Cost Efficiency of Indonesia's Banking Industry:
A Comparison between Community Development Banks, Government Banks and Private Banks

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Abstract

The unique characteristic of the banking system in Indonesia is the existence of a community development bank (CDB), which is owned by the local government. This study tested the efficiency of costs against other types of banks, namely private bank and Government-owned banks. The sample of the study consisted of 15 community development banks, 56 private banks, and 3 Government bank from 1995 until 2006. Using the methodology of panel data, we find that the efficiency community development banks are at least as good as other types of banks. There are two explanations of this finding is, first, the CDB received high deposits from local government , the second, the CDB doesn't need to pay interest to the Government of the region. Third, the staffs of the community development banks accept smaller salaries than private banks. To our knowledge, this is the first study that looks at the cost-efficiency of community development banks as compared to other types of banks of banks in Indonesia. Meanwhile, the average efficiency cost of the bank the Government is higher than for CDB and private banks. Banks that has the equity number of over IDR 100 billion was more efficient than the bank had a total equity of less than IDR 100 billion.

1. Introduction

The use of financial ratios to measure the performance of the bank has some weaknesses. First, the use of accounting data does not show the market value is now something of an asset [1]. Second, the uses of financial ratios do not take into account of the prices of inputs and outputs in the performance measure [2]. Third, financial ratios can be used by using a few pointers and occasionally conflicting indications with other instructions.

To address the financial ratio analysis approach, Rouse suggested that the bank's performance was assessed using financial ratios and non-parametric technique [3]. Merging both techniques this analysis can yield better performance indicators because of the weakness of the approach on a technique will be offset by other analysis techniques. Data envelopment analysis (DEA) proposed by Charnes et al. [4] is one of the non-parametric approach which is the most popularly used to measure the efficiency of the bank. DEA look at the bank efficiency in the use of inputs to produce outputs [4].

The results of research in many countries showed private-owned banks have efficiency costs better than the Government bank [5,6]. Meanwhile, Pasiouras et al. [7] and Dong [8] finding a Government bank has the efficiency cost is higher than the private banks. In Indonesia, the research conducted by Wardana and Djumahir [9] found that there is no difference in the efficiency of private banks with a Government bank in Indonesia. Because there is a difference between the results of the cost-efficiency study of Government banks and private banks and there is no research looking into bank owned by a region, namely CDB, then the paper is doing more detailed research about the cost-efficiency of private banks, the Government and the CDB bank in Indonesia needs to be done. The general objective of this research is to find factors that affect cost efficiency in banking in Indonesia.

2. Literature Review

2.1. Factors that affect cost efficiency

2.1.1. The Bank's Ownership Structure

The structure of ownership is one of the variables that are frequently used in the study of efficiency level of the bank. The Bank which has a different ownership structure will have the problem of different agencies. For example, the efficiency of Government-owned banks may be lower than private banks because of the Government-owned bank has a higher political interests, less competence and have low corporate governance [10]. However Government-owned bank, the bank may be more efficient than private banks because in the uncertain economic conditions, the Government will ensure the survival of the bank with the help of capital, reshaping the debt and eliminate the non-performing loan.

Andries and Cocris [5] researched the efficiency of banks in Romania, Czech Republic and Hungary from the period 2000-2006. The results showed that private-owned banks have a higher cost efficiency of Government banks. They proposed that to increase efficiency of the Government banks, the quality of the assets needs to be increased by improving the process of customer loans, lowering the amount of non-performing loan and reduce the administrative costs of the bank. Kaur and Kaur [6] examine the cost-efficiency of the private bank and India Government bank's from the period 1990-1998. The results showed that private-owned banks have a higher cost efficiency of Government banks with a score of 47.4% to 73.4% and private bank to the Government bank

Dong [8] examined 397 banks in China from the period 1994-2007. The results showed that Government-owned banks has higher cost efficiency than private banks because the government banks receive subsidies that are higher than the Government and got an indirectly assurances from the Government. So, Government-owned banks have lower bankruptcy risk and can attract more funds by offering lower rates loan. The results of this research are the same as Mohanty et al. [11] investigated 23 banks in Taiwan from the period 1996-2011. The results showed that Government-owned banks has higher cost efficiency than private banks because of the Government-owned bank is more trusted by the public and more accepted by the community as compared to private banks. In addition, Government-owned banks have a higher cost-efficiency because it can operate with higher scale economies than the private banks.

