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Banking Crises, Deposit Insurance, and Market Discipline: Lessons from the Asian Crises

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Abstract

We investigate the effectiveness of market discipline by depositors during the period of 1992-2002 in the four crisis-hit Asian countries: Indonesia, Korea, Malaysia and Thailand. In Indonesia, the crises first weakened and then strengthened market, which is consistent with the wake-up-call effect found for the Latin American crisis-hit countries (Martinez Peria and Schmukler, 2001). Unlike Indonesia, we could not find an increase in depositors' responsiveness to bank risk after the crisis in the other three countries. In Korea and Thailand, depositors' risk sensitivity rather decreased after the crisis. In these countries, market discipline was at play before the crisis and the deposit protection schemes were constructed to ensure its credibility under stable political conditions.

JEL Classification Codes: G21, G28
Key Words: Market Discipline, Bank Crises, Deposit Insurance, Asia

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1. Introduction

Do depositors understand bank risk and respond to it or do they just run to banks irrespectively of bank risk during banking crises? How does depositors' responsiveness to bank risk change when the governments introduce blanket guarantees to prevent bank runs? These are empirical questions yet to be resolved despite their academic and practical importance. We provide some evidence on these issues from the experiences of the countries hit by the recent Asian crises: Korea, Indonesia, Thailand, and Malaysia.

Most of the countries hit by a banking crisis expand safety nets, sometimes including a blanket guarantee to deposits, and promote restructuring in the banking industries. Such changes in institutional arrangements and other government responses to bank risk are likely to influence depositors' sensitivity to bank risk, which in turn would affect managerial incentives towards prudential management. We try to shed light on the links between market discipline, deposit protection, and banking crises by comparing the four Asian countries that varied in the government responses to financial crises. While Korea and Thailand established a credible scheme for full deposit protection just after the crisis occurred, Indonesia did not guarantee deposits for about a half year after the financial crisis occurred. At the early stage of the crisis, the Indonesian government closed insolvent banks and induced bank panic runs to the solvent banks.

The impacts of banking crises and deposit insurance on market discipline have been explored by some preceding studies. As an example of bank panics in an environment without government deposit insurance, Calomiris and Mason (1997) picked up the Chicago panic of June 1932 in the U.S. and concluded that failures during the panic reflected the relative weakness of failing banks in the face of a common asset value shock rather than contagion. On the other hand, as an example of banking crisis under deposit insurance, Martinez Peria and Schmukler (2001) examined the experiences of Argentina, Chile, and Mexico during the 1980s and 1990s, finding that deposit insurance did not necessarily diminish the extent of market discipline by depositors and that though depositors' responsiveness to bank risk was relatively weak before and during the crises, it increased after the crises. Their results suggest that depositors become more aware of bank risk after bank failures, which they call a "wake-up call" effect. This paper is complementary to theirs by investigating the experiences of Asian crises. We are interested in whether we can obtain a similar "wake-up call" effect after the Asian financial crises. Hosono (2005) examined the effectiveness of market discipline in the four crisis-hit Asian countries. His results suggest that depositors' responsiveness to bank risk taking

was lower during and after the crisis than before the crisis. However, he did not make a thorough country-by-country analysis due to a relatively small number of the sample banks. This paper analyzes market discipline in each of the four countries using a larger number of banks. Demirgüç-Kunt and Huizinga (2003) examined the effects of deposit insurance designs on depositor discipline and found that explicit deposit insurance reduced depositor's sensitivity to bank risk and that the more it did as its coverage was broader. Hosono, Iwaki and Tsuru (2004) provides evidences on bank regulations and market discipline. Neither Demirgüç-Kunt and Huizinga (2003) nor Hosono, Iwaki and Tsuru (2004) examined the impact of banking crises on market discipline.

In Section 2, we present a brief overview In Section 3, we present our hypotheses. In Section 4, we describe our methodology and data. In Section 5, we present our empirical results. Section 6 concludes.

2. Crises and Deposit Protections in the Asian Countries[1]

This section briefly overviews the development of the banking crises and the changes in the safety nets across the four Asian countries.

The development of the banking crises and the recovery from it varied across the countries. Table 1 shows the amounts of public money injected to recapitalize banks for the four Asian countries (Table 1). Though all these countries were affected by the crisis most severely in 1998, we see that Indonesia went though the most prolonged and severe banking problems. Accumulated amounts of public money injected as a proportion of GDP range from about 5 to 7 % for Korea, Malaysia and Thailand. In Indonesia, accumulated amounts of bond issued to recapitalize banks amounted to about 58% of GDP. In addition, the Indonesian government had to spend public money of more than 10% of GDP to recapitalize banks even in 2000. As a consequence, in Indonesia, assets of banks that were recapitalized by the government and survived represented more than half of the assets of all banks in 2000, though assets of failed banks were as large as 12% of the assets of all banks in 1999.

As for deposit guarantee schemes, Korea and Thailand were in sharp contrast with Indonesia and Malaysia. In Korea, depositors were implicitly guaranteed by the government until 1995. Explicit deposit insurance was first introduced in 1996 and the Korean Deposit Insurance Corporation (KDIC) was established in 1996. At that time, the insurance coverage was limited to 20 million won per individual depositor. When the crisis occurred in 1997, the coverage was extended to blanket coverage in December. As financial markets stabilized, the partial protection system was reinstated with the limit of 50 million won per individual financial institution in 2001.

In Thailand, though no explicit deposit insurance has been established yet, the Financial

Institutions Development Fund (FIDF) became responsible for insuring the repayment of deposits of financial institutions experiencing financial problems since the amendment of the Bank of Thailand regulation in August 1997. The guarantee covered all depositors and non-subordinated creditors of domestic and foreign financial institutions except for the 58 finance companies previously suspended. In November 2003, creditors were excluded from the blanket guarantee while depositors have been fully protected (at least until July 2005).

In Indonesia, the government tried to cope with the banking crisis by supplying liquidity. The government suddenly closed 16 banks and announced a partial guarantee of small deposits in November 1997, although people had expected implicit full guarantees to deposits. People lost confidence in the unexpected partial guarantee. In addition, the liquidity supply policy was failing due to the surge in capital flight. Consequently, people ran to banks to withdraw deposits in a panic. It was only in January 1998 when a presidential decree established the blanket guarantee that covered both depositors and creditors. Scott (2002, pp. 9-10) describes the situation before the introduction of the blanket guarantee as follows.

