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

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March 2005

Abstract

The purpose of this paper is to provide an overview of the relationship banking in Japan in the 1990s. We show the increasing dependence on bank borrowing in spite of the deregulation of bond market in the mid 1990s in terms of the debt composition, and we confirm the loan from main-bank also increases among the firms with higher bank borrowing. Then, we examine the effects of these facts on borrowing firm behavior. By estimating the employment adjustment function, we present that main bank did not discipline effectively firms that were required the corporate restructuring, while it encouraged the restructuring of the firm with relatively better performance.

1. Introduction.

The purpose of this paper is to provide an overview of the relationship banking in Japan in the 1990s, and answer the following questions: Is the Japanese financial system still defined as the relationship-based financial system? If the answer is yes in part, does relationship banking (or main bank system) play the 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 overwhelms its bright side, then why does it happen and what is the future of the main bank system?

To address these issue, we begin by summarizing the bank-firm relationship in the 1990s Japan, showing that bank-firm relationship is not homogenous among Japanese firms. Along with the well-known facts of the differences of bank dependence across industries, we highlight two untouched puzzling facts. First one is the increasing dependence on bank borrowing in spite of the deregulation of bond market in the mid 1990s in terms of the debt composition. By showing the estimation result on debt choice, we suggest that bank borrowing increasingly become important especially for firms with higher risk. Second is the fact that the degree of concentration of loan from main-bank increases among the firm with higher bank borrowing. It implies that the bank-firm relationship has been getting heterogeneous in the 1990s, and there are a certain number of firms that depend on main bank for their important financial resources. On the cause of this increasing commitment, we raise two possible interpretations: either the banks pick a winner and take an initiative to promote necessary corporate restructuring, or the banks roll over their loans and adopt evergreen polices, delaying corporate restructuring of borrowers.

Since banks rather than borrowers are overwhelmed by non-performing loan problem in the 1990s, 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 (2003) that focus on the market response of borrowers to the banking crisis, we show that the banking crisis does matter, but does not affect Japanese firms equally. The banking crisis is especially harmful not only for firms with high leverage and high bank

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dependence, but also for firms with low profitability 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 shows the market response of firms to the banking crisis, and it is still unclear whether the banking crisis has had a substantial effect on borrowing firm's behavior.

Then, we examine whether firms with positive NPV suffer from the credit crunch or not in the 1990s? By investigating the relationship between internal fund and investment, we show that there is little evidence that firms with high growth opportunities are seriously faced with credit crunch in general.

Furthermore, we examine whether main bank encourage corporate restructuring, while it avoid discouraging profitable projects that are slow to pay off? By estimating the employment adjustment function, we show that the increasing degree of concentration of loan from main bank is associated with the delay of employment reduction in firms facing serious necessity of corporate restructuring, and with high employment reduction in firms that are keeping their earnings relatively high. Thus, main bank in the 1990s played the reverse role from the one it is supposed: i.e. main bank did not discipline effectively the firms that are really required corporate restructuring, while it encouraged the restructuring of the firm with relatively better performance.

This chapter is organized as follows. The next section summarizes the changes of the debt composition for Japanese firms in the 1990s. Section three explores the effect of the banking crisis on Japanese firms. After discussing the theoretical framework of corporate governance by main bank in section four, we examine the problem of credit crunch in section five. Section six examines the role of main bank in corporate restructuring in firms with decreasing profits. The last section provides some conclusions.

2   Puzzling Features in Corporate Finance

2-1 Changes in corporate finance

Against a 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 in the 1990s? Let us begin to summarize the corporate finance practices of non-financial listed firms in the First Section of the Tokyo Stock Exchange.

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 change of the financial status among listed firms from 1980 to 2002.[1] It is clear that the weight of the firms in category E2, which depends only on bond issuance, increased from almost zero (0.2%) in 1980 to 7.8% in 1990, while the firms in category N, which exclusively depends on bank borrowing, decreased from 58% in 1980 to 28% in 1991.

