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Analysis of Return on Assets based on Leverage and Efficiency at State-Owned Commercial Banks in Indonesia

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Abstract

This study aims to analyze how return on assets can be influenced by the level of financial leverage and operating efficiency at state-owned commercial banks in Indonesia. Case studies were conducted on 4 (four) state-owned commercial banks in Indonesia based on data from 2011-2022 with a sample size of 48 observation data. Data is collected from the annual report of each state-owned commercial bank which is processed based on accounting metrics. Data analysis was carried out based on a quantitative descriptive approach using panel data regression. The results showed that return on assets is simultaneously influenced by financial leverage. Partially, any increase in return on assets can be explained by increased financial leverage which is managed effectively, and more efficient bank operations.

Keywords: Bank, financial leverage, operating efficiency, return on assets.

INTRODUCTION

Commercial banks are intermediary institutions that play a vital role in the macro economy, where the failure of a commercial bank business will have a systemic impact on the economy because it can cause a financial crisis that can continue into an economic crisis. Therefore, Bank Indonesia (BI) and the Financial Services Authority (OJK) are authorized to assess the health level of banks. Thus, banking conditions that have the potential to become problems can be immediately followed up in the form of corrective action by the bank and supervisory action by the OJK.

One group of commercial banks that controls market share in Indonesia is state-owned commercial banks. Generally, state-owned commercial banks have been operating for more than 50 years and until 2018 controlled a market share of 44.37% in assets, 45.10% in third party funds, and 44.28% in loans, with average growth higher than the average growth of national banking (Rustendi, 2019). The dominant position of state-owned commercial banks, on the one hand, has a positive impact on the government because it can control the national banking industry and can actually support the real sector, but on the other hand, if the performance is poor, the systemic impact is faster and wider. Because banks play a vital role in the macro and micro economy, of course banks must have good performance. Good bank performance can reflect the level of bank health, and become one of the factors considered by stakeholders in decision making.

In 2018, the intermediation performance of domestic banks continued to improve, where the escalation of credit growth and improvement in risk levels drove positive achievements in profitability and strengthened bank capital. On the other hand, banks faced challenges in the sustainability of credit risk profile improvement, asset and liability portfolio balance management in maintaining liquidity stability, and growth amidst intense competition in raising funding sources (OJK, 2018). Based on these conditions, one interesting topic is the strengthening of bank capital needs to pay attention to a controlled level

of financial leverage, because any decision to reduce liabilities (debt) or the withdrawal of funds by large third parties can affect the achievement of bank performance. In addition, credit and third party fund management factors need to be balanced with risk management and the balance of asset and liability portfolios, where banks need to improve operating efficiency to boost their profitability performance both based on assets and equity.

In general, financial leverage can contribute to increasing returns, but on the other hand, a high level of financial leverage indicates an increase in financial risk that can harm shareholders and even potentially cause financial difficulties. While a high level of operating efficiency theoretically reflects a high level of return, for commercial banks that have diverse sources of income, the level of operating efficiency is not necessarily in line with the level of return from the bank's core business. Therefore, an empirical study was conducted to show how the level of financial leverage and operating efficiency impacts bank profitability.

Bank performance in terms of profitability is one of the elements that determine the level of bank health, and as a basis for stakeholders to make good decisions related to asset management policies, investments, dividend policies and even leveraging decisions. Return on assets is one dimension of profitability that is used as variable in assessing the earning performance of a bank.

Return on assets is the company's ability to use all its assets to generate net income (Sudana, 2011). In this case, return on assets is operating profit as a percentage of average total assets which shows how efficient management is in earning operating profit from the assets it manages (Bettner, 2015). The higher the return on assets indicates better financial performance from the aspect of profitability. Return on assets is measured using the return on assets ratio (ROA ratio), namely net income divided by average total assets (AICPA, 2016).

