

* Comments Welcome

Union and Profitability of Korean Firms before the Crisis

October 2005

Jaymin Lee*

Yale University

and

Yonsei University

Seoul 120-749

Tel: 2-6232, +82-2-2123-2478

Fax: 2-3430, +82-2-365-2478

E-mail: lj89@pantheon.yale.edu, leejm@yonsei.ac.kr

* I am grateful to Professors Kang-Shik Choi, Jong Haak Hong, Jinook Jung, and Dr Duksoon Hwang for helpful comments. Remaining errors are mine.

Abstract

This paper examines whether unions have favorable, neutral, or unfavorable effect on profitability of firms depending on their financial situation, using Korean data before the crisis. In the case of ordinary (non-chaebol) firms, unions raise profitability significantly when the firms are close to insolvency, while lowering profitability when they are relatively far away from insolvency. Unions are neutral to profitability in the intermediate range. In the case of chaebol firms, unions fail to raise profitability even when the firms are close to insolvency. Unions also lower profitability of chaebol firms significantly when they are not so far away from insolvency. The finding suggests that unionization of poorly governed firms may lead to financial crisis.

Key Words: Union, Profitability, Insolvency, Governance, Crisis

JEL Classification: G34, J51, L10

I. Introduction

There is little doubt that unions lower profitability of firms (Metcalf 2003; Aidt and Tzannatos 2002: 67-68, Freeman and Medoff 1984, Hirsh 1989). However, it is questionable whether unions lower profitability even when firms are close to insolvency. Unions care about the job security of existing members as well as their wages, as long as they earn a premium over their next best alternative employment. When firms are close to insolvency and the job security of their existing members is threatened, unions may have the incentive to grant concessions, thereby helping raise profitability.

There is no lack of examples of union concessions when firms are close to insolvency (Freeman and Medoff 1984: 189; Kaufman and Martinez-Vazquez 1988). Of course, an opposite story is also possible. If unions feel that a firm is likely to fail, they may pursue an endgame bargaining to gain quasi-rents for workers while increasing the pressure on the firm to shut down (Lawrence and Lawrence 1985). Or, in case collective bargaining occurs at the industry level, unions might be willing to push unprofitable firms out of business to maintain a 'standard' of pay within an industry, as in countries like Sweden (Freeman and Kleiner 1999: 512). Whether unions really make concessions when firms are close to insolvency is thus an empirical question that should be resolved through an analysis taking differences in institutional setting into account.

The possibility that unions may raise profitability, however, may not necessarily be inconsistent with the fact that unions lower profitability. Unions may well lower profitability if firms are regarded as far away from insolvency. There could also be some intermediate range where unions may be neutral to profitability because firms are perceived as neither close nor far away from insolvency. The impact of unions on profitability may thus be favorable, neutral or unfavorable, depending on the distance of the firm from insolvency.

However, the relationship may be even more complex. Even with the same distance from insolvency, the union's perception of firm's "ability to pay" may vary. There are at least two reasons for this:

First, firms vary in their managerial transparency. If management of firms is transparent enough, unions will have a clear idea about the ability to pay. Unions may help raise profitability when firms are regarded as close to insolvency, while they will lower profitability when firms are regarded as far away from insolvency. This will not be the case, however, if management lacks transparency. Management may lack transparency because managers conceal profits, for example, by refusing to open books to unions. When they are obliged to do so, managers may use circumventions.

Second, the market discipline imposed by financial institutions may vary. Most

firms have debt, and debt is by definition supposed to be a hard budget constraint to firms (Hart 1995: 685-686; Jensen 1986: 324; Shleifer and Vishny 1997: 761-764). Insolvency of firms is thus usually manifested as the inability to meet debt obligation. However, the monitoring role of financial institutions to make sure that firms repay debt may not necessarily be perfect. If financial institutions are 'soft' on firms, managers will not feel that they are close to insolvency even though they would actually be so under a tighter monitoring by financial institutions (Hart 1995: 685). Under such situation, unions may also well think that firms still have the ability to pay, and not help raise profitability. If, on the contrary, financial institutions quickly discipline firms that come close to insolvency, unions may help raise their profitability.

This has a further implication. The possibility that, even with the same distance from insolvency, the union's perception of the firm's ability to pay may vary with the state of managerial transparency and the strength of market discipline imposed by financial institutions may have an important implication for the soundness of financial institutions. If transparently managed firms under tight financial discipline are unionized, unions may help them raise profitability when they are close to insolvency. If, on the other hand, firms lacking managerial transparency and financial discipline are unionized, unions may not help them raise profitability even when they are close to insolvency. This will undermine the soundness of financial institutions by generating non-performing loans. If the soundness of a sufficient number of financial institutions is undermined, a full-fledged economic crisis may set in.

This is exactly what happened in East Asian countries such as South Korea (henceforth Korea) before the crisis at the end of 1997. The Korean economic crisis in 1997, and indeed the East Asian crisis in that year in general, was precipitated by the fact that so many firms were close to insolvency, which in turn produced a large amount of non-performing loans for financial institutions (Krugman 1998; Krueger and Yoo 2001; Mishkin and Hahn 1999).

Few studies have so far addressed these questions. There are studies showing that unions indeed do not push firms or plants over the brink of insolvency or closure (for example, Freeman and Kleiner 1999; Machin 1995). But no study has shown that unions can have a positive impact on profitability when firms are close to insolvency. And naturally, no study has comprehensively dealt with the possibility that unions may have favorable, neutral, or unfavorable effect on profitability depending on the distance of the firms from insolvency, not to mention further complications stemming from the difference in managerial transparency and financial discipline imposed. Of course, no study has been done on their implications for the possibility of the outbreak of economic crisis.

This paper will try to fill this shortage of studies, using firm level data of an

emerging market economy: that of South Korea (henceforth Korea) before the crisis in 1997. Section II presents data and the scheme of analysis, and Section III elaborates upon the actual specifications of empirical analysis. Section IV presents the results of empirical analysis. Section V is discussion and concluding remarks, including elaboration upon the implications of the analysis for the explanation of the Korean crisis in 1997, and the examination of its further implications in a global context.

