Center for Economic Institutions
Working Paper Series

Bank Loans to Distressed Firms: Cronyism, bank governance and economic crisis

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First draft: July 19, 2003
This draft: October 15, 2003

Abstract

       Loans to financially distressed firms contributed to Korea's 1997 crisis. Possible explanations for these loans include bank's better inside information on borrowing firms, crony lending, and financial institutions' (FI) moral hazards (FIs' poor governance). We examined 6474 non-financial firms' capital structures during 1990-2000. Firms in distress or with higher leverage growth rates tended to show lower ex-post ability to pay debt, and lower return on assets, suggesting that lending decision is not based on inside information. Even after controlling for available collateral, size and industry effects, distressed firms with large business group (chaebol) affiliation showed the highest borrowing growth rate without proportionately more short-term loans, suggesting crony lending or government guarantees. Distressed firms with FI affiliation showed a higher leverage growth rate, consistent with the related lending argument. Distressed non-chaebol firms without FI affiliation also showed higher leverage growth rates and with proportionately more short-term loans. However, their ex-post performance was lower. These results show that banks lent to these small firms without affiliation to chaebols nor FIs despite the lack of external pressure, suggesting poor governance at the FIs.

1. Introduction

Banking sector problems coupled with huge non-performing loans were prevalent during the economic crisis in Asian countries. When large firms with high debts failed, they caused a cascade of bankruptcies among affiliated firms and subcontractors and so on. A huge non-performing loans resulting from failure of many firms exhausted banks' own debt capacity as foreign investors stopped revolving loans to them, thereby triggering the financial crisis in 1997 (Corsetti, Pesenti, & Roubini, hereafter CPR, 1999; Diamond & Rajan, 2000). While bank problems were correlated with loans to bankrupt firms, it is not clear why banks were lending loans to them. This study examines whether banks in a country that eventually experienced the crisis were lending money to firms with higher risk without being compensated for taking extra-risk. In addition, this paper tries to identify the reasons why banks lent money to poorly performing firms.

Banks can lend money to distressed firms because of (a) banks' better inside information, (b) related lending, (c) crony lending and (d) bank managers' moral hazards. In the most optimistic view, distressed firms are credit-worthy because of their likely future profits or their collateral. A bank can have a close historical relationship with the firm and thus have inside information that the firm's future profits will cover its current losses (see Hoshi, et al., 1991a, 1991b, Aoki, Patrick and Sheard, 1994). Related lending can occur through firm affiliations with banks. Firms with ownership in banks can borrow money on favorable terms (e.g., Mexican banking sector, La Porta, López-de-Silanes and Zamarripa, hereafter LLZ, 2002; Peek & Rosengren, 2003). Even without direct ownership, Charumilind, Kali, and Wiwattanakantang (2003) showed that firms with bank connection through bankers on board borrowed more money. Crony lending can occur through government influence. Through political donations and other payments, firms can have government officials influence banks to lend more money (Graham, 2003; Kang, 2002; see also Dinc, 2003). Some argue that a crony lending was a fundamental cause in Asian economic crisis. (CITE) Government bailouts of banks and political incentives create moral hazards for bank managers and harm bank governance. Under government protection (such as deposit insurance or government recapitalization), bank managers face a moral hazard and can take excessive risks by routinely approving additional loans without evaluating the borrower's creditworthiness (Mitchell, 1998). Meanwhile, bank managers concerned with their reputation during their tenure might focus on avoiding blemishes, such as loan defaults, rather than maximizing bank profits (KDI, 2000). So, banks may prop up a weak firm with short-term loans to avoid loan defaults. In this case, many distressed firms without bank affiliations or political connections are also likely to receive more loans than profitable firms, through short-term loans rather than long term loans.

We tested the above hypotheses by analyzing the capital structure of Korean firms during 1990–2000. In the early 1990s, the government was reforming the financial sector and reduced their direct intervention in the corporate sector (Yoo, 1997). Banks were privatized in the early part of the 1980's and industrial policy

loans were officially ended. So, government direct intervention into lending practices was weaker, and banks had profit incentives. Government regulations imposed ceilings on lending interest rates until 1997 (Graham, 2003), so maximizing bank profits required minimizing non-performing loans through conservative loans to credit-worthy borrowers. The decreasing rates of economic growth in Korea throughout most of the 1990's (**CITE**) also encouraged conservative lending practices.

Specifically, we examined FIs' lending decisions. The borrower information that FIs used to make loan decisions is not readily available. So, we tested whether the firm's capital structure reflected the available information on its financial stability and its likelihood of repayment. The empirical tests consist of three parts. In the first part, we tested whether FIs lent more money to financially distressed firms than to other firms. We examined whether distressed firms showed higher leverage ratios, including short term loan over total asset ratio and debt asset ratio, controlling for initial borrowing ratio, size, and industry characteristics. In the second part, after establishing that financially distressed firms showed higher debt growth rates, we also examine whether high debt growth rates of distressed firms are due to bank's better information on firm's future performance. We tested whether firms receiving loans were likely to show performance improvement by examining the determinants of firm's ex-post ability to pay future loan payments as well as ex-post return on assets, controlling for debt growth rate, financial distress (losses in last three years), and business group (chaebol) affiliation. In the third part, we examine the determinants of debt growth rates: we measure the effects of FI affiliation, political connections on firm's debt growth rate. As capital structure depends on asset tangibility, profitability and firm size (Rajan and Zingales; 1995), we controlled for these effects as well as the industry effects. Asset tangibility, which can be used for collateral, is measured as the ratio of fixed assets over total assets. To test the effect of related lending, we identified business groups with FI affiliation. When a firm is affiliated to a business group with ownership in financial institutions, we call the firm FI-affiliated. Then, we compared the loans to FI-affiliated firms with loans to other firms. As shown in many political scandals (Graham; 2003), large business groups in Korea have sought political favor through political donations and other payments. We use chaebol affiliation as a proxy for political connections. Then we compared loans to chaebol firms and to non-chaebol firms, controlling for all the above variables.

In a related paper, Peek and Rosengren (2003) showed that Japanese firms with lower stock returns borrowed more, and that weaker banks lent more. Linking these two sets of results, they argued that banks were forestalling loan defaults and hid these losses to maintain their required capital ratios on paper. However, as firms with lower stock returns are not necessarily financially distressed, some of them likely serviced their debts. Furthermore, they argued that the Japanese government preferred that banks extend loans to troubled firms to avoid massive firm failures. However, they showed that government-controlled banks were less likely than other banks to increase loans to weaker firms. Also, lending to riskier, weaker firms could be more profitable to the FIs if the FIs charged higher interest rates. Unlike their paper, we test directly whether distressed firms borrowed more from FIs. In addition, this paper examine whether distressed firms with government connection or with bank affiliation managed to borrow more money.

The study showed that both large chaebol and non chaebol financially distressed firms showed higher debt growth rates. They also showed the highest debt ratio. Unlike financially distressed chaebol firms, small distressed firms showed proportionately higher short term debt than non-distressed their counterparts. Distressed firms or firms receiving more loans were more likely to face ex-post difficulty to repay the loans and their ex-post performance measured through return on asset was lower. So, inside information could not account for FIs' increased lending to these distressed firms, suggesting that lending decision is not based on a borrower's credit-worthiness. After controlling for available collateral and other factors, distressed firms show higher growth rates of debt and bank loans than non-distressed firms. Firms with FI affiliation showed higher growth rates of debt and bank loans than firms without FI affiliation. Distressed chaebol firms had the highest debt and borrowing growth rates, controlling for all the factors. These results still remain even when we control for bank affiliation. Distressed, small independent firms (non-chaebol firms) also showed a higher loan and debt growth rates than their sound counterparts. However, distressed small independent firms showed a higher short term debt than their counterparts.

These results imply that Korean FIs generally made bad lending decisions. Using the publicly available information on financially distressed firms, FIs should have reduced their lending to them, ceteris paribus, to minimize their risk of heavy losses. The results showed that was not the case. These results indicate that political connections or affiliation with FIs increased access to FI credit. FI governance was also inadequate as FIs were lending extra money to distressed non-chaebol firms, which were less likely to influence them through political connections or corporate affiliation with banks. Moreover, the short-term debt ratio of distressed non-chaebol firms was higher than otherwise, suggesting that FIs gave them more short-term loans. Short term loans in theory makes it easier for lender to liquidate the borrower who is about to default. Therefore, a higher short term rate of loan or debt implies that FIs reduce their risk exposure for distressed non-chaebol firms. However, FIs did not stop revolving loans. In fact, banks lent more money to distressed small firms. These conflicting results suggest the influence of bank managers' reputation incentives. Bank managers have an incentive to avoid higher defaults during their short tenures, so they give short term loans to avoid defaults during their tenure.

The remainder of this paper is organized as follows. First, we discuss the previous literature on FI lending to firms, followed by background information on the Korean banking sector. After introducing the methodology and data, we present the empirical results. Finally, section 5 concludes with a discussion of the implications.

2. FI decisions on loans to distressed firms

Debt and equity holders derive different payoffs from a firm's cash flow and play different roles in control and governance. The optimal allocation of cash flow control depends on firm performance (Aghion and Bolton, 1992; Dewatripont & Tirole, 1994; Zender, 1992). When a firm meets its financial obligation, equity holders control the firm through the board or through shareholder meetings. If the firm defaults on its loan payments, control shifts to debt holders. The debt holder typically liquidates the firm if the firm's debt and the value of its fixed assets both exceed its future profits. If the default size is relatively small, the debt holder can refinance the existing debt without extending further loans. When a firm is in financial distress, the debt holder can stop revolving the loan, refinance the current debt or extend further loans to claim the firm's future profits. The debt holder can lend more money to distressed firms due to (a) better inside-information (b) crony lending, and (c) FI managers' moral hazards.

2.1 Better inside information of banks

Debt holders can have sufficient inside information about a firm's future profits. When a firm is likely to earn sufficient future profits to cover its debt as the financial distress is believed to be temporary, debt holders can extend extra loans. In such case, the FI can recover both its initial and additional loans from the firms' future profits rather than settling for the typically lower value of the firm's fixed assets in the case of liquidation. Whereas individual debt holders rely on only publicly available information, large institutional debt holders, such as banks, often have inside information (Fama, 1985, 1990). Compared to public debt holders, FIs can typically access better information more easily and hence have lower monitoring costs, especially if they have a historical relationship with the firm (Aoki, Patrick, & Sheard, 1994; Gerschenkron, 1962; Hoshi, Kashyap, & Scharfstein, 1991a, 1991b). With inside information about a firm, a FI can better assess the risks and expected profits of investment projects. If a FI extends loans to distressed firms because it has inside information, then these firms should generally show higher likelihood to repay their loans.

