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BANK SPECIFIC FACTORS AFFECTING THE EFFICIENCY OF REGIONAL DEVELOPMENT BANKS

Anneke Puspasari[1], D.S Priyarsono[2], Hendro Sasongko[3]

[1,2] School of Business, IPB University, Bogor, Indonesia
[3] Faculty of Economics, Pakuan University, Bogor, Indonesia
E-mail: Puspasarianneke@yahoo.com

ABSTRACT

Regional Development Banks (RDB) are part of the banking industry which has an important role in regional development. Therefore, RDB performance is important to be evaluated, and efficiency is an important indicator in measuring performance. The purpose of this study is to analyze the efficiency of the Regional Development Bank (RDB) in Indonesia and the internal factors that influence efficiency. Based on data of 26 RDBs in the study from 2011Q1 to 2019Q4, this study uses a non-parametric frontier methodology analysis, Data Envelopment Analysis (DEA), and the Tobit regression to investigate the determinants of technical efficiency. This analysis aims to explain the variations in calculated efficiencies to a set of internal explanatory variables. The results showed that most RDBs were technically inefficient during the study period. Furthermore, the internal variables that affect are size, capital adequacy ratio (CAR), loan to deposit ratio (LDR), return on asset (ROA), Listed Bank.

Keywords: Bank Specific Factors, Data Envelopment Analysis (DEA), Regional Development Bank, Technical Efficiency, Tobit Model

INTRODUCTION

The financial sector plays an important role in the economy of a country. In Indonesia, the financial sector especially the banking industry has a dominant role. It can be seen from the total asset of the banking industry compared to other institutions of financial services is 76.99% (Financial Services Authority, 2019). The important role of the banking industry as intermediary institutions will affect national economic growth so that banking performance needs to be considered for its stability and efficiency (Sathye, 2011). Efficiency is one of the parameters of performance that is quite popular and an important measure of bank operational conditions and is one of the key indicators of a bank's success, individually after comparing it with the entire banking industry (Wheelock and Wilson, 1995).

One of the banks in the spotlight in Indonesia is the Regional Development Bank (RDB) that RDB is currently not developing as rapidly as Conventional Banks (Sutanto, 2015). RDBs contribution to total assets and funds compared to national commercial banks is relatively low at 8.38% and 8.41% (Financial Services Authority, 2019). RDB is part of the national banking industry which has an important role, especially in regional development. RDB was established in 1962 based on Law No. 13 of 1962 concerning Basic Provisions for Regional Development Banks. The establishment of the RDB is intended to provide funding for the implementation of regional development within the framework of National Development. Based on the Decree of the Minister of Home Affairs (Kepmendagri) No. 62 of 1999 concerning the guidelines for the organization and work procedures of the Regional Development Bank, that function of RDB is (1) Driving the creation of economic growth and regional development, (2) Regional cash holders and/or saving money regions and (3) one source of regional original income.

RDB is a Regional Government-owned company that is highly dependent on the Regional Government (Yusuf, 2018). Dependence of RDBs on local governments is an obstacle for RDBs in developing performance and pushing RDBs to be inefficient due to the high intervention from the local government. The existence of political intervention pushes banks to become less efficient and makes it difficult for banks to compete with other commercial banks (Hadad et al, 2012). RDBs failure will have a systemic impact on the regional economy (Yonnedi and Panjaitan, 2019).

The role of RDB which is quite important in regional economic development as an intermediary institution encourages RDB to be able to improve its performance (Abidin and Endri, 2009). In 2015, Financial Services Authority (FSA) launched in RDB Transformation program. Transforming RDB has a vision of becoming a bank that is highly and powerfully engineered and contributes significantly to sustainable growth and equitable distribution of the regional economy. This program will further develop the overall RDB by strengthening the foundation through good governance, business and risk management so that going forward the RDB will become a more competitive, stronger, and contributive bank for regional development. One attempt to encourage RDB to be more competitive is by increasing efficiency through optimizing the internal factors of RDB.

