จุฬาลงกรณ์มหาวิทยาลัย
ทุนวิจัย
กองทุนรัชดาภิเษกสมโภช

รายงานผลการวิจัย
เรื่อง

การคิดค่าธรรมเนียมประกันเงินฝากตามความเสี่ยง การประยุกต์ใช้สำหรับประเทศไทย

โดย

สันติ ถิรพัฒน์

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บทคัดย่อ

ในการศึกษาครั้งนี้ได้ประยุกต์การใช้แบบจำลองของ Option มาประมาณค่าธรรมเนียมประกันเงินฝากในประเทศไทยตั้งแต่ช่วงปี ค.ศ. 1992-1996 ซึ่งนอกจากจะใช้แบบจำลองของ Black และ Scholes แล้ว ในการศึกษายังได้ทดลองใช้แบบจำลองประเภท Barrier Option ของ Boyle และ Lee อีกด้วย เนื่องจากแบบจำลองประเภท Barrier Option คำนึงถึงผลการบริหารไว้ในแบบจำลองด้วย โดยคณะผู้บริหารซึ่งเป็นเจ้าของกิจการมีแรงจูงใจในการเพิ่มความเสี่ยงของการบริหารเพื่อเพิ่มมูลค่าผลตอบแทนให้กับตนเอง จากการศึกษาในอดีตพบว่าสถาบันการเงินในประเทศไทยส่วนใหญ่มีการบริหารแบบครอบครัวและขาดการดูแลในเรื่องของบรรษัทภิบาล ดังนั้นดูเหมือนว่าแบบจำลองประเภท Barrier Option จะเหมาะสมกับสถาบันการเงินของไทย ผลจากการศึกษาครั้งนี้พบว่า ค่าธรรมเนียมประกันเงินฝากของสถาบันการเงินที่ประสบปัญหาถูกปิดกิจการสูงกว่าสถาบันการเงินที่ยังสามารถเปิดกิจการอยู่ จากผลการศึกษายังสนับสนุนการจัดเก็บค่าธรรมเนียมประกันเงินฝากตามความเสี่ยง กล่าวคือสถาบันการเงินที่มีความเสี่ยงสูงควรจ่ายค่าธรรมเนียมประกันเงินฝากสูงด้วย นอกจากนี้ผลการศึกษาแสดงให้เห็นว่าค่าธรรมเนียมประกันเงินฝากจากแบบจำลองมีการเปลี่ยนแปลงตามเวลาและโดยเฉลี่ยมีค่าต่ำกว่าที่กองทุนเพื่อการฟื้นฟูและพัฒนาระบบสถาบันการเงินจัดเก็บ

Project Title : Risk-Based Deposit Insurance: An Application to Thailand

Name of the Investigator : Sunti Tirapat*

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Abstract

This paper investigates the application of option pricing to calculate the premium of deposit insurance in Thailand during 1992-1996 period. In addition to applying the traditional Black-Scholes model, the barrier model of Boyle and Lee (1994) is examined. The barrier model takes the management (owners) action into account: the management (owners) may have a strong incentive to increase the volatility of the bank's assets since this action increases the value of their equity. As suggested by the stylized evidence, most financial institutions in Thailand were owned by "family" and there was inadequate corporate governance to prevent the incentive problems. The barrier model seems to fit the description of financial institutions in Thailand. The results overall show that the deposit insurance premiums of failed financial institutions are higher than the premiums of non-failed institutions. The evidence suggests that the option framework seems to be appropriate for pricing the premium: higher risk institutions pay higher insurance premiums. The results also show that the risk-based insurance premiums vary across time and on average are less than the premiums charged by the Financial Institutions Development Fund (FIDF).

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Chapter 1
Introduction

Financial institutions have important role in an economy: they allocate public savings (usually of short duration) to sectors (usually of long duration) that need resources. This function usually puts financial institutions into mismatch position and creates instability in the financial system. Therefore, to ensure the stability and soundness of the financial system, there is a need for some sort of safety net from the government such as implicit guarantee or deposit insurance. The guarantee scheme whether implicit or explicit (deposit insurance), however, creates its own problem, so called the moral hazard. As explained by Santomero (1997), it encourages risk taking by insured institutions since depositors neglect the monitoring function due to the government insurance. This in turn weakens the financial sectors as a whole and creates another instability to the system. One way to mitigate this moral hazard problem is to charge deposit insurance premium based on the riskiness of the financial institutions.

The option model can be applied to price such guarantee premiums since the insurance can be viewed as options as suggested by Merton (1977). To be specific, the deposit insurance is a put option written by regulators on the value of depository institutions' assets whose strike price is future deposit value. The value of the insurance can then be calculated using the Black and Scholes (1973) option pricing model. Subsequent to Merton (1977), several studies have empirically estimated the deposit premium using the option model. For example, Marcus and Shaked (1984) apply the Black and Scholes option pricing model to calculate banks' insurance premium in the U.S. and find that the Federal Deposit Insurance Corporation (FDIC) rate greatly exceed estimates of the risk-adjusted premium derived from the model. Ronn and Verma (1986) apply the option pricing model to calculate the insurance premium to the U.S. banks. They also perform the sensitivity analyses and show that rank orderings based on premiums are robust to changes in parameter, thus supporting the application of option pricing in charging the insurance premium across banks.

Due to the assumption of the derivation of the option model in the Black-Scholes (1973), the extant studies that estimate the insurance premium usually assume that the asset volatility of the bank is constant, i.e. exogenous. It is this point that Boyle and Lee (1994) argue that in the real world it may not be appropriate to assume the volatility is endogenous. The management of a bank can and will make decision that may affect the asset volatility. In particular, Boyle and Lee (1994) develop a model that provide for a changing volatility based on a class of exotic options known as the *barrier options*. The volatility of bank's assets can be changed when the assets cross a certain level. The idea is that when bank's assets value are low enough the managers (owners) of the bank may call for certain actions. And the managers (owners) have an incentive to increase the volatility of the bank since the bank shareholders' equity can be thought of a call option whose value increase with the volatility. Their model allows for the *go-for-broke strategy* when the owners have less to loose (when assets are low). The model of this type seems to be appealing and applicable to the newly developed financial structure such as Thailand.

The Thai financial system can be characterized as bank-centered system, given that funds provided by financial institutions (commercial banks and finance companies) are much higher than those raised from capital markets. For example, during the period of 1993-1996 loans provided by financial institutions were about 6 times funds raised from capital markets (issues of equity and bonds). Due to excessive lending and overinvestment in business sectors Thailand faced the severe financial sector crisis in the late 1996 to 1997. The regulators closed down 56 finance companies and 7 banks. Before this incident Thailand has no explicit deposit insurance scheme[1]. However, it was widely believed that the government implicitly fully guaranteed all the deposits. This led to severe moral hazard problems. Although most of the evidence is anecdotal, Corsetti, Pesenti, and Roubini (1998) point out that the government bail-out guarantees facilitate the accumulation of foreign loans by domestic financial institutions. They cite

[1] The idea of setting up a deposit insurance corporation was initiated by the Bank of Thailand in 1971. However, the Rehabilitation and Development Fund for Financial Institutions was established under the management of Bank of Thailand in November 1975, and later it's name was changed to the Financial Institutions Development Fund (FDIF) in March 1976. The FDIF is responsible for supporting the distressed financial institutions.

the best known case of Finance One: " *Few months before its collapse, ING Bank in Thailand had approved a loan to the company as part of a USD 160m syndication led by the World Bank's International Finance Corporation. According to ING sources, concerns about the viability of Finance One were simply dismissed by the Bank of Thailand, which made explicit reference to a promise of bail-out in case the company had financial problems.*" Aggravated by the financial liberalization process without adequate legal and regulatory infrastructure, the Thai financial system was inefficient and weak, waiting to be busted when the real sector shocks occurred in the late 1996. After the rescue by the International Monetary Fund (IMF), Thailand stated in the first letter of intent that the government would set up the deposit insurance corporation within Aug 31, 1999. Although the plan was postponed in the later letter of intent, the issue of appropriate pricing deposit insurance will certainly become important. If the insurance premium is priced accurately and efficiently the incentive or moral hazard problem will be mitigated.

This study intends to investigate the application of risk-based insurance pricing in Thailand. Although estimation of deposit insurance may appear to be a direct application of the Black and Scholes model but the implementation is not so straightforward. As mentioned by Ronn and Verma (1986): "*the chief argument against risk-adjusted deposit insurance has been that the implementation will be infeasible, as it calls for accurately quantifying the riskiness of each insured bank in terms of observable and realistic data.*" In addition to apply the traditional Black-Scholes model to the insurance premium, the paper investigates alternatives of the constant volatility assumption. This assumption is unlikely to hold since in the emerging market the volatility tends to change over time due to the dynamic of the economy. The GARCH (Generalize Autoregressive Conditional Heteroskadesticity) type model will be applied to estimate the volatility. And finally I investigate the application of the exotics options suggested by Boyle and Lee (1994) since this type of model is more appealing under an inadequate supervisory infrastructure environment where the *go-for-broke strategy* may prevail.

The paper proceeds as follows. Chapter 2 presents the brief review of the literature. The risk-based pricing model is discussed in Chapter 3. Chapter 4 reports results and implications. The paper concludes by summary and discussion in Chapter 5.

Chapter 2

Review of previous studies

Charging the appropriate premium for the deposit insurance has been examined by various studies subsequent to Merton (1977). There are three broad approaches in pricing the insurance premiums. One approach is to set the "fair" rate in the sense that it equals to administrative costs plus the expected value of the loss incurred in the future. Usually the expected losses are determined by the historical loss of the whole banking system. The approach has limitations to implement for emerging economy since the state of economy tends to change drastically so there is not adequate *history of failure*. This applies as well to the structure of Thai financial system which has experienced a lot of change during the past ten years. Hence using the past loss may not be a good representative of the future loss. The second approach concerns with frameworks such as dynamic optimization models or general equilibrium model, such as a model of deposit insurance with the coexistence of other regulators' mechanisms[2]. The approach is rather rigid in assumptions so the application is quite cumbersome to implement. The third approach, which the review is focused on, is to apply the option pricing model to charge the risk-based premium. This approach is quite appealing since it uses market information to infer risk and it requires less *history*[3].

The application of the option pricing model to deposit insurance is pioneered by Merton (1977). The insight by Merton (1977) is that the deposit insurance is analogous to put options. Consider a bank that insures its deposit with a deposit insurance corporation. It is assumed that a bank will be examined periodically (roughly once a year). If it is found that a bank is insolvent (i.e., a bank's total assets are less than its deposits), regulators will close down the bank and the cost to regulator is the difference

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[2] For example, Acharya (1996) develop a dynamic optimization model that allows the assets-to-deposits ratio and the charter value (the value that would be foregone due to a closure of a bank) to be stochastic. Pecchenino (1992) develops a model of a risk-based deposit insurance using the self-selection techniques. Knantas (1986) provides a theoretical framework of deposit insurance with the coexistence of the discount window under asymmetric information: banks have private information concerning their financial conditions. The study illustrates an interesting point that deposit insurance pricing policies that ignore informational asymmetry are unlikely to be incentive-compatible.

[3] The drawback, however, is that market should be efficient so the information implied by securities prices is correct. The issue of market efficiency of Thai market is out of the scope of this study.

between the asset value and the deposit. This is analogous to a put option whose exercise price is deposits and the underlying asset is a bank's total asset.

Marcus and Shaked (1984) provide an empirical test of the risk-based pricing model to sample of banks in the U.S. during the period of 1979-1980. They find that the values derived from the model are much less than the charge by the FDIC for banks in their sample[4]. In addition, the distribution of the premiums is extremely skewed, comparing to the flat charges by the FDIC. The risk-ordering among banks also seems to be moderately stable.

Ronn and Verma (1986) also apply the Black-Scholes option pricing model to the valuation of the deposit insurance premium. Their approach differs from Marcus and Shaked (1984) in certain aspects. Using a sample of 43 banks in 1983, they find that the weighted average premium is about 1/12 percent. They also perform the sensitivity analysis and find that the rank-ordering based on the estimated premium are robust to changes in parameters. The implication is that the model can be used to allocate aggregate premium across banks.

Boyle and Lee (1994) extend the Black-Scholes option pricing model by using barrier option model. They argue that the conventional approach to value deposit insurance as a put option has been criticized by many scholars, especially on the assumption of the constant volatility. The bank managers[5] (owners) have a strong incentive to increase the volatility of the bank's assets since this action increase the value of their equity. Boyle and Lee (1994) assume that the bank's volatility can be changed when the assets fall to a certain level, so called the barrier in option jargons. Their idea is that when assets fall to this level it is a signal that the bank may be in trouble and some action may be called for. The bank manager (owner) actions are incorporated in the model by the changing level of the volatility. They do not apply the model empirically but illustrate the characteristics of the model by numerical examples.

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[4] In their Table 1, the mean value of the premium in 1979 and 1980 is 92.8 and 28.4 per million dollars of deposits (0.00928% and 0.0028% of deposits), respectively. The charge by FDIC at that time is roughly 333 per million dollars of deposits (0.033%).

[5] It is assumed that the managers work in the benefit of the equity holders or owners.

They claim that the results correspond to the intuition: if the bank has the incentive and the capability to increase the volatility, then this will increase the liabilities of the deposit insurance.

Allen and Saunders (1991) point out that deposit insurance differs from that standard put option when it comes to the right to exercise the option. The ability to time the exercise is generally in the hands of the put writer (the deposit insurer) and not the put holder (the bank). They model deposit insurance as a *callable put option*. The deposit insurance in effect has the right to expedite or delay the exercise of the put. In other words, the insurance premium is the spread between the put and the call. Consequently, studies that ignore the value of the call option have tended to overestimate the fair value of the deposit insurance premium.

King and O'Brien (1991) provide an alternative application of the option pricing model. Instead of calculating the risk-based premium, the option model can be used to set up a risk-based examination schedule whereby riskier banks would be examined a more frequent basis. They argue that such an examination schedule is consistent with prompt resolution strategies since it would relate the frequency of examination and closeness of supervision to banks' riskiness.

Although it is well accepted that the incentive problems incurred by the guarantee will be less pronounced if the government could price the premium accurately and efficiently. Santomero (1997) points out that nowhere in the world has appropriate risk-based pricing of deposit insurance been instituted. See also the practice of deposit insurance in G7 countries in the Appendix 1a. Santomero (1997) suggest the reason may be that an efficient risk-based pricing scheme would require the accurate and dynamic estimation of risk for each asset class. Faced with this difficulty until recently the FDIC in the US chose to apply the insurance based on a flat pricing schedule. The current US scheme is also presented in the Appendix 1b.

Chapter 3
The pricing model

3.1 The basic model

In this section I present the basic risk-based pricing model that suggested by Merton (1977) and employed by others such as Marcus and Shaked (1984) and Ronn and Verma (1986). Then the model using exotics options will be presented in the next section. It is convenient to define the following notion:

I = Value of deposit insurance
V = Market value of bank's assets
F = Value of bank deposits
r = Risk-free rate of interest
σ_V = Standard deviation of rate of return on the bank's assets
σ_E = Standard deviation of rate of return on the bank's equity
δ = Dividend rate
$N(.)$ = The cumulative standard normal distribution
t = Time where $t = 0$ is current and $t = T$ is time to next audit of bank's assets or "maturity" of option
E = Market value of equity
D = Market value of debt

Since the payoff of the deposit insurance at the maturity is:

$$\text{Maximum } \{F_T - V_T, 0\}$$

and this can be thought of a put with the strike price of F_T and the underlying asset is the value of bank's assets. As shown by Merton (1977) if the value of bank assets follows a diffusion process then the market value of the deposit insurance at time 0 can be derived as:

$$I_0 = F_T e^{-rT}[-N(d_2)] - e^{-\delta T} V_0[-N(d_1)]$$

or

$$I_0 = F_T e^{-rT}[1 - N(d_2)] - e^{-\delta T} V_0[1 - N(d_1)] \quad (1)$$

where

$$d_1 = \frac{\ln(V_0 / F_T) + (r - \delta + 0.5\sigma_V^{\,2})T}{\sigma_V \sqrt{T}}$$

$$d_2 = d_1 - \sigma_V \sqrt{T}$$

It should be noted that we can not observe V since it is the value of asset *before* insurance, what we can observe is the market values of debt plus equity, D+E. That is,

$$V + I = D + E \quad (2)$$

To estimate equation (1) the problem is that we can not observe the volatility of the return on bank's assets. Hence, we have to calculate it from the volatility of return on equity. Using the relation:

$$\sigma_E = \frac{\partial E / E}{\partial V / V} \sigma_V \quad (3)$$

and from (2), $\partial E / \partial V = 1 + \partial I / \partial V = N(d_1)$. Substitute in (3), note also that here the asset pay dividend at rate δ so we have

$$\sigma_V = \frac{E}{V_0 e^{-\delta T}} N(d_1)^{-1} \sigma_E \quad (4a)$$

and if we recall that equity value equals to a call option, i.e.,

$$E = V_0 e^{-\delta T} N(d_1) - F_T e^{-rT} N(d2)$$

From (4a), we get the following relationship,

$$\sigma_V = \left[1 - \frac{F_T e^{-rT} N(d_2)}{V_0 e^{-\delta T} N(d_1)}\right]\sigma_E \qquad (4b)$$

To estimate the value of the insurance premium in (1) in effect we have to simultaneously solve for the system of equation (1)-(4) since the term I appears in the right hand side of (1) and in d_1 of (4).

3.2 The barrier option model

As mentioned before, the application of the traditional Black-Scholes to deposit insurance pricing has been questioned about the validity of the constant volatility. It seems appropriate in practice that some serious actions will be called for when banks' equity prices decrease to a certain level. And these actions will lead to a change in the volatility of bank asset: usually it should increase since there is incentive for the *go-for-broke strategy*. Boyle and Lee (1994) propose the application of the barrier option framework to take into account the changing volatility resulting from the management actions.

