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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 effects are examined. The *distressed bank effect*, which claims that the stock price of client firms are coupled to that of their related distress banks, and the *distressed firm effect*, which claims that the related banks are negatively affected when their client firms are in distress. We collect the detailed information of individual transaction loan data to find the relationship between banks and their client firms. Asymmetric responses are reported in this paper. Our results reject the *distressed bank effect* but, by contrast, cannot reject the *distressed firm effect*. We propose the *fund diversification hypothesis* and the *leverage hypothesis*, and argue the decoupling effect of the distressed bank and their listed firms, owing to the diversified choice of clients' financing channel.

1. Introduction

In banking field, 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 customers, 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.

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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 when hard information fails to predict the firm's prospect based on the history financial data.[1]

Past studies examining relationship banking contain two strands of literature. The first strand literature is referred to as the *distressed bank effect* which claims that the client firms are adversely affected when their related banks are in distress (Slovin et al., 1992). This hypothesis focuses on whether the interruptions in bank lending activities can propagate negative shocks to the real sector. Ongena et al. (2003) measure the impact of bank distress announcements upon the stock prices of firms related to the troubled banks. Kang and Stulz (2000) examine how borrowers in Japan are affected when banks experienced large shocks. Slovin et al. (1993) analyze share price effects on firms with lending relationships with Continental Illinois Bank during its de facto failure and subsequent FDIC rescue.

The second strand literature investigates the *distressed firm effect* which claims that banks are negatively affected when their affiliated client firms are in distress. The transmission channel involves direct and indirect effects. The direct effect is related to the exposure of the bank to the borrower and is on the related bank on account of the expected losses caused by the borrower's distress. The indirect effect indicates that the borrower's distress may 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). Dahiya et al. (2003) identify that a comprehensive list of firms that defaulted on their debt and have demonstrated that the announcement of a borrower's financial distress, in fact, serves as an adverse news event which has a negative impact on a bank's share price.

While numerous studies have largely confirmed the two effects, these studies pay little attention to the rationales behind the effects, which are the major aim of this paper. We propose hypotheses for each effect to put forth possible explanations for our findings. For the distressed bank effect, we propose the *fund diversification hypothesis* to suggest that related firms to the distressed banks are less hurt if the firms have various fund resources than the firms which do not. Namely, a well funded diversified firm should not be affected by the announcement of bad news of its related distressed banks. On the other hand, when the lion's share of a firm's funding is from its related distressed banks, any suffering on the part of the banks could very likely affect that firm's equities. Our fund diversification is defined by whether the firm is listed or non-listed. If the client firms are listed, then they can obtain funds from either public capital markets or private banks. When their related banks are in distress, the shrinkage of the bank loans affects little about the liquidity of client firms. Alternatives, if the clients firms are not listed and bank loans are the major shares of their funding, the related bank, once in distress, would immediately affect the liquidity of client firms. We collect the related loan data of both listed and non-listed firms to investigate this hypothesis. Our results support this hypothesis because we reject the distress bank effect at the sample of listed firms.

Next, turning to the *distressed firm effect*, we propose the *leverage hypothesis* to explain whether or not banks are affected. We calculate the debt ratio of the distressed firms that borrow from their related banks. The effect is rejected if the distressed firms do not borrow much from the banks they are associated with. Dahiya et al. (2003) analyze the lead bank's share price reaction when one of its corporate borrowers enters financial distress. However, they do not consider that this effect should be related to the exposure of the bank in the multiple banking relationships for most (emerging) markets. Shen and Wang (2005) suggest that the optimal number of banks changes across countries. For example, the number of bank relationships across 22 countries range from 2.3 (Norway) to 15.2 (Italy), with an overall average of 5.6. Then, a single-bank relationship is relatively uncommon in the world, perhaps because most firms

[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.

maintain multiple-bank relationships with the aim of reducing the chance of being denied credit. From a different perspective, the percentage of firms with a single-bank relationship is only 14.5%, whereas that of firms with three or more bank relationships is more than 50%. Relatively few papers have focused on the distress effect of multiple banking relationships, particularly in an emerging market, like Taiwan, where firms tend to have fewer single-bank relationships. Our empirical study contributes to the field by attempting to fill this gap.

Banking relationship is a well-researched topic in developed markets, but there is a dearth of research on emerging countries. Whereas there is an extensive literature in the US (James, 1987; Slovin et al., 1993; Kang and Stulz, 2000; Dahiya et al., 2003; Chava and Purnanandam, 2011), Japan (Gibson, 1995; Weinstein and Yafeh, 1998; Morck and Nakamura, 1999) and Germany (Elsas and Krahnen, 1998), the separation of business and banking in US financial system and the close connection between the main bank's (or house bank's) leading role and the business group in Japan and Germany show that the significant feature at the above cases is that single-bank relationship is relatively common; however, they do not consider the multiple banking relationships for most (emerging) markets, because most firms maintain multiple-bank relationships with the aim of reducing the chance of being denied credit in the environment of financial asymmetry.

On the other hand, La Porta et al. (2002) point out that government ownership of banks is large and pervasive around the world, and such ownership is particularly significant in underdeveloped countries. In this respect, the cases in US, Japan and Germany also differ from the rest of the world. Specially, our banking cases in Taiwan have been a highly regulated industry as in many developing countries. In addition, Taiwanese banking has been severely impacted by various political and environmental factors including threats from the East Asian financial crisis beginning in Thailand in 1997; and local financial scandal tornados from massive non-performing loans in 1998. Most important, the Taiwanese government regulatory banking reform, also called “First Financial Restructuring”, accomplished its mission to improve the operating efficiency by encouraging the M&A and adopting the financial holding system. Furthermore, the second financial restructuring reform in 2002 required the nonperforming loan ratio of financial institutions to be below 5% and the capital adequacy ratio to be at least 8% within 2 years. In brief, the banking industry in Taiwan experiences the oligopoly market of large-size oriented to free entry and exit market of small size-oriented during the periods of two financial reforms. Therefore, the sample of distressed banks, distressed firms and their counterparts in Taiwan provided a rich setting to observe the effects of distressed bank and distressed firm that are relevant for most countries.

The aim of this paper is to examine whether the two hypotheses can explain the two effects. Using Taiwanese data, we first follow the earlier studies to examine the existence of both effects simultaneously. For the *distressed bank effect*, we study how the stock prices of client firms are affected when their affiliated banks are in distress.[2] Also, we examine the *distressed firm effect* 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.

Once the effects are confirmed, we next examine the *fund diversification hypothesis* and the *leverage hypothesis*. We use Taiwanese data because of the availability of the detailed loan data. When earlier studies examined the *distressed bank effect*, they identify the main financing bank from annual financial statements (e.g. Slovin et al., 1993) or the other publication of government (e.g. Ongena et al., 2003), and analyze the reactions of stock prices of distressed firms and their main banks. The non-individual transaction loan data may hinder them to further investigate the structure of bank debts details to identify the reasons behind the two effects.[3] This is because firms in most countries may indeed have multiple bank relationships as we mentioned before. In general, the complete and detailed lists of banks that firms borrow from are not available to the public. Ongena, et al. (2003), for example, detect the bank–firm relation because all firms on the OSE must provide annual information on their “primary” bank relationships, up to a

[2] See Slovin et al. (1993) and including Ongena et al (2003), plus a host of other papers working off of the East Asian Crisis (though not in Taiwan), including Kang and Stulz (2000) and Bae et al. (2002). Other papers have investigated the hypothesis using Japanese data, including Gibson (1995), Yamori and Murakami (1999), Spiegel and Yamori (2003), and more recently, Giannetti and Simonov (2009).

[3] For example, Hausmann and Gavin (1995), Caprio and Klingebeil (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.

maximum of four. These relationships are reported in Kierulfs, a handbook published by the OSE. However, they do not study the negative results from the fund diversification or leverage effect at the corporate individual transaction loan level. Chava and Purnanandam (2011) use an exogenous shock to the U.S. banking system during the Russian crisis of Fall 1998 to separate the effect of borrowers' demand of credit from the supply of credit by the banks. They find firms that primarily relied on banks for capital suffered larger valuation losses during this period and subsequently experienced a higher decline in their capital expenditure and profitability as compared to firms that had access to the public-debt market.

Specially, our unique data allows us to examine the *fund diversification hypothesis*. We argue that the non-listed firms have more information asymmetry than the listed firms and therefore the former's funding sources are limited. We also focus on the debt structure, the changes of loan terms, and investment, financing, performance of listed and non-listed client firms for distressed and non-distressed banks before and after the bank distress year. If we can find that these basic characteristics do not change for listed clients but that these are deteriorated for the non-listed clients after the distressed event of their related banks. Relatively, non-listed firms are severely affected when their related banks are suffering. Then, we can conclude that is, because of information asymmetry, non-listed firms have difficulty in finding another funding channel once their related banks are in distress, thus they have to reduce their real investment and the revenue of sales which decreases their performance. By contrast, listed firms do not have information asymmetry problem and can continue making investments. This is why the distress bank effect decouples with listed firms but still couples with non-listed firms. Thus, our explanation for the differences may lie in the alternatives of a firm's funding. When a firm with information asymmetry relies heavily on one source of funds, the bad news surrounding distressed banks significantly affects their clients, such as non-listed firms.[4]

At a broader level, our paper contributes to the broader debate on the role of credit channel in the transmission of banking finance shocks to the real economy. Some economists argue that distress in banks may well not be important to affect their clients 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. Accordingly, whether a bank-related firm will be hurt by the news of distressed banks relies on whether the firm has a diversified funding source.[5]

The rest of this paper proceeds as follows. The next section provides a brief description of Taiwan banking industry. Section 3 introduces the data, sample selection and describes the final sample lists of distressed banks, distressed firm and their matched sample, and their basic summary statistics in Section 4. Section 5 reports the model specifications and the estimated results of event-study and the regression analysis. Section 6 lays out the robustness test and further policy discussion for the decoupling effect of distressed banks and their listed and non-listed firms. The last section presents the concluding remarks.

