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Decoupling the Distressed Banks and their Clients, and Coupling the Distressed Firms and their Lending Banks

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Abstract

This paper simultaneously investigates the responses of stock prices of the related banks and the client firms when one of them is in distress. Two hypotheses are examined. The *distressed bank hypothesis*, which claims that the stock price of client firms are coupled to that of their related distress banks, and the *distressed firm hypothesis*, which claims that the related banks are negatively affected when their client firms are in distress. Asymmetric responses are reported in this paper. Our results reject the *distressed bank hypothesis* but, by contrast, cannot reject the *distressed firm hypothesis*. We argue the decoupling effect of the distressed bank and their clients, owing to the choice of firms' financing channel. On contrast to the listing and large-size firms, non-listing firms which are business of small medium size are still aversely affected to their related distress banks because of financial constraints.

Key Words: (De)coupling Effects, Distressed Bank Hypothesis, Distressed Firm Hypothesis, Stock Price, Asymmetry

JEL: G21, G25, E51

1. Introduction

In the literature on banking, "relationship banking" is, for the most part, portrayed as being invaluable not only to banks but also to their client firms. While banking relationship exists in various styles between banks and their customs, the most basic role is as a lender repeatedly providing credit to the same firm. Because of repeated lending, banks obtain not only the conventional "hard" information regarding the firm's repayment ability, such as financial ratios, but also "soft" information, such as the ability of management to overcome adverse situations, internal control of spending, and veracity of the firm's financial statements. The soft information in particular helps a distressed firm, which still requires liquidity to remain in operation, to obtain funds from its relation banks. It is this soft information that is critical for bank relation because it reduces the asymmetric information between banks and firms.[1]

Initiative studies regularly focus on the extent to which and the manner in which firms benefit from sound banks. After all, given the close, on-going relationship they are in, a bank provides its client firms with loans and diverse services. Banks, therefore, maintain a competitive advantage by fully aware of the information about a firm's prospects, and can also by being in a position to closely monitor a borrowing firm. As such, informational asymmetries are considerably reduced, suggesting that if a firm obtains loans from a bank, the credit ability of a firm may very well be sounded. James's (1987) and Lummer and Mcconnell's (1989) studies echoed this viewpoint. They found that the stock prices of a firm increased with the announcement of obtaining a bank loans. Along the same line, by examining the performance of Japanese firms in a conglomerate, i.e., *keiretsu* (the main bank system), Gibson (1995) came to the conclusion that the investments of the affiliated firms are not financially constrained because of the reduced asymmetric information. These

[1] Particularly in the case of distress, a firm may adopt business practices aimed at appeasing its lender simply out of hope that the lender will continue to provide it with funds. In such a situation, a lender to a distressed firm might follow the pattern documented in Weinstein and Yafeh's 1998 study of Japanese firms, where lenders provided credit, but inhibited the firm's ability to generate profits. On the other hand, it may be that lenders rise to the occasion and provide liquidity to the distressed firm under loan terms, exhibiting preferential treatment to valued customers.

studies have pointed to suggest the benefits derived by firms which maintain a relationship with banks.

Relationship banking can be understood as an implicit commitment between the bank and its client firm, where the bank shares the business risk of the firm, while the firm shares its profits with the bank. In this paper, we have turned the focus on the wealth effects of relationship banking when related banks or their client firms fail. It therefore could create two somewhat contradictory hypotheses. To be precise, the *distressed bank hypothesis* claims that the client firms are adversely affected when their related banks are in distress, whereas the *distressed firm hypothesis* claims that banks are negatively affected when their affiliated client firms are in distress. Most studies, for example, those of Slovin, Sushka and Polonchek (1993), Hoshi, Kashyap and Scharfstein (1991), Bae, Kang and Lim (2002), plus Ongena, Smith and Michalsen (2003), center on the former hypothesis. As for the latter hypothesis, as far as we know, only Dahiya, Sunders and Srinivasan (2003) have demonstrated that the announcement of a borrower's financial distress, in fact, serves as an adverse news event which has both a direct and an indirect negative impact on a bank's share price. Nevertheless, those authors neither test the two hypotheses simultaneously nor do they use individual lending data. Instead, they identify the principal financing bank from annual financial statements (eg. Slovin et al., 1993) or other government publications (eg. Ongena, Smith and Michalsen, 2003), and analyze the reactions of stock prices of distressed firms and their main banks. This is because while firms in most countries may indeed have multiple bank relationships (for examples, see Ongena and Smith, 2000; and Shen and Wang, 2005), complete and detailed lists of banks that distressed firms borrow from are not available to the public in general.

Theoretically, the corporate and banking sectors should have strong ties, making us unable to reject the two hypotheses. However, in practice, this is not always the case. It is typically thought that a bank cannot perform well without a healthy corporate sector, of which is able to redeem debt, and thus reduce the non-performing loans. Aside from this, funding channels through a sound banking industry are easier than through a fragile one.

Thus, while the performance of the two sectors cannot theoretically be kept apart, opposing views may also empirically exist between them. Healthy corporations do not ensure the soundness of the banking industry since banks themselves may encounter distress owing to moral hazards, restrictive regulations and unduly supervision, and vice versa.[2] Therefore, the two industries may not always be closely linked.

The major aim of this paper is to concurrently investigate the above two hypotheses. To this effect, we examine the *distressed bank hypothesis* by studying how the stock prices of client firms are affected when their affiliated banks are in distress, and conversely, we examine the *distressed firm hypothesis* by studying how the stock prices of banks are affected when their related firms are in distress. Studying the two postulations simultaneously allows us to establish whether the effects are symmetric or not. Beyond this, we put forth possible explanations for our findings. With respect to the *distressed bank hypothesis*, we argue that a well funded diversified firm should not be affected by the announcement of bad news of its related banks. On the other hand, when the lion's share of a firm's funding is from its related banks, any suffering on the part of the banks could very likely affect that firm's equities. Turning to the *distressed firm hypothesis*, we calculate the debt ratio of the distressed firms that borrow from their related banks. Simply put, the hypothesis should be rejected if the distressed firms do not borrow much from the banks they are associated with. We provide substantive evidence to support these expected findings.

Finally, to investigate the two hypotheses directly, we collect individual loan transaction contracts in Taiwan to shed light on these issues of concern. First, with respect to the *distressed bank hypothesis*, our study differs from that of Ongena, et al. (2003) who have measured the impact of the overall stock market index (excluding the finance industry) and financial stock market index separately in the events of 1988-1991 Norwegian banking crisis. They have not used the individual stock prices of firms or of banks in their study of

[2] Take the 1989 crisis in the savings and loan industry in the US as one classic example. This was not caused by weak corporate performance; on the contrary, it was brought about by greedy CEO (Shen and Huang, 2003).

the effects of that bank crisis. Our study, however, directly tests how the stock prices of client firms are affected when their related banks are in distress and vice versa. In previous research, as far as the *distressed firm hypothesis* is concerned, the interaction of firms and banks have often been discussed at the in macro level but much less often at the micro level. Our paper overcomes this shortcoming.

Our empirical findings support the distressed firm hypothesis, but not the distressed bank hypothesis. To explain the latter hypothesis of why the client firms are not affected by the distressed banks, we propose the financial channel argument. If the client firms are listed, then banks loans are just one of many funding channels. Thus, a bank in distress affects little about the liquidity of client firms. Alternatives, if the clients firms are not listed, bank loans are the loin's shares of their funding, a bank in distress would immediately affect the liquidity of client firms. Because most of data are listed firms, thus, a bank once in distress shows no impact on the client firms.

The rest of this paper proceeds as follows. The next section briefly surveys the two hypotheses. The third section introduces the data. Section four reports the model specifications and the estimated results of event-study and the regression analysis. Section five lays out two further discussion and tests: one is the decoupling effect of distressed banks and their clients; another is the policy implication of empirical results. The last section presents some concluding remarks.

2. Literature Survey and Two Hypotheses

How banks and their clients are affected is an important and interesting issue, especially when one sector is in distress. Prior studies typically focus on only one side of view, that is, studying either how distressed firm affect banks or how distressed bank affect firms. This paper takes both views into account.

2.1 The Distressed Bank Hypothesis

Relationship banking is commonly regarded as being beneficial during an economic

boom though it is not considered cost-free during an economic downturn. The *distressed bank hypothesis* postulates that client firms are adversely affected when their related banks are in distress if the sources of financing are not diversified and if its related banks are suddenly in distress. The equity market will have an intensely negative reaction because cutting loans from the bank imply unfavorable conditions of firms. Against this, when a firm has successfully diversified its sources of financing, an related bank in distress may not affect that firm's stock price because any loan might have given likely only makes up a small portion of its funding channels.

Briefly stated, the *distressed bank hypothesis* advocates that whether a related bank in distress affects a client firm depends on how fast the firm can access the capital market and how heavily it relies on that particular bank's funding. If it is highly dependent on bank loans and cannot easily obtain funds from the capital market, then the *distressed bank hypothesis* gains support; otherwise, the hypothesis must be rejected.

Employing Japanese bank data, Kang and Stulz (2000) have found that the impacts of a distressed bank on its client firms may be asymmetric to economic conditions. During an economic boom, firms with good bank-relations exhibit superior stock price performance than do those without; in contrast, during an economic downturn, the stock performance is reversed, i.e., firms with strong bank-relations perform worse than do those without. Rajan (1992) also argued that since bank financing allows a bank to be well informed about a firm, it may follow that the firm is held hostage by the bank, thereby enabling that bank to extract additional rents. When a bank performs poorly and its ability to lend to a potential borrower diminishes, the client firm is understandably adversely affected.

Empirical research regarding how relationship banking may be detrimental to the related firms is voluminous. Using the Continental Illinois Bank crisis as an example, Slovin, et al. (1993) conducted an empirical study and found that the stock prices of client firms dropped substantially when the crisis occurred. Hoshi, et al. (1991) found that the *keiretsu* in Japan, though listed on the exchange and able to easily obtain funds from the

capital market, were still able to obtain a significant number of loans from banks. Bae, Kang and Lim (2002) have identified 115 unfavorable events that affected 15 Korean banks during the Asian financial crisis, and at that time, the stock prices of the related firms were found to have fallen. In Korea, the government even provided debt guarantees for business groups, *chaebol*, to be able to access funds from banks. Hence, once related banks are in distress, the financing channels of the groups are severely affected. In Ongena, Smith, and Michalsen's (2003) investigation of costs of bank distress during the Norwegian banking crisis of 1988-1991, costs are measured as the impact of bank distress announcements on the stock prices of firms related to troubled banks. The stock prices have dropped when the announcement were made. Ferri, Kang and Kim (2000) have also reached a similar conclusion, i.e. that firms were found to be adversely affected when related banks were in distress.[3]

Some economists argue that distress in banks may well not be important if a country has a well-defined capital market. In such countries, firms which have relationships with distressed banks only have to confront small, temporary changes in their stock prices. Rajan and Zingales (1998) and Greenspan (1999) have proposed that firms most susceptible to banking shocks are located in those countries that lack a developed capital market. They reasoned that countries with a well-developed capital market insulate borrowers by providing acceptable substitutes whenever banks stop lending. This may be one reason why Ongena et al. (2003) failed to find a drop of the stock prices of their client firms when the banks are in distress. That is, when the banks in Norway were in distress, though the stock returns of the financial industry fell, the stock returns of the client firms

[3] From the macro perspective, some economists argue that the rise of the large-scale interruptions in bank lending activities can propagate negative shocks to the real sector. They show that market imperfections have prevented firms from obtaining valuable financing once their related banks are in distress. See for example, the study of Bernanke and Gertlet (1995) for the U.S. economy during the Great Depression; the study of Slovin et al. (1993) for the collapse of the Continental Bank in 1984; the study of Hoshi and Kashyap (2000) for Japan's economic malaise in the 1990s, and the study of Shen (2002) which has taken Taiwan bank loan transaction data, and has similarly confirmed that funding channels for related firms are indeed affected when banks are in distress.

did not. In this regard, those researchers have made the argument that the sound capital market in Norway provided liquidity for the client firms when their related banks were in distress, which means the firms were not affected by those banks in distress.

