

Determinants Of Efficiency and Its Impact On The Performance Of Banking Industry Profitability In Indonesia

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ABSTRACT

The Objective of this study is to estimate the factors influencing the level of technical efficiency of banks as measured by a non-parametric Data Envelopment Analysis (DEA) and its impact on the profitability performance as measured by return on assets (ROA). This study applies to panel data regression models with random effects approach to 110 conventional bank over 2006-2010.

Based on estimation of the determinants of bank efficiency levels, it can be informed that bank size factors, types of banks, capital adequacy ratio, loans deposit ratio, operating expenses and net interest margin affect the level of technical efficiency significantly. At a later stage, estimation of the determinants of profitability shows that the factors that influencing the bank size, types of banks, non-performing loans, loans deposit ratio, operating expenses and net interest margin significantly affect ROA.

This study has implications both theoretically and managerially. Theoretical implications for this research provide an important contribution to the development of the theory of efficiency and financial performance. Finally the managerial implications of this research have the consequences of improving the efficiency and profitability performance, especially for the domestic banks.

Keywords: Technical Efficiency, Data Envelopment Analysis, profitability, Panel data regression model

A. Introduction

Empiric study which investigation of good banking industry efficiency used approach of parametrik or non-parametrik have experienced mushroom growth. Bank efficiency study uses approach of parametrik among others performed by: Altunbas et al, (2001), De Guevara and Maudos (2002). While study with approach of non-parametrik, among others performed by; Lozano-Vivas et.al, (2001, 2002), Casu and Molyneux (2003).

Study to literature related to factors which affects profitability performance and banking efficiency gives result of empiric which still contradiction with various the factor identified, between it: size of bank (bank size), capital, and risk, but most of proving positive relation. Study which notes relation which are positive significant, for example; Atallah et.al, 2004; Chen et.al, 2005, while as the other study shows relation of significant negativity (for example; Girardone et.al, 2004; Isik & Hassan, 2002).

Bank with high risk level posed at by bad debt ratio (non-performing loans) high tending to less efficient. Molyneux and Thornton (1992) find relation of negativity and significant between liquidity level and profitability. Be differ with study Bourke (1989) find the contrary, while credit risk influence to profitability there proved also by Miller and Noulas (1997). This empiric findings explainable by paying attention to reality of that in general finance-related institution which has risk of high loan, what affects to height of bad debt, and as consequence of bank profitability will go down

Meanwhile, study relation between bank efficiency and capital level still mixed, some studies shows big capital ratio found more efficient (Carvallo & Kasman, 2005; Chang & Chiu, 2006), however some of the the other studies shows relation of negativity (Altunbas et al, 2004; Freixas and Rochet, 1997).

Hadad et al (2003a), research at national public bank during period 1995-2003 with approach of DEA. There are three important points from result of the research are; firstly,

credit related to bank and marketable securities has very high development? expansion potency to increase efficiency as a whole; second, merger from bank do not forever make bank becomes more efficient; and third, group of non-foreign exchange commercial banks can be told representing most efficient during 3 years (2001-2003) in analysis epoch of 8 years (1996-2003) compared to other banks. Joint Venture Banks for a while become most efficient the year 1997, while foreign exchange commercial banks in the year 1998 and 1999.

Hadad et.al (2003b), research to 167 public banks during January period 1995-Juni 2003 using method parametrik with approach of Stochastic Frontier Approach (SFA) and Distribution Free Approach (DFA). Result of research indicates that efficiency score DFA more various compared to efficiency score SFA, if it used data of monthly and annual data which merges all bank. However, most efficient banks which is produced with using both methods are equal. Therefore calculation of by using DFA and SFA if using observation of all bank produced

consistent values. Based on both methods also indicates that merger from bank do not forever make bank becomes more efficient. This research also concludes that bank with joint venture banks category represents category which most efficient compared to other category.

Astiyah and Husman (2006) research to analyse banking efficiency level in Indonesia by using derivative of function of profit. Measurement of profit efficiency in study includes model with emphasis of inter-mediation function and without any emphasis of intermediation function. Psychometry estimation uses method SFA with data of monthly during period 2001-2004 to 20 banks with the biggest asset. Result of research shows in average value of efficiency with intermediation emphasis model lower than model without any intermediation penekakan. Average of efficiency during research period of by using model non-intermediasi is 92,4 % there compared to 91,4 % with intermediation emphasis model.