II. Data and Scheme of Analysis

Our sample consists of the firms listed in Korea's stock exchange from 1993 to 1997 whose accounts are settled in December. We exclude financial institutions and state enterprises. Data for variables other than the union variable come from the package provided by Korea Listed Company Association. The data are restricted to the firms receiving 'clean' opinion from outside auditors. Since listed companies receiving clean opinion from outside auditors probably have more accurate accounting practices, the sample data are relatively more reliable ones among the financial statement data for Korean firms. Meanwhile, union data come from the Ministry of Labor's firm level statistics. Since this data source does not cover listed companies completely, they have been complemented by data obtained by direct contact through telephone and fax. Data thereby obtained do not give information about union density, but only about whether a firm is unionized or not. Checking the concordance between the two data sources leaves 538 firms as sample.

The analytical scheme of the paper is simple. Regression analysis is carried out with profitability as dependent variable on the one hand and, on the other hand, unionization as independent variable alongside other explanatory variables of profitability. It will start with the sample of all 538 firms, and then proceed to analyses of sub-samples of firms classified by categories of distance from insolvency and by categories of degree of managerial transparency and discipline imposed by financial institutions.

The state of insolvency is represented by the inability to meet debt obligation. A firm will decide to close itself down when profitability is too low even when it has no debt, but firms that go insolvent must do so because they are unable to meet debt obligation.¹

¹ All of our sample firms have debt, with the minimum debt ratio (debt/total assets) being 0.156, 0.177, 0.209, 0.199 and 0.071 from 1993 to 1997 respectively.

To represent the distance from the state of insolvency, we use interest coverage ratio (henceforth ICR), which is the proportion of operating income to interest payment. *Ceteris paribus*, more highly indebted firms will have more interest to pay, so they face a higher probability of insolvency. But they can remain solvent if they generate more operating income to cover the interest payment on their debt, though eventually the principal as well as interest on debt should be paid out of operating income. ICR apparently captures well the idea in corporate finance theory that only more profitable firms can afford to have higher debt ratio to avoid financial distress (Ross et al. 1999: Chapter 16).²

We classify 538 sample firms into three groups depending on the values of ICR. The first group consists of firms with ICR smaller than one on average during the preceding three years, that is, three years preceding the year that is being analyzed as sample. The second group is firms with ICR between one and two, and the third group with ICR larger than two, each on average in the preceding three years respectively.³

The intuitive logic of classification for the first group is obvious: if a firm has been unable to pay interest it owes using all its operating income during the preceding three years, it apparently faces a high probability of being unable to repay debt. After the breakout of the crisis, the Korean government and banks have actually regarded ICR less than one as a first-hand criterion to select firms to be liquidated. Adding the other two groups is not for compelling theoretical reason but more or less for practical purpose. The Bank of Korea's reports on financial statement analysis also classify firms into those three categories. It could be said that among Korean firms, the first group is close to insolvency, the third group relatively far away from insolvency, and the second group in-between. The number of firms in our sample is reasonably evenly distributed among the three categories. On average 33.4% of our sample firms had ICR smaller than one, 40.0% of them had ICR between one and two, and 26.6% of

² Bongini et al. (2000) show that ICR is indeed negatively correlated with the probability of corporate bankruptcy after the crisis in Korea. We do not classify firms by the criterion of whether firms have formally defaulted on debt or not. When firms have formally defaulted on debt, the relationship between unionization and profitability becomes more complicated because creditors will intervene in the management. However, in our sample there are only nine firms that have formally defaulted on their debt, and estimation results are not affected by including or excluding those nine firms.

³ There is no firm in our sample with average ICR during the preceding three years exactly equal to one or two, so we do not set such criterion as "equal to or smaller than one," etc.

them had ICR larger than two over the 1993-1997 period.⁴ Classifying the sample firms into those three categories thus serves well the purpose of analyzing the effects of unions on profitability as favorable, neutral, or unfavorable depending on the distance from the state of insolvency.

As a measure of the degree of managerial transparency and financial discipline, we choose the status of chaebol (Korean business conglomerate) versus ordinary (non-chaebol) firms. Classifying the firms into chaebol and ordinary firms apparently serves our purpose well. While all Korean firms have tended to lack managerial transparency and financial discipline, chaebol firms before the crisis of 1997 were a pronounced case of firms lacking managerial transparency and financial discipline.

Before the crisis, chaebol firms were characterized by a complicated system of interlocking ownership among member firms, and were under exclusive control by chaebol heads. Chaebol heads, either by the benefit of being founders or being inheritors of the conglomerates, were exercising exclusive control with only minority share ownership.⁵ The system was used for equally complicated transfer pricing for the purpose of subsidizing new or weak member firms, evading taxes, for 'tunneling' shareholders' money for the private benefit of chaebol heads, and so on. Since the system was one of heavy cross-subsidy, the financial situation of individual member firms revealed by their financial statements did not accurately represent their ability to pay. And since chaebol heads, who were enormously wealthy, were in control, unions tended to think that the ability to pay came from the depths of chaebol heads' own pockets as well as the financial situation of the firms they worked for.

Financial discipline was also weak for chaebol firms before the crisis. Chaebol firms were inter-locked together through mutual guarantee of loan payback, which made the bankruptcy of individual member firms virtually impossible. Bankruptcy of a chaebol as a whole was regarded as a rarity because it was expected that the government, which was controlling banks, would not let chaebol go bankrupt for fear of a possible credit crunch and ensuing increase of unemployment. In other words, chaebol were regarded as "too big to fail." Non-banking financial institutions were owned

⁴ More detailed statistics will be given in Table 1 below. It should be remembered that classification is done in terms of relative magnitude of ICR within Korea. ICR of Korean firms on average before the crisis was very low by international standards, as will be verified in Figure 1 in Section IV.

⁵ The average ownership share of chaebol heads and their family in the thirty largest chaebol was 8.5% in April 1997. However, chaebol heads could exercise exclusive control over all aspects of management in all affiliated firms, mainly utilizing complicated interlocking ownership among member firms.

and controlled by the chaebol themselves.

During the 'developmental state' era of the 1960s and 1970s, this kind of problem with the Korean chaebol was more or less offset by a tight discipline imposed by the government through direct regulations. However, from the 1980s on the chaebol were gradually freed from government discipline, and managerial transparency and financial discipline deteriorated until the outbreak of the crisis in 1997. Chaebol are thus believed to be responsible for the crisis (Krugman 1998; Krueger and Yoo 2001), and many reform measures have been imposed on chaebol since the crisis broke out.⁶

To define the status of chaebol firms, we use data provided by the Korea Fair Trade Commission. Korea Fair Trade Commission designated thirty largest chaebol every year until 2001. If a firm is affiliated with the thirty largest chaebol in any year from 1993 to 1997, it is classified as a chaebol firm. Among 538 sample firms, 442 are ordinary (non-chaebol) firms and 96 are chaebol firms.

