

**DETERMINANTS OF BANK NET INTEREST MARGINS OF
SOUTHEAST ASIA**

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Abstract

We investigate the determinants of net interest margins (NIM) of banks in four Southeast Asian countries. We use the dealer model (Ho and Saunders, 1981) and run a two-step regression. Results of the first regression indicate that the region's NIM are partially explained by bank-specific factors namely operating expenses, capital, loan quality, collateral and liquid assets. Second step regression results show that while NIM manifest sensitivity to changes in short-term interest rates, they are still largely explained by the non-competitive structure of the region's banking systems. Finally, we find evidence that the NIM declined after 1997 thus reflecting the profit squeeze experienced by the region's banks due to extensive loan defaults in the aftermath of the Asian currency and banking crises.

JEL Classification: G21

Keywords: Banks, Interest Margins, Spreads, Southeast Asia

Section I. Introduction

In banking research, the determinants of net interest margins (bank spreads) are empirically well explored. Results strongly suggest that net interest margin determinants vary across countries and among regions of the world. For instance, studies on banking systems of developed countries show that net interest margins have significant positive relationships with a bank's level of capital, loan loss provisions, reserve requirements, implicit interest payments, and interest rate volatility (Ho and Saunders, 1981; Saunders and Schumacher, 2000). These results are considered benchmarks because banks in developed countries operate in mature financial systems. On the other hand, a study of Latin American bank spreads rarely confirmed and even contradicted some of the benchmark results (Brock and Suarez, 2000). For example, loan losses and bank capital were shown to have significant negative relationships with bank spreads in some Latin American countries. These anomalous findings were partly explained by distortions caused by inadequate regulatory systems that allow weak banks to continue operating, unreliable financial reporting practices that result in misstated bank capital, and extensive government guarantees that encourage excessive risk taking among banks.

In Southeast Asia, little is known about the determinants of its banks' net interest margins. Since banks are the major source of financing in this region, the level of net interest margins is an important policy variable for it indicates how efficiently banks perform their intermediary roles of collecting savings and allocating funds. Curiously, and although in varying degrees, the banking industries of Southeast Asia exhibit similarities in market openness, regulatory stance, extent of government intervention,

lending practices and the influence of macroeconomic policy.¹ In fact, some of these shared commonalities became vulnerabilities that caused a systemic crisis in 1997 which decidedly undermined the solvency of this region's banking systems. An empirical investigation that considers some of these commonalities may demonstrate their unique effects on Southeast Asian bank net interest margins.

The objective of this paper is to investigate the determinants of the region's net interest margins while taking into consideration bank-specific factors, namely: collateral, capital, liquid assets, operating expenses and loan quality. Four Southeast Asian countries - Indonesia, Malaysia, Philippines and Thailand - constitute the sample of this paper. There is the impression that while the financial system of the region is indeed continually evolving, weaknesses still persist in the areas of financial reporting, regulation and government interference (Gochoco-Bautista, 1999; Kane, 2000). Thus, as between those for developed and Latin American countries, one would expect findings for Southeast Asia to be closer to Latin America especially that both regions have similarities in the problems that plague their financial systems.

The rest of the paper is organized as follows: Section II reviews the literature on net interest margins. Section III describes the variables, data and the empirical specification. Section IV presents and interprets the estimation results. Finally, section V concludes.

Section II. Review of Related Literature

The analysis of net interest margins is an attempt to measure the cost of financial intermediation; that is, the difference between the gross cost paid by a borrower to a bank

¹ For an extensive discussion on the banking systems of countries considered in this paper, see Chou (1999), Gochoco-Bautista (1999), Kawai and Takayasu (1999), and Oh (1999).

and the net return received by a depositor (Brock and Suarez, 2000). Generally, high interest margins are taken to be unfavorable because they lead to disintermediation. Low deposit rates represent unattractive returns for maintaining deposit accounts hence discouraging savings. High loan rates, on the other hand, make the cost of funds increasingly prohibitive to potential users thereby inhibiting investment activity. Nevertheless, while high net interest margins have usually been associated with inefficiency, they may also contribute in the strengthening of a country's banking system (Saunders and Schumacher, 2000). This happens when profits earned from high spreads are being channeled by banks to their capital bases. For example, high spreads and healthy capital ratios were both observed among Colombian banks (Barajas, Steiner, and Salazar, 1999).