To be specific, we assume that initially V > H the barrier level and the initial volatility level is σ_0. If the asset price reaches the barrier level, H, the bank selects a volatility level from the interval $[\sigma_l, \sigma_h]$, where $\sigma_l < \sigma_0 < \sigma_h$. The regular option is composed of the down-and-out put (DOP) and the down-and-in put (DIP). If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. The deposit insurance, I, can be written as:

$$I = DOP + DIP \qquad (5)$$

The DOP can be valued as the following gap options[6]:

$$DOP[V_0, H, F, r, \sigma_0, T] = GP[V_0, F, F, r, \sigma_0, T] - GP[V_0, F, H, r, \sigma_0, T]$$
$$- \left\{\frac{H}{V_0}\right\}^{\gamma} GP[H, \frac{V_0 F}{H}, \frac{V_0 F}{H}, r, \sigma_0, T]$$
$$+ \left\{\frac{H}{V_0}\right\}^{\gamma} GP[H, \frac{V_0 F}{H}, V_0, r, \sigma_0, T] \qquad (6)$$

where $\gamma = \frac{2r}{\sigma_0^2}$

and

GP[asset (S), strike price (K), trigger value (A), r, σ, T] =

$$Ke^{-rT}[-N(b_2)] - V_0[-N(b_1)]$$

$$b_1 = \frac{\ln(S_0 / A) + (r + 0.5\sigma^2)T}{\sigma\sqrt{T}}$$

$$b_2 = b_1 - \sigma\sqrt{T}$$

Following Boyle and Lee (1994), let μ is the time that the barrier H is first attained, the value of a DIP is:

$$DIP[V_0, H, F, r, \sigma_0, \sigma_h, T] =$$

$$\int_0^T g(V_0, H, r, \sigma_0, \mu) e^{-r\mu} PUT[H, F, r, \sigma_h, T - \mu] d\mu \qquad (7)$$

where the density g is given by:

---

[6] Gap options are options that the asset level that trigger the exercise decision is different from the exercise price where the standard options that the trigger level to exercise is the exercise price.

$$g(V_0,H,r,\sigma,\mu)=\frac{X_0}{\sqrt{2\pi\sigma^2\mu^3}}e^{-\left\{\frac{[X_0+(r-0.5\sigma^2)\mu]^2}{2\sigma^2\mu}\right\}},\ X_0=\ln(\frac{V_0}{H})$$

and PUT is the regular Black-Scholes put option[7]. The value of the DIP can be estimated using the numerical method.

3.3 Discussions of assumptions

The Black-Scholes model requires several assumptions such as the normality of asset returns, non-stochastic interest rates, and the option type is European. Besides these usual assumptions, applying the Black-Scholes model to deposit insurance in Thailand needs to assume the following:

Maturity

Unlike the option, the maturity of the insurance in practice is not clearly specified. Since the Bank of Thailand make an on-site inspection once a year, it is reasonable to assume that the maturity of the insurance is one year.

Risk-free rate

The risk-free rate in Thailand during the 1992-1996 period is essentially not exists since the government bond market was not active. The proxy for the risk-free rate here is the average of the major banks saving rate. This may be appropriate since the government has implicitly guaranteed the deposits.

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[7] Specifically, $PUT(H,F,r,\sigma_h,T-\mu)=Fe^{-r(T-\mu)}N(-d_2)-HN(d_1)$ where

$d_1=\dfrac{\ln(H/F)+(r+0.5\sigma_h^{\ 2})(T-\mu)}{\sigma_h\sqrt{T-\mu}}$ and $d_2=d_1-\sigma\sqrt{T-\mu}$

The barrier level and the selected volatility

Since we can not observe the barrier of the level that will trigger the management actions. I use various level of the barrier ranging from 0.9 to 1.2 of the deposit value. The level of the changed volatility is also ranging from 1.25 to 1.75 of the initial level.

Chapter 4
Data and Results

4.1 Sample and data

Financial institutions (commercial banks and finance and securities companies) listed in the Stock Exchange of Thailand that operate during the period of 1992 – 1996 are selected as a sample. The resulting sample consists of total 35 financial institutions, 14 banks and 21 finance and securities companies. The Stock Exchange of Thailand I-SIM CD Rom and DataStream provides data of deposits, dividend, market value of equity, and stock price. The standard deviation of equity returns, σ_E, was calculated using average daily log price ratio of each year and then annualized. The risk free rate is the average of saving rate reported by the Bank of Thailand since during most period of study there was no government securities being issued. The sample and their descriptive statistics are reported in Appendix 2. List of companies' abbreviations is shown in Appendix 3. The normality tests of securities returns are in Appendix 4. It is not surprising that the most of securities returns are fat-tailed distributions.

4.2 Empirical results

The results of the estimated risk-based deposit premiums for commercial banks and finance and securities companies during the period of 1992-1996 are reported in Table 1 through Table 5. Table 1 (see also Figure 1) presents the premiums based on the traditional Black-Scholes pricing model as in Marcus and Shaked (1984). It should be noted that in Thailand the fee required by the Financial Institutions Development Fund (FIDF) was 0.1% of deposits from 1992 until 1996 but starting in 1998 it was raised to 0.4% of deposits and borrowings (exclude subordinated debts). From Table 1, it can be seen that on average the insurance premiums of banks and finance and securities companies are lower than those required by the FIDF. The total weighted-average premiums (weighted by deposit size) vary from 0.0013 - 0.0424 % for banks and 0.0099 – 0.0368 % for finance and securities companies. It should be noted also that the weighted average insurance premiums of failed institutions, both banks and

finance companies, are higher than those of the non-failed institutions consistently throughout the 1992-1996 period. It may be surprising to see that the total average insurance premiums of banks during 1992-1993 were higher than the premiums of the finance and securities companies, 0.0424 and 0.06626 comparing with 0.0176 and 0.0099, respectively. This was due to the high premium of the Union Bank (UB) in 1992 and that of the Bangkok Bank of Commerce (BBC) in 1993. However, this pattern has reversed during the 1994 through 1996 suggesting that on average the finance and securities companies are riskier than banks.

Under the GARCH (1,1) volatility estimation, see Table 2 and Figure 2, the results show that in general the estimated volatility has more movement than the historically estimated volatility. The total weighted average of premiums of banks are higher than 0.1% in 1993 while those of finance and securities companies are higher than 0.1% in 1993 and 1994. It is also observed that the premiums of some institutions are extremely high in some period, for example 6.873% for FCI in 1993 or 6.523% for GF in 1994. However, consistent with the historical estimation, the weighted-average insurance premiums of failed institutions, both banks and finance companies, were higher than those of the non-failed institutions consistently throughout the 1992-1996 period, suggesting that the option model perform quite well in pricing risk.

Table 3 through 5 report the premium based on the barrier models, using the barrier level 90%, 100%, and 120% of the strike price. The results in Table 3 show that the for the 90% barrier[8] the magnitude and the behavior of the premium is not significantly different from the premiums calculated using the traditional Black-Scholes model in Table 1. It should be noted also that the premium is not sensitive to the level of the volatility. For example, in 1996, the total average insurance premium of banks are 0.0209, 0.0215, and 0.0221 for the σ_H is equal to 1.25, 1.5, and 1.75, respectively (see also Figure 3.1). For the barrier level of 100%, Table 4, it can be seen that the premiums are in general higher than those of the traditional Black-Scholes. For example, in 1996 the total weighted average premiums of banks are 0.0047 %,

[8] The management begins to change policy after the value of the assets fall to 90% of the strike or the deposit value.

0.0059%, and 0.0072% for the σ_H = 1.25, 1.5, and 1.75, respectively, comparing to the 0.0035% of the Black-Scholes. The behavior of the premiums is quite similar to that of the Black-Scholes. In general the premiums declined after 1993 and started to increase again in 1996 (see Figure 3.2). The insurance premiums of banks were lower than the premiums of the finance and securities companies during the study period, except for 1993 (due to BBC case). Under the barrier level of 120%, Table 5 shows that the premiums are in general higher[9] than those of the previous cases for both banks and finance and securities companies. The volatility level selected by the management, σ_H, now play an important role in determining the premiums (see Figure 3.3).

Finally, the results, consistent with the Black-Scholes model, show that the weighted-average insurance premiums of failed institutions, both banks and finance companies, were higher than those of the non-failed institutions consistently throughout the 1992-1996 period. This evidence seems to support the application of the option model in determining the deposit insurance premiums.

[9] The reason is that the management begins to take action (increase the volatility) earlier than the previous cases.

Chapter 5
Discussions and conclusions

5.1 Discussions

Thailand, at the time of writing, is in the process of setting up the Deposit Insurance, replacing its implicit guarantee scheme by the government. This study aims to provide some insight on the issue of risk-based insurance premium. However, it is important for recognize that the deposit insurance is *only an element of the financial safety net*. The stability of the financial system also depends on other mechanisms such as short-term lending and the lender of the last resort role of the regulators. The role of deposit insurance is to prevent the depositors' incentives to make a "run" on the banks, thereby reducing panic from spreading through the system. It should be noted also that the deposit insurance is not to substitute to the strong and prudent supervision. As Helfer (1999) suggests that "*In the absence of strong bank supervision, the central bank and the deposit insurance system might find themselves providing financial support for insolvent banks engaged in risky activities that could damage the health of the financial system. Prudential supervision, which consists of onsite surveillance of banks through examinations ad offsite surveillance trough regular financial reporting employing internationally recognized accounting standards, is the eyes and ears of central and deposit insurance systems.* "

Other alternatives to control incentive problems are discussed by Calomiris (1997). The study provides an excellent review of the evolution of the modern financial safety net from developed and developing economies (Latin America countries). He points out that idea of the so-called postmodern safety net is to avoid abuse of government protection that arises when the cost of banks for access to the safety net does not properly reflect their decision to bear risk. The risk based pricing using option theory may not be a solution to this problem due to: i) the asymmetric information between banks and regulators and ii) politic incentives. He also discusses two popular reforms that have been considered: the narrow-banking approach and market discipline (or required "subordinated debt").

The concept of narrow-banking approach is that banks should be required to back demand deposits entirely by short-term assets (i.e. 100 percent reserve requirements). Under this approach government does not insure deposits held outside the narrow bank. Hence it effectively reduces risks but it may not be politically credible. Uninsured deposits would still leave banks susceptible to capital crunches and runs which would require ad hoc government interventions.

The subordinated-debt-financing requirement approach requires banks to finance a minimum fraction of their total non-reserve assets with a capped rate (say, no greater than 50 basis point above the riskless rate). To be willing to hold the bank's subordinated debt, market (debt holders) would have to be satisfied that the bank is not too risky to be compensated by the capped spread. Banks that were not be able to convince debt markets that their operations were sound (adequate capital, prudent investments) would be unable to rollover their debts. Hence, under this approach, debt markets drive banks to reduce their risk if it ever becomes too excessive. The subordinated-debt-ratio requirement is appealing in an financial environment that become more dynamic and complex since the scheme has shifted the regulatory burden an sophisticated market participants. Government regulatory bodies may not have adequate skills to monitor under this environment. Calomiris (1997) points out that under this approach it ensures incentive compatibility with a minimal set of regulatory guidelines and reliance on government supervisors to analyze and disclose the condition of bank loan portfolios.

Garcia (1999) recently documents that in practice a country faces six choices regarding deposit protection: (1) Explicitly no protection; (2) Higher priority for the claims of depositors; (3) Ambiguity concerning coverage; (4) Implicit guarantee; (5 Explicit limited coverage; (6) Full explicit guarantee. It is argued that, if well-designed, an explicit deposit insurance can be preferable to other alternatives.

In designing the deposit insurance system for a country it should be recognized that there are three strands of good bank governance: internal control (from owners, board of directors, and managers); market discipline (from depositors, other creditors

and borrowers); oversight from regulation and supervision. A well designed deposit insurance system should not hamper these mechanisms. Experience from the survey of 68 countries shows that a deposit insurance faces problem of providing incentive compatibility for owners, managers, depositors, borrowers, regulators, and politicians. Hence, when setting up the insurance it needs to build good incentives for all of these economic agents. It is unwise to construct the system only from the regulatory perspective.

In addition, Garcia (1999) points out an interesting point that a deposit insurance may not work well in the time of crisis. A separate response may be needed to manage systemic crisis, which may require overriding a normal deposit insurance system. Thus, an attempt to replace a full implicit guarantee by a limited insurance when the banking system is facing systemic problems is likely to be ineffective. The initiation of the insurance should wait until after the banking system has been recapitalized and restructured[10].

5.2 Conclusions

This paper investigates the application of option pricing to calculate the premium of deposit insurance in Thailand during 1992-1996 period. In addition to applying the traditional Black-Scholes model, the barrier model of Boyle and Lee (1994) is examined. The barrier model takes the management (owners) action into account: the management (owners) may have a strong incentive to increase the volatility of the bank's assets since this action increases the value of their equity. The barrier model seems to fit well with the description of the Thai financial institutions: according to stylized evidence, most of financial institutions in Thailand were owned by "family" and there was inadequate corporate governance to prevent the incentive problems. The results show that the deposit insurance premiums of failed financial institutions are higher than the premiums of non-failed institutions. This seems to

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[10] This is probably the reason that the Bank of Thailand postpones its plan to implement the deposit insurance system since the two stated own banks, Krung Thai Bank and Thai Bank, have not been successfully recaptialized.

suggest that the option framework be able to appropriate for pricing the insurance premiums: high risk institutions pay high premium.

The results also suggest that on average the risk-adjusted premiums are less than those charged by the FDIF (0.1% of deposits) during the period of study. Under the traditional Black-Scholes model with the historical volatility estimation, the overall premiums on average are ranging between 0.0004 – 0.0291% and 0.009-0.037% of deposits for banks and finance and securities companies for the 1992-1996 period, respectively. During 1992-1996, the average (across time) total weighted-average premium for banks is around 0.02 % (of deposits) for both banks and finance and securities companies, five times less than those required by the FDIF. Under the GARCH volatility estimation, the premiums vary quite significantly resulting from the dynamic of the estimation. The total weighted-average premiums are ranging from 0.0004-0.1535% and 0.005-0.8608% of deposits for banks and finance and securities companies, respectively. The average during 1992-1996 is around 0.06% and 0.22% for banks and finance and securities companies, respectively. For the barrier options, the results are quite similar to the Black-Scholes under historical volatility estimation for the 90% and 100% barrier level. Under the 120% level with $\sigma_H = 1.75$, the premiums are higher than those charged by the FDIF.

In summary, it is found that the option model seems to price insurance premiums according to the risk of financial institutions. In other words, the direction of charging the insurance premium is correct: failed institutions pay high premiums than non-failed institutions. The question whether the magnitude is too high or too low should be left to further study.

Appendix 1a: Government Safety Nets In G-7 Countries

	Germany	France	Japan	United Kingdom	Italy	Canada	United States
Deposit Protection Method							
Date established	1966[a]	1980	1971	1979	1987	1967	1934
Govt. administered or private	Private	Private	Govt. and private	Government	Private	Government	Government
Voluntary or compulsory	Voluntary	Voluntary	Compulsory for some	Compulsory	Voluntary	Compulsory	Voluntary
Funding method	Contributions form Members	Loss-sharing Agreement	Insurance premiums	Routine and special Contributions	Callable Commitments	Insurance premiums	Insurance premiums
Level of contributions	Annual premiums = 0.06 of deposits	Regressive scale based on deposits up to FR 30 billion	Annual premium = 0.132% of insured deposits	$10,000+special assessments if fund <$3 million≤ 0.3% of domestic deposits	Up to 1% of total deposits and 0.5% of members' customers' deposits[g]	Annual premium of 0.1 of insured deposits	Annual premium of 0.23% of total Domestic deposits (see Table 5.4)
Coverage Offered							
Basic protection[c]	Up to 30% of liable Capital[d] per depositor	Up to 400,000 francs $63,000 per deposit	10 million yen $74,000 per depositor	75% of first $20,000 ($33,000)per depositor	100% of first 200 million lire($146,000) 80% of next 800 million lire ($584,000) per deposit	C$60,000 (US$50,000) per depositor	$ 100,000 per deposit
Deposit in foreign currency	Yes	No	No	No	Yes	No	Yes
Interbank deposits	No	No	No	No	No	Yes	Yes
Branches of foreign banks	Yes	Yes	No	No	Yes	Not available	Yes
Branches in other countries	Yes	No	No	No	Only if host country doesn't cover	No	No
Prudential Supervision and Industry Structure							
Number of banks	4,400 commercial (incl. 1,200 small banks	500 banks	<500 banks	500	1,000 but majority of assets held by top 25 banks	500 banks	12,800 commercial banks (19900
Reporting requirements	Monthly return and balance sheet data[e]	Balance sheet Data, incl. Non \ banks	Periodic financial reports	Monthly balance sheet and income statement[h]	Data on bank ratios and liquidity levels	Not available	Quarterly balance sheet and income statement
On-site exams conducted by	Qualified outside auditors	High-ranking senior Bank regulators	Bank regulators	Outside auditors	Bank regulators	Bank regulators[i]	Bank regulators
Ownership	Private commercial Public saving[f]	68% publicly owned	Private ties to MoF	Private, licensed by Bank of England as per banking Act of 1979	Not available	Federally and provincially chartered	National and state charters
Universal banking	Yes(insurance through subsidiaries)	Yes (insurance through Subsidiaries)	No	Yes (through subsidiaries)	Yes	Yes	No
Unofficial too big to fail?	Yes, e.g., Schroder Munchmeyer, Hengst & Co. in 1983	Yes, e.g., Al Saudi Basque in 1998 and during 1990s financial crisis	Yes, mortgage banks and large banks	Yes, e.g., Johnson Marthey Bankers, 1984	No, e.g., Banco Ambrosiano in 1982	Yes,e.g., 1985 , Canadian Commercial and Northland Bank of Calgary	Yes, e.g., bank of New England in 1991

Source: L. Allen. "Deposit Insurance and Bank Capital Regulation." In A Stone and C. Zissu, eds., *Global Risk Based Capital Regulations.* Vol. I. Burr Ridge, III: Irwin, 1994.

