CNAEC Research Series 06-03

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KIEP CNAEC Research Series 06-03
Published November 6, 2006 in Korea by KIEP

Executive Summary

Both Korea and Japan experienced massive corporate debt restructuring after the late 1990s. Although the apparent factors that gave rise to corporate sector distress seem differ between the two countries, i.e., Korea faced the financial crisis of 1997 and Japan suffered from a bad loan problem after the burst of the bubble economy in the 1990s, there are several similarities. First, in both countries, formal legal bankruptcy procedures were relatively weak and instead informal bankruptcy procedures such as workout played an important role in corporate debt restructuring. However, regarding the use of informal bankruptcy procedures, there has been criticism that facile debt forgiveness and additional lending to distressed firms cause the "too big to fail" problem and put off the early exit of nonviable firms. Responding to this criticism, both countries recently set about introducing legal bankruptcy reforms (1998, 1999, and 2001 in Korea, and 2000 and 2002 in Japan). These legal reforms are for massive corporate bankruptcies in both countries and are related to the encouragement of a market-based mechanism for restructuring. It is worth examining how efficient debt restructuring is, and whether there are any differences in both countries. So, in this paper, the efficiency of debt restructurings is empirically examined by using the qualitative response model and data on bankrupt firms from both countries. The conclusions of this paper are as follows. For the Japanese case, overall tendencies toward under-liquidation and excess-legal bankruptcy are observed. However, for sub-samples or for samples after 2000, when the Civil Rehabilitation Act was introduced, under-liquidation disappears and the efficiency of legal bankruptcy procedures increases. But on the other hand, under-legal bankruptcy or excess-reorganization in a workout program seem to occur. This may reflect weaknesses of workout schemes and reduced intervention by the government. In contrast to the Japanese case, excess-legal bankruptcy is not observed in Korea. Instead, there was a tendency for under-legal bankruptcy or excess-reorganization in a workout program before 2000. This result may be interpreted to mean that before the introduction of the

Corporate Restructuring Promotion Act, workout programs were relatively weak and included firms that should have gone legally bankrupt.

JEL Classification: G33, G34, G38
Keywords: corporate debt restructuring, workout, liquidation, legal bankruptcy

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Contents

Tables

Figures

Bankruptcy Procedures and the Efficiency of Corporate Debt Restructuring in Korea and Japan

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Ⅰ. Introduction

Both Korea and Japan experienced massive corporate debt restructuring after the late 1990s. Although the apparent factors that gave rise to corporate sector distress seem to differ between the two counteries, i.e., Korea faced the financial crisis of 1997 and Japan suffered from a bad loan problem after the burst of the bubble economy, there are several similarities. First, in both countries, formal legal bankruptcy procedures were relatively weak and instead informal bankruptcy procedures such as workout played an important role in corporate debt restructuring. As is well known, big *chaebols* were restructured under the workout program in Korea, and also in Japan there was the main banking system under which the largest creditor bank arranged a workout program. However, as for the use of informal bankruptcy procedures, there has been criticism that facile debt forgiveness and additional lending to distressed firms create a lot of "zombie firms" or the "too big to fail" problem and may put off the early exit of nonviable firms. Responding to this criticism, both countries set about legal bankruptcy reforms recently. For example, in Korea, bankruptcy acts were amended substantially in 1998, and also in Japan, the new bankruptcy act (Civil Rehabilitation Act) was introduced in 2000. These legal reforms are for massive corporate bankruptcies and are related to the encouragement of a market-based mechanism for restructuring.

It is worth examining how efficient debt restructuring is and the impact of several reforms, and whether there are "too big to fail" firms or any differences between the two countries. In the economic sense, it is desirable to resolve a financially troubled firm in such a way that the firm's maximum is attained, regardless of whether the procedures are legal or private and whether the company decides to liquidate or to reorganize. Therefore, the evaluation of the

degree of the efficiency of debt restructuring seems to be crucial for the above discussions. So, in this paper, I empirically examine the efficiency of debt restructuring by using the qualitative response model (probit-like estimation) and data from bankrupt firms in both countries. The structure of this paper is as follows.

In section 2, previous studies about bankruptcy resolutions are discussed. Theoretical factors that affect the efficiency of the bankruptcy resolution and some empirical results are examined. In section 3, an overview of corporate debt restructurings or insolvency schemes both in Korea and Japan is given. In section 4, the estimation model used here is presented. This model is a kind of an application of the qualitative response model and will directly evaluate the degree of over- and under-liquidation or bankruptcy. In section 5, sample data and estimation results are presented. In the final section, the conclusions of this paper are stated.

Ⅱ. Issues of Corporate Debt Restructuring: Related Literature

1. Theoretical Impediments to Optimal Bankruptcy Resolution

Corporate debt restructuring can be largely categorized in one of two ways: as “legal procedures,” in which reorganization or liquidation takes place in accordance with legal procedures, including corporate reorganization, composition, civil rehabilitation, etc., or as “private procedures,” in which reorganization (workout) or liquidation takes place outside of legal procedures under certain guidelines.

Regardless of whether the procedures are legal or private, it is desirable from an economic standpoint to restructure a firm in such a way that its value is maximized. It is not necessarily clear, however, that actual debt restructuring is in line with the maximization of a firm’s value.

For example, let’s say a firm is restructured under legal procedures. Interests among senior and junior creditors may vary depending upon whether the firm continues after reorganization or is liquidated. In this case, even though greater firm value would be created by the continuance or reorganization of the firm than by its liquidation, if senior or secured creditors insist on liquidation and the liquidation is approved by a majority vote, the company will be liquidated, generating over-liquidation. On the other hand, even though greater firm value would be created by liquidation than by continuing the business, if the junior or unsecured creditors insist on reorganization and the reorganization is approved by a majority vote, a firm that should otherwise be liquidated may continue and be reorganized, generating under-liquidation.

A similar problem could happen in private procedures as well. Let’s assume that greater firm value is generated if debts are privately waived and reorganized than in a case where debts are restructured under legal procedures. For example, this may be true when legal procedures decrease the trust in and reputation of the firm and cause valuable employees and business partners to

leave. Even in this case, individual creditors have an incentive not to waive their own debts and instead to try to achieve private reorganization at the expense of other creditors. This is known as the free rider problem. If many creditors thought the same way, it would result in costly legal procedures. On the other hand, if creditors try to collect their claims at the same time through inefficient piecemeal liquidation, the firm may be forced into de facto bankruptcy (legal procedures). In either case, over-bankruptcy (excessive use of legal procedures) happens in the sense that a company that should otherwise be privately reorganized becomes bankrupt.[1)]

By contrast, there is the possibility that a firm may avoid bankruptcy through private procedures, even when legal procedures are more desirable, i.e., under-bankruptcy occurs. In fact, we cannot deny the possibility that junior creditors who do not want bankruptcy might agree to additional loans or debt waivers to mitigate the cash flow of the firm and delay legal procedures.