The diversity of the capital composition across Japanese firms has increased during the 1990s. Firms in category E1, which do not depend on leverage at all, increased from 4.2 % in 1990 to 11.7% in 2000, while the firms in category N, which exclusively depend on bank borrowing, increased from 29.4 % in 1991 to 46.9% in 2000. Firms which depend on bond issuance and firms using a mixture of bond issuance and bank borrowing constantly decreased.

<center>== **Figure 1** is about here ==</center>

Detailed information on capital composition is presented in **Table 1.** First, we see that the ratio of debt (the sum of bond and borrowing) to asset in 1990 decreased 4.5% points from 1986 with low standard deviation, while the ratio of borrowing to debt decreased from 69.5% in 1986 to 54.5% in 1990.

This decreasing bank dependence was the result of rational choices by Japanese 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

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[1] Aoki et al (1994) shows similar figure from 1966 to 1992.

<center>3</center>

non-manufacturing sectors. Then, it was inevitable that the loan portfolio of banks deteriorated at the end of the bubble period in the sense that firms with low profitability remained clients of the banks, and land-collateral loans to non-manufacturing sectors increased.

The increasing diversity in the capital composition among firms is also clear from Table 1. Even though the debt-asset ratio of firms on average is almost constant, its standard deviation has increased during the past decade, especially since 1997. The difference in bank dependence across industries is also enlarged in the 1990s. While bank dependence on average among firms in manufacturing sectors has decreased since 1993, the firm in non-manufacturing sectors, particularly construction, real estate and retail sector, increased its bank borrowings. Stressing that the declining profitability of these sectors has been obvious since 1993, Peek and Rosengren (2003) and others suggested that there have been serious credit misallocations since the mid 1990s.

Another feature of corporate finance in the 1990s is the changes in debt composition. It is remarkable that after 1991, the ratio of borrowing to total debt consistently increased during the 1990s, especially from 1997 to 1999. This ratio in 2000 is 70.7%, which is higher than that of 1986, when the bond issuance was still heavily regulated. 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 late 1980s were amortized and replaced by bank borrowing. Then what type of firms continued to raise their funds through bond issuance, and what kind of firms switched their financial resources from corporate bonds to bank borrowing again?

<div align="center">== Table1 is about here ==</div>

2-2 Debt choice after complete deregulation

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) construct a model that shows firms with less established reputations

tend to borrow from banks, while firms that are more successful tend to issue bonds.[2] 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 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 projects.[3]

Following this theoretical literature, we derive the hypothesis that a firm does 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 clear.[4] We use listed firms on the TSE First Section from 1996 to 2000 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,

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[2] 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.
[3] 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.
[4] 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.

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. The 2-Limit Tobit model is selected as the estimation method, since dependent variables are truncated at both zero and one. We use the ratio of bank borrowing to total debt as a dependent variable. For an explanatory variable, debt divided by total assets is used as the proxy of likelihood of financial distress.[5] We predict that high values of this variable would encourage a firm to use bank borrowing, while low leveraged firm tend to issue bonds more in order to avoid strict monitoring by banks. The volatility of monthly stock returns over the last three years is also included as a proxy of risk. We adopt Tobin's q to capture the firm's growth opportunity in the same way as Hoshi et al.(1993).[6] Following Wo, Sercu, and Yao (2002), we also introduce 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 to the explanatory variables to control for the effect of firm size on debt choice. Lastly, year dummy variable 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 year dummy in 1997 is only significant, 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. The coefficient of log of assets as a proxy for firm size is significantly negative. This means that larger firms can issue bonds more easily using their reputation. Firms' choice of bank borrowing is significantly and positively correlated with debt-asset ratio. A higher possibility of financial distress implies

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[5] Here, we use the market value of land and holding securities, but other tangible assets are accounted by book value.
[6] Anderson and Makhija (1999) adopt growth opportunities for investigating the determinant of debt choice.

larger demand for bank borrowing. Similarly, the coefficient of volatility is significantly positive.

On the other hand, the relation between the ratio of bank borrowing to total debt and q is significantly negative. The firm with better prospects tends to move away from bank borrowing. The coefficient of q^2 is significantly positive, and 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.