Appendix 1b: Risk Adjusted Deposit Insurance Premium: United States, 1996 (cents per $ 100 of deposits)

Capital Classifications	Tier 1	Tier 2	Total	Healthy	Supervisory Concern	Substantial Supervisory Concern
Deposit Insurance Premiums for Banks (27-cent rate spread)						
Well capitalized	>6%	>5%	>10%	0[a]	3	17
Adequately capitalized	>4%	>4%	>8%	3	10	24
<Adequately capitalized				10	24	27
Undercapitalized	<4%	<4%	<8%			
Significantly undercapitalized	<3%	<3%	<6%			
Critically undercapitalized	<2%					
Pct. of banks in each group						
Well capitalized *				92%	5.2%	1.3%
Adequately capitalized				0.7%	0.2%	0.3%
<Adequately capitalized				0.1%	0.04%	0.2%
Deposit Insurance Premiums for Thrifts (8-cent rate spread)						
Well capitalized				23	26	29
Adequately capitalized				26	29	30
Undercapitalized				29	30	31
Pct. of thrifts in each group						
Well capitalized				86.1%	7.7%	1.4%
Adequately capitalized				1.2%	1.7%	1.5%
Undercapitalized				0.0%	0.0%	0.4%

[a]Subject to the statutory minimum of $2,000 per institution per year

Source: FDIC Corporate Communications Office.

Appendix 2: Descriptive Statistics

The data set consists of a sample of 35 financial institutions (14 commercial banks and 21 finance and securities companies) that operate during the period 1992 - 1996. The Stock Exchange of Thailand I-SIM CD Rom and DataStream provides data of deposits, dividend, market value of equity, and stock price.

Banks	1992			1993			1994			1995			1996		
	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)
BAY	147,513	12,652	123,817	178,114	18,916	148,557	212,857	28,996	167,922	296,789	29,772	234,828	385,295	38,768	312,440
BBC*	77,570	2,119	63,136	105,445	9,344	79,534	122,378	6,700	98,428	143,215	6,148	108,649	186,863	15,656	132,965
BBL	601,908	43,800	448,334	713,673	93,000	498,754	934,025	218,000	591,534	1,026,235	206,034	657,282	1,158,770	216,276	770,423
BMB*	73,462	3,705	54,007	89,804	8,710	65,735	118,183	14,609	90,146	140,357	17,646	96,740	173,986	17,706	124,447
BOA	63,810	12,652	39,417	71,074	18,916	39,470	93,635	28,996	47,071	106,714	29,772	53,603	139,546	38,768	79,660
FBCB*	97,622	7,075	73,667	137,099	19,334	98,117	170,974	31,211	119,416	197,531	37,122	139,115	229,647	37,474	164,609
KTB	335,581	13,530	289,110	382,509	40,163	315,706	492,916	90,680	371,491	631,402	107,528	461,377	750,466	154,440	500,280
LTB*	9,864	485	8,716	13,677	443	11,916	19,449	1,560	15,066	24,223	2,320	17,870	32,731	3,609	23,256
NTB*	23,666	1,276	19,697	31,030	3,768	22,661	42,207	7,506	25,861	49,946	8,208	29,816	62,521	9,428	40,317
SCB	233,249	21,922	177,667	294,092	38,399	216,080	374,856	75,939	261,553	410,520	73,070	277,395	506,974	88,879	342,191
TDB	33,243	1,272	27,510	41,135	2,308	32,067	51,437	3,893	39,380	67,814	4,630	63,184	86,494	5,050	81,444
TFB	312,216	26,726	254,517	393,588	56,960	296,563	502,767	96,800	360,422	600,520	138,400	403,315	670,068	137,600	466,574
TMB	126,350	7,951	105,818	157,070	13,019	128,347	215,783	36,964	154,688	246,455	34,654	178,514	308,153	44,377	217,229
UB*	34,520	3,406	26,497	36,662	2,225	27,012	41,870	3,482	31,153	45,599	3,491	31,833	55,225	3,260	36,733
Weighted Average															
Failed Institutions	**75,136**	**4,759**	**59,221**	**92,587**	**9,950**	**69,384**	**117,312**	**17,732**	**84,985**	**137,774**	**19,299**	**96,016**	**168,674**	**23,363**	**117,333**
Non-Failed Institutions	**231,734**	**17,563**	**183,274**	**278,907**	**35,210**	**209,443**	**359,784**	**72,533**	**249,258**	**423,306**	**77,983**	**291,187**	**500,721**	**90,520**	**346,280**
Total	**155,041**	**11,326**	**122,279**	**188,927**	**23,250**	**141,466**	**242,381**	**46,095**	**169,581**	**284,809**	**49,914**	**196,680**	**339,053**	**57,949**	**235,183**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

Appendix 2 (Continue): Descriptive Statistics

The data set consists of a sample of 35 financial institutions (14 commercial banks and 21 finance and securities companies) that operate during the period 1992 - 1996. The Stock Exchange of Thailand I-SIM CD Rom and DataStream provides data of deposits, dividend, market value of equity, and stock price.

Finances	1992			1993			1994			1995			1996		
	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)	Asset (Btm)	Equity (Btm)	Deposit (Btm)
AIFT	5,128	1,162	2,611	5,828	1,147	3,029	7,783	2,235	3,725	9,042	2,205	5,435	9,532	1,824	6,160
AITCO	7,024	1,985	3,525	7,522	2,101	3,331	10,239	3,864	3,356	10,117	3,062	4,199	14,201	3,350	5,013
BFIT	4,988	1,027	3,055	6,247	1,240	3,797	9,816	2,553	5,364	10,104	2,498	6,174	9,805	1,757	6,468
CMIC*	19,925	2,900	13,039	27,039	3,844	13,039	38,121	6,969	21,732	43,989	5,727	31,848	65,672	15,427	41,230
DS*	25,085	1,333	16,965	36,146	3,680	23,973	50,411	11,042	21,374	58,741	9,586	28,669	85,451	28,670	34,339
FCI*	10,695	1,594	8,571	11,875	3,773	7,107	20,162	14,575	4,422	n/a	n/a	n/a	28,427	10,534	9,004
FIN1*	29,047	4,955	18,085	42,962	5,218	26,055	67,886	21,630	30,970	81,826	17,241	43,172	142,939	60,841	50,808
GF*	10,497	1,365	7,231	16,654	2,432	11,461	28,833	6,604	15,047	37,227	5,535	22,544	61,109	16,066	27,951
ITF*	8,294	4,057	3,345	13,407	7,749	4,325	21,439	9,818	9,774	25,538	5,679	18,247	29,836	3,773	23,245
KK	4,328	374	3,117	9,346	1,295	6,001	14,189	2,205	8,277	20,842	7,051	9,624	21,939	4,826	11,157
MCC*	8,105	1,667	3,664	14,731	3,955	5,782	28,265	8,748	11,653	31,046	4,351	16,624	35,401	3,580	17,530
NAVA*	13,009	1,955	7,818	21,867	3,345	11,939	35,542	8,191	16,636	39,461	5,534	22,486	59,247	16,063	23,509
NFS	19,087	531	13,958	25,756	765	20,186	40,408	3,478	27,182	51,236	8,241	32,047	83,878	29,528	36,121
PHATRA	23,090	1,950	15,413	31,422	2,946	20,531	48,109	9,873	24,387	95,139	52,299	28,788	101,995	50,737	36,769
SDF*	4,049	528	2,890	5,071	469	2,971	9,718	2,361	6,100	12,745	2,013	8,224	18,392	2,529	13,181
SGACL	35,389	7,616	19,789	46,797	10,973	26,958	67,785	24,914	25,549	62,643	14,657	28,457	66,150	11,921	31,124
TISCO	21,388	1,439	11,493	27,204	2,139	15,018	31,178	4,118	15,948	37,751	2,291	15,162	42,890	2,139	13,414
TMF*	4,677	1,337	1,940	6,198	1,468	2,164	10,989	3,245	5,910	14,671	3,300	9,162	14,900	2,265	8,960
TTF*	4,953	644	3,111	6,024	1,192	3,610	7,365	1,606	4,271	12,004	3,125	6,187	16,344	4,125	8,715
UAF*	24,523	3,849	16,157	33,441	8,442	19,909	46,738	15,159	19,530	41,901	9,448	19,686	43,783	7,008	19,702
UNITED*	3,068	362	2,452	5,849	754	4,171	11,366	2,606	7,051	14,908	3,120	9,829	16,247	3,510	10,576
Weighted Average															
Failed Institutions	12,764	2,042	8,098	18,559	3,563	10,500	28,987	8,658	13,421	31,851	5,743	18,206	47,519	13,415	22,212
Non-Failed Institutions	15,053	2,011	9,120	20,015	2,826	12,356	28,688	6,655	14,223	37,109	11,538	16,236	43,799	13,260	18,278
Total	13,636	2,030	8,487	19,114	3,282	11,207	28,873	7,895	13,727	33,854	7,951	17,455	46,102	13,356	20,713

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997.

Appendix 3: List of Banks and Finance and Securities Companies in the Sample

Banks		Finance and Securities	
BAY	BANK OF AYUDHYA	AIFT	AIG FINANCE (THAILAND)
BBC	BANGKOK BANK COMMERCE	AITCO	AYUDHYA INVESTMENT AND TRUST
BBL	BANGKOK BANK	BFIT	BANGKOK FIRST INVESTMENT AND TRUST
BMB	BANGKOK METROPOLITAN BANK	CMIC	CMIC FINANCE AND SECURITIES
BOA	BANK OF ASIA	DS	DHANA SIAM FINANCE AND SECURITIES
FBCB	FIRST BANGKOK CITY BANK	FCI	FIRST CITY INVESTMENT
KTB	KRUNG THAI BANK	FIN1	FINANCE ONE
LTB	RADANASIN BANK	GF	GENERAL FINANCE AND SECURITIES
NTB	NAKORNTHON BANK	ITF	ITF FINANCE AND SECURITIES
SCB	SIAM COMMERCIAL BANK	KK	KIATNAKIN FINANCE AND SECURITIES
TDB	DBS THAI DANU BANK	MCC	MULTI-CREDIT CORPORATION OF THAI
TFB	THAI FARMERS BANK	NAVA	NAVA FINANCE AND SECURITIES
TMB	THAI MILITARY BANK	NFS	NATIONAL FINANCE AND SECURITIES
UB	BANKTHAI SUSP	PHATRA	PHATRA THANAKIT
		SDF	SRI DHANA FINANCE AND SECURITIES
		SGACL	SG ASIA CREDIT
		TISCO	TISCO FINANCE
		TMF	THAIMEX FINANCE AND SECURITIES
		TTF	THAI TANAKORN FINANCE AND SECURITIES
		UAF	UNION ASIA FINANCE
		UNITED	UNITED FINANCE CORPORATION

Appendix 4: Normality test of daily security returns during 1992-1996

Banks

	BAY					BBC					BBL				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.1780	0.1851	0.0259	0.1155	-0.2090	0.5199	-0.0046	-0.0958	0.1172	N/A	0.3168	0.3483	-0.0013	0.0282	-0.0357
Median	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0
Maximum	9.93	9.86	6.95	9.17	10	10.01	44.61	9.05	9.72	N/A	10	8.78	9.17	4.84	5.26
Minimum	-9.98	-7.61	-8.11	-5.56	-9.95	-9.92	-10.01	-8.02	-5.09	N/A	-9.83	-7.52	-9.09	-4.64	-8.33
Std. Dev.	2.1890	2.0749	1.7832	1.6688	2.4325	3.4791	5.1246	2.1968	2.2240	N/A	2.4103	2.0314	2.0267	1.4152	1.5047
Skewness	0.7270	0.8508	-0.2752	0.6514	-0.3036	0.6979	2.4922	0.3932	1.1122	N/A	0.8688	0.4545	-0.1384	0.4380	-0.3015
Kurtosis	8.04	7.02	6.76	6.63	5.92	5.00	24.05	4.91	6.32	N/A	7.29	5.73	6.11	3.91	6.95
Jarque-Bera	299.08	207.30	156.53	161.10	97.11	64.78	5089.63	46.37	172.73	N/A	232.25	89.40	105.09	17.14	174.15
Probability	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0.0002	0
Observations	261	261	260	260	262	261	261	260	260	N/A	260	260	259	259	262

	BMB					BOA					FBCB				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.3935	0.2343	0.0328	-0.0348	-0.2574	0.3723	0.4358	-0.0307	0.0359	-0.1440	0.3811	0.1426	0.0182	-0.0334	-0.1344
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	10.06	9.81	10.02	9.77	9.43	10.03	10	9.68	9.95	6.29	10.03	9.99	10	9.52	7.14
Minimum	-10.05	-9.42	-8.52	-7.63	-9.38	-9.95	-7.4	-9.68	-6.67	-9.68	-10.01	-7.77	-8.13	-6.49	-9.63
Std. Dev.	3.4832	2.6996	2.4556	2.1752	2.5003	3.3525	2.9652	2.4940	2.5479	1.8381	3.6498	2.4307	2.0989	1.9803	2.1880
Skewness	0.5371	0.4355	0.4245	0.8566	0.1324	0.5079	1.1273	-0.0446	1.1387	-0.7142	0.4848	0.8253	0.1780	0.8542	-0.5806
Kurtosis	5.29	4.85	5.63	5.83	5.92	5.13	5.08	5.28	6.06	8.10	4.29	5.03	6.31	7.12	6.64
Jarque-Bera	69.39	45.58	82.69	118.39	93.67	60.67	102.50	56.62	157.75	306.24	28.26	74.43	119.71	215.52	159.51
Probability	0	0	0	0	0	0	0	0	0	0	0.000001	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

Remark : *Normality Properties*
Skewness = 0 and Kurtosis = 3
Jarque-Bera (at 95% confidence level) < 5.99

Appendix 4 (Continue): Normality test of daily security returns during 1992-1996

Banks

	KTB					LTB					NTB				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.3431	0.3362	0.0902	0.1170	-0.2479	0.0481	0.5320	0.0307	-0.0274	0.0174	0.2634	0.3036	0.0215	0.0394	-0.0312
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	10.02	10	10	4.97	9.26	10.03	9.92	9.98	10	9.71	9.81	9.93	10.01	9.04	9.93
Minimum	-9.98	-5.24	-7.19	-4.97	-9.9	-10.08	-9.01	-9.31	-8.96	-8.04	-8.35	-9.66	-7.01	-7.04	-8.89
Std. Dev.	2.8915	2.1865	2.2269	1.7001	2.4917	4.0819	3.1425	2.5457	2.8905	2.5984	2.4235	2.8201	2.6891	2.2015	2.1306
Skewness	1.0004	0.9596	0.3966	0.4310	-0.3039	0.0840	0.8229	0.7737	0.3284	0.6433	0.6594	0.6058	0.7949	0.7664	0.3005
Kurtosis	5.55	6.12	6.03	3.57	5.11	4.11	5.14	7.16	6.10	5.78	7.04	5.95	5.57	5.75	6.76
Jarque-Bera	114.06	146.00	106.29	11.51	52.74	13.62	79.19	213.71	108.69	102.71	196.53	110.88	99.10	107.57	157.99
Probability	0	0	0	0.003161	0	0.001103	0	0	0	0	0	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

	SCB					TDB					TFB				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0 2371	0.2813	0.0070	0.0917	-0.1301	0.1926	0.2276	0.0497	-0.0131	0.0873	0.2642	0.2227	0.1586	0.0054	-0.1090
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	9.89	9.49	9.43	7.36	5.88	9.81	9.96	9.35	10	9.92	9.9	10	9.92	4.35	4.37
Minimum	-6.97	-6.38	-8.77	-6.31	-8.93	-8.41	-9.09	-5.21	-6.13	-9.4	-8.93	-7.96	-7.03	-3.59	-9.88
Std. Dev.	2.1219	2.0027	2.0827	1.8149	1.9269	2.1651	2.3525	1.9856	1.8932	2.4653	2.2579	1.9872	2.0465	1.2487	1.5832
Skewness	1.1469	0.9603	-0.0708	0.5111	-0.1939	0.4232	0.6934	1.2269	1.0301	1.0829	1.1422	1.3801	0.2791	0.1805	-0.9304
Kurtosis	7.65	5.87	5.49	5.04	5.72	7.32	6.58	7.34	8.73	7.44	7.62	9.87	5.87	3.54	8.85
Jarque-Bera	292.71	129.75	67.29	56.61	82.15	211.10	160.18	269.27	401.96	266.31	289.28	595.91	92.48	4.52	411.27
Probability	0	0	0	0	0	0	0	0	0	0	0	0	0	0.104361	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

Remark : *Normality Properties*
Skewness = 0 and Kurtosis = 3
Jarque-Bera (at 95% confidence level) < 5.99

Appendix 4 (Continue): Normality test of daily security returns during 1992-1996

Banks

	TMB					UB				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.1840	0.3439	-0.0017	0.0422	-0.1776	-0.0541	0.2071	0.0434	-0.0025	0.1354
Median	0	0	0	0	0	0	0	0	0	0
Maximum	9.99	9.46	9.37	9.37	6.31	10.01	10.01	10	9.76	9.78
Minimum	-9.7	-7.9	-7.19	-5.36	-9.83	-10.01	-10.01	-9.68	-10	-9.81
Std. Dev.	2.4244	2.3295	2.1481	1.8749	2.4413	4.6672	2.6787	2.9266	2.1824	3.1970
Skewness	0.9604	0.8592	0.0569	0.9360	-0.3949	-0.0647	0.9541	0.2456	0.2894	-0.0128
Kurtosis	7.11	5.95	5.13	6.63	4.94	3.45	9.20	6.96	11.27	5.31
Jarque-Bera	223.40	126.78	49.51	180.94	47.81	2.41	457.22	172.87	744.02	58.34
Probability	0	0	0	0	0	0.299237	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262

Remark : *Normality Properties*
Skewness = 0 and Kurtosis = 3
Jarque-Bera (at 95% confidence level) < 5.99