Efficiency is one of the most important indicators in measuring bank performance. Recent research shows that efficiency is an important factor in banking competition where efficient banks have competitive advantages and lower costs than inefficient banks (Spong et al 1995). With a higher level of efficiency, banking performance will be better in allocating financial resources which will later affect increasing investment and economic growth (Weill, 2003). Indicators that indicate bank efficiency can be shown through the ratio of operating costs to operating income (BOPO) and net interest margin (NIM). NIM RDBs still show a fairly high figure of 5.95% in 2019 although it has decreased compared to 2011 of 8.1%. The ideal NIM ratio is 5%. BOPO RDB also showed an increase. In 2019 it was 79.56%, an increase compared to 2011 at 79.14%. This condition indicates a decrease in efficiency at the RDBs. Measurement of efficiency cannot only be based on financial ratios. The calculation of efficiency using financial ratios is inaccurate (Hadad *et al*. 2003). Firdaus and Hosen (2013) argue that the measurement of efficiency using a BOPO (operational expenses to operational income) ratio does not describe of efficiency of a bank because of the calculation of efficiency using a BOPO ratio is partial efficiency. Efficiency will be clearer if it is related to the concept of output-input comparison not only with partial calculations (Berger and Humphrey, 1997).

The measurement of banking efficiency is also influenced by various factors. According to Widiarti et al. (2015), bank efficiency is affected by the ratio of non-performing loans (NPL), loan to deposit ratio (LDR), bank size, cost efficiency ratio (CER), and capital adequacy ratio (CAR). Gross domestic product (GDP), interbank money market interest rate volatility, overhead cost (OHC), market share, credit channeled also affects bank efficiency (Muljwan, 2014). Firdaus and Husen (2013) conducted research related to the efficiency of Islamic commercial banks showing that the factors that influence total assets of Islamic commercial banks, return on assets (ROA), return on equity (ROE), and the number of branches affects efficiency. According to Ghofur and Sukmaningrum (2018), good corporate governance also affects of bank efficiency.

LITERATURE REVIEW
BANK EFFICIENCY

Efficiency is defined as the ratio between input and output, and the amount of output produced per unit of input shows great efficiency, while the maximum output produced per unit of input shows optimal efficiency (Sherman and Zue, 2006; Hasibuan, 1994). The concept of efficiency was first proposed by Farrel (1957) who stated that the concept of measuring efficiency can take into account more than one input and output. There are 3 factors that cause efficiency, namely (1) if the same input produces a larger output, (2) a smaller input produces the same output, and (3) a larger input produces a larger output (Gordo, 2013). Measurement of efficiency determines how a company can maximize output and profits by minimizing costs (Mokhtar et al, 2008).

Measurement of efficiency can be done using two approaches, namely parametric and non-parametric approaches (Coelli, 1996). According to Berger and Mester (1997) that the parametric approach is divided into the Stochastic Frontier Approach (SFA), Thick Frontier Approach (TFA), and Distribution Free Approach (DFA) methods. While the non-parametric approach uses a non-stochastic approach and tends to combine disturbance and inefficiency in measuring efficiency. This approach is known as the Data Envelopment Analysis (DEA) method. In conducting an analysis of the non-manufacturing sector in this case the banking sector, measurement with the non-parametric analysis is most appropriate.

BANK FACTORS OF TECHNICAL EFFICIENCY

Capital Adequacy Ratio (CAR) shows the ability of capital owned by banks to be able to survive. Banks with high capital levels are technically more efficient and have sufficient reserves to minimize the impact of increased credit risk (Isik and Hasan, 2003; Casu and Molyneux, 2003). The higher capital owned by a bank will increase efficiency (Pasiouras, 2008; Mamatzakis et al. 2015;

Rosman et al., 2014). However, some research also shows that lower bank capital will increase efficiency (Zhang et al., 2012; Ariff and Can, 2008; Girardone et al., 2004).