Because banks operate in an intermediation function, where the dependence of funds on third parties is very large, both in the form of third party deposits, as well as other external funding which has consequences for the cost of funds, as well as long-term risks related to bank solvency, financial leverage is one of the factors that must be managed carefully. In addition, the banking business, which relies on services followed by digitalization, has driven up labor and overhead costs. Thus conceptually, the use of debt in the bank's capital structure (financial leverage) and operating efficiency are interesting factors to be studied empirically on how they impact earning performance, especially the bank's return on assets. The first hypothesis is:

H_1: Financial leverage and operating efficiency affect the return on assets in state-owned commercial banks.

Financial leverage is the use of debt in a company's capital structure, where the amount of debt (percentage of assets) owned by the company can increase potential rewards for shareholders, but also potentially increase financial difficulties and business failure (Ross *et al*., 2017). In general, financial leverage can increase return on equity, but it also increases company risk (Brigham & Houston, 2015). Managing assets funded by debt is about how to use loans that contain fixed costs to increase returns and control the company's financial risks as a result of the use of debt. In this case, the use of debt containing fixed costs is intended to increase potential returns for shareholders (Sartono, 2010).In the context of the banking industry, a bank can be successful by taking reasonable leverage risks or can go bankrupt if the risks are out of control, but the higher the ratio, the riskier the business is considered to be because it is too dependent on debt (Isedu & Erhabor, 2021).

The leverage ratio is used to explain the use of debt in financing a portion of the assets (Tampubolon, 2013). The commonly used leverage ratios are debt to assets ratio, debt to equity ratio, long term debt to equity ratio, time interest earned ratio, and fixed payment coverage are ratio (Utari dkk, 2014).This study uses Debt to Assets Ratio (DAR) as an indicator to measure financial leverage. Brigham & Houston (2015) stated that total debt measured using the debt to assets ratio is the sum of long-term debt and short-term debt and does not include other liabilities, so the size of total debt with total assets can provide more balanced leverage measurement results. A similar opinion was expressed by Brealey *et al.,* (2014) that leverage measurement uses a broader definition of debt by taking into account total liabilities (debt) divided by total assets.

Quiry *et al.,* (2014) argues that the leverage effect will be seen when the company adds debt and invests the borrowed funds in its industrial/commercial activities, so that it can generate operating profits that are usually higher than the interest expense that must be paid on the loan, but if the opposite happens, then the investment is not worth funding from debt. Empirical studies on manufacturing companies conducted by Ahmad *et al.,* (2015), Zaitoun & Alqudah (2020), and Bintara (2020)shows that financial leverage has a negative effect on profitability, where companies with high leverage levels have lower profitability. Research by Sutama & Lisa (2018) also produces the same conclusion, namely that a high leverage ratio (debt to assets ratio) indicates a risk of default and the costs that must be incurred by the company are also getting bigger, which causes low company profitability. Meanwhile, research by Soendoen & Siagian (2021) shows that leverage has no effect on profitability, where a high level of debt to equity has no impact on the value of profitability. This is in line with research by Nengzih

(2019) which concluded that in the banking industry in Indonesia, leverage does not affect earning management. Different results were shown by Singapurwoko & El Wahid (2011), Ramnoher & Seetah (2020), andShaik & Sharma (2021) that financial leverage has a positive effect on profitability/return on assets, where companies with high levels of debt have high profitability which indicates that the company is able to manage funds sourced from loans to increase its profits. In this study, the authors formulate the second hypothesis as follows:

H_2: Financial leverage affects the return on assets in state-owned commercial banks.

Operating efficiency relates to the costs incurred to generate profits less than the benefits obtained from the use of these assets. Banks that are inefficient in the implementation of their operations will result in the inability of the bank to carry out its intermediary function. Madura (2015) it is argued that efficiency in banks is determined by the speed of execution, i.e. processing transactions quickly and handling documents correctly in an effort to reduce inputs and increase the opportunity to get outputs because they can handle more customers. With efficiency in banking institutions, especially cost efficiency, it will contribute to the achievement of optimal profit levels (Mudrajad & Suhardjono, 2002). Operating efficiency is measured by dividing overhead costs by total revenue (AICPA, 2016). More specific, Gibson (2013) stated that efficiency is measured based on the efficiency ratio which compares operating expenses with operating income. OJK (2016) stipulates that the level of operating efficiency is measured using the ratio of Operating Costs to Operating Income (hereinafter reffered to as Operating Efficiency Ratio - OER).