2.2 Crony lending

Crony lending can occur through government influence or firm affiliations with FIs. Governments can influence FIs in several ways, including legislation, regulation, direct subsidies, direct ownership, and selection of FI managers (directly or indirectly). Through legislation or regulation, governments can restrict loans to favored firms (often politically connected ones). When governments bail out distressed firms, they increase the borrowing firms' moral hazard behavior (such as strategic bankruptcy) by reducing their exit threat (Hart & Moore, 1989; Bolton & Scharfstein, 1990). Likewise, governments can own FIs and directly or indirectly appoint its managers. Through any of these means, a politically connected, distressed firm can induce FIs to lend it more money (Dinc, 2003; Peek & Rosengren, 2003).

In Korea, large business groups were believed to have strong connections with the government. As we repeatedly observe in political scandals, large corporations have provided the top government officials with political donations or other types of payments (Graham; 2003. D. Kang; 2002). In fear of a series of bankruptcies that the collapse of a large business group can cause, the Korean government had bailed out large chaebols in financial distress.

2.3 Related lending

Likewise, a firm can pressure its affiliated FI(s) for loans. Firms can own shares in FIs, have its employees sit on the FIs' boards of directors, or guarantee payment of one another's debts (cross-debt payment guarantees). Akerlof and Romer (1993) argued that when the value of the FI's capital falls below a threshold, a firm can divert an affiliated FI's resources to their firm (looting). LLZ (2002) generalized looting to include a firm defaulting on a loan from its affiliated FI loan at the cost of foregoing their equity in the FI. A controlling shareholder in the above firm has an incentive to loot if his or her share of firm profits exceeds his or her share of FI profits (cf. exploitation of affiliated firms through tunneling, Johnson et al., 2000; and keiretsu exploitation in Japan, Morck and Nakamura, 1999; Kang and Stulz, 1997). If the government protects the banking system (deposit insurance or expected recapitalization), the controlling shareholder of a FI has further incentive to take excessive risks or make loans to their own companies on non-market terms, as the government bears the costs (CPR, 1999; LLZ, 2002). For example, LLZ (2002) showed that FI loans to affiliated firms in Mexico had higher default rates and lower recovery rates.

While business groups are not the controlling owners of commercial banks in Korea,[2] many FIs including merchant banks, insurance firms, securities etc. are affiliated with business groups. If only government influence and affiliation affected FI lending, then only distressed firms in business groups receive more loans, while independent firms do not.

2.4 FI managers' moral hazards

FI managers' moral hazards include government protection and reputation incentives. Without adequate supervision or regulation, government bailouts of FIs can cause moral hazards for FI managers (Mitchell, 1998). FI managers then face distorted incentives and can allocate credit according to non-market criteria (CPR, 1999; Dinc, 2003; Peek & Rosengren, 2003). Furthermore, FI managers accustomed to political interference are unlikely to have (or quickly acquire) the necessary expertise to make informed lending decisions after a government reduces its influence. Without appropriate incentives due to poor FI governance, FI managers can minimize their effort and continue lending to familiar borrowers. As a result, weaker borrower performance does not necessarily induce FIs to lend more conservatively or reduce the risk in their portfolios (CPR, 1999). In this case, many distressed firms without political connections or FI affiliations are also likely to receive loans.

Without strong bank governance, bank mangers are primarily concerned about their reputation during their brief tenure. As they often have brief tenures, they try to avoid blemishes during their term (such as loan defaults), rather than optimizing FI performance (KDI, 2000). So, they can try to "prop up" distressed firms with short-term loans until they become profitable, or at least until their term ends. Peek and Rosengren (2003) also argued that Japanese FIs gave credit to distressed firms to avoid listing these potential loan defaults on their balance sheet, especially weak FIs whose risk-based capital ratio were dangerously

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[2] Industrial groups (chaebols) own shares in Korea's commercial banks. Due to government regulation however, chaebol ownership of banks is small or a bank has multiple chaebol owners. Therefore, commercial banks are not affiliated with any chaebol.

close to its minimum required capital ratio. By controlling the duration of potential future firm losses, short-term loans limit FI risk, especially considering the possible dangers of illiquid investment, low borrow credit quality, low potential for short-term cash flows, and little secondary market value (Diamond & Rajan, 2000; Rajan, 1992). Although this strategy can often be successful in a fast growing economy, it is less likely to succeed as an economy slows down. In this case, propped up distressed firms should show proportionately higher growth of short-term loans.

3. Korea's financial sector

Any of the above explanations for loans to distressed firms appear plausible when examining a brief history of Korea's financial sector. Through government-controlled FIs' subsidized loans to targeted firms, Korea developed its heavy and chemical industries in the 1970s. These firms grew into diversified business groups (chaebols) and developed long-term relationships with the banks. When these firms failed, the government bailed them out and recapitalized banks, thereby creating moral hazards. Despite gradual reforms, these conditions generally persisted through the 1997 crisis.

3.1 Industrial policy and development of chaebols

Government control of banks began after Park Chung Hee's coup in 1962. He nationalized the banks and appointed bank CEOs. These CEOs engaged in bank lending decisions and personally approved large loans. The government continued appointing bank CEOs until 1993 and approved them until 1997.[3] Top bank managers often had short appointments (around 3 years), so they only had to prop up failing firms for a few years to avoid loan defaults during their tenure.

Park used banks to develop the heavy and chemical industries.[4] The government mobilized scarce capital from foreign investors and domestic depositors and allocated it through banks to targeted firms at subsidized interest rates until 1981 (Cho and Kim, 1997).[5] In addition to powering economic growth, the loans helped these firms accumulate capital, expand into many industries, and develop long-term banking and political relationships,[6] in short, become diversified chaebols.[7] Chaebol access to bank credit declined when the government privatized banks, cut subsidized projects, introduced prudential regulation, and gradually promoted competition in the 1980's (Yoo, 1997). To ensure adequate credit, chaebols invested in and effectively controlled non-commercial banks (such as merchant banks) and other FIs (such as insurance and

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[3]Chun Doo Whan privatized the banks in 1981-1983, but the government still appointed bank CEOs. In 1993, banks introduced CEO recruitment committees whose members were approved by the government's Bank Supervisory Board (later it became the Financial Supervisory Commission FSC). In 1997, the CEO recruitment committee members consisted of independent directors.

[4] The share of heavy and chemical industry in GDP was 11.9% in 1970, 26.3% in 1980 and 31.3% in 1988. (Source: Bank of Korea, Input-output Tables)

[5] These rates were lower than time deposit rates or inflation rates (Cho and Kim, 1997; Hong, XXX).

[6] Chaebols donated large sums to presidential campaigns (Kang, 2002) and directly bribed several presidents (Graham, 2003).

[7] According to Yoo (1997), the number of subsidiaries of the largest 30 chaebols grew from 126 in 1970 to 429 in 1979.

securities firms, CPR, 1999; Graham, 2003). Kim's (1998) study supports the looting view of these chaebol-FI relationships. When a chaebol owned a FI, firms affiliated with that chaebol had higher debt-equity ratios than other firms had. Moreover, these chaebol-owned FIs showed lower profitability.

3.2 Moral hazards

Moreover, these subsidized loans created moral hazards and distorted firm and FI incentives. As the government directed banks' lending, they did not evaluate whether borrowers could pay back their loans. Unlike failing small firms that exited, large chaebol firms facing defaults received subsidized loans (e.g., 1972 debt crisis, 1979-1983 depression, 1984-88 firm insolvencies). This government behavior led to the belief that some firms were "too big to fail" (Cho & Kim,1997; Joh, 2001; Kim 1991; S. Lee, 1995; Yang, 1997).

Even when the government did not bail out distressed firms, government supervision and bankruptcy proceedings aggravated moral hazards. Firms successfully lobbied the government's Bank Supervisory Board (BSB) for favorable treatment from banks. On the other hand, BSB members' close relationships with these FIs created an incentive against tightly disciplining the banks' lending practices (BSB members often moved to high positions at these FIs, similar to 'amakudari,' in Japan, Hanazaki and Horiuchi, 2000).

3.3 Banking sector at the time of the crisis

These conditions generally persisted through the 1990's. Poor firm performance continued (Joh, 2003), non-performing loans rose and FIs weakened (Hahm, 2003). Government ceilings on lending interest rates continued until 1997 (Graham, 2003). So, maximizing FI profits required minimizing losses to non-performing loans and lending to the most credit-worthy borrowers.

Nevertheless, FIs lending to firms increased, especially to financially distressed firms. By 1995, the average debt to equity ratio of Korean firms (280%) was much higher than their counterparts in Japan (210%), US (160%), and Taiwan (86%). Lee and Lee (1998) showed that, ceteris paribus, chaebols had higher debt equity ratios than non-chaebol firms, but small and medium sized firms also had high debts (see figure 1).

<Insert Figure 1 around here: debt equity ratio of firms>

Beginning in January 1997, a series of chaebols defaulted on their loans and failed, causing a cascade of bankruptcies among affiliated firms. Joh (2003) shows that the total debt of the six conglomerates in 1997 before the bailout money was promised alone amounted to 24.02 trillion won, 35.5% and 5.3% of the government budget and GNP in 1997, respectively. She argues that banks were too weak to absorb the huge losses incurred by the non-performing loans. They exhausted their own debt capacity as foreign investors stopped revolving loans to them, thereby triggering the 1997 financial crisis.

The government responded in part by passing a law requiring the supervisory regulatory authority (SRA) to evaluate each FI's capital adequacy ratio and take appropriate action (recommendation, request or order depending on the degree of the problems). This law applied to commercial banks, merchant banks and

securities firms in April 1998, then to insurance firms in June 1998 and mutual savings FIs in December 1999.

