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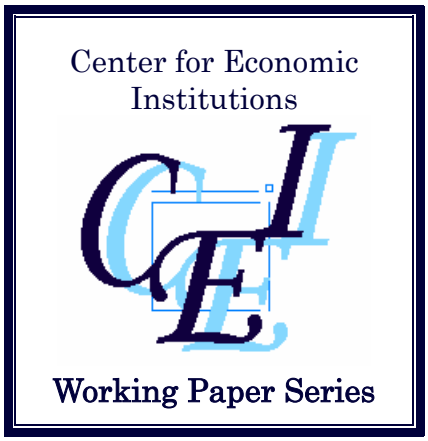
Chaiyasit Anuchitworawong



Institute of Economic Research
Hitotsubashi University
2-1 Naka, Kunitachi, Tokyo, 186-8603 JAPAN
Tel: +81-42-580-8405
Fax: +81-42-580-8333
e-mail: cei-info@ier.hit-u.ac.jp

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Chaiyasit Anuchitworawong
Center for Economic Institutions, Institute of Economic Research
Hitotsubashi University, 2-1 Naka, Kunitachi
Tokyo 186-8603, Japan
chaiyasit_a@yahoo.com

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Abstract

Claiming that the implicit cost of deposit insurance is an alternative proxy for risk-taking behavior, we examine the effects of incentive-inducing ownership and entrenchment of the largest shareholders and discretionary behavior of the management on the risk of Thai financial institutions. Our empirical results suggest that, during 1994-1996, the largest shareholders engage in low risk-taking activities when they hold large cash flow rights and have low deviation of cash flow from control rights. However, the risk is higher when the largest family shareholder enters the board and when Chairman-CEO can manipulate loan loss provisions. After the financial crisis, earnings management through discretion on loan loss provisions reduces risk. Overall, this study suggests that the problems underlying the implicit guarantee scheme are different between banks and finance companies, and between types of governance structure.

JEL Classification: G13, G21, G32

Keywords: Implicit guarantee; Risk; Ownership Structure; Managerial Discretion; Thai Financial Institutions

1. Introduction

Despite the attention on the causes of the 1997 financial crisis, there is no consensus explanation on the cause of the crisis. Models of Asian crisis are often debated and divided into different lines of research. However, this paper focuses on bank fundamentals regarding weak corporate governance and moral hazard problems in financial sector. The main objective of this paper is to investigate whether the incentives of families to hold equity ownership in regulated financial institutions beyond the prescribed levels stipulated by the laws are important to the viability of financial institutions.

Banks and other financial institutions are of particular importance in real and financial sectors especially in bank-based emerging markets. Banking channel is important in helping bridge the gap between the collection and the use of resources. However, the loss of confidence in financial institutions can break this gap and damage all economic activities as simply evidenced by the 1997 financial crisis in Thailand.

Thailand provides a unique opportunity to study the relation between risks and bank fundamentals. Most Thai financial firms had long been owned and run by families before the onset of the financial crisis in 1997 (Anuchitworawong et al., 2003). Although Thailand faced several financial crises in the past, the magnitude of the crisis was most severe and apparent in the 1997 crisis. Regardless of when the crises occurred, the most common practice that Thai government would do is to intervene in rescuing troubled institutions to protect depositors from losses, and reimburse the depositors partially even if there is no formal legislation on deposit insurance in Thailand. Under such implicit insurance scheme, the stakeholders of financial institutions may seriously encounter agency and moral hazard problems (Garcia, 1999).

Deposit insurance was first modeled as a put option on bank assets by Merton (1977) who demonstrates that deposit insurance encourages banks to take excessive risks. Subsequent to his work, Ronn and Verma (1986) and Duan and Yu (1994) test and calculate insurance premiums. They find that financial institutions in their sample were heavily subsidized. Kaplan (2002) calculates risk-adjusted deposit insurance premiums for 15 Thai banks during the pre-crisis period of 1992-1997 and finds that the cost of insuring the deposits was highest for banks that were later closed, intervened, or sold to foreign investors. From this evidence, this paper accounts for the implicit cost of deposit insurance as an alternative proxy for the risk of financial institutions.

As risk-taking behaviors vary across specific characteristics of firms, we examine whether the risk taking behavior of financial institutions are related with bank fundamentals like ownership structure and discretionary behavior of the management. From the literature, very little is known about the relationship especially in the banking environment of emerging markets.

The paper closest to our approach is Laeven (2002) who uses international cross-section data to examine the relation between bank risk and governance structure, and find that banks with concentrated ownership tend to take high risk. Our paper differs from Laeven (2002) and others in three important ways. First, we analyze financial institutions in a country to reduce the missing of information specific to its market structure. Second, we account for incentives, a potential for expropriation and internal corporate control. Lastly, we emphasize whether the discretionary behavior of managing accruals affects risk.

In this study, Thai financial firms listed during the pre-crisis period of 1994-1996 and the post-crisis period of 1998-2001 are used. Covering these two periods,

we investigate changes in managerial behavior and corporate governance. It is important to note that the 1997 financial crisis caused at least three important changes in corporate governance context: 1) bank ownership becomes more concentrated in the hands of the state and foreign investors (Anuchitworawong et al., 2003), 2) the Stock Exchange of Commission has enforced the code of best practice that focuses on transparency, accountability, and responsibility to cope with weak corporate governance, and 3) there were substantial increases in accruals - loan loss provision and allowance for doubtful accounts (Figure 1). The amount of accruals can be easily manipulated by the management of a firm because it is an account entry that depends largely on the management's subjective estimates of future outcomes.

Insert Figure 1 about here

This study contributes to the literature by providing our understanding about the emerging market that incentives can be an effective mechanism that helps align the interests between large controlling shareholders and non-controlling shareholders. The results suggest that, before crisis, when the largest shareholders hold large cash flow rights and have low degree of separation between control and cash flow rights, they tend to engage in low risk-taking activities, resulting in lower cost of deposit insurance. However, there is some evidence that the risk is intensified when the largest family shareholders participate in the board of directors, and when chief executive officer chairs the board and has high potential to manage earnings through discretion on loan loss provisions.

For the post-crisis period, we observe that the risks in financial institutions

where the controlling families enter the board are higher relative to those in the non-family run institutions. Importantly, the managerial discretion on the use of accruals has negative impact on institutional risk. In addition, banks create lower cost of deposit insurance relative to finance companies in both periods. The evidence confirms that, due to the bank's regulatory and cost advantages, the business opportunities of finance companies are concentrated in high-risk business areas.

The rest of this paper proceeds as follows. Section 2 provides an overview of institutional background in Thailand. Section 3 summarizes theoretical background and hypotheses. Section 4 presents information on data and methodology used in the study. Section 5 summarizes the results and Section 6 concludes the paper.

2. Overview of institutional background

The history of Thai financial market development dates back to 1888 when the British-owned *Hong Kong and Shanghai Bank* set up its first branch to facilitate foreign trade financing in Thailand. Foreign banks had enormous influence on banking business in Thai financial market during its early stage of development. For Thai banks, the first domestic bank was established in 1904. The bank was initially under the name of *Book Club*, presently known as the *Siam Commercial Bank (SCB)*. From then on, Thai commercial banking business has expanded over time. There were 14 more domestic banks established during the 1930s and 1960s. Twelve of these banks were founded by families. Many of the founding families still had control of the banks' daily operations until before the crisis (Anuchitworawong, 2004).

Equity ownership had been highly concentrated in the hands of large individual/family shareholders, although the laws put the upper limits of shareholdings for each person to be at the 5 percent and 10 percent for banks and finance companies

respectively. One plausible explanation for high concentrated ownership is that large family shareholders may value the benefits from control, which provides them with an opportunity for wealth transfer for the benefit of the families' business groups.

Thailand's banking industry was concentrated and characterized by an oligopolistic market structure. Bangkok Bank, the largest bank in the market, had a market share of 28 and 21 percent at the end of 1988 and 2001 respectively. The bulk of the commercial banking system assets were accounted for by five largest banks – privately owned Bangkok Bank, Thai Farmers Bank, Bank of Ayudhya, Siam Commercial Bank and government-owned Krung Thai Bank. Their combined market share amounted to more than 60 and 59 percent in 1988 and 2001.

Thai domestic banks have long enjoyed a high degree of protection against foreign bank competition in two important ways. First, prior to the 1997 financial crisis, foreign shareholding had been limited at the 25 percent level. Second, there was also a moratorium on the granting of new banking license by the central Bank of Thailand. These protections are believed to cause slow progress in institutional development that subsequently drives crisis. In addition, such a moratorium or market access limitation give rise to an increasing number of finance companies that are less governed.