Coupled with uncertainty how the limited guarantee would be honored, political tensions over the state of President Suharto's health, uncertainties regarding his impending reelection, and growing fears over the country's corporate debt and banking sector problems, the closures contributed to the wide spread panic that led to deposit runs on many private banks.

Even the declaration of the blanket guarantee did not gain credibility from depositors, given that it did not specify which instruments would be covered and which agency would implement the guarantee (Scott, 2002).

The Malaysian government tried to contain the crisis by restricting capital flight. The government did not officially introduce a blanket guarantee, though the government had always provided some form of implicit deposit insurance.

3. Hypotheses

In this section, we present our hypotheses concerning the impact of banking crises on market discipline and the interaction between market discipline and deposit insurance.

Depositors might not respond to individual bank risk during banking crisis, because macroeconomic shocks such as the currency crises and real estate market debacles hit most of the banks alike in the crises. In the case of a severe crisis, depositors may run to banks to withdraw deposits irrespectively of individual bank risk. It should be noted that large systemic effects on depositor behavior during a banking crisis do not necessarily mean that depositors are irrational. Rather, depositors may rationally behave themselves given that most banks cannot diversify a large macroeconomic shock.

The interaction between market discipline and deposit insurance is at least theoretically

clear. As deposit insurance becomes more generous, depositors are thought to be less likely to respond to bank risk taking, because depositors incur a smaller fraction of losses from bank failures. Generous deposit insurance is thought to undermine market discipline. Though this theoretical prediction is supported by some empirical evidences (e.g., Demirgüç-Kunt and Huizinga, 2003), there remains a subtle question. Generous deposit guarantee, explicit or implicit, may not be credible if funds are not sufficient. This credibility issue or repudiation risk (Cook and Spellman, 1994) seems to be of practical importance during and after a severe banking crisis, because a large number of banks fall into financial distress and deposit insurance funds or government funds may be depleted.

The impact of banking crises on market discipline is likely to change over time. After the crisis, a positive effect of crises on market discipline is likely to be at play. Martinez Peria and Schmukler (2001) argue that traumatic episodes during a severe crisis may act as "wake-up calls" for depositors, increasing depositors' awareness of the risk of their deposits. They also point out a possibility that deposit insurance funds might be depleted during a crisis, losing credibility after the crisis, and finally increasing depositors' sensitivity to bank risk. However, if the credibility of deposit insurance is not shaken by the crisis due to the strong financial basis of deposit insurance fund or the government, depositors may not be sensitive to bank risk after the crisis. Whether the Asian crisis-hit countries followed the same way as the Latin American crisis-hit countries did depend (at least partly) on the credibility of deposit insurance. By comparing Indonesia, where the government announcement of a blanket guarantee did not seem to gain credibility from depositors with the other countries, we can tackle this credibility issue.

4. Methodology and Data

A. Methodology

A vast literature on market discipline analyzes the price (i.e., the interest rate) response to bank risk (e.g., Hannan and Hanweck, 1988; Ellis and Flannery, 1992, and Cook and Spellman, 1994), the quantity (i.e., the deposits outstanding or their growth rate) response to bank risk (e.g., Goldberg and Hudgins, 1996; Calomiris and Wilson, 1998) or both (Park, 1995; Park and Peristiani, 1998, and Martinez Peria and Schmukler, 2001). Following these preceding studies, we analyze the responses of the deposit interest rate and the deposit growth rate to bank risk. However, because complete data on the merger and acquisition that took took place during the crises is not available, our results on the deposit growth rate may not be accurate. Therefore, we report the results for the deposit interest rate in the main text and leave the results for the deposit growth rate in Appendix. Specifically, we estimate the following deposit interest rate equation using OLS for each country:

$$\begin{aligned} Interest\,Rate_{i,t} = {} & \beta' Bank\,Risk_{i,t-1} + \gamma' Bank\,Characteristics_{i,t-1} \\ & + \delta' Macroeconomic Variables_{t-1} + \mu_i + \varepsilon_{i,t} \end{aligned} \tag{1}$$

A larger absolute value of the coefficient on a bank risk measure suggests that depositors are more sensitive to bank risk and hence that stronger market discipline is at play.[2] Bank risk is (inversely) measured either by equity (Equity) or liquid assets (Liquidity) as a proportion of total assets. While Equity is a direct measure of the bank insolvency risk, we also use Liquidity, considering that accounting equity might not be a good proxy to economic value of equity under poor accounting standards. Controlling variables for bank characteristics are overhead costs (OVERHEAD) as a proportion of total assets, the logarithm of total assets (SCALE), and the ratio of customer and short-term funding to total interest bearing liability (MATURITY). ASSETSIZE may either lower or heighten the deposit interest rate. Depositors of a large bank may be protected implicitly by a "too-big-to-fail policy" and hence require a low risk premium. If a large bank takes excessive risk under the too-big-to-fail policy, however, depositors would require a higher risk premium. MATURITY is added to the interest rate equation to control for the difference in interest rates across deposits with different maturities. Macroeconomic variables include the inflation rate (INFLATION), real per capital GDP growth rate (GROWTH). In the deposit interest rate equation, short-term government bond rate (GOVERNMENT RATE) is also added.[3]

To examine the impacts of banking crises and deposit guarantee on market discipline, we estimate equation (1) by adding a crisis dummy (CRISIS) that takes the values of one in 1998 and zero otherwise, a post-crisis dummy (POST) that takes the value of one over the period 1999-2002 and zero otherwise, and the interaction terms of CRISIS and POST, on one hand, and a bank risk measure, on the other.[4]

$$\begin{aligned} Interest\,Rate_{i,t} = {} & \beta Bank\,Risk_{i,t-1} + \gamma' Bank\,Characteristics_{i,t-1} \\ & + \delta' Macroeconomic Variables_{t-1} \\ & + \varphi CRISIS_t + \eta CRISIS_t \times Bank\,Risk_{i,t-1} \\ & + \kappa POST_t + \lambda POST_t \times Bank\,Risk_{i,t-1} + \mu_i + \varepsilon_{i,t} \end{aligned} \tag{2}$$

The interaction term of CRISIS and bank risk measures capture the immediate impact of crises on market discipline. On the other hand, the interaction term of POST and bank risk measures capture the "wake-up" effect that is supposed to come after the crisis. As we have stated above, Korea, Indonesia and Thailand adopted blanket guarantees, either explicit or implicit, as soon as the crisis emerged. Therefore, the interaction term of CRISIS and POST with bank risk measures also capture the effect of blanket guarantees on market discipline in these three countries. Considering that in Korea, a limited coverage of deposit insurance was reinstated in

2001, we divide the post-crisis period into the two periods: the 1999-2000 period and the 2001-02 period The interaction term of the 2001-02 dummy and bank risk measures captures the effect of the reinstatement of partial protection.