The measurement of operating efficiency places operating costs as inputs and operating income as outputs. According to Miller *et al.*, (2018) companies seek to generate sales revenue and drive operating efficiency by reducing costs to increase business profits. Samonas (2015) also pointed out that the approach through estimating operating income and operating expenses is useful for determining earnings before interest and taxes. This means that operating efficiency will increase business profits. The greater the value of the OER, which shows the inefficiency of bank operations, tends to reduce the bank's profit achievement. Research conducted by Haryati & Widyarti (2016), Setyowati (2019), Yuttama (2019), Tanjung (2019), Kusmayadi *et al.*, (2019), Puteri (2020), and Santioso & Daryatno (2021) shows that a high OER level (inefficient bank operations) has an impact on the low achievement of return on assets which means that any increase in OER indicates that the costs incurred by the bank are getting bigger for each value of operating income. In other research conducted Hosen & Rahmawati (2016) on 5 (five) Islamic banks in Indonesia, showing that there are cases where OER in one of the banks in question has no effect on profitability. Different results are also shown by Sunarya (2019) that based on the forecasting model for the next 10 periods there is no causal relationship between return on assets as the dependent variable and OER. In this study, the authors formulate the third hypothesis as follows:

H_3: Operating efficiency affects return on assets at state-owned commercial banks.

RESEARCH METHODS

This research uses multiple case studies with unit analysis of Persero Commercial Banks consisting of Bank Negara Indonesia (BBNI), Bank Rakyat Indonesia (BBRI), Bank Mandiri (BMRI), and Bank Tabungan Negara (BBTN). The research objects are financial leverage, operating efficiency, and return on assets, each of which is abstracted to its indicators to obtain reliable measurement results.

Return on assets, measured using:

$$ROA = \frac{Net\ Income}{Average\ Total\ Assets}\ X\ 100\%$$

Financial leverage measured using:

$$DAR = \frac{Total\ Liabilites}{Total\ Assets}\ X\ 100\%$$

Operating efficiency measured using:

$$OER = \frac{Operational\ Expenses}{Operational\ Income}\ X\ 100\%$$

The sample data collected is based on a combination of crossection data and time-series data for the four state-owned commercial banks for 12 years (2011-2022), resulting in a sample size of 48 observational data. The data is analyzed using panel data regression, with the following steps:

1) Determine the appropriate estimation model, whether Fixed Effect Model (FEM) or Common Effect Model (CEM) or Random Effect Model (REM) based:
   a. Chow test, to choose the right panel data estimation model whether FEM or CEM. If the probability of $\chi 2 > 0.05$ then the model chosen is CEM, while if $\chi 2 < 0.05$ then the FEM is chosen.
   b. Hausman test, to choose the right panel data estimation model, whether FEM or REM. If the probability of the crossectional random output value is <0.05 then FEM is chosen, while if>0.05, REM is chosen.
   c. Lagrange Multiplier test, to determine whether REM is better than CEM. This test uses the Breusch-Pagan Method, where if the P-value of Breusch-Pagan <0.05, REM is used, while if> 0.05, CEM is used.
2) Based on the selected panel data estimation model,

data analysis is conducted based on the observed panel data set to determine how the exogenous variables explain (estimate) the endogenous variables following the panel data regression equation as follows:

$$Y^t = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_\varepsilon \varepsilon$$

RESULT AND DISCUSSION

Return on Assets of State-owned Commercial Banks 2011-2022

The profitability performance of the four state-owned commercial banks is in the healthy category with an average return on assets of 2.68%. BBRI has the highest return on assets achievement with an average value of 3.93% in the value range of 1.98% to 5.15%, while BBTN has the lowest return on assets with an average value of 1.33% in the value range of 0.13% to 2.03%. The achievement of the return on assets performance of state-owned commercial banks was significantly corrected during the Covid-19 pandemic, especially in 2020 with an average value of 1.20%. The decline in return on assets was due to declining credit growth, and on the other hand, operating costs increased, mainly from the allowance for impairment losses on financial assets which was set larger in line with the credit restructuring policy.