We use the data for five years from 1993 to 1997, the period just before the crisis. It was the period when the problem of lack of managerial transparency and financial discipline for chaebol reached its peak. Those years were also a period when union power was pronounced. After the liberalization in 1987 from the oppression of the previous era, the Korean labor movement obtained a somewhat better environment with the emergence of the civilian government in 1993. Then, after the crisis in 1997, union power was more or less weakened.⁷

We construct panel data of 538 firms for five years from 1993 to 1997, with a total number of 2,690 observations. The analysis starts with the estimation using this sample, as in the existing studies.

We then construct three panel data with the sub-samples of three groups of firms classified by the magnitude of ICR: firms with ICR smaller than one, firms with ICR between one and two, and firms with ICR larger than two on average in the preceding three years. We also construct two panel data with sub-samples of ordinary firms and chaebol firms. All five panel data are for five years from 1993 to 1997. Five regression

⁶ One could guess that lack of transparency may be more pronounced with smaller ordinary firms which often lack even the ability to keep books with normal accounting method. But our sample is composed of listed corporations receiving clean opinion from outside auditors. Among them, chaebol firms may well lack managerial transparency relative to ordinary firms.

⁷ Since the crisis broke out in 1997, the year 1997 is not a pre-crisis period in a strict sense. However, as the crisis actually broke out at the end of 1997, the accounting data for 1997 are expected to reflect mostly the outcome of operations before the crisis.

analyses will be done with those five panel data.

The next step is constructing six panel data using six groups of firms classified by the combination of the three categories of the ICR values and two categories of chaebol and ordinary firm status: ordinary firms with ICR smaller than one, ordinary firms with ICR between one and two, ordinary firms with ICR larger than two, chaebol firms with ICR smaller than one, chaebol firms with ICR between one and two, and chaebol firms with ICR larger than two, each on average in the preceding three years. All six panel data are of course for five years from 1993 to 1997. Six regression analyses will be done with those six panel data.

Table 1 presents the summary of the numbers of observations in each of the regressions using those twelve panel data constructed from the sample and sub-samples of firms.

<Table 1 here>

The analysis will then proceed to the test of whether there is statistically significant difference among the coefficients for the unionization variables included in the estimations using six panel data constructed by six sub-samples of firms classified by the combination of the three categories of the ICR values and two categories of chaebol and ordinary firm status. For this purpose, we run a 'grand' regression specified as follows:

$$(1) \begin{bmatrix} P_{1,ORD} \\ P_{2,ORD} \\ P_{3,ORD} \\ P_{1,CHB} \\ P_{2,CHB} \\ P_{3,CHB} \end{bmatrix} = \begin{bmatrix} X_{1,ORD} & 0 & 0 & 0 & 0 & 0 \\ 0 & X_{2,ORD} & 0 & 0 & 0 & 0 \\ 0 & 0 & X_{3,ORD} & 0 & 0 & 0 \\ 0 & 0 & 0 & X_{1,CHB} & 0 & 0 \\ 0 & 0 & 0 & 0 & X_{2,CHB} & 0 \\ 0 & 0 & 0 & 0 & 0 & X_{3,CHB} \end{bmatrix} \begin{bmatrix} \beta_{1,ORD} \\ \beta_{2,ORD} \\ \beta_{3,ORD} \\ \beta_{1,CHB} \\ \beta_{2,CHB} \\ \beta_{3,CHB} \end{bmatrix} + \begin{bmatrix} \varepsilon \end{bmatrix}$$

Here P denotes vector of profitability and X denotes matrix of the determinants of profitability, while subscript 1, 2, or 3 denotes ICR categories and another subscript ORD or CHB denotes ordinary or chaebol firm status. $P_{1,ORD}$ and $X_{1,ORD}$ are thus the vector of profitability and the matrix of the determinants of profitability for ordinary firms with average ICR smaller than one in the preceding three years. As shown in Table 1, the number of observations for $P_{1,ORD}$ and $X_{1,ORD}$ is 733. $P_{2,ORD}$, $P_{3,ORD}$, $P_{1,CHB}$, $P_{2,CHB}$ and $P_{3,CHB}$ are the vectors of profitability and $X_{2,RD}$, $X_{3,RD}$, $X_{1,CHB}$, $X_{2,CHB}$ and $X_{3,CHB}$ are the matrices of the determinants of profitability, each for the other five combinations of ICR and ordinary-chaebol status. Their numbers of observations are also shown in Table 1.

The Wald test will be done to see whether pairs or combinations of pairs of coefficients for unionization variables included in $X_{1,ORD}$, $X_{2,RD}$, $X_{3,RD}$, $X_{1,CHB}$, $X_{2,CHB}$ and $X_{3,CHB}$ are the same.⁸

As the estimation method of panel data, the fixed effects model is used. As software, E-Views 5.1 is used.

III. Profitability and Its Determinants

In each of the estimations specified in Section II, dependent variable is vector of profitability. Its scalar component is defined as

$$PROFIT = (\text{operating income})/(\text{total assets} - \text{investment assets}).$$

Investment assets are subtracted from total assets in the denominator because they are not used for obtaining operating income.⁹

Independent variables are matrix of the determinants of profitability. Among

⁸ For using a grand regression such as Equation (1), see Baltagi (1995: Chapter 4). Specification of the regression as in Equation (1) first requires that $X_{1,ORD}$, $X_{2,RD}$, $X_{3,RD}$, $X_{1,CHB}$, $X_{2,CHB}$ and $X_{3,CHB}$ can be written as they appear in (1). For this purpose it should be ensured that there is no structural difference of coefficients, including constant terms, across the years from 1993 to 1997 within each of the six groups of firms. The Wald test will be done to see whether this is indeed the case.

⁹ Given the scheme of regression analysis in the last section, superscript and subscript to denote firm and year are suppressed.

them, the vector of unionization variable is of course the most important. Its scalar component is represented by

UNION = dummy variable representing the presence of labor union.

UNION is expected to have a significantly negative coefficient in the regression using all 538 firms as sample, as long as there is no reason to think that Korea is a special case globally where the overall impact of union on profitability is not negative.