Appendix 4 (Continue): Normality test of daily security returns during 1992-1996

Finance and Securities

	AIFT					AITCO					BFIT				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.0273	0.2938	-0.1157	-0.0352	-0.3492	0.0559	0.2602	-0.0543	0.0480	-0.2125	0.1018	0.3091	-0.1311	-0.1066	-0.3071
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	9.89	9.94	9.99	9.85	9.87	9.35	9.93	9.94	7.35	9.56	9.68	10	9.96	9.15	7.93
Minimum	-9.68	-9.34	-10	-9.39	-10	-9.64	-7.28	-9.89	-6.21	-9.63	-9.52	-7.22	-9.93	-9.03	-9.54
Std. Dev.	2.5680	2.7952	3.0013	2.7575	2.9741	2.6249	2.3300	2.6544	1.6114	2.8417	2.4453	2.5577	2.5829	2.4141	2.1687
Skewness	0.9042	0.9279	-0.2040	0.6307	0.2057	0.7439	1.3088	0.1116	0.1311	0.1288	0.6653	0.9191	-0.1594	0.3966	-0.4588
Kurtosis	6.31	5.79	5.54	5.12	5.73	6.26	7.08	6.07	5.92	5.59	6.32	4.92	6.49	5.90	6.65
Jarque-Bera	154.92	121.94	71.45	65.77	83.12	139.98	255.14	102.37	92.82	74.02	139.44	76.67	133.26	97.64	154.46
Probability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

	CMIC					DS					FCI				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.1472	0.2572	-0.0434	0.0053	-0.2429	0.2661	0.4589	-0.0365	-0.0630	-0.2486	0.4366	0.1010	-0.1635	0.1061	-0.3061
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	9.85	9.86	9.95	9.68	9.82	10	9.78	8.51	10	9.61	10	9.89	9.94	9.59	10
Minimum	-9.72	-8.54	-9.95	-17.36	-10	-9.75	-6.58	-9.93	-9.74	-9.73	-10	-40.33	-10	-7.56	-9.68
Std. Dev.	2.8200	2.4204	3.2314	3.2761	3.2032	2.9039	2.7422	2.6932	3.3287	2.8267	4.6328	4.6403	2.7850	2.4139	2.8361
Skewness	0.6290	0.5770	0.1989	0.1005	0.0600	0.6806	0.7568	-0.4414	0.4445	-0.2218	0.1987	-3.0607	-0.2969	0.6854	-0.0425
Kurtosis	5.57	5.84	4.84	6.46	4.65	4.84	4.42	5.28	4.67	5.29	3.10	27.62	6.06	5.70	5.86
Jarque-Bera	88.79	102.15	38.36	129.86	30.04	56.96	46.88	64.59	38.68	59.48	1.83	7000.43	105.35	99.24	89.58
Probability	0	0	0	0	0	0	0	0	0	0	0.399529	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

Remark : *Normality Properties*
Skewness = 0 and Kurtosis = 3
Jarque-Bera (at 95% confidence level) < 5.99

Appendix 4 (Continue): Normality test of daily security returns during 1992-1996

Finance and Securities

	FIN1					GF					ITF				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.0551	0.5693	-0.0554	0.0884	-0.3802	0.1004	0.4167	-0.0079	0.0186	-0.3243	0.2995	0.1321	-0.1762	-0.1191	-0.5088
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	10	10.01	9.85	17.69	10	9.79	9.88	9.83	9.82	9.52	10	9.47	9.83	9.86	9.89
Minimum	-9.85	-9.03	-9.93	-8.59	-9.87	-9.54	-7.57	-10	-9.71	-9.84	-9.52	-9.68	-9.68	-9.9	-10
Std. Dev.	2.6801	2.7287	3.2368	3.0650	2.8360	2.6439	2.6043	3.4580	2.8890	2.9249	3.2502	2.8845	2.6172	2.7667	3.1216
Skewness	0.8650	0.9207	-0.0870	1.2031	-0.0046	0.6556	0.9733	-0.0415	0.3749	-0.1465	1.0722	0.5552	-0.1225	0.3244	0.3590
Kurtosis	6.15	5.00	5.06	8.17	4.86	6.11	5.57	4.26	4.47	4.85	5.22	5.29	6.64	6.12	4.86
Jarque-Bera	140.13	80.20	46.14	352.79	37.89	124.01	112.79	17.31	29.49	38.34	103.46	70.46	144.05	109.82	43.22
Probability	0	0	0	0	0	0	0	0.000174	0	0	0	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

	KK					MCC					NAVA				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.3604	0.2381	-0.0642	-0.0918	-0.2622	0.2646	0.3457	-0.2308	-0.1943	-0.2939	0.1657	0.3746	-0.1044	0.0310	-0.2504
Median	0	0	0	-0.52	0	0	0	0	0	0	0	0	0	0	0
Maximum	9.65	9.77	9.51	9.99	9.99	10	9.88	9.61	9.26	9.73	9.58	9.89	8.69	9.91	9.94
Minimum	-8.88	-9.15	-9.93	-10	-10	-15.22	-9.85	-9.9	-9.09	-9.35	-9.93	-7.89	-9.99	-9.81	-9.63
Std. Dev.	2.8090	2.6280	2.5381	3.5574	3.3618	2.9553	2.8948	2.7393	2.7064	2.4461	3.0346	2.5157	3.0288	2.9827	2.9119
Skewness	0.5837	0.7302	-0.1071	0.5640	0.2160	0.2014	0.5045	-0.0426	0.4385	-0.0017	0.7024	0.9357	-0.2689	0.6046	0.0902
Kurtosis	4.89	5.08	5.74	4.51	4.64	7.37	5.55	5.85	4.95	5.39	5.17	5.48	4.89	4.70	5.32
Jarque-Bera	53.56	70.28	82.07	38.62	31.24	209.63	81.91	87.93	49.53	62.37	72.45	104.90	41.64	47.03	59.18
Probability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

Remark : *Normality Properties*
Skewness = 0 and Kurtosis = 3
Jarque-Bera (at 95% confidence level) < 5.99

above, this research should benefit from their maturity. The following list comprises the universities where the survey took place.

- Chulalongkorn University
- Kasetsart University
- Thammasat University
- Mahidol University
- Srinakharinwirot University (Only Prasarnmitra Campus)
- Silpakorn University (Only Bangkok campus)
- King Mongkut's Institute of Technology Ladkrabang
- King mongkut's Institute of technology Norh Bangkok
- The National Institute of Development Administration
- King Mongkut's Univeristy of Technology Thonburi
- Bangkok University
- Kasem Bundit University
- Mahanakorn University of Technology
- Dhurakijpundit Unviersity
- Krirk University

The sample size is N = 302 by reference of Yamane (1967) with a total of 100,000 fourth year undergraduate students or above. The information for the computation is from Table 6: Total University Students by Institutions and Degrees of Information Technology, Ministry of University Administration, Academic Year 2001. According to Yamane (1967), N = 302 is the sample size for the precision of ±7, at 95 % confidence interval.

Survey Instrument: Questionnaire items were generated and pretested with 30 undergraduate and graduate students at Faculty of Political Science, Chulalongkorn University. Corrections and adjustments are made for the purpose of clarity and effectiveness of the instrument. The actual questionnaire used in the field is in the

Appendix 4 (Continue): Normality test of daily security returns during 1992-1996

Finance and Securities

	TTF					UAF					UNITED				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Mean	0.2023	0.1474	0.0403	0.1609	-0.4177	0.2610	0.2543	-0.1433	-0.0660	-0.2584	0.2124	0.3175	-0.0374	0.0958	-0.5097
Median	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	9.93	9.55	9.99	10	9.89	9.94	9.61	10	9.73	9.93	10	9.93	9.98	9.86	9.56
Minimum	-9.64	-8.11	-9.89	-8.93	-10	-9.8	-7.56	-9.86	-9.87	-9.76	-9.94	-5.96	-9.94	-9.64	-9.9
Std. Dev.	3.2632	2.5787	3.1829	3.3144	2.8537	2.8319	2.4586	2.9602	3.1381	2.6017	2.8781	2.4114	3.1506	3.2203	2.6427
Skewness	0.9495	0.5322	-0.3029	0.4980	-0.0895	0.6991	0.5882	-0.1858	0.3156	0.0752	0.8019	1.5581	0.3305	0.9500	-0.1027
Kurtosis	5.29	4.80	4.80	3.95	6.91	5.39	5.12	5.33	5.33	5.71	5.50	7.40	5.20	5.15	5.89
Jarque-Bera	96.32	47.59	38.97	20.43	167.65	83.57	64.02	60.36	62.89	80.59	95.88	316.40	56.99	89.14	91.77
Probability	0	0	0	0.000037	0	0	0	0	0	0	0	0	0	0	0
Observations	261	261	260	260	262	261	261	260	260	262	261	261	260	260	262

Remark : *Normality Properties*
Skewness = 0 and Kurtosis = 3
Jarque-Bera (at 95% confidence level) < 5.99

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Table 1: Deposit Insurance Premium Using Black-Scholes: Historical Volatility (% of Deposit)

The standard deviation of equity returns, σ_E, was calculated using average daily log price ratio of each year and then annualized. σ_V is the standard deviation of rate of return on the bank's assets estimated simultaneously with the insurance premium from the system of equation (1)-(4).

Financial Institutions	1992			1993			1994			1995			1996		
	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E
Banks															
BAY	0.0017	5.34	35.43	0.0009	5.15	33.52	0.0001	5.85	28.75	0.0000	5.01	26.91	0.0062	6.27	39.37
BBC*	0.1287	10.20	56.31	1.4837	21.82	82.79	0.0018	6.66	35.42	0.0021	7.88	35.86	n/a	n/a	n/a
BBL	0.0051	9.60	38.94	0.0004	9.53	32.76	0.0002	11.76	32.62	0.0000	7.77	22.78	0.0000	7.56	24.36
BMB*	0.1455	14.73	56.38	0.0167	11.26	43.62	0.0064	9.11	39.59	0.0012	10.21	35.07	0.0079	10.46	40.47
BOA	0.0983	20.53	54.27	0.0255	20.96	47.90	0.0022	19.80	40.22	0.0032	19.86	41.08	0.0000	12.13	29.75
FBCB*	0.1996	14.36	59.08	0.0054	10.77	39.27	0.0007	9.97	33.84	0.0003	8.80	31.93	0.0016	9.09	35.42
KTB	0.0278	6.06	46.80	0.0018	5.75	35.33	0.0000	8.58	35.91	0.0000	6.81	27.42	0.0067	12.46	40.33
LTB*	0.2685	7.51	66.07	0.0505	6.00	50.77	0.0095	8.96	41.05	0.0322	11.31	46.61	0.0118	11.09	42.06
NTB*	0.0058	6.20	39.23	0.0253	11.86	45.56	0.0113	16.56	43.36	0.0008	13.70	35.50	0.0007	11.42	34.48
SCB	0.0011	7.87	34.35	0.0004	8.23	32.35	0.0006	9.92	33.58	0.0000	8.93	29.27	0.0001	11.16	31.19
TDB	0.0016	5.70	35.04	0.0041	7.95	38.00	0.0004	7.26	32.02	0.0002	1.27	30.53	0.0055	4.18	39.91
TFB	0.0027	6.40	36.54	0.0004	7.56	22.11	0.0005	9.11	33.00	0.0000	6.23	20.14	0.0000	8.65	25.63
TMB	0.0058	6.00	39.24	0.0037	6.44	37.64	0.0011	9.57	34.64	0.0001	7.71	30.23	0.0059	10.63	39.51
UB*	0.8852	18.38	75.54	0.0155	10.96	43.27	0.0353	11.81	47.19	0.0013	9.92	35.19	0.0755	16.20	51.75
Weighted Average: Failed institutions	**0.2304** **0.1512**[1/]	**12.91** **12.25**[1/]	**58.21** **56.11**[1/]	**0.3975** **0.0143**[2/]	**13.67** **10.79**[2/]	**52.83** **42.26**[2/]	**0.0062**	**9.47**	**37.64**	**0.0024**	**9.42**	**34.77**	**0.0083**	**7.87**	**28.98**
Weighted Average: Non-failed institutions	**0.0109**	**7.74**	**39.58**	**0.0016**	**7.92**	**33.97**	**0.0004**	**9.88**	**33.43**	**0.0001**	**7.27**	**25.63**	**0.0025**	**9.20**	**31.79**
Weighted Average: All institutions	**0.0424** **0.0291**[1/]	**8.48** **8.32**[1/]	**42.25** **41.73**[1/]	**0.0626** **0.0031**[2/]	**8.80** **8.26**[2/]	**36.88** **34.96**[2/]	**0.0013**	**9.81**	**34.10**	**0.0005**	**7.60**	**27.04**	**0.0036**	**8.99**	**31.35**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

1/ exclude LTB

2/ exclude BBC

n/a = BBC was suspended since May 20,1996 so we cannot calculate the volatility of stock return.

Table 1 (Continue): Deposit Insurance Premium Using Black-Scholes: Historical Volatility (% of Deposit)

The standard deviation of equity returns, σ_E, was calculated using average daily log price ratio of each year and then annualized. σ_V is the standard deviation of rate of return on the bank's assets estimated simultaneously with the insurance premium from the system of equation (1)-(4).

Financial Institution	1992			1993			1994			1995			1996		
	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E
Finances															
AIFT	0.0037	20.16	41.57	0.0115	21.36	45.15	0.0193	25.04	48.39	0.0154	17.00	44.46	0.0396	15.95	48.13
AITCO	0.0047	20.92	42.48	0.0004	20.73	37.64	0.0007	28.63	42.80	0.0000	14.89	25.98	0.0036	29.16	45.99
BFIT	0.0039	15.06	39.59	0.0066	15.85	41.32	0.0050	18.68	41.65	0.0033	14.47	38.92	0.0011	11.09	35.10
CMIC*	0.0229	15.46	45.65	0.0012	19.97	39.10	0.0621	22.22	52.10	0.0915	13.68	52.83	0.0736	18.22	51.85
DS*	0.0319	14.90	47.00	0.0175	14.53	44.30	0.0031	24.84	43.42	0.0627	26.83n	53.67	0.0059	26.69	45.76
FCI*	0.0319	15.55	74.99	0.0175	30.83	74.97	0.0031	34.96	44.91	n/a	n/a	n/a	0.0059	30.82	45.90
FIN1*	0.0121	16.07	43.38	0.0137	16.99	44.09	0.0378	28.20	52.19	0.0338	22.66	49.42	0.0036	28.98	45.90
GF*	0.0129	12.99	42.79	0.0109	12.72	42.07	0.0960	26.53	55.76	0.0254	17.62	46.59	0.0146	24.91	47.35
ITF*	0.0290	31.18	52.61	0.0025	31.35	46.60	0.0029	22.78	42.20	0.0213	11.88	44.61	0.0617	9.83	50.52
KK	0.0250	12.38	45.47	0.0104	14.82	42.46	0.0050	16.83	40.93	0.1020	30.27	57.36	0.0797	25.84	54.41
MCC*	0.0142	25.97	47.83	0.0064	28.15	46.77	0.0035	25.78	44.17	0.0090	19.62	43.64	0.0019	19.26	39.59
NAVA*	0.0399	19.32	49.11	0.0037	18.13	40.64	0.0200	25.79	48.84	0.0307	19.97	48.10	0.0083	27.75	47.13
NFS	0.0032	9.75	37.47	0.0170	8.95	43.50	0.0117	13.68	42.57	0.0392	17.35	48.43	0.0156	26.82	48.44
PHATRA	0.0051	12.86	39.61	0.0078	13.92	41.26	0.0077	21.52	44.05	0.0000	28.56	41.47	0.0013	26.78	42.78
SDF*	0.0337	13.12	47.00	0.0390	20.03	49.21	0.0321	17.50	47.64	0.0806	17.76	52.34	0.0941	13.78	52.96
SGACL	0.0054	18.09	41.64	0.0098	18.02	43.33	0.0167	31.72	51.17	0.0081	24.17	45.35	0.0001	17.73	34.63
TISCO	0.0012	17.19	37.67	0.0046	18.14	41.21	0.0002	16.86	34.87	0.0000	17.07	29.08	0.0016	30.69	45.42
TMF*	0.0337	30.77	52.94	0.0003	26.17	40.53	0.0325	22.59	49.32	0.0541	18.06	50.19	0.0082	15.79	41.93
TTF*	0.0815	19.40	52.82	0.0069	16.34	41.66	0.0559	21.37	51.32	0.0678	25.22	53.45	0.0176	20.68	46.19
UAF*	0.0241	15.33	45.84	0.0037	15.73	39.72	0.0104	27.61	47.73	0.0319	26.20	50.61	0.0030	22.46	42.11
UNITED*	0.0310	8.98	46.59	0.0049	10.78	38.96	0.0570	19.08	50.80	0.0769	16.86	51.93	0.0125	13.92	42.78
Weighted Average: Failed institutions	**0.0263**	**16.63**	**48.66**	**0.0100**	**18.05**	**44.18**	**0.0326**	**25.21**	**48.98**	**0.0462**	**19.95**	**49.66**	**0.0249**	**22.25**	**46.80**
Weighted Average: Non-failed institutions	**0.0049**	**15.09**	**39.90**	**0.0097**	**15.25**	**42.35**	**0.0095**	**21.13**	**43.77**	**0.0198**	**22.02**	**43.27**	**0.0123**	**24.08**	**43.57**
Weighted Average: All institutions	**0.0176**	**16.00**	**45.07**	**0.0099**	**16.88**	**43.41**	**0.0234**	**23.60**	**46.92**	**0.0368**	**20.68**	**47.40**	**0.0207**	**22.87**	**45.71**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997
n/a = FCI accounting data from I-SIM is unavailable for December, 1994.

Table 2: Deposit Insurance Premium Using Black-Scholes: GARCH Volatility (% of Deposit)

The standard deviation of equity returns, σ_E, was calculated using GARCH (1,1). σ_V is the standard deviation of rate of return on the bank's assets estimated simultaneously with the insurance premium from the system of equation (1)-(4).