Non-Performing Loan (NPL) which is a proxy of credit risk. The more efficient bank has better credit quality or a relatively small NPL value so that there are no additional costs in dealing with bad loans will reduce efficiency (Hughes and Master, 1993; Garza-Garcia JG, 2012, Karim et al, 2010; Firdaus and Hosen, 2013; Ata and Bugan, 2016). According to Muljwan et al. (2014), NPL has a negative and insignificant influence because the greater the credit risk will cause banks to tighten profit opportunities and will reduce their operational efficiency.

Return on Assets (ROA) is a proxy of banking profitability. Research by Casu and Molyneux (2003), Garza-Garcia J.G, (2012) shows that profitability ratios (ROA) affect bank efficiency. Contrary to the results of the study of Hou et al (2014) that efficiency and profitability have a negative relationship.

Loan to Deposit Ratio (LDR) is a proxy of liquidity. The higher the lending, the greater the bank's profit opportunities, so that banks can increase their business scale and efficiency (Luo and Liu, 2011; Vu and Turnell, 2011). Credit is the main source of income, so the higher income can reflect banks more efficiently, although credit extended by banks will depend on the development of credit risk itself (Non-Performing Loans) (Garza-Garcia JG, 2012).

NIM (Net Interest Margin) is the difference between interest income and interest expense. A high NIM can occur because of an improved level of efficiency, which means there is a positive relationship (Ata and Bugan, 2016). While negative relationships occur among others if the level of banking competition is low and can cause bank efficiency to be low (Kunt and Huizinga, 1999). According to Muljwan et al. (2014) banks can more efficiently increase their NIM

because the bank can reduce interest costs or increase interest income.

Banks that have a greater asset value tend to be able to pay lower input costs than competing banks so that it affects efficiency (Bonin et al, 2004; Hauner, 2005; Sufian, 2009; Hassan et al, 2004; atan and Catalbas, 2005; Ata and Bugan, 2016). However, several studies prove that the smaller the size of the eating level the better the efficiency (Hou et al, 2014; Ariff and Can, 2008).

Bank third-party deposits consist of savings, current accounts, and time deposits. Deposits are components of third party deposits which are expensive because they have a higher interest rate compared to savings and current accounts. The higher the deposit, the interest expense paid will increase so that it will have an impact on efficiency.

Good Corporate Governance (GCG) is bank governance that applies the principles of openness, accountability, responsibility, independence, and fairness. According to Peni and Vahamaa (2012) good corporate governance (GCG) has a positive effect on profitability. Saidi (2007) states that poor bank governance will increase the cost of funds and encourage inefficiency in the use of corporate capital. In contrast to the research results of Tobing et al. (2013), the implementation of GCG has a significant effect on competitiveness, namely productivity, profitability, and market valuation, but not on the BOPO ratio (efficiency).

Initial Public Offering (IPO) or offering of shares to the public is the sale of shares of a public company to the public or known as going public or listed. Banks with go public status affect efficiency. Exchange-listed banks tend to be more efficient than private banks (Berger and Humphrey 1997; Casu and Molyneux 2003). In contrast to the research results of Altunbas et al. (2001) that banks that do not go public are more efficient than banks that go public.

METHODOLOGY

Data and Variable

This research is a quantitative descriptive to 26 RDBs in Indonesia during the period 2011Q1-2019Q4. Variable input-output combination to measure the efficiency level of an individual bank consists of inputs: deposits, interest expenses, and non-interest expenses; output: loans, interest income, and net non-interest income.