If corporate debt restructuring is not implemented in an efficient way as described above[2)], the issues to be examined here are the extent of its inefficiency and its orientation: over/under-liquidation and over/under-bankruptcy. Therefore, in the following section, an estimation model is used to evaluate the efficiency of debt restructuring both in Korea and Japan.

2. Empirical Studies on the Efficiency of Bankruptcy Resolutions

Gertner and Scharfstein (1991) discuss Chapter 11, the reorganization

1) In this paper, the term “bankruptcy” is used for companies that undergo legal bankruptcy procedures.

2) Since debt restructuring (reorganization or liquidation) generally affects the interests of and distribution to individual claim holders simultaneously, a decision that is optimal to society is not easily made. Bebchuk (1988), Aghion, Hart, and Moore (1992), and Ikeo and Seshimo (1998) discuss the optimal mechanism coordinate interests among creditors in such a way that maximizes corporate value.

bankruptcy law in the United States. They point out that the characteristics of Chapter 11, including automatic stay (suspension of payment), the rights of the DIP (debtor in possession), and the majority voting rules, could create an environment that is advantageous to subordinated creditors, such as shareholders, which consequently causes over-investment or excess-reorganization. For example, while automatic stay freezes repayment obligations, the fact that the DIP has exclusive rights to submit the reorganization plan and classify creditors facilitates a reorganization that serves its self-interests. In particular, when the cost of prolonged negotiations is high, the DIP will have significant bargaining power, and a large amount of rent may go to the subordinated creditors or shareholders as well as to the DIP.

Hotchkiss (1995) studies the performance of 197 companies after their procedures under Chapter 11 were approved and completed. He finds that about 40 percent of the companies continued to lose money for three years after the completion of the procedures, and 32 percent of the companies in the study (i.e., 32 percent of the 197) had either filed for Chapter 11 again or gone to private procedures. Based on this observation, he concludes that Chapter 11 is biased toward excessive reorganization.

In the meantime, Eberhart, Altman, and Aggarwal (1999) conduct an event study of stock price reactions for 131 companies that completed reorganization plans approved under Chapter 11. They find that news of the completion of the reorganization plans generat abnormally positive increases in stock prices. Although this result does not directly negate Hotchkiss's analysis, it presents an opposing view on companies that have completed Chapter 11 procedures.

Lastly, Dahiya, John, Puri, and Ramirez (2003) give an overview of DIP financing and conduct an empirical analysis of its economic impact. According to their studies, about 30 percent of the companies that filed for Chapter 11 from 1988 to 1997 received DIP financing. There was a particularly high number of DIP financing cases among retailers with relatively high percentages of liquid assets. They also analyze the relationship between the length of time from the filing of Chapter 11 to the completion of the reorganization plan or liquidation when a case was moved to Chapter 7 and DIP financing, and found

that companies that received DIP financing completed their reorganization or liquidation sooner. This can be interpreted to mean that DIP financing mitigates the problem of under-investment and accelerates decision-making toward both reorganization and liquidation. If we accept the results of the empirical study by Eberhart, Altman, and Aggarwal (1999), we can say that early completion of the reorganization plan increases stock values. In that sense, DIP financing may increase corporate values. Meanwhile, early liquidation is also generally considered to contribute to the maintenance of a firm's value, and therefore DIP financing can be considered to have a positive effect in this respect as well. Dahiya, John, Puri, and Ramirez (2003) also find that existing creditors (banks) tend to extend DIP financing for relatively small companies; or, in cases of pre-packaged Chapter 11s, external creditors tend to extend DIP financing to large companies. They interpret this to mean that the problem of asymmetry of information is significant for small companies, and therefore the monitoring capability of existing creditors (banks) is important.

Ⅲ. Corporate Debt Restructuring in Korea and Japan

Both Korea and Japan experienced massive corporate bankruptcies after the late 1990s. As for Korea, after the Asian currency crisis in 1997, many big companies or *chaebols* went bankrupt or were financially distressed. Also in Japan, many companies became financially distressed or bankrupt after the burst of the bubble economy in the 1990s. Although apparent causes are different between the two countries, i.e., outside foreign currency shock for Korea and internal burst of the bubble economy for Japan, there are similarities in the settlement procedures. Firstly, in both countries, out-of-court or private procedures such as workouts have been used as an important means of settlement. For example, in Korea, Daewoo, one of top five *chaebols*, was reorganized under the workout program, and in Japan, Daiei, a large retail company, was planned to be revived under private procedures or under IRCJ (Industrial Rehabilitation Company Japan). However, out-of-court procedures are often criticized as unclear and may put off the exit of nonviable firms which should go bankrupt. Therefore, both countries have recently set about legal bankruptcy reforms. For example, in Korea, bankruptcy acts were amended substantially in 1998 for the first time since the introduction of bankruptcy laws in 1962, and also in Japan the new bankruptcy act (Civil Rehabilitation Act) was introduced in 2000. These legal reforms are for massive corporate bankruptcies and are related to the encouragement of a market-based mechanism for corporate restructuring. Thirdly, both countries have some similaries in introducing some government-related agencies to facilitate the disposal of distressed assets or loans and to provide liquidity and capital into distressed firms. In Korea, CRF, CRC, and CRV were established and in Japan RCC and IRCJ were established.

Therefore, in this section, I will review the corporate restructuring procedures in both countries, focusing on out-of-court procedures and legal procedures.[3)]

3) For details on corporate debt restructuring in Korea, see Young and Yang (2003) and Oh Soogeun (2005).

1. Out-of-court Procedures

Both in Korea and Japan, formal legal procedures have been relatively weak and instead private procedures have played an important role in restructuring distressed firms.