4. Methods and DATA

We examined how banks made lending decisions. The borrower information that banks used to make loan decisions is not readily available. So, we tested whether the firm's capital structure reflected the available information on its financial stability and its likelihood of repayment. Firms with higher debt-equity ratios were more likely to face bankruptcy (Kang, et al., 2000), but this ratio was not sufficient for us to judge banks' lending decisions. The top 30 chaebols had higher debt-equity ratios (Lee and Lee, 1998), controlling for other factors. But, chaebols were less likely to go bankrupt before the crisis because the government often bailed out poorly performing chaebol-affiliated firms. Thus, FIs could argue that they lent more money to chaebols because their bankruptcy risk is small. Instead of simply relying on debt-equity ratios, we examined whether a firm's capital structure reflected its financial distress, and how financial distress and changes in a firm's capital structure affected ex-post firm ability to pay debt. Examining ex-post performance allowed us to test the inside information hypothesis (Hoshi et al, 1991a, 1991b; Hall and Weinstein, 2000). As noted earlier, government imposed ceilings on interest rates, so FIs could not charge higher interest rates to riskier borrowers. Instead, FIs had an economic incentive to lend conservatively to the most credit-worthy borrowers.

4.1 Methods

We used three sets of regressions. First, we examined whether financial distress affected a firm's capital structure. When a firm experienced financial distress, the lending FI should have responded to maximize their profits. Since the lending interest rates were regulated, FIs might have reduced their exposure to the distressed firms as the FI was exposed to higher risk.

$$y_{it} = \beta_0 + \beta_1 \cdot Distress_{it} + \beta_2 \cdot chaebol_{it} + \beta_3 \cdot FI\_affiliation_{it} + \beta_4 \cdot Fixed\ Asset_{it} + \beta_5 \cdot x_{it} + \varepsilon_{it} \quad (1)$$

here, the dependent variable, y is the leverage ratio of firm 'i' at time 't'. For dependent variable, we control for financial distress, chaebol affiliation status, FI affiliation status, and the size of fixed asset as a proxy for collateral capacity. Other controlling variables include firm size and lag of debt, industry and time dummies. We use several leverage ratios such as bank loans over assets, borrowing over assets and total debt over assets. In addition, we also examine the short term leverage ratio. In this estimation, variable chaebol represents the political pressure, the accumulated asset size of affiliated FIs represents the related lending, fixed asset represents firms' capability to provide collateral.

Next, we try to identify the reasons why FIs lend money to distressed firms. FIs might have lent additional money in the following cases: inside information about firm's higher future profits, political connections or affiliation with firm, manager moral hazards and additional firm collateral.

In the second set of regressions, we examine whether FIs provided distressed firms with money because FIs have better inside information. Specifically, we explore the effects of increasing loans and financial distress on borrowing firm's ex-post ability to pay its debt. We examine the determinants of firm's ex-post profitability in two ways. Since debt holder's payoff does not increase beyond the debt payment, we captured a firm's ex-post performance with a dummy variable that measures whether the borrowing firm's accounting performance is large enough to cover its debt payment.

$$y_{i,t+2} = \beta_0 + \beta_1 \cdot Distress_{it} + \beta_2 \cdot D\_Growth_{it} + \beta_3 \cdot x_{it} + \varepsilon_{it} \qquad (2)$$

In these equations, y takes 1 if firm 'i' has income greater than its debt payment in time 't+2', otherwise 0. Specifically, we examine whether a firm's operating income at time t+2 exceeds its interest payment. We also use whether a firm's ordinary income before tax at time t+2 is positive or not as a proxy for the ex-post ability to pay the debt. Using logit and probit models, we explored the effects of increasing loans, financial distress on firm's ex-post performance controlling for other factors such as firm size, debt structure, fixed assets, chaebol affiliation and industry specific effects.

In addition, we examine the ex-post firms' rate of return on asset, which is traditionally used to measure the firm's accounting performance. Using within unit analysis with two way fixed effects (industry and year), we explore the effects of financial distress and leverage growth rates. Again, we control for other factors such as firm size, debt structure, fixed assets, chaebol affiliation and industry specific effects.

$$ROA_{i,t+2} = \beta_0 + \beta_1 \cdot Distress_{it} + \beta_2 \cdot D\_Growth_{it} + \beta_3 \cdot x_{it} + \varepsilon_{it} \qquad (3)$$

Third, we examined how financial distress affected a firm's capital structure. When a firm experienced financial distress, the lending FI should have responded to maximize their profits. FIs should have reduced their exposure to the distressed firms as the FI was exposed to higher risk. However, FIs might have lent additional money in the following cases: inside information about firm's higher future profits, additional firm collateral, political connections or affiliation with firm, and FI manager moral hazards.

$$y_{t+2/t-2} = \beta_0 + \beta_1 \cdot Distress_{it} + \beta_2 \cdot chaebol_{it} + \beta_3 \cdot FI\_affiliation_{it} + \beta_4 \cdot Fixed\ Asset_{it} + \beta_5 \cdot x_{it} + \varepsilon_{it} \qquad (4)$$

We explore the case when y is a debt growth ratio between time t-2 and t+2. We measure growth rates of bank loans, interest bearing borrowing and total debt. Controlling variables include cross action terms between distress and chaebol, and between distress and bank affiliation dummies. Finally, we examine the case when y represents the short term leverage ratio.

4.2 Data

We used firms' financial statements from the National Information and Credit Evaluation's (NICE)

database during 1990 -2000.[8] Each firm submitted a financial statement to the Korea Securities Supervisory Board. Then, NICE checked the integrity of the data.[9] To reduce the likelihood of problems associated with accounting standards, this study only used firms subject to outside auditing. About 28% of the firms in this data were publicly traded.[10] All the firms used in the analyses had at least 6 billion won in assets in 1997. FIs and state-controlled firms were not included. We used the top 70 chaebols based on their size of assets in 1995. About 7% of all firms in the data belonged to these 70 chaebols.

4.3 Variables

FIs' revenues depended on whether a firm pays back its debt service. So we used a dummy variable for ex-post firm's ability to pay its debt. We measured a firm's cx-post performance in two ways. First, using the logit and probit models, we examine whether distressed firms' future ability to pay debt has improved or not. We create dummy variables depending on whether firms' operating income covers the financial cost, or ordinary income controlling for financial expenditure/revenue is positive. Second, using a within unit-panel data analysis with two way (industry and time) fixed effects, we test whether firms' future return on asset depends the current period financial distress.

Likewise, we measured financial distress using the accounting performance in two ways, with ordinary income and with operating income. Distress_1 was a dummy variable that was 1 when operating income was lower than financial expenses at time t, t-1 and t-2. Distress_2 was a dummy variable that was 1 when ordinary income was negative at time t, t-1 and t-2. Accounting profitability is likely a better performance measure than stock market-based measures for three reasons. First, a firm's accounting profitability is more directly related to its financial survivability than is its stock market value. Low stock market returns reflect lower investor expectations, but not necessarily financial distress as the firm's operating profits can still exceed their debt payments. Second, accounting measures allow us to evaluate the performance of privately held firms as well as that of publicly traded firms. Third, stock prices are less likely to reflect all available information when the stock market shows inefficiency.

We also distinguished liabilities in three ways: bank loans, interest-bearing borrowing and total debt. Total debt includes some components that do not bear interest such as provision for employee retirement and pension plans and promissory notes for future payment of goods received, and so on. Borrowing was more closely related to the firm's financial distress because its failure to pay interest could cause bankruptcy.

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[8] Financial statements of Korean firms are available from two major credit-evaluating firms, NICE (National Information Credit Evaluation) and KIS (Korea Information Service). There are two major sources for ownership information in Korea; one is the Fair Trade Commission data recorded from 1987, but this includes ownership information for chaebol affiliated firms only, and releases the information at the aggregate level for each chaebol. The other source is information compiled by NICE and KIS.

[9] However, financial statements are checked more carefully than ownership information. Ownership information requires special care and attention as relationships of large individual owners are sometimes misreported. For example, a person declares no relationship one year, and later declares a family relationship with the controlling shareholder of the firm. Therefore, inter-temporal consistency of ownership should be checked.

[10] In 1997, there were 1,135 publicly traded firms; 776 were listed on the Korea Stock Exchange and the rest were registered with KOSDAQ.

However, interest bearing borrowing includes bonds issued by firms. Since publicly issued bonds do not necessarily reflect FI lending decisions, we also examined loans specifically from FIs. In contrast, debt included components such as contributions to employee pension, and so on. Loan growth rate t+2/t-2 measured the changes in bank loan levels between t-2 and t+2. Borrowing growth rate t+2/t-2 measured the changes in borrowing levels between t-2 and t+2. Similarly, Debt growth rate t+2/t-2 measured the changes in debt levels between t-2 and t+2. Chaebol is a dummy variable that takes 1 for any firm that belongs to top 70 chaebols based on the size of assets in 1995. We also measured interactions among financial distress, chaebol, and borrowing growth rate and debt growth rate variables. FI_Affiliate is a dummy variable that is 1 when a firm owns stock in at least one FI. Meanwhile, FI_affiliate_size is the log value of total assets of the bank(s) in which a firm owns stock. FI_affiliate_size allows us to differentiate the magnitude of money that FIs can lend. Other explanatory variables included the log value of firm size and fixed asset over total asset serving as a proxy for collateral. Fixed-time and fixed-industry effects were controlled using industry dummies constructed at the 3-digit level. As interest rates were liberalized in 1998, we also ran regressions for each year. In particular, we tested if results differed in 1998.

Table 1 summarizes the variables used in the study.
<Insert Table 1: summary statistics>

5. Results

Korea FIs generally made bad lending decisions. They lent more money to firms that had ex-post losses. Moreover, FIs lent more money to firms that had been financially distressed for several years.

5.1 Leverage ratio of distressed firms

Table 2 shows the results on various leverage rations. Panel A, B, C shows the determinants of loan over asset ratio, borrowing over asset ratio, and debt over asset ratio, respectively. Distressed firms in chaebols and non-chaebol firms had higher leverage ratios than non-distressed firms. So, these distressed firms tended to rely on debt more than sound firms did. Even after controlling for fixed assets, distressed firms showed higher loan/asset, borrowing/asset and debt/asset ratios (see table 2) suggesting that higher lending to distressed firms cannot be fully attributed to higher collateral levels of those distressed firms.[11] When a distressed firm means its operating income is lower than its interest payment, on average, distressed firm's loan/asset, borrowing/asset, and debt/asset ratio is higher than that of sound firms by 0.16, 0.21, and 0.11 percentage point, respectively. When distress is measured through whether a firm experiences ordinary income loss, on average, the distressed firm's loan/asset, borrowing/asset, and debt/asset ratio is higher than that of sound firms by 0.26, 0.32, and 0.22 percentage point, respectively.