== **Table 2** is about here ==

The estimation 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 on capital market, other 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 1990s. 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 market.[7] It implies that there are a certain number of firms with high growth opportunities that depend on bank borrowings even in the 1990s, and banking sector kept lending to these firms even during the banking crisis.

2-3 Increasing main bank loan concentration

Along with increasing dependence on bank borrowing, another remarkable feature

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

of corporate finance of Japanese firms in the 1990s is the increasing degree of concentration of loan from main bank. Is this the result of the strengthening bank-firm relationship among Japanese firm? We investigate this problem here.

First, we identify main banks of each firm as the largest lender among banks. Since main bank ties are characterized as long-term and stable, we check whether the main bank of each firm is same 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. 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, the stable relationship between bank and firms was sustained until 1997 and somehow dissolved afterward when the banking crisis became serious. Out of 82 cases of the number of firms with main banks 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 (Hirota and Miyajima 2000). Second, the percentage share held by the main bank is stable, as long as its median and third quartile is 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 this ratio into the ratio of borrowing over asset and the ratio of borrowing from main bank over total borrowing, we find that not only the ratio of borrowing over asset, but also the ratio of borrowing from main bank over total borrowing increased constantly.

Since non-performing loan problem is quite serious in construction, real estate, and retail sector, we compare the main bank relationship in these three sectors with

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that of relatively better performing sectors, transportation, electrical and industrial machinery. We find that the ratio of borrowing from main bank to assets increases in both sectors. However, in the three sectors with poor performance, we can find the higher percentage of firms that have close main banks ties shows higher ratio of borrowing from main bank to assets with lower standard deviation, and larger amount of borrowing compared to the three machinery industries. In fact, bank dependence and main bank commitment increased during 1990s in these threes sectors with poor performance.

Then, how can we interpret this increasing main bank loan concentration? According to the estimation results of the determinants of main bank loan concentration using the same model as the one for debt choice, we find that the determinants of main bank loan concentration are almost as same as those for debt choice (not reported). The ratio of borrowing from main bank to assets is negatively sensitive to tobin's q, and positively associated with the debt-asset ratio and volatility of monthly stock returns over the last three years.

There are two possible interpretation for these results. First, since the concentrated debt holding by main bank helps mitigate free riding behavior of debt holder when firms are in distress (Bulow and Shaven 1978, Hall and Weinstein 2000), the increase of the ratio of borrowing from main bank to assets could be the result that main bank coordinated the other lenders, and took the initiative in corporate restructuring of borrowers. Second, the increasing commitment to the borrower by main bank may also be possible if a bank continued to roll over loans to less profitable borrowers at the expense of their loan portfolio diversification in the hope of recovering its loan or to dress up its own balance sheet, while the arms-length lender does not lend to a borrower who is on the verge of bankruptcy.

Put differently, the increasing main bank lending concentration could be interpreted as either 1) the bank's policy of picking winners and taking the initiative in corporate restructuring, 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. Then, we ask

later which the major case is.

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

The most important factor for the relationship banking in the 1990s in Japan is the banking crisis.[8]   Banks that were formerly expected to rescue borrowers in the mid financial distress were now mired in trouble.   What was the effect of this banking crisis on the bank-firm relationship?

The poor performance of the banking sector has become a serious problem 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.   Price /Book Value ratio of major banks and local banks on average decreased from 4.04 in the end of 1990 to 2.48 in the end of 1996. The credit rating of major banks were AA or higher in the early1990s. However, following the *Jusen* crisis and some bank bailouts, many banks were downgraded to A or lower.   It was in November 1997 when financial crisis overwhelmed 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 Price /Book Value ratio of banks declined further to 1.19 at the end of 1998. Downgrading of banks also continued, and the credit rationing of almost all banks were BBB or lower at the end of 1998. [9]

There is a growing number of literature that focuses on the effect of the banking crisis on client firms.   Yamori and Murakami (1998) and Brewer et al. (2003) examine the impact of the announcement of Japanese bank distress on the stock prices of

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[8] For the detail story of banking crisis and its over all impact, see Hoshi and Kashyap (2001), Nakaso (2001),Peek and Rosengren (2001).