B. Data

Our main data source of bank financial statements is BankScope compiled by Fitch IBCA. We exclude the bank-year samples that displayed 50% or more growth rate of deposits because they are likely to have been involved with mergers or acquisitions. We also exclude obvious data errors, including the samples that displayed -50 or less growth rate of deposits, that displayed no loan outstanding, and that displayed 100% or more absolute values of real deposit interest rate. We restrict sample banks to commercial banks and exclude savings banks, cooperative banks, real estate mortgage banks, medium and long-term credit banks, non-banking credit institutions, specialized governmental credit institutions, and multi-lateral governmental banks, because the coverage of these types of banks vary across countries. We are left with 32 banks for Korea, 96 banks for Indonesia, 39 banks for Malaysia, and 15 banks for Thailand. The sample covers the period of 1992-2002.

The definitions of bank-level variables are given by Table 1. Descriptive sample statistics of bank-level variables are given by Table 2 by country.

5. Empirical Results

5.1 Preview

Before performing formal regression analyses, we classify banks into four risk groups and see the average deposit interest rates of each risk group. In particular, we classify banks by Equity in the previous year into quartiles (Figure 1).

For Indonesian banks, the differences in deposit interest rates across Equity quartiles emerged only after 1999. For Korean banks, lower Equity groups had tended to pay higher interest rates until 2000, suggesting the presence of market discipline. However, such differences seem to have disappeared after 2001. For Malaysian banks, there seem no significant differences in deposit interest rates across Equity quartiles over the whole period. For Thai banks, there was a clear difference in deposit interest rates across Equity quartiles only in 1998. However, we could not observe such a systematic difference except for 1998. In sum, Figure 1 suggests a large difference in the relationship between the deposit interest rate and bank risk across countries and periods. This observation motivates us to estimate the deposit interest rate equations (and the deposit growth rate equations) for each country allowing for the change in the strength of market discipline over the sample period. Now we turn to the estimation results for each country.

5.2 Baseline Results

A. Indonesia

Table 3A shows the estimation results for Indonesian banks. The estimation results for Equation 1 (Columns 1 and 2) show that the coefficients on Equity and Liquidity are both negative and significant. Using a point estimate of the coefficient on Equity, for example, we see that if a bank equity ratio is lower by one percentage point than another bank, then the former bank has to pay a higher deposit interest rate by four basis points than the latter. Turning to other bank characteristic variables, we see that the coefficient on MATURITY is negative and significant, as is expected, suggesting that the interest rates on long-term debt are higher than those on short-term debt. The coefficient on SCALE is positive and significant, suggesting that a larger bank has to pay a higher deposit interest rate. The coefficient on OVERHEAD is positive and significant when Liquidity is used as a bank risk measure. Among the macroeconomic variables, the coefficients on GOVERNMENT RATE and GROWTH are not significant, while that on INFLATION is significantly negative but its absolute value is less than one. The later result suggests that the deposit interest rate does not respond to inflation rate one-by-one.

Next, we see the effects of the crisis on market discipline by estimating Equation (2) (Columns 3 and 4). The coefficients on the interaction terms of Crisis and Equity or Liquidity are significantly positive, suggesting that the immediate impact of the crisis on market discipline was weakening. On the other hand, the interaction term of Post and Equity is significantly negative, suggesting that depositors became more sensitive to bank risk than before. This pattern is consistent with the wake-up-call effect found for the Latin American crisis-hit countries (Martinez Peria and Schmukoer, 2001): A crisis first decreases the depositors' sensitivity to bank risk due to the relative importance of macroeconomic shock, and then increases their awareness of individual bank risk. The initial decrease in depositors' risk sensitivity may also reflect a panic-like behavior by depositors who faced the abrupt closures of a significant number of banks. Our result also suggests that though a blanket guarantee was introduced, deposit protection did not gain full credibility.

In Indonesia, depositors were said to shift their deposits from domestic banks to foreign banks during the crisis. To examine whether depositor responses toward bank risk were different between domestic banks and majority foreign-owned banks, we construct the dummy for foreign banks (Foreign) and add the interaction term of Foreign with Equity, the interaction term of Foreign with Equity and Crisis, and the interaction term of Foreign with Equity and Post (Column 5).[5] We see that the coefficient on the interaction term of Foreign with Equity and Crisis is significantly negative, while the coefficients on the interaction term of Foreign with

Equity and the interaction term of Foreign with Equity and Post are significantly positive. The currency debacle and other macroeconomic shocks during the crisis hit most of the domestic banks alike. Consequently, depositors were indifferent among domestic banks. On the other hand, the effect of the currency crisis on foreign banks was different among each other because the degree of currency mismatches between asset and debt and other sensitivity to the currency risk were different among foreign banks. As a result, depositors could distinguish a safe, well-capitalized foreign bank from a risky, poorly-capitalized bank. Once the effect of macroeconomic shocks on domestic banks became smaller after the crisis, depositor became more selective among domestic banks.

We further compared foreign banks with domestic banks by investigating whether the former paid lower interest rates on deposits than the latter on average. The answer was affirmative; the averages of the fixed effects were 0.007 for foreign banks vis-à-vis 0.011 for domestic banks (not reported in the table). In Column 6, we replaced Equity with Liquidity and obtained similar results. The averages of the fixed effects were 0.006 for foreign banks and 0.012 for domestic banks.

B. Korea

Table 3B shows the results for Korean banks. The estimation results for Equation 1 (with no dummy) show that the coefficient on Equity is not significant and that the coefficient on Liquidity is positive and significant. MATURITY is significantly negative, as is expected, while SCALE is not significant. GOVERNMENT RATE is significantly positive, as is expected, while INFLATION is significantly negative, though the absolute value of its coefficient is less than one. GROWTH is significantly negative.

