The Evaluation of Bank Efficiency in Post Merger Stage in Banking Industry

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ABSTRACT

This research evaluated the technical efficiency of the banks before and after the merger. This research observed 15 banks which were involved in merger activities. This research used the Data Envelopment Analysis (DEA) method with Variables of Returns to Scale (VRS) and input orientation. Analysis of Variance (ANOVA) was also applied to test the difference between the technical efficiency in pre- and post-merger activities. This research finds that only six banks are efficient after the merger. Furthermore, four banks have a better technical efficiency than before, and five banks have lower technical efficiency after the merger.

Keywords: bank technical efficiency, merger stage, Analysis of Variance, Data Envelopment Analysis

INTRODUCTION

Banking is a sector that has an important role to the national infrastructure development. Banking serves as the financial intermediary for those who have excess fund and for those who lack funds. Moreover, the role of the national banking system needs to be improved in accordance with its function in collecting and distributing public funds by paying more attention to financing as the priority sector of the national economy. Those priority sectors are the cooperatives, small and medium enterprises, and various segments of society without discrimination. Therefore, it will ultimately strengthen the structure of the national economy. Based on data taken from the Indonesian central bank (Bank Indonesia) in 2012, banking sector disbursed loans to the real sector more than Rp2.700 trillion. That total bank credit is extremely significant to encourage the real sector. Therefore, the performance of banking is a factor that influences the performance of the national economy.

Banks that have obtained the merger permission or consolidation is obliged to compile the closing balance of each bank that merge or consolidate, prepare the balance sheet of banks resulted from the merger or consolidation, and announce the merger or consolidation accompanied by the opening balance sheet of bank mergers or consolidated in daily newspapers that circulates no more than thirty days from the validity date of the merger or consolidation. The banks also need to submit reports on the implementation of merger or consolidation to Bank Indonesia no later than ten days after the date of announcement by attaching a copy of the base budget amendment or a copy of the establishment deed. It includes the base budget that already has the approval of an authorized agency and clipping the daily newspaper of the announcement. This is done to encourage better performance of the banks. Policy makers and banks have undertaken various strategies. A strategy or policy that is currently used to improve the performance of banking is the banking consolidation or merger strategies. With the merger strategy, the banks are expected to gain operating cost synergies and economies of scale so it could avoid the risk of business failure. More importantly, the merger is to encourage the improvement of the efficiency of these banks. Related to that, it is important to assess the impact of the bank mergers on the efficiency of the post-merger bank.

Regarding the impact of the merger on the efficiency, several previous researches have already done the analysis. Nevertheless, the conclusion obtained is different. For example, Hadad *et al.* (2003) and Santoso (2010) found that the merger did not always produce efficiencies. The impact of the merger is affected by the business scale in the merging banks (Drake & Hall, 2003). Then, Avkiran (1999) found inefficiencies in the bank, which was acquired after the acquisition or merger occurred. Regarding these results, it is necessary to analyze the merger impact on the banks in Indonesia with the latest approach and period.

This research aims to analyze the technical efficiency of banks before and after the merger. This research differs from previous researches because it includes a comparison of banks with the same type of the banks in pre- and post- merger. For example, Mandiri bank is a bank merger with the type of Persero. It will be benchmarked with other Persero bank before and after the merger. This research also analyzes the difference of the technical efficiency before and after the merger.

This research has policy implications that can be applied to the banking sector in Indonesia. From these results, policymakers could encourage inter-bank merger if the merger could create synergies and improvement in bank efficiencies in Indonesia. Conversely, if the bank mergers do not generate any noticeable efficiency, then the bank's merger strategy needs to be reevaluated, so it will not harm the whole banking sector and the economy.

From the various phenomena described, this research formulates two main issues that have to be addressed. First, it is about what the level of banking efficiency after the merger is in Indonesia. Second, it is whether there are significant differences in efficiency between the period of before and after the merger or not. Related to the problems that have been formulated, this research to obtain banking efficiency level after the merger in Indonesia and to analyze the technical efficiency of banks before and after the merger

A merger in the banking sector is an amalgamation two or more banks. It is done by maintaining the existence of one bank and another bank dispersing without liquidating beforehand. Meanwhile, consolidation is a merging of two or more banks by establishing a new bank and disbanding those banks without liquidating beforehand. Then, the acquisition is the takeover of ownership of a bank which results in the shift of control to the bank. The control is the ability to determine, directly or indirectly the management or policies of the bank.

