

Assessing the Performance Efficiency of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) in Banyumas Area Using Data Envelopment Analysis

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ABSTRACT

This research is entitled “Assessing the Performance Efficiency of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) in Banyumas Area Using Data Envelopment Analysis”. The objectives of this research are: to analyze the efficiency of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) financial performance using the DEA analysis; and to compare the efficiency between Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) since 2008-2009. The hypotheses are the Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) has an efficient financial performance and, the Conventional Rural Bank (BPR) is more efficient as compared to Islamic Rural Bank (BPRS). The method analysis in this research is data envelopment analysis (DEA). Based on the results of the analysis and discussion, it can be concluded that the Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) has an efficient financial performance and, the Conventional Rural Bank (BPR) is more efficient as compared to Islamic Rural Bank (BPRS). Based on the conclusions, the implications could be made as follows: This research is only done at the conventional rural bank (BPR) and Islamic rural banks (BPRS) in Banyumas area. It is strongly advise that future studies should involve all conventional rural bank and Islamic rural bank, so that the result could reflect the efficiency of all conventional rural bank (BPR) and Islamic rural bank (BPRS).

Key words: Data envelopment analysis (DEA), conventional rural bank (BPR) and Islamic Rural Bank (BPRS).

1. INTRODUCTION

A. Research background

A bank is a financial intermediary that accepts deposits and channels those deposits into lending activities, either directly or through capital markets. A bank connects customers with capital

deficits to customers with capital surpluses (Kasmir, 2004: 2).

The most important concern is the unavailability of familiar indication on both cost and profit efficiency of Islamic banking operations. The majority of the past studies focused on every cost efficiency or profit efficiency (Fare et al., 2004; Fitzpatrick and

McQuinn, 2005; Akhigbe and McNulty, 2005). A study on one aspect of efficiency does not present a comprehensive evaluation of a state of efficiency of a bank. Studies by Chu and Lim (1998), Isik and Hassan (2002) and Maudos and Pastor (2003) emphasize the importance of investigating both cost and profit efficiency in the analysis of bank production efficiency. However, these studies were conducted on conventional commercial banks in Singapore, Turkey, Spain, and Australia respectively. Meanwhile, Malaysian studies conducted by Karim (2001) and Majid et al. (2005) only measured cost and technical efficiency of conventional banks. It is not possible to generalize their findings as conventional banks and Islamic banks that are two different entities and are operating in different economic environment and banking systems.

Paryati (2009) conducted a study with the title of Financial Performance Analysis of Islamic Banking in Indonesia by Using Data Envelopment Analysis (DEA) and work rate. The research took samples of 36 Islamic banks consisting of 3

public banks and 33 Islamic sharia business unit. From this study there are 25 banks that have been efficient. Research of Masyum (2005) about the performance analysis of commercial banks and Islamic banks. Involving the variable inputs of capital, labor, number of branch offices and the output variable of financing and third party funds. The conclusion of this research is that from 14 banks under investigation by the DEA analysis are 7 banks have reached a score of 100% efficiency, while still there are 7 banks that have not reached the maximum score.

Conventional Rural Bank (BPR) forms the largest group of conventional banking institutions participating in Indonesia. Total number of Conventional Rural Bank in 2010 had reached up to 1.706 units. Maneuver the total asset of the bank by the end of December 2010 amounted to IDR 45.7 trillion, while deposits and financing totaled IDR 36.6 trillion and IDR 43.8 trillion (Bank Indonesia, December 2010).

Meanwhile Islamic Rural Bank (BPRS) has grown rapidly over the last ten-years. The total number of Islamic Rural Bank in 2010 has

reached up to 150, with total asset as at end December 2010 amounted to IDR 2.8 trillion, and deposits and financing amounting IDR 1.6 trillion and IDR 2.1 trillion(Bank Indonesia, December 2010) .

The Conventional Rural Bank and Islamic Rural Bank industry has grown very rapidly in term of assets, deposits, financing base, over the past ten-years. Thus, it would be interesting to investigate whether the growth banks indicate higher efficiency level.

The contribution to the banking sector and national economy as well the issue of cost and profit efficiency for Conventional and Islamic banking is considerably as area of investigation. The purpose of this research is to measure the level of efficiency of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) using the application Data Envelopment Analysis (DEA). This research evaluates the performance of the operations efficiency aspect; particularly, both the cost and profit efficiencies of the Conventional and Islamic banks within the period of 2008-2009.