Estimating Equation (2) with the three period dummies, we see that the interaction term of Crisis (the 1998 dummy) and Liquidity, the interaction term of the 1999-2000 dummy and Equity, and the interaction terms of the 2001-02 dummy and Equity and Liquidity are all significantly positive. These results suggest that the immediate impact of the crisis on market discipline was weakening, as was Indonesia, that there was no wake-up effect after the crisis, unlike Indonesia, and that the reinstatement of partial deposit protection did not strengthen market discipline, but rather weakened it. In sum, in Korea, depositors' responsiveness to bank risk was weakened after the crisis. There are some possible reasons for the failure of the wake-up call hypothesis for the Korean crisis. First, in Korea, depositor discipline worked effectively before the crisis. We see that the coefficients on Equity and Liquidity are significantly negative in Equation (2). Second, the deposit protection by explicit deposit protection was credible, even though it became a partial protection.

C. Malaysia

Table 3C shows the results for Malaysian banks. The estimation results for Equation 1 (with no dummy) shows that the coefficients on Equity and Liquidity are not significant. The coefficient on OVERHEAD is significantly positive, while the coefficients on MATURITY or SCALE are not significant. The coefficients on macroeconomic variables are all significant with the same signs as for Korean banks.

The estimation results of Equation (2) show that neither the bank risk measures nor the interaction terms of CRISIS and POST with the bank risk measures are significant, suggesting that no significant market discipline worked in Malaysia.

D. Thailand

Table 3D shows the results for Thai banks. The estimation results for Equation 1 (with no dummy) show that the coefficients on Equity and Liquidity are not significant. The coefficients on MATURITY or SCALE are not significant. The coefficients on macroeconomic variables are all significant with the same as for Korean banks except for one variable (GROWTH in the case of Equity).

The estimation results of Equation (2) show that the coefficient on Liquidity is significantly negative while the interaction term of Post (the 1999-2002 Dummy) and Liquidity is significantly positive. These results suggest that in Thailand, market discipline became weak after the crisis occurred. The reasons for the failure of the wake-up call hypothesis are also similar to Korea: Market discipline seems to have been at play before the crisis. In addition, the deposit protection scheme seemed to be credible because the agency in charge of deposit protection (FIDF) was clearly determined, which was in sharp contrast with the Indonesian case.

5.3 Robustness

There are two potential pitfalls or biases when we estimate Equations (1) or (2) with OLS. First, Liquidity may be endogenous, because a risky bank may hold more liquid assets to avoid higher interest rates. In addition, the deposit interest rate may be correlated with Liquidity simply due to reserve requirements even without market discipline. Following Demirgüç-Kunt and Huizinga (2003), we deal with these problems by instrumenting for Liquidity using exogenous influences on bank operations such as macro shocks and the Reserve Rate defined by total bank reserves (at the macro level) divided by total bank deposits (at the macro level). Specifically, we perform a two-stage regression where the first regression is as follows,

$$Liquidity_{i,t} = \alpha + \beta' BankCharacteristics_{i,t} + \gamma' MacroeconomicVariables_t + \delta ReserveRate_{t-1} + \varepsilon_{i,t} \quad (3)$$

, where Overhead and Maturity are included in the vector of Bank Characteristics, while Inflation, Growth and Government Rate are included in the vector of Macroeconomic Variables. At the second stage, we replace Liquidity by its predicted value as a regressor in Equation (2).

The second problem is that we do not control for deposit growth in the deposit interest rate Equations (1) and (2), though market discipline works through both interest rate and deposit quantity adjustment. Following Demirgüç-Kunt and Huizinga (2003) again, we estimate the following equation for the growth rate of deposits outstanding, $\Delta Deposits$, and add its predicted value to the regressors in Equation (2):

$$\Delta Deposits_{i,t} = \alpha + \beta' BankCharacteristics_{i,t} + \gamma' MacroeconomicVariables_t + \varepsilon_{i,t} \quad (4)$$

, where Overhead (t-1) and Scale (t) are included in the vector of Bank Characteristics, while Inflation and Growth are included in the vector of Macroeconomic Variables.

In sum, as a robustness check, we estimate Equation (2) with $Liquidity$ replaced by the predicted value of $Liquidity$ ($\overline{Liquidity}$) and the predicted value of $\Delta Deposit$ ($\overline{\Delta Deposit}$) added as a regressor:

$$\begin{aligned} Interest\,Rate_{i,t} = {} & \beta \overline{Liquidity}_{i,t-1} + \gamma' Bank\,Characteristics_{i,t-1} \\ & + \delta' MacroeconomicVariables_{t-1} \\ & + \varphi CRISIS_t + \eta CRISIS_t \times \overline{Liquidity}_{i,t-1} \\ & + \kappa POST_t + \lambda POST_t \times \overline{Liquidity}_{i,t-1} \\ & + \nu \overline{\Delta Deposit}_{i,t} + \mu_i + \varepsilon_{i,t} \end{aligned} \quad (5)$$

The estimation results are shown in Table 5.

A. Indonesia

The coefficient on $\overline{\Delta Deposit}$ is negative and significant, suggesting that depositor depositors withdraw deposits from a risky bank as well as demand a high interest rate to it. The coefficient on $\overline{Liquidity}$ is negative and significant, and the coefficient on the interaction term of Crisis and $\overline{Liquidity}$ is positive and significant. We can reconfirm that the immediate impact of the crisis on market discipline was weakening. On the other hand, the interaction term of Post and $\overline{Liquidity}$ is also positive and significant, which suggests that the weakening

effect of the crisis lasted for long. The wake-up call effect of the crisis found by OLS does not seem to be robust.

B. Korea

The coefficient on $\overline{\Delta Deposit}$ is positive and significant which contradicts with the hypothesis that market discipline works through the quantity as well as the price. Though the coefficient on $\overline{Liquidity}$ is negative but not significant, the coefficients on the interaction terms of Crisis, the 1999-2000 Dummy and the 20001-02 Dummy with $\overline{Liquidity}$ are all positive and significant, reconfirming that market discipline was weak after the crisis in Korea.

C. Malaysia

The coefficient on $\overline{\Delta Deposit}$ is negative and significant, as in the case for Indonesian banks. Though the coefficients of $\overline{Liquidity}$ and the interaction term of Crisis with $\overline{Liquidity}$ are not significant, the coefficient on the interaction term of Post with $\overline{Liquidity}$ is positive and significant, suggesting that market discipline became weaker after the crisis.

D. Thailand

The coefficient on $\overline{\Delta Deposit}$ is negative and significant, as in the case for Indonesian and Malaysian banks. None of the coefficients of $\overline{Liquidity}$ and its interaction term with Crisis or Post is significant.