On the other hand, very low spreads cannot always be taken positively especially in liberalized but inadequately regulated environments where certain mechanisms ensuring the closure of or intervention in poorly capitalized or unstable banks are absent. If weak banks are allowed to continue operating, there is the likelihood that they will adopt the strategy of offering lower loan rates to gain additional market share or to grow out of their troubles. This was presumed in some Latin American countries in the period after financial liberalization reforms were instituted in the region over the last decade (Brock and Suarez, 2000).

There are at least two modeling frameworks for net interest margins. The first framework, which is considered here, is the Ho and Saunders (1981) dealer model. This model has been extended and modified by McShane and Sharpe (1985), Allen (1988) and Angbazo (1997). It has also been applied in different settings by Ho and Saunders (1981), Saunders and Schumacher (2000), Brock and Suarez (2000) and Drakos (2003).

The alternative model is the firm theoretic approach developed by Klein (1971) and Monti (1972). This model views the banking firm in a static setting where demands and supplies of deposits and loans simultaneously clear both markets. Following the same line of research, this framework was further explored by Zarruk (1989) and Wong (1997). Finally, there is the specification and estimation of Barajas, Steiner, and Salazar (1999) that can also be categorized under the firm theoretic approach.

Under the dealer model, the net interest margin (s) is given by the following equation:

$$s = \frac{\mathbf{a}}{\mathbf{b}} + \frac{1}{2} R \sigma^2 Q \quad (1)$$

The first term, $\frac{\mathbf{a}}{\mathbf{b}}$, is the ratio of the intercept (\hat{a}) and the slope (\hat{b}) of the symmetric deposit and loan arrival functions of the bank and is a measure of the bank's risk-neutral spread.² Another interpretation of the ratio is that it provides some measure of the effect of market structure (i.e. monopoly rent) in the determination of the spread because if a bank faces relatively inelastic demand and supply functions, as expressed by a high $\frac{\mathbf{a}}{\mathbf{b}}$ ratio, then it may be able to exercise monopoly power.

The second term is a first order risk-adjustment term and depends on three factors: (1) the bank management's coefficient of risk aversion (R), (2) size of bank transactions (Q), and (3) the instantaneous variance of the interest rate on deposits and loans (σ^2). This implies that, all things equal, the higher the degree of risk aversion, the bigger the size of transactions and the greater the variance of interest rates, the larger bank margins are.

² For the derivation of the model, see Ho and Saunders (1981).

Applying the dealer model however entails the recognition of the effects of certain market and institutional imperfections that distort the observed net interest margin. Unfortunately, these factors cannot be directly incorporated in the dealer model. Thus, to control for the effects of these factors, a two-step regression is performed (Ho and Saunders, 1981; Saunders and Schumacher, 2000; and Brock and Suarez 2000). In the first regression, the hypothesis is that the observed net interest margin will comprise of the “pure spread” that is constant across banks plus the effects of certain market and institutional imperfections. Varied sets of institutional and market imperfections have been considered in existing empirical applications of the model.³ In the process, the estimated intercept in the first regression is the “pure spread” and is treated as the dependent variable in the second regression for the estimation of the effects of market structure ($\frac{a}{b}$) and interest rate volatility (σ^2). The effects of risk aversion (R) and size of bank transactions (Q) are not considered since they are not seen to change as fast as interest rates (Ho and Saunders, 1981).

Section III. Method

Empirical Specification

We propose to analyze the determinants of Southeast Asian net interest margins following a two-step regression. The first step controls for the effects of collateral, operating expenses, decline in loan quality, capital, and liquid assets on the observed net interest margin to determine the “pure spread.” The second step is to analyze the effects

³ Ho and Saunders (1981) considered implicit interest payments, loan loss, and bank capital. Saunders and Schumacher (2000) considered implicit interest payments, bank capital, and opportunity cost of reserves. Brock and Suarez (2000) considered operating expense, loan loss, bank capital, and liquid assets. Finally, Drakos (2003) considered liquidity, loan loss provisions, leverage, and interest rate risk.

of market structure, interest rate volatility, and possible country and time effects on Southeast Asian banks' "pure spread."