However, if unionization helps raise profitability when a firm is close to insolvency, *UNION* will have a positive coefficient in the estimation using the panel data of firms with average ICR of the preceding three years less than one. As mentioned in the introduction, this will depend on the institutional setting for collective bargaining: it will be the case more clearly when collective bargaining occurs at firm level rather than at industry level. In Korea, collective bargaining has indeed been occurring at firm level rather than at industry level. This practice has the origin in the oppressive policy of the military government in the 1980s, which forced the organization of unions to take place at enterprise level by oppressing the bargaining right of the higher-level organizations (the military government loathed the alleged power of industry-based unions and their leaders). Partly because of that, when union activity was liberalized with political democratization from June 1987, union activists found it easier to organize enterprise-based unions than industry-based unions. There is also an economic explanation. In the post-war period, employment structures have tended to be firm-specific, reflecting the fact that workers' skills may be formed and transmitted on the job and in a team context. This means that enterprise unions are a better fit for collective bargaining. As a latecomer in industrialization, Korea after 1987 has had no institutional inertia to hamper the formation of enterprise-based unions congruent to firm-specific employment structures, as Japan did in the 1950s and 1960s (Aoki 1987; Kim and Lee 1997).

On the other hand, if unions do erode profitability when a firm is relatively far away from insolvency, *UNION* will show up with a significantly negative coefficient in the estimation using the panel data of firms with average ICR larger than two in the preceding three years. The coefficient for *UNION* is expected to have an intermediate value in the estimation using the panel data of firms with ICR between one and two as sample.

It is expected that coefficients of *UNION* will further differ between the estimations using ordinary firms and those using chaebol firms as sample. In the case of ordinary firms, owing to higher managerial transparency and stronger financial discipline, the union's perception of the firm's ability to pay may not diverge much from

the firm's real financial situation. As a result, the positive, neutral and negative effects of unions on profitability are likely to be more or less clearly manifested depending on the distance of firms from insolvency as manifested by ICR values.¹⁰

On the other hand, in the case of chaebol firms, owing to the lack of managerial transparency and financial discipline, the union's perception of firm's ability to pay may diverge from the firm's real financial situation. As a result, even when chaebol firms are close to insolvency, their unions may not help raise profitability. *UNION* may not necessarily have a significantly positive coefficient in the estimation using the sample of chaebol firms with average ICR less than one in the preceding three years. Unions of chaebol firms may also undermine profitability even when their firms are not very far from, if not close to, insolvency. *UNION* may thus also have a significantly negative coefficient in the estimation using the sample of chaebol firms with average ICR between one and two in the preceding three years.

Determinants of profitability other than unionization are conventional ones used in the structure-conduct-performance model in industrial organization.

The first of these is firm size. Larger firms may enjoy economies of scale and higher market share, so they may show higher profitability.¹¹ On the other hand, larger firms may be under weaker financial discipline, since they may be, aside from chaebol status, "too big to fail." If this is the case, they will show lower profitability. Which is true is an empirical question. We use log value instead of the value itself, as is usually done.

$LOG(TA)$ = log value of total asset.

¹⁰ Whether unions lower or raise profitability depending on the distance from insolvency could be analyzed alternatively by including the interaction term between unionization variable and ICR variable as a determinant of profitability. However, using interaction term entails, most of all, a multicollinearity problem, because the ICR in the preceding three years is by definition correlated with profitability in the preceding three years, and thus is correlated with the current year's profitability. Here, we do separate regression analyses for three different categories of ICRs. Doing so incurs some loss of information, because the firms belonging to the same category of ICR are assumed to behave in the same way regardless of their fine differences in ICRs. But this loss seems less of a problem compared with the case of using the interaction term, given the awkwardness of dealing with a multicollinearity problem.

¹¹ Market share variable itself is not used here because of lack of data. The Korea Listed Company Association provides market share data, but they have too many missing observations to be used for empirical analysis.

Another variable to be considered is

ADS = advertising-sales ratio.

Advertising works as a barrier to entry as it is supposed to do in the old structure-conduct-performance model of industrial organization. Also, the value of total assets used as the denominator in defining *PROFIT* may not include the full capitalized value of advertising as an intangible asset. In either case, *ADS* is expected to show a positive coefficient.

The next variable to be considered is fixed asset to sales ratio:

KS = fixed asset to sales ratio.

This variable may capture the possibility that a large amount of fixed assets may impose a barrier to entry for new entrants. If that is the case, it will show a positive coefficient. On the other hand, it has often been thought that Korean firms before the crisis had more than optimal fixed assets from carrying out 'over-investment' due to weak financial discipline. Which is true is a matter of empirical test.

Table 2 presents the averages and standard deviations of *PROFIT*, *UNION*, *LOG(TA)*, *ADS* and *KS*. Each statistic is given for all firms and for each sub-sample elaborated upon above.

<Table 2 here>

In the regression using samples that do not distinguish between ordinary and chaebol firms, a dummy variable representing chaebol affiliation is included as a determinant of profitability in addition to the variables in Table 2:

CHAEBOL = dummy variable representing affiliation with thirty largest chaebol.

Chaebol firms are subject to a weaker financial discipline, so their profitability may be low. Previous studies by Joh (2003) and Krueger and Yoo (2001) also have shown that chaebol firms had lower profitability before the crisis. The chaebol variable is thus expected to have a negative coefficient.

Lastly, dummy variables representing industries are included. Industries are classified into ten sectors: primary, light manufacturing, heavy and chemical manufacturing, construction, electricity and gas, sales, transportation, communication,

personal and business service, and other. All these ten dummy variables are used in the estimation using all 538 firms as sample. However, the sub-samples often do not have observations covering all ten categories of industries. The estimations using sub-samples should thus include smaller numbers of dummy variables, representing more aggregated categories of industries. In order to conduct estimations with all sub-samples, industries have been consolidated so that only two dummy variables respectively representing manufacturing and service (including social overhead capital) are included.

IV. Estimation Results

Table 3 presents the estimation results for all firms, each of the three groups of firms with different average ICR values in the preceding three years, and ordinary firms and chaebol firms, respectively.

<Table 3 here>

In the first column of figures in Table 3, *UNION* turns out to have a significantly negative coefficient, as expected. The overall impact of unions on firm profitability in Korea is not different from that observed in other countries and presented by previous studies. It does not change when the estimation is done for the sub-sample of ordinary firms and chaebol firms respectively, as shown by the significantly negative coefficients for *UNION* in the fifth and sixth columns of the figures in Table 3.