Many finance companies were independent while some institutions were subsidiaries or affiliates of banks that were in turn owned by families. Finance companies have not been allowed to take direct deposits from the public, but they can fund their operations primarily through the issuance of large-denomination promissory notes, or through credits from commercial banks and other financial institutions.

Based on the statistics of the Bank of Thailand, banks were the central players in Thai financial system. The ratio of total assets to GDP has been more than 100

percent throughout the period of 1993-2001 for banks, while less than 40 percent for finance companies. Banks also play important role in absorbing more than 75 percent of total deposits during 1993-2001 while finance companies absorb less than 32 percent before the crisis and less than 10 percent after the 1997 financial crisis. Compared with the size of financial market, the size of the Thai stock market has been much smaller, except in 1993 when the boom of stock market made its size more comparable with that of the financial market. However, in the post-crisis period, we can observe an overall contraction of the size of stock market relative to GDP.

In retrospect, Thai financial system had ever experienced three important crises from the collapses of, for example: 1) large finance company named *Raja* Finance in 1979 due to the use of substantial amount of money in manipulating its share price, 2) a number of finance companies in 1983 due to fraud and mismanagement, 3) the Asia Trust Bank's over-lending to its affiliated firms in 1984 that subsequently resulted in high non-performing loans, and 4) 56 troubled finance companies and the bath devaluation in 1997. One of the reasons that could help explain such phenomena is the lack of sufficient supervisory structure on financial institutions, especially for the 1997 financial crisis, after which the quest to achieve better corporate governance in all sectors and to provide greater investor confidence has become a hot issue worldwide.

To rehabilitate troubled institutions and restore solvency and financial stability, the Bank of Thailand set up the Financial Institutions Development Fund (FIDF) in 1985. In fact, Thailand has no formal explicit deposit insurance scheme, but the FIDF may be considered as providing implicit guarantee and financial assistance to depositors and creditors of financial institutions.

During the financial crisis in 1997, the FIDF had to resort to a blanket

guarantee to restore public confidence and played an important role in reimbursing the depositors of 56 closed finance companies by exchanging promissory notes of these institutions with three- to five-year notes of government owned financial institutions. Note that the depositors of failed institutions were reimbursed a portion of their deposits long before the establishment of the FIDF.

3. Theoretical background

3.1 Deposit insurance and governance

Many countries have developed deposit insurance as a precautionary measure, intending 1) to protect depositors against bank runs, and 2) to contribute to confidence in the financial system's stability by reducing unpleasant macroeconomic consequences of bank failures, or by preventing contagious effects of panics during crises.

Deposit insurance has different regulations across countries, ranging from full to partial coverage and from explicit to implicit scheme. All have costs and benefits. Full coverage scheme helps eliminate bank run to preserve the stability of all financial institutions. However, such a scheme can create moral hazard problem that tempts the management of financial institutions to make unreasonable commitments, and at the same time makes depositors less careful, and discourage them from moving their funds to safer institutions. These arguments suggest that a poorly designed scheme may encourage risky behavior by both depositors and institutions, and this will not improve the stability of financial system.

Based on cross-country data, Demirgüç-Kunt and Huizinga (1999) find that explicit deposit insurance lowers banks' interest expenses and makes interest payments less sensitive to bank liquidity. Therefore, such explicit insurance system weakens market discipline on banks. Garcia (1999) further argue that poorly designed deposit

insurance scheme will cause agency problem in which bank managers or employees acting as an agent of shareholders pursue their own interests rather than those of the shareholders. In addition, by realizing that runs are unlikely under government guarantee, the bank owners and managers of the insured institutions may take on additional risk in their asset portfolios.

Subsequent to the development of option-pricing framework of Black and Scholes (1973), Merton (1977) was the first to model deposit insurance as a put option on the assets of the bank with a strike price equal to the face value of the deposits. Theoretically, the cost of deposit insurance depends on the volatility of bank assets, the leverage level, and the time horizon of the option. Applying the option valuation approach, Marcus and Shaked (1984) examine the overpricing of deposit insurance by looking at the pre-insurance value of bank assets and find evidence of substantial overpricing of insurance premiums. Ronn and Verma (1986) account for regulatory capital forbearance in their pricing model, and the post-insurance value of assets, allowing for the dependence of the value of guarantee on the future value of assets.

Later, Duan (1994) develops a maximum likelihood framework to estimate the value of deposit insurance. However, implementing the Duan method requires accurate and high frequency data on deposits. Duan and Yu (1994) apply the method of Duan (1994) to calculate insurance premiums for Taiwanese depository institutions. They find that these institutions were heavily subsidized by the deposit-insuring agency.

Using the sample of 15 Thai banks, Kaplan (2002) uses the method of Duan (1994) to estimate government subsidies. The author argues that the estimated value of government subsidy can serve as an early warning indicator of banking crisis in Thai financial system.

Applying the barrier model of Boyle and Lee (1994) to measure deposit insurance premiums of Thai banks and finance firms during 1992-1996, Tirapat (2002) finds similar evidence that higher risk institutions have higher insurance premiums. However, the results from using the barrier model are quite similar to those derived from the traditional method of Marcus and Shaked (1984).

By arguing that the level of the safety net subsidy granted to the bank is a measure of the risk-taking of that bank, Laeven (2002) uses a large sample of banks in 14 countries including Thailand to examine the relationship between the risk-taking behaviors of the banks and their corporate governance structure. The author suggests that banks with concentrated ownership tend to take the greatest risk and those with dispersed ownership engage in a relatively low level of risk-taking.

3.2 Ownership structure and risk

Much of the focus in the governance literature is how managerial discretion can be brought under effective control through ownership and internal control (Jensen and Meckling, 1976; Grossman and Hart, 1988). The benefits of having large shareholders are at least theoretically clear. Large shareholders have strong incentives to monitor the management and ameliorate agency problems, as it is more likely that the gains on their investment from monitoring would be sufficient to cover the associated costs (Shleifer and Vishny, 1986; Admati et al., 1994). Demsetz and Lehn (1985) argue that large shareholders are not well diversified and have to bear excess risks due to wealth vested in firms. When large shareholders who hold large ownership stakes and have large non-diversifiable human capital invested in the firms are involved in the management, the extent to which they hold less diversified wealth will give them an added incentive to reduce the risk of their equity holdings and firm-specific human capital.

Recent view of the role of large shareholders posits that, like managers, dominant or controlling shareholders who hold sufficient voting rights, and in many cases are involved in the firms' management may use their influence and control power to pursue their own interests at the expense of small shareholders, leading an agency conflict between controlling shareholders and minority shareholders (La Porta et al., 1999; Bukart and Panunzi, 2001). The conflict may take the form of the preference for on-the-job perks, shirking, making self-serving decisions in relation to dividend payout and investment policies that increase firm risk and reduce other shareholders' wealth.

However, the relative importance of this problem depends on their cash flow stakes in the firm. The greater their ownership stakes, the more dependent their utility or wealth is on corporate value. Therefore, if the controlling shareholders adopt sub-optimal strategies, the firms would perform poorly and subsequently affect the controlling shareholders' wealth.

A number of studies examine the relationship between bank risk and ownership. Their findings have varied considerably. Some argue that the relationship between the ownership of the managers or controlling shareholders and the risk of banks is sometimes positive, sometimes negative, sometimes U-shaped, and sometimes inverted U-shaped. For instance, Demsetz et al. (1997) study a sample of 350 bank holding companies and find that risk is positively related with insider ownership, but only at low franchise value banks. Brewer and Saidenberg (1996) find a U-shaped relation between risk and insider ownership, indicating that a positive relation may occur only at higher levels of insider ownership. Many studies of non-financial firms also provide a similar relation between risk and ownership structure. For example, May (1995) finds empirical evidence that CEOs of the firms consider personal risk, so when they have more of their

personal wealth in firm equity, they will have more incentive to reduce firm risk.

As banking crises have not only shown that financial institutions often take excessive risks but also that risk taking differs across institutions, i.e. some banks engage in more risks while other institutions are more prudent and can survive the crisis, we expect that, in general with ownership as an incentive-inducing mechanism,

H1: Greater ownership held by the largest controlling shareholders is associated with lower risk.

In banking industry, the problems regarding risk-taking behavior should be more concerned when there is improper implementation of deposit insurance. Although deposit insurance scheme has several benefits as described in previous section, it creates the incentive for moral hazard, i.e. the motivation for excessive risk-taking activities because the costs of pursing riskier strategies are reduced under the scheme.