Financial Institutions	1992			1993			1994			1995			1996		
	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E
Banks															
BAY	0.5816	12.04	72.86	0.0006	5.00	32.49	0.0006	6.60	32.48	0.0000	4.45	23.93	0.0001	4.45	27.99
BBC*	0.0197	7.87	44.35	0.0000	5.39	22.96	0.9235	16.14	77.38	0.0007	7.25	33.00	n/a	n/a	n/a
BBL	0.0003	7.74	31.44	0.0000	7.76	26.66	0.0023	13.61	37.74	0.0000	8.01	23.49	0.0000	6.15	19.82
BMB*	0.0010	8.78	34.30	3.1589	29.20	95.46	0.0163	10.00	43.35	0.0010	10.10	34.68	0.0013	8.98	34.80
BOA	0.0001	7.64	29.04	0.6512	23.94	70.48	0.2242	27.95	61.40	0.0004	14.79	34.84	0.0006	10.89	33.73
FBCB*	0.0000	5.15	21.78	0.3332	18.00	63.49	0.0023	10.85	36.80	0.0001	8.31	30.15	0.0001	7.58	29.57
KTB	0.0101	5.38	41.76	0.0440	8.06	48.93	0.0009	8.12	33.99	0.0001	7.19	28.94	0.0000	8.07	26.15
LTB*	3.7815	17.03	109.89	0.0834	6.53	54.75	1.5744	20.91	84.34	0.0095	9.92	41.03	0.3414	17.34	63.59
NTB*	0.0060	6.22	39.35	0.0003	8.14	31.43	0.0033	14.91	39.10	0.0214	17.78	45.95	0.0066	13.42	40.50
SCB	0.0006	7.53	32.87	0.0000	7.18	28.22	0.0218	13.34	45.00	0.0001	9.24	30.31	0.0000	10.40	29.04
TDB	0.5762	12.78	72.13	0.0008	6.97	33.34	0.0022	8.20	36.14	0.0000	1.00	24.02	0.0000	2.63	25.17
TFB	0.0229	7.95	45.12	0.0001	6.85	29.11	0.1368	15.69	55.84	0.0001	9.25	29.92	0.0000	6.29	18.64
TMB	0.0065	6.06	39.66	0.0023	6.17	36.05	0.0013	9.72	35.21	0.0000	6.34	24.87	0.0001	7.82	29.08
UB*	0.2941	14.59	62.82	0.3884	17.18	65.22	0.0009	8.44	33.95	0.0038	10.76	38.14	0.0011	10.88	35.07
Weighted Average: Failed institutions	**0.1716** **0.0389**[1/]	**8.17** **7.84**[1/]	**39.29** **36.69**[1/]	**0.8257** **0.1847**[2/]	**15.87** **12.21**[2/]	**57.24** **46.74**[2/]	**0.3065** **0.2541**[3/]	**12.49** **12.15**[3/]	**50.67** **49.28**[3/]	**0.0026**	**9.36**	**34.08**	**0.0161**	**8.82**	**32.59**
Weighted Average: Non-failed institutions	**0.0665**	**7.62**	**40.81**	**0.0239**	**7.58**	**33.89**	**0.0339**	**12.27**	**41.15**	**0.0001**	**7.69**	**26.92**	**0.0000**	**7.02**	**24.11**
Weighted Average: All institutions	**0.0816** **0.0627**[1/]	**7.70** **7.65**[1/]	**40.59** **40.24**[1/]	**0.1474** **0.0440**[2/]	**8.85** **8.16**[2/]	**37.48** **35.49**[2/]	**0.0776** **0.0680**[3/]	**12.30** **12.25**[3/]	**42.68** **42.41**[3/]	**0.0004**	**7.95**	**28.02**	**0.0026**	**7.30**	**25.45**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

1/ exclude LTB

2/ exclude BMB

3/ exclude LTB

Table 2 (Continue): Deposit Insurance Premium Using Black-Scholes: GARCH Volatility (% of Deposit)

The standard deviation of equity returns, σ_E, was calculated using GARCH (1,1). σ_V is the standard deviation of rate of return on the bank's assets estimated simultaneously with the insurance premium from the system of equation (1)-(4).

Financial Institution	1992			1993			1994			1995			1996		
	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E	Premium (%)	σ_V	σ_E
Finances															
AIFT	0.0054	20.74	42.75	0.0010	17.79	37.64	0.1856	32.03	61.47	0.0022	14.45	37.83	0.0043	12.88	39.05
AITCO	0.0030	20.24	41.12	0.0000	18.01	32.71	0.0734	40.86	60.95	0.0000	18.28	31.90	0.0000	16.06	25.33
BFIT	0.0082	16.01	42.06	0.0000	10.47	27.31	0.0046	18.56	41.39	0.0004	12.42	33.44	0.0027	11.83	37.45
CMIC*	0.0015	12.21	36.16	0.0118	13.92	42.66	0.1883	25.59	59.56	0.0093	10.50	41.04	0.0234	16.01	45.77
DS*	0.0001	9.52	30.16	0.0025	12.28	37.52	0.2943	38.65	66.93	0.0010	19.03	38.22	0.0087	27.50	47.13
FCI*	0.0036	7.09	37.49	6.8731	52.26	111.25	0.1487	56.94	72.99	n/a	n/a	n/a	0.0000	23.43	34.90
FIN1*	0.0364	17.94	48.31	0.0077	16.14	41.91	2.2907	51.66	90.90	0.0006	16.49	36.06	0.0000	22.60	35.79
GF*	0.0290	14.12	46.42	0.0026	11.24	37.24	6.5233	60.01	110.90	0.0347	18.20	48.09	0.0138	24.79	47.13
ITF*	0.0024	25.61	43.27	0.0835	41.74	61.91	0.1433	32.70	60.22	0.0003	8.41	31.71	0.0137	8.18	42.45
KK	0.0008	9.19	33.90	0.0030	13.35	38.28	0.3590	27.25	64.89	0.0002	18.81	35.82	0.1068	26.75	56.27
MCC*	0.0000	16.89	31.14	0.0312	32.13	53.32	0.0034	25.74	44.10	0.0026	17.80	39.62	0.0017	19.14	39.36
NAVA*	0.0039	15.61	39.81	0.0047	18.47	41.39	0.3277	35.51	66.49	0.0023	15.96	38.54	0.0053	26.83	45.58
NFS	0.0064	10.35	39.75	0.0001	5.90	28.80	0.0268	14.87	46.20	0.0027	13.58	38.05	0.0000	19.06	34.45
PHATRA	0.0017	11.83	36.44	0.0006	11.51	34.15	0.1570	29.28	59.49	0.0000	23.64	34.33	0.0002	24.43	39.01
SDF*	0.0737	14.46	51.52	0.4850	28.24	67.75	0.1322	20.78	56.11	0.0050	13.34	39.63	0.0966	13.83	53.14
SGACL	0.0054	18.07	41.61	0.0012	15.34	36.91	0.6890	48.57	77.20	0.0010	20.92	39.26	0.0022	20.82	40.66
TISCO	0.0000	12.07	26.46	0.0000	12.21	27.76	1.9063	44.26	86.55	0.0000	18.28	31.14	0.0000	16.22	24.01
TMF*	0.8036	45.86	77.41	0.0047	30.63	47.43	0.3210	30.02	64.62	0.0198	16.20	45.18	0.0019	14.08	37.41
TTF*	0.0107	15.62	42.80	0.1718	23.16	58.33	0.0241	19.54	47.04	0.0126	21.34	45.38	0.0713	23.89	53.19
UAF*	0.0026	12.55	37.65	0.0017	14.86	37.53	0.0114	27.81	48.08	0.0000	15.84	30.65	0.0191	25.99	48.69
UNITED*	0.0050	7.39	38.63	0.0060	10.97	39.65	0.2233	22.89	60.24	0.0187	14.36	44.48	0.0142	14.09	43.30
Weighted Average: Failed institutions	**0.0268**	**14.04**	**40.08**	**0.3811** **0.8245**[1/]	**18.74** **16.90**[1/]	**45.88** **42.29**[1/]	**1.0984** **0.1754**[2/]	**36.91** **30.65**[2/]	**68.95** **58.74**[2/]	**0.0072**	**15.44**	**38.91**	**0.0158**	**20.75**	**43.71**
Weighted Average: Non-failed institutions	**0.0038**	**14.06**	**37.48**	**0.0007**	**12.00**	**32.88**	**0.4965** **0.2667**[2/]	**32.05** **30.06**[2/]	**63.73** **60.01**[2/]	**0.0010**	**18.49**	**36.09**	**0.0009**	**20.43**	**37.64**
Weighted Average: All institutions	**0.0173**	**14.05**	**39.02**	**0.2213** **0.0142**[1/]	**15.91** **14.78**[1/]	**40.42** **38.21**[1/]	**0.8608** **0.2149**[2/]	**34.99** **30.39**[2/]	**66.89** **59.29**[2/]	**0.0050**	**16.52**	**37.91**	**0.0135**	**20.64**	**41.67**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

1/ exclude FCI

2/ exclude FIN1,GF,TISCO

Table 3: Deposit Insurance Premium Using Barrier Options (% of Deposit)
Barrier Level (H) = 90% of the Strike Price (F)

For the barrier model, the deposit insurance, I, can be written as: I = DOP + DIP. If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. Using equation (6) and (7) the insurance premium is numerically estimated for σ_H equals to 1.25, 1.5, and 1.75 of the initial level σ_0, proxied by using historical volatility.

Financial Institution	1992			1993			1994			1995			1996		
	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$
Banks															
BAY	0.0018	0.0018	0.0018	0.0009	0.0009	0.0009	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0062	0.0062	0.0062
BBC*	0.1264	0.1276	0.1290	1.4586	1.5814	1.7084	0.0018	0.0018	0.0018	0.0021	0.0021	0.0021	n/a	n/a	n/a
BBL	0.0052	0.0052	0.0052	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
BMB*	0.1471	0.1511	0.1556	0.0170	0.0171	0.0172	0.0064	0.0064	0.0064	0.0012	0.0012	0.0012	0.0080	0.0080	0.0081
BOA	0.1034	0.1082	0.1133	0.0273	0.0282	0.0291	0.0022	0.0023	0.0023	0.0033	0.0034	0.0035	0.0000	0.0000	0.0000
FBCB*	0.1996	0.2055	0.2119	0.0054	0.0054	0.0054	0.0007	0.0007	0.0007	0.0003	0.0003	0.0003	0.0016	0.0016	0.0016
KTB	0.0270	0.0270	0.0270	0.0018	0.0018	0.0018	0.0020	0.0020	0.0020	0.0000	0.0000	0.0000	0.0068	0.0068	0.0069
LTB*	0.2426	0.2438	0.2452	0.0476	0.0476	0.0476	0.0095	0.0095	0.0095	0.0323	0.0325	0.0327	0.0120	0.0120	0.0121
NTB*	0.0058	0.0058	0.0058	0.0258	0.0260	0.0261	0.0116	0.0118	0.0120	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
SCB	0.0011	0.0011	0.0011	0.0004	0.0004	0.0004	0.0006	0.0006	0.0006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TDB	0.0016	0.0016	0.0016	0.0042	0.0042	0.0042	0.0004	0.0004	0.0004	0.0001	0.0001	0.0001	0.0055	0.0055	0.0055
TFB	0.0027	0.0027	0.0027	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TMB	0.0058	0.0058	0.0058	0.0038	0.0038	0.0038	0.0011	0.0011	0.0011	0.0001	0.0001	0.0001	0.0060	0.0060	0.0060
UB*	0.8747	0.9364	1.0006	0.0159	0.0159	0.0160	0.0354	0.0356	0.0358	0.0013	0.0013	0.0013	0.0771	0.0788	0.0807
Weighted Average: Failed institutions	**0.2280** **0.1499**[1/]	**0.2377** **0.1532**[1/]	**0.2479** **0.1570**[1/]	**0.3910** **0.0143**[2/]	**0.4230** **0.0144**[2/]	**0.4562** **0.0144**[2/]	**0.0063**	**0.0063**	**0.0063**	**0.0024**	**0.0024**	**0.0024**	**0.0084**	**0.0085**	**0.0087**
Weighted Average: Non-failed institutions	**0.0109**	**0.0110**	**0.0112**	**0.0017**	**0.0017**	**0.0017**	**0.0008**	**0.0008**	**0.0008**	**0.0001**	**0.0001**	**0.0001**	**0.0026**	**0.0026**	**0.0026**
Weighted Average: All institutions	**0.0421** **0.0290**[1/]	**0.0436** **0.0295**[1/]	**0.0451** **0.0301**[1/]	**0.0616** **0.0032**[2/]	**0.0666** **0.0032**[2/]	**0.0717** **0.0032**[2/]	**0.0017**	**0.0017**	**0.0017**	**0.0005**	**0.0005**	**0.0005**	**0.0035**	**0.0035**	**0.0036**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

1/ exclude UB

2/ exclude BBC

Table 3 (Continue): Deposit Insurance Premium Using Barrier Options (% of Deposit)
Barrier Level (H) = 90% of the Strike Price (F)

For the barrier model, the deposit insurance, I, can be written as: I = DOP + DIP. If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. Using equation (6) and (7) the insurance premium is numerically estimated for σ_H equals to 1.25, 1.5, and 1.75 of the initial level σ_0, proxied by using historical volatility.

Financial Institution	1992			1993			1994			1995			1996		
	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$
Finances															
AIFT	0.0038	0.0039	0.0040	0.0118	0.0122	0.0126	0.0200	0.0209	0.0218	0.0156	0.0158	0.0161	0.0400	0.0407	0.0415
AITCO	0.0048	0.0050	0.0051	0.0004	0.0004	0.0004	0.0007	0.0007	0.0007	0.0000	0.0000	0.0000	0.0037	0.0039	0.0041
BFIT	0.0039	0.0040	0.0040	0.0066	0.0067	0.0068	0.0050	0.0051	0.0052	0.0034	0.0034	0.0034	0.0011	0.0011	0.0011
CMIC*	0.0232	0.0236	0.0240	0.0012	0.0013	0.0013	0.0641	0.0667	0.0695	0.0913	0.0926	0.0941	0.0749	0.0770	0.0794
DS*	0.0322	0.0327	0.0334	0.0176	0.0178	0.0180	0.0032	0.0033	0.0034	0.0659	0.0695	0.0734	0.0061	0.0063	0.0066
FCI*	0.7575	0.8000	0.8447	0.9804	1.0780	1.1778	0.0001	0.0001	0.0001	n/a	n/a	n/a	0.0021	0.0022	0.0023
FIN1*	0.0123	0.0125	0.0127	0.0139	0.0141	0.0144	0.0397	0.0419	0.0442	0.0348	0.0362	0.0376	0.0037	0.0039	0.0041
GF*	0.0130	0.0131	0.0132	0.0109	0.0110	0.0110	0.1009	0.1067	0.1129	0.0258	0.0263	0.0269	0.0151	0.0157	0.0163
ITF*	0.0309	0.0329	0.0350	0.0026	0.0027	0.0029	0.0029	0.0030	0.0031	0.0213	0.0214	0.0215	0.0610	0.0612	0.0614
KK	0.0250	0.0253	0.0255	0.0105	0.0106	0.0107	0.0051	0.0051	0.0052	0.1085	0.1161	0.1239	0.0834	0.0880	0.0929
MCC*	0.0148	0.0155	0.0163	0.0067	0.0070	0.0073	0.0036	0.0037	0.0039	0.0091	0.0093	0.0096	0.0019	0.0020	0.0020
NAVA*	0.0410	0.0423	0.0438	0.0037	0.0038	0.0039	0.0208	0.0217	0.0227	0.0314	0.0323	0.0333	0.0086	0.0090	0.0094
NFS	0.0032	0.0032	0.0032	0.0169	0.0169	0.0170	0.0117	0.0118	0.0119	0.0397	0.0406	0.0416	0.0162	0.0169	0.0177
PHATRA	0.0051	0.0051	0.0052	0.0079	0.0079	0.0080	0.0079	0.0081	0.0083	0.0003	0.0003	0.0003	0.0013	0.0014	0.0014
SDF*	0.0338	0.0342	0.0347	0.0400	0.0413	0.0427	0.0325	0.0332	0.0340	0.0818	0.0841	0.0866	0.0939	0.0953	0.0969
SGACL	0.0055	0.0056	0.0057	0.0099	0.0101	0.0103	0.0176	0.0187	0.0198	0.0084	0.0086	0.0090	0.0002	0.0002	0.0002
TISCO	0.0012	0.0012	0.0012	0.0047	0.0047	0.0048	0.0002	0.0002	0.0002	0.0000	0.0000	0.0000	0.0017	0.0018	0.0018
TMF*	0.0359	0.0383	0.0408	0.0004	0.0004	0.0004	0.0335	0.0348	0.0361	0.0550	0.0564	0.0580	0.0083	0.0084	0.0085
TTF*	0.0839	0.0872	0.0908	0.0070	0.0071	0.0072	0.0575	0.0596	0.0619	0.0708	0.0745	0.0784	0.0180	0.0185	0.0191
UAF*	0.0244	0.0248	0.0253	0.0038	0.0038	0.0038	0.0108	0.0113	0.0118	0.0332	0.0349	0.0366	0.0031	0.0032	0.0033
UNITED*	0.0308	0.0309	0.0310	0.0049	0.0049	0.0049	0.0582	0.0599	0.0618	0.0778	0.0797	0.0819	0.0125	0.0126	0.0127
Weighted Average: Failed institutions	**0.0858**	**0.0899**	**0.0941**	**0.0603**	**0.0655**	**0.0708**	**0.0338**	**0.0353**	**0.0370**	**0.0472**	**0.0486**	**0.0502**	**0.0251**	**0.0256**	**0.0263**
Weighted Average: Non-failed institutions	**0.0050**	**0.0050**	**0.0051**	**0.0098**	**0.0098**	**0.0100**	**0.0097**	**0.0101**	**0.0105**	**0.0206**	**0.0214**	**0.0223**	**0.0128**	**0.0133**	**0.0140**
Weighted Average: All institutions	**0.0527**	**0.0551**	**0.0577**	**0.0391**	**0.0421**	**0.0453**	**0.0243**	**0.0254**	**0.0265**	**0.0377**	**0.0390**	**0.0403**	**0.0209**	**0.0215**	**0.0221**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

Table 4: Deposit Insurance Premium Using Barrier Options (% of Deposit)
Barrier Level = 100% of the Strike Price

For the barrier model, the deposit insurance, I, can be written as: I = DOP + DIP. If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. Using equation (6) and (7) the insurance premium is numerically estimated for σ_H equals to 1.25, 1.5, and 1.75 of the initial level σ_0, proxied by using historical volatility.