2. A brief background of Taiwan banking system

Taiwan's financial system has changed greatly since the 1991 Banking Act revisions, in that it has taken another step toward liberalization. Before 1991, Taiwan's banking industry, which was then composed of 25 banks, was highly protected from outside competition and the entrance of new banks into the market was very restricted. After the deregulation of the banking industry, the licenses of bank were available to

[4] Although Wang and Kuo (2010) use the same database to detect the effect of flocking together between distressed banks and their clients; however in this paper, we extend the empirical period to 2010 to include the 2007 subprime mortgage crisis and 2009 global financial crisis. Most importantly, we test two effects of the distressed banks and distressed firms simultaneously and extend the discussion of the policy implication.

[5] As quoted from The Economist (November 17, 2005): …Financial crises have a cruel way of revealing what an economy lacks. When many emerging markets suffered a sudden outflow of capital in the late1990s, one painful lesson was that their financial systems had relied too heavily on bank lending and paid too little attention to developing other forms of finance. The lack of a spare tyre, said Alan Greenspan, chairman of America's Federal Reserve, in1999, is of no concern if you do not get a flat. East Asia had no spare tyre. If a functioning capital market had existed, remarked Mr. Greenspan.

private groups. Since then, 17 newly established commercial banks have entered the market, for a total of 42 banks by 1996. This numerical increase suggests that competition in the banking market structure might have increased at that time. However, because the new banks generally have a relatively small market share and asset holdings, the impact of fresh competition may be insignificant.

After debate for decades, the Glass–Steagall Act was eventually terminated in 1999, when the Financial Service Modernization (Gramm–Leach–Bliley) Act was signed into law in the U.S. The Financial Holding Company (FHC) Act in Taiwan followed in 2001, which allowed banks, securities, and insurance companies to consolidate and form FHCs. Under the regulatory framework for FHCs in Taiwan, the structure of FHC is considered to be a conglomerate that combines at least two or three financial institutions, ranging from banking to securities-related business and insurance. Securities and insurance underwriting, brokerage and mutual fund services, and other activities can produce additional information that improves loan-making decisions. Thus, a bank within a financial conglomerate enjoys the so-called 3Cs, namely, cross-selling, cost savings, and capital sharing, and benefits from economies of scale and scope that boost performance and market valuations.

These reforms do not avoid potential problems within the industry. For example, it is often argued that there might be over-banking on the island. By April 2011 there are 37 domestic banks and 28 foreign branches in Taiwan. The homogeneity and lack of niche lead to the high severity of banking competition. The main source of profit is lending business, but the average net interest margin is only 1.39 percentage points at the first quarter of 2011. This has made Taiwanese banks less profitable for a long time. Although the government has promulgated several policies to lower the number of banks by encouraging the merger and acquisition, the results are not obvious so far.

3. Identifying distressed banks and firms

It is noted that most studies vis-a-vis bank–firm relationship centered uniquely on one country. This is because limiting the scope to one country has one strong merit: detailed information among banks and related firms, such as the relationship proxy by the bank number, the ratios of bank loans over total debts and so on can be readily obtained. Thus, this study focuses only on Taiwanese data.

3.1. Distressed banks, client and matched firms

To examine the *distressed bank effect*, the first step is to find out the distressed banks and their client firms along with the event dates. Once the client firms of distressed banks are found, we look for the matched firms from non-distressed banks.

Distressed banks are banks which have difficulty in paying their debts (Flannery and Guttentag, 1980). Five conditions of varying severity may be at the root of this. The loosest definition is that banks have "insufficient liquidity"; followed by "unusual withdrawal of deposits", "bank run", and "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 more than one of the above symptoms simultaneously.

Using above terms as the key words, we search over databank of the *Excellent Business Data Source* (hereafter EBDS), which is a private company compiling relevant data of the daily news over 1995 to 2010 in newspapers. Once we identify the "distressed" banks as defined above, then we record their names, respective distressed dates and their financial status from *Taiwan Economic Journal* (hereafter TEJ).

The next step is to search for their respective client firms. 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

[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. Shen (2002), 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.

each item in the two publicly available financial statements is compiled. These long-format financial statements record all the borrowing transaction data that the company has made, including loan rates, loan amounts, loan period and sometimes the types of its collateral. The names of lenders (i.e., banks) are also given. Based on this loan transaction contract information, we identify the client firms and their related banks. Client firms are then categorized into listed firms and non-listed firms to examine the fund diversification hypothesis since the former is not bank-dependent, and the latter is bank-dependent.

The third step is to find the matching firms from non-distressed banks during the same periods. The matching criteria are that matched firms and client firms come from the same industry with similar total asset sizes. Also, we adopt 1:2 ratio, where one client firm corresponds to two matched firms.

3.2. Distressed firms, related and matched banks

Similar identification procedure of distressed firms and their related banks are applied to the *distressed firm effect*. Distressed firms are commonly defined as those that cannot pay their debt obligations. Also, their failure announcements are more common than distressed banks are. Gilson et al. (1990), Franks and Torous (1994) and Andrade and Kaplan (1998) classified a firm as being financially distressed if it has an insufficient cash flow and, as a consequence, cannot meet the payments on its debts. Based on these definitions, we collected the distressed firms from EBDS and their financial status from *TEJ* since 1995.[7]

Next, once the distressed firms are identified, we collect their related banks. It is worth noting that during this collection, we only collect those banks that are in normal. That is, because the distressed firm effect examines whether financial distresses in the borrowing firms have any negative impact on the lending banks, banks already in distress should be excluded. Hence, we remove the distressed banks from the sample when investigating the distressed firm effect.

Finally, we match the distressed firms with their non-distressed counterparties from the controlled sample, which do not use banks as their main financing sources. In our basic statistics, we simply use bank loan to total debt ratio (*BankLoan* hereafter) of 20% as criterion to assess the main financing source. However, in regression analysis, we examine whether this variable affect the abnormal stock returns. We still adopt 1:2 ratio to search over the matched firms. Namely, for each distressed-firm, we identify two matched non-distressed firms with similar asset size and operating performance in the same industry.

3.3. Basic statistics

Table 1 presents the searching results of the distressed banks. In the beginning, we find 15 events involving 9 distressed banks. However, because we consider only listed banks so that we can calculate abnormal stock returns, three non-listed banks are excluded because they are not listed,[8] reducing both events and banks to be six.[9]

Once we identify the distressed banks, we look for their respective client firms. In the beginning, we find 198 client firms. However, we next exclude 21 client firms because they are also in distress around the distressed bank event period, leaving 177 client firms in our sample. Among these 177 client firms, 45 and 132 firms are listed and non-listed, respectively. Because most of the distressed banks are small and medium in size, their client firms tend to be non-listed, indicating that they do not provide any financial statements. Also, after matching, we have 90 listed matched firms and 264 non-listed matched firms. We do not report the client firms for the space sake.

[7] In brief, we can categorize 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 (highly leverage); and the presence of a rogue chief executive officer.

[8] The three non-listed banks are Hua-Lien Small and Medium Enterprise Bank, the Overseas Chinese Commercial Bank, and the Chin-Fon Commercial Bank.

[9] 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 also severely hurt during these two large financial crises because of data availability and consistency. Most of the distressed events occurred in 1998 during the period of the Asian financial crisis, 2007 during the period of the subprime mortgage crisis and global financial crisis.

Table 1
Sample lists of the distressed banks.

Distressed banks	Dates of distressed events	Number of client firms	Number of client listed-firms
Tai-Dong Small and Medium Enterprise Bank	February 4, 1996 and September 12, 2007	12	4
Kao-Hsiung Commercial Bank	March 31, 1996 and July 9, 1997	23	6
Tai-Chung Commercial Bank	November 24, 1998	30	10
Pan-Asia Commercial Bank	December 1, 1998 and May 17, 2008	45	11
Chung-Hsing Commercial Bank	May 1, 2000	31	7
Chang-Hwa Commercial Bank	March 15, 2008	36	7
Total	–	177	45

Notes:
1. Distressed banks are defined as banks that have difficulty in paying debt. The name-lists of distressed banks are from *Excellent Business Data Source* (*EBDS*) data bank.
2. Client firms (or related firms): firms have the long-term borrowing with the banks, where the long term indicates that the length of contract is at least more than 1 year. These data are collected manually from the various sources of *Taiwan Economic Journal* (*TEJ*) loan-transaction data bank.
3. Client listed-firms: client firms are listed in Taiwan Stock Exchange (*TSE*).

Table 2 presents the name list of the distressed firms, their respective types of industry, and the date of distressed news. There are 37 distressed firms identified in our sample and 21 respectively related banks. Also, the 223 transactions are found. It is not surprising that the distressed firms are clustered around the Asian financial crisis, the subprime mortgage crisis and global financial crisis. Finally, there are 74 matched non-distressed firms from their respectively 28 related banks.

4. Data source and basic summary statistics

4.1. Basic statistics for the distressed bank effect

As we have already mentioned, our list of distressed banks and firms are collected from *EBDS*, whereas their corresponding client firms and related banks are available from individual loan transaction data provided by *TEJ*. The stock prices and financial information of firms and banks are also available in *TEJ*.