Based on that background of problems that emerge at Conventional Rural Bank and Islamic Rural Bank, this research is carried out under the title of: "Assessing the Performance Efficiency of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) in Banyumas Area Using Data Envelopment Analysis."

B. Research Question

1. To what extent have Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) been efficient in their financial performance if measured using Data Envelopment Analysis (DEA).
2.
 - a. Have Conventional Rural Bank (BPR) been more efficient in their cost efficiency as compared to the Islamic Rural Bank (BPRS)
 - b. Have Conventional Rural Bank (BPR) been more efficient in their profit efficiency as compared to the Islamic Rural Bank (BPRS)

C. Limitation of Research

1. The subject of this study is limited to Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) within the Banyumas area.
2. This research focuses on analyzing the performance of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) using Data Envelopment Analysis (DEA) method.

D. Research Objective

1. To analyze the efficiency of financial performance of Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS) in Banyumas area using the Data Envelopment Analysis.
2. To compare the efficiency between Conventional Rural Bank (BPR) and Islamic Rural Bank (BPRS).

E. Research Benefit

1. Theoretical Perspective
The result is expected to be useful as references for science in general,

especially knowledge about the financial performance.

The result also can be used as a reference for students majoring in economics to add insight and knowledge.

2. Practical Perspective

a. Company

The results of this research are to be used as references and information to assist the management of company in reaching a decision about the source of spending that will be used to finance corporate investment.

b. Investor

- 1) As advices for investors and prospective investors about the importance for financial performance analysis in considering investment decisions, so investors are not get disadvantaged because of poor company financial statements.

- 2) For consideration and evaluation of corporate finance for investors who invest capital, so in the

presence of the company's increase productivity.
investors will be able to

F. Research Framework

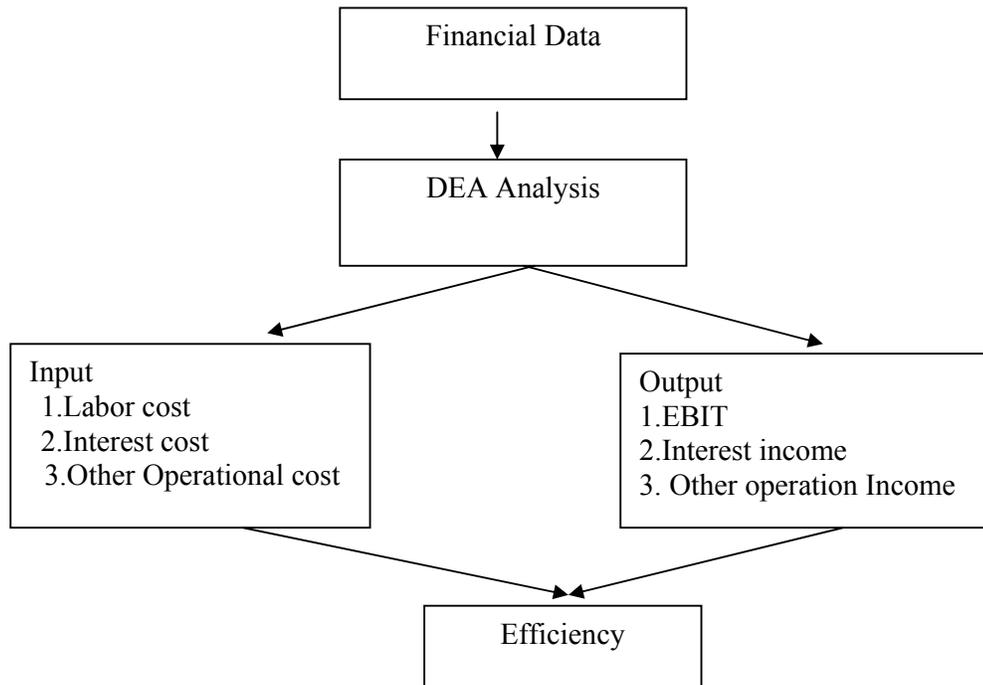


Figure1: The Research Framework

G. Hypothesis Formulation

Based on the basic theory and ideas that have been described above research hypothesis can be formulated as follows:

H1 : The Conventional Rural Bank (BPR) and Islamic Rural Bank have an efficient financial performance.