6. Conclusions

We have investigated the effectiveness of market discipline by depositors during the period of 1992-2002 in the four crisis-hit Asian countries by measuring the risk premium to deposit interest rates. Our results suggest that the impacts of banking crises on market discipline vary across countries.

In Indonesia, the immediate impact of the crises on market discipline was

weakening. After 1999, however, market discipline seemed to have become stronger in Indonesia. This pattern is consistent with the wake-up-call effect found for the Latin American crisis-hit countries (Martinez Peria and Schmukler, 2001): A crisis first decreases the depositors' sensitivity to bank risk due to the relative importance of macroeconomic shock, and then increases their awareness of individual bank risk. The initial decrease in depositors' risk sensitivity may also reflect a panic-like behavior by depositors who faced the abrupt closures of a significant number of banks. Our result also suggests that deposit protection did not gain full credibility in Indonesia. However, the result for the wake-up call effect was not robust even in Indonesia.

Unlike Indonesia, we could not find an increase in depositors' responsiveness to bank risk after the crisis in the other three countries. In Korea and Thailand, depositors' risk sensitivity rather decreased after the crisis. In these countries, market discipline was at play before the crisis. In addition, the deposit protection scheme seemed to be credible. Our results suggest that the wake-up call hypothesis does not hold if market discipline is at play before the crisis and deposit protection schemes are constructed to ensure credibility under stable political conditions.

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Footnotes

[1] This section owes partly to Hosono (2005), which, in turn, owns much to Kameyama et al. (2004) for Indonesia, Park (2004) for Korea, Lum and Koh (2005) for Malaysia, and Polsiri (2004) for Thailand. It also owes to Scott (2002).

[2] Hosono et al., (2004) presents a theoretical model showing how the equilibrium deposit interest rate is affected by bank capital and institutional factors.

[3] We replaced the macroeconomic variables with year dummies and obtained similar results to Table 4. The only exception was that for Thai banks, the interaction term of Post and Liquidity was not significant when we used the year dummies.

[4] We replaced Crisis (i.e., the 1998 dummy) with the 1997-98 dummy and obtained similar results to Table 4. The only exception was that for Thai banks, the interaction term of Post and Liquidity was not significant when we used the 1997-98 dummy.

[5] We use the list of majority foreign-owned banks in Heatherway (2003). Her list licludes the subsidiaries of foreign banks but does not include the branches of foreign banks.

Figure1 Deposit Interest Rate by the Quartile of Equity

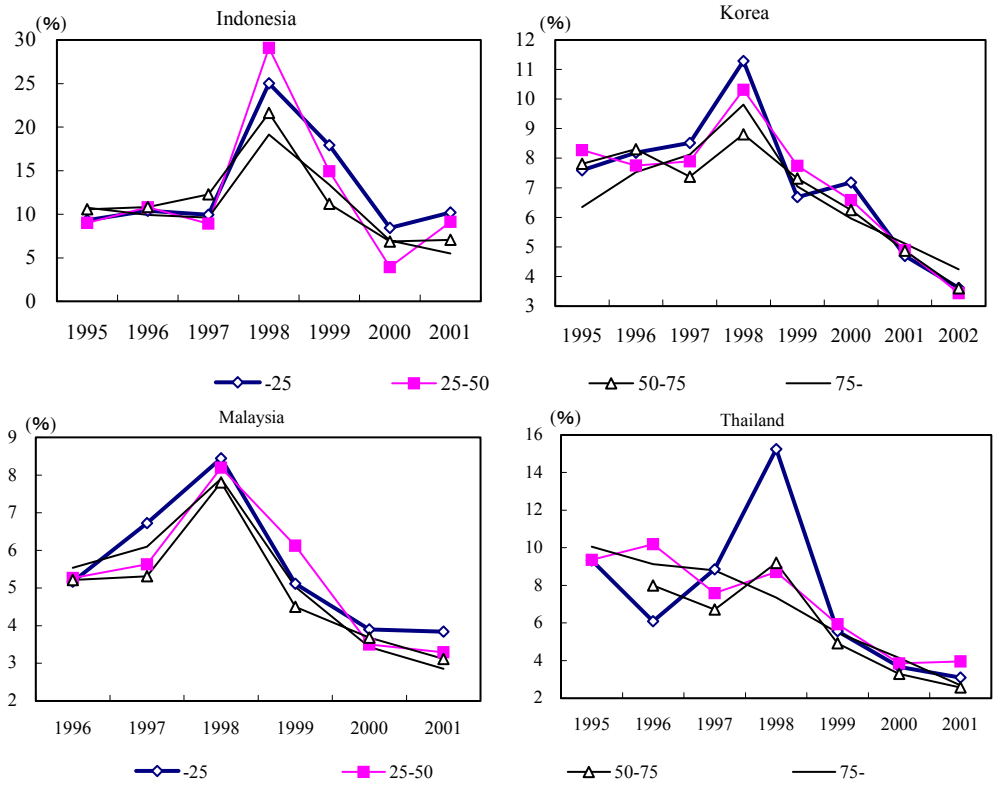

Table 1. Amounts of public money injected to recapitalize banks
(as a proportion of GDP, %)

	Indonesia	Korea	Malaysia	Thailand
1998	N/A	2.6	2.2	6.3
1999	45.2	3.2	2.4	0.0
2000	12.4	0.9	0.0	0.0
2001	0.4	0.6	0.0	0.0
2002	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0

For Indonesia, amounts of bond issued for recapitalization program are reported.
Source: Hosono (2005)

Table 2. Definitions of Variables

dependent variables	Definition
Deposit Growth	Rate of Change in Total Deposits (6080) / GDP Deflators
Deposit Interest Rate	Interest Expense (6250) / (Customer & Short Term Funding (2030) + Other Funding (2035))- Rate of change in GDP

Bank risk variables	Definition
Liquidity	Liquid Assets (2075) / Total Assets (2025)
Equity	Equity (2055) / Total Assets (2025)

Dummy variables	Definition
CRISIS	1998 dummy
POST-CRISIS	1999-2002 dummy
1999-2000D	1999-2000 dummy (Korea only)
2001-2002D	2001-2002 dummy (Korea only)
Foreign	Majority foreign-owned banks dummy

Others	Definition
OVERHEAD	Overheads (2090) / Total Assets (2025)
MATURITY	Customer & Short Term Funding (2030) / (Total Liability (6290) - Non-Interest-Bearing Liability (2040))
SCALE	Logarithm of (Total Assets (2025) / GDP Deflator)

Macroeconomic variables	Definition
Inflation rate(INFLATION)	Rate of change in GDP deflators
Real Percapita GDP Growth Rate (GROWTH)	Rate of change in real percapita GDP
Short-Term Government Bond Rate (GOVERNMENT RATE)	T-bill rate, discounr rate or bank rate – Rate of change in GDP deflators

Note

1. Numbers in parentheses denote code numbers from BankScope

2. GDP deflators are from International Financial Statistics by IMF.

3.Macroeconomics variables source : International Monetary Fund, International Financial Statistics and the World Bank, World Development Indicatiors.