Merger, consolidation, and acquisition of bank can be made on the initiative of the bank concerned. This merger permission may be granted if such requirement has gained the approval of the general meeting of shareholders at the time of the total assets of bank mergers is no more than 20% of the total assets of the entire bank in Indonesia. Moreover, the capital of bank mergers complies with the minimum capital adequacy ratio set by Bank Indonesia, prospective commissioners, and directors of the bank resulting from the merger. It is compliant with the regulation of Bank Indonesia that governs the management of the bank.

Merger, consolidation, and acquisition can be done because of the request from Bank Indonesia. This permission could be granted if Bank Indonesia judges the bank currently experiencing difficulties that could endanger its survival. Also, if the bank is not able to implement the corrective measures stipulated by Bank Indonesia, Bank Indonesia may request the owners and managers from the respective bank to merge or consolidate with another bank or sell some or all of its ownership to the bank or the other party.

Furthermore, merger, consolidation, and acquisition of banks can be done by the initiative of the specialized agencies. However, this specialized agency has to request permission first from Bank Indonesia to conduct merger, consolidation and acquisition of banks whose ownership has been taken over by the specialized agencies according to Surat Keputusan Direksi Bank Indonesia nomor 32/51/KEP/DIR/1999 (Bank Indonesia Director's Decree Number 32/51/KEP/DIR/1999).

The indicator of a successful merger strategy is when the merger is successful on creating a synergy where the post-merger bank could generate greater profits than the profit achieved before the merger. The condition is caused by a better level of efficiency because of the new synergies that can boost the economies of scale derived from the complementary resources and better production processes (Hitt *et al.*, 2002). Coyle (2000) stated that if there were synergies, there would be no benefit from the merger and the merger would ultimately worsen the performance of the company or the bank mergers. According to him, there are four synergies which could be created from the merger when it was properly managed. Those were the sales synergies, operating synergies, investment synergies, and management synergies. To measure the efficiency of the post-merger bank, the researcher uses a variety of analytical techniques used previously by researchers. In addition, several analytical techniques such as Stochastic Frontier Approach (SFA) and Data Envelopment Analysis (DEA) are utilized as well. In the analysis of banking mergers, DEA technique is more widely used since DEA does not need the assumption of a certain type of production function as it should be done at the SFA (Setiawan, Emvalomatis, & Lansik, 2012).

Regarding the impact analysis of the merger, Hadad *et al.* (2003) found that the merger in Indonesia during the period 2001-2003 in general improved the efficiency of the banking despite some merging banks had a decrease in its technical efficiency. Similarly, Santoso (2010) used DEA to measure the efficiency before and after the merger in 1998 to 2009 on the banks in Indonesia and concluded that the merger did not always produce efficiencies. However, the analysis does not do a comprehensive review of the technical

efficiency before and after the merger of the banks.

Then, Drake and Hall (2003) found that the merger carried out by major banks in Japan resulted in a low efficiency in the post-merger bank. However, the opposite happened to small-scale banks. The merger increased the economies of scale for the bank. Furthermore, Avkiran (1999) examined the technical efficiency, labor productivity, profit, and average efficiency related to the banking industry in Australia in 1986-1995. The research found that the acquiring bank was more efficient compared to banks that became an acquisition target. However, after the merger, the acquiring bank could not maintain the same level of efficiency as before. Recently, Liu and Tripe (2001) found that five out of six bank mergers had the better level of efficiency based on the financial ratios.

METHODS

This research uses the technical efficiency approach. Technical efficiency measurement was done by using DEA using Variable Returns to Scale (VRS) and the orientation of the input. VRS method is used because the analysis input consists of the different banks with different sizes. Meanwhile, the orientation of the input used for banking can easily reduce the variety of inputs related to output. In this research, the DEA method follows Coelli *et al*. (2005), and Setiawan, Effendi, Emvalomatis, and Lansik (2012). The equation is as follows.

$$\max{}_{\theta, \lambda} \phi,$$
$$\text{st} \quad -\phi q_i - Q\lambda \geq 0,$$
$$\text{x}_i - X\lambda \geq 0,$$
$$\text{I1'}\lambda = 1$$
$$\lambda \geq 0, \tag{1}$$

Where, $1 \leq \phi < \infty$, and $\phi - 1$ show the decline in the input that can be achieved by assuming the constant output. X and Q show the input and output for the whole of each bank.