2.2 The Distressed Firm Hypothesis

Be true that past studies have reported that the stock prices of client firms are affected by banks' distress, but the opposite cases have rarely been investigated. The question here is how banks' stock prices are influenced when client firms are suddenly in distress. The *distresses firm hypothesis* argues that when firms are suddenly in distress, the negative effects on the stock prices of banks are expected but only if the banks' loans to those firms occupy the largest share of the banks' loan portfolio. On the other hand, little do the stock prices respond when their loans account for only a small percentage of their loan portfolio. Aside from this, another factor attributing to insignificance of the shocks is that in Taiwan, for instance, people, by and large, traditionally believe in the notion, "too big to fail". Even if banks are in trouble, in other words, they trust that the government will eventually find a solution to the problem. In light of this, the stock prices seem to have little response in the case of bank clients.

Institutively, the announcement of a borrower's financial distress serves as an unfavorable news event, and as such, it has a negative impact on a bank's stock price. The reasons are explained in the followings. First, there is a direct effect on the related bank on account of the expected losses caused by the borrower's distress. As a rule, this effect is related to the exposure of the bank to the borrower. Second, the borrower's distress may indirectly affect the bank's stock price by means of, for example, the multiplier or contagion effects if the distress conveys information about an increased likelihood of distress for other borrowers in the same industry to which that bank is exposed. In addition, the news of a corporate borrower's distress may be construed as a sign of poor loan the initiation and the lack of good management skills, which could lead to a deterioration in that bank's corporate image (Smith, 1992). However, a direct test as to how client firms get

in distress and how this affects banks is not available. Apart from the above studies, the interactions of the firms and banks are often discussed at the macro level but less often from a micro perspective.[4] For example, similar studies have been undertaken by Hoshi and Kashyap (2000), Morck and Nakamure (1999), and Bayoumi and Prasad (1999). They have found that the bank loans in Japan increased prior to 1990. This lending boom then became non-performing once the firms were no longer sustainable during the economic downturn in 1990. Hence, the balance sheets of the banks worsened. Hoshi, Kashyap and Scharfstein (1991) also suggested that the operation risks of firms and those of banks are strongly linked. Elsas and Krahnen (1998) referred to the Germany House-Bank as support for this argument.

On the other hand, there are strong arguments in favor of treating the announcement of a borrower's distress as a "no news (or low cost)" event for a bank (Dahiya et. al., 2003). First, prudent banking norms limit the losses that a bank might suffer from if any single borrower is unable to repay its debt, because typically a bank loan is secured (Weiss, 1990; Franks and Torous, 1994). Second, as mentioned earlier, banks are considered insiders with significant advantages vis-à-vis information, meaning they are likely to be better informed about the financial status of their borrowers. Banks are always able to take steps to reduce both their loans and their loans exposures before the news of a borrower's distress becomes public information.

3. Definitions of Variables, and Data Sources

3.1 Definitions of Distressed Banks and Firms

The definition of a distressed bank is, in essence, elusive because banks have a tendency to be cautious as far as admitting their worsening balance sheets. Although the Taiwan government has ranked banks state into five levels depending on their financial well-being, this information is not released. Thus, unless banks are severely in trouble, the

[4] For example, Hasumann and Gavin (1995), Caprio and Klingebiel (1996) also found that, in a given country, one of the precursors of a banking crisis is the worsening balance sheet of an enterprise. In addition to this, Kaminsky and Reinhart (1999) argued that reverse is also plausible since a banking crisis causes banks to reduce the amount of their loans.

names of distressed banks are usually not announced. This paper defines distressed banks in such a way that it is accordance with the definition in *the Financial Dictionary*, where a distressed bank is similar to a "troubled bank" or "a bank with operation difficulty". The former indicates that there is a higher probability that a given bank is unable to pay the interest rate on deposits, while the latter denotes a bank with a higher than average's non-performing loan or negative net value. Flannery and Guttentag (1980) defined the "problem banks" as those banks which tend to close unless restructuring procedures are undertaken.

Distressed banks are, in other words, lumped together with banks which do not pay their debts. Five conditions of varying severity may be at the root of this. The loosest definition is that banks have "insufficient liquidity"; the next loosest definition indicates the concept of "unusual withdrawal of deposits", followed by "bank run" to the two most severe conditions of "re-capitalized or restructured" and "suspended". The severest condition is the closure of a bank. Obviously, banks which agonize because of any one of these events cannot operate at their full capacity. Furthermore, a distressed bank may have one or more of the symptoms of these conditions. Using these above conditions as the key words, we search in all of the newspapers in Taiwan for reference to these terms from 1987 to 2002.[5] Once we identify the "distressed" banks as defined above, we record their names and their respective distressed periods. Because of data limitations, we only take into account the banks listed in the Taiwan Security Exchange (TSE).

The Unlike the somewhat elusive definition of distressed banks, the definition and names of distressed firms are more easily found in the literature. Typically, distressed firms, by general definition, are those that cannot pay their debt obligations and those whose announcements of failure are more common than distressed banks are. Gilson et al. (1990), Franks and Torous (1994), along with Andrade and Kaplan (1998), for example, studied the effects of distress on borrowing firms and classified a firm as being financially

[5] We in fact search data bank of the *Excellent Business Data Source* (EBDS), a private company, by compiling relevant data from the daily news from in newspapers. Details will be discussed in Section 3.2.

distressed if it has an insufficient cash flow and, as a consequence, cannot meet the payments on its debts. Following, we have collected the names of thirty distressed firms since 1998 and categorized them into four types based on the reasons for their failure. These are: poor performance of the core business; over-investment; protection of stock prices through subsidization; and the presence of a rogue chief executive officer.

3.2 Sources of Data

While studies vis-a-vis bank-firm relationships have been abundant, almost all have centered uniquely on one country, as reported before. However, limiting the scope to one country has strong merits: detailed information among banks and related firms, such as the lending relationship, bank loans over total debt ratios and so on can readily be obtained. Accordingly, studies as to how bank shocks affect related firms' performances can be easily most fruitful.

Identifying our data sources involves three steps. The first is to list the distressed banks and default firms along with the event dates of their respective crises. The next step is to search for their respective client firms and related banks, and the third, to determine the stock prices of their client firms and related banks. We take the list of the distressed banks and distressed firms from the *Excellent Business Data Source* (EBDS), as described above. We locate the client firms and their related banks from detailed accounts. In Taiwan, as is the case in many countries, listed companies are required to send their balance sheets and income statements to the local authority (the TSE in this case). When sending these publicly available financial statements, however, companies in Taiwan are further requested to send a "long-format" [6] of their financial statement to describe how each item in the two publicly available financial statements is compiled. These long-format financial statements record all the borrowing transaction data the company has made, including loan rates, loan amounts, loan period and sometimes the value of its collateral. The names of

[6] The long-format financial statement in Chinese means "detailed" financial statement. It is also worth noting that the relationship defined here is only based on lending. While a bank may engage with firms in various activities by providing lending, consulting services, fee management and others, the relationship here is strictly based on lending because of data availability.

lenders (i.e., banks) are also given. Shen (2002) and Shen and Wang (2005) have used these data sets to study the issues of asymmetric information and financial constraints. See their papers for details about these data. Based on this loan contract information, we identify the client firms and their related banks. We also obtain the stock prices of the client firms and their related banks from the *Taiwan Economic Journal,* which is also a private data vending company in Taiwan.

Table I presents the list of the distressed banks we use in this paper. Seven out of a total 48 banks in Taiwan have suffered from the above distressed symptoms of distress. Because two banks, the Hua-Lien Small and Medium Enterprise Bank, and the Overseas Chinese Bank, were not listed banks when their crisis events occurred, we exclude them from our sample, which makes for a total of five banks in our sample. The number of distressed banks may be fewer than people might have originally expected because we only consider publicly listed banks. We exclude the non-listed banks, credit unions, bill companies, finance companies and insurance companies, which were severely hurt during the Asian Crisis, are excluded because of data availability and consistency.

The five distressed banks with their event dates given in parentheses are the Tai-Chung Bank (November 24, 1998), Pan-Asia Bank (December 1, 1998), Chung-Hsin Bank (May 1, 1990), Tai-Tung Bank (February 4, 1986) and Kaoshiung Bank (March 31, 1996 and July 9, 1997). Note that there are two event days in Kaohshiung Bank which indicates that there were two crises. Most of the crises occurred in 1998 during the period of the Asian Crisis.

Once we identify the distressed banks, we look for the dates of their respective client firms dates. We only consider those firms listed on the TSE and the Over the Counter Exchange (OTC) since this paper focuses on the reactions of stock prices. The numbers of client firms of these five distressed banks are 16, 66, 27, 3 and (2, 8) (with two event days for the Kaohshiung Bank) respectively. Among these 2, 17, 14, 1, and (1, 1) respectively are listed on the TSE and OTC, and 14, 39, 13, 2, and (1, 7) are non-listed firms. The total

sample number of client listed-firms with distress banks for the further event study is 36. Hence, the clients of distressed banks are more often belonged to non-listed firms, whose size, profitability and financial strength are inferior.

[Table I] about here

Table II lists the names of the thirty distressed firms, the type of industry they belong to the event dates of the distress, the reasons for their distress and that of their forty related banks. As shown in the second and third columns, most firms belong to traditional industries, and the event dates are around 1998 and 1999. Four event types, namely weak fundamentals, over-investment, over-protection of stock prices and expropriation by a CEO, are listed using the proxy numbers 1, 2, 3 and 4, respectively. In the last column, the number of banks related to the distressed firms is greater than 10, which in total, is above the average of 8 that has recently been reported by Shen and Wang (2005). That there is an above average number of related banks reflects the fact that the amount of borrowing from each bank at that time may have been insufficient to cover the firms' needs, and hence, they had to borrow from a larger number of banks by a multi-banking relationship. This also implies that banks may have been more cautious when lending to those firms in distress.

[Table II] about here

4. Econometric Specification and Empirical Results

In the next two sections, we use event study methodology and a cross-sectional regression analysis to assess the impact of impending failures and the subsequent rescue respectively of the stock prices of the borrowing firms on the distressed banks, and vice-versa. First, we examine the abnormal returns for the related banks and their client firms around the time of the announcement of the negative news confronting them. Following Brown and Warner (1985), we compute the abnormal returns (hereafter ARs) by using standard event-study methodology. That is, we estimate the Capital Asset Pricing Market (CAPM) model by using days –150 to –30 prior to the news announcement. Then,

we calculate ARs from –*t* days to +*t* days (the event window of *t* is equal to -10 and +10). The daily ARs is accumulated to obtain the cumulative abnormal returns (hereafter CARs) from days –*t* to days +*t*. We use *t*-statistics to test the hypothesis the significances of the average CARs.

4.1 The Distressed Bank Hypothesis

Table III presents the estimated results relevant to the *distressed bank hypothesis*, and it shows the ARs of both the client firms and the distressed banks around the announcement of the bad news of the distressed banks. Overall, six events for distressed banks and 36 for listed firms borrowing from these distressed banks are found. We also calculated the ARs of the financial industry stock index and the market index, and those are listed in the last two columns.

We first look at the impact of the announcement of the bad news of the distressed banks on their own stock prices. Not at all surprising is that the ARs of these banks in the event windows (-1, +1) and (-10, +10) are -0.378% and -0.116%, respectively, both of which are both are negatively significant at the 1% level. Moreover, the CARs are -0.853% and -1.022%, respectively, and both are also significant at the 1% level. This event seems to have influenced the stock prices of the distressed banks from the first to the tenth day after the event.

We next examine how the equities of the 36 client firms responded. Note that the ARs in the two event windows (-1, +1) and (-10, +10) are -0.133% and 0.016%, respectively, with only the former being significant at the 10% level. Accordingly, the *distressed bank hypothesis* is only supported in the short-term period after the events. To further elucidate this issue, we examine additional responding days after the events, i.e., stock prices on days +1, +2,…,+10. Again, the ARs are only significant on day +1 after the event. Thus, the *distressed bank hypothesis* that contends the banks suffering from unfavorable disturbance negatively affect their client firms is accepted but only for a very short period. The results for the CARs reveal similar results. Figure 1 shows the ARs and CARs of the listed firms

which borrowed from the distressed banks. The plots show they drop immediately after the events but stable, strongly suggesting that the adverse influence is again rather short-lived.

Finally, for the event window (-1,+1) and (-10,+10), the ARs of the finance industry, which is calculated by the stock price of total 48 banks in Taiwan, are -0.358% and -0.078 % respectively, while the corresponding CARs of the stock index of the finance industry are -0.534% and -0.516% respectively. This is quite consistent with the contagious effect, which asserts that when one bank is in distress, the whole financial industry suffers from its bad news.