Pasiouras et al. [7] examined the 3.086 bank in 88 countries in the world from the period 2000-2004. The results showed that the Government bank has higher cost efficiency than private banks because of the Government-owned bank can control and minimize the bank operating cost Meanwhile, Sofyan [12], Karim et al. [13] and Alsalkhadi and Al-Mwalla [14] found that bank ownership does not affect the efficiency cost

2.1.2. Bank Status

Foreign Exchange Bank is a bank that was given permission to offer the service of foreign exchange transactions which led to an increase in the operating income of the bank and will further increase the efficiency of the bank. But the bank should increase the cost of operation and this will reduce the cost-efficiency of the bank. Based on studies of researchers, there is no study that tested the effects bank status towards bank efficiency

2.1.3. The Minimum Equity Requirement

A high amount of equity can improve efficiency because the bank can achieve an economic scale. This shows that the banks have capital of less than IDR 100 billion may not be as efficient as the bigger banks. In addition to high operating costs and low profits, small capital banks will have difficulty to run various business operations or taking higher risk like derivatives activities. This will affect the cost-efficiency of the small capitalized banks. Based on studies of researchers, there is no research that tested the influence of the minimum equity requirement towards the efficiency of the bank.

2.1.4. The Financial Crisis

The financial crisis affects cost-efficiency because the bank pays a higher interest rate than deposits resulting from the rise in market interest rates. In addition, the financial crisis will also lead to a reduced demand for loans by customers and this will affect the efficiency of the bank negatively. Janoudi [15] examines 141 private banks in Europe from the period 2004-2010. The research found that the financial crisis has negative effects towards cost efficiency. The results of this research are the same as the results of Maredza and Ikhide [16] research which examines four banks in North Africa from the period 2000-2010.

2.1.5. Economic Growth

During the good economic growth, banks will loosen lending standards such as loan assessment and monitoring of the borrowers. This will affect the amount of the loan and the operating costs of a bank and so on which will affect the cost efficiency of a bank. Frimpong et al research results [17] found that economic growth has a negative influence against the efficiency of 25 banks in Ghana from the period 2001-2010. This shows that good economic growth make the bank more dare to take risks and this will lead to an increase in the number of non-performing loans so as to reduce the cost efficiency.

2.2. Control Variables

2.2.1. Equity to total assets ratio

Equity is one of the factors that can affect the level of cost efficiency. Equity is the ability of a bank to deal with the possibility of losses. So the amount of the bank equity can establish a security the level of a bank. This will affect the confidence of the customer against the bank and its subsequent will affect customer wishes to store in the bank. The next Bank would issue larger loans than the storage. This will improve the cost efficiency of a bank.

The research on the influence of the equity on the bank cost efficiency of has not settled any agreement yet. Darrat et al. [18], Kablan [19], Tochkov and Nenovsky [20], Jimborean and Brack [21], San et al. [22], Ahmad and Mohammad Noor [23] and Janoudi [15] found that the ratio of equity had positive influence towards cost efficiency. Meanwhile, Pasiouras et al. [7], Sofyan [12], Mohanty et al. [11] and Frimpong et al. [17] found that the equity ratio has influence negatively to cost efficiency. Finally, Alsalkhadi and Al-Mwalla [14] found that the ratio of equity not affecting the cost efficiency.

2.2.2. Loan to total assets ratio

Loan ratios against total assets assess the ability of the banks to change their assets on loan. The higher the ratio, the higher the loan cost efficiency. Sofyan [12] found that the ratio of loans having a positive influence towards cost efficiency. Meanwhile, Ahmad and Mohammad Noor [23] and Janoudi [15] found that the ratio of the loan have negative influence towards cost efficiency. Finally, Darrat et al. [18], San et al. [22] and Ismail et al. [24] found that the ratio of the loan does not have an impact on cost efficiency.

