

การตั้งสำรองหนี้สงสัยจะสูญ :
ผลกระทบที่มีต่อผลตอบแทนในอนาคตและราคาหุ้นของธนาคารพาณิชย์



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จุฬาลงกรณ์มหาวิทยาลัย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน


คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2543

ISBN 974-346-308-9

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

LOAN LOSS RESERVE :
AN IMPACT ON BANK FUTURE RETURN AND STOCK PRICE



Miss Sunsanee Sakulsurarat

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Finance

Department of Banking and Finance
Faculty of Commerce and Accountancy

Chulalongkorn University

Academic Year 2000

ISBN 974-346-308-9

Thesis Title LOAN LOSS RESERVE : AN IMPACT ON BANK FUTURE RETURN
AND STOCK PRICE

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จุฬาลงกรณ์มหาวิทยาลัย

นางสาว ศันสนีย์ สกกุลสุวรรณ์: การตั้งสำรองหนี้สงสัยจะสูญ : ผลกระทบที่มีต่อผลตอบแทนในอนาคตและราคาหุ้นของธนาคารพาณิชย์. (LOAN LOSS RESERVE : AN IMPACT ON BANK FUTURE RETURN AND STOCK PRICE) อ. ที่ปรึกษา : ผศ. ปิยรัตน์ กฤษณามระ; 80 หน้า. ISBN 974-346 -308 -9.

การตั้งสำรองหนี้สงสัยจะสูญ เป็นการปรับรายการทางบัญชี ซึ่งกระทำโดยธนาคารพาณิชย์ เพื่อสะท้อนถึงสภาพและมูลค่าที่แท้จริงของเงินให้สินเชื่อ งานศึกษานี้จะใช้วิธีกำลังสองน้อยที่สุดเพื่อทดสอบว่าหนี้สงสัยจะสูญที่ไม่ได้คาดหมายมีผลกระทบต่อราคาหุ้นและกระแสเงินสดของธนาคารพาณิชย์ในอนาคตอย่างไร โดยใช้ข้อมูลรายครึ่งปีของธนาคารพาณิชย์ไทย 10 แห่ง ระหว่างปี 2540-2542 สาเหตุที่ทำการทดสอบโดยใช้หนี้สงสัยจะสูญที่ไม่ได้คาดหมายนั้น เนื่องจากว่าราคาหุ้นในปัจจุบันน่าจะสะท้อนถึงข้อมูลที่มีอยู่รวมทั้งข้อมูลที่มีการคาดการณ์ไว้แล้ว ดังนั้นการเปลี่ยนแปลงของราคาหุ้นจึงน่าจะเป็นผลมาจากข้อมูลที่ไม่ได้คาดหมายมาก่อน

ผลการศึกษาพบว่าหนี้สงสัยจะสูญที่ไม่ได้คาดหมายไม่สามารถใช้ในการอธิบายราคาหุ้นและกระแสเงินสดในอนาคตของธนาคารพาณิชย์ได้ งานศึกษานี้จึงได้ขยายขอบเขตการทดสอบออกไปโดยศึกษาว่าหนี้สงสัยจะสูญทั้งจำนวนมีผลกระทบต่อราคาหุ้นและกระแสเงินสดในอนาคตอย่างไร ผลการศึกษาพบว่าหนี้สงสัยจะสูญทั้งจำนวนมีผลกระทบในทางลบต่อราคาหุ้นและมีผลกระทบในทางบวกต่อกระแสเงินสดในอนาคต สาเหตุที่พบผลกระทบในทางลบต่อราคาหุ้นนั้น เนื่องจากนักลงทุนมองหนี้สงสัยจะสูญว่าเป็นค่าใช้จ่ายซึ่งทำให้กำไรสุทธิของธนาคารพาณิชย์ลดลงและส่งผลถึงการจ่ายเงินปันผล การตั้งสำรองหนี้สงสัยจะสูญยังทำให้อัตราส่วนเงินกองทุนต่อสินทรัพย์เสี่ยงลดลง ทำให้นักลงทุนเกิดความไม่มั่นใจในสภาพปลอดจนความมั่นคงของธนาคารและทำการขายหุ้นออกมา สำหรับสาเหตุของผลกระทบในทางบวกต่อกระแสเงินสดในอนาคต เนื่องจากธนาคารพาณิชย์ที่ทำการตั้งสำรองหนี้สงสัยจะสูญไว้อย่างเพียงพอจะสามารถดำเนินการกับหนี้ที่มีปัญหาได้อย่างรวดเร็วและมีประสิทธิภาพมากขึ้น นอกจากนี้ธนาคารที่ทำการตั้งสำรองไว้ครบก็มักจะทำการตัดหนี้จำนวนนั้นเป็นหนี้สูญ ซึ่งจะทำให้ได้ประโยชน์ในเรื่องของความสามารถในการขยายสินเชื่อเพื่อเพิ่มรายได้ในธนาคารต่อไป

ภาควิชา การธนาคารและการเงิน.....ลายมือชื่อนิติ.....
 สาขาวิชา การเงิน.....ลายมือชื่ออาจารย์ที่ปรึกษา.....
 ปีการศึกษา 2543.....

G4282419126 : MAJOR FINANCE

KEY WORD: LOAN LOSS RESERVE / STOCK PRICE / RETURN / NON-PERFORMING LOANS

SUNSANEE SAKULSURARAT : LOAN LOSS RESERVE : AN IMPACT ON BANK

FUTURE RETURN AND STOCK PRICE. THESIS ADVISOR : ASSIST. PROF.

PIYARATH KRISHNAMRA. 80 pp. ISBN 974-346 -308 -9.

Loan loss reserve is an accounting adjustment made by banks in order to reflect the actual performance and reveal the appropriate value of loan portfolios. This study would apply the ordinary least square methods (OLS) to examine an impact of unexpected loan loss reserve, on bank stock price and future cash flow, using the semi-annual data of 10 Thai commercial banks during 1997-1999. The reason to substitute unexpected loan loss reserve as independent variable is because current stock price should reflect all available information or any expected information. Therefore, the change in stock price is related only with unexpected, not anticipated information.

Empirical result finds that unexpected loan loss reserve has no impact on bank stock price or future cash flow. Consequently, the paper extends the study by replacing unexpected loan loss reserve with total amount of loan loss reserve. The result suggested that total amount of loan loss reserve has significant negative impact on bank stock price and has positive impact on bank future cash flow. Reasons for the negative impact on stock price are that investors view an increase in loan loss reserve as an expense that reduce current earnings and increase the risk of a bank's capital structure. These reasons affect the confidence of investors, which result in a drop in stock price. The positive impact of loan loss reserve on bank future cash flow is occurred from the ability to deal with troubled debts more effectively and the ability to finance new projects to generate revenue.

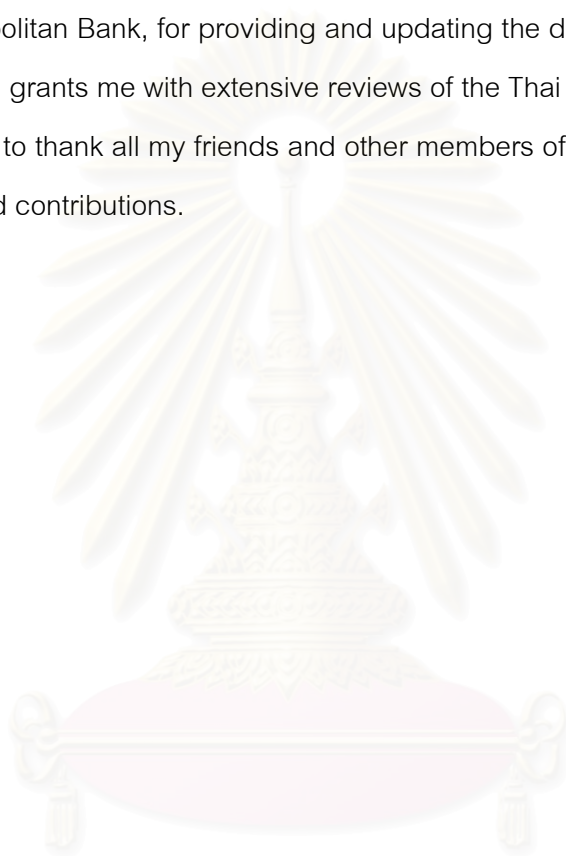
Department Banking and Finance..... Student's signature.....

Field of study Finance..... Advisor's signature

Academic year 2000.....

ACKNOWLEDGEMENTS

This thesis can not be accomplished without the assistance of Assist. Prof. Piyarath Krishnamra, thesis advisor, who gives valuable suggestions and recommendations. Mr. Prajak Udomsilp, research and planning department: the Bangkok Metropolitan Bank, for providing and updating the data sets. I am also thankful to my father who grants me with extensive reviews of the Thai commercial banks. Finally, I would also like to thank all my friends and other members of my family for giving me all the supports and contributions.



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CHAPTER 1

Introduction

Lending is a vital activity for most financial institutions. Not only do loans represent the largest commitment of funds for depository institutions, but also they produce the greatest share of the total revenue generated from all earning assets. Moreover, it is in the lending function that depository financial institutions generally accept the greatest risks. The failure of individual commercial banks and other depository financial institutions is usually associated with problems in the loan portfolio and is less often the result of shrinkage in the value of other assets.¹ Consequently, loan portfolio characteristic is likely to have sufficient impact on bank future return and stock price, and it becomes the significant factor for investors to consider.

Investors regularly apply three kinds of loan loss disclosures to examine loan characteristic of each bank. First is an amount of non-performing loans, which can be obtained from the notes, being attached to financial statements. Second is an amount of loan loss reserve, which is presented in the income statement. Finally is the loan charge off, which could be derived from the financial statements and supplement data.

“Non-performing loans” denote loans where the borrower has failed to pay on time or in the full amount but might be considered not to have defaulted but merely not to have performed – i.e. not met the legal terms of a contract. Therefore, Non-performing loans indicate the quality of loans, which could precisely imply future earnings and credit-management ability of the banks.²

In Thailand, the declaration and the definition of non-performing loans have been transformed continuously. Prior to 1997, an information about non-performing

¹ Rose P. S., Financial institutions: understanding and managing financial services (United States of America : Richard D. Irwin Inc.,1995), p.288.

² Edna C., The language of Money (Australia : George Allen & Unwin Australia Pty Ltd.,1985), p.137.

loans was not public. Although every bank had to report loans that were prohibited from the recognition of interest income to the Bank of Thailand, the figures were not evidenced to investors. Since 1997, the new regulation has required commercial banks and finance companies to disclose their status about non-performing loans in their annual reports.³ The Bank of Thailand has also changed the determination of non-performing loans for many times to attain the international standards and to reinforce financial institutions. Before 1997, non-performing loans referred to loans with an interest or principal payments had been overdue for more than 12 months. This figure, nevertheless, was influenced by many other factors besides the aging. For example, the loans may not be defined as non-performing loans if they still have sufficient collateral.⁴ This standard has been modified later, all loans that have been overdue over the specified periods must be defined as non-performing loans, whether that loans have adequate collateral assets or not. The aging of non-performing loans is also decreased from 12 months in 1997 to 6 months in 1998 and 3 months currently.⁵

Loan loss reserve and loan charge off are accounting adjustments made by commercial banks in order to reflect the actual performance and reveal the appropriate value of loan portfolios. When outstanding loans are having the probability of default, banks have to set aside loan loss reserve and loan loss allowance to cover loan losses. Lending bank would reduce the net book value of loan assets by making a charge (debit) to the “loan loss reserve” expense account and a credit to the “loan loss

³ “กฎกระทรวงพาณิชย์ ฉบับที่ 7(พ.ศ. 2539),” 25 ตุลาคม 2539. และ “หนังสือธนาคารแห่งประเทศไทย ที่ ฅว.(ว.) 34/2540 เรื่อง ประกาศธนาคารแห่งประเทศไทย เรื่อง แบบงบดุลและบัญชีกำไรขาดทุนของธนาคารพาณิชย์,” 27 มกราคม 2540.

⁴ “หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.ง.พ.(ว.) 509/2538 เรื่อง การบันทึกบัญชีเกี่ยวกับดอกเบี้ยค้างรับ,” 6 มีนาคม 2538.

⁵ “หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.ง.(ว.) 3989/2540 เรื่อง การเปิดเผยข้อมูลเงินให้สินเชื่อหรือเงินให้กู้ยืมที่สถาบันการเงินระงับการรับรู้อย่างได้ในงบการเงิน,” 15 ธันวาคม 2540.

“หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.ง.(ว.) 1322/2542 เรื่อง การเปิดเผยข้อมูลเงินให้สินเชื่อหรือเงินให้กู้ยืมที่สถาบันการเงินระงับการรับรู้อย่างได้ในงบการเงิน,” 16 เมษายน 2542.

allowance” account. Loan loss allowance is a contra asset account, so any increase in loan loss reserve reduces the net book value of loan asset account and reduces current net income. Alternatively, specific loans can be “charged off” when they are deemed uncollectible, which would reduce the loans account and the loan loss allowance by the same amount that is equal to the principal lost, net of any expected recoveries.

Bank management should make loan loss accounting decisions cautiously since accurate estimation of loan loss reserve and loan charge off could avoid erratic movements in earnings and potential liquidity problems. The central bank also observes commercial banks management via examining the quality of bank loans consorts with an amount of loss reserve, loan charge off, and loan loss allowance. Altogether, loan loss reserve sends signal to all interested parties, including depositors, investors, and regulators, concerning the credit risk of the bank. The loan loss reserve and loan charge off guidelines for Thai commercial banks are described next.

“**Loan charge off**” has first introduced in Thailand in 1979, in according with the Commercial Banking Act B.E. 2505, amended in 1979. This act ordained commercial banks to charge off worthless and irrecoverable loans annually. Worthless and irrecoverable loans referred to **claims for which a reasonable action has been taken for the recovery of debt where there is no possibility of such debt being recovered**. The Bank of Thailand’s measurement; however, was ambiguous and difficult to define since it was unclear what was the reasonable action or the possibility of recovered.⁶

The Commercial Banking Act B.E.2505, amended in 1979 and 1985, imposed commercial banks to close their accounting semiannually to better notify the changing in loan quality on time. In addition, an adjustment has clarified the characters of the worthless or irrecoverable loans by providing further details on the definitions, as presented in article 3.

⁶ ชัยชาญ วิบูลศิริ, เจาะวิกฤตสถาบันการเงินไทย (กรุงเทพฯ : 2541), หน้า16

Article 3: Claims for which a reasonable action has been taken for the recovery of debt where there is no possibility of such debt being recovered and should be written off, satisfying any one of the criteria:

(a) The debtor is dead or adjudged of disappearance, or there is some evidence of disappearance, and the debtor does not have any property to repay the debt.

(b) The debtor has dissolved his business operation and is in debt to other creditors with preferential rights over the whole property of the debtor ranked ahead that of the commercial banks in an amount exceeding the value of the property of the debtor.

(c) The commercial bank has sued the debtor or has applied for participant in property in the case where other creditors have sued the debtor, and the court has ruled that the debtor does not have any property to repay the debt.

(d) The commercial bank has filed for bankruptcy action against the debtor or has applied for participation in property in the case where other creditors have filed for bankruptcy action, and in such cases there has been a compromise with the approval of the court or the debtor has been adjudged as bankrupt and there has already been a distribution of the debtor's property.

“Loan loss reserve” regulation has been initiated in the Commercial Banking Act B.E.2505, amended in 1979 and 1985. At the beginning, the Bank of Thailand imposed commercial banks to set aside loan loss reserve for assets classified as doubtful and doubtful of loss by 100 percent full amount, however, there was no reserve requirement for substandard loans. The loan loss reserve regulations become hardened when the Bank of Thailand has announced the “Measures to Strengthen Soundness of the Financial Institutions” on 3 March 1997. This ordering demands commercial banks to provide 15 percent reserve against substandard loans for every half-year accounting period. Half of the requirement has to be set within the first half of

1997 and total requirement has to be achieved within 2 years.⁷ Since financial institutions were fragile and faced numerous problems by that time, the act was strongly objected by many related parties. As a result, on 30 March 1997, the Bank of Thailand has declared the standard modifications by expanding the reserve duration from 2 years to 5 years.

After Thailand has entered financial support programs of an International Monetary Fund (IMF) on 14 August 1997, the Bank of Thailand has been forced to manipulate stronger standards in order to reinforce financial institutions. The notification of the Bank of Thailand dated 31 March 1998 has imposed commercial banks to apply asset classification criteria and loan loss reserve requirement in line with international standards, according to the following guidelines.⁸

(a) Loans are classified into five categories, i.e., pass, special mention, substandard, doubtful, and doubtful of loss.

Pass denotes loans which the debtor has no overdue payment with usual risk characteristics, required a minimum of 1 percent reserve.

Special mention denotes loans which the debtor has been unable to pay interest and/or principal payments for a cumulative period over 1 month from the contractual due date, or the date of demand by the commercial bank, whichever is earlier, required a minimum of 2 percent reserve.

⁷ “หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.งพ.(ว.) 579/2540 เรื่อง การกันสำรองสำหรับสินทรัพย์ ที่สงสัยว่าจะไม่มีราคาหรือเรียกคืนไม่ได้,” 3 มีนาคม 2540.

⁸ “หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.ง.(ว.)1236/2541เรื่อง การปรับปรุงหลักเกณฑ์การระงับรับรู้ดอกเบี้ยค้างรับเป็นรายได้ การจัดชั้นลูกหนี้ การกันสำรองสำหรับลูกหนี้ที่จัดชั้น และมาตรการอื่นที่เกี่ยวข้อง,” 31 มีนาคม 2541.

“หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.ง.(ว.) 1837/2541 เรื่อง หลักเกณฑ์การปรับปรุงโครงสร้างหนี้และหลักเกณฑ์การประเมินมูลค่าหลักประกันของสถาบันการเงิน,” 2 มิถุนายน 2541.

“หนังสือธนาคารแห่งประเทศไทย ที่ ธปท.ง. (ว.) 1387/2541 เรื่อง การนำส่งธนาคารแห่งประเทศไทย เรื่อง สินทรัพย์ที่ไม่มีราคาหรือเรียกคืนไม่ได้ และสินทรัพย์ที่สงสัยว่าจะไม่มีราคาหรือเรียกคืนไม่ได้,” 30 มิถุนายน 2541.

