Changes in Main Bank Rescues during the Lost Decade:

An Analysis of Corporate Restructuring in Japan, 1981-2007

Takeo Hoshi

Satoshi Koibuchi

Ulrike Schaede[†]

ESRI Research Program: "Japan's Bubble, Deflation and Long-Term Stagnation"

Revised April 2009

Abstract:

We study the incidence and processes of corporate restructuring between 1981 and 2007 in Japan by building a unique database from newspaper articles on major episodes of corporate restructuring. By linking this database to financial data on listed firms, we examine what types of companies were more likely to be restructured and how this changed over time, especially during the "lost decade." We find that larger firms, firms in distress, and firms with a high dependence on banks, in particular a main bank, are more likely to be restructured. During the "lost decade", however, the likelihood for a distressed firm to undergo restructuring declined, including for firms highly dependent on bank borrowing. Nor did high dependence on a main bank increase the probability of restructuring during the 1990s. In terms of measures adopted by firms undergoing restructuring, we find significant reductions in employment, fixed capital, and total debt, but during the "lost decade," adjustments in debt and capital became more tentative.

[†]Hoshi and Schaede: School of International Relations and Pacific Studies, University of California, San Diego; Hoshi also at NBER, and TCER. e-mails: thoshi@ucsd.edu, uschaede@ucsd.edu; Koibuchi: Faculty of Commerce and Economics, Chiba University of Commerce (CUC), Japan, e-mail: koibuchi@cuc.ac.jp. We are grateful for helpful comments to Anil Kashyap and the editorial board, participants of the ESRI conferences in New York and San Francisco, and seminar participants at Hitotsubashi University and the Development Bank of Japan. We thank Emi Fukuda, Kanako Hotta, Masafumi Iino, Akifumi Irie, Yuichiro Kawai, Yoshikazu Kuki, Kuni Nemoto, Masashi Osakada, Mary Shiratori, Christopher Syling, Kunio Takeda, and Koki Yoshida for research assistance.

1. Introduction

During Japan's period of rapid growth between the 1950s and 1970s, an institutionalized mechanism of corporate restructuring developed, led by the distressed company's main bank. In the typical rescue event, the main bank, being a large shareholder and usually the largest lender, intervened in a distressed borrower by dispatching executives and restructuring debt (often with the help of other lenders) with an eye toward turnaround so that the company would recover and resume debt repayment. Most bailouts were informal in nature, as courts were rarely involved. By the time Japan entered the 1980s, such rescue intervention had become quasi-automated, and the few exceptional cases where a main bank refused to bail out a large firm were well publicized and only proved the standard rule.

Given its large exposure in both debt and equity at the time, the main bank had an obvious economic interest in the recovery of the customer. Moreover, it also strove to maintain its reputation as a dependable monitor on behalf of other lenders. Sheard (1989) argues that this type of reciprocal delegated monitoring reduced costs by eliminating duplication of the monitoring effort. Under delegated monitoring, the main bank was responsible for rescuing a client in financial trouble. Politics may occasionally have played a role, as the government had set strong priorities toward supporting Japan's largest companies, in order to uphold employment.[1]

In his chapter in this book, Joe Peek reviews the literature on main bank rescues and provides evidence that increases in main bank lending were beneficial to the receiving firms in the 1980s, both in terms of performance (return on assets) and evaluation (book-to-market valuation). These beneficial aspects, however, cannot be found for the 1990s, which leads Peek to conclude that the effectiveness of increased main bank lending has declined. In this chapter, we examine a broader set of episodes of restructuring, where main bank rescues are just one subset of the data. Thus, we address the larger question of the overall incidence of restructuring: What is the likelihood that a troubled firm undergoes restructuring, who are the leading players pushing for restructuring, and what are the means by which companies attempt to turn

[1] There is a large literature on Japan's main bank system in general, and main bank interventions in particular. See, for example, Aoki and Patrick (1994); Hoshi, Kashyap, and Scharfstein (1990); Hoshi and Kashyap (2001); Hirota and Miyajima (2001); Kaplan and Minton (1994); Kang and Shivdasani (1995); Morck and Nakamura (1999); and Sheard (1989, 1994).

themselves around? What is the role of the main bank in corporate restructuring? Most importantly, have these changed during the lost decade of the 1990s? That is, has corporate restructuring in general lost or gained effectiveness during the lost decade?

These questions are motivated by the fact that during the 1990s, Japan's political economy underwent great change. The combination of financial deregulation that began in the late 1970s, the subsequent disintermediation between large firms and their banks, the banking crisis and large-scale bank mergers, and vast-ranging reforms of both the banking and corporate sector beginning in 1998 may have altered the economic calculations of both banks and companies. As bank-company relations have become less tight, and as banks fought to survive a severe non-performing loan crisis, are banks still inclined to lead restructuring efforts for their clients? Has the introduction of new bankruptcy laws and procedures altered the choices made by managers or creditors of troubled companies? How have new laws and rules on corporate reorganization – such as easier processes of spin-offs or layoffs – changed the content of restructuring plans? And have new accounting rules and increased transparency on corporate financials invited new players in addition to the main bank?

Thus, this chapter looks at the effects of financial deregulation, the banking crisis, and corporate reforms on the incidence and processes of corporate restructuring in Japan. Based on a unique database of major corporate restructuring cases between 1981 and 2007, combined with financial data for large Japanese firms, we study the incidence and content of restructuring. We identify changes over time in what triggered the onset of corporate restructuring, who led corporate restructuring, and how restructuring effected employment, capital growth, bank loan growth and total debt growth of the distressed company. We find that the likelihood that a large distressed firm undergoes restructuring has decreased over time, especially during the lost decade. Moreover, firms that announce a "restructuring" effort show greater downward adjustments in the growth rates of employment, capital, and debt than other distressed firms, meaning that these announcements are not just a publicity effort but have true economic implications. Moreover, our data present evidence that high reliance on main bank lending is no longer a reliable predictor that a troubled firm will undergo restructuring. In other words, main banks no longer push distressed clients into restructuring more than other creditors. That said, we also find that financial restructuring measures are more pronounced when a bank leads the effort. Thus, the main bank is no longer the automatic last resort for a troubled firm, but when it steps in, it is more aggressive in relieving the debt burden of the company than other leaders of restructuring.

This chapter is organized as follows. Section 2 provides details on financial deregulation and corporate reforms to explain how the environment and motivations for undergoing corporate restructuring in Japan have changed. Section 3 introduces the database and overview statistics. Section 4 contains the data analysis and findings. Section 5 concludes.

2. Changes in Corporate Restructuring Due to Financial Deregulation and Corporate Reforms

Financial deregulation in Japan began in the late 1970s and occurred in a piecemeal and skewed process that lifted restrictions on large firms' financing first (Hoshi and Kashyap, 1999, 2001). As deregulation of financing options for large companies proceeded more quickly than deregulation aimed at banks or savers, banks started to lose corporate customers while savers continued to hold large portions of their assets in bank deposits. The banks searched for new clients among small- and medium-sized companies, especially those in the real estate business. But whereas those new clients had looked promising during the land price boom of the 1980s, loans turned sour as land prices dropped in the 1990s.

Non-performing loans were a major problem for Japanese banks throughout the decade, and the non-performing loan problem escalated into a full blown crisis in the late 1990s, and continued into the early 2000s. The banking crisis led to great changes in Japan's banking industry. Some banks went bankrupt, others merged. The previous 13 large city banks reorganized into four mega-financial groups, all straddling previous business group boundaries (such as Sumitomo-Mitsui). This muddled the previously clearly defined bank-company relations, and left the new banks with competing clients in one industry. For example, the Mizuho Financial Group, formed in 2002, found itself with six large construction companies as clients (all of which in dire straits at the time). The long-term credit banks were nationalized and sold to foreign financial interests, to be turned into commercial banks (Shinsei, Aozora). For our study of corporate restructuring, the changes brought about by financial deregulation and the banking crisis raise the question of whether the new business environment and clientele of Japanese banks may have altered the banks' willingness and effectiveness in bailing out troubled firms.