[Table III] and [Figure 1] about here

We next delve into the reasons for such short-lived responses to the announcement of bad news of the related banks. As we argue in the introduction, a firm with a diversified funding source should not be affected much, if at all, by the announcement of bad news of a bank. Alternatively, when the greatest share of a firm's funding sources is from its related banks, the harm to the banks could affect the stock prices of these related firms. What's more, the listed firms are expected to be less affected by the distress of related banks than are non-listed firms in that the former can more readily obtain public funds. In the next step, we examine the banking relationship of each firm, which is proxied by the number of banks that a firm borrows from. This procedure follows that of Ongena and Smith (2000) and Shen and Wang (2005) and suggest that a firm with a small number of related banks is more affected by the bad news of a distressed bank than is a firm with a larger number of related banks probably because the former is probably "lock-up", more or less, hold captive to its fewer banks. Third, we examine the bank loan ratio, which we define as bank loans divided by total debts. A low bank loan ratio is indicative of a lower degree of dependency on a bank, and a lower effect of the bad news of distressed banks on a firm.

As shown in Table IV, we examine this issue by dividing the 122 client firms into two groups on the basis of whether they are publicly listed or not: 36 listed and 86 non-listed firms. Interesting to note is that the listed firms have more bank relationships

than do their non-listed counterparts with the means of bank number, 13.31 and 7.00, respectively. Next, while both types of firms share similar bank loan ratios, 51.06% vs. 59.85%, respectively; however, the listed firms borrow less them half as much as non-listed firms from “distressed” banks (12.82% vs. 26.74%). It appears that the listed firms are more risk adverse about borrowing from distressed banks which, to be sure, causes the stock returns of the client firms to be less responsive to the unfavorable news of the distressed banks. Thus, that there is a diversification of funding sources is consistent with our short-lived responses of the client firms. The non-listed firms, on the other hand, are related to few banks, affected more if those banks are in distress.

[Table IV] about here

4.2 The Distressed Firm Hypothesis

Table V provides the CARs of both the distressed firms and their related banks around the announcement date of bad news of the distressed firms. Also, the ARs of three major related banks and the banking industry as a whole are given. There are 30 events among the distressed firms and 40 banks which gave loans to these distressed firms. Furthermore, we show ARs and CARs of three largest related banks and the financial industry.

We first examine the ARs of the distressed firms themselves and find that they are significant before the events. For example, the ARs are -0.111% and -0.267 respectively in the event windows of (-1, 0) and (-10, 0) with both being significant negatively. The ARs of the event windows (-1, +1) and (-10, +10) are, however, still significantly negative. As more the CARs are also significantly negative before the events. The bad news of the events appears to have been revealed in advance, thereby causing the stock prices of the distressed firms to drop before the events.

We also find a stronger negative response from the related banks. The ARs of related banks are -0.295% and -0.045％ respectively the event windows (-1, 0) and (-10, 0) and both are significant. Hence, it is apparent that the related banks also suffer from the bad news of their client firms. If we merely look at the three largest related banks with ARs of

-0.313％ and -0.050%, respectively. From this, it is interpreted that the related banks are hurt before the events. We obtain similar results even when the event windows are (-1, +1) and (-10, +10). Thus, the *distressed firm hypothesis* gains full support during both in the short-term and relatively long-term. Figure 2 also compares the average ARs and CARs of their related banks and three major related banks. The plots clearly illustrate that these patterns of the CARs for the distressed firms, their related banks, and the three largest related banks are very similar. These CARs that lines of related banks drop for lasting a long-term after the announcement date of the firms' distress.

[Table V] and [Figure 2] about here

We again determine for whether the effects of diversification play a significant role by collecting data with respect to concerning firms' funding sources. As shown in Table VI, the ratio of loan amounts to firms' total asset that distressed firms have from borrowing from all banks, the largest main bank, and its three major related banks are 8.86%, 1.25% and 3.02% respectively. Although, the distressed firms do not borrow much from the banks they are related to; however, from the viewpoints of these related banks, noteworthy too is that the largest three financing banks have supported one-third share by all firms' loans to these distressed firms (1/3＝3.02%/8.86%), and the largest financing banks have also contributed one-tenth by all firms' loans (1/10＝1.25%/8.86%). These figures show the loan concentration risk exists in the more funding related banks of the distressed firms, and also explain why the events of distressed firms have strongly effect to related banks; on the contrary, the events of distressed banks have less effect to related firms.

[Table VI] about here

4.3 Regression Analysis

We perform a regression analysis to investigate how the CARs of the distressed banks affect the CARs of their respective client firms and vice-versa. That is,

$$\begin{aligned} CAR(-1,+1)_{F,i} = {} & \alpha_0 + \alpha_1\left(CAR(-1,+1)_{Distressed\ Bank,j'}\right) + \alpha_2 BN_{F,i} + \alpha_3 DB1_{F,i} \\ & + \alpha_4 DB2_{F,i} + \alpha_5\left(STOCK\right) + \alpha_6\left(SIZE_{F,i}\right) + \varepsilon_{F,i} \end{aligned} \qquad (1)$$

$$CAR(-1,+1)_{B,j} = \beta_0 + \beta_1\left(CAR(-1,+1)_{Distressed\ Firm,i'}\right) + \beta_2 FN_{B,j} + \beta_3 DF_{B,j} + \beta_4\left(STOCK\right) + \beta_5\left(SIZE_{B,j}\right) + \varepsilon_{B,j} \quad (2)$$

where the subscript *F,i* denotes the *i*-th client firm when its related banks are in distress; *B,j* denotes the *j*-th related banks when their client firms are in distress. Hence, $CAR(\text{-}1,+1)_{F,i}$ and $CAR(\text{-}1,+1)_{B,j}$ represent the cumulative abnormal returns of the client firms (*F*) and related banks (*B*) from one-day before to one-day after the event of distress, respectively. $CAR(-1,+1)_{Distressed\ Bank}$ and $CAR(-1,+1)_{Distressed\ Firm}$ are the cumulative abnormal returns of the distressed banks and those of the distressed firms, respectively. Our focus is on the coefficients α_1 and β_1, i.e., the impact of the distressed banks on their client firms, and the impact of the distressed firms on their related banks, respectively. Based on our two hypotheses, we expect that α_1 and β_1 are positive which supports the distressed banks (firms) affect the stock price of their related firms (banks).

On the question of the controlling variables: $DB1_{F,i}$ and $DB2_{F,i}$ denotes the ratio of the borrowing amount the *i*-th firm from a distressed bank to the firm's total debts, and to the firm's total loans, respectively. $DF_{B,j}$ denotes the ratio of the lending amounts of the *j*-th banks to a distressed firm. High borrowing or lending ratios are indicative of stronger negative impacts than the impacts of their respective counterparts. Other control variables are $BN_{F,i}$ and $FN_{B,j}$ which denote the number of related banks of *i*-th firms and the number of the client firms of the *j*-th banks, respectively; *STOCK* is the TSE stock weighted index; $SIZE_{F,i}$ and $SIZE_{B,j}$ denotes the total assets of related banks of *i*-th firms, and the assets of the client firms of the *j*-th banks, respectively.

Table 7 reports the estimated results from equations (1) and (2). In each equation, we consider two specifications with and those without the variable of firm's (or banks') asset (*SIZE*). The estimated coefficients of α_1 are –0.782 and 1.106 depending on whether asset *SIZE* is included or excluded. Both coefficients are insignificant. The results force us to reject the *distressed bank hypothesis*, contradictory to the results of the above event study, where the hypothesis is confirmed but only for one short-term day of distressed event. Nevertheless, those effects of the *distressed bank hypothesis* were small.

The results are different when we examine the *distressed firm hypothesis*. The estimated coefficients of β_1 are 0.139 with asset *SIZE* included and 0.526 without, and both are significant. This is in full agreement the results of the event study and again supports the *distressed firm hypothesis*.

The coefficients of the control variables show the signs that we anticipated. The coefficients of $DB1_{F,i}$ and $DB2_{F,i}$ are –0.705 (inclusion of asset *SIZE*) and -0.972 (exclusion of asset *SIZE*), and both are significant, suggesting that having a higher bank loan ratio has a detrimental effect on the stocks of a client firm when its banks are in distress. Similar inferences were reported in the studies of Slovin et al. (1992) and Slovin et al. (1993). While the coefficient $DF_{B,j}$ is intuitively negative, it is insignificant.

When we perform the regression analysis, based on our results, we reject the *distressed bank hypothesis*, but we cannot reject the *distressed firm hypothesis*. During the banking crisis, the client firms do not seem to have lose too much of their equity value. Moreover, in Figure 1, we note the stock prices of related listed-firms climb increase quickly after the banking crisis. Firms maintaining relationships with the distressed banks experienced an insignificant CARs around the same event dates. On the contrary, on an event-by-event basis, our analysis reveals that banks must have experienced a significant negative CARs in the three days surrounding the announcement of their related firms' distress. These findings suggest that firms that are able to draw on liquid sources of financing, or those that have alternatives to banks, suffering less harm from the events of bank distress. On the other hand, the stock prices of the lending banks for corporate distress is, however, negative significantly.

[Table VII] about here

5. Further Discussion

5.1 Further Analysis of the Distressed Banks and their Clients

The rejection of the distressed bank hypothesis deserves further study. Our above

analysis is based on the stock price for related listed-firms, however, in fact the distressed bank deal with more non-listed firms (as Table I shows). Relatively, the non-listed firms have more information asymmetry than the listed firms have. Following, we try to use the financial accounting data to observe the distressed bank how to affect their non-listed but public firms.

Table VIII's panel A and B show the changes of local credit rating of listed and non-listed client firms before and after the distress bank event. Five period's event windows are considered, starting from two years before and ending two years after the event, i.e., T-2, T-1, T, T+1, T+2, where T is the year that banks are in distress (as Table I shows). The first column presents the rating from 1, 2, …,9 where smaller values denote better ratings and greater values denote worse ratings. In particular, the three smallest values, 1, 2 and 3, are summed together to be referred to as the best rating, whereas the three largest values, 7, 8 and 9 are summed together as the worst rating.

Panel A presents the results using sample of the listed companies. Two striking results come into view and both of them support the "flocking" argument, i.e., distressed bank and unhealthy firms stay together. First, the number of distressed bank clients with the best rating declines and with the worst rating rises. For example, for event windows of T-2, T-1 and T, the numbers of the best rated clients are 9, 6 and 4, respectively and with the worst rated clients are 11, 13 and 16, respectively. Thus, before the event, the number of the best rated clients decreases and increases for the worst rated clients, being consistent with flocking hypothesis. Also, the number of the worst rated clients is significantly higher than that of the best rated ones, again consistent with the hypothesis. The reason of this result is probably because the best rated clients tend to borrow less from distressed banks due to the fact that the bank-relation is a life-long commitment. For these clients, it becomes less meaningful to release the soft information to the distressed banks. Oppositely, the increased number of worst rated clients could be that the fragile banks tend to accept loan applications from the marginal customers, whom they reject before.

Panel B using the sample of the non-listed companies again support show similar scenario. Across the first three periods, the numbers of best ratings are 33, 30 and 21 and the worst are 28, 35 and 45. Thus, once banks are in distress, sounded non-listed firms turn to other banks for funding, whereas bad non-listed companies get more funds from the distressed banks. Thus, the distressed banks and unhealthy firms flock together.

[Table VIII] about here

Table IX further investigates detailed "three types of loan conditions", i.e., amounts, tenure and collateral of related firms, for those loan banks that are in distress (Panel A) and not in distress (Panel B). Both panels furthered comprise two sub-panels to denote these related firms to be the listed or non-listed clients, respectively. Panel A1, which is the distressed banks lending to listed clients, demonstrate that only one of the three loan conditions, loan amounts, are substantially reduced but the remaining two are not significantly altered from time T (periods that banks are in distress) to T+1. Therefore, when banks fall into distress, their listed clients turn to other channels for funding. For example, loan amounts drop substantially from 8,115 million to 2,957 million New Taiwan dollar and *t*-statistics for the difference is high up to 6.167. The lending periods are shortened from 5.14 to 4.78 but statistically insignificant. Panel A2 shows stronger deteriorated loan conditions when non-listed clients are examined. The loan amounts also substantially dropped, suggesting that once banks are in distress, its lending ability deteriorated. For example, government may restrict its lending. The lending period also shrinks for the non-listed clients.