In the family-run institutions in which families own business groups, there may be a larger possibility of inefficient transfer of resources from the institutions to the firms in the group (Shin and Park, 1999). Saunders et al. (1990) show that owner-controlled banks exhibit high risk-taking behavior than manager-controlled banks. From the 'tunneling' view of Johnson et al. (2000), it is also possible that minority shareholders are exploited by the controlling families through pyramids and cross-shareholdings. This argument may be applicable to the Thai context. Anuchitworawong et al. (2003) show that large family shareholders most often use indirect control mechanisms to gain control in Thai banks and finance companies before the crisis. Therefore, the reduction in cash flow rights through indirect control may induce the family shareholders to expropriate minority shareholders during the pre-crisis period.

H2: Insider ownership by the largest controlling shareholders under implicit guarantee scheme in which there exist weak supervisory practices and lax regulations increases risk.

Recent studies provide convincing evidence that, when the degree of deviation of cash flow from control rights that is used as a proxy for entrenchment is high in countries with lax minority protection, this will have significant negative effect on firm performance (Claessens et al., 2002; La Porta et al., 2002). Bebchuk et al. (1999) theoretically suggest that the agency costs of controlling shareholders are increasing the larger the potential to extract private interests incompatible with other shareholders' interests. Thus, the widespread use of pyramidal and cross-shareholding structures to separate cash flow from control rights constitutes an important measure of incentives and the likelihood of agency costs. Hence, we expect:

H3: An increase in the degree of separation between cash flow and voting rights of the largest controlling shareholders increases risk.

3.3 Internal control, earning management and risk

Another reason that may help explain financial crisis in East Asian countries is the lack of transparency and accountability. The disclosure of true financial information is important to good governance because it provides outsiders with a basis to monitor their claims and exercise their rights on deposit and ownership. Under poorly designed governance system, the management of a firm is able to exercise much discretion in concealing poor performance or postponing a portion of unusually good current earnings to next period (DeAngelo, 1988; DeAngelo et al., 1994; Warfield et al., 1995).

Earnings management comes with costs and benefits. Benefits include the

potential for improvement in resource allocation decisions and in management's credible communication of favorable, private information about future prospects to external stakeholders (Beaver et al., 1996; Subramanyam, 1996). Studies of loan loss accruals in the banking industry show that stock returns are positively related to abnormal loan loss provisions (Beaver et al., 1989; Beaver and Engel, 1996).

However, the costs are the potential misallocation of resources that arise from income smoothing. Dye (1988) and Trueman and Titman (1988) indicate that the management's information advantage over investors and creditors is a necessary and sufficient condition for earnings management to occur. Overall, the earnings management benefits managers while it leaves investors at a disadvantage since the latter cannot detect and undo the manipulated accounting numbers due to information asymmetry, but simply accepts the investment based on the managed earnings.

Attempting to explain why management manages earnings, Fudenberg and Tirole (1995) argue that concern about job security creates an incentive for the management to smooth earnings. During years of poor performance, it has incentive to smooth reported earnings by increasing current earnings at the expense of future earnings. But when future performance is expected to be poor, managers have incentive to shift current earnings into the future. This can be achieved by making accounting choices that reduce current discretionary accruals for possible use in the future.

To the extent that the management benefits from manipulation, we should expect that the management equipped with superior information has incentive to tunnel more. For instance, managers may use discretionary accruals to alter reported performance to maximize earnings-based bonuses for personal benefits. Such practices will be detrimental to overall performance and firm risk, especially under market

structure where there is severe information asymmetry problem. Thus we expect:

H4: Financial institutions with board independence are less likely to manage earnings through discretionary accruals that create greater risk.

4. Empirical design

4.1 Sample description

We examine empirical hypotheses using pooled, cross-sectional data for financial institutions listed on the Stock Exchange of Thailand (SET) in the pre-crisis period of 1994-1996 and the post-crisis period of 1998-2001. The separate time periods aim at comparing the effects in the pre- and post-crisis periods. This study includes only listed financial firms that are quoted in the banking section and finance and securities section except securities and leasing firms. Two principal sub-samples of 129 and 94 firm years before and after the crisis respectively are available in this study.

We have collected data on daily market capitalization, total liabilities, other related accounting information, and equity ownership of shareholders who hold more than 0.5 percent of total outstanding shares from the I-SIMS database developed by the SET. The data on internal corporate control is obtained from annual reports and disclosure statements (Form 56-1) that are filed to the Securities and Exchange Commission (SEC) annually by all listed firms.

Further, this study is based on a newly constructed and comprehensive ownership database and different sources of information about family relationship. The sources include Phipatseritham (1981), Phipatseritham and Yoshihara (1983), Suehiro (1989), Chulpongsatorn (2000), and Sapphaibun (2001a and 2001b). Importantly, the information on all registered firms used in tracing ownership of private firms at the

layers of control chains is obtained from the on-line database service of Business Online (BOL) that has been granted the right by the Ministry of Commerce. Using this information allows us to trace for ultimate ownership of each financial institution.

4.2 Methodologies

4.2.1 Implicit cost of deposit insurance

In this section, we describe the Merton (1977) deposit insurance pricing model, which is implemented by Ronn and Verma (1986). The model is derived based on the option-pricing framework developed by Black and Scholes (1973). The concept is to interpret deposit insurance as a security that a bank holds and that yields same payoff structure as a put option.

To apply the option-pricing model to a financial institution, several assumptions are made. First, it is assumed that the bank's debts are equal to its deposits, *D*, and that all deposits including their interest are insured. Next, it is assumed that the time, *T*, until the maturity of the deposits is equal to the time until the next annual audit of the bank. In this context, we assume *T* to be one year. This is reasonable since the Bank of Thailand makes an on-site inspection annually. Lastly, it is assumed that the bank's asset values follow geometric Brownian motion with drift μ and volatility σ:

$$d \ln V_t = \mu dt + \sigma dW_t \qquad (1)$$

where V is the value of assets, W indicates a standard Wiener process.

Given the above assumptions, the Black and Scholes (1973) option pricing model is used to value the price of deposit insurance per unit of deposits, *p*, which can be written as follows:

$$p = \Phi(\sigma\sqrt{T} - y_t) - ((1-\delta)V_t / D)\Phi(-y_t) \qquad (2)$$

where $y_t = (\ln[(1-\delta)V_t / D] + (\sigma^2 / 2)(T)) / (\sigma\sqrt{T})$, Φ is the cumulative standard normal distribution function, and δ is the dividend per dollar of the value of assets.

In order to implement the model, we follow Ronn and Verma (1986) to estimate two unobservable variables in equation (2), i.e. the bank's asset value, *V*, and the volatility, σ. The equity value of the bank, *E*, which is directly observable, is viewed asa fully dividend-protected call option on the bank's assets with a strike price equal to the value of its debt as follows.

$$E_t = V_t \Phi(h_t) - D\Phi(h_t - \sigma\sqrt{T}) \tag{3}$$

where $h_t = (\ln[V_t / D] + (\sigma^2 / 2)(T)) / (\sigma\sqrt{T})$. σ can be solved by applying Ito's Lemma to equation (3).

$$\sigma = \frac{\sigma_E E_t}{V_t \Phi(h_t)} \tag{4}$$

where σ_E is the annualized standard deviation of equity returns.

With observable market capitalization and equity volatility, we can simultaneously estimate these two non-linear equations to obtain V and σ, which will be used in deriving the implicit cost of deposit insurance in equation (2). Note that we acknowledge the deficiency of imposing constant equity volatility. Nevertheless, to implicit the Duan's method where estimates are consistent, we need audited high-frequency data on deposits that is not generally available.

4.2.2 Discretionary portion of loan loss provision

This section explains how to model discretionary and non-discretionary behavior. Following McNichols and Wilson (1988) who model provisions for bad debts for non-financial sectors, this paper applies their methodology to model loan loss

provision in financial sector. We emphasize on loan loss provision rather than a collection of accruals as often used to study earning management in non-financial sectors. Loan loss provisions (LLP) are important because they are highly judgmental based on the management's decisions. They also reflect both past loss experiences and the impact of recent events and current conditions on the possible credit losses at the end of an accounting year.

