

**Relational Banking in post Bubble Japan:
Co-existence of soft-and hard budget constraint**

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1. Introduction.

Since the Japanese financial system has left banks in a more important position than in other countries, it is classified as a relationship-based financial system¹. In the heyday of the relationship-based financial system, the main bank played an active role not only in supplying funds to a firm, but also in disciplining the firm's top management team, engaging in ex-ante, interim, and ex-post monitoring of client firms. (Aoki et al. 1994). Under this system a main bank is charged with the task of supplying new money for the investment projects of client firms, mitigating an asymmetric information problem between lender and borrower through intensive monitoring. Main banks do not themselves intervene in the management of well-performing borrowers. In times of financial distress, however, main banks dispatch representatives to client firms, and at times take over the boards of the firms, and take an initiative in restructuring the firms. This disciplinary mechanism differs from the Anglo-American system based on takeovers and bankruptcy procedures.

The bright side of relational financing in its heyday (1960s to 1970s) is supported by various types of regulation on new entry, interest rates on deposits, and market financing (bond issuance). These regulations guarantee to the banking sector the monopolistic rent that might provide incentives to take a long-term strategy for banks. Because, as Petersen and Rajan (1995) explain, in monopolistic markets, banks can bail out distressed firms with the expectation that they can impose higher interest rates in the future on that firm.

However, these regulations were liberalized since the early 1980s. Financial restraint in the sense of Helman, Mardock and Stiglitz (1997) disappeared with the deregulation of deposit interest rates during the 1980s. The deregulation of bond issuance proceeded step by step during the 1980s, and reached its final stage in January 1996 when bond issuing criteria and some other covenants were removed, freeing

¹ Relational financing is a type of financing in which the financier is expected to make additional financing in a class of uncontractible states in the expectations of future rents (Aoki and Dink 2000:20).

Japanese firms from the regulation with regard to debt choice². Last, entry regulation was relaxed since the Financial System Reform Act of 1993, and completely abolished by the financial “Big Bang” of 1996. These changes in regulatory framework, together with the decline of new money demand among firms, have affected the incentives of both firms and banks to keep relational financing.

Further, the bank-firm relationship for the past decade has been most remarkably affected by the problems afflicting the banking sector over the past decade.

As a result of the dramatic decline of asset prices in the early 1990s, non-performing loan problems in the banking sector have become severe. After costly resolution of the *Jusen* problem (Housing Loan Companies insolvency problems), the Japanese banking sector was involved in a serious crisis in October 1997. Banks were required to write off non-performing loans, which might reduce their lending ability to borrowers. When banks rather than borrowers have troubles, this must have a huge effect on the bank-firm relationship.

Along with these developments, the dark side of the main bank system gradually overshadowed its bright side. Recent works document that the close ties with main banks induced firms to make “excess” investments in the bubble period (Horiuchi 1995, Miyajima, Arikawa and Kato 2002). The banking crisis in the 1990s may have placed financial constraint on bank dependent firms (Kang and Stultz 2000). It also gave banks an incentive to take the “ever-greening” of old loans to almost insolvent firms for to bolster their balance sheet (Peek and Rosengren 2003). The purpose of this chapter is to provide an overview of developments in the relationship financing in Japan for the past decade. The final goal of this chapter is to answer following a series of questions: Is the Japanese financial system still defined by the relationship-based financial system? If the answer is at least yes in part, does relational financing still play its expected welfare-enhancing role (the bright side) or rather plays a welfare-decreasing role (the dark side)? If the dark side of the main bank system overwhelmed its bright

² In November 1990, every criteria except the rating criteria was lifted from the Bond Issue Criteria. In April 1993, the lowest bound of the rating criteria for issuing unsecured straight bond was lowered to BBB. See details at Hoshi et al.(1993), Miyajima and Arikawa (2000).

side, then why did it happen and what is the future of the main bank system?

To address these issues, we begin by summarizing the bank-firm relationship at the time of the bubble collapse in 1990, showing that bank-firm relationships are not more homogenous in Japanese listed firms. Along with well-known facts of discrepancy of bank dependence across industries, we highlight two untouched puzzling facts. The first is the increasing dependence on bank borrowing in spite of the complete deregulation of bond issuance in the mid 1990s. By showing the estimation result on debt choice, we suggest that increasing bank dependence could be the result of the rational choice of both firms and banks, and thus bank borrowing increasingly became important for both firms with high risk and firms with high growth opportunities without a solid reputation.

The second is that among bank dependent firms, main-bank loan concentration increased with widening of the standard deviation. It implies that the bank-firm relationship has been getting heterogeneous in the 1990s, and there are a certain number of firms that increasingly depend for their financial resources on their main bank. On the cause of this increasing commitment, we raise two possible interpretations: either the banks picked a winner and took an initiative to promote corporate restructuring based on healthy incentives, or the banks rolled over their loans and adopted 'evergreen polices,' delaying corporate restructuring of borrowers based on perverse incentives.

Since what is new in the 1990s is that banks rather than borrowers were beset with problems, understanding the impact of the banking crisis on borrowers is naturally essential for understanding the current bank-firm relationship. Introducing the growing literature on this topic such as Brewer et al. (2003) and Miyajima and Yafeh (2004) that focus on the market response of borrowers to the banking crisis, we show that the bank crisis does matter, but has not affected Japanese firms equally. The banking crisis is especially harmful not only for firms with high leverage and high bank dependence, but also for firms with low profitability and high risk in low-tech industries. These results imply that the market pushed the "creative destruction," and thus the banking crisis is not necessarily welfare decreasing. However, the "creative

destruction” interpretation derived from the market model merely shows the market response of firms to banking crisis, and it is still unclear whether the banking crisis has had a substantial effect on corporate investment and restructuring.

The rest of this chapter is devoted to addressing these issues, decomposing them into the following two sets of questions: Did firms with positive NPV really suffer from the banking crisis driven credit crunch or not? And did the bank-firm relationship really matter in terms of intensifying the credit crunch? Estimating a standard model of the investment function, we show that there is no evidence that firms with high growth opportunities have been seriously impacted by a credit crunch in general. On the other hand, however, we find that the high commitment of main banks has a strong negative effect on firm’s investment. This is consistent with the understanding that the main bank relationship imposed a hard budget constraint on client firms with high growth opportunities through the bank’s strong position in negotiations with client firms, instead of encouraging investment by mitigating agency problems.

Second, if the market response encourages “creative destruction”, does the main bank actually encourage corporate restructuring, and does its high commitment really help to provide incentives for borrowers’ restructuring? Estimating the employment adjustment function by identifying the firms facing serious earnings declines, we highlight that high bank dependence itself exhibits the expected encouraging effect on employment adjustment. However, the concentration of main bank loans is associated with the delay of employment reduction in firms facing serious earnings declines, and on the other hand with high employment reduction in firms that are keeping their earnings.

Thus, the main bank in the 1990s has played an almost reverse role from the one it is supposed to play: i.e. the main bank imposed hard budget constraints on firms with positive NPV, while it did not discipline effectively those firms that are really require corporate restructuring (soft budgeting).

This chapter is organized as follows. The next section summarizes the changes in corporate finance in the 1990s. Section three explores the effect of the banking crisis on the firm. The subsequent two sections examine the role of the bank-firm

relationship, dividing sample firms into sub-groups by certain criteria such as their growth opportunities. Section four sheds light on the role of relational banking on investment in firms with high growth opportunities. Section five examines their role in corporate restructuring in firms with decreasing profits. The last section provides some conclusions.

2 Two Puzzling Features in Corporate Finance

2-1 Changes in corporate finance

Against a backdrop of drastic changes in macroeconomic circumstances and deregulation, to what extent did corporate finance among Japanese listed firms shift away from the former bank-based pattern? Let us begin to summarize the corporate finance practices of non-financial listed firms in the First Section of the Tokyo Stock Exchange.

Our starting point is the end of FY 1989, when the bubble collapsed. After the vigorous use of equity related financing during the late 1980s, the capital structure of Japanese firms underwent drastic change. Figure 1 summarizes the time series changes of the financial status among listed firms from 1980 to 2002 following Aoki et al (1994). It is clear that the weight of category E2, which exclusively depends on bond issuance, increased from almost zero (0.2%) in 1980 to 7.8% in 1990, while category N, which exclusively depends on bank borrowing, decreased from 58% in 1980 to 28% in 1991.

== **Figure 1** is about here ==

Detail information on capital composition is presented in **Table 1**. First, we see that the debt-asset ratio in 1990 decreased 4.5% points from 1986 with low standard deviation, while the borrowing over the debt (the sum of bond and borrowing) decreased from 69.5% in 1986 to 54.5% in 1990. The decreasing bankdependence was the result of rational choices between banks and firms under deregulation. According to Hoshi et al (1993), and Miyajima and Arikawa (2000), firms with higher profitability increasingly depended on bonds for their financial resources, while firms with lower profitability continued to depend on bank borrowing during the 1980s. On the other

hand, facing the large shift from borrowing to bonds, banks increased land-collateral loans to small and medium-sized firms in non-manufacturing sectors. Although such behavior is completely rational *ex ante*, it was inevitable *ex post* that the loan portfolio banks have deteriorated at the end of bubble in the sense that (1) firms with low profitability remained clients of the banks, and (2) land-collateral loans to non-manufacturing sectors increased.

Starting from the initial structure, the listed firms have diversified their capital composition during the 1990s.

== Table1 is about here ==

Intuitively, **Figure 1** shows that E1, no longer dependent on external financial resources, increased from 4.2 % in 1990 to 11.7% in 2000, while category N, exclusively dependent upon bank borrowing, increased from 29.4 % in 1991 to 46.9% in 2000. Thus, category E1, exclusively dependent on bond issuance and E2, using a mixture of bond issuance and bank borrowing, constantly decreased. The aggregate share of category E1 and E2 in 2000 is 41.4%, compared to 63.6 % in 1990.