In Korea, the government introduced and reinforced out-of-court procedures depending on the size of the firm after the crisis. For example, for the top five *chaebols*, debt reductions and business swaps referred to as "Big Deals" were implemented. In 1998, the top five *chaebols* and their creditors reached an agreement on debt reduction and reached an agreement with the government on five principles of corporate sector reform, i.e., adopting consolidated financial statements, strengthening the voting rights of minority shareholders, appointing outsider director, establishing an external audit committee, and prohibiting cross-subsidiary debt guarantees. And also in 1998, the top five *chaebols* agreed to business swaps between *chaebols* in important industries such as semiconductors, aerospace, petrochemicals, etc. As for the other six to 64 *chaebols*, a workout program was introduced (later the workout program was expanded to include small and medium sized firms). Although the workout is in principle a voluntary or private settlement among creditors, the Korean workout program seems to be affected by the government and seems to some extent compulsory. For example, the government established an arbitration committee (the Corporate Restructuring Coordination Committee) to resolve disputes between creditors and debtors, and the Corporate Restructuring Promotion Act in 2001 stipulates that the workout program is effective if more than 75 percent of creditors approve the plan. Korean workout programs involve management changes, debt-equity swaps, asset sales, debt rescheduling, and new loans. At the end of 2002, 83 firms (*chaebols*) were selected as workout firms (in 1999, Daewoo Group, one of the top five *chaebols*, was included in the workout program) and among them, 55 firms completed the workout program, 16 firms went legally bankrupt, and 12 firms were still in the program (see Table 1).

Table 1. Number of Firms in Workout Programs in Korea

	1998	1999	2000	2001	2002
Workout firms	55	77	84	83	83
Completed		1	36	47	55
Out of workout program		9	11	14	16
Remaining		67	37	22	12

Source: Choong Yong Ahn and Doo Yong Yang (2003).

In Japan, it is said that the central bank, the largest creditor among banks that has even equity of firms and dispatches executives to distressed firms, has played an important role in workout programs. Indeed, before the late 1990s, the central bank usually not only abandoned its claims but also shouldered or discharged debts for other banks, resulting in the success of workout programs. However, after the burst of the bubble economy, the power of the central bank was lost. As the number of distressed firms increased, the central bank could not afford to make enough concessions, and it became difficult to make an agreement on a workout program. Instead, in order to avoid sudden bankruptcy or a bad loan problem for banks, it is said that banks are inclined to abandon their claims and this may cause the "too big to fail" problem. In 2002, a banker's association in Japan set forth some guidelines for out-of-court procedures based on the London approach. However, because of stringent conditions, such as the replacement of existing managers, the wipeout of shareholders' claims, and going into the black within three years, these guidelines were not used actively.

Table 2 shows changes in borrowings from banks and the amount of debt forgiveness in the Daiei Co. case. In the Daiei case, the stringent guidelines from the banker's association were not adopted, and now, Daiei suffers from a low rate of sales and profits. As we can see, the lending shares and balances of the three major private banks (UFJ, Sumitomo Mitsui, and Mizuho) in Daiei increased annually, and that the so-called *mein yose* (the concentration of debts with main banks) occurred. In the meantime, the lending shares and balances of other banks decreased rapidly.

And also when we look at the amount of debt forgiveness, the waived debt percentages against the lending balances of the three main banks as of 2004 were about 40 percent or 50 percent, while those of other banks were small or decreasing. One could say that this *mein yose* is only a reflection of the lender responsibilities of central banks, something like the equitable subordination practices in the United States, which are expected to strengthen corporate governance. However, in Japan, as the number of failed firms increases, central banks can not afford to forgive debts thoroughly, and this situation seems to bring about a halfway workout or a "too big to fail" problem.

Table 2. Balance of Loans to Daiei Co. from Banks

(unit: 100 million (yen))

Lender(bank)	2000	2001	2002	2003	2004	Amount of Debt Waived (Debt Waver Ratio)
UFJ	672 (17.5)	2676 (36.1)	3504 (40.6)	3540 (43.2)	4206 (43.6)	2043 (48.6)
Mitsui Sumitomo	394 (10.3)	1338 (18.1)	1768 (20.5)	1573 (19.2)	1906 (19.7)	853 (44.7)
Mizuho	506 (13.2)	1338 (18.1)	1857 (21.5)	1768 (21.6)	2101 (21.7)	836 (39.8)
Tokyo Mitsubishi	146 (3.8)	N/A	N/A	100 (1.2)	100 (1.0)	57 (57)
Development Bank	315 (8.3)	250 (3.4)	178 (2.1)	160 (1.9)	99 (1.0)	14 (14.1)
Norinchukin	282 (7.4)	253 (3.4)	253 (2.9)	353 (4.3)	474 (4.9)	227 (47.8)
Others	1506 (39.4)	N/A	N/A	684 (8.4)	764 (7.9)	20(0)
Total	3821 (100)	7404 (100)	8627 (100)	8178 (100)	9650 (100)	4050 (100)

Note: Numbers in parentheses for each year represent percentages against total loan balance. Debt waiver ratios are the percentages of requested debt waiver amount of January 2005 against the borrowing baiance for 2004.

Source: Annual Report. Daiei Co.

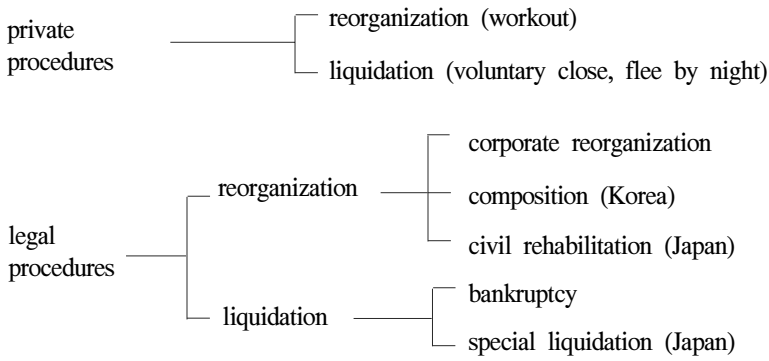
2. Legal Bankruptcy Procedures

In Korea, there used to be three bankruptcy procedures: composition, corporate reorganization, and liquidation. Both composition and court reorganization are for the reorganization or rehabilitation of bankrupt firms, and

the former was originally designed for small and medium sized firms and the latter was designed for large firms (both acts were unified in 2004). Before the crisis of 1997, there were negative feelings toward the legal bankruptcy procedures, e.g., outside political influence, ambiguous rules, delays in processing. Therefore, in 1998, the bankruptcy laws were amended in order to improve the speed and efficiency of bankruptcy adjustment in the court system. For example, an economic criterion that compares liquidation values and going concern values of bankrupt firms and decides upon the initiation of bankruptcy proceedings was introduced. And in order to enforce professional assistance and encourage the involvement of creditors in the procedures, a management committee, composed of accountants and law specialists, and a creditors' conference, an official entity for creditors, were introduced. And also to answer the criticism that legal procedures were time consuming, time limitations for proceedings were strictly set. In addition, in 1999, automatic stay proceedings with a duration of one month to avoid inefficient piecemeal liquidation were introduced.