Table 3's Panel A presents the basic statistics of distressed and non-distressed banks, respectively and Panel B presents the basic statistics of clients and matched firms respectively. We compare the asset size (*Size*), equity to asset ratio, non-performing loan ratio (*NPL*), return on assets (*ROA*), the share of commercial and industrial loans (*C&I*) to total loans and interest revenue to total revenue ratio (*INTREV*).

Panel A compares the basic statistics between distressed and non-distressed banks. The distressed banks exhibit smaller size, lower *CAR*, higher *NPL* and lower *ROA* and the differences are all statistically significant at the 1% level. Thus, the distressed banks perform much worse than non-distressed banks. This could reduce their ability to resist the impacts of economic shocks, such as the financial crisis erupted in 1997 and 2008, and adversely affect their ability to provide liquidity for their customers. However, the distressed banks show significantly higher *C&I* and *INTREV*. Hence, the businesses of the distressed banks seem to be much focused on the *C&I* and obtain higher net interest revenue ratio. Thus, once the distressed banks cease to provide funds to their related firms, the impacts would be larger than the case of non-distressed banks. As argued by Baelea et al. (2007) and De Jonghe (2009), the "size bias" is especially evident in banking industry, namely, the larger banks typically obtain higher noninterest revenues than interest revenues. Thus, during the crisis, when enterprises cannot pay the interest, larger banks suffer less and can still provide liquidity for their related firms.

Panel B compares the basic statistics of client and matched firms with the similar asset sizes. We compare their *ROA*, number of related banks, long-term debt to total asset ratio (*LRdebt*) and bank loan amounts to total debt ratio (*BankLoan*). The ROAs are in a tie for these two types of firms. Also, the client firms have more multi-banking relationship (7.82) than the latter the client firms (5.04), suggesting that the client firms of the distressed banks tend to diversify their funding sources. Also, the client firms of distressed banks display higher *LRdebt* and *BankLoan* and the differences are significant.

Table 2
Sample lists of the distressed firms.

Distressed firms	Industry	Dates of distressed events
Feng-An	Steel	June 30, 1998
Wan-Yow	Paper	Aug. 26, 1998
Ruei-Yuan	Textile	Oct. 2, 1998
Lien-Cheng	Food	Oct. 31, 1998
Tai-Fang	Food	Nov. 3, 1998
Pu-Da	Plastic	Nov. 3, 1998
Min-ChaLi	Steel	Nov. 3, 1998
Shing-Tai	Steel	Nov. 3, 1998
Chinese Automobiles	Automobile	Nov. 3, 1998
Hong-Fu	Architecture	Nov. 7, 1998
Dung-Yun	Textile	Nov. 9, 1998
Kuo-Yang	Architecture	Nov. 10, 1998
Guang-Yu	Electronics	Nov. 11, 1998
Chung-Jing	Electricity	Nov. 16, 1998
Shu-Da-Yu	Food	Nov. 24, 1998
Chang-E	Architecture	Dec. 2, 1998
Ren-Shiang	Architecture	Dec. 25, 1998
King-Well	Textile	Jan. 7, 1999
Chien-Mei	Architecture	Jan. 8, 1999
Da-Kou	Steel	Jan. 20, 1999
You-Li	Steel	Jan. 20, 1999
Da-Yung-Shin	Textile	Feb. 7, 1999
Chung-Chiang	Electronics	Mar. 30, 1999
Shin-Yan	Textile	May 25, 1999
Guo-Bin-Tsz	Ceramics and Glass Products	May 25, 1999
Niu-Shin	Steel	Jun. 3, 1999
Da-Ying	Plastic	Aug. 28, 1999
Yan-Ying	Plastic	Aug. 28, 1999
Ty-Phone	Food	Nov. 28, 1999
Huang-Pu	Architecture	Nov. 28, 1999
Fortune Electronic	Electronics	Apr. 24, 2006
Der-Pao Construction	Construction	Apr. 28, 2006
Yhi-Shen	Electronics	Apr. 4, 2007
Xepex	Electronics	Aug. 1, 2007
Picvue	Electronics	Sept. 20, 2007
Premier Camera	Electronics	Feb. 28, 2008
Kolin Inc.	Electronics	July, 30, 2008

Notes:
1. This table lists the 37 distressed firms that are listed on *TSE*. Distressed firms are commonly defined as those that cannot pay their debt obligations. We collected the distressed firms from *EBDS* and their financial status from *TEJ*.
2. The lists of related banks see Appendix A.

Recall that the purpose of this study is to examine whether the fund diversification hypothesis can explain the distressed bank effect. Thus, we next discuss the listed and non-listed client firms. Because listed firms can better access funds from the capital market, they are referred to as bank-independent firms, whereas the non-listed firms have relied heavily on bank lending and are referred to as bank-dependent firms. Chava and Purnanandam (2011) adopt the similar concept to separate firms into bank-dependence and independence. They use the absence of public debt rating as the proxy for bank-dependence. However, we do not apply their approach because both listed and non-listed firms in Taiwan are also rated by *TEJ*. The fund diversification hypothesis suggests that non-listed client firms tend to show worse performance than listed firms when banks' health is deteriorated.

Panel A of Table 4 presents the basic statistics of listed and non-listed client firms of the distressed banks. Interesting to note is that the listed firms have more bank relationships than do their non-listed counterparts as the average of related bank numbers are 11.25 and 6.05, respectively. The more bank relationship suggests that listed firms either have strong fund demand or is afraid of the single banking relationship. Next, while both types of firms exhibit the similar debt ratios (53.17% vs. 58.75%), bank loan/total debt ratios are much higher for the former than the latter (25.43% vs. 59.60%), indicating that listed

Table 3
Descriptive statistics of distressed and non-distressed bank: distressed bank effect.

Panel A: distressed and non-distressed banks

	Distressed banks	Non-distressed banks	t-test
Total number of banks	6	29	–
Bank-year observations	74	348	–
Ln (assets)	9.58	15.26	−5.49***
	(0.65)	(1.25)	
Capital ratio (equity/assets, %)	3.92	10.61	−4.55***
	(1.37)	(1.67)	
Non-performing loan ratio (NPL, %)	9.79	3.83	7.46***
	(1.22)	(1.56)	
Return on assets (ROA, %)	−1.15	0.44	−2.56***
	(2.35)	(1.31)	
Commercial and industrial loans to total loans ratio (%)	64.35	52.26	1.74**
	(21.58)	(12.22)	
Interest revenue/total revenue (InTREV, %)	47.36	29.81	1.80**
	(15.32)	(22.05)	

Panel B: client firms of distressed and non-distressed banks

	Client firm of distressed banks	Matched client firms of non-distressed banks	
Total number of clients firms	177	354	–
a. Number of client firms: listed	45	90	–
b. Number of client firms: Non-listed	132	264	–
Total firm-year observations	2124	4248	–
Ln (assets)	3.39	3.75	−0.93
	(1.51)	(2.25)	
Return on assets (ROA, %)	3.24	3.58	−1.02
	(1.77)	(1.51)	
Average number of related banks	7.82	5.04	1.67*
	(3.95)	(2.43)	
Long-term debt/total assets (LRdebt, %)	62.21	54.26	1.79**
	(15.32)	(18.47)	
Bank Loan amounts/total debts (BankLoan, %)	25.16	17.95	1.83**
	(10.36)	(8.75)	

Notes:
1. Distressed bank effect: the performance of client firms when the related banks are in distress.
2. Distressed banks and client firms: see notes in Table 1.
3. Matched firms: matching non-client firms with client firms if they are in the same industry with the similar asset size. We adopt 1:2 ratio to find the lists of matched firms to client firms.
4. The financial ratios are the average of two years prior to event date to the event dates using quarterly data.
5. The standard deviations are reported in the parenthesis.
* Denotes significance at the 10% level.
** Denotes significance at the 5% level.
*** Denotes significance at the 1%.

firms rely less on bank funds. This suggests that listed firms can diversify their funding sources. Finally, listed firms borrow much less from the distressed banks than the non-listed firms (13.75% vs. 25.13%). Next, Panel B presents the similar basic statistics of the listed and non-listed matched firms from the non-distressed banks. Results resemble those shown in Panel A. Namely, the listed firms are less bank-dependent than the non-listed firms, then they are more fund diversified, such as lower average number of banking relationship and bank-loan ratio.

4.2. Basic statistics for the distressed firm effect

We use basic statistics to discuss the *distressed firm effect* in this section. Panel A of Table 5 presents the basic statistics of distressed and matched non-distressed firms, and Panel B presents their respective related banks. In Panel A, it is not surprising that ROA of the distressed firms is much smaller than that of the

Table 4
Capital structures of the listed and non-listed client firms for the distressed banks and non-distressed banks.