The increasing diversity in the capital composition among firms is also clear from Table 1. Even though the debt-asset ratio of listed firms on average is almost constant, its standard deviation has enlarged during the past decade, especially since 1997. The difference in bank dependence across industries is also enlarged in the 1990s. The bank dependence on average among listed firms in manufacturing sectors has decreased since 1993, while the firms in non-manufacturing, particularly the so-called problematic three industries such as construction, real estate and retail increased their dependence. Stressing that the declining profitability of these sectors has already been obvious since 1993, Hoshi (2000) and others suggested that there have been serious credit misallocations since the mid 1990s.

Another feature of corporate finance in the 1990s are the changes in debt composition. It is remarkable that after bottoming out in 1991, the ratio of borrowing to total debt consistently increased during the 1990s, especially from 1997 to 1999. Consequently, that ratio in 2000 is 70.7%, which is higher than that of 1986, when the bond issuance was still heavily regulated. It seems to be puzzling, because the capital

cost of bonds is usually lower than bank borrowing, and the regulation on bond issuance was completely struck down in 1996.

Why did the borrowing substitute for bond issuance in this period? Since the demand for new money stagnated during the 1990s, it is highly plausible that bonds issued in the bubble period were amortized and replaced by borrowing. Then what type of firms could continue to raise their funds through bond issuance, and what kind of firms have switched their financial resources from corporate bonds to bank borrowing again?

2-2 Debt choice after complete deregulation

According to standard theories of finance, one approach for explaining the determinants of debt choice between bonds and borrowing is to stress the comparative advantage of a bank as a monitor. By emphasizing the ability of banks to mitigate the costs of asymmetric information, Diamond (1991) constructed a model which shows that firms with less established reputations tend to borrow from banks, while more successful firms tend to issue bonds³.

Thakor and Wilson (1995) discuss another benefit of bank borrowing. Because of its concentrated ownership, the banking sector decides efficiently whether to liquidate or bail out a firm in financial distress by renegotiating the terms of the debt contract with borrowers. Since the ownership of public bonds is dispersed among bondholders, they cannot rescue financially distressed firms as efficiently as banks do. Furthermore, as Chemmanur and Fulghieri (1994) shows, a bank devotes more resources to renegotiate with its client in financial distress than do bond holders because banks are concerned with their long-term reputation.

Although bank borrowing has benefits for borrowers, there exist offsetting costs that prevent firms from borrowing exclusively from banks. One approach for explaining the cost of bank borrowing suggested by Sharpe (1990) and Rajan(1992) is based on the observation that while a bank can reduce agency problems, the

³ Following this idea, Petersen and Rajan (1994) find empirical evidence that close relationship with banks have made it possible for small U.S. firms to borrow at lower costs.

firm-specific information acquired by a bank may create a hold-up problem. Rajan(1992), for example, argues that the informational rents extracted by banks ex post distort the firm's investment by reducing the entrepreneur's returns from successful projects⁴.

According to this theoretical literature, we derive the hypothesis that a firm will not use bank borrowing when default risk is low enough or future profit is high enough. Thus, the first point to be empirically tested is the validity of this hypothesis

We focus on the debt choice after 1996, when regulations for bond issuance were completely lifted, and the reverse shift from bonds to borrowing became clear⁵. Out of the listed companies on the TSE First Section from 1996 to 2000 fiscal year, 1,302 companies are used as the sample. We exclude firms in finance and public utilities from our sample. The average total asset for our sample firms in 2000 is 24.1 billion dollars and the average number of employees is about 2,800, whereas the median of total assets for firms listed on TSE First Section is 9 billion dollars and the median number of employees is 2,000. Thus, our sample includes not only large firms but also relatively middle-size firms.

To test our hypothesis, we regress the debt structure on some explanatory variables at the previous year as in equation (1). The 2-Limit Tobit model is selected as the estimation method, since dependent variables are truncated at both zero and one.

$$LDR_t = f(Q_{t-1}, Q_{2t-1}, DA_{t-1}, Vol, SIZE_{t-1}, YD) \quad (1)$$

Where, the dependent variable *LDR* is defined as the ratio of bank borrowing to total debt, which is the sum of bank borrowing and bonds outstanding. We use the following as explanatory variables. First, the total book debt divided by the current

⁴ Following this idea, Houston and James (1996) find that U.S. large firms with substantial growth opportunities tend to limit the use of bank debt because of the serious hold-up problem.

⁵ Miyajima and Arikawa (2000) present the empirical evidence of what determines the Japanese firm's choice between unsecured bond and bank-borrowing in the 1980s and the early 1990s. They test the hypotheses that the firm does not use bank borrowing with an implicit rescue-insurance when the default risk is low or future profitability is high enough.

value of total assets, *DA*, represents the likelihood of financial distress⁶. We predict that high values of this variable would encourage a firm to use bank borrowing. On the other hand, low leverage could allow managers to use bonds in order to avoid strict monitoring by banks. The volatility of monthly stock returns over the last three years, *VOL*, is also included as a proxy of business risk. Second, we adopt Tobin's *q*, *Q*, to capture the firm's growth opportunity in the same way as Hoshi et al.(1993)⁷. Following Wo, Sercu, and Yao (2002), we also introduce *q* squared, *Q*² in the regression to capture the possibility that firms with high growth opportunities but facing large uncertainty demand bank borrowing. In addition, we add the logarithm of assets, *SIZE*, to the explanatory variables to control for the effect of firm size on debt choice. Lastly, *YD* is included for controlling macroeconomic factors and other exogenous factors such as the banking crisis associated with the downgrading of government bonds and so on.

The estimation results are shown in **Table 2**. The coefficient of *YD* in 1997 is only significant among Year dummies, and its magnitude is huge. The ratio of bank borrowing to total debt in 1997 is roughly five to seven percent higher than other years, other variables being equal. Somehow ironically, the banking crisis brought about increasing bank dependence by reducing the reliability of the financial system. The coefficient for *SIZE*, a proxy for firm size, is significantly negative. This means that larger firms can issue bonds more easily using their reputation. Firms' choices of bank borrowing are significantly and positively correlated with *DAR*. A higher possibility of financial distress implies larger demand for bank borrowing. Similarly, the coefficient of volatility is significantly positive.

== Table 2 is about here ==

On the other hand, the relation between the issue of bonds and *Q* is significantly positive. The firm with better prospects tends to move away from bank borrowing. The result is not changed if we use the real sales growth rate instead of *Q* as a proxy for

⁶ Here, we estimate the market value of land and holding securities, but other tangible assets are accounted by book value.

⁷ Anderson and Makhija (1999) adopt growth opportunities (book assets minus book equity plus market value of equity, divided by total assets) to test, which is a more significant determinant of debt choice, monitoring managerial moral hazard or hold-up is.

growth opportunity. The coefficient of Q^2 is significantly positive. This result is consistent with the result of Wo, Sercu and Yao (2002). The threshold of Q is around 1.9, although the value of the threshold slightly varies by the specification. Roughly speaking, approximately 5 to 10 % of firms out of the entire sample locate to the right hand side of this threshold.

The estimation results above indicate the following points. First, the result that firms with high growth opportunities and low risk depend on the bond issuance would be consistent with theoretical predictions, and could explain the drastic decrease of bond issuance in the 1990s. While firms that are relatively large, with low default risk and high growth opportunities, continue to depend less on relational financing, most firms even in the First Section of TSE depend on bank borrowing due to decreasing profitability and increasing default risk. Consequently, the importance of bank borrowing has been revived again in the 1990s⁹.

Second, the positive sign of Q^2 suggests that bank borrowing is important for firms with quite high growth opportunities, although this type of firm is relatively limited. They tend to be relatively young, and thus have less reputation in the capital market¹⁰. It implies that there are a certain number of firms with high growth opportunities but facing large uncertainty that demand bank borrowings even in the 1990s.

2-3 Increasing main bank loan concentration

Along with increasing dependence on bank borrowing, another remarkable feature of the financial system in the 1990s is that the bank-firm relationship looks to be strengthened, as long as their ties are concerned.

According to Aoki et al (1994), features which make the main bank different from other banks in the market is that the main bank is typically the primary lender as well

⁹ However, the result could be interpreted differently. Especially, the negative relationship between bank dependence and growth opportunities may reflect the perverse incentive of banking sectors that supply loan to less profitable client with low interest payment as is pointed out by Peek and Rosengren (2003). By this debt choice analysis, we cannot conclude which interpretation is right, or which case is the major phenomenon.

¹⁰ The average year of incorporation in this type of firms is 1948, which is 4 years younger than the rest of firms.

as the firm's settlement bank and largest shareholder (at least among banks). We first identify main banks of each firm as the largest lender among banks based on the "financial data base" of the Japan Developmental Bank. Then, since main bank ties are characterized as long-term and stable, we check whether the main bank of each firm is the same bank as five years ago or not. If a firm has a main bank that has not changed for five years, then we call it a firm with stable main bank ties ($MB1=1$). This definition roughly identifies about three-quarters of all firms as having a main bank.

== Table 3 is about here ===

According to **Table 3**, as long as we see the number of firms with main banks ($MB1$), the stable relationship between bank and firms was sustained until 1997 and somehow dissolved afterward when the banking crisis became acute. Out of 82 cases of $MB1$ decrease between 1998 and 1999, 14 cases are due to the delisting of firms, 26 cases are the result of three banks failures, and the remaining 42 cases show main bank changes. In this regard, the banking crisis may mark the beginning of the dissolution of the stable relationship between bank and firms.

Right side of **Table 3** presents the overall change of main bank ties in the 1990s. First, dispatching bank members to client firms seems to be decreasing. This is consistent with the finding that bank intervention became less systematic in the 1990s than before (Miyajima and Hirota 2000). Second, however, the percentage share held by the main bank is stable, as long as its median and third quartile are concerned (not reported). This result is consistent with the fact that a bank tends to keep the equity holdings of firms when it is their main bank (see chapter 3). Third, most remarkably, the ratio of borrowing from main bank to assets, MBR , consistently increases with escalating standard deviation since 1991, especially after 1997, of financial crisis. Decomposing MBR into the borrowing over asset ratio, LA , and the borrowing from main bank over total borrowing, MBL , not only LA but also MBL increased constantly.