Ariff, and Can (2008), research of efficiency expense of and profit in 28 commercial banks in Chinese uses

technical non-parametrik during period 1995-2004. This researchs tests type influence ownership of, size, risk profile, profitability and change of local of core to bank efficiency. Result of research indicates that efficiency level profit lower than efficiency expense of.

Study which is performed by Ramli (2005), Heralina (2007) its the results indicates that size of bank which is proxy with asset total which is owned by bank has influence which are positive and significant. Hauner (2005) give two correct explanations why size of bank has positive influence to bank efficiency level.

Study Jemric and Vujcic (2002) express that foreign bank significantly more efficient of at domestic bank. The same conclusion also happened in bank in Polandia Havrylchyk (2006) and bank in Hungaria (Hasan and Marton, 2003). Matthews and Ismail (2006) express that foreign banks in Malaysia shows higher level technical efficiency level.

Weill (2003) in its research also proves that foreign bank in Polandia and Cekoslowakia has

efficiency is larger because of foreign bank more superior in cultural practice corporate governance and higher level skill. Be differ with research before Sathye (2001) what found that domestic banks more efficiency from foreign bank in Australian banking.

Study Estrada et al. (2006) and Gelos (2006) indicate that bank which more efficient tends to to have NIM low. Result of research of related to CAR, Ramli (2005) prove that CAR has significant and positive influence to bank efficiency.

Relate to ratio NPL in general found by positive relation with un-efficiency of bank. Bank with big risk charge (shown by height of ratio NPL) tend to inefficient (Carvallo and Kasman, (2005). Bank with higher level efficiency level performs better credit risk evaluation (Berger and Deyoung, 1997). McAllister and Mcmanus, (1993) note that wholesale banking follows business strategy in risk management through larger expenditure to labour to observe risk of high loan and interest rate for risk compensation fails to payee from bank creditor.

Bank profitability determinant study from internal factor, among others in form of bank size, capital, risk management, operating expenses and efficiency. Demirguc and Huizinga (2000) find significant and positive relation between size and bank profitability. Study Lloyd et.al (1994) find that size of bank and CAR has an effect on significant and positive to bank profitability. Guru et.al, (1999) what performs research of commercial banks profitability determinant in Malaysia proves asset composition and deposit has an effect on significant and positive to profitability.

Research in Indonesia by Zamil and Rahman (2007) also prove existence of positive relation between efficiency level with bank profitability performance, while study Mawardi (2005) conclude that efficiency level has an effect on negative to bank performance which is proxy with ROA.

Bank profitability performance which is owned by foreigners there proven better than bank which is owned domestically. Some of the reasons which can be laid open, for example: (i) capital which is brought

by foreign investor drops expense of bank restructuring fiscal (Tang et.al, 2000); (ii) experienced foreign owned banks in risk management and cultural arranges to manage company (corporate governance) better, what makes bank more efficient (Bonin et.al, 2005); (iii) foreign owned banks existence increases emulation, what triggers domestic bank performs emphasis of expense of and improve;repair efficiency (Claessens et.al, 2001). Final, domestic banks gets infection benefit of technology which is developed by foreign owned banks.

Study Werdaningtyas (2002) and Mabruroh (2004) what proves CAR significantly influential positive to profitability on the contrary to profitability research of Usman (2003) conclude negative influence of ratio CAR to ROA. According to Guru et al, (2002) banks which has high capital ratio will relatively more safe in facing loss. The contrary, Demirguc-Kunt and Huizinga (1999) and Abreau (2000) express there is positive influence between capital ratio with bank profitability level.

Result of study related to ratio influence LDR to profitability

performance ROA national banking of research of Werdaningtyas (2002) and Usman (2003), show significant and negative influence. The contrary, study which is performed by Mabruroh (2004) show positive influence of ratio LDR with bank profitability performance. While result of study related to non-performing loans (NPL) Miller and Noulas (1997), prove that NPL has an effect on significant and negatively to profitability performance ROA national banking.