Contrary to the results in Panel A, the three loan conditions of non-distressed banks, as reported in Panel B, do not change too much. Panel B1 presents the three loan conditions of non-distressed banks to listed firms. The difference of the three loans conditions between T and T+1 are insignificant. Thus, the loan businesses for the listed firms in non-distressed banks are not affected. Namely, it needs not to switch to other funding sources for listed-firms when there is an external event of bank distressed. Turning to the case of

non-listed firms in Panel B2, the three loan conditions drop significantly.

In short, the lending amounts to the listed and non-listed clients by distressed banks drop immediately after banks are in distress; but the lending period and collateral-required are affected less for listed than non-listed clients. In brief, the lending to the listed clients by non-distressed banks are not affected, but affected to the non-listed clients.

Here, the distressed bank hypothesis postulates that client firms are adversely affected when their related banks are in distress. However, using the stock market data of event study rejected this hypothesis. The empirical results claim that the stock price of listed client firms are decoupled to that of their related distress banks. Further analysis of using loan transaction data, we find the support of this hypothesis depends on the information asymmetry of clients firms. If the sources of financing are not diversified, for example the non-listed firms, and their loan conditions will be worsen after the related banks are suddenly in distress. The conditions of bank financing for non-listed firms still coupled with the health of their related banks. On the contrary, the listed firms will be less negative reaction on equity price, and loan conditions because they will be trading at exchanges and be well-known by investors. They also share more advantage of information symmetry and be easy to switch to their other financing channels while one related bank is in the distress.

[Table IX] about here

Table X presents the capital structure of firms which have transactions with the distressed banks. The bank loan/total debt ratios are 29.54% and 65.00% for listed and non-listed clients, respectively, suggesting that listed clients rely less on bank finance than non-listed firms. Also, the ratio of bank loan from distress banks to total banks loan are 14.15% and 24.56% to the listed and non-listed clients, suggesting that non-listed clients rely more on distressed bank lending. Therefore, once banks are in distress, the non-listed clients should be severely affected.

Once again we provide the evidence that the coupling (or decoupling) effect is determined by the dependence of bank financing for the client firms. Because the

non-listed firms rely on less bank number for financing (5.01 for non-listed firms vs. 11.78 for listed firms), and much loan amounts proportion form the distressed banks (14.15% vs. 24.56%), then the couple effect exists on the sample of non-listed firms. Also, it's not surprised that the co-movement of stock price is not to be found between the distressed bank and their client listed firms as Figure 1 shows. Because the 86 non-listed firms, comparing to 36 listed firms, have more loan share to borrow from any one distressed bank, and listed firms diverse their loan financing easily. Next, we try to observe how the coupling effect affects the health of non-listed firms in the event of distressed bank.

[Table X] about here

Table XI discusses whether the corporate finance activities of bank clients change or not when their related banks are in distress, where financial activities comprises investment decisions, financial decision and issuance of financing instruments. The investment decision is proxy by the growth rate of real investment and the growth rate of sales; the financing decisions is proxy by the long-term debt/total assets and the bank debt/long term debt; and the financing instruments include the issuance number of second equity offering (SEO), the issuance number of bond, and the issuance number of commercial paper. The *t*-statistics are conducted to examine the differences of these financial activities between T-1 and T and between T and T+1.

Two striking results are summarized as follows. First, the changes of financial activities are overwhelmingly insignificant for listed firms but are significantly negative in investment, sales, ROA and ROE for non-listed firms. That is, because of information asymmetry, non-listed firms have difficulty in finding another funding channels once their related banks are in distress, thus they have reduce their investment and sales which decrease their ROA and ROE. By contrast, listed firms do not have information asymmetry problem and can continue make investments. Their ROA and ROE are thus not affected. Next, the listed firms finance their funding from equity, bond and commercial papers, to replace the funding channel from related banks. Results of non-listed firms are not clear

because data of equity and bond are not available.

It is interesting to note that these basic characteristics do not change for listed clients but are deteriorated for the non-listed clients after the distressed event of their related banks. Thus, non-listed firms are severely affected when their related banks are suffering. This is why the separation effect of (de)coupling co-existed. Then, the performances of listed firm de-couple with their related bank health. On the other hand, the investment and financing decisions are affected severely by the related distressed banks, and their performances of non-listed firm couple with the bank health.

In summary, we focus on the changes of loan terms (Table IX), capital structure (Table X), and investment, financing, performance of listed and non-listed client firms for distressed and non-distressed banks (Table XI) at T-1, T (bank distress year), T+1, respectively. Our conclusion is that the de-coupling effect exists in the sample of less information asymmetry firms, and coupling effect also be supported in the sample of information asymmetry firms, such as non-listed firms.

[Table XI] about here

5.2 Policy Implication

Our studies concerning the role two hypotheses play in affecting the relationships between banks' and firms' performances are crucial not only in academic works, but also in policy decision-making and investors. If the two sectors are isolated, policy-makers need not worry about any contagious effects spreading from the financial sector to the non-financial one. Investors can also successfully diversify their portfolios. By contrast, if the two sectors are tightly knit, the rescue of one sector can often help in the recovery of the other, particularly when both are in distress. This means the authorities can save the least crisis-hit industries first, of which the recovery will spillover to the heavy crisis-hit industries.

The finding that there is an existence of coupling effect between the distressed banks

(firms) and their listed-clients (related banks), and the decoupling effect only exists in the distressed banks and their lending non-listed firms, show the benefits of financing diversification and the risk of financing concentration. Greenspan (1999) has reasoned that countries most susceptible to banking shocks are those that lack developed capital markets. That is, countries with well-developed capital markets provide alternative funding substitutes for firms to insulate them from banks shocks. If Greenspan's argument is correct, market-based economies, *a la* Demirguc-Kunt and Levine (1999),[7] offer different funding channels for firms, and therefore, firms' performances are less influenced by banks shocks. In those bank-based countries, such as Germany and Japan, a close relationship with a single main bank entails a risk along with the advantages. Thus, it is not easy for such firms to turn to other banks or the capital market. Evidence shows that the values of these borrowing firms highly depend on the health of their banks (Hoshi, et al., 1991; Elsas, et al., 1998; Slovin, et al., 1993). Accordingly, the negative impact of bank distress is expected to be stronger in the highly concentration of bank-financing firms. Our (de-)coupling evidence of distressed bank hypothesis corroborates this conjecture.

To cite an example, Rajan and Zingales (1998) have meanwhile argued that sufficient competition from capital markets, first, prevents the misallocation of funds to unprofitable investments and, secondly, mitigates the impact of a financial crisis on the real sector. Simply put, firms in a market-based system should be less affected by a distressed bank. This also support our conjecture is that the firm-bank relationship should be stronger in bank-based economies than that in market-based ones, and the coupling effect exists significantly on the firms with highly dependency of banking financing. Our micro-data and empirical results of this paper can also partially reply this question and are consistent with the macro relationship of financial system and banking crisis.

[7] The distinction of bank-based vs. market-based is a difficult issue. For example, Demirguc-Kunt and Levine (1999) have categorized countries into developed and undeveloped markets; they have then sub-divided the former in terms of bank-based and market-based systems. Banks in bank-based economies have stronger power in the financial market but less in market-based economies. This separation resembles, but is not identical to, BCL's classification. Countries adopting a universal banking system tend to be bank-based economies, but countries that are bank-based cannot necessarily be considered to have universal banks.

Finally, our empirical results also have significant policy implications when a country based on more information asymmetry firms, such as non-listed firms (and their size are also small and medium), how to design these firms' financing after their related distressed banks. It should be stabilize the performance of macro-economy for the dual well-function financial system. For example, Demirguc-Kunt and Huizinga (2000) have pointed out that, for firms, differences in banking and stock market developments do, to a great degree, translate into differences in the cost of bank financing. Their study reflects the complementarities between bank and stock market development. Specifically, stock market development and the improved availability of equity financing to firms may increase their borrowing capacity. Furthermore, the better and more easily available information which stock markets demand also enables banks to better evaluate credit risk. This can lead to an increase in bank profits and margins.

6 Conclusions

The relationship between firms and banks has recently become a subject of growing concern, especially as it leads to both beneficial and adverse effects on firms and banks. The benefits stem from the fact that a well-function banking relationship presents less of an obstacle with respect to asymmetric information processing and that this relationship can facilitate the flow of credit for more productive uses when a firm cannot obtain it elsewhere. Hence, there is a paucity of studies suggests that banks and firms find it valuable to invest in and maintain long-term customer relationships. Nevertheless, the costs of such relationships are often ignored. For example, the adverse effects pertain to the consequences on a firm resulting from distress in the banking sector.

Previous studies pursuing the bank-firm relationship have mainly focused on Japanese and German banks given the fact that they are prototype of bank-centered systems. In this type of system, banks and firms are strongly linked, providing ideal example to study the beneficial and adverse effects of this bank-firm relation when one party is in distress (For Japan: Gibson, 1995; Kang and Stulz, 1997; Kang and Stulz, 2000; and for

Germany: Gorton and Schmid, 1996). Despite Japanese and German cases, Ongena, Smith, and Michalsen (2000) have used Norwegian data to study the impact on stock prices when firms maintained a strong relationship with distressed banks during the 1988 Norwegian banking crisis. Shen (2002), taking Taiwan bank loan transaction data, has similarly confirmed that funding channels for firms are indeed affected when banks are in distress. Our paper, different from past studies, investigates bank-firm relationship using the rich micro data and being distinguish from the financial constraints degree of firms. We not only answer why the (de)coupling effects co-exist on the distressed banks (and firms), but also discuss details about the processing and their results of distressed banks (and firms) to their client firms (and loan banks).

In this paper, we attempt to fill this gap in the literature by examining the impact of a borrower's (lender's) distress on its bank (client firms). The financial distress of a borrower (lender) should reduce the value of any banking relationship. Specifically, this paper investigates simultaneously whether the worsening balance sheet of a bank affects its related client firms (the *distressed bank hypothesis*) and vice versa: i.e., the worsening balance sheet of a firm affects its related banks (the *distressed firm hypothesis*). The *distressed bank hypothesis* postulates that client firms are adversely affected when their related banks are in distress, whereas the *distressed firm hypothesis* predicts that related banks are negatively affected when their client firms are in distress. We employ both event-study methodology and a regression analysis.

What we find in this research are asymmetric responses are found in this paper. Our results demonstrate that the *distressed bank hypothesis* lasts for only one-day when the event-study is used but is outright rejected when a regression analysis is performed. On these grounds, the adverse effect of bad news of banks on their client firms is rather short-lived. The *distressed firm hypothesis*, by contrast, cannot be rejected regardless of the methods used. That is, banks are severely affected when their client firms are in distress. Furthermore, the announcements of the distressed firms have a negatively influence on the stock prices of all their lending banks. Even worse, the three largest financing banks of the

distressed firms are more severely affected than are those of all lending banks.

The rejection of our *distressed bank hypothesis*, however, is a sharp contradiction to recent empirical evidence taken from crises in bank-oriented financial systems of in Asian countries, like Japan (Hoshi, et al. 1992) and Korea (Bae et al., 2002). Previous studies have shown that firms in these countries experienced large average stock price declines upon the announcement of bank distress. One explanation for the differences may lie in the alternatives of firm's funding. When a firm relies heavily on one source of funds, the bad news surrounding distressed banks significantly affects their client firms.

On the other hand, our empirical results also reveal two interesting findings. One is the performances of the distressed banks and their unhealthy borrowing firms flock together. It implied that a bank cannot perform well without a healthy corporate sector, and the performances of the two sectors cannot theoretically be kept apart. Another is the loan terms for the non-listing firms are stricter. The results mean that the adverse effects from distress in the banking sector banking pertain to the consequences on firms with more serious information asymmetry particularly. However, listed firms can shift their financing alternatives quickly and easily. The finding has implication to policy-marker that the attention of banking crisis will be focused on information asymmetry firms more.

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Table I Name List of the Distressed Banks and their Related Firms' Number

This table lists the five distressed banks (six distressed bank events: (1) The Tai-Chung Bank; (2)Pan-Asia Bank; (3)Chung-Hsing Bank; (4)Tai-Dong Small and Medium Enterprise Bank; (5)Kaohsiung Small and Medium Enterprise Bank (This bank had experienced two distressed bank events). The list of related firms is from the TEJ loan transaction data. We summarize the total number of related firms in the period of banking distress in the third column and list the number of these related firms which are listed in TSE or OTC in the fourth column. The related firm is defined that the long-term borrowing contracts (>1 years) exist while the bank is in distress. The source of the distressed bank is from the EBDS data bank. *** Notes:** there are two other banks, the Hwalien Small and Medium Enterprise Bank and the Overseas Chinese Bank excluded sample because they are not listed in the public market and we cannot find enough data of their stock prices.