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[11] Fixed asset ratio negatively affected borrowing growth rate and showed no significant effect on either loans or debt. (These results suggest that firms with higher fixed asset ratios can obtain bank loans more easily and need not issue corporate bonds.)

<Insert Table 2: loan/asset, borrowing/asset, total debt/asset>

In addition, distressed firms tended to have proportionately higher short-term loan over bank loan ratios (see table 3). Controlling for size, fixed asset, industry effects, firms in distress or affiliated with FIs showed a higher short-term loan ratio. Among distressed firms, on average, non-chaebol firms showed higher short-term loan ratios than sound non-chaebol firms by 0.029 percentage point. However, distressed chaebol firms did not. Typically, FIs can more easily liquidate borrowing firms with short term loans than long term loans. So, this result suggests that banks were aware firms in financial distress. If overall bank lending to distressed firms decreases, a higher short-term loan ratio suggests that banks responded to borrowing firms' distress by reducing their exposure to risk. However as we have observed in Table 2, distressed firms have higher leverage ratios. This behavior is consistent with the argument that myopic FI managers use short-term loans to avoid blemishes on their reputation rather than accepting poor lending decisions and liquidating these distressed firms.

<Insert Table 3: short term debt>

5.2 Ex-post firm ability to pay debt

We examine firms' ex-post ability to pay debt in two ways. A firm's ex post ability to pay debt is measured by whether firms' operating income covers the financial cost, or ordinary income controlling for financial expenditure/revenue is positive. Using the logit and probit models, we test whether firms' distress status and leverage growth rates affect the probability of the ability to pay debt. Second, using a panel data analysis with two way fixed effects, we test whether firms' future return on asset depends the current period financial distress.

Table 4 shows the results when logit and probit models are employed. Each panel summarizes the results when an increase in leverage ratio is measured by bank loan, borrowing, and total debt growth rates, respectively. In addition, we also present the results, using different types of distress. Each coefficient on the variable represents the marginal contribution of the variable to the probability of being able to pay debt. Firms in distress tended to increase the probability of facing ex-post losses. Firms with higher debt-asset ratios tended to increase the probability of facing ex-post losses. Firms with a greater growth rate of loans, borrowing, or debt tended to increase the probability of facing ex-post losses. These results suggest that FIs were lending more money to firms that were less likely to repay them. When the distress is measured depending on whether a firm experience ordinary income loss, the results are practically same. Therefore, we focus our discussion when distress is measured through operating income.

When a distressed firm means its operating income is lower than its interest payment, the coefficient on the variable 'distress' is -1.22, -1.19, and -1.24 when a firm's leverage is measured by loan, borrowing and total debt, respectively. On average, the probability that distress firm at time t has an operating income greater than its interest payment is LOWER than that of sound firms by 70.5% (antilog(-1.22)=0.295), 69.6%

(antilog(-1.19)=0.304), and 71% (antilog(-1.24)=0.290) when a firm's leverage is measured by loan, borrowing and total debt, respectively. We also try to disentangle the differences of distress effects on ex-post ability to pay interest across chaebol and non-chaebol firms. While both types of distressed firms showed the same tendency of lower ex-post profits regardless of chaebol affiliation, distressed independent firms were more likely than distressed chaebol firms to have ex-post losses. The probability of experiencing losses in t+2 for distressed non-chatebol firm is LOWER by 71.6% (antilog(-1.26)=0.284), 70.2% (antilog(-1.23)=0.292), and 71.9% (antilog(-1.27)=0.281) while that for distressed chaebol firm is LOWER by 55.7% (antilog(-0.815)=0.443), 53.1% (antilog(-0.757)=0.469), and 53.6% (antilog(-0.768)=0.464) when a firm's leverage is measured by loan, borrowing and total debt, respectively. Among firms with higher loan growth rates, chaebol firms were more likely to have ex-post losses than independent firms, and distressed chaebol firms were more likely to have ex-post losses than non-distressed chaebol firms. The results are practically same regardless of the use of logit or probit model. However, there is some difference in the magnitudes of coefficient, because the logit and probit model assume different distribution function. Under the probit model, marginal probability of the effects of distress is LOWER than that of sound firms by 57.9% (antilog(-0.652)=0.421), 58.1% (antilog(-0.633)=0.469), and 48.2% (antilog(-0.658)=0.518) when a firm's leverage is measured by loan, borrowing and total debt, respectively.

<Insert Table 4: ex-post debt payment ability, using logistic and probit models>

Table 5 summarizes the results on the determinants of firm's return on asset, using the within-unit panel analysis. The results are similar to those when dummy variables are used under logit and probit models. Financially distressed firms show a lower rate of return on asset than sound firms. Both high leverage and high growth rate of leverage ratio negatively affect firms' rate of return on asset. Distressed chaebol affiliated firms' rate of return is lower than sound non-chaebol firms by -0.05 percentage point, and -0.07 percentage point, when distress is measured by operating income and ordinary income, respectively. Distressed non-chaebol firms' return is also lower than sound non-chaebol firms by between -0.04 and -0.05 percentage point, and by between -0.05 and -0.06 percentage point, when distress is measured by operating income and ordinary income, respectively. There is one difference in two models. Unlike the case when logit or probit models are used, loan growth rate is does not appear to lower firms' rate of return on asset.

<Insert Table 5: ex-post debt payment ability, using a within unit estimation with two way fixed effects>

These results on the ex-post performance of firms imply that FI lending was not based on inside information effects. Overall, distressed firms with higher loan growth rates were more likely to face ex-post losses, lowering their ability to pay back the debt. All of the above results held for both ex-performance measures, both distress measures, both distribution assumptions (logit and probit) and loan, borrowing and debt growth rates with the following exceptions. Aside from distressed independent firms, all other types of

firms with higher loan growth rates were more likely to have ex-post losses, supporting the claim of poor bank lending decisions. In particular, high leverage growth rates among distressed chaebol firms show the lowest probability to face losses. In addition, the within unit estimation using ROA as dependent variable also show similar results.

5.3 Factors that affect bank lending

We examine the factors that affect bank lending decisions. After controlling for factors such as size, industry, we examine whether banks lent money to distressed firms. Moreover, we examine whether lending to distressed firms results from political pressure, related lending, firm's collateral ability or FIs poor governance. Political pressure is measured through chaebol affiliation, related lending through the affiliated financial institutions, and collateral ability is through the affiliation with FIs. We test factors that affect bank lending in three ways. First, we examine different types of leverage ratios. Second, we examine the determinants of leverage growth rates. Third, we explore factors that affect short term leverage ratios.

Table 6 shows the results on the determinants of firms' leverage growth ratios. Firms in distress, with higher debt-asset ratios, or with affiliations to FIs had higher leverage growth rates controlling for firm size, collateral capacity, initial leverage condition and industry specific effects. Vulnerable firms in distress showed higher loan, borrowing and debt growth rates. The positive and significant coefficient on the variable, 'distress' shows that the leverage between t-2 and t+2 for the distressed firms grew faster than that for sound firms.

Columns 4 and 6 show that distressed non-chaebol firms exhibit the highest leverage ratio, controlling for the affiliated FIs' asset size as well as aforementioned other controlling variables. The results were drawn when we divided firms into four groups depending on distressed or sound, and chaebol or non-chaebol. The benchmark is the group of sound and non-chaebol firms. When distress is measured by operating income, on average, the loan and borrowing of distressed-non chaebol firms grew faster than those of sound non-chaebol firms by 94%, and 92%, respectively. Even the total debt grew 63% faster than sound firms.

Columns 5 and 7 show results on the multiplicative effects of FI and chaebol affiliation on leverage growth rates. We created interaction terms with FI affiliation with aforementioned four groups of firms (chaebol or not, distress or not). It depends on the choice of the measures of leverage and distress whether chaebol affiliated-distressed firms show a higher leverage growth rate. Among distressed chaebol firms, in some situations firms without FI affiliation seem to increase their leverage fast than firms with FI affiliation. While chaebol affiliated-distressed firms' debt growth rate is higher, their loan growth rate is not statistically different from that for sound non-chaebol firms. On the other hand, we have a consistent result that among distressed firms without FI affiliation, chaebol firms increase their leverage ratio faster than non-chaebol firms, regardless of leverage ratio. Affiliation with FIs appears to play an important role in firm's leverage

growth among non-chaebol firms. Among non-chaebol firms, distressed firms exceeded those of sound firms in terms of loan and debt growth rates. Moreover, distressed, non-chaebol firms with FI affiliation had higher loan growth rates than distressed non-chaebol firms without such FI affiliation. Furthermore, distressed non-chaebol firms without FI affiliation also show a higher growth rate of leverage than sound non-chaebol firms without FI connection. Controlling for firm size, initial leverage condition and industry specific effects, the loan, borrowing, and debt of distressed-non chaebol firms grew faster than those of sound non-chaebol firms by 85%, 121% and 43%, respectively. Furthermore, among non-chaebol firms not in distress, those affiliated with FIs had higher loan growth rates, suggesting that FI affiliation improves access to credit for these firms. All of the above results hold for both measures of distress, and loan, borrowing and debt growth rates.[13]

<Insert Table 6: growth rate of loan, borrowing, total debt>

5.4 Discussion

After establishing that distressed firms show a higher leverage ratio than sound firms, we identify the reason why FIs lent money to distressed firms. The analyses of leverage growth rates indicate that bank lending is not based on the better inside information on future performance of the distressed firms. In fact, distressed firms show a lower ex-post ability to pay debt service, and their ex-post return on asset is lower than sound firms.

These results in this study suggest that political connections and related lending both affected FI lending, especially to distressed firms. First, when other things are being equal, lending more to distressed chaebols is more likely to have connection with the government and politicians as many political corruption scandals suggest. It is widely documented that the government had provided implicit guarantees to large chaebols creating a phrase that chaebols are "too big to fail" (Joh, 2001, Graham, 2003), suggesting that government imposed pressure on FIs to lend money to distressed chaebol affiliated firms. The importance of government pressure is found in that distressed chaebol firms without FI affiliation increase their leverage ratio faster than distressed non-chaebol firms without FI affiliation, regardless of leverage ratio. Higher growth rate of distressed, chaebol affiliated firms is consistent with crony lending.