Data Envelopment Analysis

Data Envelopment Analysis (DEA) is a non-parametric mathematical program used for frontier estimation. DEA in the research of Chames, Cooper, and Rhodes (1978) is a measure of efficiency for each decision-making unit (DMU) which is the maximum ratio between weighted output and weighted input. Each weight used in the ratio is determined by the limitation that the same ratio for DMU must have a value of less than one or equal to one. If the efficiency score is 100%, meaning that the DMU no longer wastes the use of its inputs and outputs. Besides, DMU is inefficient if the efficiency value is less than 100%, which means that the bank is still not able to optimally utilize its production capabilities. In the DEA, the relative efficiency score will be obtained between each DMU that is the object of research. In addition to producing efficiency values for each DMU, DEA also shows units that are a reference for inefficient units. DEA is very effective to be used to measure the performance of DMUs which in operation involve a lot of inputs and outputs.

$$Efficiency\ of\ DMU = \frac{\sum_{k=1}^{n} \mu_k y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}}$$

Subject to:

$$\frac{\sum_{k=1}^{n} \mu_k y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1; \qquad j= 1,2,\ 3\ldots\ldots\ldots n$$

$$\mu_k, v_i \geq 0; \qquad r= 1.2.\ 3,\ldots\ldots\ldots n$$

Information:
k = DMU
m = number of inputs

n = number of outputs
xij = i DMU i input value j
yrj = r DMU output value j
μk = weight of DMU k for the evaluated DMU
vi = DMU weight j for the calculated DMU

Two models form the basis of DEA measurements, namely the Charnes, Cooper, and Rhodes (CCR) models and the Banker, Charnes, and Cooper (BCC) models. DEA calculations using the CCR model are based on the constant return to scale (CRS) assumption, while the BCC model is based on the variable return to scale (VRS) assumption. In the CCR model, each DMU will be compared to the existing DMU, with the assumption that the internal and external conditions are the same. This model assumes that the ratio of the addition of input and output is proportional to the optimal scale, meaning that the addition of input causes the addition of the same amount of output. The BCC model is a development of the CCR model. This model assumes that the company does not or has not yet operated at an optimal scale. The assumption of this BCC model is the ratio of the addition of input and output varies. The addition of inputs causes the addition of output with varying proportions.

The CCR model calculates efficiency by comparing output weights to input weights per each DMU unit and this model combines technical efficiency and scale efficiency calculations for each DMU. CCR modeling allows each DMU to determine the weighting of each input and output. However, due to imperfect competition, limited funds, and others, DMU did not operate optimally. It is assumed that x_i and y_r respectively represent inputs and outputs with indices i = 1, 2, ..., I and r = 1, 2, ..., R. If u and v are respectively the weights of inputs and outputs, then respectively each DMU has input and output weights.

Maximization $\theta = \frac{\sum_{r=1}^{s} u_r y_{ro}}{\sum_{i=1}^{m} v_i x_{io}}$

Subject to : $\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1,$

$u_r \geq 0$; r= 1, 2,..., s; $v_i \geq 0$; i = 1, 2, ..., m; j=1, 2,..., n; $y_{rj} \geq 0$; j=1, ..., n.
Where:
x_{ij} = input value to 1 in unit j
v_i = weighting for input to i
y_{rj}= output value to r
u_r = weighting for input to i

The BCC model is a model developed by Banker et al. (1984). The formulated model is based on the results of the modification of the CCR model which evaluates a limit on each DMU evaluated. The BCC development is a dual model of the DEA model, stated.

Maximization $\theta_B = \frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}}$

Subject to: $\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1,$

$u_r \geq 0$; r= 1, 2,..., s; $v_i \geq 0$; i = 1, 2, ..., m; j=1, 2,..., n; $y_{rj} \geq 0$; j=1, ..., n.
Where:
x_{ij} = input value to 1 in unit j
v_i = weighting for input to i
y_{rj}= output value to r
u_r = weighting for input to i

The BCC model has fewer decision variables than the CCR model, namely λj = 1, 2, ..., n. To obtain a special set of weights per DMU for each input and output. BCC model is a DEA model with the principle of Variable Returns to Scale (VRS). The DEA-CRS program can be easily modified into the DEA-VRS model by only adding convexity constraints, namely Σ λj = 1. In this study using the VRS model in which an evaluation of the DMU is done by overall efficiency with the assumption that all DMUs are operating at an optimal scale.