2.2.3. Operating costs to total assets ratio

The bank's operating cost management is very important because it will affect the cost efficiency of the bank. Even if operating costs decreased, cost efficiency will increase. This shows that the bank efficiently will ensure that operational costs are under control. The research results of Ahmad and Mohammad Noor [23] and Ismail et al. [24] found that the ratio of operating expenditure have negative influence towards cost efficiency.

2.2.4. Deposit to total loan ratio

Deposits of clients can be converted into a loan. It will then be able to increase operating revenue and efficiency of the bank. Research results of Vu and Turnell [25] and Paul et al. [26] find the ratio of the number of loans against deposits have positive influence towards the efficiency of the bank. This indicates that the deposit which turns into loan will increase a profitable bank operational

3. Research Methodology

The sample of the study consisted of 15 community development banks, 56 private banks, and 3 Government bank from 1995 until 2006. The DEA method has been introduced by Charnes, Coopers and Rhodes [4]. This method assumes constant return to scale or CRS. This review has been using CRS-oriented inputs such as research conducted by Pavero and Papi [27], Das and Ghosh [28], and Foroughi and Zoysa [29]. CRS is oriented input chosen because bank managers have limited control towards output and also suitable in the banking industry [29].

To compute cost efficiency for a particular bank (j), we first find the minimum cost of producing outputs, given input prices (w). Assume that there are n banks, utilizing m different inputs, to produce s different outputs. Minimum cost is calculated by the following linear programming problem:

$$Min_{I_i} \sum_{i=1}^{m} w_i I_i,$$

$$\text{s.t} \sum_{j=1}^{n} \lambda_j O_{rj} \geq O_{rjo}$$

$$\sum_{j=1}^{n} \lambda_j I_{ij} \leq I_{ijo}$$

$$\sum_{j=1}^{n} \lambda_j = 1,$$

$$\lambda_j \geq 0.$$

Where for bank j, λj and wj are the intensity variables and input prices, respectively. Orj is the rth output variable of the bank; Iij is the ith input variable of the bank; $Orjo$ is its observed output vector; and $Iijo$ is its observed input vector. Cost efficiency for bank j is measured by the ratio of minimum cost to actual cost incurred by the bank.

To specify the input and output variables that are most relevant, researchers disagree [26,28,29,30,31]. This study chose the deposits, assets and operating costs as variable input to an output variable is a temporary bank profits and lending operations.

3.1. Testing Data for cost efficiency

James Tobin introduced limited dependent variables [32]. The model introduced by Tobin, or better known as a model of Tobit, according to be used when the dependent variable values between zero to one. Because of the efficiency of the bank can't lower than zero and cannot be higher than one, then the model is very appropriate to use Tobit.

Tobit model equations are:

$Efficiency_{it} = \alpha + \beta_1\ DGOVERMENT_{it} + \beta_2\ DCDB_{it} + \beta_3\ DDEVISA_{it} + \beta_4\ DEQUITY_{it} + \beta_5\ DCRISIS_{it} + \beta_6\ EG_{it} + \beta_7\ EQUITY_{it} + \beta_8\ LOAN_{it} + \beta_9\ COST_{it} + \beta_{10}\ DEPOSIT_{it} + \varepsilon_{it}$

Where i refer to bank, t refers to the years and

$Efficiency_{it}$: Cost efficiency.

$DGOVERMENT_{it}$: A dummy variable takes the value of one to the Government-owned bank and empty to other banks

$DCDB_{it}$: A dummy variable takes the value of one to the Government-owned bank and zero to other banks

$DDEVISA_{it}$: A dummy variable takes the value one for foreign exchange bank and zero to other banks

$DEQUITY_{it}$: A dummy variable takes the value of one to the total number of equity of IDR 100 billion while the rest of the equity amount to zero.

$DCRISIS_{it}$: A dummy variable takes the value of one for the years 1997, 1998 and 1999 and zero for the rest of the year.

EG_{it} : Indonesia's annual economic growth variable.

$EQUITY_{it}$: Equity to total assets.

$LOAN_{it}$: Loan to total assets.

$COST_{it}$: Operating cost to total assets.

$DEPOSIT_{it}$: Deposit to total loan.