H2a: The Conventional Rural Bank (BPR) is more efficient as compared to Islamic Rural

Bank (BPRS) if measured of cost efficiency.

H2b: The Conventional Rural Bank (BPR) is more efficient as compared to Islamic Rural Bank (BPRS) if measured of profit efficiency

II. RESEARCH METHODS AND TECHNIQUES OF DATA ANALYSIS

A . Research Design

1. Scope of Research

This research is a case study that will examine the performance as reflected in the efficiency of the Conventional Rural Bank and Islamic Rural Bank in 2008 and 2009. The main data were achieved from the Purwokerto Indonesian Central Bank. The object of research consists of 19 Conventional Rural bank and 6 Islamic Rural Bank of Banyumas area.

2. Types and Sources of Data

Data used in this research is secondary data. Secondary data is data reported by a organization, this organization is not directly collect own but obtained from other parties who have collected and published advance (Djarwanto, 1998:9). In that case, this research also uses published secondary data in period 2008-2009 as the main data, such as balance sheet report, profit-loss report, productive asset quality report, and information of same of financial ratio. Respectively it is

obtained from each Conventional Rural Bank and Islamic Rural Bank, Indonesian Central Bank (BI) and some other data sources.

3. Data Collection Techniques

In this research, data collection was done by using the literature, which is a technique performed by finding the necessary literature associated with data and theory in this study. This literature study was obtained through Indonesian Central Bank (BI), IDX, the Internet, and various sources of support.

4. Population and Sampling Method

The population of this study comprising of are the Conventional and Islamic Rural Bank which are Banyumas area; they are 19 Conventional Rural Bank (BPR) and 6 Islamic Rural Bank (BPRS). Because of the small number of population, the method of sampling is the entire population of the total a member to be observed as a large sample tended to give or closer to the real value of the population or less can be said also error (deviation from the population value).

5. Specification of Input and Output

Specification of input and output used in this research is DEA model with the same variable. Input variables consist of: *Labor Costs(X1)* that are the expenses to be paid to workers in the form of salaries, wages, honorariums, fees and other educational, *Interest cost(X2)* that is an expense that must be paid to the customer and *Operational cost(X3)* that are general administrative

B. Analytical Technique

In this study, the variable returns to scale (VRS) DEA model to define the best-practice frontier in used. The VRS assumption ensures that each bank is only compared to other banks of a similar size when calculating its relative efficiency. Cost efficiency (CE) and profit efficiency (PE) are also measured.

1. Cost Efficiency (CE)

The costs of an organization depend on the vector of output y , on the vector of the prices of the inputs used w , and on the level of inefficiency in costs u . Thus, the cost frontier determines the minimum cost that each firm could attain,

expenses, personnel expenses, and foreign exchange transactions. In the meantime output variables consist of: *EBIT(Y1)* that is all income received from operating activities bank before deducting tax and interest, *Interest income(Y2)* that is income received by banks from loans and other productive assets non-performing and *Other operating income(Y3)* that is interest installment receipts that have been deleted off, and excess of cash

given its output vector y and the input price vector w , and can be expressed as:

$$C = C(y, w, u)$$

The cost efficiency for firm j (CE_j) can be calculated as follows:

$$CE_j = \frac{C_j^*}{C_j} = \frac{\sum_p W_{pj} X_{pj}^*}{\sum_p W_{pj} X_{pj}}$$

Where, $CE_j \leq 1$ represents the ratio between the minimum costs (C_j^*) which is associated with the use of the input vector (X_j^*) that minimizes costs and the observed costs (C_j) for firm j .

2. Profit Efficiency

Profit efficiency relates the profits generated with a specific production vector P to the maximum

possible profit associated with that vector as determined by the frontier P^* . As the study applies the alternative profit efficiency, instead of taking the price vector as given, it is assumed that the possibility of imperfect competition or market power in the setting of prices exists. Therefore, the output vector y is taken as given, but not that of output prices r . In this case the 'alternative' profit frontier under examination is:

$$P = P^a(y, w, u)$$

Alternative profit efficiency is then calculated as follows:

$$APE_j = \frac{P_j}{AP_j^*} = \frac{R_j - \sum_p W_{pj} X_{pj}}{R_j^* - \sum_p W_{pj} X_{pj}^*}$$

Where APE_j represents the ratio between the observed profits ($P_j = R_j - \sum W_{pj} - X_{pj}$) and the maximum profits ($AP_j^* = R_j^* - \sum W_{pj} X_{pj}^*$) associated with the maximum revenue and the input demand X_j^* that maximize profits for firm j .