Taking into consideration that thenon-performing loan problem is quite serious in the so-called problematic three industries such as construction, real estate and retail, we compare the main bank relationship in these three sectors with that of relatively highly performing manufacturing industries, transportation, electrical and industrial

machinery. We found that the trend of increasing *MBR* is quite similar in both sectors. However, the problematic three industries show that the higher the percentage of firms that have main banks, the higher *MBR* with its lower standard deviation, and the larger the amount of average borrowing compared to the three machinery industries. Bank dependence and main bank commitment increased during 1990s in the problematic threes.

Then, how can we interpret this increasing main bank loan concentration? According to the results for the estimation of the determinants of main bank loan concentration using the same model as the one for debt choice, we found that the determinants of main bank loan concentration (*MBR*) are almost the same as those for debt choice (not reported). *MBR* is negatively sensitive to Q and positive sensitive to Q^2 , while high loan concentration was associated with the high risk factors (*DAR* and *VOL*). These results suggest two possibilities.

First, since the concentrated debt holding helps mitigate free riding when firms enter distress (Bulow and Shaven 1978, Hall and Weinstein 2000), the increase of *MBR* could be the result that the main bank coordinated the lending of other borrowers, or the main bank took the initiative in corporate restructuring of borrowers. However, second, the increasing commitment to the borrower may also be possible if a bank adopted the “evergreen policy” on old loans of less profitable borrowers at the expense of their risk diversification. While the arms-length lender does not lend to a borrower who is on the verge of defaulting, the main bank may extend further credit in the hope of recovering its loan (Boot and Thakor 2000), or to dress up their balance sheet.

Put differently, the increasing *MBR* could be interpreted as either 1) the bank’s policy of picking winners, and taking the initiative in corporate restructuring, based on healthy incentives, or 2) the rolling over their loans to less profitable firms or adopting ‘evergreen polices’ based on their perverse incentives, thus resulting in credit misallocation and the delay of corporate restructuring of borrowers. The questions to ask are, which is the major case? And what determines when a bank decides to take one of these opposing policies?

3. The Impact of Banking Crisis on Bank-Firm Relationship

The most important factor that might affect relational banking in the 1990s is the banking crisis¹¹. Banks that were formerly expected to bail out troubled borrowers were now mired in trouble. What was the effect on the bank-firm relationship? The problems in the banking sector grew acute since 1995 when the *Jusen* problem (Housing loan company's insolvency problem) emerged. As a result, a "Japan premium" on the costs of Japanese banks firstly appeared in the Euro market (Ito and Harada 2000). Bank stock prices declined relative to other stock prices starting around the end of 1995 (see Figure 1 of chapter 3). PBR of major banks and local banks on average decreased from 4.04 in the end of FY 1990 to 2.48 in the end of 1996. The credit rating of major banks were AA or higher in the early 1990s, following the *Jusen* crisis and some bank bailouts, and many banks were downgraded to A or lower. It was in November 1997 when financial crisis beset the Japanese financial system. On November 3, Sanyo Securities defaulted in the inter-bank loan market, which was followed by the failure of Hokkaido Takushoku Bank and Yamaichi Securities, one of the four large securities houses. Subsequently, two long-term loan banks, Long Term Credit Bank and Nihon Credit Bank that almost became insolvent were nationalized in 1998. During this banking crisis, the Japan premium increased, and average PBR of banks declined further to 1.19 at the end of 1998. Downgrading of banks also continued, and almost all banks rated BBB or lower at the end of 1998¹³.

There is a growing literature that focuses on the effect of the banking crisis on client firms. Murakami and Yamori (1998) and Brewer et al. (2003) examine the impact of the announcement of Japanese bank distress on the stock prices of non-financial institutions, and highlight the negative response of their stock prices. Extending this literature, Miyajima and Yafeh (2004) investigates the effect of the banking crisis on Japanese firms using about 800 listed firms including firms in three problematic

¹¹ For the detail story of banking crisis and its over all impact, see Peek and Rosengrem (2001), Nakaso (2001), Hoshi and Kashyap (2001).

¹³ For downgrading of major banks, see detail Miyajima and Yafeh (2004), Appendix A.

industries on the First Section of the Tokyo Stock Exchange (TSE). Their main question is, who has the most to lose?

The empirical analysis is based on the standard event study method: measurement of abnormal stock returns for the sample firms around the date of an event related to the banking crisis. As in all event studies, they begin by estimating the “market model.”¹⁴ Because it is sometimes hard to verify the date on which news might have affected the market, and because some events evolved over several trading days, the analysis focuses on cumulative abnormal returns (*CAR*) between dates –5 and +5 for each event.

Considering existing intensive studies of the effect of bank failure on client firms, they pick up events such as bank downgrading, government action and others from 1995 to 2000. Estimated simple equation is as follows:

$$CAR_t = f(SIZE_{t-1}, Q_t, DA(LA), BOND, MBR, YD) \quad (2)$$

Where, *CAR* is cumulative abnormal returns, *SIZE*, the logarithm of firms assets, *DAR* is the leverage calculated by the debt over total assets, *BOND* is the variable that expresses the bond rating of firm *i*. *Q* is Tobin’s *q*, which is the proxy of firms’ quality. *RD* is a dummy variable that is given one if a firm belongs to high R&D industries, following Carlin and Mayer (2003), which predicts that R&D activity rarely relies on bank finance. *MBR* is the borrowing from main banks to total assets.

The essence of their empirical result is summarized in **Table 4**. First, they show that government injections of capital to the banking sector have been important. In particular, these measures have constituted “good news” for the typical bank dependent company: operating in a low-tech sector (low R&D expenditure), with limited access to

¹⁴ For each firm, stock returns are regressed on (a constant and) the market returns (Tokyo Stock Exchange Price Index, the TOPIX index), using 40 daily observations between dates –60 and –20 (where date zero is the date of the event in question). The estimated parameters of the regression are then used to generate the predicted return for each firm around the event date. Finally, abnormal returns are defined as the actual stock returns in excess of the model’s prediction.

bond markets and a high degree leverage, the coefficient of which is large and highly statistically significant.

=== Table 4 about here===

Similarly, the main beneficiaries of improving banking supervision, presumably interpreted as steps to remedy the system, were also small firms, which are less profitable, in low-tech sectors, with limited access to bond financing (low bond rating) and a high degree of leverage (although the latter coefficient is not statistically significant). They conclude that (a) government actions matter, and (b) that firms which can be characterized as bank-dependent respond more to such government actions.

Furthermore, they show that downgrading announcements of banks' credit ratings appear to have been particularly harmful to highly leveraged companies, where the coefficient is both statistically significant and of substantial magnitude¹⁷. Also sensitive to downgrading are firms in low R&D industries and with low credit ratings, although its effect is smaller than that of leverage. In addition, there is evidence that large and profitable firms (with a high Tobin's q) seem to suffer less from downgrading of their banks.

Lastly, the dummy variable "main bank involved" (which takes the value one if a firm's main bank was downgraded) suggests no special impact of downgrading on firms that use the downgraded bank as their main bank. However, the stock price of firms with high dependence on bank borrowing as well as main bank loans (MBR) negatively responded more to downgrading and positively more to government action than that of less dependent firms. Firms with MBR two standard deviations above the mean experienced 1.3 % lower CAR in downgrading events, and 3.4% higher in capital injections.

In sum, the negative stock price response of firms with high leverage and high main bank dependence to banking troubles such as bankruptcy and downgrading, and their positive response to government action suggest that the bank-firm relationship

¹⁷ For example, firms with leverage two standard deviations above the mean experienced 7% lower CAR .

does matter. More importantly, however, the banking crisis does not affect client firms equally. The banking crisis is especially harmful for low tech, less profitable firms with difficulty accessing the capital market. Thus, the result implies that the banking crisis might cause the “creative destruction”. What occurred during the banking crisis is a slow “cleansing process”.

However, so far they examined just the market response of client firms to the banking crisis. Furthermore, the estimation result does not eliminate the fact that firms with high growth opportunities faced a negative market response if they were high leveraged or had high main bank dependence. Consequently, it is still unclear whether the banking crisis had a substantial effect on corporate investment and restructuring or not. The following two questions are crucially important:

1. 1. If most firms that are identified as sensitive to events in the banking sector are essentially failing, then the reduced bank lending to them is not detrimental to Japanese economy. However, if it were not the case, the welfare implication is quite serious. Then the question is whether firms with positive NPV were really free from the credit crunch or not.
2. Another question is if the market response encourages “creative destruction”, then did high bank dependence actually drive corporate restructuring, and the main bank take an initiative in that? Or, as recent literature has pointed out, the high bank dependence undermines incentives for firms to take necessary corporate restructuring measures.

In the subsequent section, we address these two questions.

4 The Role of Main Bank System in Firms with High Growth Opportunities

4-1 Credit crunch and investment

A large volume of literature treats from various perspectives about the credit crunch triggered by the banking crisis as one of the most important causes of the long stagnation of the Japanese economy. The first approach is to focus on the supply side of loans, and examine whether the non-performing loan problem or risk-based capital ratios really brought about the contraction of bank lending or not. For instance, Itoh

and Sasaki (2002) show that banks with lower capital ratios tended to issue more subordinated debt and to reduce lending. Honda (2002) and Montgomery (2004) examine the differential effects of the Basel Accords on domestic and international banks, and show clear evidence that international banks with relatively low capital ratios tended to contract their overall assets and shift their asset portfolio out of loans and into risk-less assets such as government bonds. However, Woo (1999) points out the strong evidence that the contraction of lending is rather limited, and found only for 1997, immediately after many large banks went bankrupt.

The second approach is to look at the demand side of loans by addressing whether the credit crunch affects the real economy or not. Motonishi and Yoshikawa (1999) estimate investment functions for large and small firms using the Bank of Japan Diffusion Indices (DIs) of real profitability and bank's willingness to lend as the explanatory variables. Employing the latter variables as an indicator of possible financing constraints, they find that the financing constraints significantly affect investments of small firms, but not that of large firms. Thus, they conclude that the credit crunch does not explain the long stagnation of investment throughout the 1990s, but it had a negative impact on investment during 1997-1998.

