Statistics of Debt Forgiveness

	Mean	Median	Min.	Max.
Total Amount (Billion Yen)	253	200	105	640
Lead Bank (9 observations)				
Amount (Billion Yen)	152	120	50	342
Ratio of Total Amount (%)	65	61	38	85
Second Bank (6 observations)				
Amount (Billion Yen)	38	35	15	78
Ration of Total Amount (%)	21	20	7	38

Panel C: Relationship between Firms and Lending Banks				
	Mean	Median	Min	Max
Loan ratio (%)				
Lead Bank: 16 observations	26.62	26.41	11.10	51.12
Second Bank: 16 observations	11.52	11.36	3.24	23.03
Bank Equity Holding (%)				
Lead Bank: 16 observations	4.37	4.67	3.20	4.92
Second Bank: 11 observations	3.03	2.90	2.10	4.99
Panel D: Financial Conditions of Lending Banks				
	Mean	Median	Min	Max
Bad Loan Ratio (%)				
Lead Bank: 16 observations	6.24	5.27	2.55	13.48
Second Bank: 16 observations	7.43	6.65	2.64	17.24
Net Bad Loan Ratio (%)				
Lead Bank: 16 observations	3.55	2.55	0.17	10.17
Second Bank: 16 observations	3.93	3.99	0.27	10.58

Table 3: Announcement Effects of Debt Forgiveness on Stock Prices of Lending Banks

This table presents the announcement effects of debt forgiveness on the stock price of a portfolio of both the lead lending banks and the second lending banks. Panel A describes the daily abnormal returns of a portfolio of the lending banks in a 3-day event window around the date of out-of-court debt forgiveness. Panel B describes the cumulative abnormal returns in three event windows. The abnormal return is computed as the difference between the actual return and the estimated return from the market model. The cumulative abnormal return is the sum of the abnormal returns for the days in the relevant event window. The *t*-value in parentheses is the standard statistic for testing the null hypothesis that each abnormal return or cumulative abnormal return is equal to zero.

Panel A : Daily Abnormal Returns for Lending Banks

Day	(31 samples)
Day -1	-0.035%
	(- 0.060)
Day 0	-1.014%
	(-1.756)**
Day 1	-0.658%
	(-1.139)

Panel B : Cumulative Abnormal Returns for Lending Banks

Event Window	(31 samples)
3-day window (-1 , 1)	-1.707%
	(-1.706) **
2-day window (-1 , 0)	-1.049%
	(-1.284)
2-day window (0 , 1)	-1.673%
	(-2.047) **

** Significant at the 5% level

* Significant at the 10% level

Table 4: Announcement Effects of Debt Forgiveness on Stock Prices of the Lead Banks and Second Banks

This table presents the announcement effects of debt forgiveness on the stock prices of a portfolio of the lead lending banks and a portfolio of the second lending banks, respectively. Panel A describes the daily abnormal returns of each portfolio in a 3-day event window around the date of out-of-court debt forgiveness. Panel B describes the cumulative abnormal returns of each portfolio in three event windows. The abnormal return is computed as the difference between the actual return and the estimated return from the market model. The cumulative abnormal return is the sum of the abnormal returns for the days in the relevant event window. The *t*-value in parentheses is the standard statistic for testing the null hypothesis that each abnormal return or cumulative abnormal return is equal to zero.

Panel A : Daily Abnormal Returns

Day	Lead Banks (16 samples)	Second Banks (15 samples)
Day -1	- 0.163 %	0.102
	(- 0.236)	(0.147)
Day 0	- 1.542 %	- 0.451
	(- 2.233)**	(- 0.646)
Day 1	- 0.830 %	- 0.475
	(- 1.202)	(- 0.680)

Panel B : Cumulative Abnormal Returns

Event Window	Lead Banks (16 samples)	Second Banks (15 samples)
3-day window (-1 , 1)	- 2.535 %	- 0.824
	(- 2.119)**	(- 0.681)
2-day window (-1 , 0)	- 1.705	- 0.349
	(- 1.745)	(- 0.353)
2-day window (0 , 1)	- 2.372 %	- 0.926
	(- 2.429)**	(- 0.938)

** Significant at the 5% level

* Significant at the 10% level

Table 5: Announcement Effect and Financial Conditions of Lending Banks Ⅰ: The Negative-CAR Group and the Positive-CAR Group

This table presents the unhealthiness of the financial conditions of lending banks grouped according to the sign of the announcement effect. The Negative-CAR group consists of 22 lending banks that experience negative cumulative abnormal returns in a 2-day event window of (0, 1). The positive-CAR group consists of 9 lending banks that experience positive cumulative abnormal returns in a 2-day event window of (0, 1). Average CAR means the average cumulative abnormal returns for each group. Average BLR (NBLR) means the average bad loan ratio (net bad loan ratio) for banks in each group. Welch's *t*-test is used to determine the difference of the average BLR and NBLR between the two groups.

Panel A : Announcement Effect and Bad Loan Ratio

	Negative-CAR group (22 samples)		Positive-CAR group (9 samples)
Average CAR	-3.506%		2.809%
Average BLR	7.372%		5.451%
Test Statistics		1.829**	

Panel B : Announcement Effect and Net Bad Loan Ratio

	Negative-CAR group (22 sample)		Positive-CAR group (9 samples)
Average CAR	-3.506%		2.809%
Average NBLR	4.274%		2.482%
Test Statistics		1.935**	

** Significant at the 5% level.

Table 6: Announcement Effect and Financial Conditions of Lending Banks Ⅱ: The-High CAR Group and the Low-CAR Group

This table presents the unhealthiness of the financial conditions of lending banks grouped according to the magnitude of the announcement effect. The Low-CAR group consists of 16 lending banks that experience relatively low cumulative abnormal returns in a 2-day event window of (0, 1). The High-CAR group consists of 15 lending banks that experience relatively high cumulative abnormal returns in a 2-day event window of (0, 1). Average CAR means the average cumulative abnormal returns for each group. Average BLR (NBLR) means the average bad loan ratio (net bad loan ratio) for the banks in each group. Welch's *t*-test is used to determine the difference of the averages BLR and NBLR between the two groups.

Panel A : Announcement Effect and Bad Loan Ratio

	Low-CAR group (16 samples)		High-CAR group (15 samples)
Average CAR	-4.541%		1.388%
Average BLR	7.905%		5.651%
Test Statistics		1.755**	

Panel B : Announcement Effect and Net Bad Loan Ratio

	Low-CAR group (16 sample)		High-CAR group (15 sample)
Average CAR	-4.541%		1.388%
Average BLR	4.688%		2.725%
Test Statistics		1.785**	

* Significant at the 5% level.

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