Substandard denotes loans that the debtor has been unable to pay interest and/or principal payments for a cumulative period of over 3 months, required a minimum of 20 percent reserve after deducted with collateral value.

Doubtful denotes loans which the debtor has been unable to pay interest and/or principal payments for a cumulative period of over 6 months, required a minimum of 50 percent reserve after deducted with collateral value.

Doubtful of loss denotes loans which the debtor has been unable to pay interest and/or principal payments for a cumulative period of 12 months or more, required 100 percent of reserve after deducted with collateral value.

(b) Commercial banks have to set aside loan loss reserve according to these requirements starting from the second accounting period of 1998, and will fully maintained by the second accounting period of 2000.

(c) Classification of loans does not take collateral into consideration. However, properly valued collateral may be deducted from the loan when determining the amount of loan loss reserve requirement. Financial institutions are encouraged to mark-to-market and appraise their collateral more frequently to better reflect market value.

The Bank of Thailand is trying to launch new qualitative loan loss reserve calculation. Financial institutions will be asked to evaluate their appropriate loan loss reserve levels through qualitative reviews of their customer financial situation, rather than calculating loan loss reserve levels based on a three-month interest accrual period net of collateral value. The change is expected to occur at end 2000 and should raise banks' loan loss reserve targets above the current reserve requirement.⁹

Loan loss reserve is an expense that would reduce current earnings and; hence, decrease retained earnings. Because the Bank of Thailand does not permit an added back of loan loss allowance account for the purpose of calculating "capital per

⁹Jardine Fleming Research, "Thai strategy : The Thai Pulse," (May 2000) : 14.

risky assets ratio,” an increase in loan loss reserve implies that the ability of banks to maintain capital per risky assets ratio might be in danger.

There were evidences that loan loss reserve has remarkable effect on stock price and capital strength of commercial banks. Following is the incident of Latin America crisis during mid-1987 when most U.S. banks, led by Citicorp, announced large increases in their loan loss reserves because of problem loans in lesser-developed countries (LDC).

On 20 February 1987, Brazil declared a moratorium on interest payments on \$67 billion of medium and long term debt and later froze payments on \$10 billion on short-term credits and \$5 billion of money market deposits. Most large banks subsequently announced they would no longer accrued interest on their Brazilian debt. The action by Brazil also increased pressures on the banks to reconsider how they should value the debt on their books. Citicorp was the first to react by announcing, on 19 May 1987, a \$3 billion increase to its loan loss reserve on less developed countries (LDC) debt. The increased reserve levels represented 25 percent of the LDC debt in its loan portfolio and 39 percent of its pre-announcement market value. Citicorp's stock price dropped 3.1 percent on May 19th in anticipation of the announcement, which was broadcast on the Dow Jones News Service after close of business at 4:45 p.m., but the price rebounded 10.1 percent during the next two days. This price rise was attributed by the popular press to perception of a strategy by Citicorp to deal with its LDC debt problem.

The Citicorp action forced banks with lesser resources to decide whether they should and could follow the lead of the nation's largest bank. The weakness of some large banks was viewed as a motivation for regulators to allow each bank to make its own evaluation of necessary reserve level. Indeed, BankAmerica immediately announced it would not follow the Citicorp lead. However, by 24 July 1987, 45 major U.S. banks, including BankAmerica, had announced substantial increase in their loan loss reserve levels.

On 14 December 1987, the Bank of Boston announced an additional increase in its loan loss reserve of \$200 million, classification of \$470 million of LDC debt into non-performing loans, and the charge off of \$200 million of LDC debt. This charge off was the first LDC-related action that significantly reduced a bank's capital adequacy ratio. This is because, during that period, U.S. regulation allowed an added back of loan loss reserve to stockholder's equity for the purpose of calculating the capital adequacy ratio so that loan loss reserve has no impact on the ratio. Only the charge off of a loan reduces the ratio and therefore has the potential to cause a violation of minimum legal capital requirements. However, even after the charge off, the Bank of Boston's capital adequacy ratio was approximately 8 percent.¹⁰ The Bank of Boston's stock price rise from 9.9 percent for the three days beginning 14 December 1987 was attributed to the announcement's signal of the bank's financial strength.

On 16 December 1987, The Wall Street Journal reported that the Bank of Boston announcement would have wide repercussions because most major money-center banks could not follow the Bank of Boston charge off without violating minimum capital requirements. The potential impact on smaller banks was less severe. For example, in January 1988, First Bank System began selling off LDC loans at 50 cents per dollar of loan.

These decisions and the aftermath in which several money-center and regional banks made public announcements provide a fruitful background for considering the economics implications of loan loss reserve announcements.

Previous empirical studies have found different kinds of market reactions to loan loss reserve announcements. There were negative, positive and also no-related impacts on stock prices after commercial banks have announced their increase in loan loss reserve decisions.

¹⁰ During that period, the general capital adequacy requirement was 5.5 percent.

For **negative** reaction, many reasons have been suggested to response the founding.

First, since loan loss reserve expense reduced the income of the bank, which affected current earning per share and dividend payment of the announcing bank, stock market should react negatively to an increase in loan loss reserve announcement.

Second reason that encourages this inverse relationship is that market tends to interpret an increase in loan loss reserve as a sign of loan-quality deterioration, which led to the reduction in revenue and income in the future.

Third, increase in loan loss reserve also reflects the trouble in the operations such as inefficient credit approval policy or not enough customer relationship.

Forth, banks have to maintain the minimum capital per risky assets ratio (BIS ratio), as required by the central bank to meet the international standard. An increase in loan loss reserve reduced net income and retained earnings of the banks. Because retained earnings are counted as tier1-capital, such loan loss reserve additions have the potential to increase the risking of a bank's capital structure, at least in the eyes of regulators.¹¹

Finally, increase in loan loss reserve may limit a bank's ability to finance new positive net present value (NPV) projects. When banks want to expand their business by financing new loans, it would result in more amounts of risky assets. This indicates that banks must have sufficient capital in order to achieve the minimum capital per risky assets ratio. Since additional in loan loss reserve reduces the capital of the bank, loan loss reserve announcements imply an opportunity cost that could engender a negative stock market reaction.¹²

¹¹ Musumeci, James, J., and Joseph, F., Jr., "The international debt crisis and bank security returns in 1987: The Brazillian experience," Journal of Money, Credit, and Banking 22 (1990b): 209-220.

¹² Madura, J., and William R. McDaniel, "Market reaction to increased loan loss reserves at money-center banks," Journal of Financial Services Research 3 (1989): 359-369.

On the other hands, markets might react **positively** to an increase in loan loss reserve announcement. There are some reasons that could explain this favorable reaction.

First is the Managers-Expectation Hypothesis. Investors likely to interpret an increase in loan loss reserve as a sign of strength because it indicates that management perceives the earning power of the bank to be sufficiently strong enough to withstand a “hit to earnings” in the form of additional loan loss reserve.¹³ In other words, they take into account that managers are already deliberate that the future earnings and capital of banks would be strong enough so a decrease in current earnings would not be a problem to maintain the capital adequacy ratio, which is required by the central bank.

Next reason is the tax benefits. This advantage is not comparable for every bank and every time because it depends on the tax regulations in each country. If the regulations do not allow loan loss reserve as a tax-deductible expense, the decisions of managers to make additional loan loss reserve for tax benefits would not be an incentive anymore. In Thailand, an adjustment on accounting practice on October 24, 1997 has allowed a full tax-deductibility on loan loss reserve effective from January 1, 1998.¹⁴

Finally, loan loss reserve additions signal that a bank is unwilling to lower interest rates, extend principal payments, or make other loan concessions to delinquent borrowers.¹⁵ If banks still compromised with clients, especially the clients who do not feel morally bound to repay an obligation, a bargaining position of debtors appears to be higher. These debtors would ask for a huge hair-cut from debt restructuring, or else they would do nothing, since they believed that banks have to consent in order to prevent themselves from the need to increase loan loss reserve.

¹³ Barth M., Beaver, W., and Stinson, C., “Supplemental data and the structure of thrift share prices,” *The Accounting Review* 66 (January 1991): 56-66.

¹⁴ “พระราชกำหนดแก้ไขเพิ่มเติมประมวลรัษฎากร (ฉบับที่ 17) พ.ศ. 2540,” 24 ตุลาคม 2540.

¹⁵ Madura, J., and William R. McDaniel, “Market reaction to increased loan loss reserves at money-center banks,” *Journal of Financial Services Research* 3 (1989): 359-369.

Approval of loans for refinancing, increasing the value of collateral and many other ways could also be done by commercial banks to avoid setting loan loss reserve. These practices could result in a decrease in bank future return since the true problems can still not be solved. So if perceived as strengthening the bargaining position of the banks with these debtors, an increase in loan loss reserve announcement might be good news for the market.

There are also reasons for the findings of the **no-market reaction**. If both loan and stock markets are informational efficient, investors will look through loan loss reserve as accounting conventions and ensure that current market value of the bank fairly reflects the value of the bank's loan portfolio. In other words, the value of bank's loan portfolio is marked-to-market on a daily basis by rational and fully informed investors and loan loss reserve announcements are merely accounting adjustments without any economic significance.¹⁶ Consequently, there would be no share price response on both announcing and non-announcing banks in the periods surrounding loan loss reserve announcements.

In conclusions, there were evidences that reveal an impact of loan loss reserve on stock price and performance of commercial banks when they have set aside their loan loss reserve. Most events and studies; however, take place in the U.S. and Latin America, where the conditions are considerably different from Thailand so that the evidences from those studies might not be applicable in the Thai market. Example of differences between U.S. markets and Thai markets includes the number and the size of financial institutions, the efficiency of equity markets, financial regulations, characteristics of loan portfolios and investor behaviors. This study, therefore, wants to examine an impact of loan loss reserve on two items; bank future return and stock price,

¹⁶ Musumeci, James, J., and Joseph, F., Jr., "The international debt crisis and bank security returns in 1987: The Brazillian experience," *Journal of Money, Credit, and Banking* 22 (1990b): 209-220.

since both of them are two of the most concerning factors for bank managers, investors, and other related parties.

Objectives

There are two objectives in this study. First is to examine an impact of unexpected loan loss reserve on bank stock price. Second is to investigate an impact of unexpected loan loss reserve on bank future cash flow.

Scope of study

This study will scope the examination only 10 Thai commercial banks, which comprised of

- Bangkok Bank Public Company Limited (BBL)
- Thai Farmers Bank Public Company Limited (TFB)
- Krung Thai Bank Public Company Limited (KTB)
- The Thai Military Bank Public Company Limited (TMB)
- DBS Thai Danu Bank Public Company Limited (DTDB)
- The Siam Commercial Bank Public Company Limited (SCB)
- The Bank of Asia Public Company Limited (BOA)
- Bank of Ayudhya Public Company Limited (BAY)
- Standard Chartered Nakornthon Bank Public Co., Ltd. (SCNB)
- Bank Thai Bank Public Company Limited (BT)

The study would investigate the impact of unexpected loan loss reserve on stock price and future cash flow of these commercial banks, using the half-year accounting data. Sample and data is obtained from the first half of 1997 to the second half of 1999. Most data can be completed from the accounting figures in the financial reports, which commercial banks have to notify to the Stock Exchange of Thailand. Some data can be captured from other kinds of database such as return on banking index, which is available from Reuters, or dividend payment record that could be observed directly from the Stock Exchange of Thailand.

Limitations

There are some limitations on this study. First, which is the most important, is the restriction of samples. There are 15 commercial banks in Thailand at the beginning of 1997 yet there has been many major transformation on these banks during the period of 1997-1999. To cite an instance, there existed authority interventions, forbidding of stock trading, merger and acquisition, and the closing of financial institutions. These situations have brought the sample size more tighten. As a matter of facts, there left only 10 banks that contained complete information for the analysis like stock prices and accounting data.

Besides, there is a constraint about the studying period. It is only 3 years subject to the fact that essential data for the test like non-performing loans could not be detected prior to 1997. Finally, the related regulations and standards have been transformed frequently and continually. For instance, there are changes in non-performing loan definition, loan loss reserve principles, dividend payment criterions and financial report guidelines. Consequently, acquired figures have to be adjusted once establishing in the testing models in order to lessen potential problems from inaccurate data entry.

Benefits of the study

Since the study provides evidences about an impact of unexpected loan loss reserve on bank future return and stock price, the article contributes benefits to associated parties as follows:

Investors can apply an information about stock price behaviors to enhance their trading activities. If they recognize how other investors react when commercial bank announced an increase in unexpected loan loss reserve, they could make decisions about the timing of investment and the pricing of securities more effectively.

Analysts can adopt the empirical results in their analysis in order to make suggestions to their clients, especially in the case that the market reaction is not consistent with an impact of unexpected loan loss reserve on bank future cash flow. For instance, if investors respond negatively to an increase in unexpected loan loss reserve yet the evidence shows that such increase would lead to an increase in bank future cash flow, they might recommend their customers to buy the stocks of announcing banks since the price tends to be undervalued during that time.

Methodology

This paper will apply the ordinary least square method (OLS), which is one form of a simple linear regression, to examine the relationships among unexpected loan loss reserve, bank stock return, and bank future cash flow.

Stock return refers to the change in market value of stock, after adjusting for dividend payments. Cash flow can be replicated by pre-loan loss earnings (PreLLE), which is equal to net income added back loan loss reserve for that period. This is because there are some limitations about an information on bank cash flow, especially on the quarterly basis. Pre-loan loss earnings could be reasonably symbolized bank cash flow since loan loss reserve is the most significant accrual affecting bank earnings.

Parts of the paper

The remainders of this paper consist of the following: Chapter 2 is the literature review of the related articles. Chapter 3 are the hypotheses that will be tested in this study, the data, and the methodology. Chapter 4 is the discussion of empirical results. Chapter 5 is the robustness-check. Chapter 6 is the robustness-check results. Chapter 7 is the conclusions and suggestions.

CHAPTER 2

Literature Review

The discussion of previous empirical studies is divided into 4 sections. First is the empirical study, which was not related to Brazil moratorium on February 20, 1987. Second are the empirical studies, following with Latin America crisis and loan loss reserve announcements that were made during the period of 1987. Third are the recent empirical studies that extended the sample size and study periods beyond mid-1987. Finally are the empirical studies in the case of Thai commercial banks.

Empirical study not related to Latin America Crisis

Beaver et al. provide evidence that banks' market values are cross-sectional correlated with characteristics of their loan loss reserves.¹ The study found that, controlling for non-performing loans, banks with higher allowances for loan losses have higher market-to-book ratios. He suggested that investors interpret an increase in loan loss reserves as a sign of strength because it indicates management perceives the earnings power of the bank to be sufficiently strong that it could withstand a "hit to earnings" in the form of additional loan loss reserve.

Empirical studies following with Latin America Crisis

Madura and McDaniel used the event-study method and find a **positive** market reaction for Citicorp on the event day and the following three days following its loan loss reserve announcement. They also find **positive** market reactions to a sample of 11 other subsequent money-center bank loan loss reserve announcements between June 1 and July 8, 1987. They interpret these findings that by mid-1987 the market had fully discounted the magnitude of loan charge off tied to faulty less-developed country

¹ Beaver, W., Eger, C., Ryan S., and Wolfson, M. 1989. Financial reporting, supplement disclosures, and bank share prices. *Journal of Accounting Research* 27 (Autumn) : 157-78.

(LDC) lending practices, but was surprised by the speed with which beneficial tax advantages of charge off decisions would be realized.

Musumeci and Sinkey used event-study methods to examine security returns for the other 25 largest U.S. bank holding companies in the period surrounding Citicorp's announcement.² They found significant **positive** return for Citicorp and other money center banks at the time Citicorp announced its reserve allocation. They also find **positive** abnormal returns for other money-center banks when such banks announce their own loan loss reserve decisions. They contended that loan loss reserve decisions foreshadow loan charge off, and thereby signal value-enhancing corporate restructuring.

Grammatikos and Saunders had examined contagion effects of loan loss reserve announcement.³ Citicorp's announcements still had a **positive** effect upon its own returns, but there were **diverse contagion effects** upon other banks' return. There is a significant positive contagious stock price reaction in the case of three money-center banks in the period surrounding the Citicorp announcement. But four other money-center banks had a significantly negative contagious stock price reaction. On an overall basis, there was no statistically significant contagious stock price reaction among all money-center banks. In addition, they reported that other announcements followed Citicorp's announcements on May, 1987 had no significant influence on the share prices of announcing banks since they contained no new or unexpected loan loss reserve information.

² Musumeci, J., and J.F. Sinkey, Jr. 1990a. The international debt crisis, investor contagion, and bank security returns in 1987: The Brazilian experience. Journal of Money, Credit, and Banking 2(May) : 209-20.

³ Grammatikos, T., and Saunders, A. 1990. Additional to loan-loss reserves: Good news or bad news? Journal of Monetary Economics 25 (March) : 289-304.

Griffin and Wallach examined how the stockholders' returns of 13 largest U.S. money-center and regional banks were affected by disclosures made during 1987 regarding decisions to place Brazilian loans as non-performing loans and to increase loan loss reserves to recognize the higher probability of default and the lower present value of future interest and principal.⁴ They believed that markets will response to an announcement when it provides incremental information only. As a result, they used a methodology that focuses on unanticipated short-term effects of the announcements. In other words, they estimated the potential market effects at the time of the accounting announcements to represent the response to incremental information. They find that markets response **negatively to an increase in non- performing loans but positively to an increase in loan loss reserve**. The paper suggested that the latter reaction be viewed as consistent with banks' use of loan loss reserve adjustments as credible signals about their intentions and abilities to resolve the Latin American debt situation.

John A. Elliott, Hanna, J., and Wayne Shaw examined the information content of announcements of increased reserves for loan loss by Citicorp and other banks, and the later charge off announcement made by the Bank of Boston.⁵ They found that the announcement had **no significant effect** on returns of other banks during the three-day surrounding Citicorp's announcement. There are also weak results for the individual announcements by other 45 banks. The paper gives an explanation for the week results for the individual announcements that they were already anticipated. Once Citicorp announced the possibility of announcements by other banks become more likely. Each subsequent announcement, therefore, reduce the information content of the later announcement. However, the results evidenced significant information transfers

⁴ Griffin, P., A., and Wallach, S. 1991. Latin American lending by major U.S. banks: The effects of disclosures about nonaccual loans and loan loss provisions. *The Accounting Review* 66 (October) : 830-46.