Group	Panel A: capital structures of the listed and non-listed client firms for the distressed banks									
	A1: listed firms that borrow from distressed banks (non-bank-dependent, N = 45)					A2: non-listed firms that borrow from the distressed banks (bank-dependent, N = 132)				
Capital structure	Mean	Median	Std dev.	Max.	Min.	Mean	Median	Std dev.	Max.	Min.
Average number of banks that firms borrow from	11.25	9.00	4.94	17.00	5.00	6.05	7.00	2.86	15.00	3.00
Long-term debt/total assets (%)	53.17	54.25	11.30	62.85	43.49	58.75	52.35	21.18	63.45	27.93
Bank loan amounts/total debts (%)	25.43	28.76	12.87	53.67	27.16	59.60	60.77	19.67	74.05	46.97
Loan amounts from distressed banks/total loan amounts (%)	13.75	12.44	6.83	26.79	7.98	25.13	25.06	11.37	38.34	15.91
Group	Panel B: capital structures of the listed and non-listed client firms for the non-distressed banks									
	B1: listed firms that borrow from non-distressed banks (N = 90)					B2: non-listed firms that borrow from the non-distressed banks (N = 264)				
Average number of banks that firms borrow from	9.12	6.00	3.21	12.00	3.00	7.03	8.00	5.45	14.42	2.00
Long-term debt/total assets (%)	52.83	50.64	7.26	59.34	42.16	54.45	53.02	10.26	61.48	44.16
Bank loan amounts/total debts (%)	20.16	22.57	10.36	44.58	19.57	46.85	22.00	7.16	65.44	41.39
The *t*-test of the group means	A1 vs. A2	B1 vs. B2	A1 vs. B1	A2 vs. B2						
Average number of banks that firms borrow from	2.078***	1.905**	1.668*	−0.750						
Long-term debt/total assets (%)	−1.697*	−1.001	0.263	1.254						
Loan amounts/total debts (%)	−2.121***	−2.491***	1.027	−2.368***						
Loan amounts from distressed banks/total loan amounts (%)	−2.714***	–	–	–						

Notes:
1. Listed firms: non-bank dependent firm. Non-listed firms: bank dependent firms.
2. The total number of related firms: 177 and classified into listed firms (45) and non-listed firms (132) in Panels A1 and A2, respectively.
* Represents significance at the 10% level.
** Represents significance at the 5% level.
*** Represents significance at the 1% level.

matched non-distressed firms. Also, the leverage ratios are 65.42% and 40.26% for the two types of firms, respectively, indicating that distressed firms borrow much more than non-distressed firms, making the debt payments difficult. This also indicates that the matched firms do not use banks as a main source of financing.

Panel B compares the basic statistics of their respective related banks. The distressed firm effect suggests that the banks related to the distressed firms are hurt by the default of the distressed firms. It is interesting to note that the differences of all financial ratios between the two types of banks are insignificant. One possible reason is that firms maintain multiple relationships with banks, making that the related banks of both types of firms are highly overlapped. Thus, the basic statistics do not lend support to the *distressed firm effect*.

Table 6 further presents the *leverage hypothesis* of the *distressed firm effect*. First, the number of related banks for the distressed firms is 14.4, which is above the average of 8.0 in Taiwan (see Shen and Wang, 2005). The higher number of related banks for distressed firms implies that banks are cautious in lending to the distressed firms because distressed firms obtain smaller loan from each bank than those of non-distressed firms. Next, the bank loan ratios are 28.86% vs. 15.21% for the distressed and non-distressed firms, respectively, indicating that distressed firms rely more on bank loans. Among

Table 5
Basic statistics of distressed and non-distressed firms: distressed firm effect.

	Distressed firms	Matched firms	t-test
Panel A: firm-specific statistics			
Total number of firms	37	74	–
Number of loan contracts for total firms	444	888	
Ln (assets)	1.03	1.15	−0.78
	(0.46)	(0.38)	
Return on assets (ROA, %)	3.88	5.06	−1.203
	(1.42)	(2.06)	
Leverage (total debt/total asset, %)	65.42	40.26	1.92**
	(25.30)	(20.15)	
Panel B: related banks statistics			
Total number of related banks	21	28	–
Number of loan contracts	165	423	–
Ln (assets)	9.10	10.99	−1.05
	(2.15)	(2.87)	
Capital ratio (equity/total assets, %)	7.84	9.10	−1.13*
	(1.68)	(1.85)	
The ratio of non-performing loan to total assets (%)	4.02	3.01	0.64
	(1.35)	(1.46)	
Return on total assets (ROA, %)	1.04	1.36	−0.06***
	(0.85)	(1.02)	
The ratio of C&I loans to total loans (%)	61.35	56.82	1.54
	(19.88)	(15.89)	
The ratio of interest revenue to total revenue (%)	49.62	42.03	1.60
	(11.65)	(17.70)	

Notes:
1. The distressed firm effect: the performance of related banks when client firms are in distress
2. Definitions of distressed firm and matched firms: see notes in Table 2. Matched firms indicate the matched the non-distressed firms with those of distressed firms with the similar asset size in the same industry.
3. Numbers in the table are average statistics which are calculated over the event year-window (−2, 0).
4. The standard deviations are reported in the parenthesis.
* Represents significance at the 10% level.
** Represents significance at the 5% level.
*** Represents significance at the 1% level.

the bank loans, the largest financing banks have contributed around one-third to the distressed firms (8.76%/28.86% = 30.35%) and the largest three financing banks support more than half of loans to the distressed firms (15.08%/28.86 = 52.25%). The large ratios suggest that the distressed firms may have a potentially negative impact for the related banks once the distressed firms default. This negative impact may even increase if the leverage of distressed firms is high.

5. Econometric model and empirical results

There are two steps in this section. First, we examine the existence of the *distressed bank effect* and the *distressed firm effect*. Then, we examine whether the *fund diversification hypothesis* and the *leverage hypothesis* can account for the respective effects.

5.1. Econometric model

5.1.1. Funding diversification hypothesis for the distressed bank effect

For the *distressed bank effect*, we study how the stock prices of client firms are affected by their distressed affiliated banks. We compare the stock market performances between the client firms of the distressed banks and the matched firms. The *distressed bank effect* suggests that their client firms tend to experience higher valuation loss as compared to the matched firms.

Table 6
Loan structures of the distressed firms and non-distressed firms.

	Mean	Std dev.	Median	Max.	Min.
Panel A The distressed firms (N = 37)					
Number of related banks	14.40	6.74	19.31	28.00	5.00
Total loans/total assets (%)	28.86	7.80	17.42	32.56	5.02
Total loans from the largest financing banks/total assets (%)	8.76	2.26	9.25	17.05	4.52
Total loans from the largest three loan banks/total assets (%)	15.08	2.75	16.62	21.85	6.29
Panel B The matched firms (N = 74)					
Number of related banks	8.05	5.23	11.25	21.00	5.00
Total loans/total assets (%)	15.21	4.72	13.98	20.79	4.75
Total loans from the largest financing banks/total assets (%)	6.02	1.57	7.01	11.58	3.74
Total loans from the largest three loan banks/total assets (%)	13.96	2.28	12.15	24.79	5.87
Panel C The t-test of the group means (A vs. B)					
Number of related banks: 1.655*					
Total loans/total assets (%): 2.68***					
Total loans from the largest financing banks/total assets (%): 1.80**					
Total loans from the largest three loan banks/total assets (%): 1.75**					

Notes:
1. Definitions of distressed firm and matched firms: see notes in Table 2. Matched firms indicate the matched the non-distressed firms with those of distressed firms with the similar asset size in the same industry.
2. The definition of the largest financing bank: the largest borrowing amounts of the related bank.
* Represents significance at the 10% level.
** Represents significance at the 5% level.
*** Represents significance at the 1% level.

Following Brown and Warner (1985), we use standard event-study methodology of market-adjusted return model to calculate abnormal returns of the client firms and related banks.

$$CAR_i(-\tau,+\tau) = \sum_{i=-\tau}^{\tau} AR_{i\tau}$$

where $CAR(-\tau,+\tau)$ is the cumulative abnormal returns from days $-\tau$ to days $+\tau$ on firm i, and τ equals 1 or 10. $AR_{it} = R_{it} - (a_i + b_i R_{mt})$ is the abnormal returns for event day t on firm i. R_{it} is the rate of return on firm i for event day t, and R_{mt} is the market return. The parameters a_i and b_i are estimated by ordinary least square (OLS) using 250 observations prior to the announcement of distressed news ($t = -150$ to $t = -30$). We use t-statistics to test the significance of the average CARs for each effect.

Next, using the regression analysis, we investigate how the CARs of the distressed banks affect the CARs of the client firms. The *fund diversification hypothesis* suggests that client firms of the distressed banks are less hurt if the client firms have more fund resources than the client firms which do not.

$$\begin{aligned} StockRet_{client\ firm,i} = {} & \alpha_0 + \alpha_1\left(CAR(-1,+1)_{DB,j}\right) + \alpha_2\left(CAR(-1,+1)_{non\text{-}DB,j'}\right) \\ & + \alpha_3\left(BankLoan_{client\ firm\ DB,i}\right) + \alpha_4\left(BankLoan_{match\ firm}\right) + \alpha_5\left(SIZE_{client\ firm\_DB,i}\right) \\ & + \alpha_6\left(SIZE_{match\ firm,i}\right) + \alpha_7\left(SIZE_{DB,j}\right) + \alpha_8\left(SIZE_{non\text{-}DB,j'}\right) + \alpha_9(StockRet_{mkt}) \\ & + \alpha_{10}\left(IndDummy_{firm}\right) + \varepsilon_i \end{aligned} \quad (1)$$

where subscripts i and j denote i-th firm and j-th bank, $CAR(-1,+1)$ is the CAR from one-day before to one-day after the event of distress, *client firm_DB* denotes client firms of distressed banks, *DB* denotes distressed bank, *match firm* denotes the matched firm of non-distressed banks' borrowing. The dependent variable, $StockRet_{client\ firm,i}$, which describes the stock performance of the client firms, are proxied by two variables. The first one is the raw CAR, $CAR(-1,+1)_{client\ firm\_DB,i}$, which is the CAR of distressed banks' client firms. The second proxy is the adjusted CAR, $CAR(-1,+1)_{client\ firm\_DB,i} - CAR(-1,+1)_{match\ firm,i}$, which is the *CAR* of the client firms of distressed banks subtracting those of the non-distressed banks. We consider that the adjusted CAR becomes when we expect that client firms of distressed banks experienced

significantly higher valuation loss as compared to those of non-distressed banks. Hence, this subtraction provides powerful evidence since it is free of any selection-bias concerns that might influence comparison of bank-dependent firms and non-bank-dependent firms.[10]

Our concerned coefficients of $BankLoan_{client\ firm\_DB}$, which is the percentage of distressed bank loans to the total debts, are expected to be negative if the *funding diversification hypothesis* holds. Namely, if client firms borrow more loans from the distressed banks, the funding source is more concentrated and less diversified. Then, the loss of client firms is more pronounced for this concentrated funding when their related banks are in distress.