Tobit Model
Efficiency scores obtained using DEA (first stage) will be analyzed with several other variables using the Tobit regression

(second stage). At this stage, an analysis of factors that influence efficiency will be carried out. The Tobit Regression assumed that the independent variables have an infinite value (non-censored) and the dependent variable has a censored value. The use of the Tobit regression is due to the value of the dependent variable, namely technical efficiency which lies between 0 and 1. The equations of the model are as follows:

$$EFF_{it} = \alpha + \beta_1\, CAR_{it} + \beta_2 LDR_{it} + \beta_3\, NIM_{it} + \beta_4 NPL_{it} + \beta_5\ ROA_{it} + \beta_6\ SIZE_{it} + \beta_7\ DEP_{it} + \beta_8\ GCG_{it} + \beta_9\ Listed_{it} + \varepsilon$$

Where: EFF: Banking Efficiency, Size: Total Asset Logarithm, CAR: Capital Adequacy Ratio, LDR: Loan Deposit Ratio, NPL: Non-Performing Loan, ROA: Return On Assets, NIM: Net Interest Margin, DEP: Composition of Deposit to third party deposits, GCG: Good Corporate Governance, Listed Bank: go public.

RESULT
The Measurement of Efficiency by Data Envelopment Analysis
Measuring of efficiency of the first stage RDB uses a non-parametric approach with the DEA method. The assumptions used in this study are VRS (variable return to scale) because the internal and external conditions of RDBs are relatively different. The addition of input causes the additional output of a different amount. VRS is suitable for banking industry activities (Irawati, 2008). Besides, this study uses an input-oriented intermediation approach because the input is the main decision variable (Coelli et al, 1998).
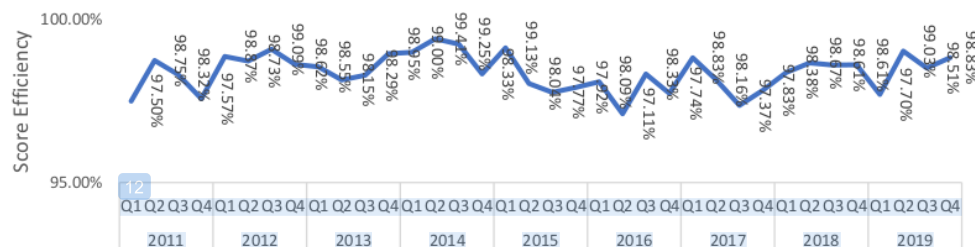

Figure 1. The average level of Efficiency RDBs in period 2011Q1-2019Q4

Source: Output DEA

Figure 1 shows the average efficiency level of 26 RDBs each quarter per year based on the DEA. The movement of efficiency in the period 2011Q1-2019Q4 has fluctuated. An unstable economic condition is one of the obstacles to increasing its efficiency. In general, RDB in Indonesia operates at an average efficiency level of 98.39%. The highest level of efficiency occurred in 2014Q3 with a score of 99.41%. There was an increase in the RDB's technical efficiency score from 97.50% in 2011Q1 to 98.83% in 2019Q4. This indicates an increase in efficiency in the RDB. Besides, there was a decrease in the level of efficiency in 2015-2016. A fairly high decline occurred in the second quarter of 2016 with an efficiency level of 97.11%. This occurred due to unstable economic conditions and policies pursued by Bank Indonesia to reduce the impact of the global crisis that was starting to have an impact on Indonesia.