Previous literature (Jones, 1988; McNichols and Wilson, 1988; to name a few) suggests partitioning an accounting accrual into two components – discretionary and non-discretionary. The model in this study is based on a balance sheet perspective by using beginning-of-the-year net loans (BLOAN), beginning-of-the-year allowance for doubtful account (BALLOWANCE), current period's write-offs (WRITEOFF), and management's expectation of future write-offs (NPWRITEOFF) that control for non-discretionary component of loan loss provisions. Since it would be difficult to model management's expectation, I use next period's write-offs as a perfect foresight for management's expectation of future write-offs. The model is expressed as follows.

$$LLP_{it} = \alpha_0 + \alpha_1 BLOAN_{it} + \alpha_2 BALLOWANCE_{it} + \alpha_3 WRITEOFF_{it} + \alpha_4 NPWRITEOFF_{it} + \varepsilon_{it} \quad (5)$$

where all variables are scaled by beginning-of-the-year total assets of firm *i* to mitigate potential estimation problems from heteroscedasticity. Discretionary components are the residuals from regressing equation 5.

It is expected that loan loss provisions are increasing in current and future write-offs since their informativeness may influence the expectation of the collectibility of current loans. We would also expect that loan portfolio in previous period is most likely to result in a higher provision in current period, although loan portfolios are less

likely to reflect default risk exposure, compared with non-performing loans.

To regress the model, I use pooled cross-sectional data in our regression for the sub-periods of 1994-1996 and 1998-2001. I acknowledge main drawback of assuming constancy of coefficients across institutions and within the sub-period. However, a pooled regression has distinct advantage of not forcing the amount of discretionary behavior to be zero in any given year across banks. This is intuitively important because discretionary behavior could persist for longer than one period.

4.2.3 Ownership concentration as a mechanism

In this study, we use cash flow rights held by the largest shareholders (CFRIGHT) and the ratio of cash flow to control rights (ALIGNMENT) are used as a proxy for their incentives in monitoring and controlling financial institutions. We collect each year's ownership structure as of December, or the closest date. Note that the shareholdings of individuals related through blood or marriage are aggregated and reported as a single unit.

Cash flow rights (CFRIGHT) are the aggregation of direct ownership and the sump of the products of all ownership stakes along all chains of control. Control rights (CRIGHT) are the sum of direct ownership and indirect ownership that is computed as the sum of the weakest links along the chain of voting rights. Both measures are computed based on the approach used in Claessens et al. (2000), and Anuchitworawong et al. (2003) in particular for Thai financial institutions. In tracing for ultimate ownership, controlling shareholder is defined as a shareholder who directly and indirectly owns more than 25 percent of the firm's voting rights in aggregate.

4.2.4 Explaining implicit cost of deposit insurance

Next, we investigate whether governance variables (ownership concentration as

an incentive-inducing mechanism and board independence) and discretionary behavior are related with the risk of financial institutions measured by the cost of deposit insurance. Generally, we include loan growth to control for risk taking in terms of excess credit growth, natural logarithm of assets for firm size, and non-interest expense ratio for management risk. Table 1 gives summary definitions of variables used in this study. The general form of the regression specification we estimate is:

$$RISK = f(Ownership, Board\ Independence, Discretionary\ LLP, other\ variables) \quad (6)$$

Specifically, we test various forms of the regression by using ordinary least square regression method for pooled cross-sectional data for each sample period.

Insert Table 1 about here

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5. Results

5.1 Descriptive statistics

Table 2 provides descriptive statistics on a set of selected variables. Banks and finance firms on average experience higher ratio of loan loss provisions to beginning-of-the-year total assets (LLP) after the 1997 crisis. The mean (median) of LLP increases from 0.4% (0.3%) in the pre-crisis period to 4.5% (2.9%) in the post-crisis period. The write-off (WRITEOFF) and expected write-off (NPWRITEOFF) ratios also rise after the crisis. Such increases may be partly due to the notification of the Bank of Thailand that requires financial institutions to write off doubtful debts, which have been 100% provisioned and appear to be unrecoverable. Besides, there may be due to tax purposes.

Furthermore, loan growth declines after the crisis. This is as expected since after the crisis, lending within Thailand has significant dropped while the decline was

due primarily to the increased write-offs of bad debts. All financial institutions were forced by the authority to solve the problem of non-performing loans that stay extremely high after the crisis. Therefore, they were more reluctant to extend loans as they attempted to protect the quality of assets and to maintain sound balance sheets. Next, we observe that equity ratio moves around 8-10 percent. Although the measure is underestimating the correct capital-risk asset ratio, the reported ratio is quite close to the minimum capital requirement of 8.5% for banks and 8% for finance firms.

Insert Table 2 about here

Table 2 further convinces us that the financial institutions are relatively focused in terms of revenue sources (FOCUSREV), but diversified in terms of loan portfolios (FOCUSLOAN). However, the FOCUSLOAN index for the pre-crisis period is not reported because information on loan portfolios was not available prior to the crisis.

5.2 Estimated implicit cost of deposit insurance

Based on the method of determining the cost of deposit insurance outlined in Section 4, we use numerical routines and come with results summarized in Table 3. Overall, the implicit costs of deposit insurance of finance companies are higher than those of banks over the period. Over the period of 1994-1996, average implicit costs stand at around 0.053 percent of total liabilities for finance companies, but only at 0.0078 percent for banks. After the crisis, the implicit costs on average increase higher to 0.493 percent for banks and to 2.147 percent for finance companies.

Panels B and C further show the estimated costs of deposit insurance by categorizing sample firms into problem and sustainable financial institutions. Problem

institutions are banks and finance companies that were closed, recapitalized by the government or merged into state-owned institutions during 1997-1999. Sustainable institutions include all institutions that are not problem institutions and survive after the crisis. Note that the estimated costs of deposit insurance for problem institutions are not reported for the 1998-2001 period for two reasons: 1) their shares were not actively traded in the market, so this limitation obstructs us from computing appropriate market value of assets and consequently the cost of deposit insurance, 2) finance and securities firms that were suspended in 1997 were closed, and delisted from the market.

Insert Table 3 about here

Overall, the estimated costs of deposit insurance are higher in problem financial institutions than in non-problem institutions. For instance, the median cost of deposit insurance is approximately at 0.034 percent for the group of problem institutions, but is relatively lower at 0.0082 percent for non-problem group.

Insert Table 4 about here

It should be noted that the implicit costs after the crisis are in general higher than those before the crisis. Merton (1977) shows that an increase in the deposit-to-asset value ratio, or an increase in asset return variability leads to a positive change in the cost of government subsidies. Table 4 confirms Merton's work. Specifically, Panel C presents that the ratios of total bank debts to market value of assets are on average higher in the post-crisis period. In addition, asset return volatility on average increases from 8 percent before the crisis to 11.3 percent after the crisis. Therefore, this may

partially help explain why the cost of deposit insurance after financial crisis is higher.

5.3 Ownership and control

This section proceeds to identify the controlling shareholders of Thai financial institutions before and after the crisis, the level of ownership concentration, and the divergence from one-share-one-vote rule. To begin with, we first look at the distribution Thai financial institutions by types of the largest shareholders in Table 5. Over the pre-crisis period, more than 64 percent of all institutions have families as the largest shareholders, followed by the government, CPB and then foreign investors.

Insert Table 5 about here

However, after the crisis, the structure was changed importantly. Strikingly, most family groups lost their ownership and control over banks and finance companies after the crisis.[1] What happened after the crisis is that government and foreign investors have come to play important roles in more than half of all sample institutions. This was partly due to capital support schemes provided by the government to expedite the recapitalization of problem institutions, and the relaxation of foreign shareholding limit that induces higher level of participation by international investors.

Table 6 shows ownership concentration in terms of control and cash flow rights.

[1] In 1997, 56 finance companies were closed. In 1998, 12 finance companies and 4 commercial banks namely the Bangkok Bank of Commerce (BBC), the Union Bank of Bangkok (UB), the First Bangkok City Bank (FBCB) and the Laem Thong Bank (LTB) were ordered to write down and recapitalize. The BBC was transformed into an asset management company. The remaining three intervened banks were merged with other state-owned banks.

Panels A and B indicate that ownership and control appear to be more concentrated after the 1997 financial crisis. In both periods, we can observe that ownership is highly concentrated in the hands of the government and foreign investors. The government on average held control and cash flow rights of more than 69 percent as the foreign investors increased their stakes to around 56-66 percent during 1999-2001. The mean and median differences of control and cash flow rights between pre-crisis and post-crisis periods are statistically significant at the 5 percent level or better.

Collectively, the statistics reported in Panels A and B of Table 6 shows that cash flow rights (control rights) held by the largest shareholders on average increase largely from the level below 25 percent (31 percent) before 1997 to the level higher than 44 percent (49 percent) after the crisis. The roles of families as the largest shareholders in banking and financial sectors become less prevalent, when compared with the roles of the government and foreign investors.