The Big Bang reforms of 1998 marked a final stage of gradual financial deregulation that began in the late 1970s (Hoshi/Kashyap 2001). One important aspect of these reforms for our study is the introduction of new accounting and disclosure rules, including mark-to-market of shareholdings and consolidated balance sheets. This switch to transparency had two main ramifications for banks and companies. First, corporate cross-shareholdings – many of which suffered losses with falling stock prices during the 1990s – were suddenly expensive to carry, which triggered a sell-out of some of these holdings. Whereas in 1987, large banks owned 14.9% of shares (in market value) listed on the Tokyo Stock Exchange, and corporations 30.1%, by 2001 these ratios had dropped to 10.1% and 21.8%, respectively. A 2001 law limited a bank's shareholdings to its Tier 1 (own) capital, and by 2007 large banks owned only 4.6% of TSE-listed shares. New owners emerged in foreigners and institutional investors who, by 2007, combined to hold almost 50% of TSE-listed shares (TSE 2007; Schaede 2008).

In addition to changing ownership structures, the new transparency invited new investors such as equity funds who were now better able to assess Japanese investment objects. For our study, this raises the question whether active investors have emerged as new players that guide troubled firms into restructuring, and if so, how their methods of restructuring differ from those previously observed in restructuring episodes led by main banks.

The period of 1998-2006 also brought great changes in corporate strategy-making, so much so that Schaede (2008) has labeled this period a "strategic inflection point". It coincides with political leadership of Prime Ministers Hashimoto and Koizumi, who shifted Japan toward the motto "leave it to the market". Rather than react to the severe banking crisis of 1998 by reverting to increased banking regulation, Prime Minister Junichirō Koizumi and his Minister of Financial Affairs, Heizo Takenaka further pushed deregulation between 2001 and 2006. Their 2002 Financial Revival Program put great emphasis on non-performing loan cleanup and was associated with a new political push toward direct loan write-offs and drastic restructuring of troubled debtors, even those previously considered "too big to fail". As the government allowed several large financial institutions to fail and raised pressure on banks to reduce their non-performing loans, it became clear that it was no longer blindly supporting bailouts of large firms. By withdrawing the previous mandate to save employment by helping troubled firms, the government freed banks from earlier obligations to bail out large clients.

Partially in response to this shift, large companies called for more options in corporate reorganization of their own. To provide more flexibility in corporate reorganization the

Commercial Code was revised literally every year beginning in 1997/98, and eventually replaced by a new Corporation Law in 2006. The gist of these revisions was to facilitate reorganization through spinoffs, spinouts, different types of stock, stock swaps, mergers and acquisitions (Yanagawa 2006, Schaede 2008).[2] One big impact of these reforms was an increase in hostile takeover attempts, which became a new cause of concern for executives at underperforming firms. A wave of proactive restructuring set in, whereby large firms refocused on core businesses, spun off non-core operations and restructured their finances. Importantly for our study, these legal reforms also afforded leaders of forced restructuring – the main bank, a lead company, or a consortium of both – more flexibility in how to restructure a distressed company, such as through labor adjustment. A first easing of layoff rules came through revised court rulings in 2000, followed by a revision of the Labor Standard Law, effective 2004. Thus, we are interested in how these reforms have influenced the measures adopted during the process of corporate restructuring.

Another major change was the complete revision of bankruptcy laws. In their old versions, these had rarely been employed because they were cumbersome, expensive, and often perceived as less efficient than an informal workout with the main bank. However, in 2000 the new Civil Rehabilitation Law (*Minji-saisei-hō*) replaced the old, clumsy Composition Law (*Wagi-hō*) to design new court-based bankruptcy procedures.[3] In 2003, the Corporate Reorganization Law (*Kaisha kōsei hō*) was revised to allow for Chapter 11-type turnarounds. In 2004, the Liquidation Law (*Hasan-hō*) was revised to simplify legal procedures for a shutdown and fair distribution of assets. Moreover, the 2001 "Guideline for Out-of-Court Workouts" added to this a new structure for bank-led workouts by stipulating how debt forgiveness should be organized in cases with multiple lenders but uncertain claims. While Koibuchi (2007) shows that this Guideline has so far rarely been used, it represents yet another alternative for companies in distress. For our study, the important question is whether these new options of turnaround, bankruptcy and exit have influenced the choices taken by troubled firms, between undergoing informal restructuring led by a main bank or the formal, court-based processes of bankruptcy.

[2] For example, one important change was to revoke the veto right of employees in case of a spin-out. Previously, corporate unions had rejected such moves on the ground that traditionally smaller firms in Japan paid lower salaries. The revocation of this rule took labor out of the restructuring equation.
[3] Another legal based procedure was "Corporate Reordering" (*Kaisha-seiri*) based on the Commercial Code. This was also cumbersome, and it was discontinued with the Corporation Law of 2006. See Schaede (2008).

Given these changes as the background, we now examine whether and how they have affected incidence and processes of corporate restructuring in Japan.

3. **Database and Overview Statistics**

We have constructed a database of major episodes of corporate restructuring for the period 1981-2007, in two-year intervals (all odd years, a set of 14 years of observation), from newspaper articles. The Japanese word for restructuring is *saiken* (再建), and we searched for this word in Nikkei Telecom 21, an electronic database that includes Japan's leading economic and financial newspapers published by Nihon Keizai Shinbun-sha (*Nihon Keizai Shinbun,* both morning and evening editions and including the economic sections of regional editions, *Nihon Kin'yū Shinbun, Nihon Sangyō Shinbun, Nihon Ryūtsū Shinbun*). Because episodes of restructuring typically last longer than one year, we are confident that our search has picked up most episodes generated in even years as well. We assume that the newspapers have been consistent in their reporting and word choice on *saiken* over time.[4] Since the newspapers may fail to report all restructuring cases, the number of episodes in our database is the lower bound of the true frequency. However, looking at the cases we identified, we did not find any obvious omissions of major corporate restructuring cases.

To further check for selection bias, we picked a random period (1997/98) and identified all listed companies that had a new bank director on their board in 1998, as compared to 1997. Empirical research has suggested that the dispatch of a board member is often the first sign of a bank intervention. We then checked details on those companies with new bank directors that were not included in our database, and found that our search omitted six cases where the company had new directors and had incurred losses, even though the companies had not announced "restructuring". These six companies are smaller than the average companies that we identify as undergoing restructuring. They are also more profitable, and none can be considered as being in "distress" according to our measures as described below. Moreover, these differences are not statistically significant, perhaps due to the small sample size. Our database for 1997 included 139 cases of restructuring, so that our finding suggests an omission rate below 5%;

[4] It stands to note that the Japanese language is much more consistent in word use than English. For example, whereas an English-language article may refer to "firms", "companies" and "corporations" interchangeably and all with the same meaning – presumably to avoid tediousness in word repetition – a Japanese-language article would use the same word, even if repeatedly. Word choice consistency is helpful for our purpose.

none of the cases involved a large company. Thus, we are confident that our database includes all major cases of restructuring.

In the next step, we limited the newspaper articles to episodes of corporate restructuring of publicly listed companies, because this allows us to combine our database with accounting and financial data. Upon this identification, we coded the information contained in each newspaper article, to build a database that contains important characteristics of each restructuring episode. This included the coding of information on: timing; the role of the restructuring leader (such as the main bank or an affiliated company); any reliance on bankruptcy laws; financial restructuring (such as debt forgiveness, interest concession); restructuring on the asset side of the balance sheet (asset sales or stock sales); managerial change (dispatch of directors, turnover of incumbent managers); corporate reorganization (spinoffs or exit from a business); labor adjustment (layoffs, early retirement, hiring freeze or employee dispatches); and salary adjustments (wage or bonus cuts, executive compensation reduction).

For the entire period, we observe a total of 1,756 episodes of corporate restructuring. Table 1 introduces summary statistics for these restructuring episodes for the 26-year period, divided into three sub-periods: (1) pre-bubble and bubble (1981-1991); (2) the lost decade (1993-2003); and (3) strategic inflection (2005-2007). For this project, our main emphasis is on comparing the first period – the pre-bubble and bubble years – with the second period of the lost decade. The table categorizes the informational items we collected from the newspaper articles into five subgroups: intervention, capital changes, business plan changes, corporate finance reforms and labor adjustments; the last three rows summarize three main groups of measures: corporate organization, employment reduction and salary reduction.