Financial Institution	1992			1993			1994			1995			1996		
	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$
Banks															
BAY	0.0031	0.0046	0.0062	0.0014	0.0019	0.0024	0.0001	0.0001	0.0002	0.0000	0.0000	0.0001	0.0088	0.0115	0.0142
BBC*	0.1851	0.2473	0.3110	1.7704	2.2000	2.6300	0.0025	0.0032	0.0039	0.0028	0.0036	0.0043	n/a	n/a	n/a
BBL	0.0074	0.0096	0.0119	0.0006	0.0007	0.0009	0.0003	0.0004	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
BMB*	0.1975	0.2523	0.3077	0.0230	0.0290	0.0350	0.0086	0.0108	0.0130	0.0016	0.0020	0.0024	0.0107	0.0134	0.0161
BOA	0.1313	0.1637	0.1962	0.0344	0.0422	0.0501	0.0028	0.0035	0.0041	0.0042	0.0051	0.0061	0.0000	0.0000	0.0001
FBCB*	0.2697	0.3463	0.4236	0.0073	0.0092	0.0111	0.0009	0.0012	0.0014	0.0004	0.0005	0.0006	0.0022	0.0027	0.0033
KTB	0.0474	0.0708	0.0960	0.0026	0.0035	0.0045	0.0027	0.0033	0.0040	0.0000	0.0000	0.0000	0.0089	0.0111	0.0132
LTB*	0.4181	0.6164	0.8284	0.0748	0.1040	0.1344	0.0128	0.0162	0.0195	0.0430	0.0539	0.0648	0.0159	0.0199	0.0239
NTB*	0.0095	0.0135	0.0178	0.0346	0.0436	0.0527	0.0149	0.0183	0.0217	0.0011	0.0013	0.0016	0.0010	0.0013	0.0015
SCB	0.0016	0.0022	0.0027	0.0006	0.0008	0.0009	0.0008	0.0010	0.0012	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
TDB	0.0027	0.0038	0.0050	0.0058	0.0075	0.0092	0.0006	0.0007	0.0009	0.0000	0.0000	0.0000	0.0088	0.0123	0.0161
TFB	0.0042	0.0059	0.0076	0.0006	0.0007	0.0009	0.0007	0.0009	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TMB	0.0096	0.0138	0.0183	0.0055	0.0073	0.0091	0.0014	0.0018	0.0021	0.0002	0.0002	0.0003	0.0080	0.0100	0.0120
UB*	1.1170	1.4209	1.7268	0.0214	0.0271	0.0328	0.0467	0.0582	0.0698	0.0018	0.0022	0.0026	0.0990	0.1223	0.1456
Weighted Average: Failed institutions	**0.3079** **0.2101**[1/]	**0.3990** **0.2755**[1/]	**0.4916** **0.3423**[1/]	**0.4764** **0.0199**[2/]	**0.5926** **0.0256**[2/]	**0.7091** **0.0314**[2/]	**0.0083**	**0.0104**	**0.0125**	**0.0032**	**0.0041**	**0.0049**	**0.0110**	**0.0136**	**0.0163**
Weighted Average: Non-failed institutions	**0.0171**	**0.0240**	**0.0314**	**0.0023**	**0.0030**	**0.0037**	**0.0010**	**0.0013**	**0.0015**	**0.0001**	**0.0001**	**0.0002**	**0.0035**	**0.0045**	**0.0054**
Weighted Average: All institutions	**0.0588** **0.0422**[1/]	**0.0779** **0.0567**[1/]	**0.0975** **0.0719**[1/]	**0.0753** **0.0044**[2/]	**0.0938** **0.0056**[2/]	**0.1123** **0.0069**[2/]	**0.0022**	**0.0027**	**0.0033**	**0.0006**	**0.0007**	**0.0009**	**0.0047**	**0.0059**	**0.0072**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

1/ exclude UB

2/ exclude BBC

Table 4 (Continue): Deposit Insurance Premium Using Barrier Options (% of Deposit) Barrier Level = 100% of the Strike Price

For the barrier model, the deposit insurance, I, can be written as: I = DOP + DIP. If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. Using equation (6) and (7) the insurance premium is numerically estimated for σ_H equals to 1.25, 1.5, and 1.75 of the initial level σ_0, proxied by using historical volatility.

Financial Institution	1992			1993			1994			1995			1996		
	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$
Finances															
AIFT	0.0049	0.0061	0.0072	0.0149	0.0183	0.0217	0.0247	0.0300	0.0354	0.0199	0.0245	0.0290	0.0514	0.0635	0.0755
AITCO	0.0062	0.0076	0.0091	0.0005	0.0006	0.0008	0.0008	0.0010	0.0012	0.0000	0.0000	0.0000	0.0046	0.0055	0.0065
BFIT	0.0052	0.0065	0.0079	0.0086	0.0106	0.0127	0.0064	0.0078	0.0093	0.0043	0.0054	0.0064	0.0015	0.0018	0.0022
CMIC*	0.0307	0.0387	0.0467	0.0016	0.0019	0.0023	0.0794	0.0970	0.1146	0.1194	0.1486	0.1780	0.0949	0.1167	0.1386
DS*	0.0430	0.0543	0.0658	0.0230	0.0286	0.0343	0.0040	0.0048	0.0057	0.0800	0.0975	0.1149	0.0075	0.0091	0.0107
FCI*	1.0053	1.2980	1.5938	1.1436	1.4004	1.6565	0.0002	0.0002	0.0002	n/a	n/a	n/a	0.0026	0.0032	0.0037
FIN1*	0.0162	0.0203	0.0244	0.0179	0.0221	0.0263	0.0481	0.0584	0.0688	0.0433	0.0529	0.0624	0.0046	0.0056	0.0065
GF*	0.0176	0.0225	0.0273	0.0144	0.0181	0.0217	0.1222	0.1488	0.1755	0.0329	0.0404	0.0479	0.0186	0.0227	0.0268
ITF*	0.0373	0.0457	0.0540	0.0032	0.0039	0.0046	0.0037	0.0044	0.0052	0.0282	0.0351	0.0421	0.0827	0.1049	0.1272
KK	0.0344	0.0441	0.0539	0.0137	0.0170	0.0203	0.0065	0.0079	0.0094	0.1296	0.1576	0.1856	0.1016	0.1239	0.1462
MCC*	0.0184	0.0226	0.0268	0.0082	0.0100	0.0117	0.0045	0.0054	0.0064	0.0116	0.0142	0.0167	0.0025	0.0030	0.0035
NAVA*	0.0526	0.0656	0.0786	0.0048	0.0059	0.0070	0.0255	0.0311	0.0366	0.0395	0.0484	0.0573	0.0105	0.0128	0.0151
NFS	0.0045	0.0058	0.0072	0.0235	0.0303	0.0371	0.0152	0.0188	0.0224	0.0507	0.0624	0.0741	0.0199	0.0242	0.0285
PHATRA	0.0069	0.0088	0.0106	0.0104	0.0129	0.0154	0.0099	0.0121	0.0143	0.0003	0.0004	0.0005	0.0017	0.0020	0.0024
SDF*	0.0461	0.0589	0.0718	0.0505	0.0622	0.0739	0.0414	0.0509	0.0603	0.1039	0.1280	0.1521	0.1227	0.1527	0.1829
SGACL	0.0072	0.0089	0.0107	0.0127	0.0157	0.0187	0.0212	0.0257	0.0302	0.0104	0.0126	0.0149	0.0002	0.0002	0.0003
TISCO	0.0015	0.0019	0.0023	0.0060	0.0074	0.0088	0.0003	0.0004	0.0004	0.0000	0.0000	0.0000	0.0021	0.0025	0.0030
TMF*	0.0435	0.0532	0.0435	0.0005	0.0006	0.0005	0.0416	0.0508	0.0416	0.0698	0.0859	0.0698	0.0107	0.0132	0.0107
TTF*	0.1075	0.1343	0.1612	0.0091	0.0112	0.0133	0.0715	0.0875	0.1034	0.0866	0.1057	0.1247	0.0226	0.0277	0.0327
UAF*	0.0324	0.0409	0.0494	0.0049	0.0060	0.0072	0.0132	0.0161	0.0189	0.0407	0.0495	0.0584	0.0039	0.0047	0.0056
UNITED*	0.0456	0.0610	0.0769	0.0066	0.0083	0.0100	0.0733	0.0899	0.1065	0.0994	0.1227	0.1460	0.0163	0.0201	0.0240
Weighted Average: Failed institutions	**0.1136**	**0.1456**	**0.1776**	**0.0715**	**0.0877**	**0.1039**	**0.0414**	**0.0505**	**0.0590**	**0.0596**	**0.0734**	**0.0858**	**0.0323**	**0.0400**	**0.0475**
Weighted Average: Non-failed institutions	**0.0067**	**0.0084**	**0.0102**	**0.0130**	**0.0163**	**0.0196**	**0.0122**	**0.0149**	**0.0176**	**0.0255**	**0.0312**	**0.0369**	**0.0157**	**0.0191**	**0.0226**
Weighted Average: All institutions	**0.0698**	**0.0895**	**0.1091**	**0.0469**	**0.0577**	**0.0685**	**0.0299**	**0.0364**	**0.0426**	**0.0475**	**0.0584**	**0.0685**	**0.0267**	**0.0330**	**0.0392**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

Table 5: Deposit Insurance Premium Using Barrier Options (% of Deposit)
Barrier Level = 120% of the Strike Price

For the barrier model, the deposit insurance, I, can be written as: I = DOP + DIP. If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. Using equation (6) and (7) the insurance premium is numerically estimated for σ_H equals to 1.25, 1.5, and 1.75 of the initial level σ_0, proxied by using historical volatility.

Financial Institution	1992			1993			1994			1995			1996		
	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$
Banks															
BAY	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
BBC*	0.0000	0.0000	0.0000	2.5862	4.0567	5.6725	0.0000	0.0000	0.0000	0.0187	0.0708	0.1735	n/a	n/a	n/a
BBL	0.0366	0.1207	0.2711	0.0033	0.0116	0.0273	0.0013	0.0038	0.0080	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004
BMB*	0.4300	0.8739	1.4460	0.0738	0.1862	0.3546	0.0385	0.1167	0.2493	0.0071	0.0216	0.0466	0.0389	0.1051	0.2092
BOA	0.2323	0.4116	0.6251	0.0629	0.1130	0.1736	0.0060	0.0116	0.0189	0.0087	0.0168	0.0272	0.0002	0.0005	0.0011
FBCB*	0.5867	1.1952	1.9790	0.0273	0.0754	0.1524	0.0044	0.0139	0.0307	0.0027	0.0103	0.0254	0.0112	0.0374	0.0850
KTB	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0147	0.0507	0.1175	0.0005	0.0030	0.0101	0.0267	0.0644	0.1197
LTB*	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0566	0.1699	0.3600	0.1261	0.2994	0.5483	0.0520	0.1318	0.2522
NTB*	0.0000	0.0000	0.0000	0.1011	0.2414	0.4436	0.0329	0.0661	0.1095	0.0033	0.0082	0.0156	0.0040	0.0112	0.0232
SCB	0.0000	0.0000	0.0000	0.0045	0.0185	0.0483	0.0040	0.0127	0.0283	0.0005	0.0022	0.0057	0.0007	0.0020	0.0045
TDB	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0052	0.0236	0.0654	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TFB	0.0000	0.0000	0.0000	0.0054	0.0249	0.0692	0.0040	0.0138	0.0326	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004
TMB	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0070	0.0224	0.0499	0.0018	0.0082	0.0228	0.0291	0.0789	0.1576
UB*	0.0000	0.0000	0.0000	0.0716	0.1851	0.3577	0.1286	0.2941	0.5260	0.0081	0.0250	0.0546	0.1994	0.3786	0.6019
Weighted Average: Failed institutions	0.2704 0.3031[1/]	0.5504 0.6169[1/]	0.9111 1.0213[1/]	0.7130 0.0521[2/]	1.1567 0.1336[2/]	1.6694 0.2572[2/]	0.0255	0.0674	0.1336	0.0135	0.0415	0.0917	0.0294	0.0702	0.1320
Weighted Average: Non-failed institutions	0.0174	0.0480	0.0997	0.0040	0.0129	0.0307	0.0052	0.0172	0.0395	0.0005	0.0019	0.0051	0.0072	0.0181	0.0347
Weighted Average: All institutions	0.0537 0.0546[1/]	0.1201 0.1220[1/]	0.2162 0.2196[1/]	0.1132 0.0097[2/]	0.1890 0.0272[2/]	0.2830 0.0576[2/]	0.0084	0.0252	0.0545	0.0025	0.0080	0.0184	0.0107	0.0264	0.0502

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

1/ exclude UB

2/ exclude BBC

Table 5 (Continue): Deposit Insurance Premium Using Barrier Options (% of Deposit) Barrier Level = 120% of the Strike Price

For the barrier model, the deposit insurance, I, can be written as: I = DOP + DIP. If the asset price ever touches the barrier H during the live of the option, the DOP is canceled (or knocked out) and the DIP becomes activated. Using equation (6) and (7) the insurance premium is numerically estimated for σ_H equals to 1.25, 1.5, and 1.75 of the initial level σ_0, proxied by using historical volatility.

Financial Institution	1992			1993			1994			1995			1996		
	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$	$\sigma_{H=1.25}$	$\sigma_{H=1.5}$	$\sigma_{H=1.75}$
Finances															
AIFT	0.0102	0.0200	0.0325	0.0280	0.0511	0.0795	0.0413	0.0699	0.1033	0.0426	0.0841	0.1374	0.1092	0.2140	0.3479
AITCO	0.0124	0.0238	0.0382	0.0012	0.0023	0.0039	0.0014	0.0025	0.0038	0.0000	0.0000	0.0000	0.0075	0.0126	0.0186
BFIT	0.0140	0.0321	0.0578	0.0207	0.0439	0.0755	0.0135	0.0265	0.0431	0.0117	0.0264	0.0474	0.0057	0.0163	0.0339
CMIC*	0.0725	0.1536	0.2621	0.0034	0.0068	0.0113	0.1342	0.2283	0.3383	0.2687	0.5460	0.9051	0.1777	0.3225	0.4983
DS*	0.1027	0.2195	0.3764	0.0564	0.1212	0.2090	0.0071	0.0126	0.0192	0.1245	0.2010	0.2876	0.0127	0.0217	0.0323
FCI*	0.0000	0.0000	0.0000	1.5358	2.2647	3.0427	0.0003	0.0004	0.0006	n/a	n/a	n/a	0.0043	0.0071	0.0105
FIN1*	0.0383	0.0812	0.1388	0.0391	0.0781	0.1289	0.0746	0.1200	0.1714	0.0746	0.1286	0.1924	0.0076	0.0127	0.0187
GF*	0.0518	0.1251	0.2320	0.0418	0.0990	0.1818	0.1875	0.2998	0.4263	0.0668	0.1274	0.2037	0.0317	0.0542	0.0806
ITF*	0.0568	0.0908	0.1291	0.0052	0.0085	0.0125	0.0069	0.0127	0.0198	0.0812	0.1910	0.3484	0.0000	0.0000	0.0000
KK	0.1018	0.2479	0.4611	0.0340	0.0737	0.1280	0.0148	0.0303	0.0510	0.1894	0.2933	0.4083	0.1592	0.2581	0.3703
MCC*	0.0312	0.0534	0.0796	0.0135	0.0227	0.0335	0.0078	0.0136	0.0205	0.0230	0.0435	0.0691	0.0053	0.0106	0.0174
NAVA*	0.1013	0.1890	0.2971	0.0106	0.0215	0.0358	0.0421	0.0705	0.1035	0.0734	0.1325	0.2044	0.0173	0.0290	0.0426
NFS	0.0226	0.0751	0.1697	0.0000	0.0000	0.0000	0.0395	0.0874	0.1539	0.1015	0.1920	0.3049	0.0325	0.0542	0.0794
PHATRA	0.0218	0.0552	0.1056	0.0278	0.0632	0.1132	0.0187	0.0341	0.0530	0.0006	0.0010	0.0016	0.0030	0.0052	0.0079
SDF*	0.1247	0.2881	0.5180	0.0934	0.1685	0.2596	0.0830	0.1571	0.2497	0.1966	0.3591	0.5569	0.2741	0.5545	0.9165
SGACL	0.0160	0.0327	0.0547	0.0271	0.0533	0.0871	0.0322	0.0512	0.0725	0.0183	0.0321	0.0485	0.0005	0.0011	0.0020
TISCO	0.0038	0.0084	0.0148	0.0132	0.0264	0.0438	0.0008	0.0019	0.0033	0.0000	0.0000	0.0000	0.0034	0.0057	0.0084
TMF*	0.0662	0.1058	0.1505	0.0009	0.0016	0.0025	0.0718	0.1237	0.1850	0.1337	0.2461	0.3840	0.0251	0.0525	0.0892
TTF*	0.1988	0.3621	0.5602	0.0212	0.0442	0.0751	0.1240	0.2141	0.3206	0.1379	0.2259	0.3265	0.0423	0.0766	0.1186
UAF*	0.0769	0.1633	0.2792	0.0122	0.0266	0.0465	0.0216	0.0360	0.0527	0.0656	0.1083	0.1574	0.0074	0.0137	0.0214
UNITED*	0.0000	0.0000	0.0000	0.0249	0.0690	0.1399	0.1349	0.2421	0.3715	0.1948	0.3637	0.5720	0.0417	0.0917	0.1606
Weighted Average: Failed institutions	**0.0684**	**0.1413**	**0.2382**	**0.1080**	**0.1770**	**0.2597**	**0.0682**	**0.1142**	**0.1678**	**0.1152**	**0.2158**	**0.3419**	**0.0498**	**0.0929**	**0.1465**
Weighted Average: Non-failed institutions	**0.0198**	**0.0500**	**0.0971**	**0.0189**	**0.0395**	**0.0672**	**0.0239**	**0.0458**	**0.0741**	**0.0456**	**0.0811**	**0.1245**	**0.0265**	**0.0453**	**0.0678**
Weighted Average: All institutions	**0.0485**	**0.1040**	**0.1805**	**0.0706**	**0.1192**	**0.1789**	**0.0507**	**0.0872**	**0.1308**	**0.0905**	**0.1681**	**0.2648**	**0.0419**	**0.0769**	**0.1200**