The control variables are explained as follows. Term $CAR(-1,+1)_{non\text{-}DB}$ is the CAR of non-distressed banks to control the influence of the non-distressed banks during the event; $SIZE_{DB}$ and $SIZE_{non\text{-}DB}$ denote the average sizes of distressed and non-distressed banks, respectively to exclude the small bank effect because the distressed bank effect could be relevant only for small and medium sized banks. Also, large banks could be well diversified in their exposure to firm specific or industry specific risks. $StockRet_{mkt}$ represents the stock return of Taiwan stock index, *IndDummy* denotes 1 if firms belong to the high-tech industry, otherwise zero if they belong to the traditional economy; the *Industry* dummy is used to control the heteroscedasticity of client firms.[11] This industrial dummy could also be a proxy for growth opportunities (Chava and Purnanandam, 2011). See Table 7 for the definition of both dependent and explanatory variables used in this study.

5.1.2. Leverage hypothesis for distressed firm effect

The *distressed firm effect* focuses on how the stock prices of related banks are affected by their related distress firms. Also, the *leverage hypothesis* suggests that the larger the funding of distressed firms is from their related banks; the more the related banks are suffering when firms are in distress. The specification below is similar as that discussed in the distressed bank effect.

$$\begin{aligned} StockRet_{related\ bank,j} = {} & \alpha_0 + \alpha_1\left(CAR(-1,+1)_{DF,i}\right) + \alpha_2\left(CAR(-1,+1)_{non\text{-}DF,i'}\right) \\ & + \alpha_3\left(BankLoan_{related\ bank\_DF,i}\right) + \alpha_4\left(BankLoan_{non\text{-}DF,i'}\right) \\ & + \alpha_5\left(SIZE_{related\ bank\_DF,j}\right) + \alpha_6\left(SIZE_{match\ bank,j}\right) + \alpha_7\left(SIZE_{DF,i}\right) \\ & + \alpha_8\left(SIZE_{non\text{-}DF,i'}\right) + \alpha_9(StockRet_{mkt}) + \alpha_{10}\left(IndDummy_{firm}\right) + \varepsilon_i \end{aligned} \tag{2}$$

where subscript *related bank* denotes related banks of distressed firms, *DF* denotes distressed firm, *match bank* denotes the matched bank where the related firms are non-distressed. We skip the discussion of the most variables since they have been introduced immediately after Eq. (1). Our dependent variable in Eq. (2) also has two proxies. One is the raw CAR of related banks, $CAR(-1,+1)_{related\ bank\_DF,\ j}$ and the other is the adjusted CAR, $CAR(-1,+1)_{related\ bank\_DF,j} - CAR(-1,+1)_{match\ bank,j}$, which is the *CAR* of the related banks of distressed firms subtracting those of the non-distressed firms. The distressed firm effect suggests that the related bank experienced significantly higher valuation loss as compared to the non-distressed firms' banks.

Our concerned coefficient of $BankLoan_{related\ bank\_DF}$, which is the bank loans to the distressed firms over the firms' total debt, is expected to be negative if the *leverage hypothesis* holds. Namely, the loss of related banks is larger if their client firms borrow more from the related banks when the firms are in distress.

Our control variables are similar as those used in investigating the distressed bank effect. For example, we consider $SIZE_{related\ bank\_DF,j}$ and $SIZE_{match\ bank,j}$, because the distressed firm effect could be relevant only for small and medium sized banks, as large banks could be well diversified in their exposure to firm specific or industry specific risks. Also see Table 7 for the definitions of all variables.

[10] We thank the referee for suggesting the subtracting from the matched firms of the non-distressed banks.

[11] As the distresses seem to be clustered at the Asian financial crisis and global financial crisis, the market-adjusted return model and t-statistics heteroscedasticity corrected standard errors are used to capture the event clustering effect (Campbell et al., 1997; Petersen, 2009).

Table 7
Definition of variables in regression models.

Independent variables	
$StockRet_{client\ firm,\ i}$	Stock returns of client firms of the distressed banks. This is proxied by two measures. First, the raw CAR = $CAR(-1,+1)_{client\ firm\_DB,\ i}$, (= CAR of client firms). Second, the Adjusted CAR = $CAR(-1,+1)_{client\ firm\_DB,\ i} - CAR(-1,+1)_{match\ firm,\ i}$, (= *CAR* of the client firms subtracts CAR of matched firms). Notation $(-1,+1)$ is the event window one day earlier and one day after the event date.
$StockRet_{related\ bank,\ j}$	Stock returns of the related banks of the distressed firms. This is proxied by two measures. First, the raw CAR = $CAR(-1,+1)_{related\ bank\_DF,\ j}$. Second, the adjusted CAR = $CAR(-1,+1)_{related\ bank\_DF,\ j} - CAR(-1,+1)_{match\ bank,\ j}$, which is the *CAR* of the related banks of distressed firms subtracting those of the non-distressed firms.
Dependent variables	
$CAR(-1,+1)_{DB,j}$	CAR of distressed banks during event window $(-1,+1)$.
$CAR(-1,+1)_{non\text{-}DB,j'}$	CAR of non-distressed banks during event window $(-1,+1)$.
$CAR(-1,+1)_{DF}$	CAR of distressed firms during event window $(-1,+1)$.
$CAR(-1,+1)_{non\text{-}DF}$	CAR of non-distressed firms during event window $(-1,+1)$.
$BankLoan_{client\ firm\_DB,\ i}$ $BankLoan_{match\ firm}$	The percentages of bank loans to the total debts. Subscript *client firm_DB* denotes the client firms borrowing from distressed banks. Subscript *match_firm* denotes the matched firms borrowing from non-distressed banks.
$BankLoan_{related\ bank\_DF}$ $BankLoan_{non\text{-}DF,\ i'}$	The percentage of bank loans to the total loans. Subscript *related bank_DF* denotes the related banks lending to distressed firms. Subscript *non_DF* denotes the matched banks lending to non-distressed firms.
$SIZE_{DB}$ $SIZE_{non\text{-}DB}$	*Size* = logarithmic transformation of the total assets. Subscripts *DB* and *non-DB* denote distressed and non-distressed banks.
$SIZE_{DF,\ i}$ $SIZE_{non\text{-}DF,\ i'}$	*Size* = logarithmic transformation of the total assets. Subscripts *DF* and *non-DF* denote distressed and non-distressed firms.
$SIZE_{client\ firm\_DB,\ i}$ $SIZE_{match\ firm,\ i}$	*Size* = logarithmic transformation of the average assets. Subscript *client firm_DB* denotes the client firms borrowing from distressed banks. Subscript *match firm* denotes the matched firms borrowing from non-distressed banks.
$SIZE_{related\ bank\_DF,\ j}$ $SIZE_{match\ bank,\ j}$	*Size* = logarithmic transformation of the average assets. Subscript *related bank_DF* denotes the related banks lending to distressed banks. Subscript *match bank* denotes the matched banks lending to non-distressed firms.
$StockRet_{mkt}$	*StockRet* = the stock return of *TSE* index during the event window.
$IndDummy_{firm}$	*IndDummy* = 1, if related firms belong to the high-tech industry; otherwise = 0, if they belong to the traditional economy.

Table 8
Testing the distressed bank effect: event study.

	Client firms for distressed banks (N = 45)		Distressed banks (N = 6)		Matched client firms for non-distressed banks (N = 90)		Matched and non-distressed banks (N = 29)	
Date	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)
(−1,+1)	−0.268	0.122	−5.704	−12.877	1.264	4.691	−1.788	−2.670
	(−1.652)*	(1.475)	(−3.232)***	(−3.526)***	(1.537)	(1.863)**	(−1.711)*	(−1.886)**
(−10,+10)	0.031	0.384	−0.010	0.033	0.270	−2.578	−0.389	−2.578
	(1.225)	(1.125)	(−1.328)	(1.651)*	(1.235)	(1.750)*	(−1.629)	(−1.905)**

Notes:
1. Event date: dates that distressed banks that are announced to be in distress based on the commercial newspaper in Taiwan. See Table 1 for the event date of each distressed bank.
2. Event window $(-1,+1)$ denotes the window length one-day before and one-day after the event.
3. AR and CAR are abnormal and cumulative abnormal returns, respectively. The market model is used to calculate AR and CAR, where the estimation period is t = −150 to −30.
4. *t*-statistics using heteroscedasticity corrected standard errors are in parentheses.
* Represents significance at the 10% level.
** Represents significance at the 5% level.
*** Represents significance at the 1% level.

Table 9
Testing of the distressed firm effect: event study.