We can already find interesting signs of change just by looking at this table. The number of restructuring episodes has increased over time, from 572 during the pre-bubble and bubble years, to 929 during the lost decade. In terms of content, beginning with the last three measures, we see an increase in the portion of companies under restructuring that reorganize their business (from 33% in the first period, to 43% during the lost decade). We attribute this to legal reforms that have facilitated reorganization through sell-offs and exits from certain businesses beginning in 1998. In contrast, employment and salary adjustments do not fluctuate much across the three periods, although employment reduction was adopted by fewer firms under restructuring in more recent years. Two explanations stand out for the latter: reducing the workforce had become consecutively easier since 2000, so that by 2005 many companies had already restructured labor.

Moreover, Japanese companies were expecting a labor shortage beginning around 2010, which may have made them cautious in laying off workers.

Looking at the more detailed level reported in the upper half of Table 1, we find that management turnover increased from 22% in the 1980s to 32% in the 2000s. While changes in capital structure were similar over the three periods, the proportion of firms under restructuring that sold assets declined, whereas those that sold stocks rose during the lost decade. For all three periods the majority of restructured firms changed their business plan in one way or another. Scaling down the business has become an increasingly important tool, as have cost reductions and sales promotions, especially in the 2000s. An interesting finding is the substantial decline in the proportion of restructured companies that "entered a new business" during the lost decade. Both, in the 1980s and the 2000s, almost 10% of firms under restructuring entered new business lines, presumably while cutting back or exiting old ones at the same time. Such attempts at strategic repositioning occurred much less frequently during the lost decade (less than 4%), perhaps because the continued stagnation of the 1990s thwarted firms' optimism toward new business expansion. A similar activity drop is observed for sales promotion during the lost decade.

In terms of corporate finance, we observe changes tied to the reforms of corporate and financial laws. Interest rate concession became a less popular tool as interest rates dropped during the 1990s. In contrast, debt forgiveness became more popular. Debt-equity swaps were conducted in only 3.5% of companies under restructuring in the mid 2000s – more than previously but not as much as one might expect. The share of restructuring companies issuing new equity, in contrast, climbed from 8.4% in the 1980s to 24% in the 2000s perhaps reflecting the recovery of stock market between 2004 and 2007.

The incidence of labor adjustments remained stable during the lost decade but declined in the 2000s. Dispatching *(shukkō)* and relocation (*tenseki*) of workers to affiliated companies have often been mentioned in the literature as important adjustment valves for large companies. However, even in the 1980s only about 7-8% of restructuring firms announced these measures, and that ratio has fallen to 2.7% and 5.9%, respectively, in the mid 2000s. One reason for this low incidence may be that by the time a company undergoes restructuring it has already dispatched and relocated employees in large numbers. Indeed, it used to be the rule that companies could not lay off lifetime employees until they had relocated or dispatched workers and initiated early retirement programs. Early retirement programs continue to be the most

frequently adopted means of labor adjustments, adopted by 16% of restructuring firms during the lost decade.

Table 2 offers an overview of the data by type of restructuring leader; i.e., whether the effort was self-directed (or with no specific leader identified in the newspaper article), led by the main bank or a group of banks, by a company or group of companies, by a consortium of banks and companies, or by an equity fund (a new player beginning in the late 1990s). The table shows that the majority of restructuring cases was informal, as laws and courts were used in only 103 cases, or 5.8% of the total. Recall that bankruptcy laws were revised only beginning in 2000, so that this number points to a slow but steady adoption of alternatives to bank-led bailouts. When opting for the Corporate Reorganization or Civil Rehabilitation Law (Japan's equivalent to "Chapter 11", 94 cases in total), a distressed company needs to identify a sponsor, which explains the large role played by other companies in this category (37 cases). Bank-led restructurings were almost always conducted out-of-court.

All leaders appear roughly equally likely to dispatch directors and replace the management of the distressed firm. In 35 cases, the rescue leaders dispatched more than five executives to the ailing company, and previous managers were replaced in 452 cases. Episodes led by a group of banks or companies tend to have a higher incidence of corporate reorganization, labor adjustments, and salary adjustments. Overall, we find variation in these data that affords us great opportunity to study differences in corporate restructuring over time, and by type of leader.

For our analysis of these differences in process and leadership of corporate restructuring, we also look at the financial conditions of the companies undergoing restructuring. We source this information from the Nikkei Financial Database, which contains accounting data for all listed firms (including firms that used to be listed). Summary statistics of financial variables are presented in Table 3. The table shows that fewer listed firms underwent restructuring during the 1980s (4.1%) than during the lost decade (5.3%). During the lost decade, 4.4% of listed firms had negative operating income for two years in a row, as opposed to 1.7% in the 1980s. The main bank dependence (expressed as the proportion of loans from the largest lender) was slightly higher during the lost decade than during the 1980s. The last four rows report the averages of growth rates of employment, depreciable assets, bank borrowing, and total debt, which we use in our analysis of the content of restructuring below. Not surprisingly, all these showed lower growth during the lost decade.

4. Data Analysis and Findings

For our analysis, we have three data sample sets. The first is all companies that were listed at some point between 1980 and 2007. Of these companies, we identify two subgroups: companies that are in distress due to poor financial results (for example, as expressed in operating income), and those we identified through our newspaper search as having undergone restructuring. We begin our analysis with a few graphs that differentiate distressed companies that undergo restructuring from distressed firms that do not. We consider three alternative measures for "distress": (1) negative operating income during the previous two years; (2) negative net profits for the previous two years; and (3) an interest coverage ratio below one for the previous two years (this is a cash flow measure calculated by dividing a company's earnings before interest and taxes by its interest expenses).

Figure 1a shows the ratio of all distressed firms that underwent restructuring in each year, using negative operating income as the "distress" marker. There appears to be a downward trend in distressed firms to undergo restructuring. While not reported here, we find a similar downward trend when we use negative net profits to define "distress". In contrast, when we use the interest coverage ratio to identify firms in "distress" (Figure 1b), the trend is less obvious.

Figure 2 shows differences across firms under distress that undergo restructuring from distressed firms that do not, in terms of employment adjustment (using negative operating income as the "distress" marker). It appears that distressed firms under restructuring reduce their labor force more than those not undergoing restructuring. Figure 3 shows that distressed firms under restructuring reduce their investments more than other distressed firms. Thus, these figures suggest that undergoing "restructuring" seems to result in real adjustments.

These figures provide suggestive evidence that the likelihood of a distressed firm to undergo restructuring has changed over time, as may have the measures adopted during restructuring. Of course, these figures do not consider factors other than financial distress, such as industrial composition or size distribution of restructuring companies. Thus, we next conduct regression analysis to control for some obvious factors that may influence the probability of undergoing restructuring or restructuring content.

4.1. Changes in the Likelihood of Undergoing Restructuring

To understand the apparent decline in the incidence of restructuring by distressed firms, we estimate several probit regressions. The dependent variable is "*saiken*", which takes the value 1 if a firm is identified to be under restructuring in that year, and 0 if not. We examine whether the likelihood of undergoing restructuring is determined by whether the company is in financial distress (determined in three different ways: operating income, interest coverage, and net profits), and by the company's dependence on bank borrowing (measured by the ratio of total bank debt to total assets). Moreover, we look at how relations have changed over time.

We report estimation results that use negative operating income as the distress measure in Table 4. The first column contains the minimal specification that includes: the ratio of bank debt to total assets; (the natural logarithm of) total assets (both measured at the beginning of the period); and "distress," which takes the value 1 if the firm has earned negative operating income over the previous two years. The coefficient estimates on these variables are all positive and statistically significant. Thus, not surprisingly, companies in distress are more likely to be restructured. Companies that depend more on bank debt are also more likely to be restructured, as are larger companies. We repeated these estimations using our alternative definitions of distress (interest coverage ratio, net profits). The results are qualitatively similar, and not reported here.

In the specification in the second column, we add a two-year lag of the *saiken* variable as an explanatory variable, to see if a company under restructuring is likely to stay under restructuring for more than two years. We can also think of this as an attempt to control for the existence of chronically depressed and restructured companies. Because the lag of *saiken* is not available for the first year of our sample (1981), the number of observation drops. The coefficient estimate on the lagged *saiken* is positive and statistically significant, suggesting that a company under restructuring is indeed more likely to continue being restructured, even after two years. The coefficient estimates on the other variables are now a bit smaller but still positive and statistically significant.