⁵ Elliot, J.K., Hanna, J., and Shaw, W. 1991. The Evaluation by the Financial Markets of Changes in Bank Loan Loss Reserve Levels. *The Accounting Review* Vol.66 No.4 : 847-861.

from the Bank of Boston announcement to other banks. The three-day average abnormal returns were significantly **negative** for both the money-center banks and for the regional banks. They also found that banks with the greatest exposure to LDC debt and with the largest reserves sustained the largest stock price decreases at the Bank of Boston charge off announcement. In addition, the larger money-center banks sustained, on average, a three-day decline in value of 5 percent around the Bank of Boston announcement date.

Recent Empirical Studies

James M. Wahlen examines the nature of three loan loss disclosures, which comprised of (1) unexpected amount of changes in non-performing loans (2) unexpected amount of loan loss reserve (3) unexpected amount of loan charge off. He applied the annual data sample over the period 1977 to 1988 to test (1) an impact of three loan loss disclosures on stock price and (2) the impact of three loan loss disclosures on bank future cash flow.⁶ He found that the **positive relation between unexpected loan loss reserve and stock return** emerged only when unexpected loan loss reserve are conditioned on unexpected changes in non-performing loans and unexpected loan charge off. He also indicated that banks appeared to increase loan loss reserve when their future cash flow prospects improved. Stock market; therefore, used non-performing loan and loan charge off as the additional information to interpret the decision made by bank managers. This is conforming to an empirical result on an impact of unexpected loan loss disclosures on bank future cash flow. Unexpected loan loss reserve demonstrates a **positive relationship with the changes in future cash flow**. In contrast, unexpected changes in non-performing loans and unexpected loan charge off are negatively related to the changes in future cash flow. This paper also applies the event study method and the quarterly data to examine the market reaction and the abnormal return on stock price during the three-days centered on the earning

⁶ Wahlen, J.M. 1994. The nature of information in commercial bank loan loss disclosures. The Accounting Review Vol.69 No.3 : 455-478.

announcement date. The empirical results suggest the market react positively to unexpected loan loss reserve and earnings at the earnings announcement date. In contrast, the coefficient on unexpected loan charge off is negative and the coefficient on unexpected changes in non-performing loans is zero. This investigation, however, has a weakness in that it examined stock prices behavior around earning announcement dates and financial statements release dates instead of the specify release dates of loan loss disclosures. As a result, the results are clearly noisy due to event date specification error.

Chi-Chun Liu and Stephen G. Ryan investigate how bank's loan portfolio composition affects the timeliness of loan loss reserve and thus, the relation between security returns and such reserve.⁷ They believed that bank managers have more discretion over loan loss reserves for large and frequently renegotiated loans, such as foreign and commercial loans, than for a small or infrequently renegotiated loans, such as consumer loans. Large size and the possibility of re-negotiation provide rationales for banks to provide for losses on a loan-by-loan basis rather than by statistical analysis of historical data. They used the proportion of small or infrequently renegotiated loans as a measure of the timeliness of loan loss reserve. The results indicate that a **positive** market reaction to an increased loan loss reserve existed only for banks with relatively more large- and frequently renegotiated loans, or the banks with untimely loan loss reserve. In contrast, the market reaction to an increased loan loss reserve is **negative** for banks with relatively more small- or infrequently renegotiated loans, or the banks with timely loan loss reserve.

Docking, Hirschey and Jones use the ordinary least squares market-model event-study methodology to obtain estimates of abnormal stock returns

⁷ Chi-Chun Liu, and Stephen, G.R. 1995. The Effect of Bank Loan Portfolio Composition on the Market Reaction to and Anticipation of Loan Loss Provisions. *Journal of Accounting Research* Vol.33 No.1 : 77-94.

surrounding loan loss reserve announcements.⁸ The paper reported the **negative** and statistically significant announcement effects of bank loan loss reserve over the 1985-1990 periods. However, the negative effects were nullified when such announcements were accompanied by favorable earning announcements. These mean investors were influenced by additional information about the banks' earning. They also find **significant contagion effects** for non-announcing banks following loan loss reserve announcements by other banks; however, with different results. On average, there is a significant negative contagion effects, which reflect the fact that expectations concerning both money-center and regional bank profitability are interrelated. The announcements made by money-center banks; however, do not evidence significant contagious effects to other banks. This is consistent with previous study by Grammatikos and Saunders (1990) that money-center bank loan loss reserve announcements have a generally ambiguous effect on share prices of other money-center and regional banks. The negative and statistically significant contagion effect are only consistently related to loan loss reserve announcements by regional banks. The effect of regional banks announcements to money center bank prices is about -0.50 percent, while an impact on other regional banks is somewhat smaller or -0.1 percent. The smaller impact for this regional bank contagion effect is reasonable since regional bank markets frequently tend to be rather insular in nature. Finally, they found that the location of the banks played an important role to the effect of loan loss reserve announcements. The contagion effects between banks in the same or the nearby regions are more significant than the effects between banks that located in different regions. This may be resulted from the similar loan portfolios and comparable lending experiences.

⁸ Docking, D., Hirschey, M., and Jones, E.1997. Information and contagion effects of bank loan-loss reserve announcements. *Journal of Financial Economics* 43 : 219-239.

Empirical studies in Thailand

Boonchai Kiathanawit examined the factors that have influences on stock return of Thai commercial banks and finance companies, representing by return on bank index and finance index accordingly.⁹ The paper applied the ordinary least square method, using log linear regression model, to provide an empirical test during the period of 1986-1990. This study assumed that Thai stock market were quite small and inefficient so that other factors beside economics and fundamental factors should still have much influenced on stock prices. These factors comprised of technical factor, psychological factor, and speculative factor. Economics and fundamental factors comprised of private investment index, trading volume, an acceptance on rules 8 from IMF on 21 May 1990, interest rate spread, yields on Treasury bill, and inflation rate. Technical factor was represented by bank and finance index in the previous month. Psychological factor was represented by Dow Jones Industrial Average (DJIA). Speculative factors included two variables, which might effect the easiness of speculation, the size and liquidity of stock. The size was determined by dividing the number of banks (finance companies) that has its market value over 50 percent of total market value of bank (finance) sector by total number of banks (finance companies) that were listed in the Stock Exchange of Thailand that time. The liquidity was estimated by averaging the number of trading stocks to the number of registered stocks of each company each month. Empirical results indicate that the applicable factors that have influences on commercial banks' stock prices are private investment index, bank index in the previous month, Dow Jones Industrial Average, size of stocks and the trading liquidity. In addition, stock price of finance companies depends on trading volume, rules 8 acceptance, finance index in the previous month, and interest rate spread.

Dusida Butrkawee studied the relationship between asset-management and the profitability of Thai commercial banks during 1983-1990 by applying ordinary

⁹ บุญชัย เกียรติธนาวิทย์. 2534. ปัจจัยทางเศรษฐกิจที่มีอิทธิพลต่อราคาหุ้นกลุ่มธนาคารพาณิชย์และบริษัทเงินทุนและหลักทรัพย์. วิทยานิพนธ์ปริญญาโทบริหารธุรกิจ สาขาเศรษฐศาสตร์ มหาวิทยาลัยธรรมศาสตร์.

least square method.¹⁰ Return on earning assets was adopted as independent variable, representing the profitability of each bank; whereas the quantity and quality of loans were substituted as dependent variables, representing the asset-management style. Loan's quantity was represented by total loans per earning assets and its quality was represented by loan loss allowance per total loans. Earning assets comprised of loan and investment securities while non-earning assets is composed of required cash reserves and excess cash reserves. The paper classifies the samples in three categories, using the size criteria, and tests each of them separately.¹¹ An empirical test evidences that for six large commercial banks, quantity of loans has a significant positive relationship with the profitability. In addition, there was no significant connection between loan loss allowance proportion and the profitability for these large commercial banks, though the coefficient showed a negative sign. This could be implied that an amount of loan loss allowance per total loans was not capable to reflect actual loan's quality. The paper proposes that **large** commercial banks tend to hide their problem loans by account decorating in order to maintain their image and their operating performance. For the four **medium** banks, the quantity of loans has a negative relationship with the profitability. The paper indicates that it might due to the specific management problems in two banks, which are the Siam City Bank (SCIB) and the First Bangkok City Bank (FBCB). The loan loss allowance per total loans states a significant negative relationship with the profitability in the case of these four medium banks, which implies that loan loss allowance could reflect the quality of medium banks' loan portfolio. Finally, the five **small** banks demonstrate positive relationships between total loans per

¹⁰ ดุสิตดา นุตกรวี. 2536. การบริหารสินทรัพย์กับการทำกำไรของธนาคารพาณิชย์ไทย. วิทยานิพนธ์ปริญญา มหาบัณฑิต คณะเศรษฐศาสตร์ มหาวิทยาลัยธรรมศาสตร์.

¹¹ Large banks comprised of all Thai banks, whose total asset value at the end of 1987 exceed Bt 50,000 million. This included BBL, TFB, SCB, KTB, BAY and TMB. Medium banks comprised of Thai banks, whose asset value at the end of 1987 over Bt 30,000 million but not over Bt 50,000 million, which are BBC, BMB, SCIB and FBCB. Small banks comprised of banks whose asset value below Bt 30,000 million at the end of 1987, which included BOA, TDB, UB, NTB and LTB.

earning assets, including loan loss allowance per loans, with the profitability ratio. The study remarks that small banks tend to increase loan loss reserve when their profitability improved. In other words, loan loss allowance was partially consequences of profit, besides from loan quality adjustment.



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER 3

Methodology

There are two objectives in this study. First is to examine an impact of unexpected loan loss reserve on bank stock price. Second is to investigate an impact of unexpected loan loss reserve on bank future return or, in other words, bank future cash flow, which can be replicated by pre-loan loss earnings.¹

Stock return and future cash flow are performed as dependent variables in the testing models; whereas loan loss reserve and other factors, are categorized as independent variables.

Hypotheses

Two hypotheses will be examined in this paper, which comprised of:

1. H_1 : There is no impact of unexpected loan loss reserve on bank stock return.

If the empirical result **accepted** this hypothesis, it suggests that both stock and loan markets were efficient. Investors already recognized the characteristics of loan portfolios and current stock price already reflected these data. Therefore, unexpected loan loss reserve does not provide any incremental information about loan portfolio characteristics or any additional signal about bank conditions, which results in the no-market reaction on stock price of the announcing banks.

If the empirical result **rejected** this hypothesis, it indicates that unexpected loan loss reserve made by commercial banks was an essential data that contributes consecutive information to investors. Sign and degree of the estimated coefficient can reveal the attitude of investors toward loan loss reserve. There are two feasible coefficient signs, which are positive and negative. Each sign could be resulted from the following reasons.

¹ Pre-loan loss earnings (PreLLE) is equal to net income added back loan loss reserve.

When the hypothesis is rejected with a positive sign, it demonstrates that investors view an increase in loan loss reserve as good news. Positive attitude might be resulted from (1) a belief in the “manager expectation hypothesis” (2) tax benefits (3) the strengthening bargaining power of the banks with the debtors.

When the hypothesis is rejected with a negative sign, it evidences that investors tend to have bad attitude toward an increase in loan loss reserve made by commercial banks. This might be due to (1) a decrease in net income in the current period (2) an effect on dividend payment (3) a sign of loan-quality deterioration (4) the trouble in an operation or credit approval policy (5) a decrease in capital adequacy ratio and (6) a decrease in a bank’s ability to finance new positive net present value (NPV) projects.

2. H_2 : There is no impact of unexpected loan loss reserve on bank future cash flow.

Earnings added back loan loss reserve, *pre-loan loss earnings*, would be exemplified as future cash flow of the bank. This is due to the fact that loan loss reserve is the most significant accrual affecting bank earnings.

If the empirical result **accepted** this hypothesis, it suggests that unexpected loan loss reserve does not relate to bank future cash flow. In other words, it was merely accounting adjustment and does not have impact on bank future cash flow.

If the empirical result **rejected** this hypothesis, it means that unexpected loan loss reserve has significant impact on bank cash flow in the future periods. Unexpected loan loss reserve; consequently, is able to be used as a predictor of bank future performance.

When the hypothesis is rejected with a positive sign, it indicates that unexpected loan loss reserve made today would lead to an increase in cash flow in the future. This might be resulted from (1) tax benefits (2) an ability to achieve the reserve requirement by central bank that allowed the banks to finance new projects sooner (3) an increase bargaining position of the banks with debtors.

When the hypothesis is rejected with a negative sign, it evidences that an increase in loan loss reserve depicts a sign of decreasing in cash flow in the future. Reasons for this inverse relationship were that (1) loan loss reserve was a sign of bad quality of loan portfolios and inefficient loan management (2) banks might not be able to expand their business, like financing new loans, since they did not have enough capital to handle an increase in risky assets.

Sample and Data

The sample includes half-year data of 10 Thai commercial banks during the period of 1997-1999. There are two groups of data in this study. First is the data for stock return examination and second is the data for future cash flow investigation.

There are total 15 commercial banks at the beginning of studying periods; however, 5 commercial banks that comprised of the Bangkok Bank of Commerce (BBC), the UOB Radhanasin Bank (UOBR), the Bangkok Metropolitan Bank (BMB), the Siam City Bank (SCIB), and the First Bangkok City Bank (FBCB) have insufficient data for the test.

To site an instance, the non-performing loan expectation model required an amount of non-performing loans in the past two periods (NPL_{it-2}) to calculate the change in non-performing loans in the earlier period (ΔNPL_{it-1}). Because non-performing loans data was disclosed for the first time in the 1997 semiannual report, the Bangkok Metropolitan Bank (BMB), the Siam City Bank (SCIB), and the UOB Radhanasin Bank (UOBR) whose stock has been prohibited from trading since the beginning of 1998 have to be excluded from the samples. In addition, the Bangkok Bank of Commerce (BBC) and the First Bangkok City Bank (FBCB) have inadequate accounting data since they have been transferred to merge with the Krung Thai Bank (KTB), according to the Bank of Thailand announcement on 14 August 1998.

Consequently, merely the remained 10 commercial banks would be applied in this study, which are:

Bangkok Bank Public Company Limited (BBL)
Thai Farmers Bank Public Company Limited (TFB)
Krung Thai Bank Public Company Limited (KTB)
The Thai Military Bank Public Company Limited (TMB)
DBS Thai Danu Bank Public Company Limited (DTDB)
The Siam Commercial Bank Public Company Limited (SCB)
The Bank of Asia Public Company Limited (BOA)
Bank of Ayudhya Public Company Limited (BAY)
Standard Chartered Nakornthon Bank Public Co., Ltd. (SCNB)
Bank Thai Bank Public Company Limited (BT)

Stock return refers to the change in market value of common stock, after adjusting for dividend payments. *Market value of common stock* is determined by multiplying stock price with the number of outstanding shares. **Stock price** can be brought out from Reuters's database while the number of **outstanding shares** can be obtained from the semi-annual and annual financial statements. *Dividend payment* records can be observed from the I-SIMS CD, which is an electronics database licensed under the Stock Exchange of Thailand.

Cash flow can be replicated by pre-loan loss earnings (PreLLE), which is equal to net income added back loan loss reserve for that period. This is because there are some limitations about an information on bank cash flow. Pre-loan loss earnings could be reasonably symbolized bank cash flow since loan loss reserve is the most significant accrual affecting bank earnings.

Pre-loan loss earnings is equal to net income added back loan loss reserve. Either **net income** or **loan loss reserve** can be observed from the income statements. Semi-annual and annual income statements are available at the Stock Exchange of Thailand library and I-SIMS CD.

Quarterly data on pre-loan loss earnings is demanded in this study since it would depict as future cash flow. Pre-loan loss earnings of the third quarter would denote future cash flow of the second quarter, while pre-loan loss

earnings of the first quarter would denote future cash flow of the forth quarter of the preceding year. Net income and loan loss reserve, under the quarterly basis, can be detected in I-SIMS CD.

Supplemental accounting data includes an amount of (1) outstanding loans, (2) loan loss allowance, (3) loan charge off (net of recoveries), (4) book value of common equity (5) non-performing loans.

An amount of **outstanding loans** is the total amount of loans before adjusting with accrued interest and loan loss allowance. Outstanding loans are presented in the balance sheet and the notes attached to semi-annual and annual financial statements.

Loan loss allowance is the loan' s contra asset, which would reduce the net book value of loan balance. An amount of loan loss allowance is granted in the balance sheet of the financial statements.

Loan charge off is the elimination of recorded book value of loan balance by reducing the loans account and the loan loss allowance by the same amount that is equal to the principal lost, net of any expected recoveries. Both **loan charge off** and **recoveries** could be found in the notes attached to semi-annual and annual financial statements.

Book value of common equity is an essential data to calculate a change in common equity. It is disclosed in the balance sheet under the term "issued and paid-up share capital".

Non-performing loans denote loans where the borrower has failed to pay on time or in the full amount but might be considered not to have defaulted but merely not to have performed – i.e. not met the legal terms of a contract. The figure is evidenced as supplement data in the notes attached to financial statements.

Semi-annual and annual reports that are used in this study are the *bank-only* financial statements.

Other necessity data involves industrial return and associated regulations. *Industrial return* is the change on the Banking Index (BI), which is available on Reuters' database. *Associated regulations* namely accounting principles, loan loss standards, financial report guidelines, tax regulations, capital requirements and dividend payment criteria, non-performing loans determination, etc., could be obtained from the Bank of Thailand, the Bank for International Settlement, the Institute of Certified Accountants and Auditors of Thailand, and other press releases.

Descriptive statistics for accounting and financial data of the 10 Thai commercial banks over 1997-1999 are presented in table 3-1. The figures are estimated based on semi-annual and annual reports of BBL, TFB, SCB, BAY, KTB, TMB, BOA, DTDB, SCNB, and BT. The table is categorized into separated sections, which are (1) loan loss ratio (2) key items of income statement (3) loan portfolio and shareholders' equity (4) banking index and market value of equity and (5) amount of loan charge off.²

Non-performing loans as proportion of loans increased sharply from 1997 to 1998 and dropped slightly in 1999. Banks have set aside loan loss reserve and loan loss allowance in order to handle the situation. Massive amount of loan loss reserve and loan loss allowance in 1999 indicates that both of them were made after non-performing loans arise, not a foresight of bank management. Previously, an amount of loan loss reserve was much higher than loan charge off. However, loan loss reserve to loan charge off ratio has dropped dramatically in 1999 due to the immense amount of loan charge off.