Meanwhile, also as expected, *UNION* turns out to have a significantly positive coefficient in the second column, a statistically insignificant coefficient in the third column, and a significantly negative coefficient in the fourth column. Unions indeed have positive, neutral and negative impacts on firm profitability depending on the distance of firms from insolvency.¹²

¹² One may wonder here whether there is also difference in the union effect on profitability between the firms with ‘deteriorating’ ICR and those with ‘improving’ ICR.

However, estimation by dividing the sample into two groups of firms -- one with ICR

Table 4 presents the estimation results for ordinary firms and chaebol firms, each classified by the three categories of ICR values, respectively.

The first, second and third columns of figures are estimation results for ordinary firms. *UNION* turns out to have a significantly positive coefficient in the first column, an insignificant coefficient in the second column, and a significantly negative coefficient in the third column. The estimation results for ordinary firms thus reveal strongly the positive, neutral and negative impact of unions on profitability of firms depending on the average ICR values of the preceding three years -- more distinctively than the estimation results for all firms presented in Table 3.

The fourth, fifth and sixth columns of figures in Table 4 are estimation results for chaebol firms. *UNION* turns out to have a statistically insignificant coefficient in the fourth column. Unions of chaebol firms do not raise profitability even when the average ICR values in the preceding three years is smaller than one. Meanwhile, *UNION* has negative coefficients with statistical significance in the fifth and sixth columns. Unions of chaebol firms significantly erode profitability even when their average ICR values in the preceding three years is between one and two, as well as when it is larger than two.

<Table 4 here>

These estimation results obtained for ordinary firms and chaebol firms are basically in line with expectation. When ordinary firms are close to insolvency, their unions help raise profitability significantly, but unions of chaebol firms fail to do so apparently because of lack of managerial transparency and financial discipline. When firms are relatively far away from insolvency, unions of both ordinary and chaebol firms lower profitability. In the intermediates case, unions of ordinary firms do not lower profitability, but unions of chaebol firms do so, again probably due to lack of managerial transparency and financial discipline.¹³

larger than the ICR of the previous years (one, two or three years earlier) and the other

with ICR smaller than the ICR of the previous years -- does not produce robust results.

¹³ At this juncture, one could easily see that the effect of union on profitability will feed back to the magnitude of ICR in the next period. An interesting question that arises here is how to analyze the dynamics of the evolution of ICR and to see whether that evolution will lead to final bankruptcy of firms. There is a longstanding literature on corporate bankruptcy with clearly defined models (see Zmijewski 1984; Altman 1984), and incorporating the role of unions to such models will be an important task. With our sample, it is possible to analyze the trend of ICR over time with unionization as a determinant of ICR at a preliminary level. A partial adjustment model

Among the variables other than union, firm size variable LOG(TA) shows up with positive coefficients, often statistically significant, suggesting that economies of scale and other positive effects dominate the effect of weaker financial discipline. The results for advertising-sales ratio variable ADS are a little more complicated. When average ICR of the preceding three years is larger than one, ADS shows up with positive coefficients, often with strong statistical significance, as expected. However, when average ICR of the preceding three years is smaller than one, ADS turns out to have negative coefficients, with statistical significance in the case of chaebol firms. Why this is so is a question that cannot be pursued here, and remains as a subject of further inquiry.¹⁴ Meanwhile, the fixed asset to sales ratio variable KS turns out to have a negative coefficient with statistical significance in all estimations, suggesting that the effect of weak financial discipline dominates the effect of entry barrier. Chaebol variable in the estimations using samples that do not differentiate between ordinary and chaebol firms turns out to have generally insignificant coefficients. An exception is the estimation using firms with average ICR of the preceding three years smaller than one, which gives a negative coefficient with statistical significance at 10% level. Chaebol firms are less profitable than ordinary firms when the firm is relatively far away from insolvency. Why this is so is also a subject of further inquiry.

Table 5 presents the results of the Wald test about whether pairs, or their combinations, of coefficients for *UNION* variables included in the 'grand' regression

using the lagged ICR variable and unionization as determinants of ICR has been tried, but it does not yield sufficiently robust results. Meanwhile, with our sample the analysis of bankruptcy itself is very difficult, only nine out of 538 firms being in the state of default on their debt. In any event, the focus of this paper is the analysis of union impact on profitability rather than the analysis of bankruptcy. It aims at extending the analysis of the union impact on firm profitability by taking into account the possibility that it may differ depending on the financial situation of firms. The union effect on subsequent bankruptcy of firms is an important implication of the paper, but not its main focus. That topic is the subject of further inquiry by a separate paper.

¹⁴ One could guess here that because advertising is a kind of long-term investment, a firm having average ICR less than one in the preceding three years but doing heavy advertising is actually making long term investment while the urgent job is getting out of the financial distress. Such a firm may well have lower profitability in the current year. To see whether this is indeed the case, we have constructed ADS variable by averaging the advertising sales ratio over the preceding three years rather than by taking the advertising-sales ratio of the current year. The regression results are little altered, and some other explanation seems needed.

specified by Equation (1) are the same.¹⁵

In the case of ordinary firms, coefficients are significantly different between the pairs of *UNION* variables across the three estimations using the three sub-samples with different average ICR values of the preceding three years. The hypothesis that all three coefficients in the three estimations are equal to one another is also rejected. It is thus verified that, in the case of ordinary firms, there is a significantly distinct -- positive, neutral and negative -- effect of unions on profitability according to the distance of firms from insolvency.

<Table 5 here>

On the other hand, in the case of chaebol firms, there is no significant difference between any pair of coefficients, and the hypothesis that the three coefficients are the same also cannot be rejected with statistical significance. There is no significantly different effect of unions on profitability depending on the distance of firms from insolvency, probably because the union's perception of the firm's ability to pay does not coincide with the firm's financial situation represented by ICR.

Table 5 also presents the results of the Wald test about whether coefficients for *UNION* are the same between ordinary and chaebol firms. Coefficients for *UNION* are not significantly different between ordinary and chaebol firms when firms are close to insolvency, with average ICR of the preceding three years smaller than one. The same is true when firms are relatively far away from insolvency, with average ICR of the preceding three years larger than two. Coefficients for *UNION*, however, differ significantly between ordinary and chaebol firms when firms are in the intermediate range with average ICR of the preceding three years between one and two.