Insert Table 6 about here

This evidence is consistent with Anuchitworawong et al. (2003) who study the ownership structure of Thai financial institutions for the five-year period of 1996-2000. Their study shows that cash flow rights (control rights) rise largely from 22.14 percent (29.85 percent) in 1996 to 41.28 percent (45.04 percent) in 2000. Their sample includes banks, finance and securities, securities, and leasing/factoring firms. However, our study excludes securities and leasing/factoring firms that do not accept public deposits.

In Panel C of Table 6, we present the degree of deviation from one-share-one-vote rule. To the extent that the divergence between control rights and cash flow rights

is associated with expropriation, we find that the largest ultimate shareholders on average may be more likely to extract private benefits of control in the pre-crisis period than in the post-crisis period. The ratio of cash flow to control rights suggests that the shareholders were less likely to use indirect shareholdings such pyramids and cross-shareholdings after the crisis, reflecting a more transparent control.

High discrepancy between control and cash flow rights may give large shareholder more incentive to pursue private benefits at the expense of other small shareholders. Johnson et al. (2000) present the *'tunneling"* view by arguing that a controlling shareholder with an opportunity to transfer financial wealth from one firm to other firms owned and controlled by the controlling shareholder would require large control stakes with small cash flow rights. In sum, control benefits from having large control rights create a wedge of the controlling shareholding between his power and his incentives to expropriate other shareholders.

Compared with the average ratio of cash flow to control rights of 0.93 in Khanthavit et al. (2003) who use the sample of Thai non-financial institutions, our result is relatively lower at 0.73 for the pre-crisis period.[2] This suggests that the largest shareholders in financial sectors often use indirect means of control. One main reason that leads to the use of indirect ownership method is that the laws limit the maximum percentage of shares that can be owned by a person, as described in previous section. Thus, such restriction makes a shareholder to use control leverage that help to detain control over a number of firms that collectively hold sufficient votes in an institution without breaking the laws. In so doing, this shareholder invests less, but can possess

[2] The result is comparatively similar with Claessens et al. (2000) who report the average ratio at 0.75 for financial and non-financial firms in nine East Asian countries.

control power and enjoy the benefit of control at lower cost.

5.4 Loan loss provisions and their discretionary components

In this section, the discretionary components of an accrual item i.e. loan loss provisions. In so doing, we run regression on the equation 5 by using the samples for pre- and post-crisis periods. There are three points from the results in Table 7 that should be noted: 1) there is significant influence of future write-offs on loan loss provision, 2) the coefficient on beginning balance of net loans is statistically positive, indicating that loans granted in previous period also influence the decision of provisions for loan losses, 3) there is no any significant effect of allowance for doubtful account on loan losses. Additionally, specification test for the equality of coefficients for the two sub-periods confirms that the coefficients in the two periods are significantly different from each other at the conventional level of significance (F-statistic=11.87).

Insert Table 7 about here

Next, the descriptive statistics of the absolute value of discretionary components of (LLP), which are the residuals estimated from the regression model for each period are also reported in the table. The absolute values are used as a proxy for the combined effect of income-increasing and income-decreasing managerial accounting discretion, i.e. to serve to measure the extent to which managers pursue certain techniques to adjust reported earnings. Table 7 shows that the absolute value of discretionary LLP is on average low at 0.16 percent during 1994-1996. The absolute value of discretionary LLP is almost 20 times higher during the post-crisis period of 1998-2001, revealing that the management of financial institutions exercises more to

manipulate the loan loss provisions in order to manage earnings.

5.5 Explaining implicit cost of deposit insurance

We next explore the impacts of ownership concentration in the hands of the largest shareholders as a corporate governance mechanism, managerial discretion, and the focus of the financial institutions on institutional risk. Table 8 report regression results for pre- and post-crisis periods.

For the pre-crisis sample, the costs of deposit insurance are low for banks and finance companies where the largest shareholders hold substantial cash flow rights, consistent with hypothesis 1. The main effect of cash flow rights in model 1 indicates that a percentage change in cash flow rights reduces the cost by approximately 0.0099 basis points. To account for varying effect of ownership, we test non-linear relationship between risk and ownership through piecewise specification by categorizing cash flow rights into 3 groups – 0-25%, 25-50%, and 50-100%. However, the coefficients for these three variables are not significant at conventional level.

To go further, we examine whether the effect of an incentive-inducing mechanism is different between institutions where the largest family shareholders are present in the board of directors and institutions where they are not. Models 2 and 3 suggest that there exists interaction effect, i.e. when a family enters the board, its risk becomes higher. This suggests that implicit guarantee may create moral hazard problem in the family-owned institutions, meaning that family groups may act imprudently and pursue higher risk-taking behaviors. This is consistent with hypothesis 2.

Alternatively, we examine how reduced incentives due to the deviations from one-share-one-vote influence risk. The coefficient of *ALIGNMENT* in model 4 shows that as the degree of the separation of cash flow from control rights gets smaller, the

cost of deposit insurance becomes smaller, supporting hypothesis 3. In addition, we are interested in whether the effect of this proxy for entrenchment on institutional risks is different between financial institutions with the largest individual shareholders on the board of directors and the institutions without the largest individual shareholders on the board. Models 5 and 6 suggest that the largest shareholders from family groups may not act effectively in controlling risk, probably because financial institutions perceive that they can obtain financial assistance from the government in times of trouble.

Next, financial institutions where the positions of the board chairman and the chief executive officer (CEO) are held by the same person experience different risk exposures. The overall results show that the cost of government subsidies is relatively lower for banks and finance companies in which the board chairman also serves as the CEO, suggesting that they may promote focused objectives and a clear line of command. However, when we examine if these differences vary according to the discretion, we find support for the fourth hypothesis, i.e. when high discretion exists, financial firms with Chairman-CEO duality have higher costs of deposit insurance.

For the post-crisis period, Panel B shows results different from those of the pre-crisis period. The results do not support the hypotheses earlier supported by the results for pre-crisis sample. Specifically, incentive-inducing mechanism and a reduction in the deviation from one-share-one-vote fail to show significant effects on risk. The coefficient for family group turns positive, but only marginally significant, implying that the presence of members of family/business group on the board may not be a proper measure to reduce risk exposure.

Managerial discretion through manipulating accrual account lowers the cost of deposit insurance after the crisis. From the table, the coefficient of the absolute value of

discretionary components of LLP is negative and significant at the 10 percent level in all models except the models with its interaction term. The result is in line with the earning management literature, which indicates that managers may manipulate accruals to communicate value relevant information (Healy and Palepu, 1993), or to communicate private information about the firm's future prospects. Given that our model of non-discretionary LLP can extract the element of discretionary components, our result suggests that earning management through higher discretionary accruals may lower the risk in terms of cost of deposit insurance.

For both periods, the results show that banks have relatively low cost of implicit guarantee when compared with finance firms that are highly constrained by legal, regulatory, and supervisory environment and thus need to engage in riskier activities. For instance, in model 1, the cost of deposit insurance is lower for banks, about 0.66 basis points lower than finance firms prior to the crisis, and becomes much lower for banks, around 0.91 basis points lower than finance firms after the crisis.

Insert Table 8 about here

Importantly, when banks and finance companies are not diversified in terms of revenue sources, this will cause higher risk and possibly lead to higher cost of implicit guarantee. Although the results are not reported, we use Herfindahl-Hirschman index based on loan portfolios rather than on sources of revenues and the proportion of loans to real estate and construction activities in the models for the second sub-period sample. The coefficients are positive, although insignificant. Next, the ratio of non-interest expenses to net revenues is significantly and positively related with the cost, suggesting

that management risk from having too much cost of operations may induce higher risk-associated costs. Although not reported in the text, I also regress the models without year dummies. The overall conclusion does not change importantly.

6. Conclusion

This paper uses the cost of deposit insurance to proxy for the risk-taking behavior of Thai financial institutions, and examines its relationship with institutional fundamentals like ownership concentration and discretionary behavior of the management. Our findings support that the implicit deposit insurance by the government may create moral hazard for Thai banks and finance companies where the largest individual shareholders are present on the board of directors. By having not only control rights but also the power to control the board, they may expropriate to enjoy private benefits and take excessive risk due to the expectation of future rescue from the government. Consequently, the government has to implicitly bear high costs when the institutions fail or turn into trouble.