Most banks have faced negative net income since the second half of 1997. This is an effect from lower gross margin, an increase in non-interest expense, and loan loss reserve expense. Interest rate spread was quite squeezed during 1998-1999 due to the excess liquidity in the financial market. Sudden increase in non-performing loans, resulted from tougher regulations and economics downturn, also decrease interest income of Thai commercial banks. Non-interest expense has been

² See Appendix 1-5, pp.72-79, for semi-annual data of each individual bank.

partially arisen from early retirement package, collection cost, and loss from debt restructuring.

There was a significant slow down in bank lending. Outstanding loans of 10 banks before adjusting with accrued interest and loan loss allowance were nearly stable during 1997-1998, then decreased by 0.5 percent in 1999. Total shareholder's equity for most banks should be dropped in 1998-1999 due to negative net income. However, many banks have raised their capital in 1998, which allowed total shareholder's equity to be increased by 4.5% as compared to 1997. If excluded preferred shares and premium on preferred shares, shareholder's equity would drop sharply in 1999 since both of them are significant amount in the balance sheet especially for KTB and SCB.

Banking index was dropped from 297.4 in 1997 to 262.3 in 1998 and was slightly recovered to 309.9 in 1999. However, if compared to 517.0 at the end of June 1997, banking sector was still in the recession period.

Market value of equity was excluded BT and SCNB because their stocks have been prohibited from trading since the second half of 1998 and the first half of 1999 respectively. At the end of 1997, market value of equity was decreased dramatically so that the value was somewhat smaller than shareholder's equity excluded preferred shares. In 1998, an increase in stock price has brought market value of equity to be higher than the reported book value.

Loan charge off was continually increased during 1997-1999. It was partially encouraged from the benefits of charge off on BIS ratio calculation since loan charge off reduced the risky assets of commercial banks. Banks that able to make loan charge off must first have capacity to set 100 percent loan loss reserve. Therefore, banks that made significant loan charge off were large commercial banks that have already finished raising their capital such as TFB and BAY.

Table 3-1

Descriptive Statistics for the Semi-annual data of 10 Thai Banks Over 1997-1999

Table 3-1 represents the interesting statistics, which related to banks' loan portfolio and loan loss accounting practice, during 1997-1999. The figures are estimated from the semiannual company-only reports of 10 Thai banks that comprised of BBL, TFB, SCB, BAY, KTB, TMB, BOA, DTDB, SCNB, and BT.

<i>Ratio</i>	<i>1997</i>	<i>1998</i>	<i>Δ% (YoY)</i>	<i>1999</i>	<i>Δ% (YoY)</i>
NPL/Loans	0.16	0.39	139.8	0.38	(4.0)
LLR/NPL	0.14	0.13	(11.9)	0.20	56.7
LLA/NPL	0.26	0.26	(0.3)	0.41	61.2
LLR/Loans	0.02	0.05	111.2	0.07	50.5
LLR/LCO	19.48	32.49	66.8	4.65	(85.7)
LLR/Net income	9.45	(0.90)	(109.5)	(0.89)	(0.9)
<i>Income Statement (millions)</i>	<i>1997</i>	<i>1998</i>	<i>Δ% (YoY)</i>	<i>1999</i>	<i>Δ% (YoY)</i>
Gross income	161,009	56,404	(65.0)	39,047	(30.8)
Non-interest income	56,895	60,039	5.5	55,209	(8.0)
Non-interest expense	106,545	140,769	32.1	125,868	(10.6)
Income tax expense (benefit)	8,368	(2,493)	(129.8)	4,081	(263.7)
Pre-loan loss earnings	102,990	(21,832)	(121.2)	(35,692)	63.5
Loan loss reserve	93,130	196,436	110.9	294,049	49.7
Net income	9,860	(218,268)	(2,313.6)	(329,742)	51.1
<i>Balance Sheet (millions)</i>	<i>1997</i>	<i>1998</i>	<i>Δ% (YoY)</i>	<i>1999</i>	<i>Δ% (YoY)</i>
Outstanding Loans	4,016,547	4,011,775	(0.1)	3,990,903	(0.5)
Loan loss allowance	168,692	402,967	138.9	620,392	54.0
Non-performing loans	655,680	1,570,347	139.5	1,499,926	(4.5)
Total shareholder's equity	356,783	372,675	4.5	319,605	(14.2)
Shareholder's equity-ex.preferred	356,728	372,620	4.5	109,116	(70.7)
Shareholder's equity-ex.preferred*	349,539	372,270	6.5	123,047	(66.9)
<i>Stock market</i>	<i>1997</i>	<i>1998</i>	<i>Δ% (YoY)</i>	<i>1999</i>	<i>Δ% (YoY)</i>
Banking Index	297.4	262.3	(11.8)	309.9	18.1
Market Value of Equity*	179,710	419,339	133.3	573,511	36.8
<i>Loan charge off (millions)</i>	<i>1997</i>	<i>1998</i>	<i>Δ% (YoY)</i>	<i>1999</i>	<i>Δ% (YoY)</i>
Loan charge off	4,781	6,046	26.5	63,176	945.0
Bad debt recovered	392	284	(27.5)	456	60.3
Net Loan charge off	4,389	5,761	31.3	62,720	988.6

* = excluded SCNB, and BT

Methodology³

There are two objectives on this study, which comprised of (1) to test an impact of unexpected loan loss reserve on bank stock price and (2) to test an impact of unexpected loan loss reserve on bank future cash flow. Methodologies for the empirical tests of each objective would be described next.

1. Methodology for stock reaction

This section would study an impact of unexpected loan loss reserve on bank stock price. Therefore, stock return would be substituted as “dependent variable”; in contrast, unexpected loan loss reserve and other explanation factors would be denominated as “independent variables”.

The reason to substitute unexpected loan loss reserve as independent variable instead of using the total amount or the expected amount is because current stock price should reflect all available information including any expected information. Therefore, changes in stock prices are correlated only with unexpected, not anticipated information.⁴

1.1 Loan loss expectations Models

First, this paper has to generate expectation models for each type of loan loss disclosure in order to get anticipated change in non-performing loan, anticipated loan loss reserve and anticipated loan charge off. These expectation models are based on the composition of each bank’s loan portfolio and loan loss accounting proxies, using the relations between outstanding loans, change in non-performing loans,

³ Wahlen M. James, “The nature of information in commercial bank loan loss disclosures,” The Accounting Review 69 (1994): 455-478.

⁴ Rose, P.S., “The Rational Expectations Theory,” Money and Capital Markets: Financial Institutions and Instruments in a Global Marketplace (1997), pp.211-213.

loan loss reserve, and loan charge off. The residuals from each model then serve as proxies for unexpected components in each loan loss disclosure.

Expectations model are estimated over the pooled time-series cross-sectional samples in the following regressions:

$$(a) \Delta NPL_{it} = a_0 + a_1 \text{Loans}_{it-1} + a_2 \Delta NPL_{it-1} + a_3 \text{Dummy} + U \Delta NPL_{it}$$

$$(b) LLR_{it} = b_0 + b_1 \text{Loans}_{it-1} + b_2 E \Delta NPL_{it} + b_3 NPL_{it-1} + b_4 LLA_{it-1} + ULLR_{it}$$

$$(c) LCO_{it} = c_0 + c_1 \text{Loans}_{it-1} + c_2 E \Delta NPL_{it} + c_3 NPL_{it-1} + c_4 LLA_{it-1} + ULCO_{it}$$

Where:

ΔNPL_{it} is the change in non-performing loans of bank i during period t $[(NPL_{it} - NPL_{it-1}) / NPL_{it-1}]$. Changes in non-performing loans, which are bank-specific leading indicators of potential future loan losses, are likely to be serially correlated. If so, investors are likely to use past changes in non-performing loans to predict future changes in non-performing loans. Equation (a); therefore, includes ΔNPL_{it-1} to control for this possibility.

LLR_{it} and LCO_{it} are loan loss reserve and loan charge off (net of recoveries) of bank i for period t .

Loans_{it-1} is the beginning loan balance of bank i for period t , prior adjusting with the amount of accrued interest and loan loss allowance. Previous study by James M. Wahlen suggested that different types of loans involve different default risks. Investors are likely to form expectations of loan losses on the basis of each bank's loan portfolio composition. As a result, it separated beginning loan balances into six categories, which are commercial, consumer, real estate, foreign, loans to financial institutions and others, in order to capture variation in expected loan losses across loans with different default risk. This study, however, would adopt total amount of loans, not the different loan-categories, as a variable. First reason is the limitation of sample size (n). Since an increase in explanation variable (k) would decrease degree of freedom of

the regressions (n-k), the number of Thai commercial banks was not enough to provide the efficient testing results. Another reason is that the composition of Thai commercial banks is not significantly different or fluctuated dramatically, so investors pay relatively small attentions on this factor when they anticipate the amount of loan loss disclosures.

Dummy is the dummy variable, which is used to adjust the side effect from the change in non-performing loan definitions. Dummy is equal to 1 if a bank has to re-estimate its amount of non-performing loans due to the change in non-performing loan definitions, demanded from the Bank of Thailand. In contrast, it is equal to 0 if such event does not occur that period. There have been major events about non-performing loan definitions and non-performing loan disclosure practices as follows:

December 25, 1996 - the Ministry of Commerce has ordered every commercial bank to disclose an amount of non-performing loans in its notes to financial statements, effective since 1997 accounting period.

January 23, 1997 - the Bank of Thailand has sent a notice to commercial banks to report their amount of non-performing loans as a summation of (1) loans that have no- or insufficient collateral, with more than six months overdue and (2) loans that have sufficient collateral, with more than twelve months overdue. This notice is based on the Bank of Thailand notification on March 6, 1995 about the accrued interest recognition.

December 15, 1997 - the Bank of Thailand has sent a notice to inform every commercial bank about the changes in non-performing loan definitions. Since January 1, 1998, the amount of non-performing loans that disclosed in the notes to financial statements is all loans that have been overdue for more than six months, whether the collateral is enough or not.

April 16, 1999 - the Bank of Thailand has ordered every commercial bank to report an amount of non-performing loans by using the three months overdue criteria, effective January 1, 1999.

Accounting practice suggests that non-performing loans precede or coincide with loan loss reserve and charge off. Consequently, an amount of beginning

non-performing loans, NPL_{it-1} , is included in equation (b) and (c) as a measure of prior non-performing loans. The expected change in non-performing loans, $E\Delta NPL_{it}$, which is the predicted value from equation (a), is also included in equation (b) and (c) as a proxy for investor expectations of current change in non-performing loans.

LLA_{it-1} is the beginning balance in the loan loss allowance account. Investors are also likely to use past loan loss reserve in forming expectations of future loan loss reserve and future loan charge off. Accounting practice suggests prior reserve should be negatively related to future reserve but positively related to future charge off. Thus, the beginning balance in the loan loss allowances is included in equation (b) and (c) as a measure of prior reserve.

$U\Delta NPL_{it}$, $ULLR_{it}$, $ULCO_{it}$ are unexpected amount of change in non-performing loans, unexpected amount of loan loss reserve, unexpected amount of loan charge off. They are residuals, which are mean-zero random variables.

All variables are scaled by the beginning market value of equity of bank i , period t (MV_{it-1}) to mitigate potential estimation problems from heteroskedasticity.

1.2 Stock return and loan loss reserve model

This section is extended the valuation model to address the relations between bank stock returns and changes in non-performing loans, loan loss reserve, and loan charge off. The models could be derived step by step as follows:

The market value of equity is assumed to be equal to the book value of equity added the difference between the market value and book value of outstanding loans added the difference between the market values and book values of all other assets.

$$(d) MV_{it} = BV_{it} + (MVL_{it} - BVL_{it}) + (MVONA_{it} - BVONA_{it})$$

Where

MV_{it} denotes market value of common equity of bank i at time t ;

BV_{it} denotes the book value of common equity;

$MVL_{it} - BVL_{it}$ denotes the difference between the market value and book value of outstanding loans;

$MVONA_{it} - BVONA_{it}$ denotes the difference between the market and book values of all other assets, net of all liabilities and preferred stock.

Assume that the difference between market and book value of loans outstanding ($MVL_{it} - BVL_{it}$) is linearly related to non-performing loans and loan loss allowance account. The difference between market and book values of all other assets ($MVONA_{it} - BVONA_{it}$) can be estimated as a linear function of the book value of common equity.⁵

$$(e) \quad MVL_{it} - BVL_{it} = a_1 NPL_{it} + a_2 LLA_{it} + u_{1it}$$

$$(f) \quad MVONA_{it} - BVONA_{it} = \mu BV_{it} + u_{2it}$$

Where u_{1it} , and u_{2it} are mean-zero error terms. Substituting into equation (d) yields:

$$(g) \quad MV_{it} = (1 + \mu)BV_{it} + a_1 NPL_{it} + a_2 LLA_{it} + u_{1it} + u_{2it}$$

The valuation implications of changes in non-performing loans, loan loss reserve and loan charge off can be addressed by extending equation (g) to a model of changes in bank market values. If the coefficients in equation (g) are constant over time, then differencing equation (g) yields:

$$(h) \quad \Delta MV_{it} = (1 + \mu)\Delta BV_{it} + a_1 \Delta NPL_{it} + a_2 \Delta LLA_{it} + \Delta u_{1it} + \Delta u_{2it}$$

The change in the book value of equity can be written as the net change in common stock outstanding less dividends plus earnings; that is

⁵ Beaver, W., Eger, C., Ryan, S., and Wolfson, M., "Financial reporting, supplemental disclosures, and bank share prices," *Journal of Accounting Research* 27 (autumn 1989): 157-178.

$$(i) \Delta BV_{it} = \Delta CE_{it} - Div_{it} + E_{it}$$

The change in the loan loss allowance is equal to the loan loss reserve less the loan charge off:

$$(j) \Delta LLA_{it} = LLR_{it} - LCO_{it}$$

The dependent variable can be converted to returns by adding Div_{it} to both sides and then scaling all variables by MV_{it-1} . Incorporating these changes into equation (j) and relaxing the constraints on the coefficient yields:

$$(k) \quad R_{it} = (1 - c_0) \frac{Div_{it}}{MV_{it-1}} + c_1 \frac{\Delta CE_{it}}{MV_{it-1}} + c_2 \frac{E_{it}}{MV_{it-1}} + c_3 \frac{\Delta NPL_{it}}{MV_{it-1}} + c_4 \frac{LLR_{it}}{MV_{it-1}} + c_5 \frac{LCO_{it}}{MV_{it-1}} + \frac{u_{3it}}{MV_{it-1}}$$

Common components of residual returns in equation (k) may be related to the contemporaneous return on banking index (R_{bt}). To control for industrial-wide movements in returns, the residual returns for bank i from equation (k) are written as:

$$(l) \quad \frac{u_{3it}}{MV_{it-1}} = a_i + b_i R_{bt} + u_{4it}$$

To estimate an association between returns and reserve, it is necessary to separate loan loss reserve from other components of earnings. Earnings are equal to pre-loan loss earnings minus loan loss reserve:

$$(m) E_{it} = PreLLE_{it} - LLR_{it}$$

Rewriting equation (k) provides:

(n)

$$R_{it} = a_i + b_i R_{bt} + d_0 \frac{\text{Div}_{it}}{MV_{it-1}} + d_1 \frac{\Delta CE_{it}}{MV_{it-1}} + d_2 \frac{\text{PreLLE}_{it}}{MV_{it-1}} \\ + d_3 \frac{\Delta NPL_{it}}{MV_{it-1}} + (d_4 - d_2) \frac{LLR_{it}}{MV_{it-1}} + d_5 \frac{LCO_{it}}{MV_{it-1}} + u_{4it}$$

A more direct estimate of the returns associated with any additional information in loan loss reserve for future cash flow can be obtained by substituting (E_{it} / MV_{it-1}) for $(\text{PreLLE}_{it} / MV_{it-1})$. This substitution constrains the estimated coefficient on all components of current earnings, including loan loss reserve expense, to equal $-d_2$. The parameter d_4 ; therefore, captures the return associated with any additional information in loan loss reserve about bank's future. This substitution yields:

(o)

$$R_{it} = a_i + b_i R_{bt} + d_0 \frac{\text{Div}_{it}}{MV_{it-1}} + d_1 \frac{\Delta CE_{it}}{MV_{it-1}} + d_2 \frac{E_{it}}{MV_{it-1}} \\ + d_3 \frac{\Delta NPL_{it}}{MV_{it-1}} + d_4 \frac{LLR_{it}}{MV_{it-1}} + d_5 \frac{LCO_{it}}{MV_{it-1}} + u_{5it}$$

Equation (n) and (o) have to be modified in order to test an impact of loan loss reserve on stock return, in the case of unexpected changes in non-performing loans, unexpected loan loss reserve, and unexpected loan charge off. Substituting unexpected loan loss variables, already re-scaled by MV_{it-1} , into equation (n) yields:

(p)

$$R_{it} = \alpha_i + \beta_i R_{mt} + \lambda_0 \frac{\text{Div}_{it}}{MV_{it-1}} + \lambda_1 \frac{\Delta CE_{it}}{MV_{it-1}} + \lambda_2 \frac{\text{PreLLE}_{it}}{MV_{it-1}} \\ + \lambda_3 U\Delta NPL_{it} + (\lambda_4 - \lambda_2) ULLR_{it} + \lambda_5 ULCO_{it} + u_{6it}$$

The coefficient on $ULLR_{it}$ is an estimate of $(\lambda_4 - \lambda_2)$. The parameter $-\lambda_2$ captures the return associated with the effect of unexpected loan loss reserve on current

earnings, holding constant the return associated with any additional information in unexpected reserve for bank's future. The parameter λ_4 captures the return associated with unexpected loan loss reserve, given additional information about bank's future, holding constant the return associated with an impact on current earnings. If unexpected reserve contains no additional information about bank's future, then $(\lambda_4 - \lambda_2)$ equal $-\lambda_2$. If unexpected loan loss reserve is interpreted as a current period expense as well as additional information positively related to bank's future, then $(\lambda_4 - \lambda_2)$ should be greater than $-\lambda_2$.