3. Hypothesis Testing

To test the hypothesis about efficiency performance of bank, Cost efficiencies and profit efficiencies are used. The Cost efficiencies and profit efficiencies are obtained from the ratio of output to input. The value of efficiency is the ratio of input to

output will vary between 0-1. Banks are called efficient if the performance is approaching number 1 and the less efficient if it approaches 0.

Hypothesis is accepted if the values of efficiency are ≤ 1 ,

Hypothesis is rejected if the values of efficiency are > 1 .

Testing of the hypothesis saying the Conventional Rural Bank is more efficient compared to Islamic Rural Bank is by the model of t-test.

Hypothesis is accepted if Critical Ratio \geq t-table

Hypothesis is not accepted if Critical Ratio $<$ t-table

III. RESULTS AND DISCUSSION

A. General Overview

The function of bank as mediator institution (Intermediation role) has assignment to flow money from people with excessive money to people who really need money. Banking industry as one of money institutions that has essential role demanded to have a good work manner. One of important aspects to measure good work manner of banking corporation is efficiency that can be increased by reducing cost in production process.

People in Banyumas area who use the Rural Bank continue to rise, it is proved by the increasing number of Rural Bank in Banyumas area until the end of 2010 as many as 19 Conventional Rural Bank and 6 Islamic Rural Bank. On the other hand, an increasing number of Rural Bank resulted in competition between the performances of Rural Bank. Two financial performance observed in this study are profit efficiency and cost efficiency.

B. Analysis Result

1. Cost Efficiency of Conventional Rural Bank and Islamic Rural Bank

Overall the average cost efficiency of Conventional Rural Bank (0.8711) higher compared with the Islamic Rural Bank (0.6567); this shows Conventional Rural bank is better in managing fund to provide operational benefits. In the development of CE in 2009 Conventional Rural Bank had decreased while the Islamic Rural Bank increased.

Loans are a form of placement of funds by the Rural Bank. Credit is a source of

interest income and other operating revenue derived from the Rural Bank party other than interest income banking operations, such as commissions, fees, and the other is the output variable used in this study. Meanwhile, third-party funds collected will bring consequences costs such as capital costs, financing costs and operating costs for a Rural Bank which is the aspect in the management of assets and liabilities (Asset-Liability Management).

2. Profit Efficiency of Conventional Rural Bank and Islamic Rural Bank

Overall the average profit efficiency of Conventional Rural Bank is (0.9126) higher compared with the Islamic Rural Bank (0.7483). In general, profit efficiency of Conventional Rural Bank is almost close to one which means the entry in the category of efficiency. One reason the Conventional Rural Bank is better to reach a wider market share than any other bank. The advantages of

Conventional Rural Bank are to have properties that tend to be more actively market their products in traditional markets or at home industries. Conventional Rural Bank is more able to encourage the development of micro enterprises. This is the advantages of the Conventional Rural Bank in the form of its proximity to the customer.

3. Efficiency Of Individual Bank

The Act expressly states that the conventional rural bank as a kind of a bank which business activities are primarily intended

to serve small businesses and communities in rural areas. In the implementation of conventional rural bank efforts can run a business in the conventional or based on Islamic Principles. Therefore, in accordance with the authority of BI, the efficiency of conventional rural bank efforts is better than of Islamic rural bank (Table 1 and table 2) which have flexibility in applying the principles of banking