Bank name	Date of crisis event	Client Number of crisis during event date	Client Number of listed firms during event date	Cause of the crisis
Tai-Chung Bank	Nov. 24 1988	16	2	On November 5, 1988, Kawn-San Group used Son-Dar-Yu stocks as collateral to borrow money from the Tai-Chung Bank, amounting to NT $7.4 billions. This is against the regulation of not lending more than half of their loans to a single borrower. This lending was undisclosed under the supervision of the Central Bank in the next few weeks. The bank run immediate occurred and the amount of withdrawn money amounted to NT $55 billion. On November 24, the stock of Son-Dar-Yu and Tai-Chung Bank could not be delivered. The Ministry of Finance took charge of the Tai-Chung Bank for six months.
Pan-Asia Bank	Nov. 1, 1988	66	17	Relationship lending to the Chang group was too much. Its non-performing loan was also high. This caused the largest withdrawal of deposits by the Chung-Hua Mutual Fund. Some banks also refused to lend money in the inter-bank market. It had a severe liquidity problem. The Central Bank finally provided NT $5 billion to roll over the debt. The bank was taken over by a new Group.
Chung-Hsing Bank	May 1, 2000	27	14	Relationship lending to the Tai-Fong Group and its CEOs. The NPL increased and bank assets were evacuated by the CEOs.
Tai-Dong Small and Medium Enterprise Bank	Feb 4, 1996	3	1	Loan to deposit ratio was too high. The lending was concentrated on a few large borrowers. The operating performance is deteriorated. The Ministry of Finance took over for the bank for three months.

(continued)

(continued)

Bank name	Date of crisis even	Client Number of crisis during event date	Client Number of listed firms during event date	Cause of the crisis
Kaohsiung Small and Medium Enterprise Bank	March 31, 1996	2	1	Bank President Tasi Chi-Yuan borrowed NT $ 150 million from the bank and defaulted. It was against Article 33 of Taiwan's Bank Law governing relationship lending.
Same as above	July 9, 1997	8	1	NPL reached an historical high up to NT $11.2 billion, and its ratio was 15.36%.
Hwalien Small and Medium Enterprise Bank *	June 23, 1995	-	-	Credit loans to Da-Han College were too much and later defaulted.
Overseas Chinese Bank *	Jan. 1, 1995	-	-	US $8 thousand loss due to derivative operations (SWAP)
Overseas Chinese Bank *	Nov. 19, 1995	-	-	Loans to New Che-Chung Building Corporation were too much and defaulted.
Total	**5 banks 6 events**	**122 related firms**	**36 (listed) firms**	

Table II Name List of the Distressed Firms

This table lists the thirty distressed firms that are listed on TSE and OTC. The source of the distressed firms is also from the EBDS data bank. There are four crisis types: 1 denotes: fundamental weakness; 2 denotes over-investment, 3 denotes protection of stock prices by subsidiaries; and 4 denotes the evacuation of company by the CEO. The list of related banks is from the TEJ loan transaction data.

Names of with crisis firms	Type of Industry	Event date	Cause of crisis	Related banks
Feng-An	Steel	June 30, 1998	2	Chang-Hwa, Hua-Nan, Kai-Fa, Chiao-Tung, Tai-Chi, Cosmos-Bank, Asia-Pacific, Far-Eastern, En-Tie, Bao-Dou, Overseas Chinese, Chin-Fon
Wan-Yow	Paper	Aug. 26, 1998	1	Chang-Hwa, Kai-Fa, Central-Trust, Chiao-Tung, Chinese, Tai-Chi, Far-Eastern, Pan-Asia
Ruei-Yuan	Textile	Oct. 2, 1998	1	Central-Trust, Chiao-Tung, Taipei Bank, Chinese, Tai-Chi, Pan-Asia, Overseas Chinese
Lien-Cheng	Food	Oct. 31, 1998	1	Chang-Hwa, Kai-Fa, Chiao-Tung, Chinese Far-Eastern, Overseas Chinese
Tai-Fang	Food	Nov. 3, 1998	1，3，4	Farmers Bank, Fubon, Taishin
Pu-Da	Plastic	Nov. 3, 1998	1，3，4	Chiao-Tung
Min-ChaLi	Steel	Nov. 3, 1998	3，4	Chang-Hwa, Chiao-Tung
Shing-Tai	Steel	Nov. 3, 1998	2，3	Chang-Hwa, Hua-Nan, Kai-Fa, Farmers Bank, Chiao-Tung, Da-An, Chinese, Chung-Hsing, Taiwan Cooperative, Pan-Asia, Bao-Dou, Overseas Chinese, Chin-Fon
Chinese Automobiles	Automobile	Nov. 3, 1998	1，3，4	Chang-Hwa, Hua-Nan, Kai-Fa, Taipei, Taichung, Central-Trust, Farmers Bank, Chiao-Tung, Da-An, Taipei bank, Chinese, Tai-Chi, Cathay, Cosmos Bank, Union Bank Chinese, Far-Eastern, Chung-Hsing, Bao-Dou, Overseas Chinese
Hong-Fu	Architecture	Nov. 7, 1998	1，4	Central-Trust, United World Chinese, Cathay, Cosmos Bank, Fubon, Asia-Pacific, Far-Eastern, Chung Shing, Ta-Chong, En-Tie , Overseas Chinese
Dung-Yun	Textile	Nov. 9, 1998	3	Chang-Hwa, First, Kai-Fa, ICBC, Na-Chi, Tai-Chung, Farmers Bank, Chiao-Tung, United World Chinese, Da-An, Taipei Bank, Cathay, Cosmos Bank, Sino-Pac, Fubon, Asia-Pacific, Far-Eastern, Chung-Hsing, Pan-Asia, Overseas Chinese
Kuo-Yang	Architecture	Nov. 10, 1998	2，3，4	Hua-Nan, Kai-Fa, Central Trust, Grand, Cosmos Bank, Fubon, Asia-Pacific, Far-Eastern, En-Tie , Pan-Asia, Overseas Chinese, Chinfon

(continued)

(continued)

Names of with crisis firms	Type of Industry	Event date	Cause of crisis	Related banks
Guang-Yu	Electronics	Nov. 11, 1998	4	Chang-Hwa, Hua-Nan, Kai-Fa, Central Trust, Chiao-Tung
Chung-Jing	Electricity	Nov. 16, 1998	3	Chinese Trust, Chiao-Tung, Grand, Da-An, Taipei Bank, Cosmos Bank, Union-Ban Chinese, Sino-Pac, E-Sun, Asia-Pacific, Pan-Asia, Bao-Dou, Chin-Fon
Shu-Da-Yu	Food	Nov. 24, 1998	4	Chin-Fon
Chang-E	Architecture	Dec. 2, 1998	2，4	Chang-Hwa, Hua-Nan, Kai-Fa, Farmers Bank, United World Chinese, Da-An, Taipei Bank, Fubon, Asia-Pacific, Tai-Shin, Far-Eastern, Chung-Hsing, Ta-Chong, Chin-Fon
Ren-Shiang	Architecture	Dec. 25, 1998	2，3	United World Chinese, Kaohsiung, Bao-Dou
King-Well	Textile	Jan. 7, 1999	3，4	Kai-Fa, Central Trust, United World Chinese, Grand, Tai-Chi, Cathay, United World Chinese, Fubon, Pan-Asia, Overseas Chinese
Chien-Mei	Architecture	Jan. 8, 1999	2	Chung-Hsing
Da-Kou	Steel	Jan. 20, 1999	1，3，4	Chang-Hwa, Hua-Nan, ICBC, Taipei Bank, Central Trust, Farmers Bank, Chiao-Tung, United World Chinese, Grand, Taipei bank, Tai-Chi, Cosmos Bank, Fubon, Tai-Shin, Far Eastern, Chung-Hsing, Ta-Chong, Bao-Dow, Overseas Chinese, Chin-Fon
You-Li	Steel	Jan. 20, 1999	1，3，4	Chang-Hwa, Hua-Nan, ICBC, Central Trust, Farmers Bank, Chiao-Tung, United World Chinese, Da-An, Tai-Chi, United World Chinese, Tai-Shin, Chung-Hsing, Ta-Chong, Bao-Dow, Overseas Chinese, Chin-Fon
Da-Yung-Shin	Textile	Feb. 7, 1999	3，4	Hua-Nan, Kai-Fa, Central Trust, Union Bank Chinese, E-Sun, Fubon, Chin-Fon
Chung-Chiang	Electronics	Mar. 30, 1999	4	Chang-Hwa, Hua-Nan, ICBC, Central Trust, Chiao-Tung, Taipei Bank, Cosmos Bank, Union Bank, E-Sun, Fubon, Pan-Asia, Chung-Hsing, Cosmos Bank, Pan-Asia, Bao-Dow, Overseas Chinese, Chin-Fon
Shin-Yan	Textile	May 25, 1999	3	Chang-Hwa, Hsin-Chu, United World Chinese, Chinese, Tai-Chi, Union Bank Chinese, Chung-Shing, En-Tie

(continued)

(continued)

Names of with crisis firms	Type of Industry	Event date	Cause of crisis	Related banks
Guo-Bin-Tsz	China	May 25, 1999	1，3	Hua-Nan, Central Trust, Farmers Bank, Chiao-Tung, United World Chinese, Da-An, Taiwan Enterprise, Chung-Hsing, Bao-Dow
Niu-Shin	Steel	Jun. 3, 1999	2	Hua-Nan, Kai-Fa, Central Trust, Chiao-Tung, Tai-Chi, Cathy, Cosmos Bank, Union Bank Chinese, Chung-Hsing, Pan-Asia, Overseas Chinese
Da-Ying	Plastic	Aug. 28, 1999	2，3，4	Kai-Fa, Chiao-Tung, En-Tie
Yan-Ying	Plastic	Aug. 28, 1999	2，3，4	Chang-Hwa, Taipei, Taichung, Chiao-Tung, Grand, Da-An, Tai-Chi, Cathay, Far-Eastern, Boadou
Ty-Phone	Food	Nov. 28, 1999	1，3，4	Kao-Chi, Farmers Bank, United World Chinese, Taipei Bank, Cosmos Bank, Chung-Hsing, En-Tie, Boa-Dou, Overseas Chinese, Chin-Fon
Huang-Pu	Architecture	Nov. 28, 1999	2，3	Central Trust, United World Chinese, Grand, E-Sun, Fubon, Asia-Pacific, Far-Eastern, Chung-Hsing, En-Tie , Pan-Asia, Bao-Dou, Overseas Chinese, Chin-Fon
Total Number	**30 distressed firms (events) and their related 40 banks**			

Table III Testing of the Distressed Bank Hypothesis

Event day t=0 is the day of the publication of the newspaper's announcement of distressed banks. Average prediction errors are estimated using market model methodology, where the pre-event estimation period is t=-150 to -30; t-statistics are in parentheses. The return on market stock index is calculated as: *Return*= $(P_t-P_{t-1})/P_{t-1}$; (*P*: The closed stock index for all markets on t day), and *CR* (cumulative return on the market)=$R_{t-1}+R_t$. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