Given existing empirical credit crunch literature, we extend our analysis in the following two directions. First, we distinguish firms with high growth opportunities from firms without such opportunities. Although emphasis on the extent of the credit crunch varies among existing literature, it is common to implicitly assume that the credit crunch has a negative effect on the real economy. However, as we emphasised, financial constraint is not necessary welfare reducing, if those firms do not have any growth opportunities. Second, we explicitly distinguish the effect of high loan concentration from a (main) bank from high bank dependence in general, which existing literature has never taken into account.

The sample firms are divided into three sub-groups based on three years' average of a firm's Tobin's q prior to selected firm year. Firms are defined as firms with high growth opportunities (hereafter HQ firms), if their Tobin's q is higher than the third quartile of the whole sample, while firms are defined as firms with low growth

opportunities (hereafter LQ firms), if their Tobin's q is lower than the first quartile.

In **Table 5**, we summarize the capital structure and main bank dependence by their growth opportunities. As is expected, we confirm that the number of firms with stable bank ties in HQ firms is fewer than that of LQ firms. For example, the share of the firms with stable relationships ($MB1=1$) among HQ firms (65.6%) is 11% point lower than that of LQ firms (76.9%). If we define a main bank ($MB2$) with stricter criteria such that the ratio of main bank loans to firm assets exceeds the mean value of this variable in the sample (5.1 percent), shares of $MB2=1$ among HQ firms is 7% lower than that of LQ firms in 1993.

However, interestingly, limiting firms with stable main bank ties ($MB1=1$), all indices in HQ firms is higher than or at least the same level as those of LQ firms. For instance, MBR among HQ firms (4.1%) is rather higher than that of LQ firms (3.2%) in 1993, and this difference increases further in 1999 with 6.7% associated with high standard deviation. These descriptive statistics show that most of the large firms with high growth opportunity reduced their dependence on main banks, whereas a certain number of manufacturing firms among them still kept their close ties with their main bank and they increasingly relied on their main bank for their financial resources in the 1990s. Banking crisis may affect those HQ firms with high main bank dependence prior to their investment decision.

=== Table 5 about here===

4-2 Hypotheses, results and discussion

For investigating such real effects of main bank relationships on corporate investment in the 1990s, we estimate the investment function with the cash flow and the leverage developed by Fazzari et al. (1988), Lang et al. (1995) and Kang and Stultz (2000). The estimation formula is as follows.

$$I_t = f(Q, CF, DAR, LDR, MBR, YD) \quad (3)$$

Here, I is investment level, which is calculated as depreciation plus the difference

of fixed assets from period t-1 to period t divided by fixed assets. Q is Tobin's q. CF is cash flow calculated as the depreciation plus after-tax profit minus dividend and bonus paid to directors divided by total assets¹⁸. DAR is the leverage, firms' debt (borrowing plus bonds) to their current assets. Both variables are introduced to capture the cash flow constraint and the debt overhang problem respectively. Further, we introduce the debt composition (the bank dependence), LDR , which is the ratio of bank borrowing to debt (the sum of borrowing and bonds), and the main bank loan concentration, MBR , which is the ratio of loans from main bank to total assets. Notice that MBR has positive continuous value only when a firm's largest lender is unchanged for five years interval; otherwise it is zero. For controlling the effect of parent companies on the investment of related firms, we introduce the SUB dummy, if over 15 % of a firm issued stock is held by other single non-financial institutions.

Using this model, we will be able to perform the following three tests. The first is the credit crunch test. If firms with positive NPV faced a credit crunch, their investment will be seriously constrained by their internal funds or the leverage. However, if they were free from the credit crunch, their investment will be determined by business chance. In order to test these conjectures, we divided sample firms into LQ and HQ firms, with the interaction term with HQ and LQ dummy in regression.

Second, we examine the effect of the debt composition on investment, which Kang and Stultz (2000) have tested before. By identifying the firms with high and low growth opportunities, we can test whether the bank crisis negatively affects firms with positive NPV by reducing lending ability to client firms.

The last point is the effect of the main bank loan concentration on investment. If the main bank relationship still played a significant role based on private information, we predict that the investment of firms with high main bank loan concentration prior to investment decision could mitigate the credit crunch driven by banking crisis. However, conversely, if main banks that held their superior position in negotiations could impose a hard budget constraint on their client firms to which they commit

¹⁸ In constructing Q , we exclude outlier that deviates from average value at more than three standard deviations.

heavily, their investment level would be lower than other firms without such main bank commitment. The estimation results of manufacturing firms from 1993-2000 are reported in **Table 6**.

===Table 6 about here===

First, although the coefficient of *CF* is positive, the coefficient is quite small. Further when we see the interaction term of *CF* with *HQ* and *LQ* dummy (column 3), there is no evidence that investment of *HQ* firms is more sensitive to their cash flow than that of *LQ* firms. Rather, the sensitivity of investment in *LQ* firms is much higher than that of high growth opportunities. This result is held when we estimate the same investment function in *HQ* and *LQ* firms respectively (column 8 and 9). These result imply that firms with low growth opportunities presumably faced the “free cash flow “ problems in the sense of Jensen (1986), whereas firms with high growth opportunities could invest regardless of their cash flow, and consequently they are free from the constraint of internal funds.

Second, the coefficient of *DAR* is significantly negative in column (2), but notice that there is no difference in the interaction term of *DAR* with *HQ* and *LQ* dummy in column (3). Further, if we divide sample firms into *LQ* and *HQ* firms in columns 8 and 9, we find that the coefficient of *DAR* is only positive with high significance in *LQ* firms. The leverage has less constrained the investment of firms with high growth opportunities and mainly restrained the over investment of firms with low growth opportunities. Put differently, the discipline of high leverage over *LQ* firms dominated the debt overhang problems over *HQ* firm in the 1990s Japan. This is consistent with the result of Miyajima, Arikawa and Kato (2002), which showed that physical investment of firms with growth opportunities were relatively free from financial constraints, being different from R&D investment.

Although it is true that the investment in *HQ* firms is constrained by their internal funds and their leverage if we limit sample firms to the small firms (the bottom size quartile), and the shorter sub- period (1993-95, 1995-97, and 1997-99). However, the significance level is not sufficiently high, and the sub-period that we find the

financial constraint in is only during the banking crisis (1997-1999)¹⁹. Thus, we can conclude that the firms with high growth opportunities are not seriously impacted by the credit crunch in general.

Next, let us examine the role of bank debt on investment. The coefficient of *LDR* is negative with 10% significance level in column (3). This result is consistent with the understanding of Kang and Stultz (2000) that the banking crisis could affect corporate investment through reducing the lending ability of banks. However, this effect is weak in firms with high growth opportunities. The interaction term between *LDR* and *HQ* in column (4) is not significant, and there is no difference in the coefficient of *LDR* between HQ and LQ firms in column (8) and (9). These results indicate that in spite of decline of lending ability caused by the banking crisis, bank dependence has not had strong negative effect on corporate investment of HQ firms.

Finally, when we introduce the main bank loan concentration into regression, the coefficient of *MBR* is negative and highly significant, while *LDR* remains insignificant in column (5). More importantly, the effect of main bank loan concentration is completely opposite between HQ and LQ firms. Column (6) shows that high main bank dependence could reduce the investment in HQ firms, while it raises investment in LQ firms. This result holds in column (7), where we compare the HQ firms and others, and columns (8) and (9) where the investment of HQ and LQ firms is estimated separately. Further, its magnitude is noticeably high. According to column (6), two standard deviation increase in *MBR* (0.102) would reduce investment by 8% point, which is comparable to the 17% of I/K on average. This result implies that some Japanese firms had to decrease their investment if their main bank dependence were high prior to their investment decision. This is consistent with the understanding that the main banks imposed a hard budget constraint on client firms by taking advantage of their superior position in negotiations with them, instead of enhancing investment through mitigating agency problems. Put differently, the credit crunch may have

¹⁹ This is also consistent to the understanding that Japanese firms faced such the debt overhang problem in the 1990s as Ogawa (2003) advocated. Since non-listed firms with high growth opportunities have no financial options except bank borrowing, they may face such problems more seriously, given less developed capital market.

occurred in firms with high growth opportunities, but only if the main bank loan concentration were high.

5. Corporate Restructuring and Bank-Firm Relationship

5-1 Two faces of main bank relationship in corporate governance

As is shown in section three, the result of market response seems to encourage “creative destruction”. On the other hand, firms with low growth opportunities tend to keep bank dependence and the concentration of main bank loan high. Then the question is whether the high bank dependence and high main bank commitment to borrowers actually drove corporate restructuring or not. One natural conjecture is that relational banking could restrain over-investment among firms facing serious earnings declines, whereas it helps to avoid early liquidation. This is an expected function when contingent governance based on the main bank system works well. However, after the banking crisis, a lot of empirical studies have suggested the soft budgeting of banks on client firms, especially in the problematic three industries (Cabarelllo et al 2003, Peek and Rosengren 2003, Sekine et al, 2003, Hoshi 2000). As one of the characteristics of main banks is to provide rescue insurance to borrowers, such soft budget problems might be much more serious in firms with main bank ties than firms without such ties. In this section, we address this issue. Let us briefly review the role of the bank-firm relationship on corporate restructuring.

Aoki (1994a,b) clarifies a bailout mechanism under relationship banking as “contingent governance”. In the usual debt contract, as Aghion and Bolton (1992) explain, the control right shifts from the insider to the outsider (debt-holder) at the point where the output level does not exceed interest payments in value. However, as Aoki explains, when a relationship bank (or main bank in Japan) monitors a borrower, the output level determining to whom control rights belong can be divided into three regions: the borrower-control region, the bank-control region, and the critical bankruptcy region. Consequently, what is unique in this contingent governance is the

existence of an output level where the relationship bank rescues a borrower in financial distress because the rents that banks can extract from borrowers exceed the total costs of rescuing. Therefore, the debt supplied by a bank is *de facto* debt with implicit rescue-insurance, and a manager comes to expect a bailing out by a relationship bank in cases of financial distress.