When compared with non-family controlled institutions where are run by professional managers, this may be an ideal setting that helps reduce the risk of financial institutions. Nevertheless, sufficient consideration about managerial discretion of the board chairman who also serves as the chief executive officer is essential since a dual CEO/Chairman is prone to self-interest and private benefits of control. As accruals such as loan loss provisions likely result from the exercise of managerial discretion, the dual CEO/Chairman may have considerable latitude in manipulating earnings through a variety of managerial choices and in influencing and controlling the board's decisions.

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Table 1
Summary of variable definitions

Variable name	Definition
Risk:	
COSTDEPINS	Cost of deposit insurance per unit of total liabilities using the method of Ronn and Verma (1986)
Governance variables:	
CFRIGHT	The percentage of cash flow rights held by the largest shareholder at year *t*
CRIGHT	The percentage of control rights held by the largest shareholder at year *t* (Cash flow rights and control rights are measured as of the last book closing date in a sample year which varies among the firms and is not exactly at December 31)
ALIGNMENT	The ratio of cash flow to control rights
FAMINBD	Dummy variable which takes the value of one if the largest shareholder from family group is on the board of directors and zero otherwise
DUALITY	Dummy variable which takes the value of one if the chairman of the board also serves the chief executive officer or the chairman of the executive board and zero otherwise
Control variables:	
FIRM SIZE	Natural logarithm of the book value of assets at year *t*
LOAN GROWTH	Loan growth at year *t*
DBANK	Dummy variable which takes the value of one for banks and zero otherwise
FOCUSREV	Herfindahl Hirschman index calculated using revenues from traditional and non-traditional activities of each financial institution
FOCUSLOAN	Herfindahl Hirschman index calculated using loan portfolios of each financial institution
NONINTEXP	The ratio of non-interest expenses to the sum of net interest and non-interest revenues
EQUITY RATIO	The ratio of total equity to total assets at year *t*
ESTATELOAN	Proportion of loans to real estate and construction activities
MFCLOAN	Proportion of loans to manufacturing and trading activities
Discretionary and non-discretionary components:	
LLP	Loan loss provisions for year *t* /total assets at the beginning of year *t*
BLOAN	Net loans at the begnning of year *t* /total assets at the beginning of year *t*
BALLOWANCE	Allowance for doubtful account at the beginning of year *t* /total assets at the beginning of year *t*
WRITEOFF	Write-offs (net of recoveries) for year *t* /total assets at the beginning of year *t*
NPWRITEOFF	Write-offs (net of recoveries) for year $t+1$ /total assets at the beginning of year *t*
DISCRETION	Estimated discretionary portion of loan loss provisions

Table 2

Descriptive statistics

This table provides descriptive statistics for variables used in the analysis for each sample period. The sample consists of banks and finance companies listed on the Stock Exchange of Thailand (SET) for the whole period and two sub-periods of 1994-1996 and 1998-2001.

	(A) Whole period				(B) First sub-period (1994-1996)				(C) Second sub-period (1998-2001)			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
LLP	223	0.021	0.005	0.041	129	0.004	0.003	0.002	94	0.045	0.029	0.054
BLOAN	223	0.768	0.800	0.114	129	0.808	0.830	0.062	94	0.712	0.747	0.143
BALLOWANCE	223	0.063	0.016	0.248	129	0.011	0.011	0.005	94	0.133	0.064	0.372
WRITEOFF	223	0.012	0.001	0.044	129	0.001	0.000	0.002	94	0.028	0.003	0.065
NPWRITEOFF	223	0.012	0.001	0.040	129	0.001	0.000	0.002	94	0.027	0.004	0.058
FAMINBD	223	0.457	0.000	0.499	129	0.628	1.000	0.485	94	0.223	0.000	0.419
DUALITY	223	0.309	0.000	0.463	129	0.318	0.000	0.467	94	0.298	0.000	0.460
FOCUSREV	223	0.776	0.786	0.119	129	0.787	0.806	0.100	94	0.762	0.770	0.141
DBANK	223	0.457	0.000	0.499	129	0.364	0.000	0.483	94	0.585	1.000	0.495
LOAN GROWTH	223	0.155	0.148	0.340	129	0.285	0.237	0.220	94	-0.023	-0.077	0.392
EQUITY RATIO	223	0.098	0.090	0.056	129	0.105	0.098	0.037	94	0.088	0.070	0.073
FIRM SIZE	223	11.080	10.914	1.453	129	10.862	10.708	1.260	94	11.378	11.367	1.643
NONINTEXP	222	1.065	0.503	0.433	128	0.476	0.441	0.146	94	1.866	0.856	0.659
ESTATELOAN	94	0.187	0.172	0.108					94	0.187	0.172	0.108
MFCLOAN	94	0.427	0.467	0.150					94	0.427	0.467	0.150
FOCUSLOAN	94	0.332	0.317	0.068					94	0.332	0.317	0.068

Table 3
Cost of deposit insurance

This table reports the implicit costs of deposit insurance in percentage estimated using the method of Ronn and Verma (1986) classified by types of financial institutions - banks or finance companies. Panel A summarizes the cost of deposit insurance for banks and finance firms without being classified as problem institutions. Panels B and C report the value for problem and sustainable institutions respectively. Problem financial institutions are banks and finance companies that were closed down or intervened by the government during 1997-1998. The institutions that were not closed down or intervened by the government are considered as sustainable financial institutions. The median values of deposit insurance and the number of institutions are reported in parentheses and square brackets below mean values respectively.

	Before the 1997 financial crisis				After the 1997 financial crisis				
	1994	1995	1996	All	1998	1999	2000	2001	All
Panel A: Cost of Deposit Insurance									
Bank	0.0119	0.0033	0.0082	0.0078	1.6135	0.2986	0.0387	0.0200	0.4927
	(0.0024)	(0.0006)	(0.0052)	(0.0020)	(1.1976)	(0.2357)	(0.0184)	(0.0184)	(0.0702)
	[16]	[16]	[15]	[47]	[9]	[9]	[9]	[9]	[36]
Finance	0.0590	0.0586	0.0429	0.0530	3.9219	3.2141	0.6390	0.2704	2.1470
	(0.0470)	(0.0427)	(0.0340)	(0.0366)	(3.4901)	(1.9447)	(0.4748)	(0.1626)	(1.2846)
	[31]	[33]	[37]	[101]	[12]	[10]	[10]	[9]	[41]
Whole	0.0430	0.0406	0.0329	0.0386	2.9326	1.8331	0.3546	0.1452	1.3736
	(0.0256)	(0.0249)	(0.0206)	(0.0232)	(2.0778)	(1.0931)	(0.1639)	(0.0602)	(0.3958)
	[47]	[49]	[52]	[148]	[21]	[19]	[19]	[18]	[77]
Panel B: Cost of Deposit Insurance for problem institutions									
Bank	0.0211	0.0052	0.0134	0.0132					
	(0.0067)	(0.0015)	(0.0076)	(0.0032)					
	[7]	[7]	[6]	[20]					
Finance	0.0703	0.0689	0.0488	0.0620					
	(0.0539)	(0.0664)	(0.0350)	(0.0445)					
	[21]	[23]	[25]	[69]					
Whole	0.0580	0.0540	0.0420	0.0511					
	(0.0383)	(0.0422)	(0.0328)	(0.0340)					
	[28]	[30]	[31]	[89]					
Panel C: Cost of Deposit Insurance for sustainable institutions									
Bank	0.0048	0.0019	0.0048	0.0038	1.6135	0.2986	0.0387	0.0200	0.4927
	(0.0011)	(0.0001)	(0.0052)	(0.0008)	(1.1976)	(0.2357)	(0.0184)	(0.0184)	(0.0702)
	[9]	[9]	[9]	[27]	[9]	[9]	[9]	[9]	[36]
Finance	0.0352	0.0351	0.0305	0.0334	3.9219	3.2141	0.6390	0.2704	2.1470
	(0.0229)	(0.0256)	(0.0269)	(0.0245)	(3.4901)	(1.9447)	(0.4748)	(0.1626)	(1.2846)
	[10]	[10]	[12]	[32]	[12]	[10]	[10]	[9]	[41]
Whole	0.0208	0.0194	0.0195	0.0199	2.9326	1.8331	0.3546	0.1452	1.3736
	(0.0095)	(0.0035)	(0.0103)	(0.0073)	(2.0778)	(1.0931)	(0.1639)	(0.0602)	(0.3958)
	[19]	[19]	[21]	[59]	[21]	[19]	[19]	[18]	[77]

Table 4

Summary of selected components used in/derived from the estimation of the implicit cost of deposit insurance

This table presents the mean and median values of the market value of assets and annualized standard deviation of asset returns estimated using the method of Ronn and Verma (1986), the book value of assets, the ratio of total bank debts to the market value of assets, and annualized standard deviation of equity return over the period of 1994-1996 and 1998-2001. The market value and book value of assets are expressed in millions of Baht.