Based on the results of RDBs efficiency measurements, it shows that the efficiency of RDBs that reaches 100% is not consistent every year (table 1). There are 7 RDBs or 26.92% which are consistently categorized as the most efficient RDB with an optimal efficiency level of 100% compared to other RDBs, namely Bank Jabar Banten, Bank Jatim, Bank Kaltim, Bank Bali, Bank Papua, Bank Sulteng, and Bank Sultra. RDB that has reached an optimal level of efficiency means that RDB has been able to optimize all its resources. RDBs that have achieved an optimal efficiency score will become a benchmark for other RDBs. There are 19 RDBs or 73.08% which are categorized as low-efficiency levels with a score less than 100%, namely Bank DKI, Bank DIY, Bank Jateng, Bank Jambi, Bank Aceh Syariah, Bank Sumut, Bank Riau, and Kep. Riau, Bank Sumselbabel, Bank Lampung, Bank Kalsel, Bank Kalbar, Bank Sulselbar, Bank NTB, Bank NTT, Bank Maluku, and Bank Bengkulu. This shows that the RDB has not been able to optimize its resources and does not pay attention to business continuity.

The research by Abidin and Endri (2009), Yonnedi and Panjaitan (2019), Rosyada (2011) show that the number of RDBs at optimal efficiency levels is quite low. Defung et al (2017) also show that most RDBs are technically inefficient where the efficiency measure is below the efficiency limit. When compared with other bank groups, based on the results of research by Hadad et al (2013) in 1995-2003, it was concluded that RDB was included in the inefficient bank group.

Table 1. Average Level of efficiency RDBs In 2011Q1-2019Q4

Bank Name	Efficiency Score	Bank Name	Efficiency Score	Bank Name	Efficiency Score
Bank Jabar Banten	100.00%	Bank Riau	97.11%	Bank NTB	98.43%
Bank DKI	98.74%	Bank Sumselbabel	94.95%	Bank Bali	100.00%
Bank DIY	95.73%	Bank Lampung	95.89%	Bank NTT	99.18%
Bank Jateng	99.65%	Bank Kalsel	93.70%	Bank Maluku	98.64%
Bank Jatim	100.00%	Bank Kaltim	97.65%	Bank Papua	100.00%
Bank Jambi	99.97%	Bank Kalbar	96.70%	Bank Bengkulu	97.83%
Bank Aceh	97.24%	Bank Kalteng	100.00%	Bank Sulteng	100.00%
Bank Sumut	98.98%	Bank Sulselbar	99.97%	Bank Sultra	100.00%
Bank Sumbar	98.91%	Bank Sulutgo	98.96%		

Source: Output DEA

Based on the calculation of DEA on the average RDB efficiency level, BPD Kalsel is the lowest efficiency level average of 93.70% to the other's RDB. The Bank Kalsel needs to develop interest expenses, non-interest expenses, and third party deposits. BPD Kalsel should decrease the input variable that is interest expenses 10.55%, non-interest expenses 9.77%, and third-party deposits 7.8%. On the output side, Bank Kalsel needs to increase non-interest income by 25.35%. Based on financial data, the proportion of non-interest income is compared to total assets at Bank Kalsel, respectively 0.51%. When compared with national commercial banks, the proportion of non-interest income is 2.30%. This shows that the operating income other than RDB interest is still relatively low. RDB needs to develop and optimize its products or services to increase non-interest income through an increase in

fee-based income. The application of information technology can be an alternative to increasing RDB operating income.

The result of DEA shows that the highest potential for efficiency improvement is an increase in non-interest operating income. Figure 2 shows that non-interest income is 32%. To increase non-interest income is by developing services to customers that can increase fee-based income, for example, transfer services, bank guarantees, letters of credit, payments. However, the development of these services still faces obstacles, especially in the RDB due to limited capital. Based on the grouping of commercial banks based on business activities, in 2019 shows that 21 RDBs are in BUKU[1] 1 and BUKU 2. This condition affects the RDB's ability to develop business activities. RDB's business activities are limited under the core capital owned by RDB. Banks with BUKU 3 and BUKU 4 tend to have a wider range of business activities than BUKU 1 and BUKU 2. Therefore, to develop RDB is through additional capital.
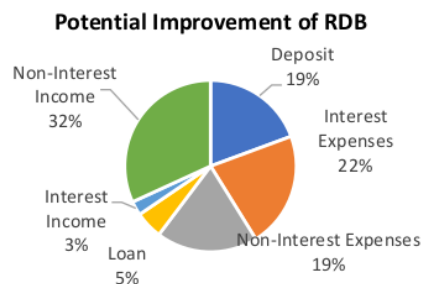
Potential Improvement of RDB