Table 1. Efficiency of Individual Bank

Name	Cost Efficiency			Profit Efficiency		
	2008	2009	Growth(%)	2008	2009	Growth(%)
BPR A	0.7497	0.8439	12.57%	0.8692	0.8559	-1.53%
BPR B	0.8813	0.8406	-4.62%	0.8899	0.8525	-4.20%
BPR C	0.7987	0.9315	16.63%	0.9261	0.9447	2.01%
BPR D	0.9913	0.9461	-4.56%	0.9743	0.9637	-1.09%
BPR E	0.8055	0.9112	13.12%	0.9343	0.9166	-1.89%
BPR F	0.9112	0.9595	5.30%	0.9815	0.9176	-6.51%
BPR G	0.8862	0.9885	11.54%	0.9274	0.9026	-2.67%
BPR H	0.8081	0.8651	7.05%	0.8891	0.8603	-3.24%
BPR I	0.7316	0.9733	33.04%	0.8482	0.9868	16.34%
BPR J	0.7714	0.8012	3.86%	0.8944	0.8126	-9.15%
BPR K	0.7066	0.9658	36.68%	0.8192	0.9081	10.85%
BPR L	0.9731	0.7493	-23.00%	0.9282	0.9076	-2.22%
BPR M	0.9781	0.8269	-15.46%	0.9134	0.9429	3.23%
BPR N	0.9156	0.8983	-1.89%	0.9775	0.9111	-6.79%
BPR O	0.9178	0.9594	4.53%	0.9833	0.9744	-0.91%
BPR P	0.8171	0.7363	-9.89%	0.8715	0.7467	-14.32%
BPR Q	0.8181	0.9254	13.12%	0.9485	0.9385	-1.05%

BPR R	0.8164	0.9329	14.27%	0.9465	0.9462	-0.03%
BPR S	0.8305	0.9004	8.42%	0.9629	0.9146	-5.02%
Average	0.8478	0.8924	6.35%	0.9203	0.9054	-1.48%

Table 2. Efficiency of Individual Bank

Name	Cost Efficiency			Profit Efficiency		
	2008	2009	Growth(%)	2008	2009	Growth(%)
BPRS B	0.6525	0.7401	13.43%	0.8001	0.7991	-0.12%
BPRS C	0.5828	0.7204	23.61%	0.7441	0.7269	-2.31%
BPRS D	0.5096	0.6682	31.12%	0.7232	0.7302	0.97%
BPRS E	0.7739	0.6781	-12.38%	0.7632	0.8051	5.49%
BPRS F	0.5288	0.7303	38.11%	0.6723	0.7903	17.55%
Average	0.6122	0.7017	16.93%	0.7425	0.7557	2.06%

Although the efficiency of conventional rural bank last in the previous (PE = 0.9054) higher than Islamic rural banks (PE = 0.7557), but growth (-1.48%) was not better than Islamic rural banks (02.06%). This show there is a tendency people prefer Islamic banks because most people in the area are Muslim. But in general the

effectiveness of the rural banks is still necessary, not least because of the following:

Table 3. T test

	Min	Max	mean	Std	Variance		
			statistic	Std.error			
CE	25	.59	.97	.8196	.02127	.10633	.011
PE	25	.72	.98	.8732	.01656	.08278	.007
Valid	25						

CE and PE ≤ 1.00 ($\sigma^2 < 0.05$)

placements with other banks

b. Reduced NPL

c. Profits allocated to increase the number of productive assets.

d. Establishment CAR

4. Hypothesis Testing

a. Performance Efficiency

b. Cost Efficiency of Conventional Rural Bank and Islamic Rural Bank

Table 4. Differences of Cost Efficiency

Bank	Mean	Different	Probability
Conventional Rural Bank	0.8711	0.2144	0.000
Islamic Rural Bank	0.6567		

Cost efficiency of Islamic Rural Bank, especially when compared with Conventional Rural Bank amounted to 0.2144.

This ratio indicates the inefficiency of Islamic Rural Bank in managing operating cost.

c. Profit Efficiency of Conventional Rural Bank and Islamic Rural Bank

Table 5. Differences of Profit Efficiency

Bank	Mean	Different	Probability
Conventional Rural Bank	0.9126	0.1643	0.000
Islamic Rural Bank	0.7483		

Probability < 0.05) and mean Conventional Rural Bank(0.9126) $>$ Islamic Rural Bank(0.7483). Profit efficiency of is Conventional Rural Bank is better than Islamic Rural Bank (0.1643) as a result of bank sizes that influence the technical efficiency.

Research conducted by Rangen, et. al (1988) states that bank size has a positive influence on technical efficiency. This means that the bigger a bank, will be more technically efficient, because the bank can maximize

its economic scale and scope. Similar results were found from research Grabowski, et. al (1994), Aly, et.al (1990), Bodie and Merton (2000), Miller and Noulas (1996). In the meantime the research conducted by Ferrier and Lovell (1990), using linear programming and econometric techniques indicated otherwise, they stated that the small banks are even more technically efficiency.