	Before the 1997 financial crisis				After the 1997 financial crisis				
	1994	1995	1996	All	1998	1999	2000	2001	All
Panel A: Estimated market value of assets									
Banks	269,330	321,807	352,991	313,895	555,695	566,897	549,996	558,217	557,701
	(165,606)	(202,761)	(232,761)	(191,146)	(464,353)	(451,518)	(429,237)	(437,705)	(444,612)
Finance	33,144	40,051	36,848	36,758	26,668	25,028	23,462	30,695	26,370
	(20,180)	(28,360)	(25,387)	(24,210)	(16,744)	(14,287)	(19,323)	(19,425)	(19,128)
Whole	113,547	132,053	128,043	124,767	253,394	281,703	272,873	294,456	274,785
	(44,544)	(45,608)	(42,719)	(43,834)	(53,275)	(67,632)	(76,479)	(99,050)	(67,632)
Panel B: Book value of assets									
Banks	240,486	289,387	339,289	288,666	519,041	535,283	545,628	554,225	538,017
	(161,144)	(192,638)	(234,206)	(183,874)	(419,449)	(446,532)	(435,112)	(443,566)	(443,566)
Finance	26,549	32,976	35,943	32,090	27,240	23,418	25,891	32,149	27,056
	(17,862)	(21,116)	(24,559)	(21,705)	(17,302)	(12,463)	(20,745)	(28,334)	(19,552)
Whole	99,379	116,702	123,446	113,570	250,786	265,880	272,082	293,187	269,435
	(37,143)	(43,584)	(42,996)	(41,340)	(60,885)	(64,318)	(85,444)	(98,699)	(69,174)
Panel C: Bank debts/Market value of assets									
Banks	0.836	0.845	0.882	0.854	0.938	0.874	0.935	0.943	0.923
	(0.826)	(0.854)	(0.884)	(0.857)	(0.948)	(0.890)	(0.965)	(0.957)	(0.945)
Finance	0.740	0.765	0.889	0.803	0.945	0.806	0.863	0.840	0.868
	(0.758)	(0.780)	(0.900)	(0.821)	(0.958)	(0.802)	(0.857)	(0.846)	(0.877)
Whole	0.773	0.792	0.887	0.819	0.942	0.838	0.897	0.891	0.894
	(0.800)	(0.809)	(0.891)	(0.838)	(0.948)	(0.869)	(0.910)	(0.906)	(0.915)
Panel D: Estimated asset return volatility									
Bank	0.062	0.049	0.040	0.051	0.099	0.089	0.034	0.028	0.063
	(0.064)	(0.043)	(0.037)	(0.047)	(0.083)	(0.069)	(0.018)	(0.021)	(0.043)
Finance	0.125	0.111	0.052	0.094	0.151	0.251	0.116	0.109	0.157
	(0.115)	(0.104)	(0.043)	(0.087)	(0.119)	(0.261)	(0.117)	(0.091)	(0.130)
Whole	0.104	0.091	0.049	0.080	0.129	0.174	0.077	0.068	0.113
	(0.089)	(0.082)	(0.042)	(0.067)	(0.092)	(0.149)	(0.062)	(0.047)	(0.083)
Panel E: Estimated equity return volatility									
Bank	0.379	0.320	0.369	0.356	0.995	0.654	0.492	0.495	0.659
	(0.353)	(0.314)	(0.383)	(0.352)	(0.992)	(0.660)	(0.482)	(0.481)	(0.558)
Finance	0.480	0.473	0.471	0.475	1.145	0.967	0.737	0.635	0.890
	(0.487)	(0.480)	(0.466)	(0.476)	(1.170)	(0.966)	(0.700)	(0.628)	(0.826)
Whole	0.446	0.423	0.441	0.437	1.081	0.819	0.621	0.565	0.782
	(0.440)	(0.443)	(0.453)	(0.444)	(1.082)	(0.795)	(0.649)	(0.569)	(0.711)

Table 5
Distribution of financial institutions

This table provides the distribution of Thai financial institutions by types of the largest shareholders over 1994-1996 and 1998-2001. Shareholders are classified into four groups that include family, a specially organized investment company of the royal family (CPB), the government, and foreign investors according to the level of control rights. The % rows show the percentage of financial institutions for each type of shareholders divided by total number of institutions in the year.

		Pre-crisis period				Post-crisis period				
		1994	1995	1996	All	1998	1999	2000	2001	All
Family	N	32	34	40	106	7	4	4	3	18
	%	(64.00)	(66.67)	(70.18)	(67.09)	(26.92)	(17.39)	(18.18)	(15.79)	(20.00)
CPB	N	5	6	5	16	4	3	3	3	13
	%	(10.00)	(11.76)	(8.77)	(10.13)	(15.38)	(13.04)	(13.64)	(15.79)	(14.44)
Government	N	10	8	9	27	9	8	8	6	31
	%	(20.00)	(15.69)	(15.79)	(17.09)	(34.62)	(34.78)	(36.36)	(31.58)	(34.44)
Foreign investors	N	3	3	3	9	6	8	7	7	28
	%	(6.00)	(5.88)	(5.26)	(5.70)	(23.08)	(34.78)	(31.82)	(36.84)	(31.11)
Total	N	50	51	57	158	26	23	22	19	90
	%	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Table 6

Control and cash flow rights

This table reports summary of control and cash flow rights of the largest shareholder classified by types of shareholders over 1994-1996 and 1998-2001. Panels A, B and C present control rights, cash flow rights, and the ratio of cash flow rights to control rights respectively. Control right is the aggregation of direct ownership and indirect ownership which is the sum of the weakest links in the chain of voting rights. Cash flow right is the aggregation of direct ownership and the sum of the products of all ownership stakes along the chain of control. Both control and cash flow rights are calculated following Claessens et al. (2000). Mean and median differences are tested using t-test and Wilcoxin rank-sum test respectively.

		Panel A: Control rights								
		Pre-crisis period				Post-crisis period				
		1994	1995	1996	All	1998	1999	2000	2001	All
Family	Mean	28.93	28.88	26.91	28.15	35.73	38.88	24.12	34.73	33.68[a]
	Median	29.02	28.47	26.79	28.07	36.53	45.51	27.82	37.45	36.62
CPB	Mean	22.72	26.24	26.08	25.09	30.21	32.94	23.76	30.11	29.33
	Median	17.39	26.59	32.61	26.04	34.08	31.80	23.25	20.81	31.80
Government	Mean	37.41	38.00	34.37	36.57	77.49	77.29	74.72	70.01	75.27***
	Median	29.65	32.29	34.04	30.62	79.52	95.81	91.77	83.39	91.77***
Foreign investors	Mean	30.54	33.20	33.85	32.53	34.86	56.35	65.42	64.15	55.96**
	Median	34.97	34.97	34.97	34.97	33.13	63.39	75.00	75.00	51.75**
Total	Mean	30.10	30.26	28.38	29.53	49.14	57.54	55.61	55.98	54.31***
	Median	29.26	30.18	29.04	29.44	40.03	51.78	46.17	49.50	49.11***
		Panel B: Cash flow rights								
		1994	1995	1996	All	1998	1999	2000	2001	All
Family	Mean	22.50	21.58	20.31	21.38	28.46	30.58	17.71	28.42	26.54[a]
	Median	19.76	19.45	18.89	19.44	30.75	38.73	19.35	28.00	28.86[a]
CPB	Mean	16.25	18.50	19.00	17.95	22.70	23.10	19.07	16.57	20.54
	Median	10.34	19.92	21.95	16.29	28.90	22.42	20.92	17.54	20.92
Government	Mean	27.96	30.87	25.70	28.07	73.95	76.78	74.22	69.92	73.97***
	Median	19.13	31.24	17.93	28.42	73.55	93.94	89.98	83.39	91.77***
Foreign investors	Mean	30.54	33.20	33.36	32.37	34.72	56.24	65.42	64.15	55.90**
	Median	34.97	34.97	34.97	34.97	33.13	63.39	75.00	75.00	51.75**
Total	Mean	23.45	23.36	21.73	22.80	44.77	54.60	53.62	52.82	51.14***
	Median	19.76	20.92	19.33	19.96	37.23	42.84	46.17	49.50	42.84***
		Panel C: The ratio of cash flow to control rights								
		1994	1995	1996	All	1998	1999	2000	2001	All
Family	Mean	0.75	0.72	0.72	0.73	0.80	0.76	0.71	0.81	0.77
	Median	0.77	0.79	0.77	0.78	0.79	0.73	0.66	0.72	0.75
CPB	Mean	0.64	0.65	0.66	0.65	0.67	0.71	0.81	0.69	0.71
	Median	0.62	0.67	0.67	0.65	0.76	0.71	0.90	0.84	0.79
Government	Mean	0.68	0.75	0.69	0.70	0.95	0.99	0.99	1.00	0.98***
	Median	0.86	0.83	0.81	0.81	1.00	1.00	1.00	1.00	1.00***
Foreign investors	Mean	1.00	1.00	0.99	1.00	0.93	0.95	1.00	1.00	0.97
	Median	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total	Mean	0.74	0.74	0.72	0.73	0.86	0.90	0.92	0.92	0.90***
	Median	0.80	0.81	0.81	0.81	0.95	1.00	1.00	1.00	1.00***