When this contingent governance works well, the effort level of managers is raised because they have strong incentives to entrench themselves against bank intervention. On the other hand, an appropriate rescue to client firms with additional money lending and interest reductions would be helpful to keep firm specific skills and avoid the inefficiencies related to the threat of early liquidation during periods of financial distress²¹.

However, the contingent governance does not work well without a set of conditions. One of its critical conditions is the threat of termination of loans to client firms, when it falls in the bankruptcy region. If the threat of termination were not credible for a certain reason, it would be highly plausible that borrowers adopt moral hazard behavior expecting the bailout policy by the bank. Suppose that a bank balance sheet is deteriorating, and the bank highly committed to an unprofitable borrower; it may decide to supply the additional lending to a borrower not based upon the exact evaluation of its future reconstruction, but to avoid declaring a loan to be non-performing. Since the minimum level of capital is strictly imposed by the Base Accord, such incentives of the bank manager would be strengthened. This perverse incentive of banks would also be stronger if a bank were the main bank of a client firms, and its loan concentration were higher, because loans from the main bank are supposedly subordinated to other loans and the huge loan amount is obviously critical in a bank's balance sheet. Thus, (main) banks tend to roll over their loans to nearly insolvent firms to reduce the reported amount of non performing loans on the books and make up their reported capital, while firms tend to put off the necessary restructuring

²¹ However, Hanazaki and Horiuchi(2000) denied the role of main bank in corporate governance, insisting that the efficiency of firms were basically kept by market competition even in the high growth era.

of firms expecting banks to bail them out.

5-2 Corporate Restructuring

There are several approaches to examine the work of contingent governance in Japanese firms. The first one is to test the relationship between bank intervention in case of presidential turnover by dispatching bank members and corporate performance. Using the sample data in the 1980's, Kaplan (1994), Kaplan and Minton (1994), Kang and Shivdasani (1995) document that banks take the initiative in changing presidents if client firms performed badly, stressing that the main bank system is an alternative mechanism for the market for corporate control in the US.

Furthermore, Hirota and Miyajima (2000) examined the work of contingent governance for long perspectives. For instance, they pick up three industries (electric, chemical and construction) and show that the relationship between bank intervention and low corporate performance was less clear in the 1990s than the 1970s, when the Japanese economy faced the oil crisis. They also point that the post performance of bank intervention in the 1990s has improved less clearly than before. From these results, they can see the contingent governance based on the main bank system became far weaker in the 1990s than before. They interpreted them as partly a reflection of the decreasing number of bank dependent firms, and partly a result of the declining health of banks.

Another approach related to contingent governance is to examine corporate restructuring when a firm faces serious earnings decline. Hoshi et al. (1990) as a pioneer work in this field document that firms with close main bank ties maintain investment levels compared to independent firms even when these firms faced financial distress in the structural adjustment period (1978-1982). On the other hand, Kang and Shivdasani (1997) show that firms with closer main bank ties reduced their assets even more during the business upturn of the late 1980s. Although the role of main banks that they reported seems to be completely opposite, they commonly stress its bright side based on private information: avoiding inefficient early liquidation (Hoshi et al. 1990) and exerting appropriate discipline on client firms (Kang and Shivdasani

1997).

However, since both works did not go beyond the late 1980s, it is still an open question whether the main bank system plays such a significant role even in the 1990s. To answer this question, we estimate the following employment adjustment function.

$$L = F(Lt-1, S, DAR, LDR, MBR, Ind, YD) \quad (4)$$

Where L is the percentage change of employment, $Lt-1$ is the lag of L , S is the change of real sales growth rate. For testing the effect of the bank-firm relationship on corporate restructuring, we also introduce the same variables as in the previous section. DAR is the leverage. LDR is the bank borrowing over debt, which is the direct proxy of bank dependence. MBR is the ratio of borrowing from main bank over asset. Furthermore, following Kang and Shivdasani (1997), we produce the dummy variable, NAD , as a proxy of the necessity of corporate restructuring, which equals one if the three-year average of operational profit from 1993-95 of sample firms is 50% lower than those of 1988-90, otherwise it is zero. By identifying firms that face the earnings decline in the 1990s (hereafter NAD firms), we can test whether the (main) bank urges these firms to take the necessary restructuring measures or just helps them to put off solving the problem. **Table 7** present the distribution of NAD firms among industry and descriptive statistics. Being different from Kang and Shivdasani (1997) that address the business upturns (the late 1980s), the NAD firms are major in the late 1990s. Roughly speaking, two thirds of sample firms are identified as the firms that are necessary to reconstruct their business. As expected, construction and retail industries include large numbers of NAD firms. However, notice that textile, iron and steel, and even the machine industry (electrical and transportation) include large numbers or high ratio of NAD firms. Employment reduction is expected to be much larger, while all indices, when the leverage, the bank dependence and the main bank loan concentration is much higher in NPD firms than others. Estimation results are summarized in **Table 8**.

=== Table 7 /8 about here===

The coefficient of S is positive and highly significant for all estimations. One percent of decrease of real sales growth associated with approximately 0.13-0.2% of employee reduction. On the other hand, the coefficient of DAR is negative and significant in column (1). The leverage affect on reducing employment in general. However, there is no difference between NAD firms and other firms in this effect, as long as the interaction term between DAR and NAD in column (2) applies²³. The coefficient of LDR is significantly negative in general (column 3), but no difference between NPD and others firms was found in column (4). Thus far, we cannot figure out whether high leverage and high bank dependence promote the “creative destruction” or impose the hard budget constraint on client firms.

However, once we add MBR to regression and introduce the NAD dummy, the result became much clearer as is shown in column (6). Interestingly, the coefficient of interaction term between LDR and NAD is significantly negative and that of MBR and NAD is positive. This result contrasts with column (5) where MBR is not significant. That is, among firms facing serious earnings declines, high bank dependence was associated with rapid employment adjustment, while the high concentration of MBR was associated with slow employment adjustment. This result is also consistent with facts in the previous section indicating that the high concentration of MBR tends to raise the investment level of LQ firms (see column 6 of Table 6), and consequently induce free cash flow.

This contrasting result of bank dependence and main bank loan concentration is also clear in column (7) and (8), where we divide sample firms into NAD and other firms, and estimated the same model separately. The coefficient of LDR is significantly negative and that of MBR is positive in NAD firms, however the sign of LDR and MBR in other firms are contrary to those of NAD firms although less significant. According to column (8), two standard deviation of increase of LDR lead to a decrease of 2.7% in the employment level, while same increase of MBR produces a 5.8% change in employment, both result are comparable to 2% of the change of employment on average.

²³ This result is supported by the comparison of the DAR of NAD firms with that of other firms in column (7) and (8).

Further, in order to distinguish the effect of the loan from main bank and other debt much more clearly, we introduce the *NMBR*, which is the ratio of the non-main bank debt to total borrowing. Here no-main bank debt includes other banks debt and bonds, which we could regard as arm's length debt. In column (9), we find the *NMBR* is significantly negative, which suggests that firms are more likely to downsize their employment when they depend for their financial resources more on the non-main bank borrowing (arm's length debt). Second, the interaction term between *MBR* and *NAD* is significantly positive, while *MBR* itself is negative. This result is unchanged if we use another model of the estimation method.²⁴ According to column (9), the estimated coefficient of *MBR* in other firms is -0.389 , while that of *NAD* firms is $0.262 (0.651 + (-0.389))$, which raised 3.4% of the change of employment, if firms' *MBR* is two standard deviations higher than average. This result suggests that the high main bank loan concentration in non-*NAD* firms associated with a relatively lower growth rate of employment, while that of *NAD* firms associated with a relatively higher growth rate of employment.

It has recently become popular to insist that Japanese banks tend to bailout almost bankrupt firms through ever-greening old loans (e.g. Peek and Rosengren 2003), and keep unprofitable firms. Caballero et al.(2004) called these artificially survived firms "zombies". First, the estimation result suggest that the evergreen policy taken by banks and resulting "zombies" are supposedly not so prevalent as current literature insists, because the high bank dependence tends to reduce the growth rate of employment in *NAD* firms. The high bank dependent firms, whose stock prices are sensitive to the troubles of the banking sector, also reduce their employment level, when they face serious performance declines. Thus what has occurred is the slow "cleansing" process.

Second, what current literature insists certainly is on the mark if, and only if, we limit bank-dependent firms to firms whose main bank loan concentrations were high. The higher concentration of bank loans to firms with poor performance gave stronger

²⁴ When we used the fixed effect model instead of GMM, the result is unchanged.

incentives to the main bank not to push the necessary restructuring onto the client to avoid a serious capital shortage. Not only that, the high concentration of main bank loans, to a lesser extent perhaps, may force non-*NAD* firms to reduce their employment level, through their superior position in negotiations.

In sum, our results imply that the main bank has undergone a role reversal. The main bank used to help firms avoid inefficient corporate restructuring, and by doing so, to keep firm specific skills, while fostering appropriate discipline for firms facing serious earnings decline. However, our results show that the main bank urges the firm with relatively better performance to reduce employment more (hard budgeting), while it allows firms with larger performance declines to delay the necessary restructuring (soft budgeting)²⁵.

6. Concluding Remarks

After financial deregulation and drastic changes in the macroeconomic situation since the late 1990s, the financial system in Japan has been getting heterogeneous compared to the high growth era when the main bank system dominated.

Among listed firms in the First Section of TSE, certain numbers of firms with high growth opportunities continued to depend on capital markets. Firms with easy access to capital markets in high tech sectors were relatively free from the banking crisis in 1997. Roughly speaking, taking firms with bond ratings A or over, one third of all listed firms now depend on capital markets for their financing. They occupied approximately 70% of the total firm value, 60% of the total book assets, and over 50% of total employees out of all firms on the First Section of the TSE. For those firms, short-term loans are currently supplied by banks based on an explicit contract (credit line). Although bank subsidiaries engaged in the bond related services (Hamao and

²⁵ This interpretation is consistent to the recent empirical studies and estimation in other chapter, which suggest that the corporate performance of firms with high *MBR* is significantly lower, or at least not higher than firms without main bank ties.