[9] For downgrading of majar banks, see detail Miyajima and Yafeh (2003), Appendix A.

non-financial institutions, and highlight the negative response of their stock prices. Extending this literature, Miyajima and Yafeh (2003) investigates the effect of the banking crisis on Japanese firms using about 800 listed firms on the First Section of the Tokyo Stock Exchange. 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."[10] 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 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:

$$CAR = f(SIZE, q, DAR, BOND, RD, MBR)$$

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 ratio of borrowing from main banks to total assets.

The essence of their empirical result is as follows. 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

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[10] 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.

company: operating in a low-tech sector (low R&D expenditure), with limited access to bond markets and a high degree of leverage.

Similarly, the main beneficiaries of improving banking supervision 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. They conclude that government actions matter, and 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 statistically significant with substantial magnitude.[11] Also sensitive to downgrading are firms in low R&D industries with low credit ratings, although its effect is smaller than that of leverage. In addition, there is the evidence that large and profitable firms seem to be suffered less from downgrading of their banks. Lastly, the stock price of firms with higher dependence on bank borrowing as well as main bank loans negatively respond more to downgrading and positively more to government action.

In sum, the result that the negative stock price response of firms with high leverage and high main bank dependence to the troubles of main bank such as bankruptcy and downgrading and the positive response to government action suggest that the bank-firm relationship 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. The banking crisis might cause the "creative destruction". In other words, what occurred during the banking crisis is a slow "cleansing process".

The above researches examined the market response of client firms to the banking crisis, but it is still unclear whether the banking crisis had a substantial effect on borrowing firm behavior. Then, we examine this problem in the following sections.

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[11] For example, firms with leverage two standard deviations above the mean experienced 7% lower *CAR*.

4 Two faces of main bank relationship in corporate governance

We first discuss the theoretical framework of corporate governance by main bank. Aoki (2001) clarifies a bailout mechanism by main bank as relational-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 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 relational-contingent governance is the existence of an output level where the relationship bank bail out a borrower in mid financial distress because the rents that banks can extract from borrowers exceed the total costs of rescuing. Therefore, the debt supplied by a main 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 relational-contingent governance works well, the effort level of managers increases because they have strong incentives to entrench themselves against bank intervention. On the other hand, an appropriate bail out of client firms in financial distress by additional money lending and interest reductions would be helpful to avoid the inefficiencies of discouraging profitable projects that are slow to pay off during periods of financial distress.[12]

However, Aoki also argues that there exist double-edged commitment problems under the incomplete contract environment in the relational-contingent governance. One is the shot-termism or credit crunch problem. That is, main bank terminate firms to be bailed out socially if main bank cannot get enough rent from bailing out. Another is the failure of commitment of termination of loans to client firms when it falls in the bankruptcy region because of the too high rent for main bank, or soft budget problem (Dewatripont and Maskin,1995). If the threat of termination were not credible, it

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[12] 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.

would be highly plausible that borrowers adopt moral hazard behavior expecting the rescue by main 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 evaluation of its future reconstruction, but for dressing up non-performing loan to keep the capital required by the Basel Accord. This perverse incentive of banks would also be stronger if a bank were the main bank of a client firms, 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.

Following these theoretical hypothesis, we investigate the two empirical problems.

1. If most firms that are sensitive to the banking crisis are in bad performance, reducing 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 free from the credit crunch or not.

2. 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 process? Or, as recent literature has pointed out, did the high bank dependence undermines incentives for firms to take necessary corporate restructuring measures?

5 Credit crunch and investment

A large volume of literature treats from various perspectives about the credit crunch in the 1990s Japan. 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 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 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.

For investigating further the credit crunch problem in the 1990s, we estimate the investment function with the cash flow developed by Fazzari et al. (1988). We use manufacturing firms listed on the TSE First Section from 1993 to 2000 as the sample. The estimation formula is as follows.

$$I_t = f(q_{t\text{-}1}, CF_t, DAR_{t-1}, YD)$$

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 assets. DAR is the leverage, or firms' debt (borrowing plus bonds) to their current assets. CF is introduced to capture the cash flow constraint. For controlling the effect of parent companies on the investment of related firms, we introduce the SUB dummy, if more than 15 % of firm's issued stock is held by other single non-financial institutions.