Figure 2. *Potential Improvement* of RDB

The Measurement of Efficiency Determinant Using the Tobit Model

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[1] OJK Regulation No. 6 / POJK.03 / 2016 concerning Business Activities and Office Networks Based on Bank Core Capital contains a classification based on bank core capital divided into 4 BUKU (Commercial Banks Business Activities): BUKU 1 with core capital up to less

The result of the Tobit regression shown factors that affect the efficiency of RDB. Table 2 shows the internal factors that affect efficiency, including CAR, LDR, NIM, NPL, ROA, size (assets), and time deposit composition of total third party deposits (DEP), Good Corporate Governance (GCG), and Listed Bank.

The CAR has positively and significantly related to efficiency. This finding similar to research conducted by Lotto (2019), Das and Gos (2006) so that banks need to be encouraged to have sufficiently high capital capacity to minimize risk exposure and improve bank operational efficiency. Banks with high levels of capital have sufficient reserves to minimize the impact of increased credit risk (Isik and Hasan, 2003; Casu and Molyneux, 2003)

The LDR has positively and significantly related to efficiency. The high of the LDR shows the high of the lending that is a chance for the bank to gain profits so that the bank can increase business scale and efficiency (Luo and Liu, 2011; Vu and Turnell, 2011). Ally Z and Patel G (2014) also show that the higher the ability of a bank to convert deposits into loans, the bank will be more efficient. However, according to Muljawan et al (2014), an increase in credit must still be accompanied by an increase in deposits because it will have an impact on liquidity risk, it will cause inefficiency.

The ROA has a positive effect on the efficiency of the RDB. The results of research related to Garza-Garcia J.G (2012) show that ROA has a positive effect on bank efficiency. Banks with high profitability ratios can attract customers so that Banks can increase the collection and distribution of funds (Ally Z and Patel G, 2014; Sambracos and Maniati, 2015).

from IDR 1 trillion, BUKU 2 with core capital of at least IDR 1 trillion to less than IDR 5 trillion, BUKU 3 with core capital of at least IDR 5 trillion to less than IDR 30 trillion, and BUKU 4 with core capital of at least IDR 30 trillion.

Besides, banks with high profitability can manage assets more effectively and efficiently to reduce credit risk. Therefore, efficient banks can use their funds to get higher returns compared to inefficient banks (Maudos, et al. 2002).

The variable of the size has a positive and significant effect on RDB efficiency. The greater the assets owned by the bank, then the bank can earn high profits (Santosa, 2018). The research similar to the results of Berger, Hasan, and Zhou (2009), Wheelock and Wilson (1995) that there is a positive relationship between total assets and bank efficiency. Large banks have a high level of efficiency because they have more ability to manage their resources (Hughes et al, 2001). Besides, banks also tend to be able to pay lower input costs than their competing banks, thereby affecting efficiency levels by considering the services provided (Hauner, 2005; Sufian, 2009; Hassan et al, 2004; Atan and Catalbas, 2005; Sambracos and Maniati, 2015; Ata and Bugan, 2016).