In Japan, there are four bankruptcy procedures: Civil Rehabilitation, Corporate Reorganization, Liquidation, and Special Liquidation. Civil Rehabilitation and Corporate Reorganization are for the reorganization or rehabilitation of bankrupt firms, and the former was originally designed for small and medium sized firms and the latter was designed for large firms. The Civil Rehabilitation Act was introduced in 2000 and replaced the former Composition Act. In Civil Rehabilitation, the DIP (debtor in possession like Chapter 11 in the United States.) was formally introduced and the initiation of proceedings and approval conditions for a reorganization plan were relaxed. At the same time, an examiner who is to supervise bankrupt firms or a DIP under a reorganization plan were introduced in order to answer the criticism that the court does not strictly oversee bankrupt firms or managers, and there was repetition of bankrupt filings under the Composition Act. In 2002, the Corporate Reorganization Act was amended in a similar way to the Civil Rehabilitation Act. It includes the relaxation of approval conditions and shorting the time limits in proceedings, although it does not admit a DIP.

Figure 1. Debt Restructuring Scheme in Korea and Japan



Ⅳ. Estimation Model

In this section, an estimation model for the selection of bankruptcy procedures is proposed. As we saw in section 2, there are several impediments to optimal bankruptcy resolutions. Therefore, there is the possibility for over/under liquidation and over/under legally bankruptcy to occur.

In this paper, we introduce a measure of efficiency regarding the selection of bankruptcy procedures. But before we explain the measure of efficiency, we will assume that the corporate value of a firm (firm *i*) when going through legal reorganization, legal liquidation, or private reorganization is expressed as V_i^C, V_i^L or V_i^B, respectively, and also these values are determined by the following linear functions.[4)]

$$V_i^C = X_i \beta^C + u_i^C$$
$$V_i^L = X_i \beta^L + u_i^L$$
$$V_i^B = X_i \beta^B + u_i^B$$

Note that X_i is a variable (vector) expressing the financial characteristics of the firm which will be explained below, β^j $(j = C, L, B)$ is a parameter (vector) common to firms, and u_i^j $(j = C, L, B)$ is a random disturbance.[5)]

4) If a corporate value is defined as the sum of current assets and fixed assets, which is the sum of cash flow in present value, the linear corporate value model described in this paper would be an acceptable theoretical process.

5) Let's assume that the corporate value is composed of fixed assets that generate cash flow or operating income, plus current assets that do not generate cash flow. Cash flow is generated only when the firm continues its business, and it is difficult to sell or convert the fixed assets to other firms. From this assumption, we can infer that in the case of legal or private reorganization, the corporate value depends largely on operating income, while in the case of liquidation, it depends largely on current assets. The corporate value after debt restructuring is also considered to be influenced by external disturbance terms such as market demand.

In a qualitative response model, it is usually assumed that the one with the maximum utility (in this case, the corporate value) is selected among the possible multiple choices. In this paper, however, it is assumed that an efficient debt restructuring procedure is not necessarily selected and that the actual procedure is based on the following criteria.

Restructuring through legal procedures: $V_i^C >< \alpha V_i^L$ (1)

Restructuring through private procedures:

$$V_i^M >< \beta V_i^B \text{ but } \begin{cases} V_i^M = V_i^C & when\ V_i^C > \alpha V_i^L \\ V_i^L & when\ V_i^C < \alpha V_i^L \end{cases} \quad (2)$$

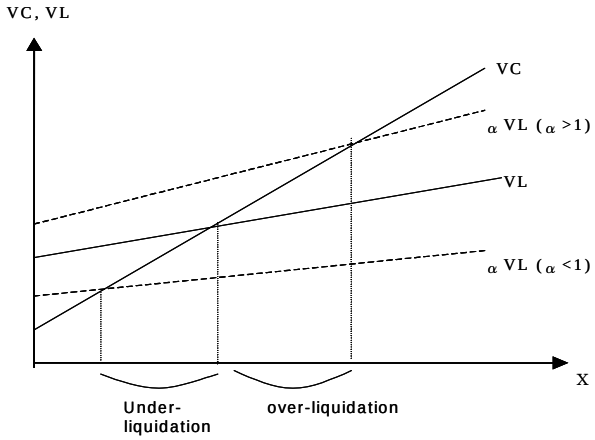
In other words, the interests among creditors concerning debt restructuring are not fully coordinated, and distortions, represented by α and β (when both α and β are not 1), are created.[6)]

This means that, for example, in the case of legal procedures, not necessarily the greater of V_i^C or V_i^L is chosen. Rather, if α is greater than 1, even if V_i^C is greater than V_i^L, liquidation may be chosen (over-liquidation), whereas if α is smaller than 1, there is a risk of under-liquidation or over-reorganization (see Figure 2).

Likewise, in the case of private procedures, the greater corporate value, be it under the legal procedures (defined as V_i^M) or under the private procedures (V_i^B), is not necessarily chosen. Rather, if β is greater than 1, over-reorganization happens in the sense that a firm that should otherwise go bankrupt survives, and if β is smaller than 1, over-bankruptcy happens.

6) We can also say that inefficiency is represented by a constant term, such as $V_i^C >< \alpha + V_i^L$. However, in general, the bigger a company is, the more creditors it has. Therefore, it would be appropriate to say that inefficiency in the selection of a debt restructuring method is proportional to its corporate value.

Figure 2. Under-Liquidation and Over-Liquidation



The probability that a certain debt restructuring procedure will be chosen can be formulated as a likelihood function by using actual corporate values for legal organization (V_i^C), legal liquidation (V_i^L), and private procedures/ reorganization (V_i^B).

In the following paragraphs, a likelihood function is formulated separately for three different scenarios: 1) when the choice of debt restructuring procedures is limited to legal procedures (i.e., legal organization or liquidation) ((VC, VL) Model), 2) when the choice is made among legal liquidation, legal reorganization, or private reorganization ((VC, VL, VB) model), and 3) when the choice is made among legal liquidation, legal reorganization, or private reorganization, but the choice among legal procedures (legal reorganization or liquidation) is nested ((VM, VB) model).