Table 3. Sample Means of Bank Characteristic Variables and Macroeconomiv Variables by Country

	Interest rate	Equity	Liquidity	OVERHEAD	MATURITY	SCALE	GOVERNMENT RATE	INFLATION	GROWTH
INDONESIA	-0.06	0.08	0.14	0.03	0.81	13.90	-0.01	0.18	0.02
KOREA REP. OF	0.04	0.05	0.12	0.03	0.87	16.47	0.01	0.03	0.06
MALAYSIA	0.02	0.08	0.23	0.02	0.99	8.83	0.02	0.04	0.02
THAILAND	0.04	0.06	0.15	0.02	0.94	12.15	0.05	0.03	0.01

Table 4. Determinants of the Deposit Interest Rate

A. Indonesia

Bank Risk	Equity	Liquidity	Equity	Liquidity	Equity	Liquidity
Bank risk	-0.04 *	-0.04 *	0.08	-0.03	-0.04	-0.04
	(0.07)	(0.10)	(0.27)	(0.60)	(0.60)	(0.51)
OVERHEAD	0.10	0.21 *	0.08	0.25 **	0.01	0.28 **
	(0.50)	(0.10)	(0.57)	(0.05)	(0.95)	(0.01)
MATURITY	-0.05 **	-0.06 ***	-0.04 **	-0.05 **	-0.05 ***	-0.07 ***
	(0.02)	(0.01)	(0.03)	(0.03)	(0.00)	(0.00)
SCALE	0.02 *	0.02 *	0.02 **	0.02 *	0.02 ***	0.02 ***
	(0.07)	(0.07)	(0.02)	(0.07)	(0.00)	(0.00)
GOVERNMENT RATE	-0.08	-0.12	-0.26 ***	-0.29 ***	-0.23 ***	-0.31 ***
	(0.43)	(0.23)	(0.01)	(0.01)	(0.01)	(0.00)
INFLATION	-0.86 ***	-0.93 ***	-0.70 ***	-0.69 ***	-0.71 ***	-0.80 ***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
GROWTH	0.01	-0.13	-0.61 **	-0.64 **	-0.65 ***	-0.72 **
	(0.94)	(0.34)	(0.04)	(0.04)	(0.01)	(0.01)
CRISIS			-0.35 ***	-0.36 ***	-0.31 ***	-0.31 ***
			(0.00)	(0.01)	(0.00)	(0.01)
POST-CRISIS			-0.04 ***	-0.05 ***	-0.05 ***	-0.06 ***
			(0.01)	(0.00)	(0.00)	(0.00)
Bank risk x			0.41 ***	0.26 **	0.46 ***	0.43 ***
CRISIS			(0.00)	(0.01)	(0.00)	(0.00)
Bank risk x			-0.13 *	0.00	-0.04	0.01
POST-CRISIS			(0.08)	(0.94)	(0.49)	(0.89)
Bank risk x					0.18 **	0.10
Foreign					(0.03)	(0.23)
Bank risk x					-1.13 ***	-0.88 ***
Foreign x CRISIS					(0.00)	(0.00)
Bank risk x					-0.04	0.03
Foreign x POST-CRISIS					(0.66)	(0.67)
Constant	-0.09	-0.07	-0.11	-0.06	-0.11	-0.14
	(0.49)	(0.61)	(0.32)	(0.62)	(0.24)	(0.22)
No. of obs.	362	362	362	362	362.00	362.00
Adj. R-square	0.95	0.95	0.96	0.96	0.97	0.96
F value	719.35 ***	717.96 ***	558.47 ***	510.68 ***	624.00 ***	490.24 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.

P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

CRISIS : 1998dummy.

POST-CRISIS : 1999-2002dummy.

B. Korea

Bank risk	Equity	Liquidity	Equity	Liquidity
Bank risk	-0.08	0.04 **	-0.19 ***	-0.06 **
	(0.20)	(0.05)	(0.00)	(0.02)
OVERHEAD	0.06	0.11 *	0.03	0.07 *
	(0.35)	(0.07)	(0.51)	(0.08)
MATURITY	-0.03 ***	-0.04 ***	-0.01	-0.01
	(0.00)	(0.00)	(0.23)	(0.30)
SCALE	-0.01	0.00	0.01	0.01 **
	(0.27)	(0.72)	(0.15)	(0.02)
GOVERNMENT RATE	0.86 ***	0.87 ***	-0.30	-0.14
	(0.00)	(0.00)	(0.30)	(0.66)
INFLATION	-0.42 ***	-0.43 ***	-1.22 ***	-1.09 ***
	(0.00)	(0.00)	(0.00)	(0.00)
GROWTH	-0.27 ***	-0.27 ***	-0.18 ***	-0.18 ***
	(0.00)	(0.00)	(0.00)	(0.00)
CRISIS			-0.01	-0.02
			(0.34)	(0.19)
1999-2000D			-0.01	-0.01
			(0.11)	(0.33)
2001-2002D			-0.05 ***	-0.05 ***
			(0.00)	(0.00)
Bank risk x CRISIS			-0.02	0.09 **
			(0.82)	(0.02)
Bank risk x 1999-2000D			0.15 *	0.06
			(0.07)	(0.14)
Bank risk x 2001-2002D			0.23 *	0.11 **
			(0.08)	(0.04)
Constant	0.19 **	0.12	0.03	-0.03
	(0.04)	(0.20)	(0.59)	(0.61)
No. of obs.	151	151	151	151
Adj. R-square	0.86	0.86	0.95	0.95
F value	95.00 ***	97.36 ***	153.36 ***	140.71 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.

P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

CRISIS : 1998dummy.