By substituting unexpected changes in non-performing loans, unexpected loan loss reserve, unexpected loan charge off as independent variables in equation (o) provides:

(q)

$$R_{it} = \alpha_i + \beta_i R_{bt} + \lambda_0 \frac{Div_{it}}{MV_{it-1}} + \lambda_1 \frac{\Delta CE_{it}}{MV_{it-1}} + \lambda_2 \frac{E_{it}}{MV_{it-1}} + \lambda_3 U\Delta NPL_{it} + \lambda_4 ULLR_{it} + \lambda_5 ULCO_{it} + u_{7it}$$

This substitution also constrains the estimated coefficient on all components of current earnings, including $ULLR_{it}$ as an unexpected expense, to equal $-\lambda_2$. The parameter λ_4 ; therefore, captures the return associated with any additional information in unexpected loan loss reserve about bank's future.

In conclusion, equation (p) and (q) are operated as the testing models for an impact of unexpected loan loss reserve on stock return.

2. Methodology for cash flow predictions

The information in unexpected loan loss reserve for future cash flow is examined by analyzing the relation between unexpected loan loss reserve and a pooled time-series of future changes in pre-loan loss earnings. Pre-loan loss earnings can approximate bank cash flow because the loan loss reserve is the most significant

accrual affecting bank earnings. The relation between future changes in pre-loan loss earnings, unexpected loan loss reserve, and other independent variables is as follows:

$$(r) \Delta\text{PreLLE}_{it+j} = \phi_0 + \phi_1\Delta\text{PreLLE}_{it} + \phi_2\text{U}\Delta\text{NPL}_{it} + \phi_3\text{ULLR}_{it} + \phi_4\text{ULCO}_{it} + e_{it}$$

Where

$\Delta\text{PreLLE}_{it+j}$ denotes the changes in pre-loan loss earnings, for bank i period $t + j$ ($\text{PreLLE}_{it+j} - \text{PreLLE}_{it}$), divided by beginning market value of period t (MV_{it-1});

$\text{U}\Delta\text{NPL}_{it}$, ULLR_{it} , and ULCO_{it} denote the unexpected amount of non-performing loans, unexpected loan loss reserve, and unexpected loan charge off, for bank i period t ; already scaled by MV_{it-1} ;

e_{it} denotes a mean zero random variable.

To test whether unexpected loan loss reserve are related to permanent or transitory changes in cash flow, equation (r) is re-estimated using changes in pre-loan loss earnings more periods ahead ($j=2,3,\dots$). Previous study suggested that unexpected loan loss reserve are related to extremely persistent changes in future cash flow at a diminishing rate over three years.⁶ Unfortunately, there was inadequate data to arrange the empirical tests for such periods. So this study would examine the relation between loan loss reserve and changes in cash flow for the next one and two quarters only.

⁶ Wahlen M. James, "The nature of information in commercial bank loan loss disclosures," The Accounting Review 69 (1994): 455-478.

CHAPTER 4

Empirical Results

This chapter would be presented exclusively in three sections. First section is an empirical result about an impact of unexpected loan loss reserve on commercial bank stock price. Second is an empirical result about an impact of unexpected loan loss reserve on commercial bank future cash flow. Finally is the summary.

An impact of unexpected loan loss reserve on bank stock price

Expectation models for each loan loss disclosure are constructed in order to substitute the residuals from such models as unexpected proxies. There are three expectation models in this study, which are (1) expected change in non-performing loans model (2) loan loss reserve model and (3) loan charge off model.

$$(a) \Delta NPL_{it} = a_0 + a_1 \text{Loans}_{it-1} + a_2 \Delta NPL_{it-1} + a_3 \text{Dummy} + U \Delta NPL_{it}$$

$$(b) LLR_{it} = b_0 + b_1 \text{Loans}_{it-1} + b_2 E \Delta NPL_{it} + b_3 NPL_{it-1} + b_4 LLA_{it-1} + ULLR_{it}$$

$$(c) LCO_{it} = c_0 + c_1 \text{Loans}_{it-1} + c_2 E \Delta NPL_{it} + c_3 NPL_{it-1} + c_4 LLA_{it-1} + ULCO_{it}$$

Coefficient estimates of expectation models are presented in table 4-1.

Change in non-performing loans (ΔNPL_{it}) is statistically significant and positively related to the change in non-performing loans in the previous period (ΔNPL_{it-1}). Dummy variable (Dummy), which is the representative of the change in non-performing loan definition, is not significantly related to the change in non-performing loans. However, its estimated coefficient states the positive sign, which means the regulation adjustments resulted in an increase in the change in non-performing loans.

Table4-1

Expectation Models for Semi-annual Loan Loss Disclosures

Estimates of the relations between loans outstanding, change in non-performing loans, loan loss reserve and loan charge off for a pooled cross-sectional sample of 10 banks with semi-annual data over 1997-1999.

<i>Variables</i>	<i>Intercept</i>	<i>Loans_{it-1}</i>	<i>ΔNPL_{it-1}</i>	<i>Dummy</i>	<i>EΔNPL_{it}</i>	<i>NPL_{it-1}</i>	<i>LLA_{it-1}</i>
<u>Change in NPLs:</u>							
Coefficient Estimates:	0.0028	-0.0002	9.3870	31.6661	-	-	-
(t-statistics)	(2.58) ^a	(-4.25) ^b	(4.66) ^b	(1.69)			
N=36 R ² =.991							
<u>Loan Loss Reserve:</u>							
Coefficient Estimates:	-1.0334	0.0703	-	-	389.0284	0.3101	-1.4330
(t-statistics)	(-3.26) ^b	(9.54) ^b			(4.65) ^b	(2.85) ^b	(-7.95) ^b
N=36 R ² =.999							
<u>Loan Charge Off:</u>							
Coefficient Estimates:	-0.0962	-0.0064	-	-	-10.6857	0.1101	-0.1836
(t-statistics)	(-.73)	(-2.09) ^a			(-0.31)	(2.44) ^a	(-2.46) ^a
N=36 R ² =.241							

^a = significant at < .05 ; ^b = significant at < .01 ; two tailed test

The loan loss reserve and loan charge off expectation models also confirmed the loan loss accounting practice, which suggested that non-performing loans should be coincide with loan loss reserve and loan charge off.

Beginning total amount of non-performing loans (NPL_{it-1}) is significantly and positively related to current loan loss reserve and current loan charge off. The expected change in non-performing loans (EΔNPL_{it}), however, is positively related to loan loss reserve but contains no relationship with loan charge off. The coefficients on the loan loss allowance (LLA_{it-1}) indicate that larger loan loss reserve in the prior periods would lead to smaller loan loss reserve and smaller loan charge off in the current period. Moreover, the figures demonstrate that beginning amount of loan balance (Loans_{it-1}) is

statistically related to the change in non-performing loans, loan loss reserve, and also loan charge off.

Since R-square (R^2) is measure of the goodness of fit and a high R-square is desirable, the acquired high R-square, especially that of the change in non-performing loan and loan loss reserve expectation models, indicates that these models are effective and capable.

The residuals from equation (a), (b), and (c) are served as unexpected change in non-performing loans, unexpected loan loss reserve, and unexpected charge off accordingly. They are substituted as unexpected proxies in the following equations.

$$(p) R_{it} = \alpha_1 + \beta_1 R_{bit} + \lambda_0 (Div_{it}/MV_{it-1}) + \lambda_1 (\Delta CE_{it}/MV_{it-1}) + \lambda_2 (PreLLE_{it}/MV_{it-1}) + U\Delta NPL_{it} + (\lambda_4 - \lambda_2) ULLR_{it} + \lambda_5 ULCO_{it} + u_{6it}$$

$$(q) R_{it} = \alpha_1 + \beta_1 R_{bit} + \lambda_0 (Div_{it}/MV_{it-1}) + \lambda_1 (\Delta CE_{it}/MV_{it-1}) + \lambda_2 (E_{it}/MV_{it-1}) + \lambda_3 U\Delta NPL_{it} + \lambda_4 ULLR_{it} + \lambda_5 ULCO_{it} + u_{7it}$$

The empirical results are presented in table 4-2. The low t-statistic values of all independent variables, except that of return on banking index, indicate that these variables can not be used to explain bank stock return.

Return on banking index, replicated as industrial return, is statistically and positively related to bank stock price at the 99 percent confident interval. Estimated coefficients on industrial return for equation (p) and equation (q) are equal to 2.1807 and 2.4458 accordingly.

Adjusted R-square for stock return models are merely 21.3 percent and 25.4 percent respectively, which indicates that unexpected loan loss variables should not be the efficient factors to anticipate bank stock return in the case of Thai market.

Noticed that there exists no data on dividend payment (Div_{it}) since none of the Thai banks announced its dividend payment during the study period. This is resulted from the negative earnings, and the Bank of Thailand notification on 30 June

1998, which prohibited financial institutions to make dividend payments or pay-outs that originate from the firm's profits to its shareholders if it has not written off losses or made the total loan loss reserve required following the regulations of the Bank of Thailand.

Table4-2

An impact of unexpected loan loss reserve on stock return

Regression analyses of semi-annual bank stock return associated with semi-annual unexpected loan loss reserve. The models are estimated using OLS on a pooled sample of 10 banks over 1997-1999.

Panel A : Regression analysis of semi-annual returns (R_{it}) associated with semi-annual unexpected loan loss reserve ($ULLR_{it}$), return on banking index (R_{bt}), changes in common equity (ΔCE_{it}), unexpected change in non-performing loans ($U\Delta NPL_{it}$), unexpected loan charge off ($ULCO_{it}$), and pre-loan loss earnings ($PreLLE_{it}$).

Panel B : Regression analysis of semi-annual returns (R_{it}) associated with semi-annual unexpected loan loss reserve ($ULLR_{it}$), return on banking index (R_{bt}), changes in common equity (ΔCE_{it}), unexpected change in non-performing loans ($U\Delta NPL_{it}$), unexpected loan charge off ($ULCO_{it}$), and earnings (E_{it}).

Variables	-	R_{bt}	Div_{it}	ΔCE_{it}	$PreLLE_{it}, E_{it}$	$U\Delta NPL_{it}$	$ULLR_{it}$	$ULCO_{it}$
Panel A :Equation(p)	α_i	β_1	λ_0	λ_1	λ_2	λ_3	$\lambda_4 - \lambda_2$	λ_5
Coefficient Estimates	0.6829	2.1807	-	-0.0033	-0.0024	145.0753	0.8112	-1.7862
(t-statistics)	(1.61)	(2.83) ^b		(-0.12)	(-0.12)	(0.92)	(1.86)	(-1.67)
N=36								
Adjusted R ² =.2130								
Panel B :Equation(q)	α_i	β_1	λ_0	λ_1	λ_2	λ_3	λ_4	λ_5
Coefficient Estimates	0.6898	2.4458	-	0.1186	0.0237	-12.3659	0.7962	-1.602
(t-statistics)	(1.68)	(3.31) ^b		(1.19)	(1.27)	(-0.08)	(1.88)	(-1.53)
N=36								
Adjusted R ² =.02540								

^a = significant at < .05 ; ^b = significant at < .01 ; two tailed test

An impact of unexpected loan loss reserve on bank future cash flow

Unexpected loan loss reserve and other unexpected loan loss variables are adopted as proxies in the following cash flow prediction model.

$$(s) \Delta \text{PreLLE}_{it+j} = \phi_0 + \phi_1 \Delta \text{PreLLE}_{it} + \phi_2 U \Delta \text{NPL}_{it} + \phi_3 \text{ULLR}_{it} + \phi_4 \text{ULCO}_{it} + e_{it}$$

Table 4-3

An impact of unexpected loan loss reserve on bank future cash flow

This table presents regression analyses of the relations between semi-annual unexpected loan loss reserve and future changes in pre-loan loss earnings (as proxies for future changes in cash flow) up to two quarters ahead ($j=1-2q$). The models are estimated with semi-annual and quarterly data for a pooled sample of 10 banks over 1997-1999.

Variables	—	$\Delta \text{PreLLE}_{it}$	$U \Delta \text{NPL}_{it}$	ULLR_{it}	ULCO_{it}
Coefficients:	ϕ_0	ϕ_1	ϕ_2	ϕ_3	ϕ_4
Panel A : One quarter Ahead ($j=1q$)					
Coefficient Estimates:	-9.3563	-0.8782	1928.8040	-0.0254	-0.6541
(t-statistics)	(-0.77)	(-5.62) ^b	(0.63)	(-0.01)	(-0.03)
N= 33					
R ² = .6096					
Adj R ² = .5539					
Panel B: Two quarter Ahead ($j=2q$)					
Coefficient Estimates:	-18.4107	-0.2174	4695.734	0.0073	-1.3307
(t-statistics)	(-0.72)	(-0.67)	(0.73)	(0.00)	(-0.02)
N= 33					
R ² = .0214					
Adj R ² = -.1184					

^a = significant at < .05 ; ^b = significant at < .01 ; two tailed test

All variables are scaled by MV_{it-1} in order to mitigate potential estimation problems from heteroskedasticity

Table 4-3 demonstrates an impact of unexpected change in non-performing loans, unexpected loan loss reserve, and unexpected loan charge off, on the changes in cash flow one-and two quarter ahead.

Panel A indicates that unexpected loan loss reserve ($ULLR_{it}$) holds no statistically significant relationships with the changes in bank cash flow one quarter ahead, or the next three months ($\Delta PreLLE_{it+1q}$). R-square and adjusted R-square for this model is equal to 60.96 percent and 55.39 percent accordingly. Moreover, the t-statistics for unexpected change in non-performing loans ($U\Delta NPL_{it}$) and unexpected loan charge off ($ULCO_{it}$) demonstrate no relationships with bank future cash flow. Therefore, it is worthless to substitute unexpected loan loss reserve, unexpected non-performing loans, and unexpected loan charge off in the cash flow prediction model. **The only relevant factor is the change in cash flow of this period ($\Delta PreLLE_{it}$).** The negative relationship suggests that current drop in cash flow would result in an increase in cash flow in the next three months.

Panel B evidences an impact of unexpected loan loss reserve to the changes in bank cash flow two quarters ahead, or the next six months ($\Delta PreLLE_{it+2q}$). **None of the independent variables holds significant relationship with the change in six-month future cash flow.** In addition, R-square and adjusted R-square are merely 2.14 percent and -11.84 percent accordingly. Therefore, the study could not interpret the results from this model effectively.

Summary

The empirical results show that unexpected loan loss reserve could not be utilized as explanation variable for both stock return and cash flow prediction models since its estimated coefficients are not statistically significant different from zero. Moreover, the regression models that substitute unexpected loan loss reserve as independent variables provide quite low R-square and adjusted R-square, which imply

that the models are not efficient enough to explain an impact on bank stock return and future cash flow.¹

This problem might be risen from the violation of the “Rational Expectations Theory” in the Thai market. The vital rationale of this theory is that the price of securities should reflect all available information and investors use all of this information to establish a probability distribution of expected future price. In addition, the expectations concerning future security prices are formed rationally and efficiency. Therefore, the change in security price is correlated only with unanticipated, not anticipated information.²

According to this theory, investors must able to observe and forecast associated factors accurately in order to predict anticipated amount of loan loss reserve effectively. Such factors comprised of outstanding loan balances, non-performing loans in the previous periods, outstanding loan loss allowance, and expected changes in non-performing loans. It is very hard to forecast these factors in the Thai market due to the information ineffectiveness or in other words “ the asymmetric information.”

“**Asymmetric information**” refers to the situation where participators in the economic and financial systems have inequality information.³ Causes and samples of the asymmetric information in the Thai market are as follows:

First, most investors do not actually understand the loan loss practices, their natures and their relationships, especially an impact of loan loss reserve, non-performing loans, and loan charge off on the performance and the strength of commercial banks.

¹ A small value of R-square implies that a lot of the variation in the dependent variable (Y) has not been explained by the independent variables (Xs). (Ramanathan R. 1998 :103)

² Rose, P.S., “The Rational Expectations Theory,” Money and Capital Markets: Financial Institutions and Instruments in a Global Marketplace, pp.211-213.

³ Mishkin, Frederic S. “Asymmetric Information: Adverse Selection and Moral Hazard,” The Economics of Money, Banking, and Financial Markets (1998), p.35.

Second, there are frequent changes in related regulations, which resulted in the changing amount of loan loss reserve, non-performing loans, and loan charge off, over times.

Third, there is a difficulty on document collection for Thai commercial banks. Data such as non-performing loans, collateral value, or classified loans is quite hard and need times for gathering. This problem often led to a downside biased when banks have to report such figures to the public.

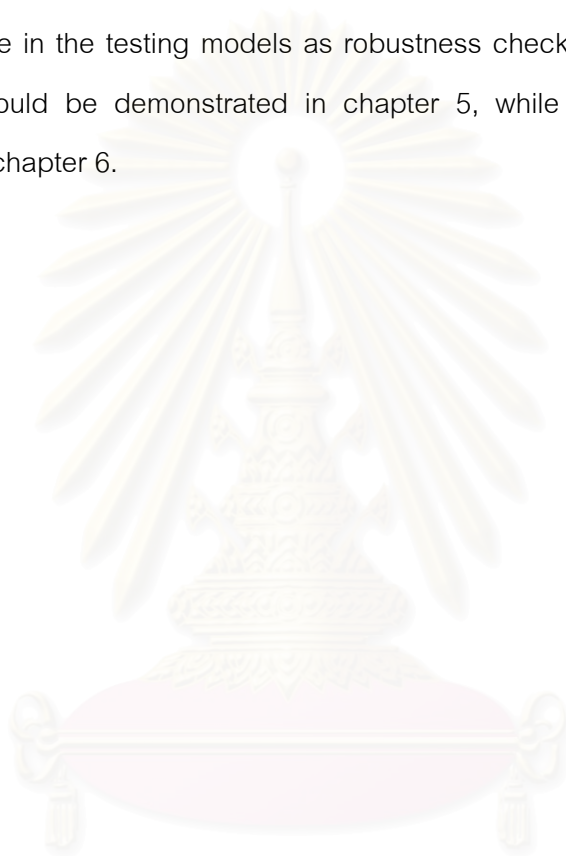
Forth, investors are often confused with the disagreement figures made by bank managers, auditors, the central bank, credit rating agencies, or maybe consulting firms. This could be noticed significantly during August-September, 1998 after the Krung Thai Bank merged together with the First Bangkok City Bank.⁴

Finally, there were many changes in major structure of financial institutions such as the merger and acquisition, the re-capitalization, the creating of

⁴ *PricewaterhouseCoopers*, a hired consulting firm, reported that 84 percent of the bank's business loans were non-performing while 66 percent of personal loans were not generating income. *The auditing committee of KTB* also found a frightening figure, 71.95 per cent or Bt724 billion. Yet *the bank's management team* reported that the bank's NPLs was 59.3 per cent, which later explained that PwCs used different criteria in studying the bank's financial position. The bank also said it calculated its NPLs by using data from all of its debtors, but the external agency's calculation was based on a 42 per cent-random sample method. In addition, *FITCH IBCA*, the international rating agency reported that it expects KTB's non-performing loans to increase from 59 percent to 66-67 percent after acquiring FBCB.