Following Brock and Suarez (2000) and using panel data from 1994-2001 for each country, we perform the first step pooled regression as:

$$NIM_{it} = \mathbf{g} + \sum_y \mathbf{d}_y D_y + \sum_j \mathbf{d}_{jit} X_{jit} + u_{it} , \quad (2)$$

where:

NIM_{it} is the published net interest margin of bank i at year t ;

\mathbf{g} is the intercept of the regression and also the estimate of the "pure spread" component of the NIM for all i at year 1994;

D_y is a dummy variable that captures yearly time effects for the years 1995-2001.

Consequently, the annual estimates of the pure spread for the years 1995-2001 are estimated as $\mathbf{g} + \mathbf{d}_y$;

X_{jit} is a vector of control variables (collateral, operating expenses, loan quality and capital and liquid assets) for each bank i at year t ; and

u_i is the residual.

This first regression yields 32 estimates (4 countries and 8 years) of the "pure spread" which are used in the second step regression.

As in Saunders and Schumacher (2000), the second step regresses the "pure spread" against interest rate standard deviation (a measure of volatility) and country dummies (D_T , D_P and D_I), with Malaysia as the base country, to account for differences in market structure of the four countries. In addition, a crisis dummy (D_z) is included where from 1998 onwards the dummy equals 1. Hence, the second regression is of the form:

$$\mathbf{g}_m = \mathbf{q}_0 + \mathbf{q}_1 D_z + \mathbf{q}_2 D_T + \mathbf{q}_3 D_p + \mathbf{q}_4 D_l + \mathbf{q}_5 \mathbf{s}_m^2 + u_t, \quad (3)$$

where:

\mathbf{g}_m is a time series of the pure spreads of country m ;

\mathbf{q}_0 is the intercept and it reflects the effect of the market structure on the pure spread of Southeast Asia whereby a significantly high value indicates a noncompetitive market structure;

\mathbf{s}_m^2 is the annual variance of the short term interest rate of country m ; and

u_t is the residual.

The Variables

Similar to the existing empirical applications of the model, this study tries to account for the effects of market or institutional imperfections to isolate the behavior of the “pure spread.” In the first regression we assume that the imperfections manifest themselves through the movements of 5 variables, namely: (1) collateral, (2) operating expenses, (3) loan quality, (4) capital requirements and (5) liquidity.

A cursory review of balance sheets of Southeast Asian banks shows that banks report real and other properties owned or acquired (ROPOA) as a major line item. ROPOA arises when banks foreclose existing mortgages (collateral) that secure nonperforming loans. The significant presence of ROPOA can be explained by the region’s credit culture which can be typified as collateral-based. This suggests that banks are willing to lend as long as the loan is sufficiently covered by collateral, usually in the form of real estate (Dickinson and Mullineux, 2002). However, in the long-run, despite providing full collateral cover, when a client fails to service the debt, the bank is forced to foreclose the existing mortgage thereby causing ROPOA to rise.

The impact of collateral is relevant in the determination of Southeast Asian bank net interest margins although it is uncertain whether this variable has a decreasing or increasing effect. To be sure, when banks foreclose the collateral mortgage and thus hold ROPOA, they forego opportunity costs and incur maintenance and documentation costs, real estate taxes, and all other forms of carrying costs. As such, there is a possibility that banks are recouping these costs through the high spread that they demand.