Note: * denotes failed institutions, institutions that were closed down or intervened by the government in 1996-1997

Table 6: Average Deposit Insurance Premium during 1992-1996(% of Deposit)

Model	Average Premium(%)					
	Banks			Finances		
	Failed	Non-failed	Total	Failed	Non-failed	Total
1. Black-Scholes						
- Using Historical Volatility	0.1290	0.0031	0.0220	0.0280	0.0112	0.0217
- Using GARCH (1,1) Volatility	0.2645	0.0249	0.0619	0.3058	0.1022	0.2236
2. Barrier Options						
- Barrier level 90%(H) $\sigma_H = 1.25$	0.1272	0.0032	0.0219	0.0504	0.0112	0.0349
$\sigma_H = 1.50$	0.1356	0.0032	0.0232	0.0523	0.0119	0.0366
$\sigma_H = 1.75$	0.1443	0.0033	0.0245	0.0557	0.0124	0.0384
- Barrier level 100%(H) $\sigma_H = 1.25$	0.1614	0.0048	0.0283	0.0637	0.0146	0.0442
$\sigma_H = 1.50$	0.2040	0.0066	0.0362	0.0794	0.0180	0.0550
$\sigma_H = 1.75$	0.2469	0.0084	0.0442	0.0948	0.0214	0.0656
- Barrier level 120%(H) $\sigma_H = 1.25$	0.2104	0.0069	0.0377	0.0819	0.0269	0.0604
$\sigma_H = 1.50$	0.3772	0.0196	0.0737	0.1483	0.0523	0.1111
$\sigma_H = 1.75$	0.5876	0.0419	0.1245	0.2308	0.0861	0.1750

Figure 1.1: The Black-Scholes Based Deposit Insurance Premium Using Historical Volatility during 1992-1996

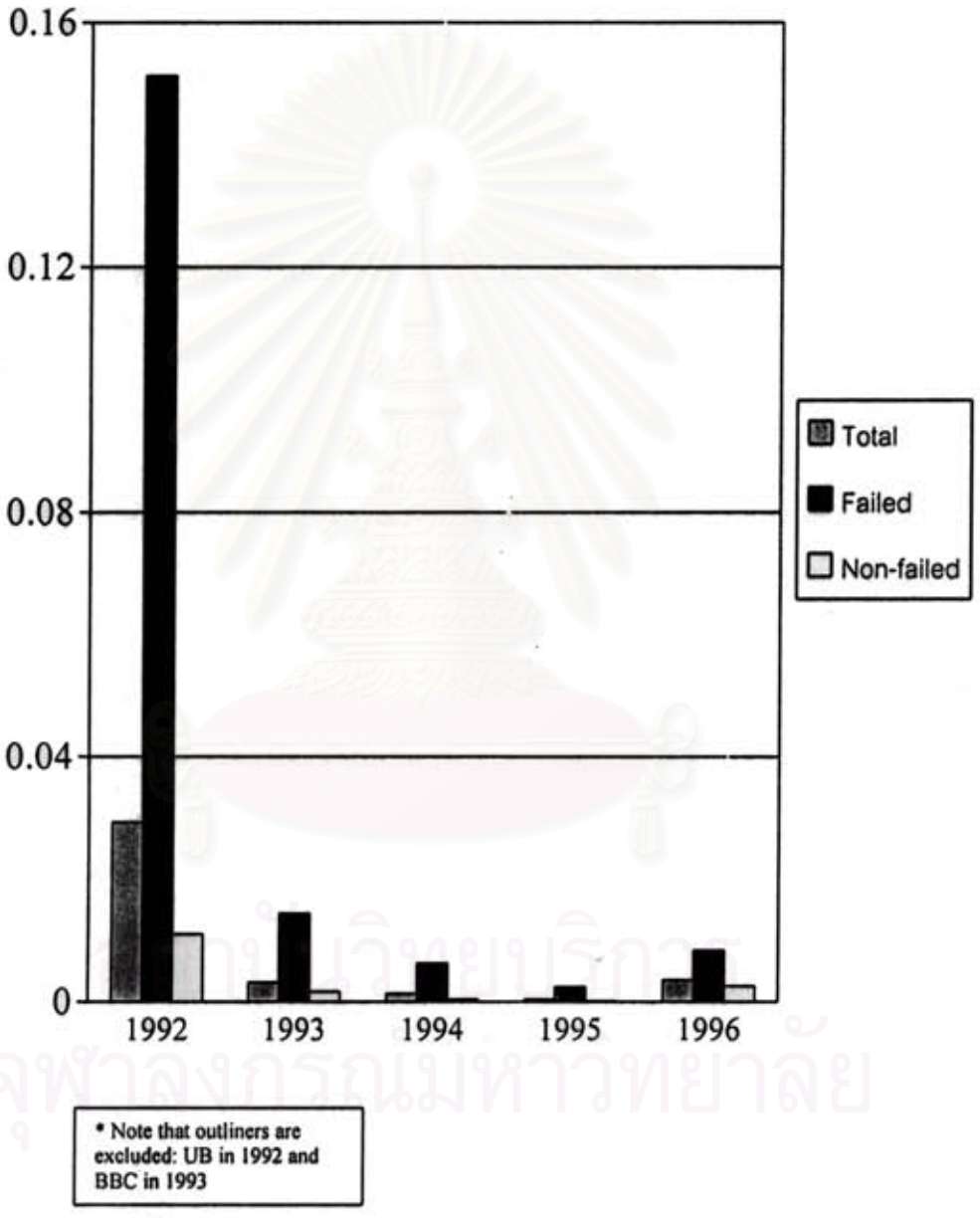


Figure 1.2: The Black-Scholes Based Deposit Insurance Premium Using Historical Volatility during 1992-1996

Finance and Securities Companies

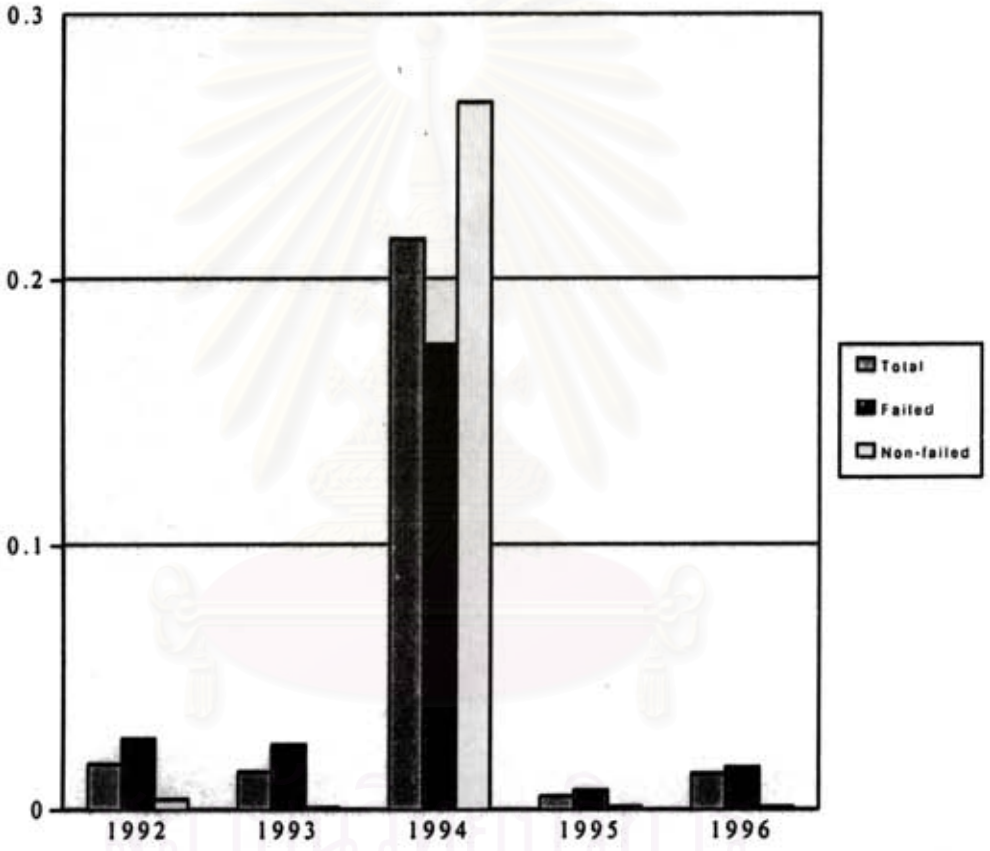


Figure 2.1: The Black-Scholes Based Deposit Insurance Premium Using GARCH (1,1) Volatility during 1992-1996

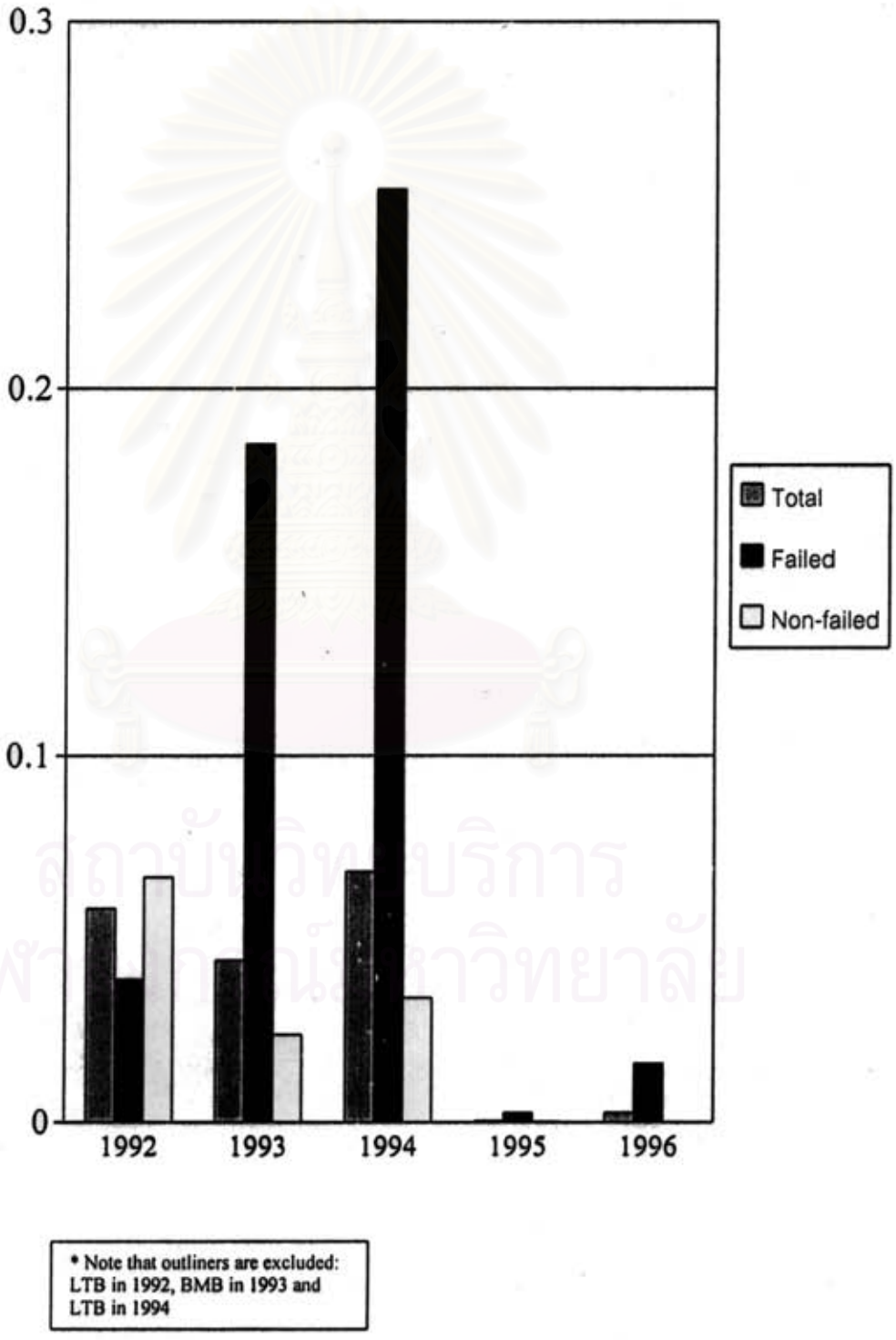
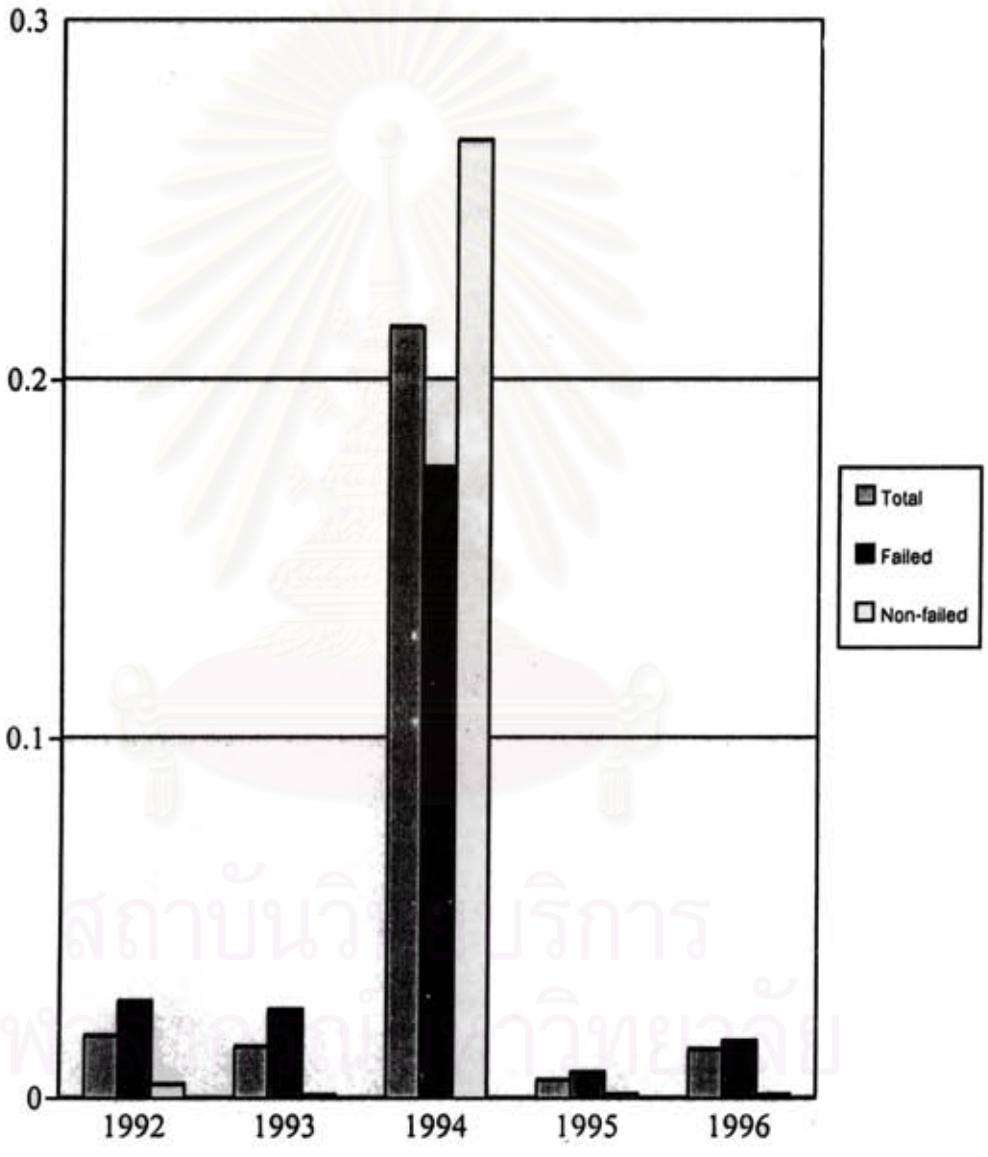


Figure 2.2: The Black-Scholes Based Deposit Insurance Premium Using GARCH (1,1) Volatility during 1992-1996