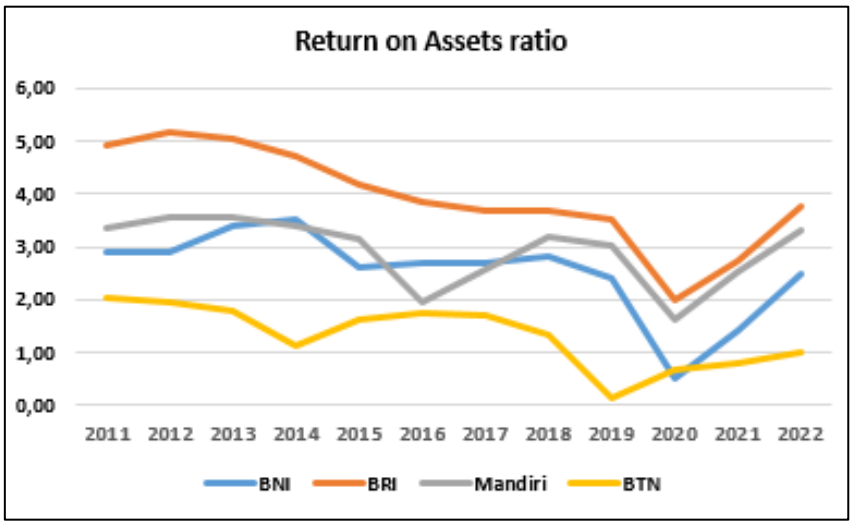

Figure 1: ROA Ratio
Source: Data Processed (2023)

Based on research data, the performance of return on assets of state-owned commercial banks has shown signs of decline starting in 2014 which continued until 2020 during the Covid-19 pandemic. The period before the Covid-19 pandemic, the global economy was shrouded in uncertainty which forced the banking sector to be more careful in channeling its credit, especially to high-risk sectors such as consumption credit, and housing construction credit and motor vehicle ownership. On the other hand, high inflation which correlates with the increase in the BI-rate has caused banks to face high interest rates that must be borne by banks, both related to the cost of third party fund deposits and the cost of capital.

In 2021, the Indonesian economy began to show signs of recovery, the BI-rate policy at a low level and liquidity support for banks through the placement of National Economic Recovery *(PEN)*funds in banks that restructured loans seemed to start showing positive results because banks had sufficient liquidity and good quality productive assets. In addition, various incentives provided by the government began to boost the performance of lending, which is the main source of income for banks, while the digitization of financial transactions contributed greatly to supporting fee-based income. The recovery in return on assets performance continued in 2022, and is estimated to be even better in the following years.

Financial Leverage of State-owned Commercial Banks

The use of debt in financing bank assets during the period studied still shows a healthy condition with an average debt to assets ratio of 85.25%. BBTN is a state-owned commercial bank that has the highest level of financial risk at 89% because the business niche in housing construction financing which is large in value and long term is considered more risky for non-performing loans so that it is vulnerable to a decrease in the quality of its productive assets. Meanwhile, the other three banks have larger capital with a dominant market share so that they are better able to manage their business by using more of their own capital. Among the four state-owned commercial banks, BMRI has a relatively smaller financial risk level of 81%.