To interpret the economic importance of these findings, we calculated the marginal change in the probability of restructuring when each left hand side variable changes by an infinitesimal amount (or from 0 to 1 for a dummy variable).[5] For the specification in Column 2, we see that a distressed firm is 10.0% more likely to be under restructuring than a firm not in distress. A firm undergoing restructuring two years earlier is 16.8% more likely to be still under

[5] The calculation is done using the "dprobit" command of the Stata 10.0.

restructuring. When the bank debt to asset ratio increases by 0.20 (which is the standard deviation for the sample, with a mean for the period 1981-2007 of 0.24), the probability of restructuring increases by 1.4%. Finally, for a firm that is larger by one standard deviation, the likelihood of restructuring is larger by 1.9%.

The third specification controls for industry effects, by adding industry dummies. All the coefficient estimates we report remain positive and statistically significant. While there is variation across industries, no industries stand out as driving the results. Calculating industry differences by using the food processing industry as the reference point, we find that firms in the shipbuilding and precision machinery industries face a probability of restructuring that is at least 1% higher. For nonbank financial, ground transportation, warehouse, and electric utility industries this probability is lower by at least 2%. In general, non-manufacturing industries seem to be less likely to be restructured. Moreover, when we estimate the model with just one industry dummy variable that distinguishes manufacturing from non-manufacturing industries, the coefficient on the non-manufacturing dummy is negative. The coefficient estimates imply that the probability of restructuring probability for non-manufacturing firms is lower by 1.2%.

Finally, in the last column, we add "main bank dependence" as an independent variable. This is measured as the amount of loans from the largest lender divided by total bank loans to the company, and the data sample extends only to the year 2002.[6] We find that "main bank dependence" has a positive association, but the finding is not statistically significant. Thus, the likelihood that a company will undergo restructuring increases with the company's dependence on its main bank, but the evidence is statistically weak.

To identify possible change over time, we now look at the three periods – the 1980s, the lost decade, and the strategic inflection of the 2000s – by adding period dummy variables for these sub-periods and interacting them with some key explanatory variables. Table 5 reports the results. The specification in the first column adds the interaction between the period dummy and distress (as identified by operating income). The estimated coefficients on the interaction terms suggest that the impact of distress on the likelihood of restructuring has faded over time. Compared with the 1983-1991 period, during the lost decade the likelihood that a distressed company will undergo restructuring has declined. When calculating the marginal impact on the

[6] This variable was originally calculated by one of the authors for a different research project that covered fewer industries and ended in 2002. In a future version of this paper, we plan to calculate this variable for all companies in our sample, and for all years. While limits on this variable reduce the sample size, we still have 17,800 observations.

probability of restructuring, we find that a distressed firm was 18.0% more likely to be restructured in the 1983-1991 period than a non-distressed firm. This difference in likelihood declined to 16.0% in the 1993-2003 period, but saw an uptick to 16.5% in the 2005-2007 period.

In the second column, we add an interaction term between the bank debt to total assets ratio and the period dummies. The impact of bank debt by a distressed company on the likelihood of restructuring declined during the lost decade of the 1990s. Even though firms that relied more on bank debt continued to be more likely to be restructured during the lost decade, the magnitude of the difference declined, suggesting reduced impact of bank financing, as compared to other forms of financing, in triggering corporate restructuring.

Next, we examine changes in the importance of main bank dependence over time. Again, data constraints reduce the number of observations. Recall that in Table 4 we estimated the impact of main bank dependence without considering possible changes over time, and found the coefficient estimate to be positive but statistically insignificant. When we allow the coefficient estimate to be different for the two subperiods, we find a positive, statistically significant impact for the first period (1983-1991). Thus, in the 1980s, the higher the loans outstanding from the main bank as a percentage of total loans, the more likely was a company to undergo restructuring. Calculating the marginal impact of the main bank dependence on the probability of restructuring using the point estimates of the coefficients, we find that when the main bank dependence increases by 0.17 (the standard deviation of the sample; the mean is 0.28), the restructuring probability increased by 1.0% during the 1983-1991 period. This finding is consistent with the research of this period that main banks engaged in corporate rescue operations in an almost automated fashion. However, during the "lost decade", this was no longer so: during the 1990s, high main bank dependence had no impact on the likelihood that a distressed firm would undergo restructuring. The sum of the last two coefficient estimates is -0.087 for the lost decade. In terms of the marginal impact on the likelihood of restructuring, this implies that an increase in main bank dependence by one standard deviation reduces the probability by 0.1% (essentially zero).

Taken together, these results provide new insights into the changes in determinants for restructuring events over time. Clearly, distressed firms with more bank debt are more likely to be restructured, but over time this tendency has declined. Especially striking is the disappearance of any impact of main bank dependence on the likelihood of restructuring. During the 1980s, a

company that depended highly on its main bank was likely to be restructured. There was no such association during the lost decade.

4.2. Differences in the Processes of Restructuring

In addition to changes in the likelihood of a distressed firm to undergo restructuring over time, our second question is whether restructuring content has changed as well.

We first look at employment adjustment, measured as growth in the number of employees over the previous year. From Figure 2, we already know that, on average, distressed companies undergoing restructuring reduce their labor force more than distressed companies not under restructuring. Regression analysis confirms this result. Here we use the *saiken* variable as an explanatory variable for employment growth. The regression also includes a one-year lag of employment growth, to capture persistence at the firm level. We also include year dummies and industry dummies to control for any time-specific or industry-specific fixed effects. Finally, all regression specifications also include the distress dummy as an explanatory variable.

Table 6 reports the results. To mitigate problems caused by a few extreme observations, in this and all following regressions that use growth variables as the dependent variable, we drop all observations where either the growth rate or the lagged growth rate is below -50% or above 100%. The regression is estimated by OLS, and robust standard errors suggested by White (1980) are reported in parentheses. The basic specification in the first column shows that distressed companies in general have lower employment growth, which is not surprising. When we control for the general effect of distress on employment growth, the regression result shows that companies under restructuring reduce employment even more. The point estimate suggests that employment growth in firms undergoing restructuring is 3.5% lower.

The specification in the second column adds the interaction term between the distress variable and *saiken* to examine whether the impact of restructuring on employment adjustment is more pronounced for distressed firms or non-distressed firms. While the result is not statistically significant, the coefficient estimate on the interaction term suggests that impact on employment adjustment is stronger for firms in distress. The point estimate suggests that when a firm is not in distress, restructuring lowers employment growth by 3.1%, but when the firm is in distress, restructuring lowers employment growth by 4.7% (on top of the 2.9% employment growth

reductions due to distress). In the third column, we introduce interaction terms between *saiken* and the period dummies to see whether the employment impact of restructuring changed over time. The estimated coefficients on all interaction terms are tiny and not significantly different from zero. Thus, we conclude that restructuring consistently led to lower employment growth throughout the entire period.

Table 7 reports a similar regression analysis with capital growth (growth in depreciable assets, a proxy for investment rate) as the dependent variable. Similar to employment growth, distressed firms display reduced capital growth. Figure 3 suggested that distressed firms under restructuring reduce capital growth more than other distressed firms. Regression analysis confirms this finding and shows that firms under restructuring reduced investments by 4.6% more than other firms in the basic specification (Column 1). In Column 2, we add the interaction term to allow the impact of restructuring to differ between distressed firms and non-distressed firms. For non-distressed firms, undergoing restructuring meant reduced investment by 4.5% (nearly identical to the Column 1 result). For firms in distress, however, undergoing restructuring meant a reduction by 1.4%, as compared to a firm in distress but not under restructuring.

Morever, the period/distress interaction term in Table 7 is positive and statistically significant for the lost decade, suggesting that during the 1990s firms under restructuring did not reduce capital growth as much as they used to, or have done in the 2000s. Recall from Table 3 that the average growth rate of capital for all firms during the first period was 8.2%. The point estimates of our regression suggest that during the 1980s a firm undergoing restructuring reduced capital growth to 2.8%, which represents a reduction of 5.4%. During the lost decade, in contrast, the average capital growth rate was 1.3%, but firms under restructuring reduced capital by 1.6%. While this reduction by 2.9% is still substantial, it is less than in the 1980s, and it is also less than in the mid-2000s, when a reductiong by 4.3% during restructuring compared with an average capital growth rate of 1.6%. Taken these findings together and combining them with insights drawn from Table 5, it appears that during the lost decade fewer firms in distress underwent restructuring, and when they did, the magnitude of their investment adjustments was smaller. This is consistent with the notion that corporate restructuring during the lost decade was at times tentative.