	Distressed bank (*n*=6)		Client firms (*n*=36)		Financial industry index		Market index of TSE	
Date	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*Return* (%)	*CR* (%)
-10	0.114 (0.153)	0.114 (0.389)	0.251 (0.597)	0.251 (-1.028)	0.210 (1.486)	0.210 (0.640)	-0.001	-0.001
-9	-0.327 (-0.204)	-0.213 (-1.112)	-0.113 (-0.341)	0.138 (0.020)	-0.167 (-1.386)	0.043 (1.497)	0.650	0.649
-8	-0.242 (-0.168)	-0.455 (-1.335)	-0.102 (-0.544)	0.036 (1.208)	0.389 (1.297)	0.432 (1.179)	1.188	1.837
-7	0.195 (0.591)	-0.260 (-1.152)	0.229 (0.919)	0.265 (1.442)	-0.219 (-1.386)	0.213 (0.365)	-0.259	1.578
-6	-0.003 (-1.641)	-0.263 (-1.907)*	0.031 (1.236)	0.296 (1.147)	0.134 (0.115)	0.347 (1.114)	-0.496	1.082
-5	0.101 (0.603)	-0.162 (-1.474)	-0.030 (-1.271)	0.266 (1.106)	-0.003 (-1.665)*	0.344 (1.616)	-0.974	0.108
-4	0.157 (1.101)	-0.005 (-1.044)	-0.010 (-0.341)	0.256 (1.275)	0.073 (1.467)	0.417 (1.391)	0.581	0.689
-3	-0.125 (-1.743)*	-0.130 (-2.091)**	0.059 (1.406)	0.315 (1.509)	-0.215 (-1.516)	0.202 (1.524)	0.858	1.547
-2	0.002 (0.888)	-0.128 (-2..792)***	0.035 (1.792)*	0.350 (1.677)*	-0.094 (-1.716)*	0.108 (1.663)	0.388	1.935
-1	-0.225 (-2.328)**	-0.353 (-2.308)**	-0.102 (-1.544)	0.248 (1.687)*	0.127 (1.104)	0.235 (0.160)	-1.560	0.375
0	-0.592 (-2.881)***	-0.945 (–2.792)***	-0.267 (-1.769)*	-0.019 (-1.846)*	-1.107 (-1.765)*	-0.872 (-1.857)*	-1.155	-0.780
+1	-0.317 (-2.400)***	-1.262 (-3.023)**	-0.029 (-1.814)*	-0.048 (-1.798)*	-0.093 (-1.907)*	-0.965 (-1.830)*	-1.003	-1.783
+2	0.009 (1.182)	-1.253 (-3.305)***	0.371 (1.043)	0.323 (1.653)	0.148 (1.493)	-0.817 (-1.710)*	-1.851	-3.634
+3	-0.198 (-1.101)	-1.451 (-3.198)***	-0.010 (-1.192)	0.313 (1.627)	0.337 (0.627)	-0.480 (-1.120)	0.512	-3.122
+4	0.027 (0.486)	-1.424 (-3.143)***	-0.354 (-1.082)	-0.041 (-1.494)	-0.609 (-1.124)	-1.089 (-1.452)	-0.179	-3.301
+5	-0.131 (0.466)	-1.555 (-3.801)***	0.154 (1.111)	0.113 (1.249)	-0.601 (-1.009)	-1.690 (-1.104)	1.301	-2.000
+6	-0.684 (-1.883)*	-2.239 (-2.896)***	0.095 (0.319)	0.208 (1.178)	0.175 (1.114)	-1.515 (-1.409)	0.499	-1.501
+7	0.135 (1.132)	-2.104 (-2.846)***	0.389 (1.175)	0.597 (1.867)	0.448 (1.179)	-1.067 (-1.573)	-0.205	-1.706
+8	-0.257 (-2.004)**	-2.361 (-2.749)***	-1.001 (-1.289)	-0.404 (-1.124)	-0.714 (-1.514)	-1.781 (-1.291)	-0.525	-2.231
+9	-0.218 (-1.535)	-2.579 (-2.608)***	0.594 (1.176)	0.190 (0.088)	0.311 (0.388)	-1.470 (-1.114)	0.285	-1.946
+10	0.151 (1.462)	-2.428 (-2.665)***	0.149 (1.257)	0.339 (1.252)	-0.164 (-1.193)	-1.634 (-1.609)	0.077	-1.869

(continued)

(continued)

	Distressed bank (*n*=6)		Client firms (*n*=36)		Financial industry index		Market index of TSE	
Date	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*Return* (%)	*CR* (%)
(-1,+1)	-0.378 (-3.232)***	-0.853 (-2.532)***	-0.133 (-1.831)*	0.060 (-1.687)*	-0.358 (-1.720)*	-0.534 (-1.936)*	-1.239	-0.729
(-10,+10)	-0.116 (-2.328)***	-1.022 (-2.160)***	0.016 (-1.675)	0.190 (0.910)	-0.078 (–1.603)	-0.516 (-1.142)	-0.089	-0.670

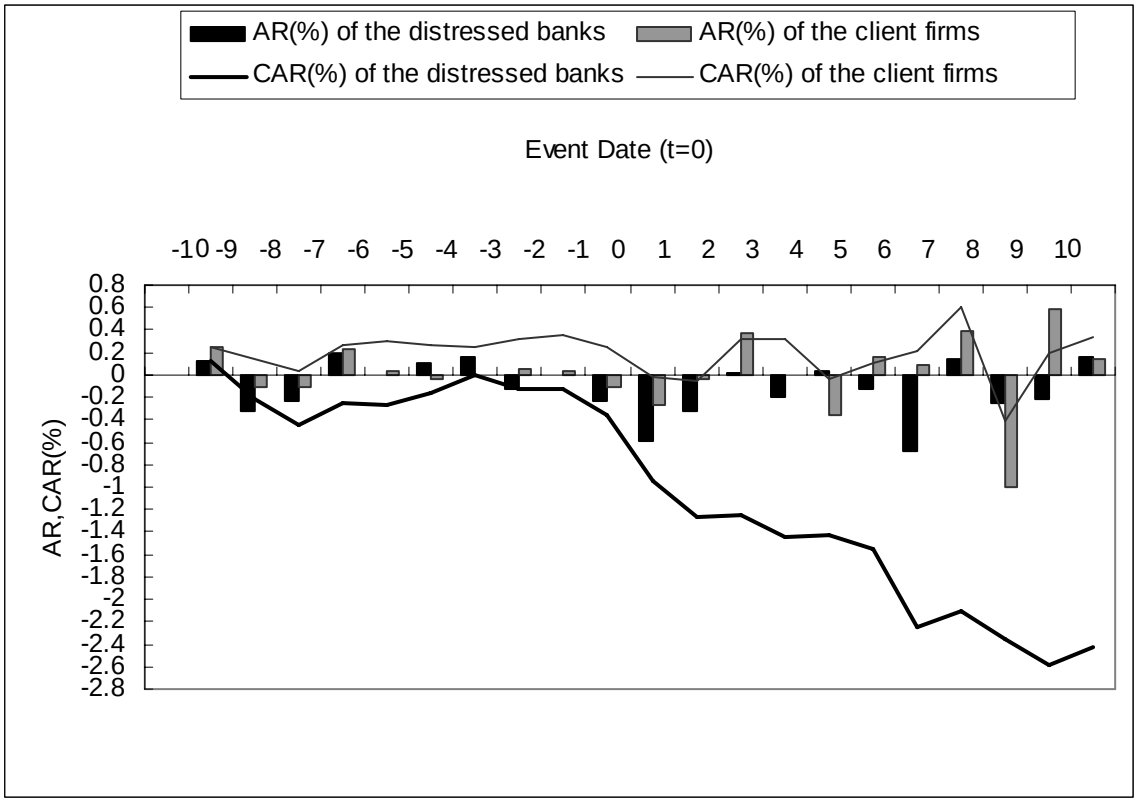

Figure 1 Responses of the Stock Prices for Borrowing Firms in the Distress Period of their Lending Banks

A comparison of the average abnormal stock return (AR) and the average cumulative abnormal stock return (CAR) of the distressed banks and their related firms in the events of the bank distress (t=-10~+10). The black solid line plots the CAR for the distressed banks.

Table IV Capital Structures of the Client Firms of Distressed Banks

This table summarizes the total 122 firms which borrow from the five distressed banks. In Panel A and Panel B, we separate the 122 firms into two groups. One comprises the 36 listed firms, and the other group comprises 86 non-listed firms. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

Capital structure	Mean	Median	Std dev.	Max	Min
Panel A Listed firms that borrow from distressed banks (N=36)					
Average number of banks that firms borrow from	13.31	14.00	3.83	21.00	6.00
Long-term debt/total assets (%)	61.75	65.48	22.64	95.42	41.36
Loan amounts /total liabilities (%)	51.06	49.35	29.46	80.45	39.97
Loan amounts from distressed banks /total loan amounts (%)	12.82	10.67	13.57	25.57	5.21
Panel B Non-listed firms that borrow from the distressed banks (N=86)					
Average number of banks that firms borrow from	7.00	8.00	3.12	11.00	2.00
Long-term debt/total assets (%)	65.95	62.44	29.81	88.46	33.34
Loan amounts /total liabilities (%)	59.85	61.45	18.96	85.93	44.37
Loan amounts from distressed banks /total loan amounts (%)	26.74	29.65	15.66	37.06	10.95
Panel C Total listed non-financial firms in TSE (N=349)					
Average number of banks that firms borrow from	8.33	9.00	4.73	35.00	1.00
Long-term debt/total assets (%)	50.43	51.79	31.25	97.46	20.17
Loan amounts /total liabilities (%)	42.75	45.77	20.56	70.56	22.94
Panel D The *t*-test of the group means	**A Vs. B**	**A Vs. C**	**B Vs. C**		
Average number of banks that firms borrow from	3.057***	2.757***	-0.154		
Long-term debt/total assets (%)	-1.040	2.431**	3.198***		
Loan amounts /total liabilities (%)	-1.540	2.091**	2.896***		
Loan amounts from distressed banks /total loan amounts (%)	-3.081***	-	-		

Table V Testing of the Distressed Firm Hypothesis

Event day t=0 is the day of the publication of the newspaper's announcement of of distressed firms. Average prediction errors are estimated using market model methodology, where the pre-event estimation period is t=-150 to -30; t-statistics are in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

	Distressed firms (n=30)		Related banks (n=40)		Three largest related banks		Financial industry index	
Date	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)
-10	-0.008 (-1.095)	0.118 (-1.774)	0.164 (1.546)	0.164 (1.619)	0.025 (1.193)	0.025 (1.127)	-0.025 (-1.494)	-0.025 (-1.113)
-9	0.033 (1.540)	0.151 (1.598)	0.022 (1.607)	0.186 (1.425)	0.000 (0.410)	0.025 (1.509)	0.043 (1.581)	0.018 (1.124)
-8	-0.198 (-1.422)	-0.047 (-1.365)	-0.010 (-1.513)	0.176 (1.700)	-0.074 (-1.382)	-0.049 (-1.189)	0.354 (1.334)	0.372 (1.214)
-7	-0.151 (-1.221)	-0.198 (-1.554)	0.035 (1.097)	0.211 (0.890)	0.223 (1.590)	0.174 (1.312)	0.120 (1.258)	0.492 (1.105)
-6	0.016 (1.187)	-0.182 (-1.533)	0.091 (1.466)	0.302 (1.374)	0.051 (1.162)	0.225 (1.504)	-0.352 (-1.814)*	0.140 (1.074)
-5	-0.180 (-1.627)	-0.362 (-1.533)	0.048 (1.503)	0.350 (1.156)	-0.035 (-1.188)	0.190 (-1.573)	0.251 (1.145)	0.391 (1.198)
-4	0.145 (1.294)	-0.217 (-1.594)	-0.184 (-1.633)	0.166 (1.433)	0.014 (1.475)	0.204 (1.222)	0.025 (1.058)	0.416 (1.355)
-3	-0.075 (-1.809)*	-0.292 (-1.425)	0.117 (1.146)	0.283 (1.334)	0.076 (1.390)	0.280 (1.807)	-0.321 (-1.787)*	0.095 (1.563)
-2	-0.267 (-1.720)*	-0.559 (–1.758)*	-0.192 (-1.277)	0.091 (-1.840)*	-0.201 (-2.050)**	0.079 (-2.157)**	0.000 (1.567)	0.095 (1.449)
-1	-0.305 (-1.970)**	-0.864 (-2.064)**	-0.286 (-3.059)****	-0.195 (-3.802)***	-0.311 (-3.737)***	-0.232 (-2.665)**	-0.244 (-2.157)**	-0.149 (-2.298)**
0	-0.229 (-1.921)**	-1.093 (-2.108)**	-0.304 (-2.933)***	-0.499 (-3.259)***	-0.315 (-3.646)***	-0.547 (-2.749)***	-0.324 (-2.184)**	-0.473 (-2.404)**
+1	-0.159 (-1.743)*	-1.252 (-2.228)**	-0.172 (-2.442)***	-0.671 (-2.417)***	-0.139 (-3.704)***	-0.686 (-3.894)***	-0.007 (-2.182)**	-0.480 (-2.207)**
+2	-0.107 (-1.495)*	-1.359 (-2.160)**	-0.117 (-1.656)	-0.788 (-1.819)*	-0.094 (-1.788)*	-0.780 (-2.198)**	0.074 (1.599)	-0.406 (1.511)
+3	-0.006 (-1.695)*	-1.365 (-2.068)**	0.005 (1.534)	-0.783 (-1.742)*	0.000 (0.142)	-0.780 (-1.797)*	0.317 (1.611)	-0.089 (-1.336)
+4	-0.102 (-1.597)	-1.467 (-1.724)*	-0.127 (-1.205)	-0.910 (-1.713)*	0.025 (1.543)	-0.755 (-1.576)	-0.079 (-1.099)	-0.168 (-1.178)
+5	0.126 (1.607)	-1.341 (-1.698)*	-0.030 (-1.807)*	-0.940 (-1.654)	0.073 (1.437)	-0.682 (-1.284)	-1.002 (-1.605)	-1.170 (-0.917)
+6	-0.241 (-1.748)*	-1.582 (-1.553)	0.095 (1.447)	-0.845 (-1.608)	-0.015 (-0.879)	-0.697 (-1.450)	0.658 (1.311)	-0.512 (-1.227)
+7	0.034 (1.299)	-1.548 (-1.325)	-0.039 (-1.138)	-0.884 (-1.647)	0.102 (1.134)	-0.595 (-1.016)	0.073 (0.069)	-0.439 (-1.463)
+8	-0.032 (-1.172)	-1.580 (-1.021)	-0.118 (-1.478)	-1.002 (-1.516)	-0.014 (-1.692)	-0.609 (-1.396)	-0.359 (-1.057)	-0.798 (-1.182)
+9	-0.071 (-1.082)	-1.651 (-1.119)	0.134 (1.158)	-0.868 (-1.572)	-0.100 (-1.088)	-0.709 (-1.285)	-0.115 (-1.557)	-0.913 (-1.194)
+10	0.149 (1.591)	-1.502 (-1.406)	0.010 (1.474)	-0.858 (-1.215)	0.108 (1.348)	-0.601 (-1.488)	0.006 (1.351)	-0.907 (-1.215)