Asset Management Corporation (AMC) to transfer and manage bad loans from the banks, and the debt restructuring. These changes have made the forecasting of non-performing loans, loan loss reserve, and loan charge off, much harder.

Because the unexpected loan loss reserve is not measurable, the paper has extended the study by replacing unexpected loan loss reserve with total amount of loan loss reserve in the testing models as robustness check. Further details about the methodology would be demonstrated in chapter 5, while the empirical results are available in the chapter 6.



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CHAPTER 5

Robustness Check

This chapter has been introduced since the previous study, which investigated an impact of unexpected loan loss reserve on bank future return and bank stock price, is not satisfactory. The statistic figures indicate that unexpected loan loss reserve does not have any relationship with both dependent variables.

This chapter would summarize the methodologies, which have been modified to support the possible transgression of this theory. The methodologies are closely similar to those of chapter 3, except that the unexpected change in non-performing loans ($U\Delta NPL_{it}$), unexpected loan loss reserve ($UULLR_{it}$), and unexpected loan charge off ($ULCO_{it}$), would be replaced with total change in non-performing loans (ΔNPL_{it}), total amount of loan loss reserve (LLR_{it}), and total amount of loan charge off (LCO_{it}), accordingly.

Hypotheses

1. H_1 : There is no impact of total amount of loan loss reserve on bank stock return.

If the hypothesis is **accepted**, it suggests that total amount of loan loss reserve does not provide any incremental information about loan portfolios or bank conditions, so there is no impact on stock price when commercial bank announces an increase in loan loss reserve.

If the hypothesis is **rejected with a positive sign**, it indicates that investors view loan loss reserve as good news so they response to an increase in loan loss reserve favorably.

If the hypothesis is **rejected with a negative sign**, it demonstrates that investors tend to have bad attitude toward loan loss reserve. It led to a drop in stock price when commercial bank made an increase in loan loss reserve announcement.

2. H_2 : There is no impact of total amount of loan loss reserve on bank future cash flow.

If the empirical results **accepted** the hypothesis, it means that loan loss reserve has no impact on bank future cash flow.

If the hypothesis is **rejected with a positive sign**, it suggests that loan loss reserve made today would lead to an increase in cash flow in the future.

If the hypothesis is **rejected with a negative sign**, it evidences that an increase in loan loss reserve depicts a sign of decreasing in cash flow in the future.

Sample and data

The sample includes semi-annual data of 13 Thai commercial banks during the period of 1997-1999, which comprised of:

- Bangkok Bank Public Company Limited (BBL)
- Thai Farmers Bank Public Company Limited (TFB)
- Krung Thai Bank Public Company Limited (KTB)
- The Thai Military Bank Public Company Limited (TMB)
- DBS Thai Danu Bank Public Company Limited (DTDB)
- The Siam Commercial Bank Public Company Limited (SCB)
- The Bank of Asia Public Company Limited (BOA)
- Bank of Ayudhya Public Company Limited (BAY)
- Standard Chartered Nakornthon Bank Public Co., Ltd. (SCNB)
- Bank Thai Bank Public Company Limited (BT)
- The United Overseas Bank Radhanasin Public Co.,Ltd. (UOBR)
- The Bangkok Metropolitan Bank Pubic Company Limited (BMB)
- The Siam City Bank Public Company Limited (SCIB)

This adjusted method that substitutes total amount of loan loss reserve, total change in non-performing loans, and total amount of loan charge off requires less data than the unexpected amount method. This is because the total amount method

could omit the data, which is used to complete the loan loss expectation models. Therefore, the UOB Radhanasin Bank (UOBR), the Bangkok Metropolitan Bank (BMB) and the Siam City Bank (SCIB), which were excluded from the sample in chapter 3, have sufficient data to be included in this chapter.

This total amount method requires the same data as the unexpected amount method, which comprised of

- Stock price of sample commercial banks
- Number of outstanding shares
- Dividend payment records
- Net income
- Amount of loan loss reserve
- Quarterly data of pre-loan loss earnings
- Amount of loan charge off (net of recoveries)
- Book value of common equity
- Amount of non-performing loans
- Return on banking index
- Associated regulations

The items that are essential in the total amount method but do not necessary for the total amount method is (1) an amount of outstanding loans, (2) loan loss allowance and, (3) non-performing loans in the previous periods.

Methodology

There are two objectives on this study, which comprised of (1) to test an impact of total amount of loan loss reserve on bank stock price and (2) to test an impact of total amount of loan loss reserve on bank future cash flow. Methodology for the empirical tests of each objective would be described next.

1. Methodology for stock reaction

This section would study an impact of loan loss reserve on bank stock price. Therefore, stock return would be substituted as “dependent variable”; in contrast, total amount of loan loss reserve and other explanation factors would be denominated as “independent variables”.

The methodology is closely similar to that of chapter 3. The difference is that it does not need to construct the three expectation models to substitute their residuals as unexpected proxies. Consequently, equation (a), (b), and (c) can be left out in this study.

The market value of equity is assumed to be equal to the book value of equity added the difference between the market value and book value of outstanding loans added the difference between the market values and book values of all other assets.

$$(d) MV_{it} = BV_{it} + (MVL_{it} - BVL_{it}) + (MVONA_{it} - BVONA_{it})$$

Where

MV_{it} denotes market value of common equity of bank i at time t ;

BV_{it} denotes the book value of common equity;

$MVL_{it} - BVL_{it}$ denotes the difference between the market value and book value of outstanding loans;

$MVONA_{it} - BVONA_{it}$ denotes the difference between the market and book values of all other assets, net of all liabilities and preferred stock.

Assume that the difference between market and book value of loans outstanding ($MVL_{it} - BVL_{it}$) is linearly related to non-performing loans and loan loss allowance account and the difference between market and book values of all other

assets ($MVONA_{it} - BVONA_{it}$) can be estimated as a linear function of the book value of common equity.¹

$$(e) \text{MVL}_{it} - \text{BVL}_{it} = a_1 \text{NPL}_{it} + a_2 \text{LLA}_{it} + u_{1it}$$

$$(f) \text{MVONA}_{it} - \text{BVONA}_{it} = \mu \text{BV}_{it} + u_{2it}$$

Where u_{1it} , and u_{2it} are mean-zero error terms. Substituting into equation (d) yields:

$$(g) \text{MV}_{it} = (1 + \mu) \text{BV}_{it} + a_1 \text{NPL}_{it} + a_2 \text{LLA}_{it} + u_{1it} + u_{2it}$$

The valuation implications of changes in non-performing loans, loan loss reserve and loan charge off can be addressed by extending equation (g) to a model of changes in bank market values. If the coefficients in equation (g) are constant over time, then differencing equation (g) yields:

$$(h) \Delta \text{MV}_{it} = (1 + \mu) \Delta \text{BV}_{it} + a_1 \Delta \text{NPL}_{it} + a_2 \Delta \text{LLA}_{it} + \Delta u_{1it} + \Delta u_{2it}$$

The change in the book value of equity can be written as the net change in common stock outstanding less dividends plus earnings; that is

$$(i) \Delta \text{BV}_{it} = \Delta \text{CE}_{it} - \text{Div}_{it} + E_{it}$$

The change in the loan loss allowance is equal to the loan loss reserve less the loan charge off:

$$(j) \Delta \text{LLA}_{it} = \text{LLR}_{it} - \text{LCO}_{it}$$

The dependent variable can be converted to returns by adding Div_{it} to both sides and then scaling all variables by MV_{it-1} . Incorporating these changes into equation (j) and relaxing the constraints on the coefficient yields:

¹ Beaver, W., Eger, C., Ryan, S., and Wolfson, M., "Financial reporting, supplemental disclosures, and bank share prices," *Journal of Accounting Research* 27 (autumn 1989): 157-178.

(k)

$$R_{it} = (1 - c_0) \frac{\text{Div}_{it}}{\text{MV}_{it-1}} + c_1 \frac{\Delta \text{CE}_{it}}{\text{MV}_{it-1}} + c_2 \frac{E_{it}}{\text{MV}_{it-1}} + c_3 \frac{\Delta \text{NPL}_{it}}{\text{MV}_{it-1}} + c_4 \frac{\text{LLR}_{it}}{\text{MV}_{it-1}} + c_5 \frac{\text{LCO}_{it}}{\text{MV}_{it-1}} + \frac{u_{3it}}{\text{MV}_{it-1}}$$

Common components of residual returns in equation (k) may be related to the contemporaneous return on banking index (R_{bt}). To control for industrial-wide movements in returns, the residual returns for bank i from equation (k) are written as:

(l)

$$\frac{u_{3it}}{\text{MV}_{it-1}} = a_i + b_i R_{bt} + u_{4it}$$

To estimate an association between returns and reserve, it is necessary to separate loan loss reserve from other components of earnings. Earnings are equal to pre-loan loss earnings minus loan loss reserve:

$$(m) E_{it} = \text{PreLLE}_{it} - \text{LLR}_{it}$$

Rewriting equation (k) provides:

(n)

$$R_{it} = a_i + b_i R_{bt} + d_0 \frac{\text{Div}_{it}}{\text{MV}_{it-1}} + d_1 \frac{\Delta \text{CE}_{it}}{\text{MV}_{it-1}} + d_2 \frac{\text{PreLLE}_{it}}{\text{MV}_{it-1}} + d_3 \frac{\Delta \text{NPL}_{it}}{\text{MV}_{it-1}} + (d_4 - d_2) \frac{\text{LLR}_{it}}{\text{MV}_{it-1}} + d_5 \frac{\text{LCO}_{it}}{\text{MV}_{it-1}} + u_{4it}$$

The coefficient on LLR_{it} is an estimate of $(d_4 - d_2)$. The parameter $-d_2$ captures the return associated with the effect of loan loss reserve as an expense on current earnings. The parameter d_4 captures the return associated with loan loss reserve, which provides additional information about bank's future. If loan loss reserve contains no additional information about bank's future, then $(d_4 - d_2)$ should equal $-d_2$. If

loan loss reserve is interpreted as a current period expense as well as additional information positively related to bank's future, then $(d_4 - d_2)$ should be greater than $-d_2$.

A more direct estimate of the returns associated with any additional information in loan loss reserve for bank's future can be obtained by replacing $(\text{PreLLE}_{it} / \text{MV}_{it-1})$ with $(E_{it} / \text{MV}_{it-1})$. This substitution constrains the estimated coefficient on all components of current earnings, including loan loss reserve expense, to equal $-d_2$. The parameter d_4 ; therefore, captures the return associated with any additional information in loan loss reserve about bank's future. This substitution yields:

(o)

$$R_{it} = a_i + b_i R_{bt} + d_0 \frac{\text{Div}_{it}}{\text{MV}_{it-1}} + d_1 \frac{\Delta \text{CE}_{it}}{\text{MV}_{it-1}} + d_2 \frac{E_{it}}{\text{MV}_{it-1}} + d_3 \frac{\Delta \text{NPL}_{it}}{\text{MV}_{it-1}} + d_4 \frac{\text{LLR}_{it}}{\text{MV}_{it-1}} + d_5 \frac{\text{LCO}_{it}}{\text{MV}_{it-1}} + u_{5it}$$

Equation (n) and (o) are operated as the testing models for an impact of total amount of loan loss reserve on bank stock return.

2. Methodology for cash flow predictions

The information in total amount of loan loss reserve for future cash flow is examined by analyzing the relation between loan loss reserve and a pooled time-series of future changes in pre-loan loss earnings. The relation between future changes in pre-loan loss earnings, unexpected loan loss reserve, and other independent variables is as follows:

$$(r) \Delta \text{PreLLE}_{it+j} = \delta_0 + \delta_1 \Delta \text{PreLLE}_{it} + \delta_2 \Delta \text{NPL}_{it} + \delta_3 \text{LLR}_{it} + \delta_4 \text{LCO}_{it} + e_{it}$$

Where

$\Delta \text{PreLLE}_{it+j}$ denotes the changes in pre-loan loss earnings, for bank i period $t + j$ ($\text{PreLLE}_{it+j} - \text{PreLLE}_{it}$);

ΔNPL_{it} , LLR_{it} , and LCO_{it} denote the total change in non-performing loans, total amount of loan loss reserve and total amount of loan charge off, for bank i period t accordingly;

e_{it} denotes a mean zero random variable.

All variables in equation (r) are scaled by beginning market value of period t (MV_{it-1}) to mitigate potential estimation problems from heteroskedasticity. In addition, the model includes $\Delta PreLLE_{it}$ to control for potential auto-correlation in changes in pre-loan loss earnings.

To test whether loan loss reserve are related to permanent or transitory changes in cash flow, equation (r) is re-estimated using changes in pre-loan loss earnings more periods ahead ($j=2,3,\dots$). Due to the limitation of data, this study would examine the relation between loan loss reserve and changes in cash flow for the next one and two quarters only.



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CHAPTER 6

Robustness Check Results

This chapter would be presented exclusively in four sections. First section is an empirical result about an impact of total amount of loan loss reserve on commercial bank stock price. Second is an empirical result about an impact of total amount of loan loss reserve on commercial bank future cash flow. Third is the discussion of additional evidences. Finally is the comparison between an impact of loan loss reserve on bank stock price and future cash flow.

An impact of total loan loss reserve on bank stock price

This part will examine an impact of total amount of loan loss reserve on bank stock return by applying the following models:

$$(n) R_{it} = a_i + b_i R_{bt} + d_0(\text{Div}_{it}/\text{MV}_{it-1}) + d_1(\Delta\text{CE}_{it}/\text{MV}_{it-1}) + d_2(\text{PreLLE}_{it}/\text{MV}_{it-1}) \\ + d_3(\Delta\text{NPL}_{it}/\text{MV}_{it-1}) + (d_4 - d_2)(\text{LLR}_{it}/\text{MV}_{it-1}) + d_5(\text{LCO}_{it}/\text{MV}_{it-1}) + u_{4it}$$

$$(o) R_{it} = a_i + b_i R_{bt} + d_0(\text{Div}_{it}/\text{MV}_{it-1}) + d_1(\Delta\text{CE}_{it}/\text{MV}_{it-1}) + d_2(\text{E}_{it}/\text{MV}_{it-1}) \\ + d_3(\Delta\text{NPL}_{it}/\text{MV}_{it-1}) + d_4(\text{LLR}_{it}/\text{MV}_{it-1}) + d_5(\text{LCO}_{it}/\text{MV}_{it-1}) + u_{5it}$$

Empirical results are presented separately in Table 6-1.

Adjusted R-square for both equations are totally high, 90.92 percent, while estimated coefficients of all explanation variables are statistically significant different from zero at the 99 percent confident interval.

Table 6-1

An impact of total loan loss reserve on stock return

Regression analyses of semi-annual bank stock return associated with semi-annual total amount of loan loss reserve. The models are estimated using OLS on a pooled sample of 13 banks over 1997-1999.

Panel A : Regression analysis of semi-annual returns (R_{it}) associated with semi-annual total loan loss reserve (LLR_{it}), return on banking index (R_{bt}), changes in common equity (ΔCE_{it}), total change in non-performing loans (ΔNPL_{it}), total loan charge off (LCO_{it}), and pre-loan loss earnings ($PreLLE_{it}$).

Panel B : Regression analysis of semi-annual returns (R_{it}) associated with semi-annual total loan loss reserve (LLR_{it}), return on banking index (R_{bt}), changes in common equity (ΔCE_{it}), total change in non-performing loans (ΔNPL_{it}), total loan charge off (LCO_{it}), and earnings (E_{it}).

Variables	-	R_{bt}	Div_{it}	ΔCE_{it}	$PreLLE_{it}, E_{it}$	ΔNPL_{it}	LLR_{it}	LCO_{it}
Panel A: Equation (n)	a_1	b_1	d_0	d_1	d_2	d_3	$d_4 - d_2$	d_5
Coefficient Estimates:	0.1463	1.2934	-	2.2597	0.2637	292.96	-0.5033	0.8744
(t-statistics)	(1.24)	(6.00) ^b		(17.88) ^b	(11.95) ^b	(11.70) ^b	(-16.91) ^b	(3.68) ^b
N= 47								
Adjusted R ² = .9093								
Panel B: Equation (o)	a_1	b_1	d_0	d_1	d_2	d_3	d_4	d_5
Coefficient Estimates:	0.1463	1.2934	-	2.2597	0.2637	292.96	-0.2396	0.8744
(t-statistics)	(1.24)	(6.00) ^b		(17.88) ^b	(11.95) ^b	(11.70) ^b	(-15.25) ^b	(3.68) ^b
N= 47								
Adjusted R ² = .9093								

^a = significant at < .05 ; ^b = significant at < .01 ; two tailed test

Total amount of Loan loss reserve (LLR_{it}) is negatively related to stock return. Estimated coefficients on loan loss reserve are equal to -0.5033 and -0.2396 , for equation (n) and equation (o) respectively. Since the coefficient values are significantly different from zero, the first hypothesis, which assumed "there is no effect of loan loss reserve on bank stock return" is rejected with a negative sign. Investors tend to have

negative attitude toward loan loss reserve, which led to a drop in stock price and market value of the banks when they announce their decision about an increase in loan loss reserve.