Second, the importance of related lending through FI affiliation can be found in a couple of ways. The total assets owned by affiliated FIs are correlated with higher loan growth rates. Among non-chaebol firms, firms with FI affiliation have higher debt growth rates than firms that do not have FI affiliation. Specifically, distressed, non-chaebol firms with FI affiliation had higher loan growth rates than distressed non-chaebol

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[13] Additional results include the following. Among profitable firms, chaebol firms affiliated with banks had higher borrowing growth rates than non-chaebol firms unaffiliated with banks. Profitable chaebol firms unaffiliated with a bank showed higher debt growth than other firms.

firms without such FI affiliation. Sound non-chaebol firms with FI affiliation had higher loan growth rates than sound non-chaebol firms without such FI affiliation.

The analysis shows that political pressure and related lending can not completely explain bank lending to distressed firms. These results suggested that FI governance was also inadequate. Among distressed, non-chaebol firms, firms without FI affiliation also manage to higher leverage growth rates. Distressed non-chaebol firms without FI affiliation still increase their loan, borrowing and debt faster than sound non-chaebol firms without FI affiliation. Because the former group was less likely to influence them through political connections or corporate affiliation, we can argue that FIs were lending extra money to these firms without external pressure. Moreover, distressed non-chaebol firms do not show better ex-post performance either. Combining these results with the finding that distressed independent firms show higher short-term loan ratio suggest that banks were aware of the risk associated with these firms. Although banks were aware of the risk, they lent more money to small distressed firms, even when banks were not under pressure to do so. This implies that poor governance at FIs allow bank managers to lend money to small distressed firms.

6. Conclusion and implications

Korean banks generally made poor lending decisions during the 1990's. Despite publicly available information, they increased lending to financially distressed firms more than to sound firms. These distressed firms were not credit-worthy as they typically had ex-post losses (no inside information effect). Crony lending and government protection help explain the increased lending to chaebol firms with greater ex-post losses without proportionately more short term loans. However, banks also increased short-term loans to distressed non-chaebol firms with ex-post losses more than to sound firms. This result suggests that bank managers recognized the financial distress of non-chaebol firms but gave them short-term loans rather than liquidating them due to manager reputation incentives. So, both crony lending and poor bank governance likely facilitated increased bank loans to failing firms.

These findings implied that bank lending to distressed firms contributed to bank problems as many of them would defaulted and increased banks' non-performing loans before the crisis. As crony lending and poor corporate governance were major causes of bank lending to failing firms, they were likely fundamental problems in the financial sector.

This study highlights the importance of financial sector reforms for addressing these harmful effects, specifically by reducing external influences on lending decisions and improving bank governance. As bank links to government and borrower firms can affect lending decisions, severing these links can reduce their external influences. The government influences banks through subsidized loans to the banks, bank ownership by government agencies, and selection of bank CEOs, and so on. The government can cut these links and increase the independence of the banking sector by ending subsidized loans to banks, fully privatizing banks, and offering no opinion on the selection of bank CEOs, etc. Firms are affiliated to FIs through ownership, cross-debt payment guarantees, overlapping personnel, etc. To reduce these lender-borrower links, the government can ban firm ownership of FIs, ban cross-debt payment guarantees, and

require declaration of employees' conflicts of interest. Greater transparency through enhanced reporting requirements for both FIs and firms (e.g., terms of loans, borrowing firm's financial stability) can reduce the effects of firm affiliations with FIs.   Lastly, improving FI governance is needed. Prudence regulation, protection of shareholder rights, greater transparency of FI management and financial sector competition can help improve FI governance by disciplining FI managers and aligning their incentives with those of FI shareholders.

Bank lending is typically important to an economy's efficiency as banks are major suppliers of the resources to the corporate sector. Therefore, enhancing independence and improving bank governance improves both banks' own performances and the economy's efficiency through better allocation of resources.

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Table 1: Summary Statistics of the variables used in the analysis.

Chaebol is a dummy variable that takes 1 when a firm belongs to top 70 largest business groups measured in assets in 1995. Distress 1 is a financial distress dummy variable that takes 1 when a firm's operating income falls short of its interest payment, Distress 2 is a financial distress dummy variable that takes 1 when a firm experiences ordinary income loss.

Variable	Mean	SD	Min	Max	Number
Debt growth rate t-2 to t+2	1.1524	3.3360	-0.9953	96.5359	30959
Borrowing growth rate t-2 to t+2	1.8109	6.0024	-6.1251	96.4394	30959
Log (Size) t-2	9.7999	1.2904	2.8263	17.3897	30959
Log (Debt) t-2	9.5109	1.3283	4.1826	16.7553	30959
Log (Borrowing) t-2	8.6958	1.6057	-2.1456	16.3532	30958
Chaebol * Distress 1	0.0173	0.1306	0.0000	1.0000	30959
Chaebol * Not Distress 1	0.0461	0.2097	0.0000	1.0000	30959
Non-chaebol * Distress 1	0.2153	0.4110	0.0000	1.0000	30959
Chaebol * Distress 2	0.0090	0.0943	0.0000	1.0000	30959
Chaebol * Not Distress 2	0.0545	0.2269	0.0000	1.0000	30959
Non-chaebol * Distress 2	0.1033	0.3044	0.0000	1.0000	30959
Collateral capacity ratio / asset	0.0123	0.0608	0.0000	0.9295	30959
Fixed asset / asset	0.3676	0.2397	0.0000	1.0120	30959
Short term debt / asset	0.6954	0.2049	0.0000	1.0000	30959
Distress 1	0.4366	0.4960	0.0000	1.0000	30959
Distress 2	0.2907	0.4541	0.0000	1.0000	30959
Debt / asset	0.8021	0.3362	0.0035	25.0878	30959

<Table 2> This Table shows determinants of various leverage ratios. Panels A, B, C summarizes the results when leverage is measured by bank loan over asset, borrowing over asset, and total debt over asset, respectively. In all panels, financial distress is measured in two ways. Distress 1 is a dummy variable that takes 1 when a firm's operating income falls short of its financial cost at time t, t-1 and t-2. Distress 2 is 1 when a firm's experiences ordinary income losses at time t, t-1, and t-2.

<Panel A> Determinants of bank loan over total asset at time t.

Predictor	Distress: operating income < interest payment for three years				Distress: ordinary income loss for three years		
	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn
LOGSIZE	- 0.0332 ***	- 0.0441 ***	- 0.044 ***	- 0.044 ***	- 0.039 ***	- 0.0388 ***	- 0.0413 ***
	0.0016	0.0018	0.0018	0.0015	0.0018	0.0018	0.0015
Log Loan at t	0.0263 ***	0.0304 ***	0.0304 ***	0.0323 ***	0.0304 ***	0.0304 ***	0.0323 ***
	0.0005	0.0006	0.0006	0.0006	0.0007	0.0007	0.0006
ROA	- 1.0838 ***						
	0.0121						
Fixed Asset/Asset	0.0344 ***	0.0429 ***	0.0429 ***	0.0518 ***	0.0073	0.0071	0.0213 *
	0.0083	0.0093	0.0093	0.0086	0.0092	0.0092	0.0086
CHAEBOL	- 0.0285 **	- 0.0244 *			- 0.031 **		
	0.0099	0.011			0.0109		
Log Asset of affiliated FIs	0.0012 **	0.0013 **	0.0013 **		0.0013 **	0.0013 **	
	0.0004	0.0004	0.0004		0.0004	0.0004	
Distress		0.1639 ***			0.2595 ***		
		0.0042			0.0056		
Distressed Chaebol			0.1399 ***			0.218 ***	
			0.0159			0.0201	
Distressed non-Chaebol			0.1638 ***			0.2605 ***	
			0.0043			0.0058	
Sound Chaebol			- 0.025 *			- 0.0289 *	
			0.0121			0.0115	
Distressed*Chaebol * FI affiliated				0.1261 ***			0.2055 ***
				0.0149			0.0212
Distressed*Chaebol * No FI affiliated				0.322 ***			0.335 ***
				0.0377			0.0409
Distressed*Non Chaebol * FI affiliated				0.2151 ***			0.3351 ***
				0.0145			0.0195
Distressed*Non Chaebol * No FI affiliated				0.152 ***			0.2483 ***
				0.0043			0.0059
Sound*Chaebol * FI affiliated				- 0.016			- 0.0161 *
				0.0089			0.0081
Sound*Chaebol * No FI affiliated				0.1142 **			0.1165 **
				0.0387			0.0354
Sound*Non-Chaebol * FI affiliated				0.0346 **			0.0336 ***
				0.0114			0.0101
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.35	0.20	0.20	0.19	0.21	0.21	0.21

<Panel B> Determinants of borrowing over total asset ratios at time t.

Predictor	Distress: operating income < interest payment for three years				Distress: ordinary income loss for three years		
	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn
LOGSIZE	-0.0342 ***	-0.0506 ***	-0.051 ***	-0.044 ***	-0.044 ***	-0.0441 ***	-0.0405 ***
	0.0019	0.0022	0.0022	0.0019	0.0022	0.0022	0.0018
Log Borrowing at t	0.0328 ***	0.0404 ***	0.0404 ***	0.0426 ***	0.0404 ***	0.0404 ***	0.0424 ***
	0.0007	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008
ROA	-1.4654 ***						
	0.0138						
Fixed Asset/Asset	0.0741 ***	0.0845 ***	0.0846 ***	0.0897 ***	0.0402 ***	0.0395 ***	0.0507 ***
	0.0094	0.011	0.011	0.0101	0.0109	0.0109	0.01
CHAEBOL	-0.0404 ***	-0.0353 **			-0.044 ***		
	0.0112	0.013			0.0128		
Log Asset of affiliated FIs	0.0022 ***	0.0025 ***	0.0025 ***		0.0024 ***	0.0023 ***	
	0.0004	0.0005	0.0005		0.0005	0.0005	
Distress		0.207 ***			0.3248 ***		
		0.005			0.0066		
Distressed Chaebol			0.1738 ***			0.2407 ***	
			0.0188			0.0238	
Distressed non-Chaebol			0.2068 ***			0.3287 ***	
			0.0051			0.0069	
Sound Chaebol			-0.036 *			-0.0348 *	
			0.0143			0.0136	
Distressed Chaebol * FI affiliated				0.1694 ***			0.2388 ***
				0.0174			0.0247
Distressed Chaebol * No FI affiliated				0.3412 ***			0.3552 ***
				0.0441			0.0477
Distressed Non Chaebol * FI affiliated				0.2503 ***			0.3737 ***
				0.0169			0.0228
Distressed Non Chaebol * No FI affiliated				0.1912 ***			0.3184 ***
				0.005			0.0069
Sound Chaebol * FI affiliated				-0.017			-0.0107
				0.0103			0.0095
Sound Chaebol * No FI affiliated				0.0716			0.0784
				0.0453			0.0412
Sound Non-Chaebol * FI affiliated				0.0475 ***			0.0485 ***
				0.0134			0.0118
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.42	0.22	0.22	0.21	0.23	0.23	0.23

<Panel C> Determinants of Debt over Asset at time t.