Using this model, we perform the credit crunch test. If firms with positive NPV face liquidity constraint, their investment is seriously constrained by their internal funds. In order to test this hypothesis, we divide sample firms 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 of LQ. Then, we introduce the interaction term between HQ and LQ dummy and CF in regression. The estimation results of manufacturing firms from 1993-2000 are reported in **Table 4.**

===**Table 4** about here===

The coefficient of *CF* is significantly positive in column 1. When we see the interaction term of CF with HQ and LQ dummy (column 4 and column 5), 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. These results imply that firms with low growth opportunities presumably face 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. This is also consistent with the result of Miyajima, Arikawa and Kato (2002), which shows that physical investment of firms with growth opportunities were relatively free from financial constraints, being different from R&D investment.

It is true that the investment in HQ firms is constrained by their internal funds if we limit sample firms to the shorter sub- period (1993-95, 1995-97, and 1997-00). The sub-period that we find the HQ firm is financially constrained is only from 1997 to 2000, which is the period of the banking crisis.[13] This result is consistent with the result of the other literatures. Thus, like Hoshi and Kasyap(2004), we can conclude that at least the firms listed on TSE do not faced the serious credit crunch in general.

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[13] Ogawa (2003) present that smaller firms faced the debt overhang problem in the 1990s. 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.

6. Corporate Restructuring

There are several approaches to examine the work of relational contingent governance in Japanese firms in terms of the threat of termination to the borrowing firm. The first approach is to focus on the relation between profitability of the borrowing firms and the loan increase, and suggested the existence of soft budget problem or credit misallocation by banks. For example, Peek and Rosengren (2003) find that bank increased its credit to poor performing firms between 1993 and 1999, and main banks were more likely to lend to these firms than other banks. Furthermore, they show that this credit misallocation is found more when the bank's balance sheet is weak.

Second approach 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 main bank system plays such a significant role even in the late 1990s. To answer this question, we estimate the employment adjustment function and investigate whether firms with close main bank ties implement the necessary corporate restructuring when they face serious performance decline or not. In the estimation equation, dependent variable is the percentage change of employment. For independent variable, we use the followings; lag of the percentage change of employment, change of real sales growth rate to control the effect of firm performance. Further, for testing the effect of the bank-firm relationship on corporate restructuring,

we introduce the ratio of debt to asset, the ratio of the bank borrowing to debt, and the ratio of borrowing from main bank to asset.

Furthermore, following Kang and Shivdasani (1997), we produce the dummy variable, *NAD*, as a proxy of the necessity of corporate restructuring. This dummy variable equals one if the three-year average of operational profit from 1993-95 of sample firms is 50% lower than those of 1988-90, and otherwise it is zero. We say a firm faces the necessity of restructuring if this dummy variable equal one. We call the firm with this dummy variable equal one as *NAD* firm.

Then, we 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 5** present the distribution and descriptive statistics of sample firms. Being different from Kang and Shivdasani (1997) that address the business upturns (the late 1980s), the number of firms that faces the significant decline of operational profit is larger 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, there are large numbers of firms that suffer a significant decrease in performance in construction and retail industries. However, it should be noticed that textile, iron and steel, and even the machine sector (electrical and transportation) include large numbers of firms with performance decline. In Panel 2, we can find that the ratio of employment reduction is much larger for *NAD* firm, and leverage*,* bank dependence and main bank loan concentration is also much higher in the *NAD* firms. Estimation results are summarized in **Table 6**.

=== **Table 5 /6** about here===

The coefficient of the change of real sale growth is positive and highly significant for all estimations. One percent decrease of this variable is associated with approximately 0.13-0.2% of employee reduction. On the other hand, the coefficient of debt-asset ratio is negative and significant in column 1. The leverage affect on reducing employment in general. However, there is no difference between firms with restructuring necessity and other firms in this effect, as long as the interaction term between the debt-asset

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ratio and *NAD* in column 2 applies.[14]   The coefficient of the ratio of bank borrowing to debt is significantly negative in general (column 3), but no difference between *NAD* firms and others firms was found in column 4.   Thus, we cannot figure out whether high leverage and high bank dependence promote the "creative destruction" on client firms.