Empirical Study of Guru et al (2002) conclude that high operating expenses will result lowering of bank profitability level. In so many literature study there indicated that expense of representing the variable included in function of profit. Result of study related to net margin interest (NIM) Mabruroh (2004), prove that NIM has an effect on significant and positively to profitability performance ROA banking.

Problems of fundamental in research, do total variable of asset, Bank type, CAR, LDR, NPL, operating expenses NIM has an effect on to efficiency level DEA and its the implication to profitability

performance ROA. Intention of this research is to prove empirically that total variable of asset, Bank type, CAR, LDR, NPL, operating expenses NIM affects efficiency level DEA and its the implication to profitability performance ROA

B. Methodology

Population and Research Sample

In all these research of conventional public bank (commercial bank) what operates in Indonesia the year 2006-2010 made by research sample or often conceived as saturated sample. As for reason all populations there made research sample is because of characteristic each different bank group. For example Bank Property of The Government is the State Owned Banks (BUMN) and Regional Development Banks (BPD), there are Foreign owned bank and joint venture Banks, Then of there are foreign exchange commercial banks and non-foreign exchange commercial banks.

Analytical method

Data Panel Regression Model

Data of panel is alliance between data of time series and data of cross section. Data of series when usually covers one object/ individual (for example; inflation, interest rate, unemployment level and rate of exchange), but cover some periods (annual). Data of cross consists of to some or many objects, often referred by responder (for example company of Banking) with a few data type (for example; Deposit interest Tribe Level) in a certain time period. Regression by using data of panel there referred data regression model of panel.

To estimate model parameter with data of panel, there are some of the the techniques offered, are Fixed Effect Model and Random Effect model. Decision of usage of effect model still and or random effect determined with using the specification which is developed by Thirsty. This specification will give assessment of by using value of Chi Square Statistics therefore decision of choosing a model will be able to determined statistically.

C. Analysis of Result of Research

1. Factors Estimation Which Affects Efficiency

Based on test Thirst indicates that estimation to variables which affects technical efficiency level of conventional banking in research uses method random effect and result of data-processing empiric uses econometric program Eviews-6 shown in tables 1. Based on parsial test uses t-test, empirically of its the result indicates that besides variable NPL, the other variable, are: size of company (SIZE), bank type, CAR, LDR, expense of operasioanl (COST), and NIM affect technical efficiency level in signifikaan with confidence level of equal to 95%. While based on entirety test uses uji-F with value of F-Statistic 14.89851 indicating that all independent variables jointly affects technical efficiency level with confidence level of equal to 99%.

For examination of goodness of fit which is measured with termination coefficient (R2) show numeral of sufficiently small that is equal to 16%, its(the meaning that change variation of explainable technical efficiency level by all independent variable only 16 %, while 84 %

explained by other variable outside model. For accomodated termination coefficient (R2 adjusted) show numeral equal to 15%,mean that on

reflection degree of freedom, all variable indepeden in research admits of to explain change in technical efficiency level DEA equal to 15%.

Table1
EfficiencyEstimation and Factors Wich its Affecting
With Method RandomEffect

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.369589	0.119749	-3.086375	0.0021
SIZE?	0.088228	0.017060	5.171572	0.0000
TYPE?	0.140664	0.031787	4.425154	0.0000
CAR?	0.000264	7.08E-05	3.734611	0.0002
LDR?	4.76E-05	2.26E-05	2.102629	0.0360
NPL?	0.002987	0.002943	1.014869	0.3106
COST?	-0.039539	0.016443	-2.404572	0.0165
NIM?	0.009902	0.004196	2.359947	0.0186

Weighted Statistics			
R-squared	0.161367	Mean dependent var	0.463689
Adjusted R-squared	0.150536	S.D. dependent var	0.231050
S.E. of regression	0.212950	Sum squared resid	24.57855
F-statistic	14.89851	Durbin-Watson stat	2.302815
Prob(F-statistic)	0.000000		

Empirical finding of tables 1 explainable that variable SIZE, TYPE, CAR, LDR, and NIM affects

significant and positively to technical efficiency level of national banking, and variable Cost affects significant

and negatively to technical efficiency level of national banking. This finding in line with research hypothesis. While variable NPL affects positively but is not significant to technical efficiency level of national banking. This finding is differ with research hypothesis.