As mentioned earlier in chapter 5, estimated coefficient from equation (n), $d_4 - d_2$, captures the return associated with total effect of loan loss reserve on current earnings and bank's future. The parameter $-d_2$ captures the return associated with the effect of total loan loss reserve on current earnings, holding constant the return associated with any additional information in loan loss reserve for bank's future. In addition, the coefficient obtained from equation (o), d_4 , gives additional information about bank's future, holding constant the return associated with an impact on current earnings.

The result shows that loan loss reserve is significantly and negatively related to stock return and also conveys bad news about bank's future. The parameter $d_4 - d_2$ is equal to -0.5033 , which means an increase in one unit of loan loss reserve would totally decrease stock market value by 0.5033 unit. The parameter d_4 is equal to -0.2396 , which indicates that total 0.5033 unit drop in stock market value has already accounted for the 0.2396 unit drop that is resulted from the negative perception of investors of loan loss reserve toward bank's future. The remained part, which is equal to -0.2637 , represents the negative stock reaction to an increase in loan loss reserve as it decreases bank current earnings.

An impact of total loan loss reserve on bank future cash flow

This part would detect the relationship between bank future cash flow and total amount of loan loss reserve. Additional independent variables involve total change in non-performing loans and total amount of loan charge off. The cash flow prediction model also includes current change in bank cash flow as one of independent variables in order to mitigate the auto-correlation problem from the time series analysis.

$$(r) \Delta \text{PreLLE}_{it+j} = \delta_0 + \delta_1 \Delta \text{PreLLE}_{it} + \delta_2 \Delta \text{NPL}_{it} + \delta_3 \text{LLR}_{it} + \delta_4 \text{LCO}_{it} + e_{it}$$

Table 6-2, panel A indicates the cash flow prediction model one quarter ahead ($\Delta\text{PreLLE}_{it+1q}$). Table 6-2, panel B represents the cash flow prediction model two quarter ahead ($\Delta\text{PreLLE}_{it+2q}$).

Table 6-2
An impact of total loan loss reserve on bank future cash flow

This table presents regression analyses of the relations between semi-annual loan loss reserve and future changes in pre-loan loss earnings (as proxies for future changes in cash flow) up to two quarters ahead ($j=1-2q$). The models are estimated with semi-annual and quarterly data for a pooled sample of 13 banks over 1997-1999.

Variables	—	ΔPreLLE_{it}	ΔNPL_{it}	LLR_{it}	LCO_{it}
Coefficients:	δ_0	δ_1	δ_2	δ_3	δ_4
<i>Panel A : One quarter Ahead</i>					
Coefficient Estimates:	-0.0965	-0.9695	-1801.1760	0.2453	10.2006
(t-statistics)	(-0.06)	(-18.33) ^b	(-13.09) ^b	(5.79) ^b	(3.08) ^b
N= 45					
$R^2 = .9876$					
Adj $R^2 = .9863$					
<i>Panel B: Two quarter Ahead</i>					
Coefficient Estimates:	0.5304	-0.2879	-3523.263	0.4662	27.7298
(t-statistics)	(0.12)	(-2.03) ^a	(-9.53) ^b	(4.10) ^b	(3.12) ^b
N= 45					
$R^2 = .9485$					
Adj $R^2 = .9433$					

^a = significant at $< .05$; ^b = significant at $< .01$; two tailed test

All variables are scaled by MV_{it-1} in order to mitigate potential estimation problems from heteroskedasticity

Both of them could achieve greatly high goodness of fit. R-square and adjusted R-square are equal to 98.76 and 98.63 percent for panel A; and 94.85 and 94.33 percent for panel B.

The results show that total amount of loan loss reserve (LLR_{it}) is positively correlated with the change in bank future cash flow. Estimated coefficients, obtained from panel A and panel B, are equal to 0.2453 and 0.4662 accordingly. Both of them are significantly different from zero at the 99 percent confident interval. As a result, **second hypothesis that assumed “there is no effect of loan loss reserve on bank future cash flow” has to be rejected with a positive sign.** It means that an increase in loan loss reserve resulted in an increase in bank future cash flow in the next three- and six-month.

Additional evidences

Empirical results indicate that all other independent variables have considerably impact on bank stock price and future cash flow since their estimated coefficients are statistically significant different from zero. Each variable could be summarized as follows:

Return on banking index (R_{bt}) is significantly and positively related to bank stock return. Its estimated coefficient is equal to 1.2934, which means that bank stock return is consistent with industry movements.

Change in amount of common equity (ΔCE_{it}) is positively related to stock return. Estimated coefficient of change in common equity on stock return is equal to 2.2597, which is significantly different from zero. Capital raising (decreasing), therefore, increases (decreases) bank stock market value.

Pre-Loan Loss Earnings ($PreLLE_{it}$) and Earnings (E_{it}) convey positive impact on bank stock return. Estimated coefficient of earnings on stock return is equivalent to the coefficient of pre-loan loss earnings, which is 0.2637.

Coefficients on current change in pre-loan loss earnings ($\Delta PreLLE_{it}$) are equal to -0.9695 and -0.2879 ; significant and negatively related to changes in cash flow, one- and two- quarter ahead. In other words, one unit increase in cash flow would drop cash flow of the following quarter by 0.9695 unit as shown in table 6-2 panel A. It also have a negative effect, but less in degree, to bank cash flow of the next two-quarter as shown in table 6-2 panel B.

Change in non-performing loans (ΔNPL_{it}) is positively related to bank stock return but negatively related to bank future cash flow. Estimated coefficient of change in non-performing loans on stock return is equal to 292.96, which is significant at the 99 percent confident interval. This positive relationship, however, does not consistent with the previous studies by Griffin et al in 1991, Wahlen in 1994, and others that found negative relationship. It might due to some special conditions on this study.

First, market tends to overestimate the amount of non-performing loans during the crisis and current stock price might already absorb that expectation. Therefore, an actual increase in non-performing loans, which is less than the expected amount is perceived as good news for investors.

Second, investors might view an increase in non-performing loans as a sign of further capital raising. Capital raising is positively related to stock return as presented in table 6-1, the estimated coefficient on the change in common equity equals to 2.2597, which is significantly different from zero. If the change in non-performing loans really led to future increase in common equity, the negative reaction on an increase in non-performing loans could be nullified when such increase was accompanied by favorable capital raising.

Finally, an increase in non-performing loans announcement can be perceived as good news for investors since it shows bank management's transparency. Market tends to forecast totally high amount of non-performing loans for Thai banks during the crisis and do not believe if those banks stated relatively small amount of non-performing loans. Hence, investors may view the report in high amount of non-performing loans as an acceptance in the actual loan quality, so the announced figures and the management of the announced banks seem to be reliable. In contrast, they might view the small amount of non-performing loans as a consequence of problem hiding, account-decoration, or the lack of management ethics.¹

¹ "Non-performing loans" are clearly defined and relatively less discretionary than loan loss reserve. However, bank manager discretion still be able to keep a bad loan classified as performing by (1) an increase in the valuation of collateral assets (2) the extending of additional credit and (3) the classification of a debt restructuring. (Chi-Chun Liu and Stephen G. Ryan,1995)

Change in non-performing loans (ΔNPL_{it}) is negatively related to change in bank future cash flow. Estimated coefficients of change in non-performing loans, on changes in cash flow the next one- and the next two-quarter, are equal to -1801.176 and -3523.263 accordingly. This implies that changes in non-performing loans contain stronger negative effect to the next six-month cash flow than to the next three-month's.

Loan charge off (LCO_{it}) is positively and significantly related to stock return and future cash flow. Estimated coefficient of loan charge off on stock return is equal to 0.8744. This positive relationship; however, is not consistent with previous studies by Wahlen, in 1994, which detected negative relationship between unexpected loan charge off and bank stock return.

Loan charge off is positively related to changes in bank future cash flow. Estimated coefficients of loan charge off on changes in cash flow one- and two- quarter ahead are equal to 10.2006 and 27.7298 respectively. Both of them are relatively significant different from zero at the 99 percent confident interval.

Comparing an impact of loan loss reserve on bank stock price and future cash flow

As the valuation theory says, "Stock prices should reflect the value of firm, which could be done by discounting all future cash flow to equity to get a net present value".² Therefore, if an increase (decrease) in stock price is found together with an increase (decrease) in future cash flow, it precisely implies that market perception toward loan loss reserve is understandable. In contrast, if an increase (decrease) in stock price is coinciding with a decrease (increase) in future cash flow, it could show that investor attitude toward loan loss reserve is doubtful and there should be some explanations or suggestions.

² Elton, and Edwin J., "The valuation process," Modern portfolio theory and investment analysis, (John Wiley & Sons Inc., 1995), pp.449-473.

While table 6-1 indicates that investors respond negatively to an increase in loan loss reserve, which led to a drop in stock price when commercial banks announced their increase in loan loss reserve, table 6-2 evidences that loan loss reserve is positively related to bank future cash flow. In other words, investors perceived an increase in loan loss reserve as bad news while the empirical results showed that an increase in loan loss reserve is a positive signal for bank future performance.

The suggestions for investors are that they should take the benefits of an increase in loan loss reserve on bank future performance into considerations besides from the fact that it decreases current earnings. Since the overall market reacts negatively to an increase in loan loss reserve, it is possible to take profit from the decline in stock price by applying the contrarian investment strategy.³

Nevertheless, other individual bank's factors such as amount of non-performing loans, collateral value, capital strengthness, and management efficiency, and loan policies must be concerned since these factors might have significant impact on bank's future performance including its stock price.

³ Contrarian investment is a method of investing involves ignoring market trends and buying neglected and depressed stocks of good companies.

CHAPTER 7

Conclusions and Suggestions

Since loan portfolios are the largest combination in the commercial bank balance sheet, default risk on loans is likely to have an important impact on bank future cash flow and stock market value. Consequently, "loan loss reserve", which is an accounting adjustment manner made by commercial banks in order to reflect the actual performance and reveal the appropriate value of loan portfolios, could precisely imply the quality of loan portfolio and reflect the default risk of each bank.

The study has applied the OLS method to examine the relationship between unexpected loan loss reserve on bank stock price and future cash flow. The reason for substituting unexpected loan loss reserve as proxies is because stock price should already reflect all available and anticipated information so any change in stock price should occur from unexpected information. The empirical results, however, evidence that unexpected loan loss reserve is not an efficient proxy to explain either bank stock price or future cash flow. Statistical figures indicate that estimated coefficients on unexpected loan loss reserve are not significantly different from zero at the 95 percent confident interval.

As a matter of facts, the paper has extended the study by replacing unexpected loan loss reserve with total amount of loan loss reserve. Rational behind this further methodology is that it is unable to anticipate an amount of loan loss reserve in the Thai market so unexpected proxy is not measurable. Investors must observe and forecast many factors in order to predict anticipated amount of loan loss reserve effectively. Such factors comprised of outstanding loan balances, non-performing loans in the previous periods, outstanding loan loss allowance, and expected changes in non-performing loans. It is very hard to forecast the mentioned factors, especially non-performing loan data.

The empirical results indicate that total amount of loan loss reserve has significant **negative impact on stock price** of commercial banks. The reasons for this finding are as follows:

First, investors view loan loss reserve as an expense that **decreases bank earnings**. Because earnings could indicate profitability, management proficiency and dividend payment of commercial banks, loan loss reserve conveys bad news to investors that brought bank stock price down after an increase in loan loss reserve announcement.

Next, loan loss reserve is also noticed as a factor that has the potential to **increase the risking of a bank's capital structure**. This is because the Bank of Thailand does not permit an added back of loan loss reserve for calculating capital adequacy ratio. An increase in loan loss reserve that reduced retained earnings, which is classified as part of tier-1 capital, could destroy investors' confidence to the banks. Investors might worry that there might be an intervention by the Bank of Thailand, the prohibited of stock trading, or the re-capitalization. These concerns led to a drop in stock price when commercial banks announce their increase in loan loss reserve.

The study finds that total amount of loan loss reserve conveys **positive impact on bank future cash flow**. The explanations on this finding are as follows:

Firstly, banks that set aside adequate amount of loan loss reserve would **deal with delinquent borrowers more aggressively and more effectively**. Reasons are that they do not have to worry about the necessity to set additional loan loss reserve or loan charge off that might be resulted from troubled-debt restructuring or legal action forced to their debtors.

“Troubled–Debt Restructuring” is a kind of debt restructuring where bank will suffer partial damage from an agreement.¹ Loss from troubled debt restructuring could be resulted from the relaxation of debt payment conditions such as interest rate reduction, principal and accrued interest reduction,

¹ ธนาคารแห่งประเทศไทย. “หลักเกณฑ์การปรับปรุงโครงสร้างหนี้ของสถาบันการเงิน,” 2 มิถุนายน 2541.

approve for grace periods, extension of payment periods, or debt-equity swap. When the new present value of debt or fair value of changed equity is lower than the current book value plus accrued interest, financial institution must record these losses in its profit and loss statement for that period, equal to the total losses minus existing loan loss allowance. Therefore, higher loan loss reserve in the previous periods indicates that banks would suffer less when trouble-debt restructuring are made in the future.

Secondly, bank could decrease an expense paid to follow the payments from debtors called “ **collection cost**”. Collection cost includes legal fees, consulting and accounting fees, appraisal fees, and other administrative expense. In addition, an increase in loan loss reserve could **prevent inappropriate activities** of commercial banks, for example, the authorization of funds for refinancing instead of using for better projects or the appraisal of collateral value over its real market value. These practices could result in a decrease in bank future return since the true problems can still not be solved.

Thirdly, commercial banks regularly charge off loans when such loans already have full amount of loan loss reserve, after adjusting for collateral. So an increase in loan loss reserve could **imply an increase in loan charge off** in the future periods. Because loan charge off provides benefits to commercial banks, it could partially answer the positive impact of loan loss reserve on bank future cash flow.

Benefit of loan charge off is that it increases an ability to finance new loans. When bank charges off loans, it would credit outstanding loans and debit loan loss allowance by the amount that is equal to the principal lost, net of any expected recoveries. Since loans are classified as risky assets, a deduction in loans would improve the capital per risky assets ratio, which led to an ability to finance new loans to generate income.

The empirical results indicate that investors are response negatively to an increase in loan loss reserve. This negative attitude is inconsistent with the evidence that reports the positive impact of loan loss reserve on bank future cash flow. The suggestions for investors are that they should take the benefits of an increase in loan

loss reserve on bank future performance into considerations besides from the fact that it decreases current earnings. Since the overall market reacts negatively to an increase in loan loss reserve, it is possible to take profit from the decline in stock price by applying the contrarian investment strategy.

The empirical results might involve some errors, due to the fact that there are some limitations on this study. The most important barrier is the insufficient samples. Aside from the small amount of Thai commercial banks, many of them have been intervened, re-organized, or even shut down. Such event has made the sample size more tighten. In addition, the study period is only 3 years because essential data for the analysis like non-performing loans could not be found prior to 1997. Furthermore, the examining periods of 1997-1999 are the years of economics downturn and financial crisis. Investors might view and response to an increase in loan loss reserve diversely between the ordinary situation and the crisis situation. Managers themselves may under pressured to make decisions about loan loss reserve during the crisis, which results from the tougher regulations and the sudden increase in non-performing loans. Finally, the regulations about loan loss have been modified frequently and continually. The analysis models; therefore, might not be able to capture the whole impact of these regulation adjustments. In the future, when the economics and financial sector are getting back to the ordinary circumstances, the larger samples size are available and the regulations become more standard, the further empirical tests should be able to provide more trusty and more efficient results.