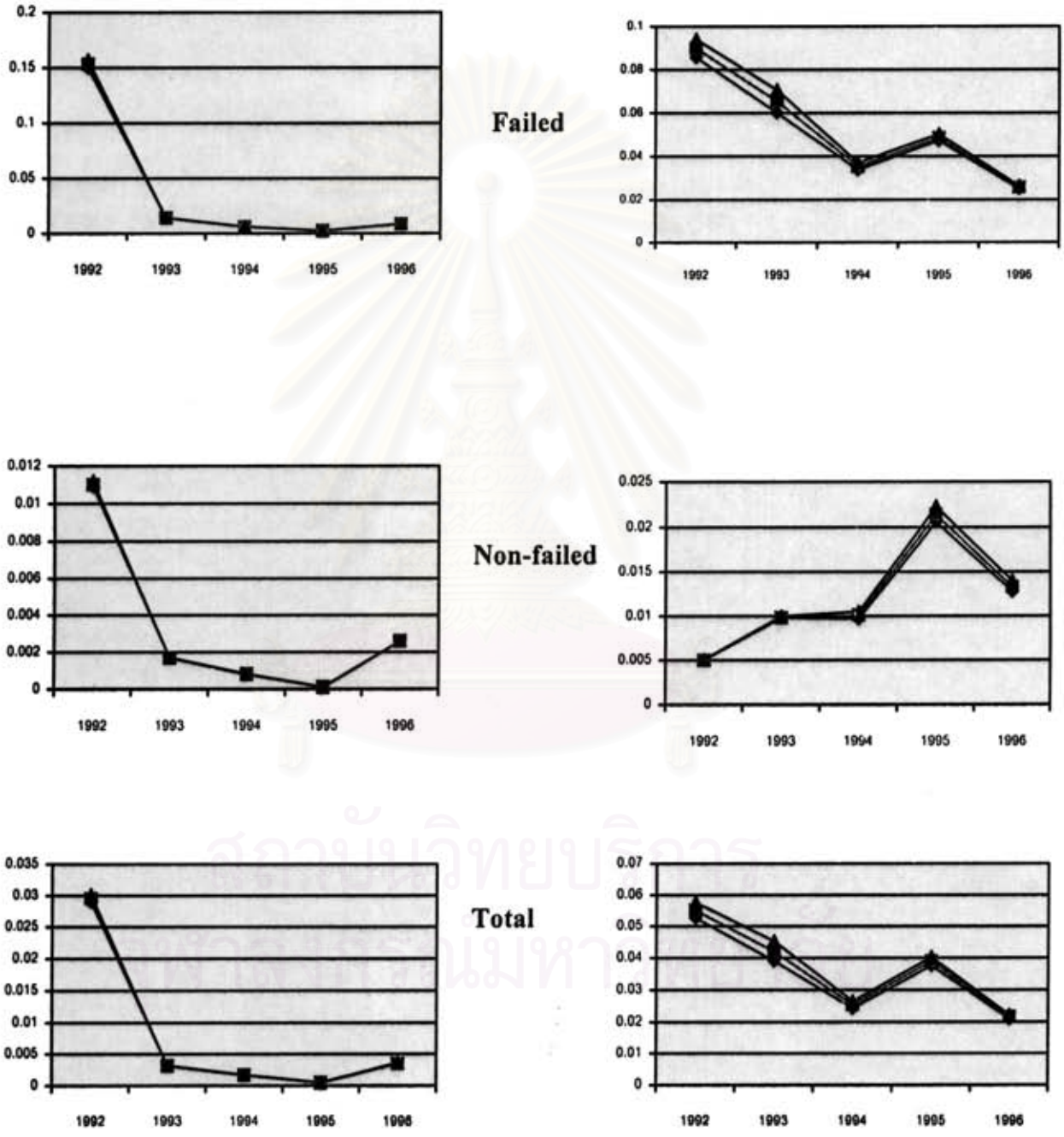
Finance and Securities Companies*



* Note that outliners are excluded: FCI in 1993 and FIN1, GF, TISCO in 1994

Figure 3.1: The Barrier Option Based Insurance Premium with Barrier (H) = 90 % of the Strike Price (F) during 1992-1996

Banks* **Finances**



* Note that outliners are excluded: UB in 1992 and BBC in 1993

σ_H= 1.25
σ_H= 1.50
σ_H= 1.75

Figure 3.2: The Barrier Option Based Insurance Premium with Barrier (H) = 100 % of the Strike Price (F) during 1992-1996

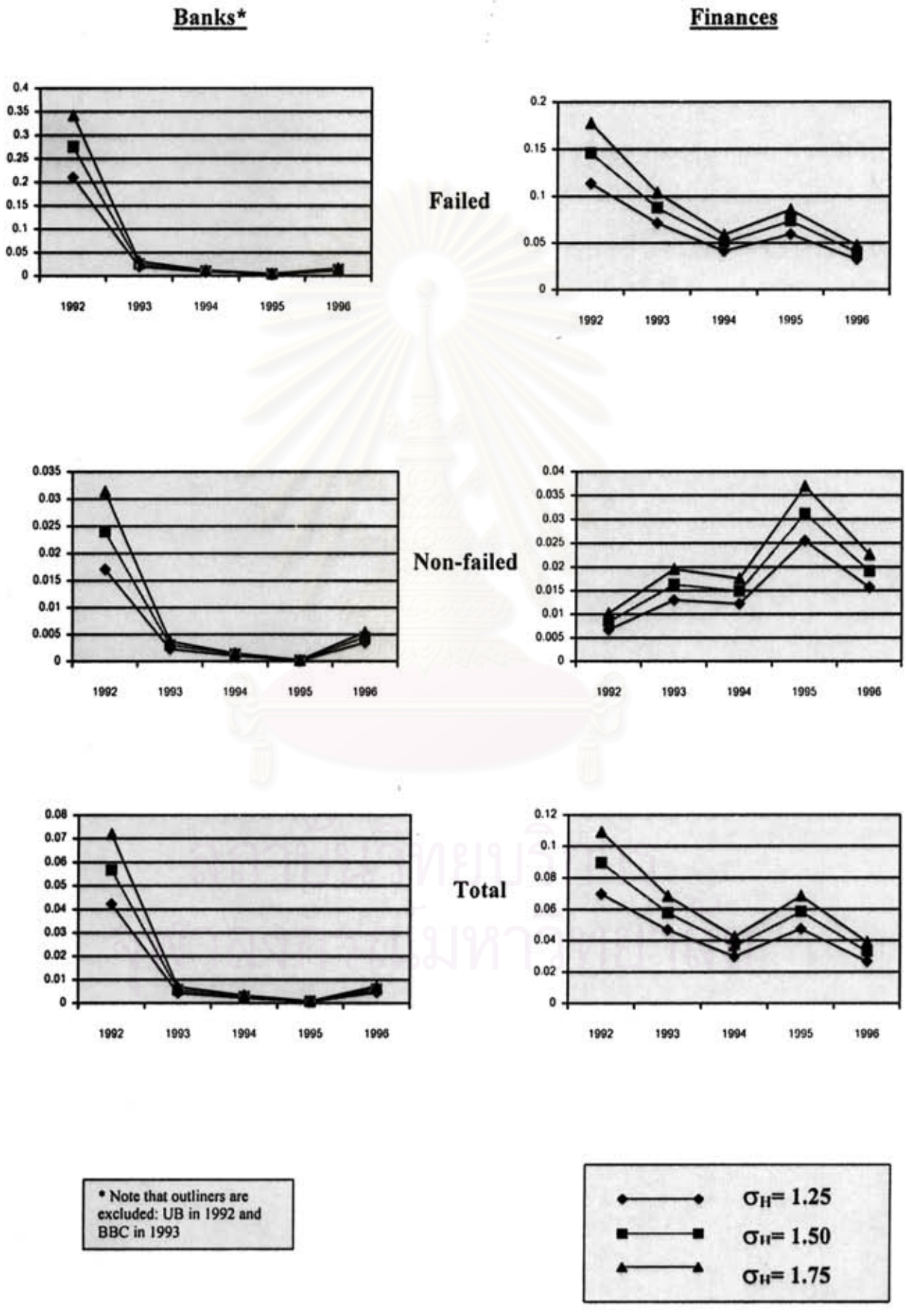
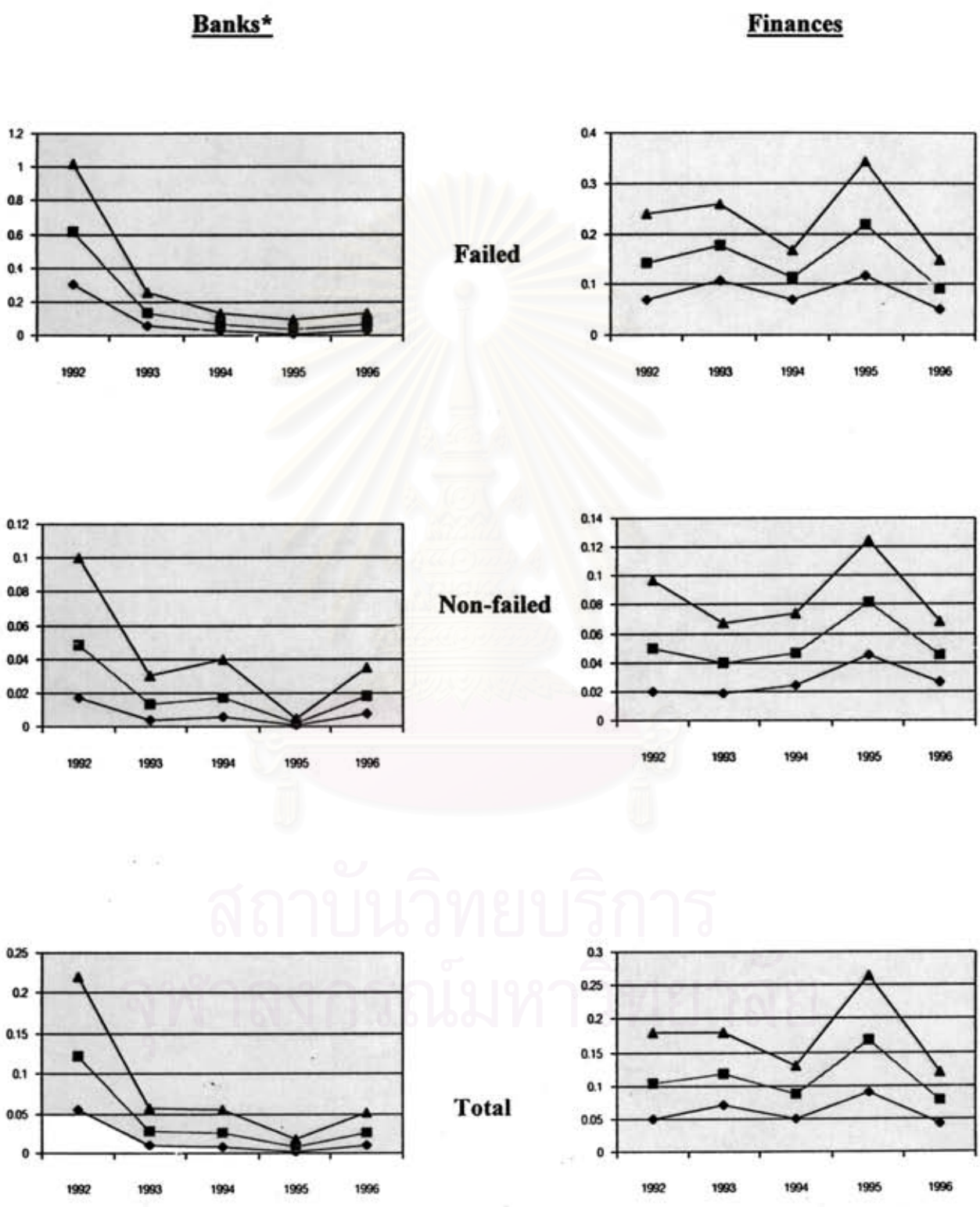


Figure 3.3: The Barrier Option Based Insurance Premium with Barrier (H) = 120 % of the Strike Price (F) during 1992-1996



THE EIGHTH CONFERENCE ON PACIFIC BASIN FINANCE, ECONOMICS AND ACCOUNTING AND THE SECOND ADSGM INTERNATIONAL CONFERENCE

SHANGRI-LA HOTEL, BANGKOK, THAILAND

Thursday, June 1 and Friday, June 2, 2000

Organizers:

The Joint Doctoral Program in Business Administration (JDBA)
of National Institute of Development Administration (NIDA), Chulalongkorn University, and Thammasat University, Thailand
Rutgers University
Society of Economic and Management in Pacific Basin countries

Program Chairs:

Professor Cheng-few Lee
Department of Finance, School of Business
Rutgers, The State University of New Jersey, USA

And

Dr. Chirayu Isarangkun Na Ayuthaya	Director General, The Bureau Crown Property Chairman of Organizing Committee
Dr. Felipe B. Alfonso	President of ADSGM Co-Chairman of Organizing Committee
Dr. Maruey Phadoongsidhi	Former, Minster of Finance Chairman of Technical Committee

Thursday, June 1, 2000
Concurrent Sessions 14:00 – 15:30 p.m.

Session B1 ~ eFinance

Chairman

Dr. Soushan Wu

National Chiao Tang University, ROC

Panelists

- Richard Shih, Securities and Futures Institute, ROC

Session B2 ~ Globalization and Relationship among Security Exchanges

Chairman

James H. Scott

Prudential Diversified Investment Strategies, USA

Panelists

- Mr. Vicharat Vichit-Vadakan, President of Stock Exchange of Thailand, Thailand
- Yesley J.D. Yu, Legislative Yuan, ROC

Session B3 ~ Banking Intermediation and Deposit Insurance

Chairman

Ms. Tarisa Watanagase

Assistant Governor, Bank of Thailand

Panelists

- Sunti Tirapat, Chulalongkorn University, Thailand.
  "Risk-Based Deposit Insurance: An Application to Thailand"
- William C. Hunter, Federal Reserve Bank of Chicago, USA
- George C. Kaufman, Loyola University—Chicago, USA
- Xuhai Pan, Development Research Center of the State Council, PRC

หมายกำหนดการสัมมนาวิชาการ
เนื่องในโอกาสมหามงคลเฉลิมพระชนมพรรษา 6 รอบของพระบาทสมเด็จพระเจ้าอยู่หัว
ในวันพฤหัสบดีที่ 16 ธันวาคม 2542 เวลา 8.30 - 17.00 น.
ณ ห้องสารนิเทศ ชั้น 2 หอประชุมจุฬาลงกรณ์มหาวิทยาลัย

8.30-8.40 ลงทะเบียน

8.40-8.50 คณบดีคณะเศรษฐศาสตร์ กล่าวเปิดงาน

<u>กลุ่มเศรษฐศาสตร์สิ่งแวดล้อม</u>

8.50-9.10	อ.ดร.ปรีชา เปี่ยมพงศ์สานต์	เศรษฐศาสตร์แห่งความพอเพียงและนิเวศวิทยาแนวลึก
9.10-9.30	ผศ.ดร.จาริต ติงศภัทิย์	ทรัพย์ในดิน-สินในน้ำ การจัดสรรทรัพยากรธรรมชาติเชิงเปรียบเทียบแนวเศรษฐศาสตร์นิเวศ
9.30-9.40	*อภิปราย*	

<u>กลุ่มเศรษฐศาสตร์แรงงานและสังคม</u>

9.40-10.00	ผศ.ดร.ณรงค์ เพ็ชรประเสริฐ	การศึกษาความเป็นไปได้ในการจัดตั้งธุรกิจชุมชน กรณีศึกษา : อ.หัวไทร จ.นครศรีธรรมราช
10.00-10.20	รศ.ดร.กิตติ ลิ่มสกุล	การประเมินผลกองทุนรวมเพื่อช่วยเหลือเกษตรกร (คชก.) ปี 2539/40
10.20-10.40	ผศ.ดร.อิศรา ศานติศาสน์	ภาระในเชิงการกระจายรายได้ของการเปลี่ยนแปลงอัตราภาษีมูลค่าเพิ่ม
10.40-10.55	*อภิปราย*	
10.55-11.10	*พักรับประทานอาหารว่าง*	
11.10-11.30	รศ.แล ดิลกวิทยรัตน์	วิกฤติการณ์เศรษฐกิจ ผลกระทบทางสังคมและขบวนการแรงงานในปัจจุบัน
11.30-11.50	รศ.ดร.วรวิทย์ เจริญเลิศ	Economic Crisis and Challenges for TU
11.50-12.00	*อภิปราย*	
12.00-13.00	*รับประทานอาหารกลางวัน*	

<u>กลุ่มเศรษฐศาสตร์อุตสาหกรรม</u>

13.00-13.20	รศ.ดร.ขวัญใจ อรุณลมิทธิ	ผลกระทบของการเปิดเสรี APEC ที่มีต่อระบบเศรษฐกิจและอุตสาหกรรมไทย (ACGE Approach)
13.20-13.40	รศ.ดร.ไพฑูรย์ วิบูลชุติกุล	Small and Medium-Sized Industries in Thailand

<u>กลุ่มเศรษฐศาสตร์ระหว่างประเทศ</u>

13.40-14.00	รศ.ดร.กนกศักดิ์ แก้วเทพ	A Cultural Perspective Reactions to Currency Crisis in Mexico
14.00-14.20	รศ.ดร.สมภพ มานะรังสรรค์	ผลกระทบจากการใช้อัตราแลกเปลี่ยนแบบลอยตัวที่มีต่อการค้าและการลงทุน
14.20-14.40	*อภิปราย*	
14.40-15.00	*พัก รับประทานอาหารว่าง*	
15.00-15.20	รศ.ดร.สุทธิพันธ์ จิราธิวัฒน์	การเปิดเสรีภาคการท่องเที่ยวของไทย ผลการศึกษาผลกระทบและการปรับตัว
15.20-15.40	รศ.ดร.วัฒนา สุวรรณแสง จั่นเจริญ	International Trade in Health Services in the Millenium : A Case of Thailand
15.40-16.00	ผศ.ดร.ศิริเพ็ญ ศุภกาญจนกันติ	A case study of the WTO trips agreement : impact on the pharmaceutical industry in Thailand and recommendations to alleviate potential negative effects
16.00-16.20	ดร.ลันติ ถิรพัฒน์	Risk-Based deposit Insurance : An Application to Thailand
16.20-16.40	ดร.จูน นวลตรณี	Transmission Mechanism of Monetary in Thailand
16.40-17.05	*อภิปราย*	
17.05-17.15	คณบดี กล่าวปิดงาน	

◆ ผู้ดำเนินรายการ อ.ศิริมา บุนนาค และอ.ดร.พรกมล มานะกิจ