Similar regressions reported in Table 8 examine the growth of bank loans during restructuring. Research has shown that there is no stereotypical *modus operandi* in this regard: In some cases, the main bank may increase loans to help a troubled client while in other cases

reducing the debt burden may be more effective for the turnaround effort, with debt forgiveness being the extreme example. There is no empirical evidence that the average firm under main bank rescue increased its loans, as pointed out by Miwa (1985) and Hoshi, Kashyap and Scharfstein (1990). However, our results suggest that the lost decade was different. Whereas we find that growth rates of bank loans to restructuring firms were not different from those to non-restructuring firms during the 1980s and the 2000s, in the 1993-2003 period companies under restructuring seem to have received additional loans. The point estimates suggest that an average increase in bank borrowings by 0.4% during the 1993-2003 period (as shown in Table 3) compared to a 2.1% increase in bank loans by firms under restructuring. Ironically, Peek's findings (in this volume) suggest that this is exactly the period when additional loans from the main bank lost effectiveness, as there is no evidence that increased main bank loans helped companies either in terms of performance or evaluation during this period.

Table 9 shows regression results for the growth rate of total debt. In contrast to the previous finding, distressed firms tend to have lower total debt growth in all specifications. It is not clear whether this is demand-driven (the company refrains from taking on more debt) or supply-driven (creditors refuse to lend more). The result for the basic specification suggests that firms under restructuring reduce debt by 1.6%.[7] The interaction term between DISTRESS and *saiken* is not statistically significant, meaning there is no difference in the impact of restructuring between firms in distress and firms not in distress. Moreover, the coefficient estimate on the interaction between *saiken* and the lost decade dummy is positive and offsets the negative coefficient on the *saiken* variable. From this we can see that during the lost decade, restructuring did not effect the growth rate of debt. In other words, while restructuring meant debt reduction in the 1980s, it did not in the 1990s. The point estimates suggest that while the average debt growth in the 1980s was 5.6% (again as shown in Table 3), firms undergoing restructuring showed debt growth of only 2.3%. Yet, in the 1990s, the average debt growth was -0.15% (i.e., the average firm reduced debt by 0.15%), regardless of restructuring. This finding is consistent with the previous, in that restructuring efforts during the lost decade often remained tentative.

Overall, we find that firms under restructuring tended to reduce their growth of employment, capital, and total debt, though not bank loans. However, the lost decade was different in that companies under restructuring did not stand out for lower debt growth, and in

[7] One might think that loan write-offs could effect this outcome, but note that we are using balance sheet data from companies for this analysis. A loan write-off in a given year would appear on the bank's balance sheet only, not on the company's.

fact may have seen higher bank loan growth than companies not under restructuring. Moreover, even though companies under restructuring cut employment growth and capital growth during the lost decade, the extent to which they reduced capital growth was significantly smaller.

4.3. The Role of the Restructuring Leader

We now turn to the question whether there are differences in process, depending on who leads the restructuring episode. Table 2 showed preliminary data on such differences, as well as six categories of leaders of restructuring: the main bank, a group of banks, a company or group of companies, a combination thereof, or an equity fund.

First, we examine whether growth of employment, capital, bank loans or total debt differ depending on the identity of the leader(s). To do this, we regress the growth variable on its lag and six dummy variables, each taking the value 1 for a particular type of leadership. Since our regression includes a constant term, the excluded category is self-leadership (including cases where the restructuring leader is unidentified). Results reported in column 1 of Table 10 show no differences across restructuring leadership in terms of employment growth. Likewise, capital growth rates do not differ greatly, with one exception: when a group of companies leads the restructuring, capital growth is reduced more than with other leaders (column 2).

In contrast, in terms of bank loan growth we find some interesting differences (column 3). Loans are reduced more when one bank leads the restructuring effort. This result is statistically significant, suggesting that a bank as rescue leader seems to ask for more aggressive measures of financial restructuring. A similar finding is observed for total debt growth.

The apparent differences between bank leadership and other types of leadership prompt us to look at the factors that make a bank-led restructuring more likely, and whether those factors have changed over time. To examine this issue, we estimate a series of probit models similar to those above, regarding the determinants of restructuring events and changes over time. Here, the dependent variable, “bank-led”, takes the value 1 if a restructuring episode is led by a single bank (probably the main bank), and 0 otherwise. Note that the bank-led variable is defined only for those firms under restructuring that we coded for our database, and the sample size for this analysis is at most 1,756. Industry dummies are included in all specifications, as are year dummies when we add interaction terms with periods.

As shown earlier, in general restructuring firms tend to be larger and have a higher dependence on bank debt. The results in Table 11 indicate that large size and a high ratio of bank debt to assets also increase the probability that restructuring is led by a bank. Interestingly, the distress dummy does not seem to matter, suggesting that the likelihood of bank-led restructuring (as opposed to other leaders) does not depend on whether a company is in distress or not, at least as measured by our classifications of negative operating income, interest coverage ratio or negative net profits.

The specification in the second column includes main bank dependence as an additional explanatory variable. As one might expect, we find that higher dependence on a main bank increases the probability of bank-led restructuring.

The last two columns report estimation results with various interaction terms with periods. None of these is statistically significant. Thus, we do not find any significant change over time in the determinants of bank-led restructuring. We therefore conclude from Table 11 that, conditional on a restructuring event, the likelihood that the restructuring is led by a single bank is positively influenced by the firm's size, dependence on bank debt in general, and dependence on the main bank in particular. We do not find any significant changes over time.

5. Conclusions

Using a unique database on major corporate restructuring cases in Japan, this paper has examined possible changes in rescue mechanisms over time, and the role of the main bank in corporate restructuring in Japan. We have looked at what type of firms are more likely to be restructured, what restructuring implies for the company's employment, investment, and debt, and how those relations have changed over time, and in particular during the lost decade.

Our analysis offers four important findings. First, the likelihood for firms in distress to undergo restructuring has decreased over time. Throughout the period 1981-2007, the larger the company in distress and the higher its dependence on bank debt, the more likely it was to undergo restructuring. However, this likelihood has declined over time.

Second, during the 1980s a high dependence on loans from a main bank meant a higher likelihood that a company would undergo restructuring. However, this was no longer true during

the lost decade. During the 1990s, high main bank dependence had no impact on the likelihood that a firm would undergo restructuring.

Third, the lost decade was also different in terms of content of restructuring. During the 1990s firms under restructuring, if compared with firms not undergoing restructuring, did not reduce investments as much as they did in the 1980s. At the same time, these firms did not reduce debt as much either, and may have increased bank borrowing. Even though restructuring firms reduced employment more than other firms, overall it appears that restructuring efforts during the lost decade were less aggressive than they used to be in the 1980s, and as they appear to be again in the 2000s.

Finally, we find that even though main bank-led restructuring appeared to happen less frequently over time, when it happened it seemed to be effective in terms of pushing financial adjustments. When a bank took charge, the distressed firm reduced debt and bank loans more aggressively.

Overall, the results are consistent with the notion that corporate restructuring was less frequent and less decisive during the 1990s, and that the lack of vigorous restructuring slowed down the Japanese economy. Our results show that there were some large and highly bank-dependent companies in distress in the 1990s that would have been restructured in the 1980s but were not during the lost decade. This decline in restructuring activity was apparently linked to a reluctance by main banks to intervene in troubled companies, as firms with high main bank dependence were more likely to be restructured in the 1980s than in the 1990s. It is possible that banks were themselves in too much trouble to bail out their failing clients, or that financial deregulation and a changing bank-firm relationship, in combination with the reforms of the 1990s, have altered the behavior of banks. Either way, supporting arguments proposed by Caballero, Hoshi, and Kashyap (2008) and others, the lessened role of the main banks in pushing corporate restructuring during the 1990s, and the slow emergence of alternative mechanisms and players only in the 2000s, may have contributed to the 1990s becoming a "lost" decade.