On the other hand, providing sufficient collateral may also serve to reduce a bank's lending rate, thus the interest margin. This result is not totally surprising since collateral tends to lessen the loss exposure of a bank in case of loan defaults. In a lending environment where there is some difficulty in challenging the financial projections and creditworthiness of a borrower (Kane, 2000), sufficient collateral is crucial in mitigating the risk of loss. Moreover, it can also be argued that banks actually recover foregone carrying and opportunity costs in holding ROPOA when the assets are disposed of in the future. It is not uncommon for banks to set a floor price for the disposal of ROPOA. This floor price usually assures the recovery of carrying costs and other opportunity costs plus profit. The ratio of non-earning assets to earning assets proxies for the effect of collateral.

The decline in loan quality is the second factor considered. The possible impact of this variable in interest margins can be seen in two ways. First, this would reflect the extent to which banks increase operating expenses as they intensify monitoring of loans and incur additional expenses for working out or selling these loans. Second, the impact may also reflect the additional risk premium charged by banks for the financial costs of forgone interest revenue (Barajas, Steiner, and Salazar, 1999). This variable is

represented by the bank's ratio of loan loss reserves to gross loans and the expected sign is positive.

The third factor considered is the level of operating expenses. Kwan (2003) finds that among the banking systems of the four countries considered here, the Malaysian system has the lowest operating cost. Further, while banks in these four countries gained some efficiency in the period 1992-96, their observed operating costs started to climb during the onslaught of the currency crisis and this pattern has persisted up to 1999. It thus pays to investigate how levels of operating costs affect the deposit and loan pricing behavior of Southeast Asian banks. This variable is represented by the ratio of the bank's personnel, administrative and other operating expenses to total assets.

The fourth factor is the effect of bank capital requirements in the determination of the spread. Although regulatory-imposed capital requirements are minimum, banks often endogenously choose to hold more capital because of perceived additional credit exposures (Saunders and Schumacher, 2000). However, maintaining a high capital base is relatively more costly than financing through debt.⁴ Thus, banks are expected to recover these costs by imposing an extra spread premium. This variable is represented by the bank's ratio of equity to total assets.

Finally, the impact of liquid assets on bank spreads is also examined. Holding liquid assets reduces the risk that banks may not have sufficient cash to meet deposit withdrawals or new loan demand (i.e. liquidity risk), thereby forcing them to borrow at excessive costs.⁵ Thus, as the proportion of liquid assets increases, a bank's liquidity risk

⁴ For example, equity financing suffers from double taxation because both the income of the bank and the dividends to shareholders are taxed whereas returns to debt holders or the banks' depositors are deductible for tax purposes.

⁵ These costs include those that are non-financial in nature. For example, banks that experience persistent liquidity problems are usually placed under closer scrutiny and examination by the Central Bank.

decreases, leading to a lower liquidity premium component of the net interest margin (Angbazo, 1997 and Drakos, 2003).⁶ This variable is represented by the bank's ratio of liquid assets to total assets. Our dependent variable for this first step regression is net interest margin as represented by net interest income as a percentage of earning assets of banks.

In the second step regression, the estimate of the "pure spread" is the dependent variable. The independent variables are interest rate volatility and time and country dummies. Volatility is measured by the annual standard deviation of the respective short-term interest rates of the four countries. Country and time dummy variables are used to capture possible country and time effects on the "pure spread."

The Data

Data at the bank level were derived from IBCA's Bankscope database. To focus on the intermediary role of banks, only commercial banks were considered. The numbers of banks considered for each country and year are summarized in Appendix A. The variables for the first step regression were constructed using the series of balance sheets and income statements for the years 1994-2001. Data for short-term interest rates were obtained from Data Stream International. Appendix B summarizes the basis of short term interest rates for the four countries considered.

Before we discuss the results of our estimation, it is noteworthy to compare Southeast Asian net interest margins with other countries. Table 1 presents comparative net interest margins of Southeast Asia and selected Western European countries. With their developed economies and properly functioning financial systems, the net interest

⁶ Brock and Suarez (2000) presented empirical evidence that liquid assets increase net interest margins. This effect was attributed to opportunity costs associated with holding liquid assets.

margins of banks of Western European countries may validly be considered as good benchmarks.