1. (VC, VL) Model

If the choice is limited to legal procedures (i.e., legal reorganization or legal

liquidation), and it is made in accordance with formula (1), the probability that legal reorganization is selected and the corporate value becomes V_i^C is expressed as follows:

$$\Pr(u_i^C = V_i^C - X_i\beta^C,\ u_i^L < (V_i^C - \alpha X_i\beta^L)/\alpha)$$
$$= \int_{-\infty}^{(V_i^C - \alpha X_i\beta^L)/\alpha} f(V_i^C - X_i\beta^C, u_i^L)du_i^L \qquad (3)$$

(where f is a joint density function for u_i^C and u_i^L)

The probability that legal liquidation is selected and the corporate value becomes V_i^L is expressed as follows:

$$\Pr(u_i^C < \alpha V_i^L - X_i\beta^C,\ u_i^L = V_i^L - X_i\beta^L)$$
$$= \int_{-\infty}^{\alpha V_i^L - X_i\beta^C} f(u_i^C, V_i^L - X_i\beta^L)du_i^C \qquad (4)$$

When the probabilities of the former and the latter are expressed as $F_C(X_i)$ and $F_L(X_i)$, respectively, and the number of samples is expressed as *N*, the likelihood that a certain debt restructuring procedure is selected (L) can be expressed as follows:

$$L = \prod_1^N F_C(X_i)^{y_i} F_L(X_i)^{1-y_i}$$
$$y_i = 1\,(if\ \ procedure\ is\ legal\ \ \ reorganization),\ y_i = 0\,(if\ \ procedure\ is\ legal\ \ \ liquidation) \qquad (5)$$

2. (VC, VL, VB) Model

If the debt restructuring method is selected from the three options including private procedures in accordance with formulas (1) and (2), the probability that legal reorganization is selected and the corporate value becomes V_i^C is expressed as follows:

$$\Pr(u_i^C = V_i^C - X_i\beta^C,\ u_i^L < (V_i^C - \alpha X_i\beta^L)/\alpha, u_i^B < (V_i^C - \beta X_i\beta^B)/\beta)$$
$$= \int_{-\infty}^{(V_i^C - \alpha X_i\beta^L)/\alpha} \int_{-\infty}^{(V_i^C - \beta X_i\beta^B)/\beta} f(V_i^C - X_i\beta^C, u_i^L, u_i^B) du_i^B du_i^L \quad (6)$$

Likewise, the probability that legal liquidation is selected and the corporate value becomes V_i^L is expressed as follows:

$$\Pr(u_i^C < \alpha V_i^L - X_i\beta^C,\ u_i^L = V_i^L - X_i\beta^C, u_i^B < (\alpha V_i^L - X_i\beta^B)/\beta)$$
$$= \int_{-\infty}^{\alpha V_i^L - X_i\beta^C} \int_{-\infty}^{(\alpha V_i^L - X_i\beta^B)/\beta} f(u_i^C, V_i^L - X_i\beta^C, u_i^B) du_i^B du_i^C \quad (7)$$

In the meantime, the probability that a private procedure is selected and the corporate value becomes V_i^B is expressed as follows:

$$\Pr(u_i^C < \beta V_i^B - X_i\beta^C,\ u_i^L < (\beta V_i^B - \alpha X_i\beta^L)/\alpha, u_i^B = V_i^B - X_i\beta^B)$$
$$= \int_{-\infty}^{\beta V_i^B - X_i\beta^C} \int_{-\infty}^{(\beta V_i^B - \alpha X_i\beta^L)/\alpha} f(u_i^C, u_i^L, V_i^B - X_i\beta^B) du_i^L du_i^C \quad (8)$$

In this case, the likelihood that a certain procedure is selected can be expressed as follows:[7)]

7) Although private procedures are chosen over legal procedures here, it is assumed that the realization of corporate value itself happens at the same time. If VL and VC are realized after VB is realized, we need to modify the probability of certain debt restructuring choices to compare the expected corporate value after bankruptcy and VB.

$$L = \prod_{1}^{N} F_C(X_i)^{y_i} F_L(X_i)^{Z_i} F_B(X_i)^{w_i}$$
$$y_i = 1\,(if\ \ procedure\ \ is\ legal\ \ reorganization),\ y_i = 0\,(if\ \ otherwise)$$
$$z_i = 1\,(if\ \ procedure\ \ is\ legal\ \ liquidation),\ z_i = 0\,(if\ \ otherwise) \qquad (9)$$
$$w_i = 1\,(if\ \ procedure\ \ is\ private\ \ reorganization),\ w_i = 0\,(if\ \ otherwise)$$

3. (VM, VB) Model

The corporate value realized when legal procedures are taken, regardless of whether it is a legal reorganization or liquidation, is expressed as follows:

$$V_i^M = X_i\beta^M + u_i^M \qquad (10)$$

If the choice between legal procedures or private procedures is made through β, the probability that legal procedures are selected and the corporate value becomes V_i^M is expressed as follows:

$$\Pr(u_i^M = V_i^M - X_i\beta^M,\ u_i^B < (V_i^M - \beta X_i\beta^B)/\beta)$$
$$= \int_{-\infty}^{(V_i^M - \beta X_i\beta^B)/\beta} f(V_i^M - X_i\beta^M, u_i^B)du_i^B \qquad (11)$$

The probability that the private procedures are selected and the corporate value becomes V_i^B is expressed as follows:

$$\Pr(u_i^M < \beta V_i^B - X_i\beta^M,\ u_i^B = V_i^B - X_i\beta^B)$$
$$= \int_{-\infty}^{\beta V_i^B - X_i\beta^M} f(u_i^M, V_i^B - X_i\beta^B)du_i^M \qquad (12)$$

If the probability of the former is expressed as $F_M(X_i)$, and that of the latter is expressed as $F_B(X_i)$, the likelihood that a certain procedure is selected (L) can be expressed as follows:

$$L = \prod_{1}^{N} F_M(X_i)^{z_i} F_B(X_i)^{1-z_i}$$
$$z_i = 1\,(if\ \ procedure\ is\ legal), y_i = 0\,(if\ \ procedure\ is\ \ private) \qquad (13)$$

In each model, we can estimate the degree of the efficiency of bankruptcy procedures (α and β) by using the maximum likelihood function method. Here, estimated parameters are α and β as well as $\beta^j\ (j = C, L, B)$. On the other hand, the explanation variable is X_i, financial characteristics of the distressed firms, such as operating incomes, sales, and cash and deposits. Besides, the firm's value when actually legally reorganized, when actually legally liquidated, and when actually privately reorganized, i.e., V_i^C, V_i^L, V_i^B, respectively, are also used for the estimation of α and β. (as for the concrete procedure for calculating these firms' value, see the Appendix).

Ⅴ. Sample Data and Results of Estimation

1. Sample Data

Before showing the estimation results for α and β in both countries, we will explain the sample data used here.

Table 3 and Table 4 are lists of firms under private procedures and legal procedures respectively, both in Korea and Japan after the late 1990s. Details of private procedures and legal procedures are rarely disclosed in either country, and in many cases, only general information about whether an agreement for a workout was made or which bankruptcy law was applied is reported by newspapers or magazines. In this study, I collected these data from Nihonkeizai Shinbun and Teikoku Data Bank for the Japanese cases, and from the Chosun Ilbo and Korea Company Annual (in Japanese) for the Korean cases.