²⁷ Based on Waseda-Nissai corporate governance data base, see also chapter 4.

²⁸ Based on this model, empirical result of Sekine et al. (2003) pointed out that this inefficient equilibrium is found in construction and real estate sectors.

Hoshi 2000) and the credit line was normally supplied by their former main bank, it is safe to conclude that relational financing became less important to those firms with bond ratings of A or higher. Looking at the corporate governance side, these firms have increasingly been under market pressure. Among these firms, now approximately 20 % of the issued shares on average are held by foreign institutional investors, and they are actively carrying out corporate board reforms as well as information disclosure (see Chapter 10). Thus, market pressure by institutional investors and bond ratings are now playing a major role in corporate governance for those firms.

On the other hand, however, the rest of firms continued to depend on, or rather increasingly depended on bank borrowing during the 1990s. These firms comprised two different categories of firms. In the first category are firms with low growth opportunities for whom relational banking is potentially expected to serve a disciplinary role to prevent them from over-investment or to encourage corporate restructuring. In the second category are firms that faced high growth opportunities, but found it difficult to access capital markets. For these firms, relational banking is supposed to play a facilitating role in corporate finance by mitigating asymmetric information.

Bank troubles in the 1990s heavily affected the role of main bank for both types of firms. According to empirical results in this chapter, firms with high growth opportunities were basically free from any financial constraint (cash flow constraint and the debt overhang). However, firms with high main bank loan concentration tended to invest significantly less compared to other firms. It was not the high leverage or high bank dependence, but rather the high commitment of banks to client firms that imposed a hard budget constraint on their investment. In this regard, the banking crisis really drove a credit crunch and may have had welfare-reducing effects.

On the other hand, as long as market response to the events related to banking crisis occurred, the effect of the banking crisis was much more harmful to firms in low tech sectors with low profitability and difficulty accessing the capital markets than to large firms in high tech sectors with high q and easy access to capital markets. In this sense, the banking crisis does not necessarily imply the welfare-reducing effect, and is supposed to encourage “creative destruction”.

Under this inexorable process, however, the extent of the “creative destruction” (corporate restructuring) highly depends on the debt composition and the main bank loan concentration. While the high bank dependence has encouraged corporate restructuring as standard economic theory predicted, main bank commitment to client firms played contrasting roles. Exploiting their superior position to client firms, the main bank tends to impose employment reduction on firms maintaining their earnings (hard budgeting). On the contrary, rolling over their loans to client firms, the main bank tends to depress employment reduction in firms that needed to reconstruct their businesses (soft budgeting) .

Thus, what is unique in the bank-firm relationship of 1990s Japan is that the main bank relationship imposed a hard budget constraint on firms with high growth opportunities, while it imposed a soft budget constraint on firms with low growth opportunities. Furthermore, these opposing choices are interrelated with each other. Facing asset price declines and strict regulation of their capital adequacy ratios, banks tended to roll over loans of borrowers with low profitability, while the borrower tends to delay corporate restructuring with the expectation of benefiting from the bank’s “evergreen policy.” The “evergreen” policy taken by banks, in turn, reduced their lending ability, and made it impossible for banks to lend new money to firms with high growth opportunities. The main banks tend to reduce their loans in healthy firms to which they have high bargaining positions. Thus, soft and hard budget constraints systematically coexist in the credit crunch of the 1990s.

These facts suggest that relationship banking or main bank system in the 1990s has lost its unique and positive function (bright side), and rather revealed its dark side. If the main bank system is a reflection of its bright side, in all likelihood, the bubble in the late 1980s seems to mark the end of the main bank system in this sense.

However, we do not necessarily conclude that relational banking is on the way out. Given increasing bank dependence even among listed firms, it is highly important for banks based on their private information to supply money to firms with high growth opportunities but have difficulty accessing capital markets, and to take the initiative in corporate restructuring of firms with low growth opportunities. Since one of the

reasons for the functional change in the main bank system is the declining soundness of the banking sector, it is crystal clear that, as many observers insisted, the restructuring of this sector is highly urgent.

The good news on this front includes the fact that: first, after the banking crisis was partly relieved by capital injection from the government in 1998 and 1999, a series of mergers among major banks developed and their healthiness has been recovering; second, the program of financial revitalization is now underway, and non-performing loans are down from peak levels³¹; third, private equity increasingly played an important role in the corporate restructuring process, complementary to the main bank bail-out mechanism. (See Chapter X) and bankruptcy procedures are well arranged under the recent regulatory reform. All these reforms may contribute to reconstruct bank health, and monitoring capability, which, in turn, will make the threat of termination to client firms credible.

Thus, the optimistic scenario is that the bank-firm relationship in Japan is now in transition toward a healthier and more competitive one that will sustain long-term relationships with clients. Since the increasing commitment of banks to client firms could help banks to encourage their corporate restructuring by mitigating free riding problems, once the health of banks is restored, and the monitoring capability of the banking sector is reconstructed, it would be possible for banks to encourage borrowers' restructuring together with corporate restructuring funds, and to supply new money to firms with high growth opportunities. Of course, nobody knows how long it will take.

³¹ Non-performing loan of major banks in September 2003 is X trillion yen comparing to 27.6 Trillion yen in March 2002.

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Figure 1 Distribution of firms by capital composition and numbers-net loss

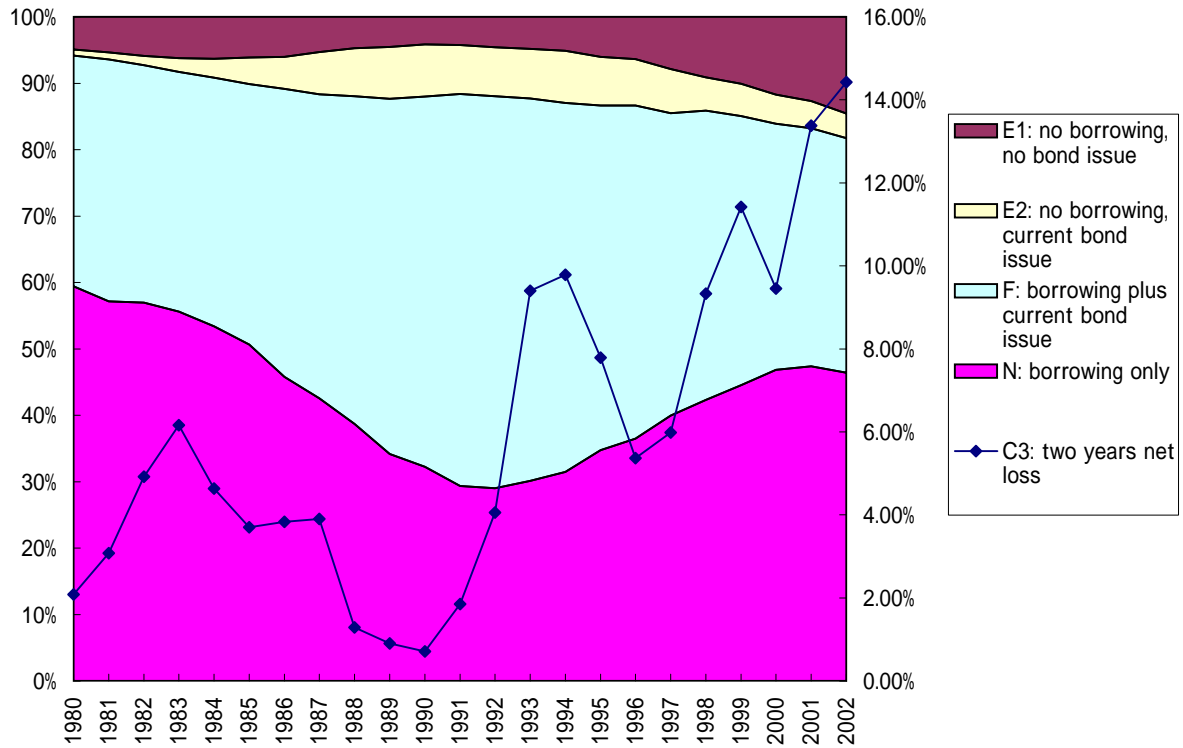


Table 1 Capital Composition of the 1990s.

DAR is the culculated as the sum of bank borrowing and the issued bond divided by current value of total asset. Bank Borrowing is the bank borrowing divided by total asset and Bond is the bond outstanding divided by total asset. LDR is (Bank Borrowing/Bank Borrowing+Bonds). The highest ratio is bolded, while the lowest ratio is underlained.

Year	N	DAR: (Bond +Borrowing)/Asset		Bank Borrowings		Bonds		LDR: Bank loan /Debt	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
1986	969	0.310	0.195	0.239	0.205	0.071	0.083	0.695	0.345
1987	992	0.303	0.187	0.219	0.200	0.084	0.089	0.637	0.361
1988	1012	0.293	0.177	0.199	0.191	0.094	0.092	0.601	0.368
1989	1036	0.276	0.168	0.172	0.175	0.104	0.098	0.551	0.370
1990	1059	0.275	<u>0.172</u>	<u>0.169</u>	<u>0.172</u>	0.106	0.097	0.545	0.363
1991	1086	0.291	0.174	0.173	<u>0.172</u>	0.118	0.103	<u>0.541</u>	0.360
1992	1090	0.301	0.182	0.184	0.179	0.117	0.105	0.554	0.355
1993	1092	0.305	0.185	0.192	0.184	0.113	0.105	0.570	0.358
1994	1098	0.299	0.186	0.190	0.187	0.109	0.106	0.571	0.365
1995	1122	0.288	0.194	0.191	0.193	0.097	0.103	0.598	0.368
1996	1154	0.281	0.191	0.187	0.187	0.094	0.103	0.611	0.370
1997	1184	0.275	0.197	0.190	0.192	0.085	0.098	0.635	0.368
1998	1191	0.288	0.208	0.207	0.202	0.081	0.099	0.666	0.354
1999	1261	0.276	0.259	0.203	0.252	0.073	0.096	0.685	0.350
2000	1341	<u>0.251</u>	0.251	0.188	0.242	<u>0.063</u>	0.090	0.707	<u>0.347</u>

Table 2: Debt choice after the complete deregulation

As a sample, we use the listed companies on the TSE First Section from 1996 to 2000 fiscal year. We use a 2-limit Tobit model with dependent variable restricted within [0,1]. The dependent Variable is D, the ratio of bank borrowing to total debt. Q is the market-book ratio of the firm, calculated as the ratio of the market value of the firm (the market value of stock plus the book value of total debt) divided by the market value of the assets. Sale is the annual sales growth. DA is total debt, divided by total asset. Volatility is stock returns volatility. Size is the log of total asset.