Predictor	Distress: operating income < interest payment for three years				Distress: ordinary income loss for three years		
	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn
LOGSIZE	-0.4062 ***	-0.5268 ***	-0.527 ***	-0.522 ***	-0.51 ***	-0.51 ***	-0.5081 ***
	0.0054	0.0057	0.0057	0.0051	0.0058	0.0058	0.0051
Log Debt at t	0.4045 ***	0.5254 ***	0.5254 ***	0.523 ***	0.5117 ***	0.5116 ***	0.5107 ***
	0.0052	0.0056	0.0056	0.005	0.0056	0.0056	0.0049
ROA	-1.3589 ***						
	0.0169						
Fixed Asset/Asset	-0.0387 ***	-0.0315 **	-0.032 **	-0.029 **	-0.064 ***	-0.0644 ***	-0.0575 ***
	0.011	0.0122	0.0122	0.0109	0.0122	0.0122	0.0109
CHAEBOL	-0.0072	-0.0091			-0.013		
	0.013	0.0145			0.0143		
Log Asset of affiliated FIs	0.0001	0.0004	0.0004		0.0003	0.0002	
	0.0005	0.0005	0.0005		0.0005	0.0005	
Distress		0.1114 ***			0.218 ***		
		0.0057			0.0076		
Distressed Chaebol			0.0872 ***			0.1449 ***	
			0.0209			0.0266	
Distressed non-Chaebol			0.113 ***			0.2239 ***	
			0.0058			0.0079	
Sound Chaebol			-0.002			0.0004	
			0.0159			0.0151	
Distressed Chaebol * FI affiliated				0.0692 ***			0.123 ***
				0.0189			0.0271
Distressed Chaebol * No FI affiliated				0.2123 ***			0.2268 ***
				0.048			0.0522
Distressed Non Chaebol * FI affiliated				0.1031 ***			0.1781 ***
				0.0184			0.0249
Distressed Non Chaebol * No FI affiliated				0.1112 ***			0.2264 ***
				0.0055			0.0077
Sound Chaebol * FI affiliated				-0.002			-0.0018
				0.0113			0.0104
Sound Chaebol * No FI affiliated				0.0276			0.0438
				0.0492			0.045
Sound Non-Chaebol * FI affiliated				0.026			0.022
				0.0145			0.0129
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.47	0.34	0.34	0.35	0.35	0.35	0.36

<Table 3> The Table summarizes the results on determinants of firms' short term loan ratio over total loan.

Predictor	Short term loan over loan			
	Eqn	Eqn	Eqn	Eqn
LOGSIZE	-0.025 ***	-0.026 ***	-0.027 ***	-0.027 ***
	0.001	0.002	0.002	0.002
Log Short term loan at t-1	0.027 ***	0.026 ***	0.026 ***	0.026 ***
	0.001	0.001	0.001	0.001
ROA	-0.020	-0.044 **		
	0.012	0.013		
Debt of asset ratio at time t-	-0.025 ***	-0.032 ***	-0.037 ***	-0.037 ***
	0.006	0.006	0.006	0.006
Fixed Asset/Asset	-0.276 ***	-0.275 ***	-0.278 ***	-0.278 ***
	0.008	0.009	0.009	0.009
CHAEBOL		0.001	0.003	
		0.011	0.011	
Log Asset of affiliated FIs		0.003 ***	0.003 ***	0.003 ***
		0.001	0.001	0.001
Distress			0.028 ***	
			0.004	
Distressed Chaebol				0.024
				0.016
Distressed non-Chaebol				0.029 ***
				0.004
Sound Chaebol				0.005
				0.012
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
R-square	0.219	0.226	0.227	0.227

*p < .05, **p < .01, ***p < .001

<Table 4> This table summaries the results on how the firms' ex-post ability to pay debt is affected by determinants including firm's financial distress, and changes in leverage ratio. Panel A shows the Logistic and Probit regression results on the binary variable that takes 1 when operating income is greater than financial cost of the firm at time t+2. . Panel B shows the Logistic and Probit results when ordinary income is positive at time t+2. Standard errors are in parentheses.

<Panel A- 1> Firms' ex post ability to pay debt when the leverage ratio was measured by loan growth rate between t-2 and t+2.

Predictor	Logistic Regressions			Probit Regressions		
	Equation	Equation	Equation	Equation	Equation	Equation
Intercept	2.9101 ***	2.9054 ***	2.9283 ***	1.6075 ***	1.6044 ***	1.6115 ***
	0.3601	0.3605	0.3608	0.2009	0.2011	0.2012
log(asset)	0.0116	0.0126	0.0087	0.0088	0.0095	0.0083
	0.0239	0.0239	0.024	0.0136	0.0136	0.0136
lag(Debt/Asset)	-1.0437 ***	-1.0473 ***	-1.0724 ***	-0.5797 ***	-0.5816 ***	-0.5934 ***
	0.1183	0.1184	0.1188	0.065	0.065	0.0652
log(loan)	-0.0315 *	-0.0313 *	-0.0295 *	-0.0195 **	-0.0195 **	-0.019 **
	0.0125	0.0125	0.0126	0.0073	0.0073	0.0073
loan growth t+1/t-2	-0.012 **	-0.012 **	-0.0074	-0.0064 **	-0.0063 **	-0.0043 *
	0.0042	0.0042	0.0038	0.0021	0.0021	0.0021
HDISTRSS	-1.2304 ***			-0.6583 ***		
	0.0651			0.0349		
Chaebol dummy	0.1627			0.1094 *		
	0.0874			0.0501		
distressed*chaebol		-0.7678 ***	-0.4536 *		-0.3782 ***	-0.2206 *
		0.179	0.1966		0.0958	0.1065
distressed*non chaebol		-1.269 ***	-1.2442 ***		-0.6812 ***	-0.6695 ***
		0.0683	0.0709		0.0366	0.0378
sound*chaebol		0.0804	0.3362 **		0.0495	0.1881 **
		0.0968	0.1108		0.057	0.0647
loan growth *distressed*chaebol			-0.3865 **			-0.1855 **
			0.1475			0.0674
loan growth *distressed*non chaebol			-0.0175			-0.0073
			0.0198			0.0091
loan growth *sound*chaebol			-0.2001 ***			-0.1034 ***
			0.049			0.0259
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

*p < .05, **p < .01, ***p < .001

\<Panel A- 2\> Firms' ex-post ability to pay debt when the leverage ratio is measured by borrowing growth rate between t-2 and t+2.

Predictor	Logistic Regressions			Probit Regressions		
	Equation	Equation	Equation	Equation	Equation	Equation
Intercept	2.1216 ***	2.1187 ***	2.164 ***	1.1613 ***	1.1592 ***	1.18 ***
	0.3402	0.3407	0.3434	0.1935	0.1937	0.1947
log(asset)	0.2211 ***	0.2221 ***	0.22 ***	0.1312 ***	0.132 ***	0.1315 ***
	0.0362	0.0362	0.0363	0.0206	0.0207	0.0207
lag(Debt/Asset)	- 0.719 ***	- 0.7212 ***	- 0.7434 ***	- 0.3912 ***	- 0.3922 ***	- 0.4005 ***
	0.1234	0.1235	0.1239	0.0677	0.0678	0.0679
log(borrowing)	- 0.2337 ***	- 0.2336 ***	- 0.2335 ***	- 0.1381 ***	- 0.1383 ***	- 0.1383 ***
	0.029	0.029	0.0291	0.0166	0.0166	0.0167
Borrowing growth t+1/t- 2	- 0.0243 ***	- 0.0242 ***	- 0.0194 ***	- 0.0123 ***	- 0.0123 ***	- 0.0104 ***
	0.0053	0.0053	0.0055	0.0028	0.0028	0.003
HDISTRSS	- 1.1884 ***			- 0.6332 ***		
	0.0642			0.0344		
Chaebol dummy	0.1345			0.091		
	0.0868			0.0496		
distressed*chaebol		- 0.7565 ***	- 0.4884 *		- 0.3702 ***	- 0.2337 *
		0.178	0.2025		0.0949	0.1081
distressed*non chaebol		- 1.2258 ***	- 1.2288 ***		- 0.6559 ***	- 0.6599 ***
		0.0673	0.0697		0.0359	0.0371
sound*chaebol		0.0533	0.3361 **		0.0308	0.1742 **
		0.096	0.112		0.0564	0.0647
borrowing growth *distressed*chaebol			- 0.2933 *			- 0.1481 *
			0.1401			0.0658
borrowing growth *distressed*non chaebol			0.0093			0.0063
			0.0163			0.0076
borrowing growth *sound*chaebol			- 0.2039 ***			- 0.0959 ***
			0.0482			0.0236
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

*p < .05, **p < .01, ***p < .001

<Panel A-3> Firms' Ex-post ability to pay debt when the leverage ratio is measured by debt growth rate between t-2 and t+2.

