

## **Chapter 1**

### **Introduction**

Since the broke out of the 1997 Asian financial crisis, Thailand and Thai commercial banks have drawn more attentions from the world. More researchers start to investigate the Thai commercial banks from the academic point of view, and efficiency is one of the hot issues. Several papers such as Chunnachinda and Srisawat (2007), Williams and Intarachote (2002), Narongtanupon (2000), and Leightner and Lovell (1998) studied the efficiency of Thai banks from the different points of view, e.g., the impact of liberalization, the efficiency difference between the foreign owned and domestic banks, and the impact of financial crisis. The methodologies applied and the time periods studied are different.

After the financial crisis, there have been more changes in regulations and more liberalization on the banking industry in Thailand. For instance, there are at least five changes of Thai commercial banks. 1) The ownership structure of the Thai commercial banks changed dramatically due to the lift of the foreign limit control by the Bank of Thailand. The foreign limit increased from 25 percent before the financial crisis to 100 percent after the financial crisis. Narongtanupon (2000) concluded that foreign banks have superior efficiency relative to Thai banks during the period of 1989 to 1998. 2) Many banks' governance also changed after the crisis through either foreign acquisitions or domestic mergers. These changes may affect the bank's efficiency level in the short-run or long-run (Williams and Nguyen, 2005). During 1998 only, four private banks were nationalized, two private banks sold more than 50 percent of their share to foreign banks, and two other problem banks were ordered to

merge with others. 3) The provisions for possible loan losses are required to increase after the financial crisis. The “non-performing-loan (NPL)” was once reached as high as 1,100 billion Baht in year 1999. Kwan (2006) found that the provision for loan losses ratio (loan-loss provision to total loans) was significantly positively related to the cost efficiency in Hong Kong commercial banks. 4) The average capital ratio (equity to total assets) is decreased from 7.12 percent before the crisis to 6.36 percent after the crisis. Mester (1996) argues that the capital-asset ratio is positively related to the bank efficiency because higher capital ratio may prevent moral hazard. 5) The banking industry is taking higher market risk after the financial crisis, i.e. the percentage of non-interest income to interest income is increasing significantly after the crisis. Higher risk taking might change the bank efficiency level. For instance, the ratio of off-balance-sheet activities to total assets is found to be significantly negatively correlated to the cost efficiency of commercial banks in Hong Kong (Kwan, 2006). These changes motivate the author to measure and compare the efficiency of Thai commercial banks for the periods before and after the 1997 financial crisis.

This study is different from previous papers in several ways:

First, this paper provides the measurement and comparison of the pre-crisis and post-crisis periods efficiencies of Thai commercial banks with the most updated time period. The full sample period covers from year 1990 to 2005. This is the first paper that divides the full sample period into three sub-periods: the pre-crisis period from 1990 to 1996, financial crisis period from 1997 to 2000, and the post-crisis period from 2001 to 2005. Whereas other papers simply took the cutoff at year 1997 and divided the study period into two sub-periods, which was also due to the short time horizon of the sample.

Second, this study is by far (to the best knowledge of the author) the most comprehensive one since it measures the efficiency of Thai commercial banks with three different approaches: parametric frontier approach (stochastic frontier approach is chosen to estimate the cost and profit inefficiency), non-parametric frontier approach (data envelopment analysis and free disposal hull analysis are utilized to estimate the efficiency), and the combination of parametric and non-parametric approach (cost and profit inefficiency scores are estimated by combining stochastic frontier approach and the data envelopment analysis). This is also the first paper using the combined approach to measure the efficiency of Thai commercial banks. After the inefficiency and efficiency scores are estimated and compared between the pre- and post-crisis periods, the inefficiency scores are converted into efficiency scores to compare the efficiency scores across different frontier approaches.

To measure the efficiency of Thai commercial banks, inputs and outputs are chosen based on the intermediation approach of Sealey and Lindley (1977). This approach recognizes that the core activity of banks is intermediation. For the parametric frontier approach in this paper, there are two inputs: total interest expenses and personnel expenses; two outputs: total loans net of allowances for doubtful accounts and total other earning assets; and two fixed netputs: physical capital and equity. For the non-parametric approach, this study considers three inputs: total interest expenses, personnel expenses, and physical capital expenses; and two outputs: total loans net of allowances for doubtful accounts and total other earning assets.

Further, the correlation analysis is conducted to study the correlation between the inefficiency/efficiency score and other factors. The other purpose of the correlation analysis tends to explain the difference of average efficiency levels among

three time periods, especially the difference between the pre-crisis and post-crisis periods. The generalized least square will be used to estimate the correlation. The dependent variable is efficiency or inefficiency scores generated with different methods (parametric, non-parametric, and the combined parametric and non-parametric approaches). The correlation analysis considers 15 independent variables including macroeconomic environmental variables, banking industry environmental variables, bank general and financial characteristic variables. The changing regulations and more liberalization of the Thai banking industry are also reflected in these factors. Macroeconomic environmental variables include annual real gross domestic production growth rate, crisis and post-crisis dummies, inflation. Banking industry environmental factors and bank's general information consist of large and medium size (classified by the size of total assets) dummies, private or government (whether a bank is privately- or state-owned) dummy, foreign ownership (to reflect the lift of the foreign limit control), the age of the bank, and the market power or share of large banks (it also reflects the competition level of the banking industry). The banks' specific financial characteristics taken into account are: the capital ratio (to reflect the capital risk), ratio of non-interest income to interest income (to reflect the market risk), ratio of deposit to total liability (to reflect the portion of the cheapest input), ratio of provision to loan (to reflect the credit risk), and ratio of loan to deposit (to reflect the liquidity risk).

The rest of the paper is organized as follows: the background and development of Thai commercial banks are detailed in chapter 2; chapter 3 reviews the literature on the bank efficiency; methodology and data are discussed in chapter 4; empirical results are presented in chapter 5; and chapter 6 concludes.