Model					
<i>Constant</i>	1.987 ***	2.266 ***	2.225 ***	2.454 ***	
	23.190	15.080	23.740	15.860	
<i>Q</i>	-0.137 ***	-0.115 ***	-0.577 ***	-0.477 ***	
	-6.800	-5.380	-7.950	-6.330	
<i>Q²</i>			0.150 ***	0.121 ***	
			6.300	5.000	
<i>DA</i>	0.926 ***	0.802 ***	1.003 ***	0.872 ***	
	21.330	16.000	22.290	16.790	
<i>Volatility</i>	0.026 ***	0.028 ***	0.025 ***	0.027 ***	
	12.540	13.000	11.890	12.500	
<i>Size</i>	-0.159 ***	-0.165 ***	-0.157 ***	-0.162 ***	
	-23.510	-23.650	-23.290	-23.240	
<i>Y97</i>	0.066 ***	0.071 ***	0.051 **	0.058 ***	
	2.910	3.200	2.250	2.620	
<i>Y98</i>	0.023	0.025	-0.002	0.003	
	1.000	1.090	-0.070	0.140	
<i>Y99</i>	0.023	0.023	-0.007	-0.003	
	0.960	0.980	-0.320	-0.140	
<i>Y00</i>	0.022	0.019	-0.015	-0.012	
	0.920	0.790	-0.590	-0.500	
<i>Industrial dummy</i>	No	Yes	No	Yes	
Log Likelihood	-3937.568	-3837.646	-3917.589	-3825.09	
Pseudo R2	0.1664	0.1876	0.1706	0.1902	
N	5309	5309	5309	5309	

***, ** and * denote coefficients significant at the 1, 5, and 10 percent levels, respectively.

Table 3 Summary Statistics of the main bank relationship

We identify each bank as main bank if it is the largest lender at time t and it is the same as five years ago.

panel 1: Whole sample

The end of FY	No of sample firms	N of firms that have MB	percentage	Firms that is identified as having main bank ties					
				Average number of outside director	percentage shareheld by Main		MBR= loan from main bank /total asset		
					Means	median	Means	median	Std.dev
1987	949	714	75.2	0.65	4.19	4.62	5.43	4.40	5.20
1988	977	696	71.2	0.65	4.20	4.63	5.12	4.00	5.44
1989	1002	674	67.3	0.62	4.19	4.56	4.57	3.37	4.95
1990	1024	665	64.9	0.63	4.27	4.65	4.48	3.40	4.28
1991	1021	705	69.0	0.63	4.28	4.69	4.63	3.42	4.84
1992	1016	732	72.0	0.61	4.27	4.69	4.87	3.68	5.21
1993	1008	744	73.8	0.62	4.28	4.68	5.14	3.82	5.20
1994	1002	762	76.0	0.62	4.28	4.69	5.23	3.85	5.53
1995	996	785	78.8	0.60	4.24	4.64	5.23	3.77	5.72
1996	986	798	80.9	0.57	4.26	4.67	5.52	3.93	6.16
1997	968	794	82.0	0.57	4.24	4.65	5.95	4.18	6.52
1998	945	769	81.4	0.53	4.21	4.64	6.73	4.70	7.27
1999	931	687	73.8	0.52	4.18	4.60	7.02	4.75	8.20

panel 2: Three machine industries vs. trouble threes

	No of sample firms	N of firms that have MB	percentage	Firms that is identified as having main bank ties					
				MBR= loan from main bank /total asset			MBL mbloan/total Loan	Toltal loan /Total Means	average borrrwoing
				Means	median	Std.dev	Means	Means	
Trouble threes: Construction, Real Estate, and Reta									
1989	161	123	76.40	3.92	2.75	6.00	22.75	17.26	56,111
1994	166	140	84.34	5.19	3.56	6.64	23.61	22.00	84,273
1999	158	122	77.22	7.86	4.62	8.80	27.14	28.97	90,525
Transportation, Electrics and Industy Machine									
1989	180	112	62.22	3.91	2.46	6.41	25.92	15.08	29,077
1994	186	129	69.35	4.19	2.53	5.63	24.80	16.90	36,262
1999	183	121	66.12	5.62	2.88	11.07	26.51	21.21	34,726

**Table 4: Summary of Effect of Events related to Banking Crisis on
Cumulative Abnormal Returns of Non-Financial Firms on Fays (-5,+5):
from Miyajima and Yafeh (2004)**

Dependent Variable: Cumulative Abnormal Returns of Non-Financial Firms on Days (-5, +5). Assets is total assets in million yen. Tobin's q is the market value to current value of asset. Leverage is the sum of burrowing and bond to total assets. High R&D sector dummy are given one to industries such as chemical, pharmaceuticals, machinery, electronics, transportation and precision instruments, otherwise zero. Bond rating is on a range from 4 (lowest, no rating) to 1 (rated A or higher). Main bank is identified as the largest lender, which status is the same as five years interval. OLS regressions with event-specific intercepts. The coefficient on assets is multiplied by 1,000,000.

	Injections of Capital	All Downgrading Events	All Downgrading Events	All Mergers	All Mergers
Constant	Event-Specific	Event-Specific	Event-specific	Event-Specific	Event-specific
Assets	0.004	0.008***	0.009***	0.000	0.000
	-0.003	-0.002	-0.002	-0.003	-0.003
Tobin's q	-0.001	0.022***	0.021***	0.003	0.003
	-0.005	-0.003	-0.003	-0.003	-0.003
Leverage	0.026	-0.084***	-0.087***	0.046***	0.057***
	-0.016	-0.014	-0.014	-0.012	-0.016
High-R&D sector dummy	-0.023***	0.012***	0.011***	-0.011***	-0.012***
	-0.004	-0.003	-0.003	-0.004	-0.004
Bond rating	0.005**	-0.008***	-0.006***	0.002	0.004**
	-0.002	-0.001	-0.001	-0.002	-0.002
MB involved dummy	N/A	0	0.001	0	-0.001
		-0.003	-0.003	-0.004	-0.004
MB loans to total assets	0.282***	-0.108**			-0.001
	-0.068	-0.048			-0.001
MB shareholding	-0.001	0			0.001
	-0.001	-0.001			-0.001
Bank loans to total assets			-0.014**	0.010*	
			-0.005	-0.006	
N	3340	4016	4016	2606	2606
R ²	0.06	0.22	0.22	0.10	0.10

***, ** and * denote coefficients significant at the 1, 5, and 10 percent levels, respectively.

Table 5 Summary statistics on debt composition and main bank relationship by firms' growth opportunities

Sample are limited to manufacturing firms. Whole sample firms are divided into three sub-samples based on three years average of a firms Tobin's q prior to selected firm year. Firms are defined as firms with high growth opportunities (HQ), if their Tobin's Q is higher than the third quartile of whole sample, while firms are defined as the one with low growth opportunities (LQ), if Q is lower than the first quartile. MBD1 is dummy variable which equals one if the main bank has not changed for five years. MBD2 is dummy variable which is equal to one if the ratio of main bank loan to the assets is higher than 5.1%. *DAR* is bonds and borrowings, divided by the market value of the assets. *LDR* is the ratio of borrowings to the sum of borrowing and bond. *MBR* is the borrowing from main bank, divided by total asset.

(%)

Year		N	Manufacturing		Firms in manufacturing sector with <i>MBD1=1</i>					
			<i>MBD1=1</i>	<i>MBD2=1</i>	<i>DAR</i>		<i>LDR</i>		<i>MBR</i>	
					Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev
1993	HQ	195	65.6	21.5	24.6	14.6	70.3	34.3	4.1	4.4
	LQ	242	76.9	27.3	25.1	10.8	62.4	27.8	3.2	2.5
1996	HQ	200	72.0	25.0	23.7	15.2	68.5	36.4	4.2	5.6
	LQ	253	78.7	28.9	23.0	11.5	65.4	29.3	3.3	2.7
1999	HQ	204	68.6	31.9	28.9	26.2	72.5	32.7	6.7	11.1
	LQ	242	76.4	40.5	24.6	13.4	74.7	26.7	4.5	4.2

Table 6 The Estimation result of investment function in firms with positive NPV.

The table presents results of fixed-effect regressions for the sample of all listed firms in manufacturing industries in 1st section of TSE.. Firms are defined as firms with high growth opportunities (*HQ*), if their Tobin's q is higher than the third quartile of whole sample, while firms are defined as the one with low growth opportunities (*LQ*), if Q is lower than the first quartile. Independent variables, *I*, is investment level, which is calculated as depreciation plus the difference of fixed assets from period t-1 to period t divided by fixed assets. *Q* is Tobin's q. *CF* is cash flow calculated as the depreciation plus after-tax profit minus dividend and bonus paid to directors divided by total asset. *SUB* is a dummy variable, which is one if over 15 percent of a firm's issued stock were held by another non-financial institution, and otherwise zero. *DAR* is the sum of bonds and borrowings divided by the market value of the assets. *LDR* is the borrowings divided by the sum of borrowing and bond. *MBR* is the borrowing from main bank, divided by total asset. Standard errors are reported in parentheses.