C. Malaysia

Bank risk	Equity	Liquidity	Equity	Liquidity
Bank risk	0.04	-0.02	0.07	-0.05
	(0.54)	(0.52)	(0.55)	(0.22)
OVERHEAD	0.74 **	0.77 **	0.51	0.37
	(0.02)	(0.02)	(0.12)	(0.28)
MATURITY	0.02	0.04	0.06	0.01
	(0.63)	(0.46)	(0.39)	(0.86)
SCALE	0.01	0.01	0.00	0.00
	(0.27)	(0.30)	(0.88)	(0.60)
GOVERNMENT RATE	0.61 ***	0.60 ***	1.22 ***	1.19 ***
	(0.00)	(0.00)	(0.00)	(0.00)
INFLATION	-0.30 ***	-0.31 ***	0.36	0.31
	(0.00)	(0.00)	(0.30)	(0.37)
GROWTH	-0.09 ***	-0.10 ***	-0.13	-0.11
	(0.00)	(0.00)	(0.28)	(0.34)
CRISIS			0.00	-0.01
			(0.87)	(0.66)
POST-CRISIS			0.03 *	0.01
			(0.07)	(0.46)
Bank risk x CRISIS			-0.07	0.02
			(0.59)	(0.64)
Bank risk x POST-CRISIS			-0.07	0.05
			(0.61)	(0.15)
Constant	-0.07	-0.07	-0.10	-0.05
	(0.31)	(0.30)	(0.25)	(0.51)
No. of obs.	157	157	157	157
Adj. R-square	0.81	0.81	0.82	0.83
F value	68.92 ***	68.95 ***	45.01 ***	45.92 ***

***,**,* indicate statistical significance levels of 1,5 and 10

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.

P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

CRISIS : 1998dummy.

POST-CRISIS : 1999-2002dummy.

D. Thailand

Bank risk	Equity	Liquidity	Equity	Liquidity
Bank risk	-0.09	-0.03	0.20	-0.42 **
	(0.16)	(0.14)	(0.42)	(0.02)
OVERHEAD	0.19	0.03	-0.03	-0.10
	(0.59)	(0.94)	(0.92)	(0.72)
MATURITY	0.08	0.08	0.01	-0.01
	(0.31)	(0.29)	(0.84)	(0.90)
SCALE	0.01	0.01	0.01	0.01
	(0.30)	(0.46)	(0.26)	(0.42)
GOVERNMENT RATE	0.96 ***	0.82 ***	0.81 **	0.28
	(0.00)	(0.00)	(0.04)	(0.48)
INFLATION	-0.27 **	-0.39 ***	-0.52	-1.05 **
	(0.04)	(0.00)	(0.22)	(0.02)
GROWTH	-0.10	-0.16 **	0.11	0.08
	(0.16)	(0.02)	(0.29)	(0.38)
CRISIS			0.08 ***	0.04 **
			(0.00)	(0.03)
POST-CRISIS			0.02	-0.07 *
			(0.65)	(0.10)
Bank risk x CRISIS			-0.41	0.25
			(0.14)	(0.17)
Bank risk x POST-CRISIS			-0.25	0.39 **
			(0.32)	(0.03)
Constant	-0.22	-0.16	-0.16	0.03
	(0.23)	(0.34)	(0.33)	(0.85)
No. of obs.	60	60	60	60
Adj. R-square	0.86	0.86	0.92	0.93
F value	33.19 ***	33.39 ***	33.57 ***	42.48 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.
Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.
P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.
CRISIS : 1998dummy.
POST-CRISIS : 1999-2002dummy.

Table 5. Robustness

	Indonesia	Korea	Malaysia	Thailand
Liquidity(Predicted value)	-0.47 ***	-0.03	0.02	-0.07
	(0.00)	(0.86)	(0.84)	(0.65)
OVERHEAD	0.11	0.87 ***	2.04 **	-14.34 ***
	(0.40)	(0.00)	(0.01)	(0.00)
MATURITY	-0.03	-0.01	0.04	-0.09
	(0.22)	(0.19)	(0.37)	(0.17)
SCALE	0.04 ***	0.03 ***	0.02 **	0.05 ***
	(0.00)	(0.00)	(0.02)	(0.00)
GOVERNMENT RATE	-0.34 ***	-0.04	0.93 ***	0.84 **
	(0.01)	(0.90)	(0.00)	(0.03)
INFLATION	0.88	0.57	-0.27	3.51 ***
	(0.39)	(0.22)	(0.44)	(0.01)
GROWTH	10.96 *	-1.82 ***	0.86 *	5.44 ***
	(0.06)	(0.00)	(0.06)	(0.00)
DEPOSIT GROWTH (Predicted	-4.83 **	5.03 ***	-0.87 ***	-6.62 ***
	(0.04)	(0.00)	(0.01)	(0.00)
CRISIS	-0.38 ***	-0.08 *	-0.03	0.02
	(0.00)	(0.07)	(0.37)	(0.62)
POST-CRISIS	-0.09 ***	-0.11 ***	-0.05 **	0.01
	(0.00)	(0.00)	(0.02)	(0.82)
2001-2002D		-0.15 ***		
		(0.00)		
Liquidity(Predicted value) x	1.05 ***	0.63 **	-0.09	0.20
CRISIS	(0.00)	(0.02)	(0.33)	(0.27)
Liquidity(Predicted value) x	0.30 **	0.80 ***	0.29 ***	-0.06
POST-CRISIS	(0.04)	(0.01)	(0.00)	(0.81)
Bank risk x		1.18 **		
2001-2002D		(0.02)		
Constant	-0.42 *	-0.86 ***	-0.22 **	0.00
	(0.08)	(0.00)	(0.02)	(0.99)
No. of obs.	361	150	157	60
Adj. R-square	0.96	0.96	0.86	0.94
F value	521.69 ***	181.30 ***	54.68 ***	40.63 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.

P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

CRISIS : 1998dummy.

POST-CRISIS : 1999-2002dummy, Except Korea(1999-2000).