In order to estimate α and β, variable *X*, the financial characteristics of distressed firms, should be specified. In this paper, I will define some financial variables, i.e., total liabilities, cash and deposits (liquid assets), sales, and operating income, as *X*. These data are also collected from same data sources given above (Teikoku Data Bank, Korea Company Annual). In addition, a firm's value under some bankruptcy procedures will be used for the estimatio n.[8] As for the concrete procedures for calculating a distressed firm's value, see the Appendix.

Table 5 shows the simple cross-sectional results of the relationship between the estimated corporate values and financial characteristics of the companies, including operating income, sales, cash, and deposits. In general, when a reorganization-type procedure is to be implemented, we can expect that corporate value would depend more on cash flow, which reflects operating

8) Typical estimations using a qualitative response model can identify only the differences between coefficients for corporate properties. In this paper, however, in addition to α and β, realized corporate values are also used as sample data, and therefore we can identify or estimate individual parameters.

income, sales, and other factors, since the business is continuing and firm-specific activities will be important for the firm's value. On the other hand, in the case of a liquidation-type procedure, corporate value can be expected to depend more on liquid assets. In fact, the results of Table 5 show the expected signs. These estimated coefficients are used as initial values for the maximum likelihood method in section 4.

Table 3a. List of Workout Companies: Japan

Year	Company Name	Amount of Debt Waived (100 million yen)	Borrowing from Government-Affiliated Agencies
1999	Urban Life	230	
1999	Towa Fudosan	2900	
1999	Shokusan Jutaku Sogo	656	
1999	Pasco	360	
1999	Aoki Construction	2049	yes
1999	Sato Kyogyo	1109	
1999	Chuo Paperboard	114	
1999	HASEKO Corporation	3546	
1999	Kanematsu	1550	
2000	TOMEN	2000	yes
2000	Inoue Kyogyo	143	
2000	Hazama	1050	
2000	Kumagai Gumi	4300	
2000	Mitsui Construction	1420	
2001	Ichida	83	
2002	Daiei	1700	yes
2002	Iwataya	280	yes
2002	Misawa Homes	350	yes
2002	Toyo Shutter	125	yes
2002	Daikyo	4100	
2003	Hazama Corporation	1390	
2004	Naito	188	
2004	Kanebo	995	

Source: Teikoku Databank.

Table 3b. List of Workout Companies: Korea

Year	Company Name	Amount of Debt Waived (100 million yen)	Borrowing from Government-Affiliated Agencies
1998	Daewoo Corporation	n.a.	n.a.
1998	Daewoo Motor	n.a.	n.a.
1998	Daewoo Motor Sales	n.a.	n.a.
1998	Daewoo Capital	n.a.	n.a.
1998	Daewoo Electronics	n.a.	n.a.
1998	Daewoo International	n.a.	n.a.
1998	Daewoo Construction	n.a.	n.a.
1998	Tongkook Trading	n.a.	n.a.
1999	Shing dong bang	n.a.	n.a.
2000	Saehan Industries	n.a.	n.a.
2001	Sampyo Industry	n.a.	n.a.
2001	Nam Kwang Construction	n.a.	n.a.
2001	Ssang Yong Motor	n.a.	n.a.
2001	Hynix Semiconductor	n.a.	n.a.
2001	Namsun Light Metal	n.a.	n.a.
2001	Dinners Club	n.a.	n.a.
2001	Orion Electric	n.a.	n.a.

Source: Chosun Ilbo.

Table 4a. List of Legally Bankrupt Companies: Japan

Year	Company Name	Type of Business	Type of Bankruptcy	Borrowing from a Government-Affiliated Agency
1997	Kyotaru	Sushi	Reorganization (corporate reorganization)	yes
1997	Coco Yamaoka	Sales of precious metals	Liquidation	
1997	IGS	Software development	Liquidation	
1997	Suzuya	Women's clothes	Reorganization (composition)	
1997	Isuzu Kensetsu	Construction	Liquidation	
1997	Kyoundo Pharmaceutical	Wholesale drugs and medicine	Liquidation	
1997	Tokai Kogyo	Construction	Reorganization (corporate reorganization)	
1997	Tada Corporation	Construction	Reorganization (corporate reorganization)	yes
1997	Daito Kogyo	Construction	Reorganization (corporate reorganization)	
1997	Yaohan Japan	Supermarket	Reorganization (corporate reorganization)	
1997	Namirei	General piping	Reorganization (corporate reorganization)	
1997	Sanyo System	Vendor development of software	Liquidation	
1997	Toshoku	Food trading	Reorganization (corporate reorganization)	
1997	Nitto Life	Golf clubs	Reorganization (composition)	

Table 4a. Continued

Year	Company Name	Type of Business	Type of Bankruptcy	Borrowing from a Government-Affiliated Agency
1997	Hakodate Seiko Sengu	Manufacturing of fishnets	Liquidation	yes
1998	Toyoko Construction	Engineering construction	Liquidation	
1998	Daido Concrete	Manufacturing of concrete	Reorganization (corporate reorganization)	
1998	Nihon Tochi Kairyo	Land leases	Reorganization (corporate reorganization)	
1998	Asahi Corporation	Rubber footwear	Reorganization (corporate reorganization)	
1998	Mitsui Warf	Transportation/ warehouse	Reorganization (corporate reorganization)	yes
1998	Asakawagumi	Construction	Reorganization (corporate reorganization)	
1998	Okura Shoji	Trading company	Liquidation	
1998	Longchamp	Women's apparel	Reorganization (corporate reorganization)	
1998	Yahagi	Imaging and software	Liquidation	
1998	Urban Home	Sales of buildings	Liquidation	
1998	Nihon Lease Auto	Automobile leases	Reorganization (corporate reorganization)	
1998	Morisho	Sale houses	Liquidation	
1998	Tescon	Testers	Liquidation	
1998	Yoshihara Gumi	General civil engineering work	Reorganization (corporate reorganization)	
1998	Toa Kogyo	Engineering	Liquidation	