This research also uses the intermediation approach to analyze the efficiency of the banking industry before and after the merger. Intermediation approach first was introduced by Sealey and Lindley in 1977. The intermediation approach is more appropriate to evaluate the overall financial institutions such as the terms of the fund intermediaries between savers and investors (Karray & Chichti, 2013). Table 1 shows

the various inputs and outputs used to calculate the technical efficiency of banks with the intermediation approach. It establishes the process such as production process.

For the input and output variables, several variables are chosen. First, total deposit is the sum of demand deposits, savings, time deposits, certificates of deposits, and deposits from other banks. Second, personnel and administration expenses include salaries and wages. It also consists of administrative expense include rent and promotions. Third, interest expense and commissions consist of all the expenses paid in the form of bank interest expense in Rupiah and foreign currencies. It includes the provision of paid commissions and bank in the form of commissions or provision of loans. Fourth, total credit represents loans provided by banks to borrowers. It is either related parties or parties that are not associated with the bank in Rupiah or foreign currency. Fifth, interest income and commissions are the total income of the bank in the form of all the interest in Rupiah and foreign currencies in its operations. It also includes the commission and provision income received on the loan.

Then, to analyze the technical efficiency difference between before and after the merger, this research conducts variance analysis by using F-statistics. If the F-statistic is greater than F-table or a p-value < α=10%, the null hypothesis stating that there is no difference between the technical efficiency before and after the merger is rejected.

This research also uses secondary data from the financial statements in the bank before and after the merger published by Bank Indonesia or Otoritas Jasa Keuangan (OJK) starting from 1998 to 2010. The other data are obtained from various official sources in Bank Indonesia such as from Departemen Perizinan dan Informasi Perbankan (2012, 2013), and other concerning banks. Meanwhile, the related reference from journals, papers, and other materials are derived from the library, the Internet and other sources.

The unit analysis is the commercial bank that merged during the period 1998-2010. This research analyzes the four-year period before and after the merger. Furthermore, the evaluation considers the availability of data in the banks that are merged and the merging year of the bank in question. Then, 15 bank mergers in 1998 -2010 are chosen and examined. Table 2 shows a sample list of banks that are merged in 1998 - 2010.

Table 1 Selection of Variable Input and Output for Intermediation Approaches

KODE	VARIABLE	INPUT/OUTPUT	SOURCE
X1	Total deposit	Input	Balance
X2	Personnel and administration expenses	Input	Profit and Loss
X3	Interest expense and commissions	Input	Profit and Loss
Y1	Total credit	Output	Balance
Y2	Interest income and commissions	Output	Profit and Loss

Table 2 Research Sample List

No.	Bank Name	Merger Year
1	Bank Mandiri Persero Tbk	1998
2	Bank Danamon Indonesia Tbk	2000
3	Bank Mizuho Indonesia	2000
4	Bank Permata Tbk	2001
5	Bank Sumitomo Mitsui Indonesia	2001
6	UFJ Indonesia Bank	2001
7	Bank Century/Mutiara	2004
8	Bank Artha Graha International	2005
9	Bank of Tokyo Mitsubishi UFJ Ltd	2006
10	Bank Commonwealth	2007
11	Bank Windu Kentjana International Tbk	2007
12	Bank ICBC Indonesia	2007
13	Bank CIMB Niaga Tbk	2008
14	Bank Index Selindo	2008
15	Bank OCBC-NISP	2010

(Source: Bank Indonesia, 2013)

RESULTS AND DISCUSSIONS

The estimation of technical efficiency of banks before and after the merger is done by using (DEA). From DEA calculation method, it obtains technical efficiency as shown in Table 3 (see appendix).