***, **, and [a] denote significance at the 1, 5, and 15 percent levels respectively.

Table 7

Loan loss provisions

This table reports estimation results for each sample from regressing loan loss provision (LLP) on begining-of-the-year net loans (BLOAN), beginning-of-the-year allowance for doubtful account (BALLOWANCE), net write-offs during year *t* (WRITEOFF), and ex-post write-offs at year *t+1*(NPWRITEOFF), and for discretionary portion of LLP. All variables are scaled by total assets at the beginning of the year *t*. ***, **, and * denote significance at the 1, 5, and 10 percent levels respectively.

	a) First sub-period (1994-1996)		b) Second sub-period (1998-2001)	
Variable	Coefficient	*t* -statistic	Coefficient	*t* -statistic
Intercept	-0.003	-1.029	-0.050*	-1.909
BLOAN	0.007**	2.097	0.118***	3.270
BALLOWANCE	0.027	0.680	-0.012	-0.860
WRITEOFF	0.160	1.302	0.221***	2.803
NPWRITEOFF	0.431***	4.633	0.220**	2.495
Adj. R-squared	0.2224		0.2253	
N	129		94	
Absolute value of estimated discretionary portion of LLP (%):				
Mean	0.1642		3.2275	
Median	0.1271		2.6248	
Stdev	0.1359		3.5202	

Table 8

Deposit insurance, ownership concentration, and discretionary behavior

This table presents regression coefficients of the effects of ownership concentration, bank focus, and discretionary behavior on the implicit cost of deposit insurance for two sub-periods of 1994-1996 and 1998-2001 in Panels A and B respectively. The dependent variable for each regression is *ln(1+COSTDEPINS)* where *COSTDEPINS* is the implicit cost of deposit insurance in basis points based on the method of Ronn and Verma (1986). *CFRIGHT* is the percentage of cash flow rights of the largest shareholder. *FAMINBD* is a dummy variable equal to 1 if there exists the largest shareholder from family group on the board of directors and zero otherwise. *ALIGNMENT* is the ratio of cash flow to control rights. *Loan Growth* is the growth rate of net loans from previous year. *Firm Size* is natural logarithm of total assets. FOCUSREV is Herfindahl-Hirschman Index calculated and non-interest revenues. ABSDISCRETE is the absolute value of residual *(DISCRETION)* from LLP equation. DUALITY is a dummy variable equal to 1 if a chairman of the board of directors also serves as the chief executive officer or the chairman of the executive board. DBANK is a dummy variable equal to 1 if a sample firm is a bank and zero otherwise. NONINTEXP is the ratio of non-interest expenses to total revenues. The values of *t*-statistics are shown in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels respectively.

Panel A: First sub-period	[1]	[2]	[3]	[4]	[5]	[6]
Intercept	0.618	0.195	0.572	0.813	0.707	0.950
	(0.576)	(0.182)	(0.546)	(0.731)	(0.654)	(0.897)
CFRIGHT	-0.010**	-0.017***	-0.016***			
	(-2.617)	(-3.353)	(-3.281)			
FAMINBD	-0.075	-0.465**	-0.447**	-0.054	-1.005***	-0.883**
	(-0.566)	(-2.029)	(-2.020)	(-0.402)	(-2.793)	(-2.494)
CFRIGHT*FAMINBD		0.017**	0.015*			0.000
		(2.075)	(1.856)			(0.000)
ALIGNMENT				-0.518**	-1.109***	-0.978***
				(-2.108)	(-3.501)	(-3.118)
ALIGNMENT*FAMINBD					1.344***	1.134**
					(2.835)	(2.414)
DUALITY	-0.209	-0.250*	-0.691***	-0.252*	-0.285**	-0.668***
	(-1.621)	(-1.948)	(-3.616)	(-1.955)	(-2.271)	(-3.479)
ABSDISCRETE	-0.057	-0.214	-0.971**	-0.085	-0.157	-0.819*
	(-0.132)	(-0.497)	(-2.000)	(-0.196)	(-0.370)	(-1.686)
DUALITY*ABSDISCRETE			2.783***			2.418**
			(3.033)			(2.590)
Loan Growth	0.196	0.144	0.081	0.185	0.068	0.029
	(0.756)	(0.559)	(0.325)	(0.703)	(0.264)	(0.114)
Firm Size	-0.059	-0.015	-0.042	-0.076	-0.024	-0.049
	(-0.763)	(-0.188)	(-0.553)	(-0.969)	(-0.303)	(-0.627)
FOCUSREV	1.524**	1.797**	1.929***	1.588**	1.766**	1.889***
	(2.110)	(2.480)	(2.751)	(2.179)	(2.485)	(2.718)
DBANK	-1.078***	-1.131***	-1.000***	-0.968***	-1.101***	-0.984***
	(-5.152)	(-5.440)	(-4.870)	(-4.360)	(-4.990)	(-4.474)
NONINTEXP	2.036***	2.061***	1.909***	2.217***	2.042***	1.926***
	(4.303)	(4.415)	(4.207)	(4.569)	(4.297)	(4.134)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.5341	0.5470	0.5772	0.5248	0.5520	0.5732
N	128	128	128	128	128	128

Table 8 (continued)

Deposit insurance, ownership concentration, and discretionary behavior

Panel B: Second sub-period	[1]	[2]	[3]	[4]	[5]	[6]
Intercept	-1.495	-1.472	-1.554	-1.227	-0.905	-1.252
	(-0.779)	(-0.759)	(-0.755)	(-0.663)	(-0.436)	(-0.609)
CFRIGHT	0.004	0.003	0.004			
	(0.631)	(0.543)	(0.677)			
FAMINBD	0.659*	0.467	0.655**	0.632*	-0.287	0.625*
	(1.898)	(0.569)	(2.062)	(1.827)	(-0.221)	(1.978)
CFRIGHT*FAMINBD		0.007				
		(0.272)				
ALIGNMENT				0.137	-0.051	0.126
				(0.231)	(-0.075)	(0.219)
ALIGNMENT*FAMINBD					1.139	
					(0.739)	
DUALITY	0.359	0.334	0.641	0.370	0.333	0.638
	(1.132)	(1.103)	(1.280)	(1.171)	(1.073)	(1.268)
ABSDISCRETE	-0.115*	-0.118*	-0.084	-0.113*	-0.106*	-0.082
	(-1.880)	(-1.872)	(-0.936)	(-1.841)	(-1.676)	(-0.917)
DUALITY*ABSDISCRETE			-0.133			-0.126
			(-0.714)			(-0.676)
Loan Growth	-0.671	-0.681	-0.607	-0.631	-0.687	-0.570
	(-1.198)	(-1.206)	(-0.809)	(-1.147)	(-1.229)	(-0.758)
Firm Size	0.005	0.006	0.010	-0.023	-0.040	-0.020
	(0.031)	(0.036)	(0.061)	(-0.162)	(-0.257)	(-0.120)
FOCUSREV	7.603***	7.589***	7.498***	7.624***	7.602***	7.524***
	(7.305)	(7.216)	(6.759)	(7.501)	(7.411)	(6.740)
DBANK	-2.463***	-2.439***	-2.464***	-2.375***	-2.294***	-2.368***
	(-4.857)	(-4.695)	(-4.104)	(-5.121)	(-4.571)	(-4.034)
NONINTEXP	0.060**	0.060**	0.058	0.060**	0.056**	0.058
	(2.156)	(2.147)	(1.502)	(2.218)	(2.012)	(1.463)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.6082	0.6026	0.6052	0.6060	0.6030	0.6027
N	76	76	76	76	76	76

Figure 1. Loan-related Ratios