Predictor	Logistic Regressions			Probit Regressions		
	Equation	Equation	Equation	Equation	Equation	Equation
Intercept	1.6184 ***	1.6256 ***	1.68 ***	0.909 ***	0.9132 ***	0.9398 ***
	0.3656	0.3657	0.3678	0.2063	0.2063	0.2071
log(asset)	0.7893 ***	0.7826 ***	0.7576 ***	0.4432 ***	0.4396 ***	0.426 ***
	0.1233	0.1231	0.1242	0.0687	0.0685	0.0688
lag(Debt/Asset)	- 0.0745	- 0.0867	- 0.1282	- 0.0538	- 0.0605	- 0.0789
	0.1813	0.1809	0.1837	0.0988	0.0986	0.0996
log(debt)	- 0.8076 ***	- 0.7999 ***	- 0.7769 ***	- 0.4535 ***	- 0.4492 ***	- 0.4365 ***
	0.121	0.1207	0.1218	0.0673	0.0672	0.0674
Debt growth t+1/t- 2	- 0.0204	- 0.0205	- 0.0141	- 0.0075	- 0.0075	- 0.0066
	0.0109	0.011	0.0112	0.0048	0.0048	0.0054
HDISTRSS	- 1.2228 ***			- 0.6515 ***		
	0.0638			0.0341		
Chaebol dummy	0.1172			0.0809		
	0.0868			0.0496		
distressed*chaebol		- 0.8149 ***	- 0.4849 *		- 0.4017 ***	- 0.2287 *
		0.1785	0.2141		0.0947	0.1143
distressed*non chaebol		- 1.2591 ***	- 1.2691 ***		- 0.6737 ***	- 0.6811 ***
		0.0669	0.0697		0.0357	0.0369
sound*chaebol		0.0385	0.3586 **		0.0217	0.1352 *
		0.0959	0.121		0.0563	0.0653
debt growth *distressed*chaebol			- 0.4068 *			- 0.2154 *
			0.1849			0.0925
debt growth *distressed*non chaebol			0.0158			0.0093
			0.022			0.01
debt growth *sound*chaebol			- 0.3905 ***			- 0.1218 **
			0.1013			0.0381
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

*p < .05, **p < .01, ***p < .001

<Panel B- 1> Firm's ex-post ability to pay debt measured by ordinary income profit when the leverage ratio was measured by loan growth rate between t-2 and t+2.

Predictor	Logistic Regressions			Probit Regressions		
	Equation	Equation	Equation	Equation	Equation	Equation
Intercept	3.3543 ***	3.3537 ***	3.3729 ***	1.9198 ***	1.9197 ***	1.9318 ***
	0.3805	0.3805	0.3812	0.2165	0.2165	0.2169
log(asset)	0.0729 **	0.0726 **	0.0706 **	0.0442 **	0.044 **	0.0426 **
	0.0239	0.0239	0.0239	0.0136	0.0136	0.0136
lag(Debt/Asset)	-1.5667 ***	-1.5664 ***	-1.5904 ***	-0.8607 ***	-0.8608 ***	-0.874 ***
	0.1198	0.1198	0.1201	0.0651	0.0651	0.0653
log(loan)	-0.0699 ***	-0.0699 ***	-0.069 ***	-0.0428 ***	-0.0428 ***	-0.0421 ***
	0.0127	0.0127	0.0128	0.0071	0.0071	0.0071
loan growth t+1/t-2	-0.0247 ***	-0.0247 ***	-0.0198 ***	-0.0112 ***	-0.0112 ***	-0.0094 ***
	0.005	0.005	0.0049	0.0022	0.0022	0.0023
ODISTRSS	-1.2087 ***			-0.6519 ***		
	0.0883			0.0484		
Chaebol dummy	-0.0135			-0.0002		
	0.0885			0.0513		
O-distressed*chaebol		-1.3976 ***	-0.8882 **		-0.7196 ***	-0.4503 **
		0.2755	0.2928		0.1442	0.1588
O-distressed*non chaebol		-1.1893 ***	-1.178 ***		-0.644 ***	-0.6393 ***
		0.092	0.0953		0.0505	0.0522
O-sound*chaebol		0.0073	0.2195 *		0.0095	0.1321 *
		0.0931	0.1057		0.0544	0.0613
loan growth *distressed*chaebol			-0.6992 *			-0.3845 **
			0.2786			0.1424
loan growth *distressed*non chaebol			-0.0035			-0.0001
			0.0216			0.01
loan growth *sound*chaebol			-0.158 ***			-0.088 ***
			0.0413			0.0226
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

*p < .05, **p < .01, ***p < .001

<Panel B-2> Firms' ex post ability to pay debt when leverage ratio was measured by borrowing growth rate between t-2 and t+2.

Predictor	Logistic Regressions			Probit Regressions		
	Equation	Equation	Equation	Equation	Equation	Equation
Intercept	2.2638 ***	2.2638 ***	2.2943 ***	1.3283 ***	1.3284 ***	1.3462 ***
	0.3622	0.3622	0.3644	0.2086	0.2086	0.2099
log(asset)	0.4204 ***	0.4201 ***	0.4193 ***	0.2396 ***	0.2395 ***	0.2396 ***
	0.0397	0.0397	0.0397	0.0222	0.0222	0.0222
lag(Debt/Asset)	-1.0579 ***	-1.0579 ***	-1.0758 ***	-0.5929 ***	-0.593 ***	-0.5993 ***
	0.1262	0.1262	0.1265	0.0687	0.0687	0.0688
log(borrowing)	-0.3937 ***	-0.3936 ***	-0.3941 ***	-0.2259 ***	-0.2258 ***	-0.2267 ***
	0.0328	0.0328	0.0329	0.0182	0.0182	0.0182
Borrowing growth t+1/t-2	-0.0392 ***	-0.0392 ***	-0.0385 ***	-0.0198 ***	-0.0198 ***	-0.0206 ***
	0.0056	0.0056	0.0059	0.0028	0.0028	0.0031
ODISTRSS	-1.1328 ***			-0.6023 ***		
	0.0869			0.0474		
Chaebol dummy	-0.0354			-0.0091		
	0.0879			0.0509		
O-distressed*chaebol		-1.2376 ***	-0.8036 **		-0.631 ***	-0.3885 *
		0.2685	0.3025		0.1413	0.1631
O-distressed*non chaebol		-1.1253 ***	-1.1698 ***		-0.5999 ***	-0.6312 ***
		0.0904	0.0928		0.0494	0.0508
O-sound*chaebol		-0.027	0.1682		-0.0061	0.1019
		0.0924	0.1062		0.054	0.0616
borrowing growth *distressed*chaebol			-0.5225			-0.307 *
			0.2712			0.148
borrowing growth *distressed*non chaebol			0.0415 **			0.0232 **
			0.014			0.0072
borrowing growth *sound*chaebol			-0.1313 ***			-0.0695 ***
			0.0378			0.0205
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

*p < .05, **p < .01, ***p < .001

<Panel B- 3> Firm's ex-post ability to pay debt measured by ordinary income profit when the leverage ratio was measured by debt growth rate between t-2 and t+2.

Predictor	Logistic Regressions			Probit Regressions		
	Equation	Equation	Equation	Equation	Equation	Equation
Intercept	2.0709 ***	2.0705 ***	2.1206 ***	1.193 ***	1.193 ***	1.2341 ***
	0.3965	0.3965	0.3981	0.224	0.224	0.2253
log(asset)	0.8837 ***	0.8835 ***	0.8722 ***	0.5241 ***	0.5241 ***	0.5096 ***
	0.1404	0.1404	0.1406	0.0747	0.0747	0.075
lag(Debt/Asset)	- 0.6028 **	- 0.6027 **	- 0.6333 **	- 0.3159 **	- 0.316 **	- 0.3401 **
	0.204	0.2041	0.2049	0.1069	0.1069	0.1076
log(debt)	- 0.8714 ***	- 0.8713 ***	- 0.8622 ***	- 0.5183 ***	- 0.5183 ***	- 0.505 ***
	0.1381	0.1381	0.1383	0.0733	0.0733	0.0736
Debt growth t+1/t- 2	- 0.0755 ***	- 0.0755 ***	- 0.065 ***	- 0.0281 ***	- 0.0281 ***	- 0.0306 ***
	0.0152	0.0152	0.0158	0.0061	0.0061	0.0071
ODISTRSS	- 1.2033 ***			- 0.6431 ***		
	0.0865			0.0472		
Chaebol dummy	- 0.0295			- 0.0097		
	0.0875			0.0507		
O- distressed*chaebol		- 1.2903 ***	- 0.8112 *		- 0.6632 ***	- 0.3951 *
		0.2684	0.3208		0.1408	0.1707
O- distressed*non chaebol		- 1.1971 ***	- 1.2442 ***		- 0.6419 ***	- 0.674 ***
		0.0901	0.0934		0.0492	0.0508
O- sound*chaebol		- 0.0227	0.3879 **		- 0.0082	0.2272 ***
		0.0919	0.1188		0.0538	0.068
debt growth *distressed*chaebol			- 0.6055			- 0.3334 *
			0.3257			0.1574
debt growth *distressed*non chaebol			0.0638 *			0.035 **
			0.027			0.0119
debt growth *sound*chaebol			- 0.4895 ***			- 0.2751 ***
			0.0968			0.0522
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

*p < .05, **p < .01, ***p < .001

<Table 5> Ex- post firm performance when within unit analysis with controlling for two way (industry and time) fixed effects. The dependant variable is ordinary income over total asset ratio at time t+ 2. H- distress means that a firm is considered financially distressed if its operating income falls below the financial cost for three years in the first three columns. A firm is financially O- distressed when it experiences ordinary income losses for three years.