Table 3 shows that on average the technical efficiency of the bank mergers is better than before the merger. Ten banks have better efficiency and can maintain its efficiency. Bank Mandiri Persero Tbk, Bank Danamon Indonesia Tbk, Bank Sumitomo Mitsui Indonesia, UJF Bank Indonesia, Bank of Tokyo Mitsubishi UFJ Ltd, and Bank CIMB Niaga Tbk are the banks that become efficient after the merger. It is seen that after the merger, the banks have an efficiency level equaling to one specifically for Bank of Tokyo Mitsubishi UFJ Ltd. The bank is a combination of efficient banks before the merger and can maintain its level of efficiency after the merger. Bank of Tokyo Mitsubishi UFJ Ltd is a combination of Bank UFJ Indonesia and Bank of Tokyo Mitsubishi.

Moreover, Table 4 shows the banks the average technical efficiency with four year period (before and after the merger). The banks that have better technical efficiency after the merger although it is still not efficient because the technical efficiency is less than 1 is Bank Permata Tbk, Bank Commonwealth, Bank Index Selindo, and Bank OCBC-NISP. Then, the banks that have a lower efficiency after a merger are Bank Mizuho Indonesia, Bank Century/Mutiara, Bank Artha Graha International, Bank Windu Kentjana International Tbk, and Bank ICBC Indonesia.

Furthermore, the Analysis of Variance (ANOVA) is applied to test the differences in the average technical efficiency of four years before and after the merger. Table 5 (see appendix) shows the results of the analysis. It shows that there is no significant difference between the efficiency before and after the merger at a significance level of 5%.

Although on average the merger has a positive impact on technical efficiency, differences in technical efficiency are still not significant because the increase and decrease of technical efficiency after the merger are relatively small compared to the efficiency before the merger.

Table 4 Average Efficiency Before and After Merger

Bank Mergers	Average Technical Efficiency	
	Before Merger	After Merger
Bank Mandiri Persero Tbk	0,98	1,00
Bank Danamon Indonesia Tbk	0,68	1,00
Bank Mizuho Indonesia	0,97	0,85
Bank Permata Tbk	0,63	0,89
Bank Sumitomo Mitsui Indonesia	0,95	1,00
UFJ Indonesia Bank	0,90	1,00
Bank Century/Mutiara	0,78	0,62
Bank Artha Graha International	0,95	0,89
Bank of Tokyo Mitsubishi UFJ Ltd	1,00	1,00
Bank Commonwealth	0,69	0,74
Bank Windu Kentjana International Tbk	0,89	0,74
Bank ICBC Indonesia	1,00	0,94
Bank CIMB Niaga Tbk	0,95	1,00
Bank Index Selindo	0,83	0,94
Bank OCBC-NISP	0,48	0,65

(Source: Bank Indonesia, 2013)

CONCLUSIONS

This research analyzes the technical efficiency of the bank mergers before and after the merger using DEA. The analysis is also performed to test whether there are differences in the technical efficiency of these banks between before and after the merger using

analysis of variance (ANOVA). It finds that not all banks that merger have better technical efficiency. Out of the 15 bank mergers in this sample, 10 banks have better technical efficiency with 6 banks are efficient and have the technical efficiency = 1. Furthermore, five bank mergers in the sample have worse technical efficiency than before the merger. However, this research does not find a significant difference between the technical efficiency before and after the merger.

From this research, policy makers in the banking sector should conduct an in-depth study on the proposed merger or acquisition of banks because bank mergers occurred is not likely to generate efficiencies. If the merger does not generate any efficiency, it will be better not to approve it. It would harm the bank and have an impact on banking customers.