Model		1	2	3	4	5	6	7	8	9
Period									H Q firms	LQ firms
<i>Q</i>	1.007 0.411 (0.011)	0.039 *** (0.011)	0.040 *** (0.011)	0.041 *** (0.012)	0.045 *** (0.012)	0.043 *** (0.012)	0.044 *** (0.012)	0.044 *** (0.012)	0.027 (0.018)	0.156 *** (0.050)
<i>CF</i>	0.173 0.727 (0.004)	0.009 ** (0.009)	0.009 (0.009)	0.002 (0.004)	0.006 (0.009)	0.003 (0.004)	0.008 (0.009)	0.018 ** (0.009)	0.015 ** (0.006)	0.056 *** (0.019)
<i>dY</i>	-0.005 0.112 (0.027)	0.302 *** (0.027)	0.298 *** (0.027)	0.302 *** (0.027)	0.302 *** (0.027)	0.301 *** (0.027)	0.300 *** (0.027)	0.303 *** (0.027)	0.137 ** (0.060)	0.210 *** (0.048)
<i>SUB</i>	0.296 0.457 (0.023)	-0.039 * (0.023)	-0.041 * (0.023)	-0.045 * (0.024)	-0.046 * (0.024)	-0.041 * (0.024)	-0.042 * (0.024)	-0.039 (0.024)	-0.089 * (0.048)	0.064 (0.046)
<i>H*CF</i>			-0.003 (0.009)		-0.007 (0.010)		-0.008 (0.010)	-0.018 ** (0.009)		
<i>L*CF</i>			0.062 *** (0.02)		0.055 *** (0.021)		0.058 *** (0.021)			
<i>DAR</i>	0.261 0.172 (0.047)	-0.247 *** (0.05)	-0.246 *** (0.05)	-0.260 *** (0.048)	-0.273 *** (0.052)	-0.178 *** (0.057)	-0.199 *** (0.062)	-0.218 *** (0.060)	-0.117 (0.117)	-0.387 *** (0.111)
<i>H*DAR</i>			0.003 (0.024)		0.028 (0.035)		0.078 * (0.041)	0.090 ** (0.039)		
<i>L*DAR</i>			-0.006 (0.026)		0.006 (0.037)		-0.045 (0.044)			
<i>LDR</i>	0.570 0.373			-0.031 * (0.016)	-0.022 (0.019)	-0.009 (0.018)	-0.006 (0.021)	-0.016 (0.019)	0.017 (0.042)	-0.035 (0.031)
<i>H*LDR</i>					-0.017 (0.018)		-0.001 (0.019)	0.006 (0.018)		
<i>L*LDR</i>					-0.002 (0.017)		-0.018 (0.019)			
<i>MBR</i>	0.039 0.051					-0.396 *** (0.153)	-0.331 (0.206)	-0.121 (0.176)	-1.002 *** (0.275)	0.277 (0.275)
<i>H*MBR</i>							-0.455 ** (0.201)	-0.615 *** (0.185)		
<i>L*MBR</i>							0.466 ** (0.234)			
<i>SIZE</i>		-0.025 (0.023)	-0.031 (0.023)	-0.048 ** (0.024)	-0.052 ** (0.024)	-0.061 ** (0.024)	-0.066 *** (0.024)	-0.060 ** (0.024)	-0.112 ** (0.050)	-0.106 ** (0.045)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R ²		0.054	0.0561	0.056	0.0581	0.057	0.0625	0.0602	0.0476	0.0775
N		5744	5744	5476	5476	5476	5476	5476	1774	1821

***, ** and * denote coefficients significant at the 1, 5, and 10 percent levels, respectively.

Table 7 Summary Statistics of Employee Adjustment

Panel 1: Industry distribution of firms facing serious earning decline

The sample firms are all listed firms in 1st section of TSE except finance and public utilities. Firms are identified as NAD firms, if its three years average of operational profit from 1993-95 were 50% lower than those of 1988-1990, and otherwise zero.

Industry	No of firm		No of firms		A/B	
	(NAD=1 &NAD=0	No of firms NAD=1	percenta ge=A	NAD=0		percenta ge=B
construction	94	75	11.33%	19	4.97%	2.28
electric equipment	116	75	11.33%	41	10.73%	1.06
machinery manufacturing	92	70	10.57%	22	5.76%	1.84
chemical manufacturing	97	50	7.55%	47	12.30%	0.61
retail trade	56	43	6.50%	13	3.40%	1.91
textile	48	40	6.04%	8	2.09%	2.89
wholesale trade	65	40	6.04%	25	6.54%	0.92
transportation equipment	55	39	5.89%	16	4.19%	1.41
iron and steel	35	31	4.68%	4	1.05%	4.47
food	56	24	3.63%	32	8.38%	0.43
stone, clay, glass, and concrete products	27	19	2.87%	8	2.09%	1.37
metal products	26	19	2.87%	7	1.83%	1.57
miscellaneous						
manufacturing industries	26	17	2.57%	9	2.36%	1.09
service	26	16	2.42%	10	2.62%	0.92
non-ferous metal	24	15	2.27%	9	2.36%	0.96
computer and electronic						
product manufacturing	17	13	1.96%	4	1.05%	1.88
paper manufacturing	17	11	1.66%	6	1.57%	1.06
rail and truck	27	11	1.66%	16	4.19%	0.40
real estate	18	10	1.51%	8	2.09%	0.72
warehousing	12	8	1.21%	4	1.05%	1.15
pharmaceuticals	32	7	1.06%	25	6.54%	0.16
Total	966	633		333	1	

Panel 2: Discriptive statistics

L is the percentage changes of employment, S is the changes of real sales growth. SUB is a dummy varibale, which is one if over 15 percent of a firm's issued stock were held by another non-financial institution, and otherwise zero. DAR is bonds and borrowings, divided by the market value of the assets. LDR is the ratio of borrowings to the sum of borrowing and bond. MBR is the ratio of loan from main bank to total asset. $NMBR$ is the ratio of non main bank debt (bank borrowing plus bond) to total asset.

	total		NAD=1		NAD=0	
	mean	std	mean	std	mean	std
L	-0.030	0.145	-0.043	0.101	-0.020	0.077
S	0.002	0.125	-0.014	0.117	0.020	0.108
SUB	0.318	0.466	0.290	0.454	0.268	0.443
DAR	0.282	0.197	0.312	0.186	0.268	0.211
LDR	0.627	0.365	0.673	0.345	0.548	0.379
MBR	0.046	0.061	0.053	0.063	0.040	0.063
$NMBR$	0.146	0.151	0.172	0.153	0.127	0.151

Table 8: Estimation result of employment adjustment function in firms

Sample are all listed firms in 1st section of TSE except financial institutions and public utilities. L is the percentage changes of employment, L_{t-1} is the lag of L , S is the changes of real sales growth. SUB is a dummy variable, which is one if over 15 percent of a firm's issued stock were held by another non-financial institution, and otherwise zero. NAD is dummy variable which is equal one, if the three years average of operational profit from 1993-95 of sample firms were 50% lower than those of 1988-1990, and otherwise zero. DAR is the sum of bonds and borrowings divided by the market value of the assets. LDR is the ratio of borrowings to the sum of borrowing and bond. MBR is the ratio of loan from main bank to total asset. $NMBR$ is the ratio of non main bank debt (bank borrowing plus bond) to total asset. All regression includes Year dummy. Arellano-Bond dynamic panel estimation is used. Standard errors, asymptotically robust to heteroskedasticity are reported in parentheses.

Model	Discipline by debt		bank dependence		Main bank loan concentration		NAD=zero	NAD=1	main bank loan vs. arm's length debt
	1	2	3	4	5	6	7	8	
L_{t-1}	0.093 *** (0.023)	0.101 *** (0.025)	0.092 *** (0.027)	0.093 *** (0.027)	0.091 *** (0.027)	0.090 *** (0.028)	0.090 *** (0.034)	0.078 ** (0.036)	0.100 *** (0.025)
S_{t-1}	0.171 *** (0.063)	0.147 *** (0.032)	0.123 ** (0.061)	0.139 *** (0.032)	0.123 ** (0.061)	0.139 *** (0.032)	0.201 *** (0.059)	0.115 *** (0.038)	0.147 *** (0.032)
SUB	-0.026 (0.034)	0.012 (0.027)	-0.015 (0.035)	0.012 (0.030)	-0.016 (0.035)	0.014 (0.031)	-0.012 (0.048)	0.027 (0.037)	0.013 0.028
DAR_{t-1}	-0.182 ** (0.072)	-0.223 ** (0.103)	-0.161 ** (0.073)	-0.228 ** (0.105)	-0.192 *** (0.065)	-0.174 ** (0.087)	-0.184 ** (0.079)	-0.163 *** (0.073)	
$DAR \times NAD$		0.168 (0.121)		0.180 (0.124)		0.019 (0.110)			
LDR_{t-1}			-0.029 ** (0.014)	0.001 (0.016)	-0.036 ** (0.016)	0.012 (0.016)	0.008 (0.016)	-0.038 ** (0.017)	
$LDR \times NAD$				-0.013 (0.019)		-0.052 ** (0.023)			
MBR_{t-1}					0.134 (0.173)	-0.233 (0.161)	-0.192 (0.155)	0.457 ** (0.227)	-0.389 ** (0.180)
$MBR \times NAD$						0.711 ** (0.280)			0.651 ** (0.264)
$NMBR_{t-1}$									-0.178 ** (0.085)
$NMBR \times NAD$									0.043 (0.105)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald test(d.f.)	112.03(9)	117.26(10)	93.6(10)	108.59(12)	94.25(11)	114.81(14)	54.62(11)	76.55(11)	123.45(12)
m1	-6.49	-6.44	-6.69	-6.2	-6.71	-6.24	-4.6	-5	-6.47
m2	1.8	1.56	1.54	1.07	1.53	1.1	0	1.28	1.6
N	6586	6100	6221	5802	6221	5802	2037	3765	6100

***, ** and * denote coefficients significant at the 1, 5, and 10 percent levels, respectively.