Table 2. Bank Factors of Regional Development Bank's Efficiency During 2011Q1-2019Q4

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.86569	0.03205	27.01052	0.00000
CAR	0.00040	0.00024	1.68542	0.09190**
LDR	0.00044	0.00008	5.33460	0.00000*
NIM	-0.00074	0.00074	-1.00078	0.31690
NPL	0.00017	0.00056	0.30545	0.76000
ROA	0.00760	0.00139	5.46823	0.00000*
SIZE	0.00322	0.00178	1.80578	0.07100**
DEP	-0.00011	0.00010	-1.13898	0.25470
GCG	0.00325	0.00212	1.53597	0.12450
Listed	0.01699	0.00563	3.02027	0.00250*

The NIM has a positive but not significant effect on the efficiency of RDB. This shows that NIM does not make a significant contribution to the efficiency of RDB. Ally Z and Patel G (2014) there is a positive relationship between NIM and banking efficiency. Banks that have high profitability will tend to attract customers to place their funds and the quality of credit distributed is of good quality so this condition will affect bank efficiency. According to Muljawan et al (2014), banks can be more efficient by increasing NIM because it can reduce interest expense or increase interest income.

The NPL reflects the level of bank credit risk, which shows a negative and insignificant effect. Banks that have a high level of credit risk will tend to have a low level of efficiency (Casu et al, 2004; Carvallo and Kasman, 2005). A high NPL causes the bank to create a high allowance for impairment losses (CKPN) which will increase costs and reduce bank profitability so that efficiency decreases. However, RDB NPL is not significant to efficiency. This condition is due to the higher demand for credit from high NPLs, so banks tend to tighten their lending.

The variable composition of deposits against the composition of the comparison is negative and not significant. Deposits are an instrument for the placement of funds with high interest compared to savings and current accounts. The higher the composition of deposits on total party funds, the level of efficiency will decrease. High-interest costs

will increase lending. Credit distribution will increase, but credit quality is poor. However, the composition of RDB's deposits to this efficiency was not significant because the interest rates determined by the RDB are adjusted to the applicable banking industry interest rates.

The variable Good Corporate Governance (GCG) has a positive but insignificant effect on the efficiency of BPD. This shows that improvements to the bank's GCG lead to an increase in costs which will reduce profits, thereby affecting efficiency levels. The insignificant effect of GCG measurement on efficiency is caused by the bank's GCG measurement which is still using bank self-assessment. The GCG assessment in this study uses the values obtained from bank publications.

The listed variable shows that banks that have been listed on the stock exchange have a positive and significant effect on efficiency. According to Hadad (2003), listed banks tend to have better performance, but this relationship is relatively low. The results related to Berger and Humphrey (1997), Casu and Molyneux (2003), Yin et al. (2014), Dianti (2019) banks that have chosen to go public are more efficient than banks that do not go public.

CONCLUSIONS

This study aims to analyze the efficiency of Regional Development Banks (RDB) in Indonesia and the internal factors that influence efficiency. The method used in this study uses two-stage Data Envelopment Analysis (DEA). In the first stage, the efficiency of 26 RDBs was measured during the 2011Q1-2019Q4 period. The inputs used in this study are third party deposits, interest expenses, and non-interest expenses, while the output used is total credit, interest income, and non-interest income. In general, based on the results of DEA calculations, the technical efficiency of RDB has increased in the 2011Q1-2019Q4 period. There are 7 RDBs

that relatively efficient with an optimal efficiency level of 100%. The main cause of RDB inefficiency is non-interest income (output), while the input is the interest expense. One of the attempts to increase non-interest income is to increase capital. Limited capital in the RDBs causes restrictions on business activities. RDBs can utilize its capital to develop fee-based income products. The second stage shows the factors that influence efficiency in RDB using the Tobit model. Factors that have a positive and significant effect on RDB efficiency include Capital Adequacy Ratio (CAR), Loan Deposit Ratio (LDR), Return On Assets (ROA), Size, and listed bank.

The managerial implication in this research is that the Financial Services Authority (OJK) is expected to be able to encourage RDB and regional governments to increase their capital. The increase in the capital can encourage RDB to increase the scope of business activities and services to increase to encourage an increase in non-interest income. Besides, encouraging RDB to increase lending to all sectors both productive and consumptive so that it is expected to increase interest expense.

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