	Related banks for distressed firms (N = 21)		Distressed firms (N = 37)		Related banks of matched non-distressed firms (N = 28)		Matched non-distressed firms (N = 74)		3 largest financing banks for distressed firms		3 largest financing banks for non-distressed firms	
Date	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)	*AR* (%)	*CAR* (%)
(−1,+1)	−0.762	−1.365	−2.437	−12.614	−0.180	−0.519	0.035	0.127	−1.782	−3..413	0.017	0.790
	(−1.855)**	(−1.820)**	(−2.885)***	(−2.856)***	(−0.527)	(−0.984)	(1.603)	(1.445)	(−1.978)***	(−1.991)***	(1.700)*	(1.225)
(−10,+10)	−0.220	−1.543	−0.802	−13.755	0.108	0.401	0.007	−0.259	−0.369	−3.313	−0.024	0.505
	(−1.798)**	(−1.758)**	(−2.027)**	(−2.309)***	(1.142)	(1.006)	(1.667)*	(−1.104)	(−1.742)**	(−1.816)**	(−1.006)	(1.341)

Notes:
1. Event date: dates that distressed banks are announced to be in distress based on the commercial newspaper in Taiwan. See Table 2 for the event date of each distressed firm.
2. Event window (−1, +1) denotes the window length one-day before and one-day after the event.
3. AR and CAR are abnormal and cumulative abnormal returns, respectively. The market model is used to calculate AR and CAR, where the estimation period is t = −150 to −30.
4. *t*-statistics using heteroscedasticity corrected standard errors are in parentheses.
* Represents significance at the 10% level.
** Represents significance at the 5% level.
*** Represents significance at the 1% level.

5.2. Results of distressed bank and distressed firm effects

We first discuss the *distressed bank effect*. Table 8 presents evidence of event study to examine the presence of the *distressed bank effect*. We report two window lengths of (−1, +1) and (−10, +10) for simplicity. First, our focus is to investigate AR and CAR of the client firms of the distressed banks. For window length (−1, +1), AR is significantly negative at the 10% level and CAR is insignificant. For window length (−10, +10), both AR and CAR are insignificant. Thus, the ARs of client firms decline only on the first day after the event of distressed bank, indicating that the distressed bank effect exists only for a very short period. Next, we examine the AR and CAR of matched firms. It is interesting to note that their AR and CAR are mostly positive, indicating that the matched firms are not influenced by the event of the distressed banks. Third, we examine two types of banks, distressed and non-distressed banks. For window length (−1, +1), the AR and CAR of the both types of banks are significantly negative, indicating that the bad news spillover the market. For window length (−10, +10), results are mixed. For example, CAR of distressed banks becomes positive, suggesting that investors expected that the authority may bail out the distressed banks to prevent the possibly systematic financial crisis. Hence, stock return starts to bounce back.

Table 9 presents evidence intended to examine the presence of the *distressed firm effect*. Similarly, we report only two window lengths of (−1, +1) and (−10, +10). First, our focus is to investigate AR and CAR of the related banks of distressed firms. For both window lengths, both the AR and CAR of the related banks are significantly negative at the 5% level. Thus, the related banks apparently suffer from the bad news of their client firms. Next, we further examine the responses of three largest related banks, both ARs and CAR react even stronger than the case of using all related banks. Hence, the more tightly related

Table 10
Distressed bank effects and diversification hypothesis: regression analysis.

	Dependent variable	Dependent variable
	Raw CAR of client firms	Adjusted CAR of client firms
Intercept	1.587	0.454
	(1.997)***	(1.764)**
$CAR(-1,+1)_{DB,j}$	−0.256	0.652
	(−1.605)	(1.206)
$CAR(-1,+1)_{non\text{-}DB,j'}$	–	−0.225
		(−1.019)
$BankLoan_{client\ firm\_DB,i}$	−1.005	−0.227
	(−1.855)**	(−1.904)**
$BankLoan_{match\ firm}$	–	0.085
		(0.775)
$SIZE_{client\ firm\_DB,i}$	0.231	−0.587
	(0.995)	(−1.853)**
$SIZE_{match\ firm,i}$	–	1.335
		(0.105)
$SIZE_{DB,j}$	−0.659	−1.635
	(−1.885)**	(−2.446)***
$SIZE_{non\text{-}DB,j'}$	–	0.369
		(1.442)
$StockRet_{mkt}$	−1.229	0.231
	(−2.137)***	(1.748)
$IndDummy_{firm}$	1.754	−0.265
	(1.502)	(−1.335)*
Sample number	45	135
Adj-R^2	0.1769	0.2057

Notes:
1. Raw CAR of client firms = $CAR(-1,+1)_{client\ firm\_DB,j}$. Adjusted CAR of client firms = $(CAR(-1,+1)_{client\ firm\_DB} - CAR(-1,+1)_{match\ firm,i})$. See Table 7 for the definition of each variable.
2. The *t*-statistics are reported in parenthesis and are calculated using White heteroscedasticity-consistent standard errors.
* Denotes significance at the 10% level.
** Denotes significance at the 5% level.
*** Denotes significance at the 1% level.

banks are hurt more than the commonly related banks. Third, the responses of the related banks of matched non-distressed firms are insignificant. The first two evidences suggest that the *distressed firm hypothesis effect* gains full support both in the short-term and relatively long-term.

Table 10 shows the estimated results of *distressed bank effect* and *funding diversification hypothesis* (Eq. (1)). As discussed earlier, the dependent variable is proxied by raw CAR and adjusted CAR. Being consistent with our basic statistics (Table 8), the insignificant coefficient of $CAR(-1,+1)_{client\ firm\_DB}$ denies the *distressed bank effect*. However, the concerned coefficient of $BankLoan_{client\ firm\ \_DB,i}$ are overwhelmingly significantly negative, supporting the *diversification hypothesis*. Namely, client firms with a higher bank loan ratio are hurt more severely than firms with lower bank loan ratios when its banks are in distress. When the lion's share of a firm's funding is concentrated on its related distressed banks, the firms' stock returns will be severely influenced. In contrast, well funded diversified firms may not be affected by the events of the distressed banks.

With respect to each coefficient on various *size* variables, only the coefficients of $SIZE_{DB,j}$ are significantly negative. Thus, distressed banks with larger asset sizes have more severely negative influence on their client firms.

Table 11 indicates the estimated results of *distressed firm effect* and *leverage hypothesis* (Eq. (2)). Again, being consistent with our results in basic statistics (Table 9), the positive coefficient of $CAR(-1,+1)_{related\ bank\_DF}$ supported the distressed firm effect. Notably, the concerned coefficient of $BankLoan_{related\ bank\ \_DF}$ are overwhelmingly significantly negative, supporting the *leverage hypothesis*. Namely, the related banks are more severely hurt when these banks lend more to their distressed firms. Banks with higher exposures to the distressed firm have larger negative announcement-period returns. Dahiya et al. (2003) found

Table 11
Distressed firm effects and leverage hypothesis.

	Dependent variable	Dependent variable
	Raw CAR of related banks	Adjust CAR of related banks
Intercept	1.035	−1.756
	(2.105)***	(−1.803)**
$CAR(-1,+1)_{DF,i}$	0.139	0.443
	(2.108)**	(1.987)***
$CAR(-1,+1)_{non\text{-}DF,i'}$	–	−0.335
		(−1.039)
$BankLoan_{related\ bank\_DF}$	−1.332	−0.651
	(−1.865)**	(−2.183)***
$BankLoan_{non\text{-}DF,i'}$	–	−1.115
		(−1.256)
$SIZE_{related\ bank\_DF,j}$	−0.221	−1.357
	(−1.700)*	(−1.687)*
$SIZE_{match\ bank,j}$	–	−0.442
		(−1.257)
$SIZE_{DF,i}$	−1.257	−0.559
	(−1.673)*	(−1.670)*
$SIZE_{non\text{-}DF,i'}$	–	0.774
		(0.225)
$StockRet_{mkt}$	−0.559	−0.324
	(−1.931)**	(−1.720)*
$IndDummy_{firm}$	−0.698	−1.254
	(−0.448)	(−0.626)
Sample number	37	121
Adj-R^2	0.1842	0.2555

Notes:
1. Raw CAR of related banks = $CAR(-1,+1)_{related\ bank\_DF,j}$. Adjusted CAR = $CAR(-1,+1)_{related\ bank\_DF,j} - CAR(-1,+1)_{match\ bank,j}$. See Table 7 for the definition of each variable.
2. The *t*-statistics are reported in parenthesis and are calculated using White heteroscedasticity-consistent standard errors.
* Denotes significance at the 10% level.
** Denotes significance at the 5% level.
*** Denotes significance at the 1% level.

similar results in that a significant negative return for the leading related bank occurs when a major corporate borrower announces default or bankruptcy.

Finally, the estimated results of bank size deserve further discussion. Theories would expect that large banks will not be affected by their distressed client firms because large banks have various lending and investment channels. Because the coefficients of $SIZE_{related\ bank\_DF}$ are only significantly negative at the 10% level, the related banks with larger asset sizes suffer less when their clients are in distress. Hence, larger banks have more ability to diversify the risk.

6. Robustness tests and further discussions

6.1. Performance of non-listed firms in the distressed bank effect

Our diversification hypothesis expects that listed firms should be less influenced by the unfavorable news of the related banks than the non-listed firms. This is because listed firms can raise funds from more sources and related to more banking-relationships than non-listed firms. Our earlier estimated results confirmed this conjecture by examining the stock responses of listed firms. This section continues to investigate this issue but examines the responses of the non-listed firms. However, because there is no stock price for non-listed firms, we design the following approach to examine the role of diversified funding.