At the same time, main banks continue to lead some episodes of corporate restructuring, and if they do we find the restructuring effort to reduce growth of bank borrowing and debt more drastically. Thus, it is possible that the banks are still willing and able to restructure troubled clients as well as, or even better than, they used to do, but that they have become more selective in doing so. The inquiry of this interesting question is left for the future research.

References

Aoki, Masahiko and Hugh Patrick (Eds.). 1994. *The Japanese Main Bank System.* Oxford, UK: Oxford University Press

Caballero, Ricardo, Takeo Hoshi, and Anil Kashyap (2008). "Zombie Lending and Depressed Restructuring in Japan." *American Economic Review*.

Hirota, Shin-ichi, and Hideaki Miyajima (2001). "Mein Banku Kainyu-gata Gabanansu ha Henka Shitaka? (Has Main Bank-led Governance Changed?)," *Gendai Fainansu,* No.10、35-61.

Hoshi, Takeo, and Anil Kashyap (2001). *Corporate Financing and Governance in Japan: Road to the Future.* Cambridge, MA: MIT Press.

Hoshi, Takeo, Anil Kashyap and David Scharfstein (1990). "The Role of Banks in Reducing the Costs of Financial Distress in Japan," *Journal of Financial Economics*, 27, 67-88.

Iwaisako, Tokuo (2005). "Corporate Investment and Restructuring," in Takatoshi Ito, Hugh Patrick, and David Weinstein (Eds.) *Reviving Japan's Economy*. Cambridge, MA: MIT Press, 275-310.

Kang, Jun-Koo & Shivdasani, Anil. 1995. Firm Performance, Corporate Governance, and Top Executive Turnover in Japan. *Journal of Financial Economics*, 38:29-58

Kaplan, Steven N. & Minton, Bernadette A. 1994. Appointments of Outsiders to Japanese Boards: Determinants and Implications for Managers. *Journal of Financial Economics*, 36:225-258.

Koibuchi, Satoshi (2007). "Debt Forgiveness during the 'Lost Decade': Impacts of the Industrial Revitalization Corporation of Japan", Paper presented in 9th Macroeconomic Conference held at Keio University, Japan (December 1, 2007).

Morck, Randall & Nakamura, Masao. 1999. Banks and Corporate Control in Japan. *The Journal of Finance*, 54 1:319-339.

Peek, Joe and Eric S. Rosengren, (2005). "Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan," *American Economic Review*, 95, 1144-1166.

Schaede, Ulrike (2008). *Choose and Focus: Japanese Business Strategies for the 21st Century.* Ithaca, NY: Cornell University Press.

Sekine, Toshitaka, Kobayashi, Keiichiro, and Yumi Saita (2003). "Forbearance Lending: The Case of Japanese Firms," *Monetary and Economic Studies*, 21, 69-91.

Sheard, Paul. 1989. The Main Bank System and Corporate Monitoring and Control in Japan. *Journal of Economic Behavior and Organization*, 11:399-422.

Sheard, Paul (1994). "Main Banks and the Governance of Financial Distress," in Masahiko Aoki and Hugh Patrick (Eds.) *The Japanese Main Bank System.* Oxford, UK: Oxford University Press, pp.188-230.

TSE (Tokyo Stock Exchange). 2007. Heisei 18nendo kabushiki bunpu jōkyō no chōsa kekka ni tsuite (Results of the 2006 Survey on Shareholdings). http://www.tse.or.jp/data/examination/distribute/h18/distribute_h18a.pdf. Tokyo.

White, Halbert (1980). "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica*, 48: 817-838.

Yanagawa, Noriyuki (2006). *Hō to Kigyō Kōdō no Keizai Bunseki (Economic Analysis of Law and Corporate Behavior)*. Tokyo, Japan: Nihon Keizai Shimbun-sha.

Table 1: Summary Statistics for 1,756 Restructuring Cases, 1981-2007

Period	**1981-1991**	**1993-2003**	**2005-2007**
Number of restructuring cases	572	929	255
Intervention	37.94%	37.03%	41.96%
director dispatch	23.08%	17.98%	20.39%
managerial turnover	22.20%	26.26%	31.76%
change of restructuring plan	2.62%	3.34%	3.92%
executive bonus cut	4.20%	6.24%	4.31%
Capital Changes	25.87%	22.17%	23.53%
Asset sale	23.95%	17.87%	20.00%
stock sale	6.64%	8.29%	8.63%
Business Plan Changes	55.77%	57.05%	60.00%
size reduction	12.24%	12.81%	21.18%
cost reduction	19.76%	18.30%	25.10%
Sales promotion	19.76%	12.49%	30.98%
exit from a business line	9.44%	15.72%	23.92%
new entry	9.97%	3.66%	8.63%
spin off	17.13%	10.23%	14.12%
liquidation of affiliated companies	8.92%	16.58%	14.12%
Corporate Finance Changes	16.61%	19.16%	30.20%
New loans	3.32%	3.44%	5.49%
interest reduction	5.59%	3.23%	0.39%
Debt forgiveness	2.27%	5.71%	5.88%
Debt equity swap	0.17%	1.18%	3.53%
new equity issue	8.39%	10.76%	23.92%
equity reduction	2.80%	3.55%	6.27%
Labor Adjustment	26.22%	28.63%	21.57%
relocation of labor	8.04%	5.38%	5.88%
furlough	0.70%	0.32%	0.00%
Stop new hires	5.94%	7.75%	1.96%
Early retirement	10.14%	16.25%	13.33%
layoffs	4.72%	3.66%	2.35%
shukko	7.34%	6.14%	2.75%
wage reduction	2.62%	3.01%	3.92%
bonus cut	1.05%	1.40%	1.18%
Reorganization (exits, spinoffs, and size reduction)	32.69%	42.63%	41.18%
Employment Adjustment (relocation, furlough, hire stop, retirement, and layoffs)	25.17%	27.56%	20.78%
Salary Adjustment (wage or salary cuts and executive bonus reduction)	5.77%	7.97%	6.67%

Table 2: Overview Data: Differences in Restructuring, by Restructuring Leader

	Self-direct or NA	Main Bank	Industrial Firm	Group of Banks	Group of Firms	Banks and Firms	Funds	Total
Total	1,058	147	321	50	42	108	30	1,756
Bankruptcy Laws								
NA	1,019	142	284	43	37	101	27	1,653
Liquidation	0	1	1	1	0	2	0	5
Corp. Reorganization (rev. 2003)	26	1	24	4	4	1	0	60
Commercial Code (until 2006)	0	1	2	0	0	0	0	3
Composition (until 2000)	1	0	0	0	0	0	0	1
Civil Rehabilitation (after 2000)	12	2	10	2	1	4	3	34
Total Court Supervised	39	5	37	7	5	7	3	103
Number of Executives Dispatched								
0	1,045	74	169	33	22	41	21	1,405
1	8	52	97	7	12	25	5	206
2	4	11	30	6	2	15	3	71
3	0	4	6	1	3	5	0	19
4	0	1	6	2	1	10	0	20
5-13	1	5	13	1	2	12	1	35
Replacement of Executives								
No replacement	851	95	209	34	27	69	19	1,304
Yes	207	52	112	16	15	39	11	452
Revisions of Reorganization Plan								
None	1,033	136	317	43	41	101	29	1,700
Once	24	11	3	6	1	6	1	52
Twice	0	0	1	1	0	0	0	2
Three times	1	0	0	0	0	1	0	2
Involved exit, spinoff or liquidation of affiliates								
No	643	75	240	20	19	51	20	1,068
Yes	415	72	81	30	23	57	10	688
Involved labor adjustments								
No	764	109	264	33	32	71	30	1,303
Yes	294	38	57	17	10	37	0	453
Involved salary adjustments								
No	989	131	311	38	40	94	29	1,632
Yes	69	16	10	12	2	14	1	124

Table 3: Summary Statistics for Financial Data for All Listed Firms, 1981-2007 (averages for each period; in million Yen)

Period	1981-1991	1993-2003	2005-2007
% of firms under restructuring	4.14%	5.28%	4.31%
% of firms with negative net profits for 2 years in a row	1.86%	6.33%	5.08%
% of firms with interest coverage ratio <1 for 2 years in a row	12.32%	17.39%	12.69%
% of firms with negative operating income for 2 years in a row	1.67%	4.43%	3.52%
total assets	130,496	166,887	169,573
total bank loans	39,364	39,812	32,101
total debt	52,441	63,110	51,297
bank debt to total assets ratio	25.61%	24.34%	18.29%
total debt to total assets ratio	29.44%	29.79%	21.61%
operating income / total assets	6.85%	4.74%	9.09%
operating income	6,258	5,560	7,140
net profit / total assets	2.95%	1.05%	4.64%
net profit	2,376	1,447	3,562
interest coverage ratio	0.65	4.67	3.38
main bank dependence (proportion of loans from the largest lender)	26.46%	28.46%	NA
amount of loan from the largest lender	3,514	5,492	NA
employment growth	0.85%	-1.34%	1.18%
growth of depreciable assets	8.16%	1.28%	1.58%
bank borrowing growth	3.97%	0.41%	-1.37%
total debt growth	5.57%	-0.15%	-1.72%

Note: The last four rows are calculated for the sub-sample that we use for regression analyses in Tables 6 through 9, and excludes outliers of those variables.