Table 4a. Continued

Year	Company Name	Type of Business	Type of Bankruptcy	Borrowing from a Government-Affiliated Agency
1998	JDC (Kokudo)	Construction	Reorganization (corporate reorganization)	
1999	Komuson	Pachinko	Liquidation	
1999	Asahi Toshi Kaihatsu	Sales and purchase of buildings	Liquidation	
1999	Nakayama Kogyo	Electrical steel	Reorganization (corporate reorganization)	yes
1999	Sasaki Glass	Manufacturing of dishware	Reorganization (corporate reorganization)	
1999	Nikko Electric Industry	Electric automobile components	Reorganization (corporate reorganization)	yes
1999	Aikoh	Chemical products	Liquidation	
1999	Kokoku Steel Wire	Manufacturing of ropes	Reorganization (corporate reorganization)	yes
1999	Murakado Construcution	General civil engineering	Reorganization (corporate reorganization)	
1999	Picoi	Housing improvement	Reorganization (composition)	
2000	Nagasakiya	Supermarket	Reorganization (corporate reorganization)	
2000	L Kakuei	Real estate	Reorganization (corporate reorganization)	
2000	Talahashi Building	Office leases	Reorganization (civil rehabilitation)	
2000	Toyo Rope Mfg.	Manufacturing of wire ropes	Reorganization (civil rehabilitation)	

Table 4a. Continued

Year	Company Name	Type of Business	Type of Bankruptcy	Borrowing from a Government-Affiliated Agency
2000	Dai-Ichi Hotel	Hotel	Reorganization (corporate reorganization)	
2000	ITO	Office equipment	Reorganization (civil rehabilitation)	
2000	Nihon Building Project	Office leases	Reorganization (civil rehabilitation)	
2000	Osada	Sales	Reorganization (civil rehabilitation)	
2000	Sogo	Department stores	Reorganization (civil rehabilitation)	yes
2000	Nagasakiya	Confections manufacturer	Liquidation	
2000	Kawasaki Electric	Manufacturing of distribution boards	Reorganization (civil rehabilitation)	
2000	Fujii	Kitting materials	Reorganization (civil rehabilitation)	
2000	Rocket	Sales of home appliances	Reorganization (civil rehabilitation)	
2000	Akai Electric	Audio equipment	Reorganization (civil rehabilitation)	
2000	Marutomi	Retail of shoes	Reorganization (civil rehabilitation)	yes
2001	Fujiseiko	Machinery and appliances	Liquidation	
2001	Ikegai	Machine tools	Reorganization (civil rehabilitation)	
2001	Fuji Car MFG	Bridges	Reorganization (civil rehabilitation)	
2001	Fujiko	Construction	Reorganization (civil rehabilitation)	

Table 4a. Continued

Year	Company Name	Type of Business	Type of Bankruptcy	Borrowing from a Government-Affiliated Agency
2001	Footwork International	Sales of local products	Reorganization (civil rehabilitation)	
2001	Better Life	Housing	Reorganization (civil rehabilitation)	
2001	Mycal	Supermarkets	Reorganization (civil rehabilitation)	
2001	Haruyama Chain	Retail of menswear	Reorganization (civil rehabilitation)	
2001	Ohkura Electric	Industrial equipment	Reorganization (civil rehabilitation)	
2001	Niigata Engineering	Integrated plant	Reorganization (corporate reorganization)	
2001	Ergotech	Air conditioning work	Reorganization (civil rehabilitation)	
2001	Nanaboshi	Electrical power work	Reorganization (civil rehabilitation)	
2001	Aoki Construction	Construction	Reorganization (civil rehabilitation)	yes
2001	Kotobukiya	Supermarkets	Reorganization (civil rehabilitation)	yes
2002	Sato Kogyo	Construction	Reorganization (corporate reorganization)	
2002	Dai Nihon Constrution	Construction	Reorganization (civil rehabilitation)	
2003	Matsuyadenki	Sales of home appliances	Reorganization (civil rehabilitation)	
2003	Morimotogumi	Construction	Reorganization (civil rehabilitation)	

Source: Teikoku Databank, Kigyo Keiretsu Soran (Toyo Keizai Inc.), etc.

Table 4b. List of Legally Bankrupt Companies: Korea

Year	Company Name	Type of Business	Type of Bankruptcy	Borrowing from a Government-Affiliated Agency
1997	Kia Motors	Automobile	Reorganization (corporate reorganization)	n.a.
1997	Ssangyong Motors	Automobile	Reorganization (corporate reorganization)	n.a.
1997	Haitai Confectionary	Food	Reorganization (composition)	n.a.
1998	Jinro	Soju	Reorganization (composition)	n.a.
1998	Kyungnam Wool	Textiles	Reorganization (corporate reorganization)	n.a.
1998	Dong Yang Gang Chul	Steel	Reorganization (corporate reorganization)	n.a.
1998	Kumkang	Construction	Reorganization (composition)	n.a.
1999	Hanil Pharm	Pharmacy	Reorganization (composition)	n.a.
2000	Segye Corporation	Apparel	Reorganization (corporate reorganization)	n.a.
2000	Anam	Electronics	Reorganization (corporate reorganization)	n.a.
2000	Sewoo Polymer	Chemical	Reorganization (composition)	n.a.
2000	Haitai Stores	Retail	Reorganization (corporate reorganization)	n.a.
2000	Peeres	Cosmetics	Liquidation	n.a.
2001	Huneed	Mobile phone	Reorganization (corporate reorganization)	n.a.

Source: Chosun Ilbo, *Korean Company Annual.*

Table 5. Estimated Corporate Value and Financial Indicators (Pooled OLS Estimation)

	VL		VC		VB	
Const.	23.07 (1.73)	25.21 (1.75)	78.9 (0.54)	112.6 (0.88)	196.6 (0.12)	487.3 (0.70)
Operating Income	0.57 (0.09)		-6.41 (-0.67)		17.53* (1.99)	
Sales		-0.01 (-0.55)		-0.01 (-0.03)		0.23** (8.99)
Cash and Deposits	2.77** (3.91)	2.74** (3.35)	4.51 (1.38)	3.54 (0.96)	1.17 (0.36)	1.76 (1.07)
Adj R2	0.81	0.84	0.11	0.11	0.54	0.90
JB	3.8	4.6	12.5	12.8	0.78	0.69

Notes: 1. Samples are pooled. Numbers for operating income and sales are taken from the most recent financial reports.
2. **1 percent, *5 percent significance.
3. ( ) white t- value

Source: JB, Jargque-Bera Residual Normality Test Statistics.

2. Results of Estimation

Table 6 summarizes the results of α and β for both Korea and Japan. In the table, ρ represents the correlation coefficients of the disturbance terms between legal liquidation and legal reorganization, which are given exogenously to reduce the number of parameters estimated (ρ = 0, 0.5, -0.5). And since the number of liquidated firms in Korea is small, both the (VC,VL) model and the (VC, VL, VM) model are not estimated (only the parameters of β are estimated).