Once we add the ratio of borrowing from main bank over asset to the regression, the coefficient of interaction term between the ratio of the bank borrowing over debt and *NAD* is significantly negative and the coefficient of the ratio of borrowing from main bank over asset and *NAD* is positive in column 6.   This result contrasts with column 5 where the coefficient of the ratio of borrowing from main bank over asset is not significant.   That is, among firms facing the serious necessity of corporate restructuring, bank dependence was associated with rapid employment adjustment, while the high concentration of the borrowing from main bank was associated with slow employment adjustment.

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 the firm with the necessity of restructuring and other firms, and estimated the same model separately. The coefficient of the ratio of bank borrowing to debt is significantly negative and that of the ratio of borrowing from main bank to asset is positive in *NAD* firms.

In order to distinguish the effect of the loan from main bank and other debt more clearly, we introduce the ratio of non-main bank debt to total borrowing.   Here non-main bank debt includes borrowing from banks except main bank and bonds, and we could regard this as the arm's length debt.   In column 9, we find the ratio of non-main bank debt to total borrowing 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, or arm's length debt. Second, the interaction term between the ratio of borrowing from main bank to asset and *NAD* dummy is significantly positive, while the ratio of borrowing from main bank

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[14] This result is supported by the comparison of the *DAR* of *NAD* firms with that of other firms in column 7 and 8.

to asset itself is negative.[15] 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.

Many literatures like Peek and Rosengren (2003) insist that Japanese banks tend to bailout almost bankrupt firms through ever-greening old loans and keep unprofitable firms. Caballero et al.(2004) called these artificially survived firms "zombies". Our estimation result suggest that the evergreen policy taken by banks and resulting "zombies" might not be so prevalent across Japanese firms, because the high bank dependence tends to reduce the growth rate of employment in non-*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 we limit bank-dependent firms to firms whose main bank loan concentrations are high. The higher concentration of bank loans to firms with poor performance give stronger 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 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 is expected 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, while it allows firms with larger performance declines to delay the necessary restructuring.

7. Concluding Remarks

After financial deregulation and drastic changes in the macroeconomic situation

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[15] When we used the fixed effect model, the result is unchanged.

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 Hoshi 2000) and the credit line was normally supplied by their former main bank, it is safe to conclude that main bank 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 increased their dependence on bank borrowing in the 1990s. These firms comprised two different categories of firms. In the first category are firms with low growth opportunities for whom main bank 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, main bank 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. Firms with high growth opportunities were basically free from any financial constraint. 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 necessary 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, 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. 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. 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 better performance, while it imposed a soft budget constraint on firms with poor performance.

However, we do not necessarily conclude that relationship banking in Japan 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 clear that, as many observers insisted, the restructuring of this sector is highly urgent.

There are some good news on this front. First, after the banking crisis was partly relieved by capital injection from the government, 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 levels. Third, private equity increasingly plays an important role in the corporate restructuring process, complementary to the main bank bail-out mechanism, 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.