Figure 1: Restructuring and Distress

Figure 1a: Ratio of firms under restructuring to number of firms with negative operating income during the previous two years

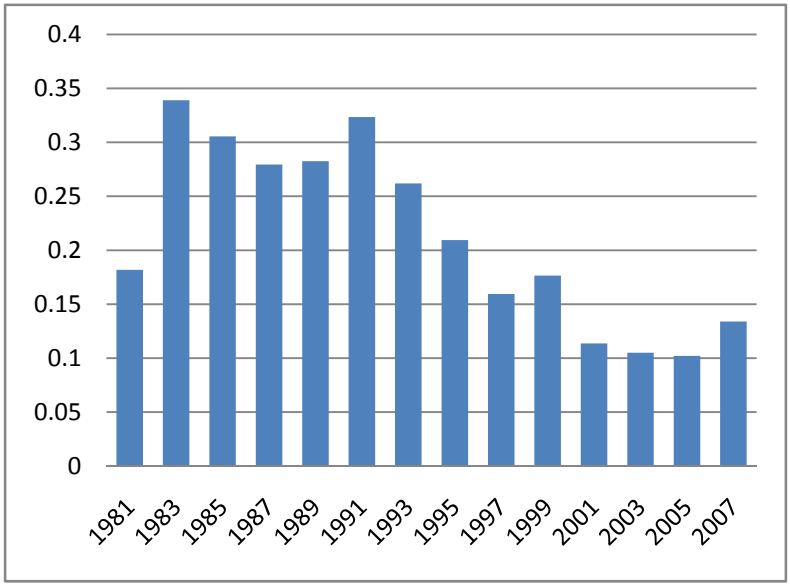

Figure 1b: Ratio of firms under restructuring to number of firms with interest coverage ratio <1 for the previous two years

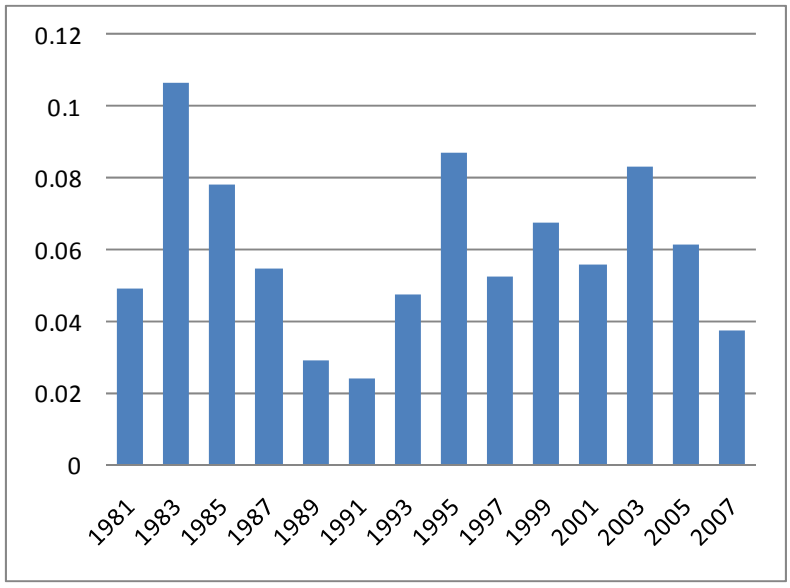

Figure 2: **Employment adjustment by firms under distress, comparing firms under restructuring (solid line) with firms not under restructuring (dotted line)**

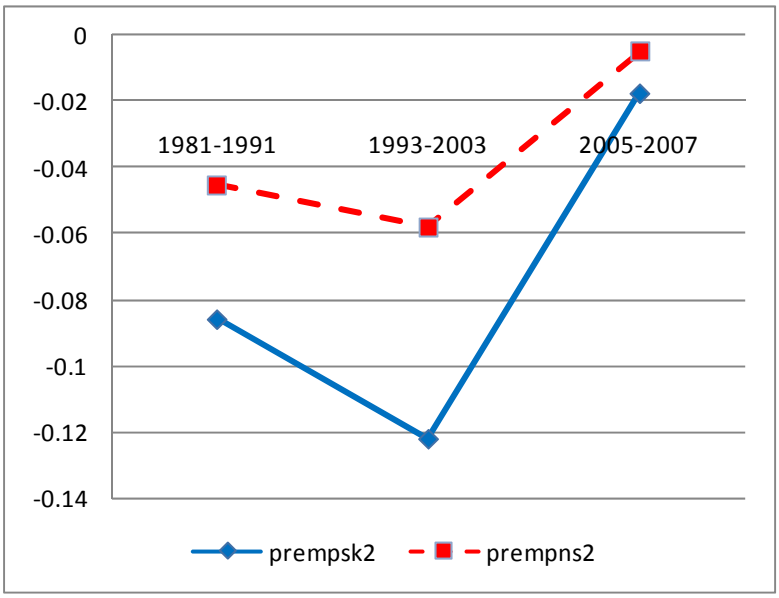

Figure 3: **Growth of depreciable assets by firms under distress, comparing firms under restructuring (solid line) with firms not under restructuring (dotted line)**

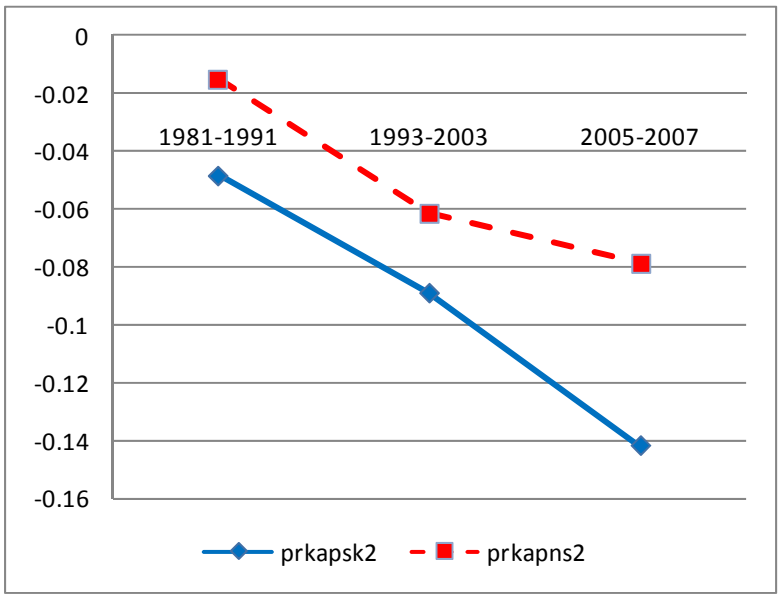

Table 4: Regression Results: Determinants of Restructuring

Variables	(1)	(2)	(3)	(4)
bank debt / total assets	1.197	1.025	1.381	1.484
	(0.055)	(0.059)	(0.070)	(0.093)
DISTRESS	0.991	0.787	0.764	0.693
	(0.042)	(0.045)	(0.046)	(0.057)
Log(total assets)	0.196	0.168	0.206	0.201
	(0.007)	(0.008)	(0.009)	(0.013)
saiken 2 years ago		1.074	0.968	0.877
		(0.039)	(0.040)	(0.049)
main bank dependence				0.179
				(0.113)
Year dummies	No	No	No	No
Industry dummies	No	No	Yes	Yes
Number of observations	36488	33640	33308	17868