The fact that the coefficients for *UNION* are significantly different only in the intermediate range does not mean that there is no significant difference in union behavior between ordinary and chaebol firms when firms are financially troubled. As

¹⁵ As mentioned in footnote 8, specification of the regression analysis as in Equation (1) first requires that there should be no structural difference in coefficients, including constant terms, across the years from 1993 to 1997 within each of the six groups of firms. The Wald test has been conducted to see whether there is structural difference in coefficients, including constant terms, across the years from 1993 to 1997 within each of the six groups of firms. In all six cases the null hypotheses that all coefficients are the same across the five years cannot be rejected at the 5% significance level.

shown in Figure 1, ICR lying between one and two is exceptionally small by international standards. Firms with ICR smaller than two are thus not so sound financially when evaluated by international standards. In this respect, it is interesting to see that in the last row of Table 5, the hypothesis that the coefficients for *UNION* are the same between ordinary and chaebol firms in both the case where ICR is smaller than one and the case where ICR lies between one and two is rejected with statistical significance. In other words, the negative effect of unions on profitability of chaebol firms is significantly stronger than that of ordinary firms when both of them are financially unsound by international standards.

<Figure 1 here>

V. Discussion and Concluding Remarks

This paper has tried to show the impact of unions on profitability in a more comprehensive way than in previous studies. Unions help raise profitability of firms if they are close to insolvency, by rallying the workers for the purpose of reviving the firms. On the other hand, unions lower profitability of firms if they are relatively far away from insolvency. Unions have no significant impact on profitability in an intermediate range where firms are neither close to nor far away from insolvency. Though the paper has used Korean data, it is not unlikely that similar results could be obtained for other countries.

The finding has an implication for the question whether unions undermine survivability of firms. There have been debates about whether unions share excess profits generated by market concentration (Freeman 1983; Salinger 1984; Karier 1985; Voos and Mishel 1986) or erode normal profits such as firm-specific rent generated by intangible assets or other sources (Clark 1984; Hirsch 1989; Hirsch and Connolly 1987). In the former case the firm's survival is not affected, but in the latter case it is undermined.

In the real world, however, it should not be easy for unions to distinguish between normal and excess profits. Instead, unions may make judgment about the distance of the firm's financial situation from the state of insolvency before they make demands or concessions, as stipulated in this paper. By lowering profitability when firms are relatively far away from insolvency, unions may sometimes encroach upon normal profits so that growth potential of firms may be undermined. But they rarely threaten the

survival of firms itself. Rather the reverse is true: if firms are close to insolvency, unions help them get out of the situation by raising profitability. The evidence thus more or less supports the impression that unions undermine firm profitability but, like successful viruses, they are smart enough not to kill their hosts (Kuhn 1998: 1039).

However, this relationship may not hold when firms lack managerial transparency and financial discipline. With chaebol firms, unions do not help raise profitability significantly even when firms are close to insolvency. Unions also lower profitability significantly when chaebol firms are not really far away from insolvency, with average ICR during the preceding three years lying between one and two. And it should be recalled that ICR smaller than two is very low by international standards.

This should have an important implication for the role of chaebol and unions in precipitating the Korean economic crisis in 1997. Chaebol and militant unions have often been alleged to be responsible for the crisis. Apparently because of that, reform of the chaebol and industrial relations has been among the major reform agenda after the crisis.

If chaebol and unions are to be responsible for the crisis, they should be so, most of all, through lowering profitability. According to the estimation results of the conventional analysis presented in the first column of figures in Table 3, on average chaebol firms have lower profitability, but the relationship is not statistically significant. Meanwhile, unionized firms have significantly lower profitability than non-unionized firms. Unions seem significantly responsible for the crisis, while chaebol seem not significantly responsible. But actually the situation is more complicated, as shown by the estimation results in Table 4.

What really matters for generating non-performing loans is not the overall union impact on profitability but the union impact on the profitability of firms that are not far away from or even very close to insolvency. In this respect, unions combined with chaebol apparently are responsible for the crisis. Unions of chaebol firms lower profitability when these firms are not far away from insolvency, with average ICR during the preceding three years lying between one and two, which is indeed very low by international standards. This may push chaebol firms close to insolvency. And even when they are actually close to insolvency with average ICR during the preceding three years smaller than one, unions do not help them get out of the situation. Pushing chaebol firms close to insolvency and then not helping them get out of the situation should have contributed to the generation of non-performing loans for financial institutions and thus to the outbreak of the crisis.

Unions of chaebol firms behaved in this way because of lack of managerial transparency and financial discipline. And, of course, managerial transparency and financial discipline are subjects of 'governance.' Chaebol firms have a governance

structure worse than that of ordinary firms. Poor corporate governance of chaebol firms combined with unionization precipitated the financial crisis by generating non-performing loans.

The fact that unionization combined with poor corporate governance can lead to financial crisis has some global implications. Though other countries may not have business conglomerates like the Korean chaebol, poorly governed firms are ubiquitous throughout the world. If these firms are unionized, unions may push them close to the state of insolvency and then not help them get out of it. This may generate non-performing loans for financial institutions, which may lead to financial crisis.

The analysis could probably be also useful for understanding the effects of unions in the public sector, which is now more densely unionized than the private sector worldwide. As Shleifer and Vishny (1997: 767-769) argue, state enterprises may present the worst case of corporate governance. If this is indeed true, their unionization may often result in chronic financial trouble. Unlike the financial troubles of private firms, the financial troubles of state enterprises will not precipitate a financial crisis by generating non-performing loans, but will end up imposing an ever-greater burden on consumers and taxpayers.