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(continued)

	Distressed firms (n=30)		Related banks (n=40)		Three largest related banks		Financial industry index	
Date	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)
(-1, +1)	-0.231 (-2..295)**	-1.070 (-2.061)**	-0.254 (-3.187)***	-0.455 (-3.232)***	-0.255 (-3.666)***	-0.488 (-2.956)***	-0.192 (-2.178)**	-0.367 (-2.291)**
(-10, 10)	-0.078 (-1.872)*	-0.866 (-1.905)*	-0.041 (-1.805)*	-0.348 (-1.699)*	-0.029 (-1.433)	-0.310 (-1.516)	-0.043 (-1.794)*	-0.215 (-1.803)*
(-1,0)	-0.267 (-2.785)***	-0.979 (-1.950)**	-0.295 (-3.004)***	-0.347 (-3.541)***	-0.313 (-3.446)***	-0.390 (-3.507)***	-0.284 (-2.240)**	-0.311 (-2.301)**
(-10, 0)	-0.111 (-1.997)**	-0.322 (-1.769)*	-0.045 (-2.005)**	0.112 (-1.928)**	-0.050 (-2.113)**	0.034 (-2.095)**	-0.043 (-1.726)*	0.125 (-1.998)*
(+1,+10	-0.041 (-1.057)	-1.465 (-1.413)	-0.036 (-1.513)	-0.855 (-1.427)	-0.005 (-1.359)	-0.689 (-1.457)	-0.043 (-1.209)	-0.588 (-1.653)

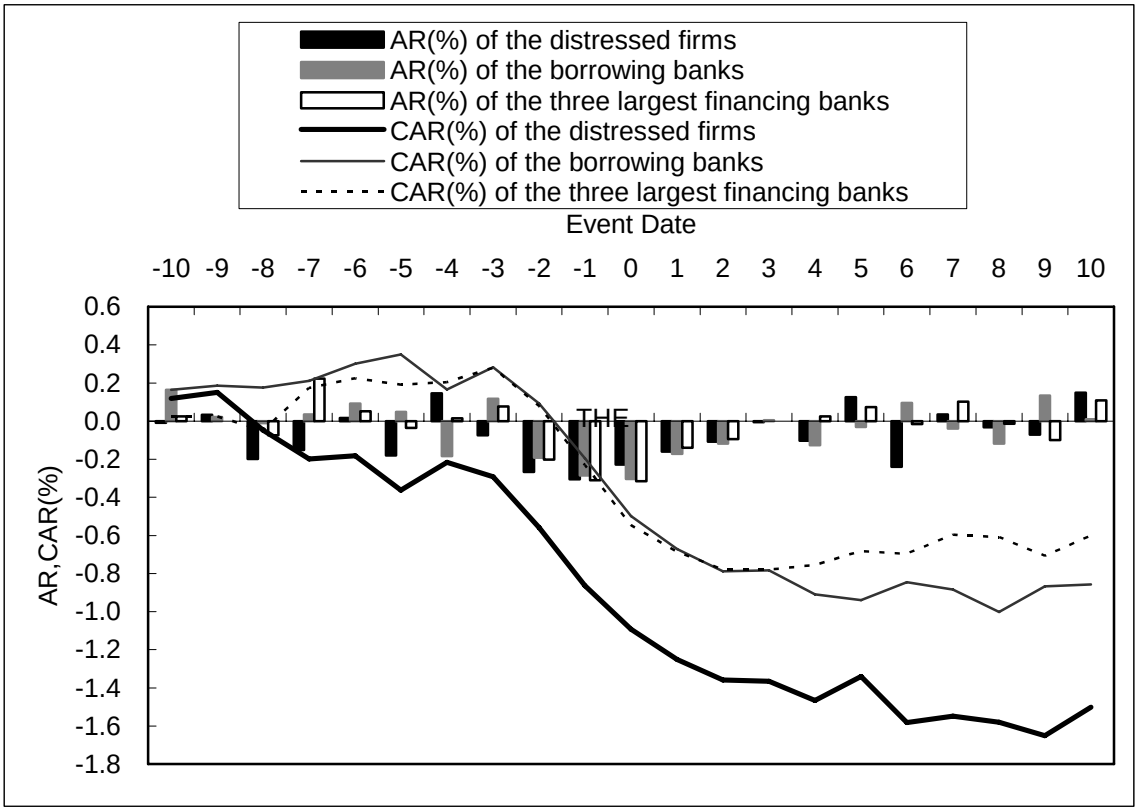

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Figure 2 Responses of Stock Prices for Lending Banks in the Distress Period of their Borrowing Firms

A compassion of the average abnormal stock return (AR) and the average cumulative abnormal stock return (CAR) of the listed firms suffering distress; and the related banks, including the borrowing banks and the main banks, the three largest lending banks in the event of firm crisis (t=-10~+10). The black solid line plots the CAR for the distressed firms. The black dashed line in the figure plots the CAR for the firms that borrow from the three largest financing banks.

Table VI Information on the Borrowing Banks from Distressed Firms

The data source is from the Taiwan Economic Journal (*TEJ*). The main financing bank (MB) is defined as the largest borrowing amounts for the bank.

Name-list of Distressed firms	Numbers of banks that borrows	Firms' total borrowing amounts/ firms' total assets (%)	Name-list of Main financing bank (MB)	Firms' total borrowing amounts from MB/ firms' total assets (%)	Firms' total borrowing amounts from the largest three lending banks/ firms' total assets (%)
Feng-An	23	12.15	Chang-Hwa Bank	3.21	6.14
Wan-Yow	27	9.87	Chiao-Tung Bank	2.54	5.56
Ruei-Yuan	24	11.65	Hua-Nan Bank	1.67	5.27
Lien-Cheng	15	13.26	First Bank	1.64	4.06
Tai-Fang	10	9.57	Chiao-Tung Bank	1.98	5.17
Pu-Da	17	8.44	Fu-Bon Bank	1.44	3.94
Min-ChaLi	7	5.24	Farmer Bank	1.04	3.41
Shing-Tai	16	10.65	Taiwan Bank	1.64	3.01
Chinese Automobiles	32	8.87	Chang-Hwa Bank	0.67	1.94
Hong-Fu	18	5.27	Central of Trust of China Bank	1.01	2.73
Dung-Yun	30	4.45	Chang-Hwa Bank	0.94	2.11
Kuo-Yang	16	6.54	Cooperative Bank	0.91	0.94
Guang-Yu	9	12.21	Overseas of Chinese Bank	1.64	3.08
Chung-Jing	27	14.61	Taiwan Bank	2.02	3.05
Shu-Da-Yu	31	7.24	Chang-Hwa Bank	0.95	1.91
Chang-E	27	6.21	Chang-Hwa Bank	1.02	2.97
Ren-Shiang	21	4.51	Cooperative Bank	0.67	1.46
King-Well	26	8.75	Central of Trust of China Bank	1.19	3.07
Chien-Mei	24	8.64	Union Bank	0.54	1.22
Da-Kou	27	9.51	Ta-An Bank	1.35	3.47
You-Li	22	10.22	Chang-Hwa Bank	1.07	3.81
Da-Yung-Shin	18	8.64	Chinese Bank	1.46	2.22
Chung-Chiang	30	7.71	Chang-Hwa Bank	1.00	2.96
Shin-Yan	14	6.99	Overseas of Chinese Bank	1.06	3.00
Guo-Bin-Tsz	16	8.21	Chang-Hwa Bank	0.94	2.01
Niu-Shin	19	7.44	Chang-Hwa Bank	0.76	2.67
Da-Ying	27	5.24	Chang-Hwa Bank	0.48	1.99
Yan-Ying	22	9.53	Pan-Asia Bank	0.67	2.20

(continued)

(continued)

Name-list of Distressed firms	Numbers of banks that borrows	Firms' total borrowing amounts/ firms' total assets (%)	Name-list of Main financing bank (MB)	Firms' total borrowing amounts from MB/ firms' total assets (%)	Firms' total borrowing amounts from the largest three lending banks/ firms' total assets (%)
Ty-Phone	28	15.00	Chung-Shing Bank	1.08	2.93
Huang-Pu	19	9.26	Taiwan Bank	0.87	2.34
Mean	**21.4**	**8.86**		**1.25**	**3.02**
Std dev.	**6.74**	**2.80**		**0.60**	**1.26**

Table VII The Results of CAR Regression Analysis

$$CAR(-1,+1)_{B,j} = \beta_0 + \beta_1\left(CAR(-1,+1)_{Distressed\ Firm,i'}\right) + \beta_2 FN_{B,j} + \beta_3 DF_{B,j} + \beta_4(STOCK) + \beta_5\left(SIZE_{B,j}\right) + \varepsilon_{B,j}$$

$$CAR(-1,+1)_{F,i} = \alpha_0 + \alpha_1\left(CAR(-1,+1)_{Distressed\ Bank,j'}\right) + \alpha_2 BN_{F,i} + \alpha_3 DB1_{F,i} + \alpha_4 DB2_{F,i} + \alpha_5(STOCK) + \alpha_6\left(SIZE_{F,i}\right) + \varepsilon_{F,i}$$

The subscripts ***F,i*** denotes the *i*-th client firm when its related banks are in distress; ***B,j*** denotes the *j*-th related banks when their client firms are in distress. $\boldsymbol{CAR(-1,+1)}_{F,i}$ and $\boldsymbol{CAR(-1,+1)}_{B,j}$ represent the cumulative abnormal returns of the client firms and related banks from one-day before to one-day after the event, respectively. $CAR(-1,+1)_{Distressed\ Bank}$ $CAR(-1,+1)_{Distressed\ Firm}$ are the cumulative abnormal returns of the distressed banks and those of the distressed firms, respectively. $\boldsymbol{DB1_{F,i}}$ and $\boldsymbol{DB2_{F,i}}$ denotes the ratio of the borrowing amount the *i*-th firm from a distressed bank to the firm's total debts, and to the firm's total loans. $\boldsymbol{DF_{B,j}}$ denotes the ratio of the lending amounts of the *j*-th banks to a distressed firm. High borrowing or lending ratios are indicative of stronger negative impacts than the impacts of their respective counterparts. $\boldsymbol{BN_{F,i}}$ and $\boldsymbol{FN_{B,j}}$ which denote the number of related banks of *i*-th firms and the number of the client firms of the *j*-th banks, respectively; ***STOCK*** is the Taiwan stock weighted index; $\boldsymbol{SIZE_{F,i}}$ and $\boldsymbol{SIZE_{B,j}}$ denotes the assets of related banks of *i*-th firms, and the assets of the client firms of the *j*-th banks, respectively. *t*-statistics are in parentheses. *, **, *** are significant at the 10%, 5% and 1% level, respectively.