In this comparison, net interest margin is defined as bank net interest revenue as a percentage of total assets. Over the period 1994-1999, the average net interest margins of Southeast Asian banks are higher by 1/2 percentage point than Western Europe's. This may indicate that Western European banks perform their intermediation roles more efficiently than their Southeast Asian counterparts. For the same period, the Philippines has the highest net interest margin in Southeast Asia. At a glance, the low average of Thailand's net interest margins seems comparable with and at some years even lower than those of European countries. However this must be interpreted with caution in the light of the 1997 crisis. Extensive borrower defaults on both principal and interest payments may have caused Thai banks to report negative net interest income thus driving down their observed net interest margins. Again, this is another case whereby low net interest margins cannot always be taken positively in that they rather indicate a crisis-ridden financial system. To conclude this section, the simple comparison exercise provides additional motivation for investigating the drivers of the relatively higher net interest margins of Southeast Asian banks.

Section IV. Results of Estimation and Discussion

First Step Regression

Table 2 summarizes the results of the first step regression using panel data for each of the four countries. The adjusted R-squared values range from 43% to 72%. The benchmark result of the positive effect of bank capital on interest margins is confirmed in Southeast Asia with the exception of Thailand. This stresses the idea that although high

levels of capital tend to insulate banks from exogenous shocks they may also serve to raise net interest margins. Thus in this region, there is a trade-off between realizing a degree of stability in the banking system and achieving the “socially beneficial” and efficient level of the cost of financial intermediation.

With regard to operating cost, its expected positive relationship with net interest margins is evident in the region except Thailand. This indicates that the region’s banks transfer a portion of their operating costs to their borrowers and depositors. Hence, a decline in the region’s bank net interest margins must be preceded by the reduction in the level of bank operating expenses.

Among the factors considered, it is the non-earning assets variable that performed best in all of the four countries. This demonstrates the significant effect of collateral in the bank spreads of Southeast Asia. Notably in Indonesia, Thailand, and the Philippines, collateral serves to reduce bank net interest margins. This suggests that banks in these countries place high reliance on collateral when they set their loan rates. The basic idea here is that collateral tends to reduce the loss exposure of banks such that the loan rates they charge reflect the reduced risk premium normally included for loans not sufficiently covered by collateral. On the contrary, the case of Malaysia shows that collateral tends to increase the net interest margin. This indicates that Malaysian banks tend to increase their desired interest margins to recoup costs associated with holding foreclosed collateral.

However, with the benefit of hindsight, collateral-based lending places banks in an increasingly precarious position in periods of asset price inflation. This is because banks may actually be lending based on collateral with assessed values far higher than their “true” values. In the pre-1997 bank crisis, banks in this region overexposed

themselves to the real estate sector which was experiencing a “price bubble.” When the property bubble burst and borrowers defaulted, Southeast Asian banks were left struggling for solvency as they attempted to convert into cash their collateral properties which have already fallen in value.

For the effect of decline in loan quality, it is only in the Philippines and Malaysia that the benchmark result is confirmed. However, the effect is insignificant for the latter. Results for Indonesia and Thailand replicate findings for Latin America whereby the decline in loan quality is significantly associated with lower net interest margins. In the Latin American case, Brock and Suarez (2000) cite two possible reasons to explain this anomalous finding. First, there could be inadequate provisioning for loan losses in Latin American banks, thereby lowering the calculated spread. Second, banks with a high proportion of bad loans may offer lower spreads as a strategy to grow out of their troubles especially if regulatory authorities are irresolute in closing them.

We observe that the anomalous Latin American finding was replicated in countries that were hardest hit by the Asian crisis, notably, Indonesia and Thailand (Brimmer, 1998). In the aftermath of the crisis, these two countries also had the most number of banks closed (Kane, 2000; Patten, Rosengard, and Johnston, 2001). This may be taken as evidence that, among the four and prior to the crisis, the banking systems of these two countries suffered the most weaknesses similar to Latin America in the areas of regulation, financial reporting, and extensive government guarantees. On balance, these presumed similarities in weaknesses may partly explain the replication of the Latin American finding in Indonesia and Thailand.