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

Legend:
- E1: no borrowing, no bond issue
- E2: no borrowing, current bond issue
- F: borrowing plus current bond issue
- N: borrowing only
- C3: two years net loss
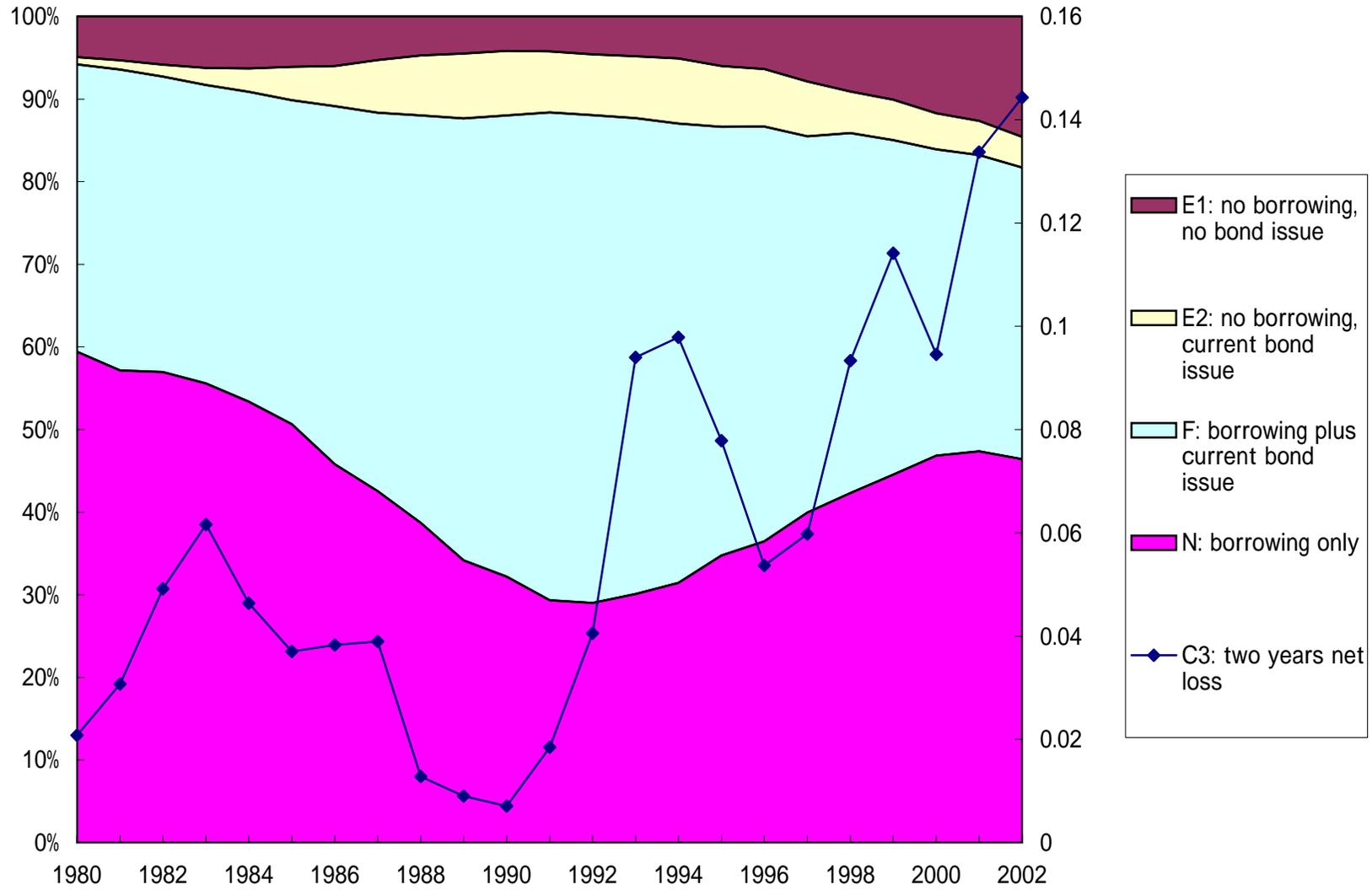
Table 1   Capital composition of the 1990s.

Bank Borrowing is the bank borrowing divided by total asset and Bond is the bond outstanding divided by total asset.

Year	N	(Bond +Borrowing)/Asset		Bank Borrowings		Bonds		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	0.172	0.169	0.172	0.106	0.097	0.545	0.363
1991	1086	0.291	0.174	0.173	0.172	0.118	0.103	0.541	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	0.251	0.251	0.188	0.242	0.063	0.090	0.707	0.347

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 2-limit Tobit model with dependent variable restricted within [0,1]. The dependent Variable is 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. DAR is total debt , divided by total asset. Volatility is stock returns volatility. Size is the log of total asset. Coefficient and t-value is