Dependent variable	**Model A**		**Model B**	
Independent variable	$\boldsymbol{CAR(-1,1)_{F,i}}$		$\boldsymbol{CAR(-1,1)_{B,j}}$	
Intercept	2.085 (1.347)	-1.175 (-2.038)**	1.059 (1.797)*	0.983 (1.634)
$CAR(-1,1)_{Distressed\ Bank\ j'}$	-0.782 (-1.035)	1.106 (1.413)	-	-
$CAR(-1,1)_{Distressed\ Firm,\ i'}$	-	-	0.139 (-2.108)**	0.526 (-1.986)**
$BN_{F,i}$	1.243 (1.095)	-0.754 (-0.045)	-	-
$FN_{B,j}$	-	-	1.254 (1.117)	0.957 (1.167)
$BD1_{F,i}$	-0.705 (-1.726)*	-0.319 (-1.421)	-	-
$BD2_{F,i}$	-1.175 (-1.532)	-0.972 (-2.141)**	-	-
$DF_{B,j}$	-	-	-1.256 (-1.274)	-0.954 (-1.317)
STOCK	1.62 (1.59)	-0.66 (-0.04)	-0.52 (-1.80)*	-0.05 (-1.51)
$SIZE_{F,i}$	1.186 (1.137)	-	-	-
$SIZE_{B,j}$	-	-	0.998 (1.629)	-
Adj-R^2	0.1548	0.1879	0.2542	0.1855

Table VIII The Changes of Credit Rating for the Client Firms at the Period of their Banks in Distress

T indicates the current year of distressed banks. The data source of credit rating is from TEJ. The ratings have 9 levels: 1-4 lower credit risk; 5-6 middle credit risk; 7-9 higher credit risk. * N= firm number in a specific rating group. ** LR= average interest rate of loan, which is calculated by the weighted loan amounts for one-year loan contract. *** SG=spread gap (spread premium), which is calculated by the average loan interest rate of (*N*+1) level credit rating – the average loan interest rate of (*N*) level credit rating.

Period	T-2			T-1			T			T+1			T+2		
Rating	N *	LR **	SG ***	N	LR	SG	N	LR	SG	N	LR	SG	N	LR	SG
Panel A Listed Firms (Firm Number＝36；Contract Number＝185)															
1	2	7.10	--	0	7.07	--	0	6.89	--	0	6.71	--	1	6.62	--
2	2	7.15	0.05	1	7.13	0.06	0	6.91	0.02	1	6.78	0.07	3	6.75	0.13
3	5	7.30	0.20	5	7.25	0.18	4	7.04	0.15	4	6.99	0.28	6	6.84	0.22
4	7	7.49	0.39	5	7.33	0.26	5	7.17	0.28	6	7.08	0.37	6	6.97	0.35
5	9	7.55	0.45	11	7.45	0.38	8	7.26	0.37	12	7.12	0.41	15	7.00	0.38
6	12	7.69	0.59	8	7.60	0.53	3	7.31	0.42	5	7.15	0.44	12	7.08	0.46
7	3	7.72	0.62	5	7.63	0.56	5	7.46	0.57	10	7.23	0.52	7	7.13	0.51
8	6	7.75	0.65	5	7.69	0.62	6	7.52	0.63	4	7.36	0.65	6	7.20	0.58
9	2	7.82	0.72	3	7.80	0.73	5	7.49	0.60	3	7.39	0.68	2	7.25	0.63
Panel B Non-listed Firms (Firm Number＝86；Contract Number＝364)															
1	5	7.36	--	3	7.25	--	1	7.05	--	3	6.89	--	3	6.75	--
2	10	7.40	0.04	7	7.28	0.03	5	7.12	0.07	7	6.92	0.03	8	6.80	0.05
3	18	7.45	0.09	20	7.30	0.05	15	7.16	0.11	15	7.09	0.20	18	6.89	0.14
4	25	7.57	0.21	21	7.35	0.10	18	7.24	0.19	20	7.15	0.26	20	7.00	0.25
5	23	7.73	0.37	20	7.42	0.17	16	7.31	0.26	22	7.29	0.40	25	7.10	0.35
6	14	7.84	0.48	16	7.54	0.29	21	7.49	0.44	23	7.35	0.46	20	7.19	0.44
7	15	7.86	0.50	18	7.60	0.35	24	7.55	0.50	16	7.44	0.55	9	7.25	0.50
8	10	7.91	0.55	14	7.65	0.40	16	7.59	0.54	12	7.48	0.59	8	7.31	0.56
9	3	7.99	0.63	3	7.72	0.47	5	7.61	0.56	2	7.50	0.61	0	7.39	0.64

Table IX The Changes of Loan Contracts for the Client Firms

T indicates the current year of distressed banks. Loan amounts (unit: ten thousands NT dollars) and collateral loan number are cumulated number. Some loans terms, such as interest rate (%) and period (year), which are calculated by the weighted loan amounts in one-year loan contract. *t*-statistics are in parentheses. *, **, *** are significant at the 10%, 5% and 1% level, respectively.

Panel A The Loan Contracts of "all Client Firms" from the Distressed Banks						
	(1) T-1	(2) T	(3) T+1	t-test (2) vs. (1)	t-test (2) vs. (3)	t-test: (2) (A1) vs. (A2)
Panel A1 The loan contracts of "listed firms" from the distressed banks (N=36)						
1.Amounts (ten thousands, NT$)	7,524 (3,285)	8,115 (4,007)	2,957 (1,954)	2.681***	6.167***	1.112
2.Loan Interest Rate (%)	7.05 (1.15)	6.95 (1.26)	6.84 (1.18)	-1.747*	-1.602	-2.009**
3.Loan Period (year)	5.13 (2.07)	5.14 (2.32)	4.78 (2.15)	-1.591	1.115	1.613
4.Collateral Loan Number	57	61	56	--	--	--
Panel A2 The loan contracts of "non-listed firms" from the distressed banks (N=86)						
1.Amounts (ten thousands, NT$)	8,221 (5,009)	7,009 (2,457)	2,254 (1,543)	-1.754*	6.225***	--
2.Loan Interest Rate (%)	7.65 (1.46)	7.25 (1.27)	6.95 (1.38)	-1.602	0.978	--
3.Loan Period (year)	4.85 (1.65)	4.57 (1.90)	3.55 (1.42)	-1.126	1.802**	--
4.Collateral Loan Number	101	95	75	--	--	--

Panel B The Loan Contracts of "all Client Firms" from the Non-Distressed Banks						
	(1) T-1	(2) T	(3) T+1	t-test (2) vs. (1)	t-test (2) vs. (3)	t-test: (2) (A1) vs. (A2)
Panel B1 The loan contracts of "listed firms" from the non-distressed banks (N=36)						
1.Amounts (ten thousands, NT$)	7,254 (2,745)	7,224 (3,152)	7,110 (1,005)	-0.097	0.746	2.335***
2.Loan Interest Rate (%)	7.10 (1.08)	7.06 (1.45)	6.90 (1.32)	-1.621	1.542	-2.100**
3.Loan Period (year)	4.95 (1.42)	5.05 (2.15)	5.24 (1.68)	1.445	-1.005	1.954**
4.Collateraled Loan Number	125	167	121	--	--	--
5.Average Number of Borrowing Banks	8.75	6.42	6.45	-1.775*	-0.006	2.068**
Panel B2 The loan contracts of "non-listed firms" from the non-distressed banks (N=86)						
1.Amounts (ten thousands, NT$)	5,806 (2,245)	5,009 (2,007)	4,219 (1,957)	-1.774*	2.548***	--
2.Loan Interest Rate (%)	7.13 (1.23)	7.68 (1.59)	7.75 (1.45)	1.705*	-1.779*	--
3.Loan Period (year)	5.06 (1.87)	4.75 (1.93)	4.10 (1.06)	1.387	1.690*	--
4.Collateraled Loan Number	136	78	67	--	--	--
5. Average Number of Borrowing Banks	5.62	5.07	4.88	-1.514	1.715*	--

Table X The Capital Structure of Firms Dealing with the Distressed Banks

t-statistics are in parentheses. *, **, *** are significant at the 10%, 5% and 1% level, respectively.

	Mean	Medium	Std. ev.	Max.	Min.	T-test(A) vs. (B)
Panel A The Listed Firms (on TSE and OTC) Dealing with the Distressed Banks (N=36)						
.1.The Bank Number	11.78	9	5.01	17	5	3.228***
2. Debt/ Total assets (%)	50.25	51.77	12.25	61.48	46.25	-1.697*
3. Bank debt/ Total assets (%)	29.54	30.10	17.98	52.42	25.33	-1.821**
4. Bank debt from the distressed banks /Total Bank debt (%)	14.15	12.97	6.75	25.95	8.25	-2.714***
Panel B The Non-Listed Firms (Public, but not Listing on TSE and OTC) Dealing with the Distressed Banks (N=86)						
.1.The Bank Number	5.01	4	3.04	10	1	--
2. Debt/ Total assets (%)	59.98	51.29	25.44	67.27	29.84	--
3. Bank debt/ Total assets (%)	65.00	58.25	21.39	79.89	45.36	--
4. Bank debt from the distressed banks /Total Bank debt (%)	24.56	24.13	10.25	36.28	16.21	--

Table XI The Change of Financial Status for Firms Dealing with the Distressed Banks

T indicates the current year of distressed banks. The data source: 1.From firms' public financial statements of basic B/S and I/S: The growth rate of real investment (%, defined by the growth rate of gross fixed assets), long-term debt/ total assets (%), bank debt/ total long-term debt (%), the growth rate of sales (%), ROA (%), ROE (%). 2.From the TEJ long-format financial statement: the external financing of capital market (the issuer number of SEO, the issuer number of bond (or CB)), and the issuer number of money-market (CP).

	(1)T-1	(2)T	(3)T+1	t-test (2) vs. (1)	t-test (2) vs. (3)	t-test (3): (A) vs. (B)
Panel A The Listed Firms (on TSE and OTC) Dealing with the Distressed Banks (N=36)						
1. The growth rate of real investment (%)	3.10 (1.57)	2.85 (1.84)	3.08 (1.95)	-0.946	-1.023	1.694*
2. Long-term debt/ total assets (%)	23.24 (13.31)	25.44 (15.25)	21.35 (14.24)	1.225	1.116	-1.779*
3. Bank debt/ total long-term debt (%)	11.25 (7.26)	9.25 (5.44)	8.49 (6.01)	-1.640	1.127	-3.554***
4. The growth rate of sales (%)	7.42 (5.13)	7.35 (4.16)	6.97 (4.42)	0.969	1.592	1.726*
5.ROA (%)	2.97 (2.15)	2.77 (1.95)	2.25 (1.15)	-0.513	1.662	1.037
6.ROE (%)	6.34 (4.45)	5.95 (5.18)	6.12 (4.01)	-1.478	-1.395	1.802*
7.the issuer number of SEO	4	3	6	--	--	--
8.the issuer number of bond (or CB)	8	2	6	--	--	--
9. the issuer number of money-market (CP)	5	5	9	--	--	--
Panel B The Non-Listed Firms (Public, but not listing on TSE and OTC) Dealing with the Distressed Banks (N=86)						
1. The growth rate of real investment (%)	4.26 (1.81)	2.80 (1.17)	2.09 (1.24)	-2.589***	2.183**	--
2. Long-term debt/ total assets (%)	25.49 (10.25)	26.20 (11.36)	24.55 (9.98)	1.511	1.629	--
3. Bank debt/ total long-term debt (%)	13.12 (5.96)	12.41 (6.85)	15.29 (7.05)	-1.494	-1.700*	--
4. The growth rate of sales (%)	10.59 (3.98)	7.42 (3.31)	6.52 (3.15)	-2.392***	-3.912***	--
5.ROA (%)	4.01 (1.58)	2.56 (0.95)	2.10 (1.08)	-3.382***	1.504	--
6.ROE (%)	6.92 (3.42)	5.43 (2.15)	5.16 (1.87)	-2.114**	1.712*	--
7. the issuer number of money-market (CP)	18	25	33	--	--	--