As regards the relationship between net interest margins and liquid assets, the expected negative effect was confirmed in 3 countries. However, it is significant only for

Thailand and Malaysia. Finally, the intercept and coefficients of time dummies of the first regression are the estimates of the “pure spreads” for each of the four countries for the period 1994-2001. The effects of factors that drive the “pure spreads” are explained in the result of the second step regression.

Second Step Regression

In performing the second regression, we initially considered a specification that tested the possible interaction between the pure spread and individual country interest rate volatilities. The hypothesis was that if any of the interaction variables was found to be significant, then the effect of interest rate volatility on the pure spread varied among the countries considered. The result of this initial regression (not reported here) showed that none of the interaction variables was significant. Hence, the second regression finally specified that there was no interaction between the pure spread and the individual country interest rate volatility.

Presented in Table 3 is the result of the second step regression. Short-term interest rate volatility appears to be a significant determinant of Southeast Asian net interest margins thereby confirming the dealer model. In effect, the net interest margins of the region show sensitivity to fluctuations in short-term interest rates. More importantly, the 1.28% intercept of the second regression is significant. As specified in the dealer model, the interpretation is that the region’s net interest margins are largely explained by the non-competitive structure of its banking systems. Incumbent banks in the region can therefore continue to extract some form of monopoly rent unless alternative sources of funding exert a stronger competitive pressure. As it is observed that the region’s equities and commercial papers markets have remained immature (Dickinson and Mullineux, 2002), monopoly rents of banks may continue to persist.

The introduced dummy variables reveal interesting results. The country dummies have shown that the portions of the “pure spread” attributable to market structure of the Philippines and Thailand are significantly higher than that of Malaysia (the base country). This suggests that Philippine and Thai banks extract higher monopoly rents than their Malaysian counterparts. For the case of Indonesia and Malaysia, their portions of the “pure spread” arising from market structure are shown to be insignificantly different with each other. This result is quite surprising considering that Malaysia admittedly has a sounder financial system than Indonesia’s. A possible explanation for this is that the banking system of Indonesia has relatively more players (222 banks in 1997) than that of Malaysia (35 banks in 1997). Thus, the effects of other structural weaknesses of Indonesia on the pure spread may be compensated for by the more intense competition among its banks.

For the time effect, we found that the “pure spread” of the region significantly declined in the period following 1997. This reflects the impact of the profit squeeze experienced by Southeast Asian banks as the effects of the crisis continued. With the increase in the number and amounts of nonperforming loans, the recognized interest revenues of the region’s banks significantly decreased leading to this observed decline in the net interest margin. On balance, it is anticipated that subsequent to the crisis, an improvement in the efficiency of the region’s intermediation activity shall follow.

Section V. Conclusion

We attempted to identify factors that drive bank net interest margins in Southeast Asia using the dealer model. Bank-specific factors, namely collateral, liquid assets, loan quality, operating expenses, and capital, were shown to be determinants of Southeast

Asian bank spreads. Also explaining the region's net interest margins are interest rate volatility and the noncompetitive market structure of its banking systems. These results can serve as basis for the framing of the correct policy by the region's regulatory authorities to achieve a convergence of the individual countries' bank net interest margins to their efficient levels.

References:

- Angabazo, L., 1997. Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking. *Journal of Banking and Finance*, 21, 55-87.
- Barajas, A., Steiner, R., and Salazar, N., 1999. Interest Spreads in Banking in Colombia. *IMF Staff Papers*, 46, (2), 196-225.
- Brock, P. L. and Suarez, L. R., 2000. Understanding the behavior of bank spreads in Latin America. *Journal of Development Economics*, 63, 113-135.
- Brimmer, A. F., 1998. Bank Lending and the Asian Economic Crisis. *North American Journal of Economics and Finance*, 9 (1), 105-119.
- Chou, C, 1999. Indonesian Banks: Survival of the Fittest. *Rising to the Challenges in Asia: A Study of Financial Markets, Indonesia*, Asian Development Bank, 6, 35-72.
- Dickinson, D. G. and Mullineux, A. W., 2002. The Asian Financial Crisis and Lessons for CEE Economies. *Financial and Monetary Integration in the New Europe*. Edward Elgar, 202-223.
- Drakos, K., 2003. Assessing the success of reform in transition banking 10 years later: an interest margin analysis. *Journal of Policy Modeling*, 25, 309-317.
- Gochoco-Bautista, M. S., 1999. The Past Performance of the Philippine Banking Sector and Challenges in the Postcrisis Period. *Rising to the Challenges in Asia: A Study of Financial Markets, Philippines*, Asian Development Bank, 10, 29-77.
- Ho, T. S.Y. and Saunders, A., 1981. The Determinants of Bank Interest Margins: Theory and Empirical Evidence. *The Journal of Financial and Quantitative Analysis*, 16, Issue 4, 581-600.
- Kane, E. J., 2000. Capital Movements, banking insolvency and silent runs in the Asian financial crisis. *Pacific Basin Finance Journal*, 8, 153-175.
- Kawai, M. and Takayasu, K, 1999. The Economic Crisis and Banking Restructuring in Thailand. *Rising to the Challenges in Asia: A Study of Financial Markets, Thailand*, Asian Development Bank, 11, 37-103.
- Klein, M., 1971, A theory of the banking firm. *Journal of Money, Credit and Banking*, 3, 205-218.
- Kwan, S. H., 2003. Operating performance of banks among Asian economies: An international and time series comparison. *Journal of Banking and Finance*, 27, 471-489.

- McShane, R.W. and Sharpe, I.G., 1985. A time series-cross section analysis of the determinants of Australian trading bank loan-deposit margins: 1962-1981. *Journal of Banking and Finance*, 9, 115-136.
- Monti, M. 1972. Deposit, credit and interest rate determination under alternative bank objective functions, in: Karl Shell and Giorgio P. Szego, eds., *Mathematical methods in investment and finance*, North-Holland, Amsterdam, 431-454.
- Nys, Emmanuelle, 2003. A European Study of bank interest margins: Is net fees revenue a determinant? An unpublished manuscript.
- Oh, Soo-Nam, 1999. Towards a Sustainable Banking Sector – Malaysia. *Rising to the Challenges in Asia: A Study of Financial Markets, Malaysia*, Asian Development Bank, 8, 33-78.
- Patten, R. H., Rosengard, J.K., Johnston, D. E., 2001. Microeconomic Finance Amidst Macroeconomic Failure: The Experience of Bank Rakyat Indonesia During the East Asian Crisis. *World Development*, 29, (6), 1057-1069.
- Saunders, A. and Schumacher, L., 2000. The determinants of bank interest margins: an international study. *Journal of International Money and Finance*, 19, 813-832.
- Wong, K. P., 1997. On the determinants of bank interest margins under credit and interest rate risks. *Journal of Banking and Finance*, 21, 251-271.
- Zarruck, E., 1989. Bank margin with uncertain deposit level and risk aversion. *Journal of Banking and Finance*, 13, 797-810.

Table 1

*Comparative Net interest Margins (in %) for the period 1994-1999
Southeast Asia versus Western Europe*

South East Asia							
Countries	1994	1995	1996	1997	1998	1999	Average
Indonesia	4.28	4.16	3.79	4.04	3.42	2.41	3.68
Thailand	3.02	2.52	2.48	2.08	(0.74)	0.26	1.60
Malaysia	2.26	2.84	2.91	2.86	3.04	2.84	2.80
Philippines	4.27	3.88	3.99	4.55	4.95	3.63	4.21
Average	3.46	3.35	3.29	3.38	2.68	2.29	3.07
<i>Source: Fitch IBCA (2002)</i>							
Western Europe							
Belgium	1.82	1.98	1.97	1.76	2.14	2.41	2.00
Denmark	5.14	4.91	4.59	4.36	4.24	4.21	4.58
France	3.06	2.99	3.04	2.95	2.94	2.64	2.94
Germany	2.73	2.60	2.68	2.32	2.37	2.16	2.48
Greece	2.50	2.68	2.83	2.98	2.66	2.42	2.68
Ireland	2.26	2.60	2.13	1.77	1.86	1.68	2.05
Italy	3.76	4.15	3.69	3.16	3.03	2.70	3.42
Luxembourg	0.89	0.85	0.82	0.82	1.02	0.94	0.89
Netherlands	1.55	1.53	1.39	1.34	1.59	1.64	1.51
Portugal	2.83	2.24	2.06	1.99	1.93	2.01	2.18
Spain	3.46	3.98	3.47	3.09	2.89	2.63	3.25
UK	2.80	2.86	2.86	2.90	3.26	2.82	2.92
Average	2.73	2.78	2.63	2.45	2.49	2.35	2.57
<i>Source: Nys (2003) with the raw data taken from Bankscope.</i>							