C. Discussion

1. Efficiency of Conventional Rural Bank

The conventional banks are efficient (average 0.9129) might expect improved profitability, greater amounts of funds intermediated, better prices and service quality for consumers, and greater safety and soundness if some of the efficiency savings are applied towards improving capital buffers that absorb risk.

This is consistent with findings of Berger, et.al (1993) that noted if banks are efficient, then we might expect improved profitability, greater amounts of funds intermediated, better prices and service quality for consumers, and greater safety and soundness if some of the efficiency savings are applied towards improving capital buffers that absorb risk. However, the converse applies to inefficient intermediaries, with the additional danger of taxpayer-financed industry bailouts if substantial losses are sustained. Consequently,

efficiency of banks improves the overall economy which affects the welfare of the society as a whole.

2. Efficiency of Islamic Rural Bank

Islamic banking performs the same intermediary function but does not receive a pre-determined interest from borrowers and does not pay a predetermined interest to the depositors; the amount of profits is based on the profit sharing agreements with the depositors and also with the borrowers. In addition, there are fee-based banking services that are similar to the conventional banks as long as there is no pre-determined interest payment/receipt in the transaction. Cost and profit efficiency of Islamic bank are lower (0,7491 less than 0.9129) because the Islamic banking considered as a different banking stream as it prohibits interest and replaces with (a) profit share

and (b) the profit share depends on the extent of the risk participation of the parties. The absence of pre-determined rewards is based on Qur'anic commands and as interpreted using shari'ah principles (Ariff, 2006).

3. Differences Efficiency of Conventional Rural Bank and Islamic Rural Bank

This research assumes that both conventional rural bank and Islamic rural banks are cost minimizes, and profit maximizes. Hence, both conventional and Islamic banks try to maximize profits by reducing costs. On this basis, this research investigates the differences in mean and overtime cost, and profit efficiency scores of conventional rural bank versus Islamic rural banks. This is according with finding (Hamim, 2006) the efficiency of the overall Islamic banking industry has increased during the period of

study while that of conventional banks remained stable over time. However, the efficiency level of Islamic banking is still lower than that of conventional banks.

IV. CONCLUSIONS AND IMPLICATION

A. Conclusion

Based on research results that have been discussed, then it can be deduced as follows:

1. Based on the calculation of the performance of Conventional Rural Bank and Islamic Rural Bank using the Data Envelopment Analysis shows that the Bank's financial performance is efficient. This is evidenced through the results of calculations where the average score obtained values close to 1. Thus, the hypothesis that states the financial performance of Conventional Rural Bank and Islamic Rural Bank is efficient, is accepted.
2. Based on the calculations using either the performance of cost efficiency and profit efficiency shows that the Conventional

Rural Bank is more efficient compared to Islam Rural Bank. Thus the hypothesis that the financial performance of Conventional Rural Bank is more efficient than the Islamic Rural bank if measured by cost efficiency, is accepted and the hypothesis that the financial performance of Conventional Rural Bank is more efficient than the Islamic Rural Bank if measured by profit efficiency, is accepted.

B. Implications

1. This research is only done at the conventional rural bank and Islamic rural bank Banyumas area with totaling are 19 conventional rural banks and 6 Islamic rural banks. For further research it is suggested to involve all conventional rural bank and Islamic rural bank on listed the IDX and the BI so that results could reflect the efficiency of all bank population.
2. Variables used in DEA analysis is that only: a) variable inputs: labor costs, interest costs and other operating costs; b) output variables: EBIT, interest income and other operating income. And there are likely still other variables that can be entered. For the next research is advised to DEA analysis experiments with various other variables.
3. This research has several weaknesses that must be refined to generate findings that more comprehensive, namely: the use of DEA efficiency analysis with the assumption that using VRS (Variable Return to Scale) so that all units of measure will result in changes to various levels of output, in addition to it notice that a technology can also take VRS (variable Return to scale), opening the possibility that the scale of production affects the efficiency, addition or merging with other analysis tools primarily aimed at obtaining better results and comprehensive.
4. Customers who will borrow and save money at conventional rural bank or

Islamic rural bank should choose a bank that approaching the LDR provisions of BI (76%)

5. The conventional rural bank or Islamic rural bank can maintain stable CAR and select the customer have approached the standards of financial statements.

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