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Appendix

Table 3 Technical Efficiency Before and After Merger

Merger Year	Bank Name	I	II	III	IV	I	II	III	IV
1998		**Before Merger**							
	Bank Bumi Daya, Bank Dagang Negara, Bank Ekspor Indonesia, dan Bank Pembangunan Indonesia								
	Average efficiency	0,98	0,97	1,00	0,98				
		After Merger							
						Bank Mandiri Persero Tbk			
	Average efficiency					1,00	1,00	1,00	1,00
2000		**Before Merger**							
	Bank Tiara, Bank Duta, Bank Rama, Bank Tamara Bank Nusa Nasional, Bank Pos Nusantara, Jayabank Internasional, Bank Risjad Salim								
	Average efficiency	0,94	0,51	0,74	0,51				
		After Merger							
						Bank Danamon Indonesia Tbk			
	Average efficiency					1,00	1,00	1,00	1,00
2000		**Before Merger**							
	Bank Dai Ichi Kanggo, Bank IBJ								
	Average efficiency	0,95	1,00	0,95	0,99				
		After Merger							
						Bank Mizuho Indonesia			
	Average efficiency					1,00	0,75	0,84	0,81
2001		**Before Merger**							
	Bank Bali, Bank Artha Media, Bank Universal, Bank Patriot, Bank Prima Express								
	Average efficiency	0,53	0,71	0,63	0,64				
		After Merger							
						Bank Permata Tbk			
	Average efficiency					1,00	0,79	0,92	0,84
2001		**Before Merger**							
	Bank Sumitomo Mitsui, Bank Sakura Swadarma								
	Average efficiency	1,00	1,00	0,88	0,92				
		After Merger							
						Bank Sumitomo Mitsui Indonesia			
	Average efficiency					1,00	1,00	1,00	1,00
2001		**Before Merger**							
	UFJ Indonesia Bank, Tokai Lippo Bank								
	Average efficiency	0,84	0,82	0,92	1,00				
		After Merger							
						UFJ Indonesia Bank			
	Average efficiency					1,00	1,00	1,00	1,00
2004		**Before Merger**							
	Bank Pikko, Bank Danpac, Bank CIC								
	Average efficiency	0,87	0,72	0,85	0,66				
		After Merger							
						Bank Century/Mutiara			
	Average efficiency					0,79	0,47	0,59	0,61
2005		**Before Merger**							
	Bank Artha Graha, Bank Inter Pacific								
	Average efficiency	0,85	0,97	0,99	0,99				
		After Merger							
						Bank Artha Graha International			
	Average efficiency					0,93	0,85	0,88	0,91

Table 3 Technical Efficiency Before and After Merger (Continued)

Merger Year	Bank Name	I	II	III	IV	I	II	III	IV
2006		**Before Merger**							
	UFJ Indonesia Bank, Bank of Tokyo Mitsubishi								
	Average efficiency	1,00	1,00	1,00	1,00				
		After Merger							
						Bank of Tokyo Mitsubishi UFJ Ltd			
	Average efficiency					1,00	1,00	1,00	1,00
2007		**Before Merger**							
	Bank Commonwealth Indonesia, Bank Artha Niaga Kencana								
	Average efficiency	0,55	0,63	0,77	0,80				
		After Merger							
						Bank Commonwealth			
	Average efficiency					0,56	0,59	0,81	1,00
2007		**Before Merger**							
	Bank Multicor, Bank Windu Kentjana								
	Average efficiency	0,86	0,97	0,88	0,85				
		After Merger							
						Bank Windu Kentjana International Tbk			
	Average efficiency					0,64	0,64	0,86	0,81
2007		**Before Merger**							
	Bank Halim, Bank ICBC								
	Average efficiency	1,000	1,000	1,000	1,000				
		After Merger							
						Bank ICBC Indonesia			
	Average efficiency					1,00	0,90	0,87	1,00
2008		**Before Merger**							
	Bank Niaga, Bank Lippo								
	Average efficiency	0,85	1,00	1,00	0,94				
		After Merger							
						Bank CIMB Niaga Tbk			
	Average efficiency					1,00	1,00	1,00	1,00
2008		**Before Merger**							
	Bank Harmoni Internasional, Bank Index Selindo								
	Average efficiency	0,70	0,92	0,80	0,89				
		After Merger							
						Bank Index Selindo			
	Average efficiency					0,85	1,00	0,91	1,00
2010		**Before Merger**							
	Bank NISP, Bank OCBC Indonesia								
	Average efficiency	0,64	0,46	0,40	0,40				
		After Merger							
						Bank OCBC-NISP			
	Average efficiency					0,62	0,68	0,64	-

Table 5 Variance Analysis

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0,011867	1	0,011867	0,533519	0,471199	4,195972
Within Groups	0,622802	28	0,022243			
Total	0,634669	29				

(Source: Bank Indonesia, 2013)