Model				
Constant	1.987	2.266	2.225	2.454
	23.190	15.080	23.740	15.860
q	-0.137	-0.115	-0.577	-0.477
	-6.800	-5.380	-7.950	-6.330
q^2			0.150	0.121
			6.300	5.000
DAR	0.926	0.802	1.003	0.872
	21.330	16.000	22.290	16.790
Volatility	0.026	0.028	0.025	0.027
	12.540	13.000	11.890	12.500
Size	-0.159	-0.165	-0.157	-0.162
	-23.510	-23.650	-23.290	-23.240
Y97	0.066	0.071	0.051	0.058
	2.910	3.200	2.250	2.620
Y98	0.023	0.025	-0.002	0.003
	1.000	1.090	-0.070	0.140
Y99	0.023	0.023	-0.007	-0.003
	0.960	0.980	-0.320	-0.140
Y00	0.022	0.019	-0.015	-0.012
	0.920	0.790	-0.590	-0.500
Industrial dummy	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

	No. of sample firms	No. of firms that have MB	percentage	Average number of outside director from main bank	persentage shareheld by main means	median	loan from main bank /total asset 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

	No. of sample firms	No. of firms that have MB	percentage	Firms that is identified as having main bank ties loan from main bank /total asset means	median	Std.dev	loan from MB/total loan means	loan /total asset means	borrowing means
Construction, Real Estate, and Retail									
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 Internal fund and investment.

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 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 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 the sum of bonds and borrowings divided by the market value of the assets. Standard errors, assymptocally robust to heteroskedasticity are reported in parentheses.

Model	1		2		3		4		5	
q	0.052	***	0.047	***	0.044	***	0.046	***	0.041	***
	(0.011)		(0.011)		(0.011)		(0.011)		(0.011)	
CF	0.014	***	0.009	***	0.014	***	0.012		0.009	
	(0.004)		(0.004)		(0.004)		(0.009)		(0.009)	
Y			0.300	**					0.299	***
			(0.027)						(0.027)	
SUB	-0.032		-0.033		-0.038		-0.040	*	-0.041	*
	(0.023)		(0.023)		(0.023)		(0.023)		(0.023)	
HQ*CF							-0.001		-0.003	
							(0.01)		(0.01)	
LQ*CF							0.069	***	0.061	***
							(0.02)		(0.02)	
SIZE	-0.082	***	-0.048	***	-0.060	***	-0.066	***	-0.031	
	(0.023)		(0.023)		(0.023)		(0.023)		(0.023)	
DAR					-0.238	***	-0.237	***	-0.246	***
					(0.048)		(0.048)		(0.047)	
Year Dummy	Yes		Yes		Yes		Yes		Yes	
Adj.R^2	0.0245		0.0486		0.0294		0.0321		0.056	
N	5744		5744		5744		5744		5744	

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

Table 5 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.

Industy	No of firm (NAD=1 &NAD=0	No of firms NAD=1	percenta ge=A	No of firms NAD=0	percenta ge=B	A/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: Discrptive 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 Mean	Std.dev	NAD=1 Mean	Std.dev	NAD=0 Mean	Std.dev
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 6: Etimation result of employment adustment 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, Lt-1 is the lag of L, 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. *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 asse. All regression includes Year dummy. Arellano-Bond dynamic panel estimation is used. Standard errors, assymptocally robust to heteroskedasticity are reported in parentheses.

Model	Discipline by debt		bank dependence		Main bank loan concentration		NAD=0	NAD=1	main bank loan vs. arm's length debt
	1	2	3	4	5	6	7	8	9
Lt-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)
St-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)
DARt-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×NAD		0.168 (0.121)		0.180 (0.124)		0.019 (0.110)			
LDRt-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×NAD				-0.013 (0.019)		-0.052 ** (0.023)			
MBRt-1					0.134 (0.173)	-0.233 (0.161)	-0.192 (0.155)	0.457 ** (0.227)	-0.389 ** (0.180)
MBR×NAD						0.711 ** (0.280)			0.651 ** (0.264)
NMBRt-1									-0.178 ** (0.085)
NMBR×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
N	6586	6100	6221	5802	6221	5802	2037	3765	6100

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