References

- Aidt, T. and Z. Tzannatos (2002) *Unions and Collective Bargaining: Economic Effects in a Global Environment*, Washington, D.C.: The World Bank.
- Altman, Edward I. (1994) "The Success of Business Failure Prediction Models," *Journal of Banking and Finance*, 8, 171-198.
- Aoki, Masahiko (1987) "The Japanese Firm in Transition," in *The Political Economy of Japan*, Volume I, Stanford: Stanford University Press, 263-288.
- Baltagi, Badi H. (1995) *Econometric Analysis of Panel Data*, New York: John Wiley and Sons.
- Bongini, Paola, Ferri, Giovanni and Hongjoo Hahm (2000) "Corporate Bankruptcy in Korea: Only the Strong Survive?" *The Financial Review*, 35, 31-50.
- Clark, K.B. (1984), "Unionization and Performance: The Impact on Profits, Growth and Productivity," *American Economic Review*, 74, 893-919.
- Freeman R. (1983), "Unionism, Price-Cost Margins, and the Return to Capital," NBER Working Paper No.1164.
- Freeman R. and M. M. Kleiner (1999), "Do Unions Make Enterprises Insolvent?" *Industrial and Labor Relations Review*, 52(4), July, 510-527.
- Freeman R. and J. Medoff (1984), *What Do Unions Do?* New York: Basic Books.
- Hart, O. (1995) "Corporate Governance: Some Theory and Implications," *Economic Journal*, 105, May, 678-689.
- Hirsch, B.T. (1989) "Union Effects on Productivity, Profits, and Growth: Has the Long Run Arrived?" *Journal of Labor Economics*, 7(1), 72-105.
- Hirsch, B.T. and R.A. Connolly (1987), "Do Unions Capture Monopoly Profits?" *Industrial and Labor Relations Review*, 41(1), 118-136.
- Jensen, M.C. (1986) "Agency of Free Cash Flow, Corporate Governance, and Takeovers," *American Economic Review*, 76(2), 323-329.
- Joh, Sung Wook (2003) "Corporate Governance and Firm Profitability: Evidence from Korea before the Economic Crisis," *Journal of Financial Economics*, 68(2), May, 287-322.
- Karier, T. (1985), "Unions and Monopoly Profits," *Review of Economics and Statistics*, 67, 34-42.
- Kaufman, B.E. and J. Martinez-Vzquez (1988) "Voting for Wage Concessions: The Case of the 1982 GM-UAW Negotiations," *Industrial and Labor Relations Review*, 41(2), January, 183-194.

- Kim, Sookon and Ju-Ho Lee (1997) "Industrial Relations and Human Resource Development," in Cha, Dong-Se, Kim, Kwang Suk and D.H. Perkins (eds.) *The Korean Economy 1945-95: Performance and Vision for the 21st Century*, Seoul: Korea Development Institute, 586-622.
- Krueger, A. and J. Yoo (2001) "Falling Profitability, Higher Borrowing Costs, and Chaebol Finances during the Korean Crisis," a paper presented at the Conference on the Korean Crisis and Recovery, May 17-19, Seoul, Korea.
- Krugman, P. (1998), "What happened to Asia?" mimeographed, Massachusetts Institute of Technology.
- Kuhn, P. (1998), "Unions and the Economy: What We Know; What We Should Know," *Canadian Journal of Economics*, 31(5), 1033-56.
- Lawrence, C. and R. Z. Lawrence (1985) "Manufacturing Wage Dispersion: An End Game Interpretation," *Brookings Papers on Economic Activity*, I, 47-106.
- Machin, S. (1995) "Plant Closures and Unionization in British Establishments," *British Journal of Industrial Relations*, 33(1), March, 55-68.
- Metcalf, D. (2003) "Unions and Productivity, Financial Performance and Investment: International Evidence," in J.T. Addison and C. Schnabel (eds.) *International Handbook of Trade Unions*, Northampton, MA.: Edward Elgar, 118-171.
- Mishikin, F.S. and Joon-Ho Hahm (1999) "Causes of the Korean Financial Crisis: Lessons for Policy," paper presented at the KDI conference on the Korean crisis, October 15, Seoul.
- Ross, S.A., Westerfield, R.W. and J. Jaffe (1999), *Corporate Finance*, New York: McGraw-Hill,
- Salinger, M.A. (1984) "Tobin's q, Unionization, and the Concentration-Profits Relationship," *Rand Journal of Economics*, 15, Summer, 159-70.
- Shleifer, A. and R.W. Vishny (1997) "A Survey of Corporate Governance," *Journal of Finance*, 52(2), 737-783.
- Voos, P.B. and L.R. Mishel (1986), "The Union Impact on Profit in the Supermarket Industry," *Review of Economics and Statistics*, 60(3), 513-17.
- Zmijewski, Mark E. (1984) "Methodological Issues Related to the Estimation of Financial Distress Prediction Models," *Journal of Accounting Research*, 22 Supplement, 59-82.

Table 1. Composition of Sample: Number of Observations
in the Panel Data

	Ordinary Firms	Chaebol Firms	Total
ICR<1	733	166	899
1<ICR<2	834	241	1075
ICR>2	643	73	716
Total	2210	480	2690

<Table 2> Summary Statistics

		<i>PROFIT</i>	<i>UNION</i>	<i>LOG(TA)</i>	<i>ADS</i>	<i>KS</i>
All Firms	Mean	0.0671	0.679	18.802	0.0129	0.449
	S.D.1)	0.0662	0.467	1.339	0.0258	0.394
Firms with ICR<1	Mean	0.0345	0.762	18.813	0.00836	0.512
	S.D.	0.0705	0.426	1.313	0.0179	0.473
Firms with 1<ICR<2	Mean	0.0724	0.685	19.018	0.0126	0.422
	S.D.	0.0502	0.465	1.341	0.0235	0.328
Firms with ICR>2	Mean	0.100	0.564	18.463	0.0190	0.411
	S.D.	0.0631	0.496	1.298	0.0347	0.365
Ordinary Firms	Mean	0.0671	0.668	18.487	0.0136	0.437
	S.D.	0.0702	0.471	1.101	0.0276	0.398
Chaebol Firms	Mean	0.0671	0.727	20.252	0.00945	0.504
	S.D.	0.0432	0.446	1.382	0.0143	0.371

Ordinary Firms with ICR<1	Mean	0.0312	0.753	18.499	0.00831	0.514
	S.D.	0.0757	0.432	1.094	0.0185	0.487
Ordinary Firms with 1<ICR<2	Mean	0.0724	0.667	18.615	0.0131	0.395
	S.D.	0.0540	0.472	1.072	0.0254	0.315
Ordinary Firms with ICR>2	Mean	0.101	0.572	18.307	0.0203	0.406
	S.D.	0.0629	0.495	1.122	0.0363	0.368
Chaebol Firms with ICR<1	Mean	0.0494	0.801	20.199	0.00856	0.504
	S.D.	0.0362	0.400	1.306	0.0151	0.410
Chaebol Firms with 1<ICR<2	Mean	0.0726	0.747	20.413	0.0107	0.518
	S.D.	0.0345	0.436	1.243	0.0148	0.354
Chaebol Firms with ICR>2	Mean	0.0894	0.493	19.838	0.00729	0.457
	S.D.	0.0643	0.503	1.839	0.00995	0.336

Note: 1) S.D. denotes standard deviation.