Predictor	Loan equation	Loan equation	Borrowing equation	Borrowing equation	Debt equation	Debt equation
log(Asset)	-0.0059 ***	-0.0072 ***	0.0142 ***	0.0139 ***	0.0511 ***	0.0531 ***
	0.0012	0.0012	0.0018	0.0018	0.0056	0.0056
lag(Debt/Asset)	-0.1173 ***	-0.1149 ***	-0.0956 ***	-0.0912 ***	-0.0661 ***	-0.0597 ***
	0.0044	0.0045	0.0048	0.0049	0.0069	0.0069
log(loan)	-0.0040 ***	-0.0043 ***				
	0.0007	0.0007				
Loan growth t+1/t- 2	0.0000	0.0000				
	0.0000	0.0000				
log(borrowing)			-0.0236 ***	-0.0247 ***		
			0.0015	0.0015		
Borrowing_growth t+1/t- 2			-0.0015 ***	-0.0014 ***		
			0.0002	0.0002		
log(debt)					-0.0614 ***	-0.0648 ***
					0.0055	0.0055
Debt growth t+1/t- 2					-0.0018 ***	-0.0017 ***
					0.0004	0.0004
H- Distressed*Chaebol	-0.0546 ***		-0.0531 ***		-0.0560 ***	
	0.0082		0.0083		0.0084	
H- Distressed*non Chaebol	-0.0531 ***		-0.0471 ***		-0.0492 ***	
	0.0028		0.0029		0.0029	
H- Sound*Chaebol	0.0082		0.0073		0.0070	
	0.0052		0.0053		0.0053	
O- Distressed*Chaebol		-0.0709 ***		-0.0729 ***		-0.0753 ***
		0.0113		0.0114		0.0115
O- Distressed *non Chaebol		-0.0637 ***		-0.0582 ***		-0.0608 ***
		0.0039		0.0039		0.0039
O- Sound*Chaebol		0.0098 *		0.0084		0.0080
		0.0048		0.0049		0.0049
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes
R- square	0.091	0.0890	0.0940	0.0920	0.0890	0.0880

*p < .05, **p < .01, ***p < .001

<Table 6> This Table shows determinants of leverage growth rates between t-2 and t+2. Financial distress is measured in two ways. Distress 1 is a dummy variable that takes 1 when a firm's operating income falls short of its financial cost at time t, t-1 and t-2. Distress 2 is 1 when a firm's experiences ordinary income losses at time t, t-1, and t-2. Panels A, B, C summarizes the results when leverage is measured by bank loan, interest bearing borrowing, and total debt, respectively.

<Panel A> Determinants of growth rate of bank loans between t-2 and t+2.

Predictor	Distress: operating income < interest payment for three years				Distress: ordinary income loss for three years		
	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn
Log Size	2.903 ***	2.741 ***	2.741 ***	2.815 ***	2.759 ***	2.759 ***	2.824 ***
	0.042	0.048	0.048	0.042	0.048	0.048	0.042
Log Loan at t-2	-3.149 ***	-3.084 ***	-3.08 ***	-3.079 ***	-3.075 ***	-3.075 ***	-3.077 ***
	0.035	0.038	0.038	0.035	0.037	0.037	0.035
Debt over Asset at t-2	0.488 ***	0.537 ***	0.537 ***	0.59 ***	0.515 ***	0.515 ***	0.57 ***
	0.049	0.05	0.05	0.049	0.05	0.05	0.049
ROA	-4.727 ***						
	0.249						
Fixed Asset/Asset	0.145	-0.078	-0.08	0.145	-0.249	-0.249	0.005
	0.171	0.186	0.186	0.172	0.187	0.187	0.173
Distress		0.942 ***			1.34 ***		
		0.086			0.115		
CHAEBOL		-0.13			-0.172		
		0.22			0.22		
Log Asset of affiliated FIs		0.034 ***	0.034 ***		0.034 ***	0.034 ***	
		0.009	0.009		0.009	0.009	
Distressed Chaebol			0.926 **			1.147 **	
			0.318			0.407	
Sound Chaebol			-0.18			-0.167	
			0.242			0.232	
Distressed non-Chaebol			0.93 ***			1.343 ***	
			0.088			0.119	
Distressed Chaebol * FI affilated				1.26 ***			1.608 ***
				0.297			0.428
Distressed Chaebol * No FI affilated				1.643 *			1.188
				0.754			0.826
Distressed Non Chaebol * FI affilated				1.239 ***			1.987 ***
				0.29			0.394
Distressed Non Chaebol * No FI affilated				0.827 ***			1.225 ***
				0.087			0.12
Sound Chaebol * FI affilated				0.224			0.266
				0.177			0.164
Sound Chaebol * No FI affilated				0.851			1.185
				0.773			0.713
Sound Non-Chaebol * FI affilated				0.848 ***			0.677 ***
				0.228			0.203
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.25	0.24	0.24	0.24	0.24	0.24	0.24

*p < .05, **p < .01, ***p < .001

<Panel B> Determinants of growth rates of (interest bearing) borrowing between t-2 and t+2.

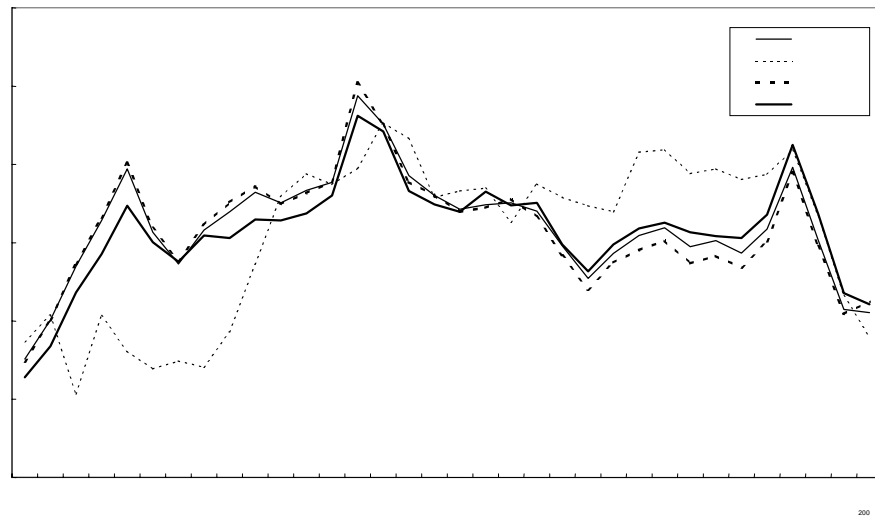|	Distress: operating income < interest payment for three years				Distress: ordinary income loss for three years		
	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn
LOGSIZE	2.807 ***	2.578 ***	2.578 ***	2.689 ***	2.6 ***	2.6 ***	2.703 ***
	0.039	0.043	0.043	0.039	0.043	0.043	0.039
Log Borrowing at t-2	-2.842 ***	-2.748 ***	-2.75 ***	-2.751 ***	-2.744 ***	-2.744 ***	-2.754 ***
	0.032	0.035	0.035	0.032	0.034	0.034	0.032
Debt over Asset at t-2	0.378 ***	0.428 ***	0.428 ***	0.474 ***	0.406 ***	0.406 ***	0.453 ***
	0.043	0.043	0.043	0.042	0.043	0.043	0.043
ROA	-4.718 ***						
	0.217						
Fixed Asset/Asset	0.129	-0.019	-0.02	0.106	-0.193	-0.197	-0.041
	0.149	0.161	0.161	0.15	0.161	0.162	0.151
Distress		0.923 ***			1.345 ***		
		0.074			0.099		
CHAEBOL		-0.306			-0.346		
		0.189			0.189		
Log Asset of affiliated FIs		0.048 ***	0.048 ***		0.048 ***	0.048 ***	
		0.007	0.007		0.007	0.007	
Distressed Chaebol			0.546 *			0.75 *	
			0.273			0.35	
Sound Chaebol			-0.27			-0.289	
			0.207			0.199	
Distressed non-Chaebol			0.931 ***			1.369 ***	
			0.076			0.103	
Distressed Chaebol * FI affilated				1.113 ***			1.362 ***
				0.258			0.371
Distressed Chaebol * No FI affilated				1.338 *			1.22
				0.654			0.716
Distressed Non Chaebol * FI affilated				1.245 ***			1.956 ***
				0.251			0.341
Distressed Non Chaebol * No FI affilated				0.837 ***			1.295 ***
				0.075			0.104
Sound Chaebol * FI affilated				0.382 *			0.398 **
				0.153			0.142
Sound Chaebol * No FI affilated				1.072			1.09
				0.67			0.618
Sound Non-Chaebol * FI affilated				1.211 ***			0.978 ***
				0.198			0.176
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.24	0.24	0.24	0.23	0.24	0.24	0.24

*p < .05, **p < .01, ***p < .001

<Panel C> Determinants of growth rate of total debt between t-2 and t+2.

Predictor	Distress: operating income < interest payment for three years				Distress: ordinary income loss for three years		
	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn	Eqn
LOGSIZE	2.995 ***	2.833 ***	2.834 ***	2.862 ***	2.86 ***	2.86 ***	2.881 ***
	0.033	0.036	0.036	0.033	0.036	0.036	0.033
Log Debt at t-2	-3.173 ***	-3.102 ***	-3.1 ***	-3.044 ***	-3.112 ***	-3.113 ***	-3.057 ***
	0.033	0.035	0.035	0.032	0.035	0.035	0.032
Debt over Asset at t-2	0.387 ***	0.403 ***	0.403 ***	0.443 ***	0.389 ***	0.389 ***	0.43 ***
	0.024	0.024	0.024	0.024	0.024	0.024	0.024
ROA	-3.226 ***						
	0.121						
Fixed Asset/Asset	0.013	-0.048	-0.05	0.02	-0.169	-0.173	-0.085
	0.083	0.09	0.09	0.083	0.09	0.09	0.084
Distress		0.632 ***			0.946 ***		
		0.041			0.056		
CHAEBOL		0.179			0.152		
		0.106			0.106		
Log Asset of affiliated FIs		0.011 *	0.01 *		0.011 *	0.01 *	
		0.004	0.004		0.004	0.004	
Distressed Chaebol			0.624 ***			0.826 ***	
			0.154			0.197	
Sound Chaebol			0.268 *			0.214	
			0.117			0.112	
Distressed non-Chaebol			0.651 ***			0.972 ***	
			0.043			0.058	
Distressed Chaebol * FI affilated				0.538 ***			0.777 ***
				0.144			0.208
Distressed Chaebol * No FI affilated				1.065 **			1.025 *
				0.366			0.401
Distressed Non Chaebol * FI affilated				0.571 ***			0.834 ***
				0.14			0.191
Distressed Non Chaebol * No FI affilated				0.569 ***			0.913 ***
				0.042			0.058
Sound Chaebol * FI affilated				0.202 *			0.183 *
				0.086			0.08
Sound Chaebol * No FI affilated				1.857 ***			1.701 ***
				0.375			0.346
Sound Non-Chaebol * FI affilated				0.427 ***			0.354 ***
				0.111			0.099
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.28	0.28	0.28	0.27	0.28	0.27	0.27

*p < .05, **p < .01, ***p < .001

[Figure 1] Average Debt/Equity Ratio of Korean Firms between 1967 to 1999

Source: Bank of Korea, Financial Statement Analysis, various issues