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APPENDIX 1

Income Statement of 10 Thai Commercial Banks during 1997-1999

<i>Income Statement (millions)</i>	<i>For 6-Month period, Ending</i>					
	<i>1H97</i>	<i>2H97</i>	<i>1H98</i>	<i>2H98</i>	<i>1H99</i>	<i>2H99</i>
Gross income						
BBL	22,488	22,936	10,810	(1,963)	566	6,972
TFB	13,724	14,151	9,790	3,687	4,519	5,811
SCB	10,858	13,314	10,822	1,898	4,139	6,458
BAY	6,631	8,204	3,067	1,549	1,305	1,707
KTB	14,120	13,983	9,788	2,935	1,669	4,398
TMB	5,231	3,788	2,482	862	905	1,021
BOA	2,015	1,834	281	(39)	473	942
DTDB	2,266	2,342	1,544	409	456	509
SCNB	808	1,092	473	(339)	21	468
BT	763	461	(620)	(1,031)	(1,700)	(1,592)
Industry	78,904	82,105	48,436	7,968	12,353	26,694
Non-interest income						
BBL	7,955	13,619	13,000	7,127	20,937	5,756
TFB	3,617	5,827	5,704	4,129	3,279	3,291
SCB	3,171	4,465	5,395	4,587	4,910	2,304
BAY	1,774	3,131	2,293	1,933	1,209	1,132
KTB	2,424	3,278	6,138	3,146	3,779	2,783
TMB	1,235	2,671	1,724	1,581	1,097	1,109
BOA	557	458	765	860	352	1,183
DTDB	360	616	387	346	584	409
SCNB	479	428	188	374	207	262
BT	398	432	194	170	143	484
Industry	21,970	34,925	35,787	24,252	36,496	18,713
Non-interest expense						
BBL	12,852	17,271	14,836	15,636	15,284	11,353
TFB	8,326	11,153	8,871	17,517	8,897	19,333
SCB	6,742	8,237	16,335	8,405	7,780	7,266
BAY	4,403	5,525	8,082	5,456	5,913	4,534
KTB	6,211	8,282	9,014	9,404	8,600	11,582
TMB	3,216	4,243	5,047	4,623	3,304	3,314
BOA	1,154	1,930	2,213	1,774	1,708	2,286
DTDB	1,319	1,966	2,129	2,653	2,297	3,884
SCNB	774	1,149	828	918	3,353	(290)
BT	852	940	5,616	1,412	2,042	3,428
Industry	45,849	60,696	72,971	67,798	59,178	66,690
Income tax expense (benefit)						
BBL	4,715	(265)	6	(6)	0	0
TFB	1,910	(1,680)	(2,042)	266	(200)	2,786
SCB	1,666	372	0	0	0	0
BAY	747	18	221	51	2	3
KTB	2,600	(2,472)	115	70	2	0
TMB	537	57	52	18	17	10
BOA	321	(193)	0	0	0	0
DTDB	299	(264)	22	(13)	8	8
SCNB	115	(115)	(1,242)	(11)	4	1,441
BT	70	(70)	0	0	0	0
Industry	12,980	(4,612)	(2,868)	375	(167)	4,248

Income Statement of 10 Thai Commercial Banks during 1997-1999

Income Statement (millions)	For 6-Month period, Ending					
	1H97	2H97	1H98	2H98	1H99	2H99
Pre-loan loss earnings						
BBL	12,876	19,549	8,968	(10,466)	6,219	1,375
TFB	7,105	10,505	8,665	(9,967)	(899)	(13,017)
SCB	5,621	9,170	(118)	(1,920)	1,269	1,496
BAY	3,255	5,792	(2,943)	(2,025)	(3,401)	(1,698)
KTB	7,733	11,451	6,797	(3,393)	(3,154)	(4,401)
TMB	2,713	2,159	(893)	(2,198)	(1,319)	(1,194)
BOA	1,097	555	(1,167)	(953)	(883)	(161)
DTDB	1,008	1,256	(220)	(1,885)	(1,265)	(2,974)
SCNB	397	486	1,074	(873)	(3,129)	(420)
BT	239	23	(6,043)	(2,273)	(3,599)	(4,536)
Industry	42,044	60,946	14,120	(35,952)	(10,162)	(25,531)
Loan loss reserve						
BBL	4,249	24,119	25,353	22,638	33,105	34,570
TFB	2,101	14,709	12,580	26,000	16,438	22,277
SCB	1,940	9,483	10,883	(510)	50,429	1,070
BAY	1,310	5,775	4,425	181	12,966	2,695
KTB	3,944	15,030	19,718	45,270	20,040	64,343
TMB	880	2,625	3,850	759	4,649	4,461
BOA	250	1,339	5,552	30	1,010	7,839
DTDB	330	1,906	5,110	1,911	8,700	0
SCNB	70	983	4,188	0	2,810	(4,438)
BT	103	1,984	8,536	(39)	8,606	2,480
Industry	15,177	77,953	100,195	96,240	158,753	135,297
Net income						
BBL	8,627	(4,570)	(16,385)	(33,104)	(26,886)	(33,195)
TFB	5,004	(4,204)	(3,915)	(35,967)	(17,337)	(35,294)
SCB	3,681	(313)	(11,001)	(1,410)	(49,160)	426
BAY	1,945	17	(7,368)	(2,206)	(16,367)	(4,393)
KTB	3,789	(3,579)	(12,921)	(48,663)	(23,194)	(68,744)
TMB	1,833	(466)	(4,743)	(2,957)	(5,968)	(5,655)
BOA	847	(784)	(6,719)	(983)	(1,893)	(8,000)
DTDB	678	(650)	(5,330)	(3,796)	(9,965)	(2,974)
SCNB	327	(497)	(3,114)	(873)	(5,939)	4,018
BT	136	(1,961)	(14,579)	(2,234)	(12,205)	(7,016)
Industry	26,867	(17,007)	(86,075)	(132,193)	(168,914)	(160,827)

APPENDIX 2

Selected Items on Balance Sheet of 10 Thai Commercial Banks

(millions)	1H97	2H97	1H98	2H98	1H99	2H99
Outstanding Loans						
BBL	971,362	1,074,396	1,028,469	952,546	936,977	921,651
TFB	564,764	608,590	583,876	554,145	549,372	490,654
SCB	468,250	568,161	556,845	544,268	519,588	488,498
BAY	369,947	406,569	391,086	370,055	368,218	354,480
KTB	618,415	687,911	678,862	957,440	949,300	934,126
TMB	286,649	303,263	298,271	290,681	282,028	282,267
BOA	112,871	134,290	128,803	125,541	125,932	125,808
DTDB	105,725	115,814	113,801	107,572	103,080	98,866
SCNB	55,469	60,028	56,249	54,185	52,502	53,571
BT	54,575	57,525	55,099	55,342	243,380	240,982
Industry	3,608,027	4,016,547	3,891,361	4,011,775	4,130,377	3,990,903
Loan loss allowance						
BBL	31,516	57,925	82,185	102,077	134,561	166,753
TFB	11,906	26,717	38,799	63,473	78,819	23,531
SCB	8,063	18,153	28,775	31,423	52,940	18,713
BAY	5,250	10,969	15,442	15,382	28,240	27,287
KTB	19,797	34,706	54,225	141,960	162,200	224,821
TMB	6,225	8,885	11,851	12,564	17,228	21,186
BOA	2,044	3,339	8,874	8,859	9,834	17,622
DTDB	1,663	3,567	8,647	10,350	19,487	18,628
SCNB	685	1,661	5,800	5,622	8,374	3,942
BT	786	2,770	11,297	11,257	95,124	97,909
Industry	87,935	168,692	265,895	402,967	606,807	620,392
Non-performing loans						
BBL	79,035	180,572	306,784	439,930	461,382	393,004
TFB	41,434	105,379	135,349	223,042	236,545	102,102
SCB	27,835	66,403	111,000	190,034	154,432	113,662
BAY	22,276	55,148	67,651	137,752	135,615	112,804
KTB	63,729	148,412	219,916	322,455	393,484	363,469
TMB	26,652	46,908	60,228	93,488	93,198	85,281
BOA	8,900	16,886	33,391	49,374	59,942	57,043
DTDB	5,563	15,335	30,393	52,357	57,958	40,631
SCNB	2,980	6,358	13,016	23,047	29,393	36,236
BT	6,515	14,280	18,359	38,868	207,344	195,694
Industry	284,919	655,680	996,087	1,570,347	1,829,293	1,499,926

Selected Items on Balance Sheet of 10 Thai Commercial Banks

(millions)	1H97	2H97	1H98	2H98	1H99	2H99
Number of shares (millions)						
BBL	1,001	1,001	1,466	1,466	1,466	1,466
TFB	800	800	1,176	1,176	1,176	2,353
SCB	381	546	589	589	589	633
BAY	500	500	1,000	1,000	1,850	1,850
KTB	1,480	1,480	3,480	11,180	11,180	11,180
TMB	513	513	1,015	1,015	1,015	1,015
BOA	423	423	427	1,853	1,862	3,106
DTDB	250	250	550	550	1,100	1,100
SCNB	134	134	202	202	202	700
BT	75	180	180	1,233	1,233	1,233
Industry	5,557	5,827	10,085	20,264	21,673	24,637
Total shareholder's equity						
BBL	110,997	103,294	129,101	101,088	82,783	44,978
TFB	64,449	56,808	80,097	52,407	39,045	26,272
SCB	40,809	41,715	37,013	38,069	56,433	57,595
BAY	29,352	26,209	26,883	26,875	29,553	24,143
KTB	50,995	45,774	51,674	83,475	63,588	101,117
TMB	64,449	56,808	80,097	52,407	39,045	26,272
BOA	11,623	9,883	4,132	9,674	9,308	12,293
DTDB	10,889	9,103	10,456	8,330	6,403	3,797
SCNB	4,883	4,203	1,679	1,166	(4,798)	6,101
BT	4,045	2,985	(11,043)	(816)	24,739	17,036
Industry	392,492	356,783	410,090	372,675	346,099	319,605
Shareholder's equity-excluded preferred (millions)						
BBL	110,997	103,294	129,101	101,088	82,780	44,975
TFB	64,449	56,808	80,097	52,407	39,045	26,239
SCB	40,809	41,715	37,013	38,069	(7,389)	(6,227)
BAY	29,352	26,209	26,883	26,875	29,549	24,139
KTB	50,940	45,719	51,619	83,420	63,533	(6,938)
TMB	64,449	56,808	80,097	52,407	39,043	26,270
BOA	11,623	9,883	4,132	9,674	9,308	12,293
DTDB	10,889	9,103	10,456	8,330	4,902	2,296
SCNB	4,883	4,203	1,679	1,166	(4,798)	6,101
BT	4,045	2,985	(11,043)	(816)	(12,329)	(20,032)
Industry	392,437	356,728	410,035	372,620	243,644	109,116

APPENDIX 3

Semi-annual data on loan charge off and bad debt recovered

<i>(millions)</i>	<i>For 6-Month period, Ending</i>					
	<i>1H97</i>	<i>2H97</i>	<i>1H98</i>	<i>2H98</i>	<i>1H99</i>	<i>2H99</i>
Loan charge off						
BBL	2,784	252	176	1,841	206	3,157
TFB	39	92	477	1,287	1,524	53,382
SCB	114	280	89	673	29	35
BAY	17	61	12	54	50	3,654
KTB	44	101	135	96	29	309
TMB	792	32	879	14	0	519
BOA	39	45	17	46	36	52
DTDB	76	2	29	209	34	34
SCNB	0	9.0	1.6	0	57.6	0
BT	1.4	0.6	8.5	1.6	38.6	29.9
Industry	3,906	875	1,824	4,222	2,004	61,172
Bad debt recovered (millions)						
BBL	117	82	75	76	66	91
TFB	3	14	21	33	43	108
SCB	4	130	5	22	9	93
BAY	17	6	2	4	2	3
KTB	1	3	14	7	6	2
TMB	6	8	14	9	12	13
BOA	1	1	0	1	0	0
DTDB	0	0	0	0	2	4
SCNB	0	2.0	0.1	0	0	0
BT	0	0	0	0	0.01	0
Industry	149	244	132	153	142	314
Net Loan charge off (millions)						
BBL	2,667	170	101	1,765	140	3,066
TFB	36	78	456	1,254	1,481	53,274
SCB	111	151	84	651	20	(58)
BAY	(0.3)	55	10	50	48	3,651
KTB	43	98	121	89	23	307
TMB	786	24	865	5	(12)	506
BOA	38	44	17	45	36	52
DTDB	76	2	29	209	32	30
SCNB	0	7.0	1.5	0	57.6	0
BT	1.4	0.6	8.5	1.6	38.6	29.9
Industry	3,758	631	1,693	4,069	1,863	60,857

APPENDIX 4

Stock price and market value of common stock of 10 Thai Commercial Banks

<i>Items</i>	<i>1H97</i>	<i>2H97</i>	<i>1H98</i>	<i>2H98</i>	<i>1H99</i>	<i>2H99</i>
Stock price (Baht)						
BBL	129.0	86.0	43.5	52.0	80.5	61.0
TFB	52.6	39.7	20.2	35.4	48.9	43.0
SCB	91.4	48.0	13.0	17.5	42.3	44.5
BAY	34.6	17.3	5.4	11.3	21.8	15.3
KTB	27.3	9.8	5.4	19.8	24.5	19.8
TMB	26.3	10.0	5.2	9.7	21.8	15.8
BOA	14.0	9.5	7.3	22.1	20.1	22.3
DTDB	28.6	13.6	7.7	15.2	20.0	18.8
SCNB	0.20	0.03	0.02	0.03	n/a	n/a
BT	53.70	16.25	3.20	n/a	n/a	n/a
Banking Index	517.0	297.4	138.3	262.3	374.2	309.9
Market Value of common stock (millions)						
BBL	129,129	86,086	63,771	76,232	118,013	89,426
TFB	42,056	31,744	23,720	41,607	57,553	101,179
SCB	34,835	26,208	7,657	10,308	24,885	28,169
BAY	17,275	8,635	5,400	11,250	40,238	28,213
KTB	40,330	14,504	18,792	220,805	273,910	220,805
TMB	13,512	5,130	5,278	9,846	22,076	15,986
BOA	5,922	4,006	3,100	40,933	37,445	69,109
DTDB	7,150	3,398	4,230	8,360	22,000	20,625
SCNB	27	5	5	6	n/a	n/a
BT	4,028	2,925	576	n/a	n/a	n/a
Industry	294,263	182,640	132,528	419,346	596,120	573,511
8 banks	290,209	179,710	131,947	419,340	596,120	573,511

จุฬาลงกรณ์มหาวิทยาลัย

APPENDIX 5

Important Ratios of 10 Thai Commercial Banks during 1997-1999

<i>Ratio</i>	<i>1H97</i>	<i>2H97</i>	<i>1H98</i>	<i>2H98</i>	<i>1H99</i>	<i>2H99</i>	<i>Average</i>
NPL/Loans (%)							
BBL	8.1	16.8	29.8	46.2	49.2	42.6	32.1
TFB	7.3	17.3	23.2	40.2	43.1	20.8	25.3
SCB	5.9	11.7	19.9	34.9	29.7	23.3	20.9
BAY	6.0	13.6	17.3	37.2	36.8	31.8	23.8
KTB	10.3	21.6	32.4	33.7	41.4	38.9	29.7
TMB	9.3	15.5	20.2	32.2	33.0	30.2	23.4
BOA	7.9	12.6	25.9	39.3	47.6	45.3	29.8
DTDB	5.3	13.2	26.7	48.7	56.2	41.1	31.9
SCNB	5.4	10.6	23.1	42.5	56.0	67.6	34.2
BT	11.9	24.8	33.3	70.2	85.2	81.2	51.1
Industry	7.9	16.3	25.6	39.1	44.3	37.6	28.5
LLR/NPL (%)							
BBL	5.4	13.4	8.3	5.1	7.2	8.8	8.0
TFB	5.1	14.0	9.3	11.7	6.9	21.8	11.5
SCB	7.0	14.3	9.8	(0.3)	32.7	0.9	10.7
BAY	5.9	10.5	6.5	0.1	9.6	2.4	5.8
KTB	6.2	10.1	9.0	14.0	5.1	17.7	10.4
TMB	3.3	5.6	6.4	0.8	5.0	5.2	4.4
BOA	2.8	7.9	16.6	0.1	1.7	13.7	7.1
DTDB	5.9	12.4	16.8	3.6	15.0	0.0	9.0
SCNB	2.3	15.5	32.2	0.0	9.6	(12.2)	7.9
BT	1.6	13.9	46.5	(0.1)	4.2	1.3	11.2
Industry	5.3	11.9	10.1	6.1	8.7	9.0	8.5
LLA/NPL (%)							
BBL	39.9	32.1	26.8	23.2	29.2	42.4	32.3
TFB	28.7	25.4	28.7	28.5	33.3	23.0	27.9
SCB	29.0	27.3	25.9	16.5	34.3	16.5	24.9
BAY	23.6	19.9	22.8	11.2	20.8	24.2	20.4
KTB	31.1	23.4	24.7	44.0	41.2	61.9	37.7
TMB	23.4	18.9	19.7	13.4	18.5	24.8	19.8
BOA	23.0	19.8	26.6	17.9	16.4	30.9	22.4
DTDB	29.9	23.3	28.5	19.8	33.6	45.8	30.1
SCNB	23.0	26.1	44.6	24.4	28.5	10.9	26.2
BT	12.1	19.4	61.5	29.0	45.9	50.0	36.3
Industry	30.9	25.7	26.7	25.7	33.2	41.4	30.6

Important Ratios of 10 Thai Commercial Banks during 1997-1999

<i>Ratio</i>	<i>1H97</i>	<i>2H97</i>	<i>1H98</i>	<i>2H98</i>	<i>1H99</i>	<i>2H99</i>	<i>Average</i>
LLR/Loans (%)							
BBL	0.4	2.2	2.5	2.4	3.5	3.8	2.5
TFB	0.4	2.4	2.2	4.7	3.0	4.5	2.9
SCB	0.4	1.7	2.0	(0.1)	9.7	0.2	2.3
BAY	0.4	1.4	1.1	0.0	3.5	0.8	1.2
KTB	0.6	2.2	2.9	4.7	2.1	6.9	3.2
TMB	0.3	0.9	1.3	0.3	1.6	1.6	1.0
BOA	0.2	1.0	4.3	0.0	0.8	6.2	2.1
DTDB	0.3	1.6	4.5	1.8	8.4	0.0	2.8
SCNB	0.1	1.6	7.4	0.0	5.4	(8.3)	1.0
BT	0.2	3.4	15.5	(0.1)	3.5	1.0	3.9
Industry	0.4	1.9	2.6	2.4	3.8	3.4	2.4
LLR/LCO							
BBL	2	96	144	12	161	11	70.9
TFB	54	160	26	20	11	0	45.3
SCB	17	34	122	(1)	1,739	31	323.7
BAY	77	95	369	3	259	1	134.0
KTB	90	149	146	472	691	208	292.6
TMB	1	82	4	54	51,656	9	8,634.3
BOA	6	30	327	1	28	151	90.4
DTDB	4	953	176	9	256	0	233.1
SCNB	n/a	109	2,618	n/a	49	n/a	925.2
BT	73	3,072	1,002	(24)	223	83	738.2
Industry	4	89	55	23	79	2	42.0
LLR/Net income							
BBL	0.5	(5.3)	(1.5)	(0.7)	(1.2)	(1.0)	(1.5)
TFB	0.4	(3.5)	(3.2)	(0.7)	(0.9)	(0.6)	(1.4)
SCB	0.5	(30.3)	(1.0)	0.4	(1.0)	2.5	(4.8)
BAY	0.7	339.7	(0.6)	(0.1)	(0.8)	(0.6)	56.4
KTB	1.0	(4.2)	(1.5)	(0.9)	(0.9)	(0.9)	(1.2)
TMB	0.5	(5.6)	(0.8)	(0.3)	(0.8)	(0.8)	(1.3)
BOA	0.3	(1.7)	(0.8)	(0.0)	(0.5)	(1.0)	(0.6)
DTDB	0.5	(2.9)	(1.0)	(0.5)	(0.9)	0.0	(0.8)
SCNB	0.2	(2.0)	(1.3)	0.0	(0.5)	(1.1)	(0.8)
BT	0.8	(1.0)	(0.6)	0.0	(0.7)	(0.4)	(0.3)
Industry	0.6	(4.6)	(1.2)	(0.7)	(0.9)	(0.8)	(1.3)

BIOGRAPHY

Miss Sunsanee Sakulsurarat was born on February 2, 1979 in Bangkok. The author has received a Bachelor degree in Business Administration (2nd class honors), major in Banking and Finance from Faculty of Commerce and Accountancy, Chulalongkorn University in 1999 and continued a Master of Science in Finance at Chulalongkorn University in the same year. Now working at the Bank of America, Bangkok branch, as a management trainee in Credit and Marketing department.



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