We compare the borrowings of listed and non-listed firms from either distressed and non-distressed banks. Because the non-listed firms rely on fewer number of banks for financing (average number is 6.05 for non-listed firms vs. 11.25 for listed firms as the Panel A of Table 4 shows), and much higher loan proportion form the distressed banks (25.13% vs. 13.75% for the average ratio), then the coupling effect should exist on the sample of non-listed firms. Hence, alternatively speaking, in a distressed bank case, if coupling effect exists, lending conditions of non-listed firms should become more deteriorated than those of listed firms but perform equally well in a non-distressed bank's case.

Panels A and B of Table 12 present the basic statistics of lending condition through distressed and non-distressed banks, respectively. We consider the three lending conditions during event window lengths from $t-1$ to T and T to $T+1$, where the three lending conditions are measured by loan amounts, lending interest rate, and tenure of loans. Panel A presents the influences of distressed banks. For listed firms, the lending condition of loan amounts is significantly reduced but the remaining two lending conditions are unchanged (i.e., insignificantly negative) during event window length t and $T+1$. For example, the loan amounts drop substantially from 7985 million to 3015 million and t-statistics of difference is 5.885, whereas the tenure of loan is shortened from 5.20 to 4.33 insignificantly. With respect to the non-listed firms, both loan amounts and tenure drop significantly from t to $T+1$, suggesting that once banks are in distress, non-listed firms are more severely affected than listed firms. Accordingly, non-listed firms are hurt more when the related banks are in distress, supporting our *diversification hypothesis*.

Panel B presents the estimated results when the lending is offered by non-distressed banks. The lending results differ dramatically. First, the three lending conditions of listed firms do not change between $T-1$ and T, or between T and $T+1$. Thus, the borrowing of listed firms from non-distressed banks is not affected by the event. Namely, the bad news of distressed banks does not affect the borrowing activities of listed firms from non-listed banks. However, to the case of non-listed firms, the bad news of distressed banks affects the three lending conditions from non-distressed banks. Thus, once there is an adverse event arising from distressed banks, lending to non-listed firms by both distressed and non-distressed banks is deteriorated but lending to listed firms is not affected.

We next discuss the distressed bank effect by using non-listed firms. While our distressed bank effect is supported by examining the negative responses of CAR for listed firms, it is wondering whether the effect also takes place for non-listed firms. However, because the non-listed firms have no stock returns, our comparison focuses on the financial activities, including the growth rates of investment, and performance (sales revenues, *ROA* and *ROE*). We examine this issue by using the following two approaches. First, we compare the financial performance between listed and non-listed firms. The *distressed bank effect* and *diversification hypothesis* expect that the financial activities of listed firms should not be affected but negatively affected those for non-listed firms. Next, we examine the financial activities of the matched listed and matched non-listed firms from non-distressed banks. We

Table 12
The changes of loan contracts' terms for all (listed and non-listed) client firms from distressed banks and non-distressed banks.

Panel A The loan contracts of "all client firms" from the distressed banks						
	(1) T−1	(2) T	(3) T+1	t-test	t-test	t-test
				(2) vs. (1)	(2) vs. (3)	(A1) vs. (A2)
Panel A1 The loan contracts of "listed firms" from the distressed banks (N=45)						
Amounts (ten thousands, NT$)	7144	7985	3015	2.548***	4.225***	1.135
	(2982)	(3985)	(1890)			
Loan interest rate (%)	7.03	6.94	6.82	−1.725*	−1.562	−2.105**
	(1.02)	(0.95)	(1.02)			
Loan period (year)	5.11	5.21	4.53	−1.602	1.258	1.493
	(1.85)	(1.02)	(1.58)			
Panel A2 The loan contracts of "non-listed firms" from the distressed banks (N=132)						
Amounts (ten thousands, NT$)	79781	6583	2534	−1.718*	4.992***	–
	(2997)	(2300)	(1477)			
Loan interest rate (%)	7.65	7.25	6.95	−1.457	1.006	–
	(1.46)	(1.27)	(1.38)			
Loan period (year)	4.72	4.40	3.28	−0.968	1.795**	–
	(1.24)	(1.95)	(1.37)			
Panel B The loan contracts of "matched-client firms" from the non-distressed banks						
Panel B1 The loan contracts of "matched-listed firms" from the non-distressed banks (N=90)						
Amounts (ten thousands, NT$)	7144	6924	6753	−0.875	0.551	2.118***
	(2002)	(2544)	(1720)			
Loan interest rate (%)	6.89	6.75	6.68	−1.002	1.016	−2.100**
	(1.12)	(1.30)	(1.06)			
Loan period (year)	4.63	5.00	5.18	1.256	−1.442	1.880**
	(1.50)	(1.73)	(0.99)			
Average number of borrowing banks	9.01	7.00	7.05	−1.687*	−0.010	2.154**
Panel B2 The loan contracts of "matched-non-listed firms" from the non-distressed banks (N=264)						
Amounts (ten thousands, NT$)	5754	4883	4120	−1.698*	2.325***	–
	(1889)	(1058)	(1335)			
Loan interest rate (%)	7.08	7.83	7.70	1.712*	−1.723*	–
	(1.03)	(1.21)	(0.95)			
Loan period (year)	5.75	4.24	4.07	1.225	1.710*	–
	(1.52)	(1.07)	(1.13)			
Average number of borrowing banks	5.41	4.95	4.60	−1.397	1.686*	–

Notes:
1. *T* indicates the event-year of distressed banks.
2. Loan amounts (unit: ten thousands New Taiwan dollars, NT$32 = US$1 in 2010). Some loans terms, such as interest rate (%) and period (year), which are calculated by the weighted loan amounts for the long-term (defined as more than one-year) contracts.
3. The standard deviations are reported in the parenthesis.
* Significant at the 10% level
** Significant at the 5% level.
*** Significant at the 1% level.

expect that both of their financial activities should not be affected. We also focus on the differences between event time T to $T+1$.

Table 13 presents the estimated results. In Panels A and B, with respect to investment growth rates and performances, the differences between T and $T+1$ are insignificant for listed firms but are significantly negative for non-listed firms. That is, when related banks are in distress, non-listed firms have difficulty in finding other funding channels, causing them to reduce their investment. Also, the performances are also negatively affected. The listed firms, however, are not affected because they can get finance from other funding sources. Panels C and D compare the samples of the matched listed and matched non-listed firms, respectively. It is consistent with our expectation that the matched-listed and non-listed firms exhibit no significant changes between before and after of the events of distressed firms.

Table 13
The change of financial status for all (listed and non-listed) client firms from their distressed banks.

	(1)T−1	(2)T	(3)T+1	t-test (2) vs. (1)	t-test (2) vs. (3)	t-test (C) vs. (D)
Panel A The listed firms from their distressed banks (N=45)						
The growth rate of real investment (%)	3.58	3.71	3.48	1.115	1.440	1.675*
	(1.60)	(1.02)	(1.42)			
Long-term debt/total assets (%)	25.18	27.95	23.00	1.307	1.223	−1.700*
	(11.28)	(10.06)	(9.57)			
Bank debt/total long-term debt (%)	13.05	10.85	8.42	−1.564	1.202	−2.377***
	(5.48)	(6.02)	(5.87)			
The growth rate of sales (%)	6.98	6.70	6.02	1.043	1.600	1.685*
	(4.82)	(3.95)	(3.82)			
ROA (%)	2.75	2.42	2.10	−1.228	1.593	1.104
	(1.10)	(1.17)	(1.00)			
ROE (%)	5.95	4.82	5.51	−1.375	−1.448	1.750*
	(3.51)	(3.00)	(2.99)			
The issued number of equity (SEO)	5	3	8	–	–	–
The issued number of corporate bond (CB)	10	3	6	–	–	–
The issued number of commercial paper (CP)	8	8	12	–	–	–
Panel B The non-listed firms from their distressed banks (N=132)						
The growth rate of real investment (%)	4.33	3.00	2.18	−2.000***	1.970**	–
	(1.54)	(1.09)	(0.85)			
Long-term debt/total assets (%)	27.52	28.15	22.83	1.316	1.648	–
	(9.81)	(10.02)	(7.55)			
Bank debt/total long-term debt (%)	11.98	13.25	16.83	1.500	−1.715*	–
	(5.20)	(4.82)	(5.22)			
The growth rate of sales (%)	8.82	6.98	5.80	−2.243***	2.415***	–
	(2.74)	(3.02)	(2.99)			
ROA (%)	3.97	2.79	2.00	−1.900**	1.650	–
	(1.42)	(1.10)	(0.67)			
ROE (%)	6.81	5.44	5.01	−1.885**	1.682*	–
	(1.87)	(2.00)	(1.32)			
The issued number of commercial paper (CP)	25	31	39	–	–	–
	(1)T−1	(2)T	(3)T+1	t-test (2) vs. (1)	t-test (2) vs. (3)	t-test (C) vs. (D)
Panel C The matched-listed firms from non-distressed banks (N=90)						
The growth rate of real investment (%)	5.01	5.22	6.25	1.485	−1.658*	1.575
	(1.48)	(1.47)	(1.68)			
Long-term debt/total assets (%)	29.58	28.34	27.62	−0.925	0.657	−1.700*
	(4.36)	(6.25)	(5.11)			
Bank debt/total long-term debt (%)	11.05	12.80	10.65	0.526	1.508	−2.377***
	(4.99)	(5.32)	(7.21)			
The growth rate of sales (%)	10.56	14.25	9.92	1.70*	1.895**	1.485
	(3.21)	(5.50)	(5.13)			
ROA (%)	3.85	4.45	4.65	1.241	−0.027	1.104
	(0.86)	(1.01)	(0.98)			
ROE (%)	8.44	8.54	7.99	0.775	1.253	1.610
	(1.17)	(2.05)	(1.31)			
The issued number of equity (SEO)	7	7	10	–	–	–
The issued number of corporate bond (CB)	13	9	11	–	–	–
The issued number of commercial paper (CP)	6	5	7	–	–	–
Panel D The non-listed firms from their distressed banks (N=264)						
The growth rate of real investment (%)	4.70	4.86	3.35	1.020	−1.973**	–
	(1.54)	(1.09)	(0.85)			
Long-term debt/total assets (%)	30.58	29.65	27.65	−0.954	1.520	–
	(7.52)	(8.99)	(7.21)			
Bank debt/total long-term debt (%)	9.00	11.20	13.88	−1.387	−1.206	–
	(2.43)	(3.69)	(4.37)			