First, we will look the results of the Japanese case. In all samples, the estimated results are α < 1, β < 1, and the null hypothesis of α = 1, β = 1 is rejected.[9)]

This means that there are overall tendencies toward under-liquidation and over-bankruptcy (legally bankrupt) in Japan.[10] However, results may be somewhat different for subsamples or samples after 2000 (after the introduction of the Civil Rehabilitation Act). After the introduction of the Civil Rehabilitation Act, both α and β became relatively large and this may refect an increase in efficiency. But as for the value of β, although the null hypothesis of $\beta = 1$ is not rejected, in some models $\beta > 1$ is observed. This may suggest that the choice between private or legal procedures sometimes becomes inefficient and that under-bankruptcy or excess-private reorganization occur. There is the possibility that private workout programs are too little and too small for a final resolution, and there is the view that banks' unwillingness to agree to debt waivers make it difficult to implement radical debt restructuring for firms with excessive loans.

Next we will look the results for the Korean case. In contrast to the Japanese case, the estimated β are relatively large for all samples and relatively small for subsamples after 2000, although the null hypothesis of $\beta = 1$ is not rejected in either sample. This result can be interpreted as follows. Before the introduction of the Corporate Restructuring Promotion Act, the workout programs were relatively weak or soft and were apt to lead to excess-reorganization of distressed firms that should have gone legally bankrupt, but after that, efficiency increased along with several legal procedural reforms such as the introduction of economic criteria, time limits, and a specialized committee in court.

9) As for the causal relationship between α and β, we can usually think of the impact of legal procedures (α) on private procedures (β). However, the relationship here may be the impact of the possibility of over-bankruptcy ($\beta < 1$) on over-reorganization under legal procedures ($\alpha < 1$).

10) We need to note that even when α and β are significantly different from 1, this does not necessarily mean that all companies utilize an inefficient debt restructuring method.

Table 6. Estimation of α and β Amounts (in parentheses are t-values against null hypothesis = 1)

	α						β					
	(VC, V L) Model			(VC, VL, VB) Model			(VM, VB) Model			(VC, VL, VB) Model		
	ρ=0	ρ=0.5	ρ=-0.5	ρ=0	ρ=0.5	ρ=-0.5	ρ=0	ρ=0.5	ρ=-0.5	ρ=0	ρ=0.5	ρ=-0.5
Japan (all samples)	0.03** (-2.72)	0.03** (-3.91)	0.04* (-1.72)	0.04** (-18.0)	0.04** (-19.3)	1.56 (1.66)	0.01** (-66.2)	1.23 (0.28)	0.02** (-11.4)	0.05** (-9.7)	0.05** (-9.5)	0.02** (-63.8)
Korea (all samples)							2.62 (0.68)	0.31 (-2.3)	0.11* (-4.1)	4.27 (0.78)	2.28 (0.63)	2.26 (0.54)
Japan (after 2000)	0.14 (-1.16)	0.13* (-2.15)	0.19 (-1.20)	2.14 (0.13)	0.18 (-1.1)	2.45 (0.18)	4.29 (0.38)	5.11 (0.41)	0.01** (-18.2)	6.65 (0.61)	6.18 (0.48)	6.08 (0.48)
Korea (after 2000)							0.01** (-17.2)	1.41 (0.32)	0.13* (-4.2)	0.53* (-3.6)	0.23* (-4.8)	0.21* (-5.2)

Notes: Normal distribution model maximum likelihood method BHHH).
For initial values, OLS estimation was used (except that initial values for α and β are 1). For ρ in (VC, VL, VB) models, only the correlations between VC and VL are shown (assumption: VB is independent).
** 1 percent significance, * 5 percent significance.

Ⅵ. Conclusion

Although the apparent factors that give rise to the increase in distressed firms are different, there are similarities in the debt restructuring procedures between Korea and Japan. For example, in both countries, formal legal bankruptcy procedures were relatively weak, and instead informal bankruptcy procedures such as workouts played an important role in corporate debt restructuring; there have also been several bankruptcy law reforms recently. On the other hand, there seems to be a difference between two countries regarding the initiative of the government and the compulsoriness of a workout scheme.

So, in this paper, I examined the efficiency of corporate debt restructuring in both countries, focusing on the selection efficiency of debt restructuring, i.e., the decision between liquidation or reorganization, and the decision between legal procedures or private procedures (workout).

The conclusions of this paper are as follows.

For the Japanese case, overall tendencies toward under-liquidation ($\alpha < 1$) and excess legal bankruptcy ($\beta < 1$) are observed. However, for subsamples or samples after 2000, when the Civil Rehabilitation Act was introduced, under-liquidation disappeared and the efficiency of legal bankruptcy procedures seems to increase. But on the other hand, under-legal bankruptcy or excess-reorganization in workout programs seems to occur. This may reflect the weakness of the Japanese workout scheme or weak intervention from the government.

In contrast to the Japanese case, excess-legal bankruptcy ($\beta < 1$) was not observed in Korea (note: dure to the limited number of samples of Korean firms, the efficiency for liquidation is not examined here). Instead, there seems to be a tendency toward under-legal bankruptcy or excess-reorganization in workout programs before 2000. This result may be interpreted to mean that before the introduction of the Corporate Restructuring Promotion Act, workout programs were relatively weak and included firms that should have gone legally bankrupt.

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Appendix

In the model in section 4, unlike the typical qualitative response model, the data also includes the value of firms achieved when a certain debt restructuring procedure is taken. The precise calculation procedures are as follows.

1) Estimation of Corporate Value in Legal Liquidation:

When bankruptcy or special liquidation was selected, the total amount of repayment (dividends) to the creditors was used as corporate value.

2) Estimation of Corporate Value in Legal Reorganization:

When Corporate Reorganization, Composition, or Civil Reorganization was selected, the total scheduled repayment amount of debt was used for the corporate value.

3) Estimation of Corporate Value in Private Reorganization: (only for Japanese samples)

In the case of private reorganization, the total liabilities after the debt waiver were regarded as the striking price and the total stock value (market value) of a firm was regarded as the call option value; then the corporate value was calculated backward by using the Black and Scholes European type option price formula. In this case, I assume the interest rate for safe assets to be 0, and maturing in one year, and used the Nikkei Average Implied Volatility as the underlying asset volatility. Supplemental Table 1 compares corporate values under private procedures in the case where the value is calculated by using the option theory and in the case where the value is simply calculated by deeming the face value of liabilities after debt waiver as the value of the claims, and adding that value to the total stock market value.

Supplement Table 1. Comparison of the Face Value of Liabilities and the Market Values of Liabilities (only for the Japanese case)

Company	When the Face Value of Liabilities is Regarded as the Value of Liabilities	Option Approach
A	2519	2507
B	522	521
C	1281	1280
D	1530	1433
E	236	235
F	4791	4776
G	9332	8343
H	173	171
I	2880	2863
J	5035	4460
K	2425	2323
L	173	156

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