From seventh of independent variable which is used to estimate the factors which affects technical efficiency level of banking of konvensional, most dominant variable of its influence is bank type with regression coefficient 0,1407, while factor loans to deposit ratio (LDR) give smallest influence with regression coefficient 0,0001.

2. Factors Estimation Which Affects ROA

Based on test Thirst which indicates that estimation to factors which affects kineja profitability which is measured with return on asset (ROA) national banking uses method random effect and result of data-processing empiric of data uses econometric program Eviews-6 shown in tables 2. Based on parsial test uses t-test, result of empiric

indicates that besides technical efficiency level factor which is measured with Data Envelopment Analysis (DEA) and CAR, all the other factors, are: SIZE, TYPE, NPL, LDR, COST, and NIM affects ROA significantly with confidence level of equal to 99%. While based on entirety test uses F-test with value of F-Statistic 144.8904 indicating that all independent variables jointly affects ROA bank with confidence level of equal to 99%.

For examination of goodness of fit which is measured with termination coefficient (R2) show rate of considerably big that is 68,18 %, what means that various change in profitability performance (ROA) explainable bank by all factor, the compose technical efficiency level, SIZE, TYPE, CAR, LDR, NPL, COST, and NIM 68,18 %, while 31,8 % explained by external other variable of model. For accomodated termination coefficient (R2 adjusted) show numeral 67,71 %, what means that on reflection degree of freedom, all variable indepeden which is used in this research admits of to explain change of profitability level ROA bank 67,71 %.

Table 2
 Estimation ROA and Factors Which its Affecting
 With Method Random Effect

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.172118	1.132950	-5.447831	0.0000
SIZE?	0.606612	0.380110	1.595886	0.1111
TYPE?	1.191441	0.160106	7.441555	0.0000
CAR?	2.266971	0.308946	7.337768	0.0000
LDR?	0.000166	0.000663	0.251100	0.8018
NPL?	-0.004465	0.000207	-21.55086	0.0000
COST?	-0.104150	0.027253	-3.821561	0.0001
NIM?	-1.070144	0.151556	-7.061044	0.0000

Weighted Statistics			
R-squared	0.681788	Mean dependent var	0.463689
Adjusted R-squared	0.677082	S.D. dependent var	0.231050
S.E. of regression	1.920268	Sum squared resid	24.57855
F-statistic	144.8904	Durbin-Watson stat	2.302815
Prob(F-statistic)	0.000000		

Empirical finding of tables 2. explainable that variable SIZE, TYPE, and NIM affects significant and positively to profitability performance ROA national banking, and variable NPL and Cost affects significant and negatively to profitability performance

ROA national banking. Finding which in line with research hypothesis is variable SIZE and bank type, while variable NIM is differ with research hypothesis. Then of Technical efficiency variable and CAR affects positively but is not significant to

profitability performance ROA national banking. This finding is differ with research hypothesis.

From eight of independent variable which is used to estimate the variables which affects profitability performance ROA conventional banking, most dominant variable of its influence is bank type with regression coefficient 2,2670, while factor LDR give smallest influence with regression coefficient 0,0045.

D. Conclusion

In general empirical conclusion of result of research of internal factor determinant of company to technical efficiency level of bank which is measured with DEA and its the impact to profitability performance ROA in line with formulation of problem and purpose of research, by applying data regression model of panel as follows:

1. Independent variable which most dominant affects technical efficiency level of banking of konvensional, it is bank type variable with regression coefficient 0,1407. While feeblest variable of its the influence affects technical efficiency level of banking of konvensional, it is variable LDR with regression coefficient 0,0001.

2. Independent variable which most dominant affects profitability performance ROA conventional banking, it is bank type variable with regression coefficient 2,2670. While variable which affects profitability performance ROA conventional banking, feeblest of its influence is bank type variable with regression coefficient 0,0045.

3. Independent variable of bank type prove that technical efficiency level DEA and profitability performance ROA foreign owned banks better compared to domestic banks. For the purpose domestic banks can make foreign owned banks as benchmarking in increasing its the efficiency level DEA and profitability performance ROA.

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