Table 13 (*continued*)

	(1)T − 1	(2)T	(3)T + 1	t-test	t-test	t-test
				(2) vs. (1)	(2) vs. (3)	(C) vs. (D)
The growth rate of sales (%)	6.65	5.72	4.99	−0.857	1.529	–
	(1.52)	(1.83)	(1.61)			
ROA (%)	3.01	3.48	3.75	1.442	−1.310	–
	(0.46)	(1.00)	(0.75)			
ROE (%)	5.04	5.35	4.82	1.206	1.690*	–
	(1.21)	(1.65)	(1.44)			
The issued number of commercial paper (CP)	16	21	14	–	–	–

Notes:
1. *T* indicates the event-year of distressed banks.
2. The data sources have two: (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*: the external financing of capital market (the issued number of seasoned equity offering (SEO), the issued number of corporate bond), and the issued number of commercial paper (CP) from short-term of money-market.

In short, for client firms of distressed banks, the basic financial characteristics of listed firms do not change but become deteriorated for the non-listed firms. Effects of coupling (for non-listed firms) and de-coupling (for listed firms) co-existed.

7. Conclusions

This study investigates the coupling or decoupling effect regarding the relationship between banks and firms. A paucity of studies examined the "bright side" of the relationship so that it is valuable for firms and banks to invest in and maintain long-term customer relationships. However, we focus on the "dark side" of the relationship. Namely, the costs of such relationships are often ignored. For example, the adverse effects on a firm may result from its related banks in distress and vice versa the adverse effect on a bank from its client firms in distress.

We first investigate simultaneously whether the coupling or decoupling effect exist or not, namely, the *distressed bank effect* and the *distressed firm effect*, where the former indicates the influences of a worsening bank balance sheet on its client firms and the latter discusses influences of a worsening firm balance sheet that affects its related banks. Then, we also propose the *fund diversification hypothesis* and the *leverage hypothesis* for the two effects, respectively.

We conclude that the *distressed bank effect* lasts for only one-day when the event-study is used and is outright rejected when a regression analysis is performed. On these grounds, the adverse effect of bad news of banks on their client listed firms is rather short-lived. The *distressed firm effect*, 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 negative 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.

Once the effects are confirmed, we next examine the *fund diversification hypothesis* and the *leverage hypothesis*. Our conclusions supported these two hypotheses. When the banks are in distress, the client firms rely more on bank loan to finance their projects and are more severely hurt than firms relying less on bank loan. Alternatively, when the client firms are in distress, the related banks are more severely hurt when these banks lend more to their distressed firms than banks that lend less. Our empirical results also reveal two interesting findings. One is that a bank (firm) cannot perform well without a healthy corporate (banking) sector, and the performances of the two sectors cannot be kept apart. Next, the loan terms for the non-listed firms are stricter than those for the listed firms. The result means that the adverse effects from distress in the banking sector 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 the important implications to policy-makers that the attention of banking crisis will be focused more on information asymmetry firms.

Appendix A. The lists of related banks for distressed firms

Distressed firms	Related banks
Feng-An	Chang-Hwa, Hua-Nan, Kai-Fa, Chiao-Tung, Tai-Chi, Cosmos, Asia-Pacific, Far-Eastern, En-Tie, Bao-Dou, Overseas Chinese, Chin-Fon
Wan-Yow	Chang-Hwa, Kai-Fa, Central-Trust, Chiao-Tung, Chinese, Tai-Chi, Far-Eastern, Pan-Asia
Ruei-Yuan	Central-Trust, Chiao-Tung, Taipei, Chinese, Tai-Chi, Pan-Asia, Overseas Chinese
Lien-Cheng	Chang-Hwa, Kai-Fa, Chiao-Tung, Chinese Far-Eastern, Overseas Chinese
Tai-Fang	Farmers, Fubon, Taishin
Pu-Da	Chiao-Tung
Min-ChaLi	Chang-Hwa, Chiao-Tung
Shing-Tai	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	Chang-Hwa, Hua-Nan, Kai-Fa, Taipei, Taichung, Central-Trust, Farmers, Chiao-Tung, Da-An, Taipei, Chinese, Tai-Chi, Cathay, Cosmos Bank, Union Bank Chinese, Far-Eastern, Chung-Hsing, Bao-Dou, Overseas Chinese
Hong-Fu	Central-Trust, United World Chinese, Cathay, Cosmos, Fubon, Asia-Pacific, Far-Eastern, Chung Shing, Ta-Chong, En-Tie, Overseas Chinese
Dung-Yun	Chang-Hwa, First, Kai-Fa, ICBC, Na-Chi, Tai-Chung, Farmers, Chiao-Tung, United World Chinese, Da-An, Taipei, Cathay, Cosmos, Sino-Pac, Fubon, Asia-Pacific, Far-Eastern, Chung-Hsing, Pan-Asia, Overseas Chinese
Kuo-Yang	Hua-Nan, Kai-Fa, Central Trust, Grand, Cosmos, Fubon, Asia-Pacific, Far-Eastern, En-Tie, Pan-Asia, Overseas Chinese, Chinfon
Guang-Yu	Chang-Hwa, Hua-Nan, Kai-Fa, Central Trust, Chiao-Tung
Chung-Jing	Chinese Trust, Chiao-Tung, Grand, Da-An, Taipei, Cosmos, Union-Ban Chinese, Sino-Pac, E-Sun, Asia-Pacific, Pan-Asia, Bao-Dou, Chin-Fon
Shu-Da-Yu	Chin-Fon, Chang Hwa, Hua Nan
Chang-E	Chang-Hwa, Hua-Nan, Kai-Fa, Farmers, United World Chinese, Da-An, Taipei, Fubon, Asia-Pacific, Tai-Shin, Far-Eastern, Chung-Hsing, Ta-Chong, Chin-Fon
Ren-Shiang	United World Chinese, Kaohsiung, Bao-Dou
King-Well	Kai-Fa, Central Trust, United World Chinese, Grand, Tai-Chi, Cathay, United World Chinese, Fubon, Pan-Asia, Overseas Chinese
Chien-Mei	Chung-Hsing, Shin Kong, E. Sun
Da-Kou	Chang-Hwa, Hua-Nan, ICBC, Taipei, Central Trust, Farmers, Chiao-Tung, United World Chinese, Grand, Taipei, Tai-Chi, Cosmos, Fubon, Tai-Shin, Far Eastern, Chung-Hsing, Ta-Chong, Bao-Dow, Overseas Chinese, Chin-Fon
You-Li	Chang-Hwa, Hua-Nan, ICBC, Central Trust, Farmers, 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	Hua-Nan, Kai-Fa, Central Trust, Union Bank Chinese, E-Sun, Fubon, Chin-Fon
Chung-Chiang	Chang-Hwa, Hua-Nan, ICBC, Central Trust, Chiao-Tung, Taipei, Cosmos, Union, Chung-Hsing, Cosmos, Pan-Asia, Bao-Dow, Overseas Chinese, Chin-Fon
Shin-Yan	Chang-Hwa, Hsin-Chu, United World Chinese, Chinese, Tai-Chi, Union Bank Chinese, Chung-Shing, En-Tie
Guo-Bin-Tsz	Hua-Nan, Central Trust, Farmers Bank, Chiao-Tung, United World Chinese, Da-An, Taiwan Enterprise, Chung-Hsing, Bao-Dow
Niu-Shin	Hua-Nan, Kai-Fa, Central Trust, Chiao-Tung, Tai-Chi, Cathy, Cosmos, Union, Chung-Hsing, Pan-Asia, Overseas Chinese
Da-Ying	Kai-Fa, Chiao-Tung, En-Tie, Hwatai
Yan-Ying	Chang-Hwa, Taipei, Taichung, Chiao-Tung, Grand, Da-An, Tai-Chi, Cathay, Far-Eastern, Boadou
Ty-Phone	Kao-Chi, Farmers Bank, United World Chinese, Taipei, Cosmos, Chung-Hsing, En-Tie, Boa-Dou, Overseas Chinese, Chin-Fon
Huang-Pu	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
Fortune Electronic	Taishin, Ta Chong, Hsin-Chu, United World Chinese, E-Sun, Fubon, Pan-Asia, Cathay
Der-Pao Construction	Jih-Sun, China trust, Taichung, Hua Nan, Chang Hwa, Ta Chong, Cathay United
Yhi-Shen	Central Trust, Chiao-Tung, En-Tie, Far Eastern, Cathay United
Xepex	Sino-Pac, En-Tie, Hwatai, Pan Shin, Taipei Fubon, Chang Hwa
Picvue	First Commercial, Hua Nan, Chang Hwa, Far Eastern
Premier Camera	Hwatai, Sunny, Pan Shin, Overseas Chinese, Taishin, Ta Chong, En-Tie, Chiao-Tung,
Kolin Inc.	Far Eastern, En-Tie, Bao-Dou, Shin Kong Commercial, Kaohsiung, Chang Hwa, China trust Commercial, Taishin

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