Note: In this comparison, NIM is defined as net interest income as a percentage of total assets.

Table 2**Results of First Step Regressions**

Dependent Variable: Net Interest Margin=Net Interest Income/Earning Assets
T- statistics are in parenthesis

	Philippines	Indonesia	Thailand	Malaysia
KAP	0.09*** (8.49)	0.22*** (19.78)	-0.05 (1.19)	0.09*** (6.09)
LIQ	-1.36 (1.50)	0.97 (0.94)	-3.02*** (2.88)	-2.34*** (5.10)
LRGL	0.08** (1.99)	-0.04*** (2.74)	-0.13*** (7.77)	0.00 (0.17)
NEA	-9.27*** (4.11)	-20.52*** (8.93)	-6.29** (2.22)	2.84*** (2.93)
OPEX	37.11*** (4.13)	45.57*** (5.67)	-11.75 (1.10)	100.78*** (13.02)
Intercept	3.09*** (4.97)	1.76*** (3.06)	4.65*** (8.73)	0.55** (2.28)
Dummy 95	0.17 (0.36)	0.37 (0.57)	-0.29 (0.51)	0.61*** (2.87)
Dummy 96	0.17 (0.37)	0.06 (0.10)	-0.37 (0.67)	0.90*** (4.26)
Dummy 97	0.26 (0.62)	0.49 (0.73)	-0.55 (0.98)	0.78*** (3.63)
Dummy 98	0.16 (0.38)	3.46*** (4.30)	-2.08*** (3.63)	0.50** (2.25)
Dummy 99	-1.12** (2.48)	-0.18 (0.22)	-0.98 (1.75)	0.59*** (2.66)
Dummy 00	-1.34*** (2.76)	0.25 (0.31)	-0.88 (1.66)	0.75*** (3.26)
Dummy 01	-1.44*** (2.76)	-0.15 (0.18)	-0.81 (1.57)	0.24 (1.02)
Adjusted R-Squared	.43	.57	.72	.50

KAP = total equity/total assets

LIQ = liquid assets/total assets

LRGL = loan reserves/gross loans

NEA = non-earning assets/earning assets

OPEX = personnel, administrative and other operating expenses/total assets

****Significant at the 1% level*

***Significant at the 5% level*

Table 3

Result of Second Step Regression

Dependent Variable: Pure Spread
T-statistics are in parenthesis

Intercept	1.28*** (4.69)
Interest Volatility	0.19*** (2.97)
Thailand Dummy	2.74*** (7.93)
Philippine Dummy	1.34*** (3.76)
Indonesia Dummy	0.61 (1.52)
1997 Dummy	-0.54** (2.13)
Adjusted R-squared	.70

****Significant at the 1% level*
***Significant at the 5% level*

Appendix A

Country	Year/Number of Banks in Sample							
	1994	1995	1996	1997	1998	1999	2000	2001
Indonesia	74	79	81	66	67	71	58	46
Malaysia	25	37	38	37	36	36	27	26
Philippines	22	25	38	40	41	38	32	22
Thailand	7	7	8	10	11	12	14	14

Appendix B

Country	Short-term interest rates
Indonesia	Indonesia SB Discount 90 – day rate
Malaysia	Base Lending Rate
Philippines	90 – day T-bill rate
Thailand	3 month deposit rate