<Table 3> Determinants of Profitability of Firms:

by ICR Values and Ordinary-Chaebol Firm Status

	All Firms	Firms with ICR<1	Firms with 1<ICR<2	Firms with ICR>2	Ordinary Firms	Chaebol Firms
<i>UNION</i>	-0.0141*** (-5.399)	0.0113** (2.149)	-0.00275 (-0.822)	-0.0221*** (-4.829)	-0.00947*** (-3.149)	-0.0218*** (-5.290)
<i>LOG(TA)</i>	0.00857*** (7.767)	0.0137*** (6.671)	0.00214 (1.505)	0.00599*** (2.807)	0.00763*** (5.685)	0.00689*** (5.161)
<i>ADS</i>	0.389*** (8.522)	-0.106 (-0.897)	0.422*** (6.627)	0.327*** (4.985)	0.397*** (7.917)	0.119 (0.947)
<i>KS</i>	-0.0630*** (-19.739)	-0.0599*** (-13.074)	-0.0420*** (-8.845)	-0.0493*** (-7.175)	-0.0605*** (-17.052)	-0.0452** (-8.849)
<i>CHAEBOL</i>	-0.00551 (-1.537)	-0.00251 (-0.399)	0.00361 (0.852)	-0.0141* (-1.750)		
Industry Dummy	Included	Included	Included	Included	Included	Included
Year Dummy	Included	Included	Included	Included	Included	Included
R ²	0.204	0.244	0.122	0.164	0.184	0.226
Adjusted R ²	0.198	0.228	0.113	0.151	0.181	0.210
F-statistic	52.584***	21.801***	24.720***	23.028***	99.490***	27.393***
Number of Observations	2690	899	1075	716	2210	480

Notes: 1) Figures in the parentheses are t-values.

2) ***, ** and * denote significance at 1%, 5% and 10% respectively.

<Table 4> Determinants of Profitability of Firms: by the Combination
of ICR Values and Ordinary-Chaebol Firm Status

	Ordinary Firms with ICR<1	Ordinary Firms with 1<ICR<2	Ordinary Firms with ICR>2	Chaebol Firms with ICR<1	Chaebol Firms with 1<ICR<2	Chaebol Firms with ICR>2
<i>UNION</i>	0.0171*** (2.801)	0.000169 (0.0417)	-0.0192*** (-3.872)	-0.00172 (-0.262)	-0.0207*** (-4.143)	-0.0227* (-1.855)
<i>LOG(TA)</i>	0.0138*** (5.741)	0.00210 (1.146)	0.00241 (0.930)	0.00696*** (3.298)	0.00151 (0.874)	0.00892** (2.487)
<i>ADS</i>	-0.0817 (-0.593)	0.439*** (6.109)	0.308*** (4.630)	-0.450*** (-2.691)	0.180 (1.261)	2.711*** (4.256)
<i>KS</i>	-0.0605*** (-11.653)	-0.0437*** (-7.277)	-0.0440*** (-5.868)	-0.0411*** (-5.525)	-0.0377*** (-6.302)	-0.0793*** (-4.280)
Industry Dummy	Included	Included	Included	Included	Included	Included
Year Dummy	Included	Included	Included	Included	Included	Included
R ²	0.212	0.127	0.152	0.315	0.234	0.477
Adjusted R ²	0.201	0.116	0.139	0.271	0.201	0.393
F-statistic	38.886***	23.917***	22.711***	14.247***	14.047***	11.312***
Number of Observations	733	834	643	166	241	73

Notes: 1) Figures in the parentheses are t-values.

2) ***, ** and * denote significance at 1%, 5% and 10% respectively.

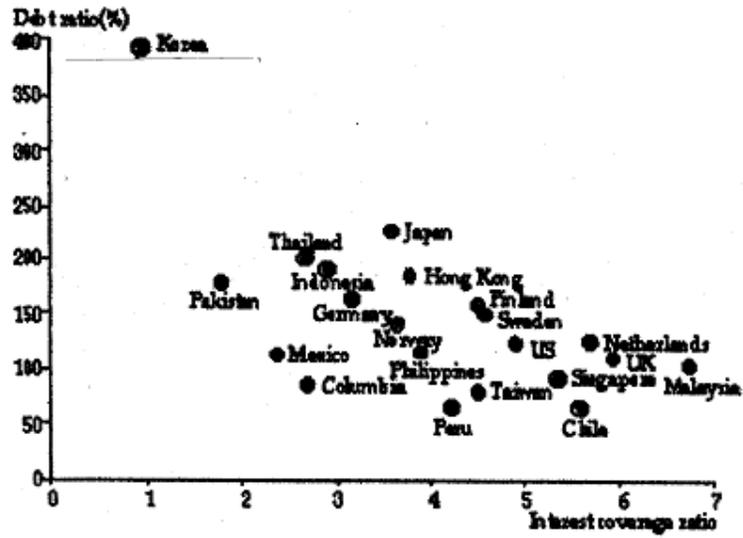
<Table 5> The Wald Test for the Hypotheses of Equality
of Coefficients for UNION Variables

Hypotheses	F-Value
Among Ordinary Firms with Different ICR Values	
<i>ICR<1 versus 1<ICR<2</i>	6.364**
<i>1<ICR<2 versus ICR>2</i>	8.525***
<i>ICR<1 versus ICR>2</i>	27.086***
<i>ICR<1 versus 1<ICR<2 and 1<ICR<2 versus ICR>2</i>	13.614***
Among Chaebol Firms with Different ICR Values	
<i>ICR<1 and 1<ICR<2</i>	1.854
<i>1<ICR<2 and ICR>2</i>	0.00283

<i>ICR<1 and ICR>2</i>	1.391
<i>ICR<1 versus 1<ICR<2 and 1<ICR<2 versus ICR>2</i>	1.0755
Between Chaebol Firms and Non-Chaebol Firms for the Same ICR Values	
<i>ICR<1 versus ICR<1</i>	1.901
<i>1<ICR<2 versus 1<ICR<2</i>	4.344**
<i>ICR>2 versus ICR>2</i>	0.0390
<i>ICR<1 versus ICR<1 and 1<ICR<2 versus 1<ICR<2</i>	3.122**

Note: 1) ***, ** and * denote significance at 1%, 5% and 10% respectively.

<Figure 1> Interest Coverage Ratio and Debt Ratio: International Comparison



Notes: The figures are the average of 1995 and 1996.

Source: LG Economic Research Institutes, *Korean Economic Briefing*, 10(9), 2000.9.21.