Notes to Table 4: The dependent variable is *saiken* that takes the value 1 if the firm was under restructuring during the year, and 0 otherwise. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the coefficient estimates and standard errors (in parentheses) for a probit model. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 5: Determinants of Restructuring: Changes Over Time

Variables	(1)	(2)	(3)
bank debt / total assets	1.382	1.555	1.543
	(0.072)	(0.122)	(0.096)
bank debt / total assets		-0.293	
X (1993-2003 dummy)		(0.144)	
bank debt / total assets		-0.041	
X (2005-2007 dummy)		(0.210)	
DISTRESS	1.188	1.176	1.085
	(0.086)	(0.087)	(0.102)
DISTRESS	-0.596	-0.572	-0.533
X (1993-2003 dummy)	(0.103)	(0.104)	(0.120)
DISTRESS	-0.376	-0.355	
X (2005-2007 dummy)	(0.152)	(0.152)	
log(total assets)	0.207	0.207	0.202
	(0.009)	(0.009)	(0.013)
saiken 2 years ago	0.993	0.994	0.896
	(0.041)	(0.041)	(0.049)
main bank dependence			0.765
			(0.177)
main bank dependence			-0.852
X (1993-2003 dummy)			(0.212)
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Number of observations	33308	33308	17868

Notes to Table 5: The dependent variable is *saiken* that takes the value 1 if the firm was under restructuring during the year, and 0 otherwise. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the coefficient estimates and standard errors (in parentheses) for a probit model. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 6: Restructuring and Employment Growth

Variables	(1)	(2)	(3)
lagged employment growth	0.303	0.303	0.303
	(0.011)	(0.011)	(0.011)
DISTRESS	-0.032	-0.029	-0.032
	(0.004)	(0.004)	(0.004)
saiken	-0.033	-0.031	-0.032
	(0.003)	(0.003)	(0.004)
DISTRESS		-0.016	
x *saiken*		(0.011)	
Saiken x period 3 dummy			-0.0040
(1993-2003)			(0.0060)
Saiken x period 4 dummy			0.0078
(2005-2007)			(0.0091)
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Number of observations	26,750	26,750	26,750
R-squared	.192	.192	.192

Notes to Table 6: The dependent variable is the growth rate of number of employees for the firm. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the result for a regression model. The models are estimated using ordinary least squares (OLS). Each cell shows the coefficient estimate and the White (1980) standard error. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 7: Restructuring and Capital Growth

Variables	(1)	(2)	(3)
lagged capital growth	0.138	0.138	0.138
	(0.008)	(0.008)	(0.08)
DISTRESS	-0.051	-0.056	-0.051
	(0.005)	(0.005)	(0.005)
saiken	-0.046	-0.045	-0.054
	(0.005)	(0.005)	(0.008)
DISTRESS		0.031	
X *saiken*		(0.016)	
saiken			0.025
X (1993-2003 dummy)			(0.010)
saiken			-0.0046
X (2005-2007 dummy)			(0.017)
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Number of observations	26750	26750	26750
R-squared	.100	.101	.101

Notes to Table 7: The dependent variable is the growth rate of depreciable assets for the firm. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the result for a regression model. The models are estimated using ordinary least squares (OLS). Each cell shows the coefficient estimate and the White (1980) standard error. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 8: Restructuring and Bank Loan Growth

Variables	(1)	(2)	(3)
lagged bank loan growth	0.149	0.149	0.148
	(0.008)	(0.008)	(0.008)
DISTRESS	-0.0049	-0.0011	-0.0047
	(0.0068)	(0.0072)	(0.0068)
saiken	-0.0009	0.0021	-0.017
	(0.0064)	(0.0068)	(0.011)
DISTRESS		-0.023	
X *saiken*		(0.020)	
saiken			0.034
X (1993-2003 dummy)			(0.014)
saiken			-0.020
X (2005-2007 dummy)			(0.020)
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Number of observations	26750	26750	26750
R-squared	.045	.045	.046

Notes to Table 8: The dependent variable is the growth rate of total bank borrowings by the firm. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the result for a regression model. The models are estimated using ordinary least squares (OLS). Each cell shows the coefficient estimate and the White (1980) standard error. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 9: Restructuring and Growth of Total Debt

Variables	(1)	(2)	(3)
lagged total debt growth	0.118	0.118	0.117
	(0.008)	(0.008)	(0.008)
DISTRESS	-0.017	-0.015	-0.017
	(0.006)	(0.007)	(0.006)
saiken	-0.016	-0.015	-0.033
	(0.006)	(0.006)	(0.011)
DISTRESS		-0.010	
X *saiken*		(0.019)	
saiken			0.033
X (1993-2003 dummy)			(0.013)
saiken			-0.004
X (2005-2007 dummy)			(0.019)
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Number of observations	26750	26750	26750
R-squared	.048	.048	.048

Notes to Table 9: The dependent variable is the growth rate of total debt of the firm. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the result for a regression model. The models are estimated using ordinary least squares (OLS). Each cell shows the coefficient estimate and the White (1980) standard error. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 10: Restructuring by Identity of Leader

Dependent Variable →	Employment Growth	Capital Growth	Bank Loan Growth	Total Debt Growth
Explanatory Variables ↓	(1)	(2)	(3)	(4)
lagged dependent variable	0.228 (0.045)	0.193 (0.041)	0.163 (0.038)	0.104 (0.036)
DISTRESS	-0.052 (0.011)	-0.018 (0.015)	-0.025 (0.019)	-0.028 (0.017)
single bank-led	-0.009 (0.009)	-0.015 (0.019)	-0.059 (0.019)	-0.054 (0.019)
led by a single industrial firm	0.007 (0.007)	-0.018 (0.012)	-0.010 (0.019)	0.002 (0.018)
led by a group of banks	-0.020 (0.020)	0.0004 (0.036)	0.055 (0.045)	0.006 (0.028)
led by a group of industrial firms	-0.041 (0.020)	-0.068 (0.032)	-0.054 (0.044)	-0.091 (0.036)
led by a group of banks and industrial firms	0.006 (0.015)	-0.031 (0.019)	0.006 (0.025)	-0.002 (0.023)
private equity fund-led	-0.018 (0.023)	-0.075 (0.047)	-0.020 (0.045)	-0.007 (0.045)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Number of observations	1260	1260	1260	1260
R-squared	.175	.125	.101	.100

Notes to Table 10: The dependent variable is specified in the first row of the table. The sample includes only those firms that are under restructuring. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the result for a regression model. The models are estimated using ordinary least squares (OLS). Each cell shows the coefficient estimate and the White (1980) standard error. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.

Table 11: Determinants of Bank-led Restructuring

Variables	(1)	(2)	(3)	(4)
bank debt / total assets	1.143	1.370	0.911	1.312
	(0.237)	(0.307)	(0.383)	(0.311)
bank debt / total assets			0.462	
X (1993-2003 dummy)			(0.489)	
bank debt / total assets			-0.690	
X (2005-2007 dummy)			(0.744)	
DISTRESS	-0.040	-0.219	0.099	-0.190
	(0.141)	(0.182)	(0.160)	(0.205)
DISTRESS			-0.083	-0.013
X (1993-2003 dummy)			(0.180)	(0.205)
DISTRESS			-0.430	
X (2005-2007 dummy)			(0.477)	
log(total assets)	0.081	0.058	0.108	0.092
	(0.033)	(0.045)	(0.035)	(0.048)
main bank dependence		1.065		0.678
		(0.375)		(0.541)
main bank dependence				0.888
X (1993-2003 dummy)				(0.663)
Year dummies	No	No	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Number of observations	1446	966	1446	966

Notes to Table 11: The dependent variable takes the value 1 if the firm's restructuring is led by a single bank during the year, and 0 otherwise. The sample includes only those firms under restructuring. Thus, the 0 value for the dependent variable means that the restructuring is led by entities other than a single bank or the leader is not clear. DISTRESS takes 1 if the firm experienced negative operating income in the previous two years. Each column reports the coefficient estimates and standard errors (in parentheses) for a probit model. The sample period is every odd year from 1981 to 2007. The model also includes a constant term. The rows "Year dummies" and "Industry dummies" indicate inclusion of these dummies (yes/no). The coefficient estimates for the year dummies, industry dummies and the constant term are not reported.