4. Result and Discussion

The results of the analysis using the method of Tobit Model 1 and Model 2 are shown in table 1. Results of the study found that cost-efficiency by using assumptions analysis Tobit model influenced significantly at a rate of one percent by dummy variable of Government bank (DGOVERMENT). Other variable was not significant.

Cost efficiency of Government-owned banks is better than private banks caused by two things. First, the Government guarantee will help the bank from bankruptcy if there is something problem such as non-performance loan. Second, the government bank serves as storage of funds (budget income and expenditure of the country or (state budget) and this can increase the amount of deposits to the Government bank. With the high amount of deposits the Government bank's sought to give larger loans compared to private banks. The results of this research are the same as Cocris [5], Pasiouras et al. [7], Dong [8], Andries and and Mohanty et al. [11].

Table 1
Results of Regression Tobit

| Variable | Tobit | | Random Effect | |
	Tobit: Model 1	Tobit: Model 2	Tobit: Model 1	Tobit: Model 2
Constan	0.5703 (0.028)**	0.7012 (0.000)***	0.56048 (0.038)**	0.7005 (0.000)***
DGOVERMENT	0.2731 (0.0000)***	0.3113 (0.0000)***	0.2716 (0.000)***	0.3113 (0.000)***
DCDB	0.0351 (0.171)	0.0474 (0.026)**	0.0343 (0.217)	0.0475 (0.037)**
DDEVISA	-0.0192 (0.433)	-	-0.0197 (0.456)	-
DEQUITY	-0.0258 (0.362)	-0.0309 (0.078)*	-0.0238 (0.407)	-0.0299 (0.099)*
DCRISIS	-0.0011 (0.966)	-	0.0018 (0.943)	-
EG	-0.0001 (0.958)	-	-0.0002 (0.934)	-
EQUITY	-0.0545 (0.536)	-	-0.0665 (0.460)	-
LOAN	0.0065 (0.680)	-	0.0065 (0.685)	-
COST	-0.0043 (0.959)	-	-0.0127 (0.883)	-
DEPOSIT	-0.0014 (0.633)	-	-0.0018 (0.552)	-
Prob > chi2	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.2239	0.2151	-	-
Log likelihood	-101.35844	-102.5185	-100.74771	-102.0427
Number observation	888	888	888	888

*, ** and *** denote significance at the 10%, 5% and 1% level, respectively, p-value in parentheses

Model 2 shows the research results in insignificant variables are discarded one by one starting with the least significant variables. Finally there are only three variables that are significant, namely DGOVERMENT, DCDB and DEKUITI. A positive coefficient for DGOVERMENT and DCDB indicates that both form of the bank is more efficient than private banks. Meanwhile, the bank's capitalization is less than the IDR 100 billion has lower cost efficiency.

Community development banks cost efficiency better than private banks because of the amount of deposits received by bank regional development from local government is high. In addition, the community development banks don't need to pay interest to the Government of the region and this can reduce the operating costs of the community development banks. In addition, the staff of the community development banks accepts smaller salaries than private banks. This can reduce the operating costs of the community development banks and increase the cost efficiency of the community development bank.

Loan has been also only given to staff of local government that has the ability to repay the loan.

Banks that has the equity number of over IDR 100 billion was more efficient than the bank had a total equity of less than 100 billion rupiah. This is caused by large-sized banks can continue their operations without getting high deposit which in turn can reduce the interest expenditure which must be paid to the customer. These conditions led to their increased operating profit and will further improve cost efficiency. A high amount of equity can also avoid the bank from making loans between banks with high costs, while it can improve the cost efficiency of the bank.

5. Conclusion

In this paper, we examine the performance of the community development banks, Government-owned banks and private banks in Indonesia from 1995 to 2006. Our study reveals interesting results. We found that the community development banks and the Government-owned bank efficiency better than private banks.

Community development banks cost efficiency better than private banks because the cost of operating the community development banks is lower than private banks because community development banks do not need to pay the deposit rates to local governments and smaller staff salaries. Government-owned banks cost efficiency better than private banks because the Government guarantee will help the bank from bankruptcy if there is some problem such as non-performing loan. In addition, the bank serves as a storage funds for government (budget income and expenditure of the country or state budget. Banks that has the equity number of over IDR 100 billion was more efficient than the bank which had a total equity of less than IDR 100 billion.

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