Appendix. Determinants of the Deposit Growth Rate

A. Indonesia

Bank Risk	Equity	Liquidity	Equity	Liquidity	Equity	Liquidity
Bank risk	0.16	0.19 *	0.10	0.04	0.18	0.01
	(0.11)	(0.12)	(0.37)	(0.25)	(0.38)	(0.25)
OVERHEAD	-0.44	-0.86	-0.35	-0.85	-0.26	-0.84
	(0.69)	(0.61)	(0.70)	(0.62)	(0.70)	(0.62)
SCALE	-0.21 ***	-0.21 ***	-0.22 ***	-0.21 ***	-0.22 ***	-0.23 ***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
INFLATION	0.24	0.44 **	0.70	0.50	0.73	0.63
	(0.19)	(0.19)	(1.27)	(1.29)	(1.27)	(1.29)
GROWTH	1.54 **	2.19 ***	2.21	2.10	2.22	2.14
	(0.65)	(0.67)	(1.51)	(1.55)	(1.51)	(1.54)
CRISIS			-0.04	-0.04	-0.07	-0.13
			(0.62)	(0.62)	(0.62)	(0.62)
POST-CRISIS			0.02	-0.03	0.02	-0.03
			(0.07)	(0.07)	(0.07)	(0.07)
Bank risk x			-1.06 *	-0.10	-1.16 *	-0.43
CRISIS			(0.61)	(0.53)	(0.61)	(0.55)
Bank risk x			0.08	0.22	-0.02	0.21
POST-CRISIS			(0.37)	(0.29)	(0.38)	(0.29)
Bank risk x					0.79	1.51 **
Foreign					(0.68)	(0.70)
Bank risk x					0.37	0.09
Foreign x CRISIS					(0.32)	(0.27)
Bank risk x						
Foreign x POST-CRISIS						
Constant	2.97 ***	2.82 ***	2.97 ***	2.91 ***	2.95 ***	3.09 ***
	(0.57)	(0.58)	(0.58)	(0.60)	(0.58)	(0.61)
No. of obs.	364	364	364	364	364	364
Adj. R-square	0.23	0.23	0.25	0.24	0.25	0.25
F value	15.89 ***	16.07 ***	9.39 ***	8.92 ***	7.92 ***	7.8 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.
P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.
CRISIS : 1998dummy.
POST-CRISIS : 1999-2002dummy.

Appendix. Determinants of the Deposit Growth Rate

B. Korea

Bank risk	Equity	Liquidity	Equity	Liquidity
Bank risk	0.77	-0.54 *	0.65	-0.51
	(0.76)	(0.28)	(0.93)	(0.50)
OVERHEAD	0.75	0.25	1.19	0.39
	(0.83)	(0.72)	(0.85)	(0.81)
SCALE	-0.16 **	-0.21 ***	-0.18 **	-0.21 ***
	(0.07)	(0.07)	(0.08)	(0.07)
INFLATION	-1.18 *	-1.05	-2.20 *	-1.61
	(0.71)	(0.65)	(1.22)	(1.24)
GROWTH	0.12	0.12	0.73	0.86
	(0.34)	(0.32)	(1.08)	(1.09)
CRISIS			-0.06	0.08
			(0.18)	(0.19)
1999-2000D			-0.20 *	0.00
			(0.12)	(0.13)
2001-2002D			0.08	-0.11
			(0.12)	(0.12)
Bank risk x			3.43	0.19
CRISIS			(2.15)	(0.76)
Bank risk x			2.41	-0.41
1999-2000D			(1.69)	(0.74)
Bank risk x			-1.94	1.09
2001-2002D			(2.64)	(1.03)
Constant	2.77 **	3.58 ***	3.09 **	3.66 ***
	(1.11)	(1.12)	(1.27)	(1.22)
No. of obs.	151	151	151	151
Adj. R-square	0.12	0.14	0.18	0.16
F value	3.19 ***	3.8 ***	2.12 **	1.93 **

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.

P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

CRISIS : 1998dummy.

POST-CRISIS : 1999-2002dummy.

Appendix. Determinants of the Deposit Growth Rate

C. Malaysia

Bank Risk	Equity	Liquidity	Equity	Liquidity
Bank risk	1.71 **	-0.21	1.29	-1.05 **
	(0.75)	(0.30)	(1.21)	(0.46)
OVERHEAD	-3.44	-2.16	-0.63	-2.60
	(3.78)	(3.83)	(3.96)	(4.15)
SCALE	-0.13 **	-0.14 **	-0.09	-0.11
	(0.06)	(0.06)	(0.07)	(0.07)
INFLATION	-0.73	-0.62	0.46	1.28
	(0.50)	(0.51)	(1.55)	(1.54)
GROWTH	1.38 ***	1.33 ***	-0.22	-1.02
	(0.27)	(0.27)	(1.39)	(1.39)
CRISIS			-0.44	-0.62 **
			(0.29)	(0.29)
POST-CRISIS			-0.12	-0.25 **
			(0.11)	(0.10)
Bank risk x			1.08	0.55
CRISIS			(1.26)	(0.51)
Bank risk x			0.50	0.79 **
POST-CRISIS			(1.22)	(0.39)
Constant	1.16 **	1.36 **	0.87	1.42 **
	(0.57)	(0.57)	(0.70)	(0.68)
No. of obs.	157	157	157	157
Adj. R-square	0.42	0.39	0.45	0.45
F value	16.15 ***	14.64 ***	9.94 ***	9.87 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.
Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP
P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.
CRISIS : 1998dummy.
POST-CRISIS : 1999-2002dummy.

Appendix. Determinants of the Deposit Growth Rate

D.Thailand

Bank risk	Equity	Liquidity	Equity	Liquidity
Bank risk	0.83 *	-0.17	-0.23	-1.31
	(0.46)	(0.13)	(2.05)	(1.44)
OVERHEAD	-5.00 *	-5.24 *	-1.88	-2.27
	(2.64)	(2.69)	(2.84)	(2.83)
SCALE	-0.26 ***	-0.17 *	-0.24 **	-0.22 **
	(0.09)	(0.09)	(0.09)	(0.09)
INFLATION	0.64	0.74	1.06	1.16
	(0.64)	(0.65)	(0.68)	(0.69)
GROWTH	0.81 *	1.13 **	-0.78	-0.21
	(0.46)	(0.45)	(0.66)	(0.70)
CRISIS			-0.44 *	-0.40 ***
			(0.23)	(0.14)
POST-CRISIS			-0.14	-0.18
			(0.19)	(0.13)
Bank risk x			0.66	0.84
CRISIS			(2.22)	(1.59)
Bank risk x			0.83	1.24
POST-CRISIS			(2.05)	(1.43)
Constant	3.17 ***	2.18 *	3.08 ***	2.87 **
	(1.11)	(1.10)	(1.09)	(1.10)
No. of obs.	60	60	60	60
Adj. R-square	0.36	0.33	0.53	0.52
F value	4.43 ***	3.96 ***	4.45 ***	4.3 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.

Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP

P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

CRISIS : 1998dummy.

POST-CRISIS : 1999-2002dummy.