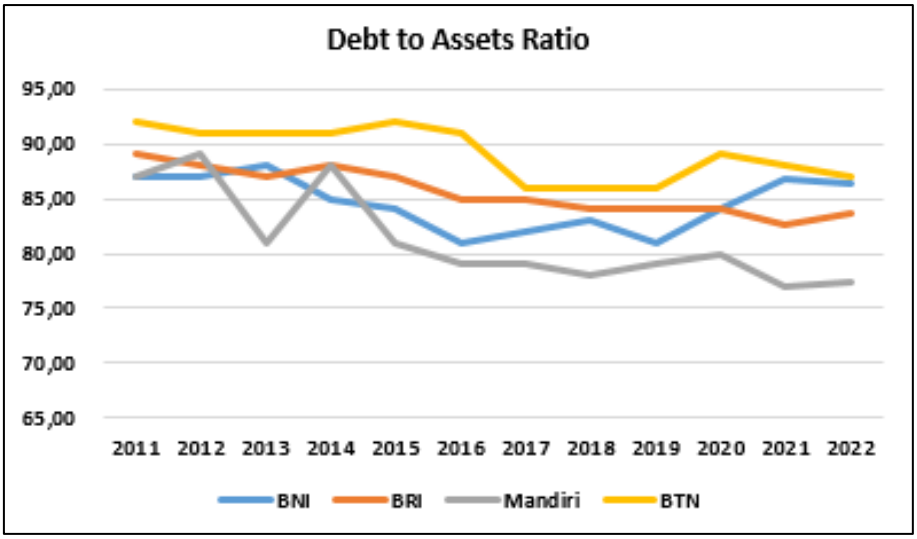

Figure 2: DAR
Source: Data Processed (2023)

Global economic uncertainty, which is feared to have an impact on the financial sector in Indonesia, one of which is the decline in asset prices and the deterioration in the quality of bank capital, has encouraged state-owned commercial banks to maintain their asset quality by being more careful in lending and handling non-performing loans more intensively, and fertilizing internal capital by maintaining the level of retained earnings to support capital adequacy. These anticipatory steps have been proven to contribute to the resilience of state-owned commercial banks' capital during the Covid-19 pandemic. During the Covid-19 pandemic, especially in 2020-2021, banks generally carry out financial consolidation to maintain their asset quality so that the risk of insolvency can be mitigated.

In line with economic recovery, state-owned commercial banks gained momentum to increase their lending to the real sector. However, credit restructuring carried out during the Covid-19 pandemic has an impact on the bank's ability to expand its credit. Therefore, the utilization of *PEN* funds, and the issuance of bonds are options for state-owned commercial banks. This has a positive impact on the bank's ability to extend credit, but on the other hand increases financial risk as shown by an increase in the debt to assets ratio. The research data shows that the use of debt in the business of state-owned commercial banks is able to contribute to increased profitability, where a significant increase in net income is a potential source of increasing bank capital so that the level of leverage can be controlled.

Operating Efficiency of State-owned Commercial Banks

The operating efficiency level of state-owned commercial banks is healthy as shown by the average operating efficiency ratio of 74.45%, where the highest efficiency level among state-owned commercial banks is achieved by BBRI with an average operating efficiency ratio of 68.05% within the range of 59.93% to 81.22%. Although its average efficiency is below BBRI, BMRI is considered more capable of maintaining its efficiency level in the long run with an average operating efficiency ratio value of 69.85% within a better value range of 57.35% to 80.94%.

The level of operating efficiency of state-owned commercial banks generally decreased during the Covid-19 pandemic, especially in 2020, where banks were generally faced with non-performing loans which resulted in an increase in the cost of writing off productive assets, and on the other hand corrected the bank's core income. However, entering 2021, state-owned commercial banks were able to reduce operating costs in line with improving the quality of their productive assets and digitizing financial transactions, while on the revenue side, state-owned commercial banks managed to increase their core income in line with the decline in credit restructuring and improved credit growth performance.

Hypothesis Test

Based on Table 1, result of the Chow-test show that statistical value of cross-section χ^2 33,979161 has a probability of 0,0000 < 0,05, and the Hausman-test result show a cross-sectional random χ^2 9,451384 with a probability of 0,0089 < 0,05, which means the estimation model that is feasible to use is the Fixed Effect Model (FEM), so the Lagrange Multiplier test is not required.

The classical assumption test based on the OLS approach shows that the data is normally distributed (prob. Jarque-Bera 0,581756 > 0,05), there is no heteroscedasticity (prob. t-statistic βX_1 dan βX_2> 0,05), and there is no multicollinearity (rX_1X_2 0,328189 < 0,8).

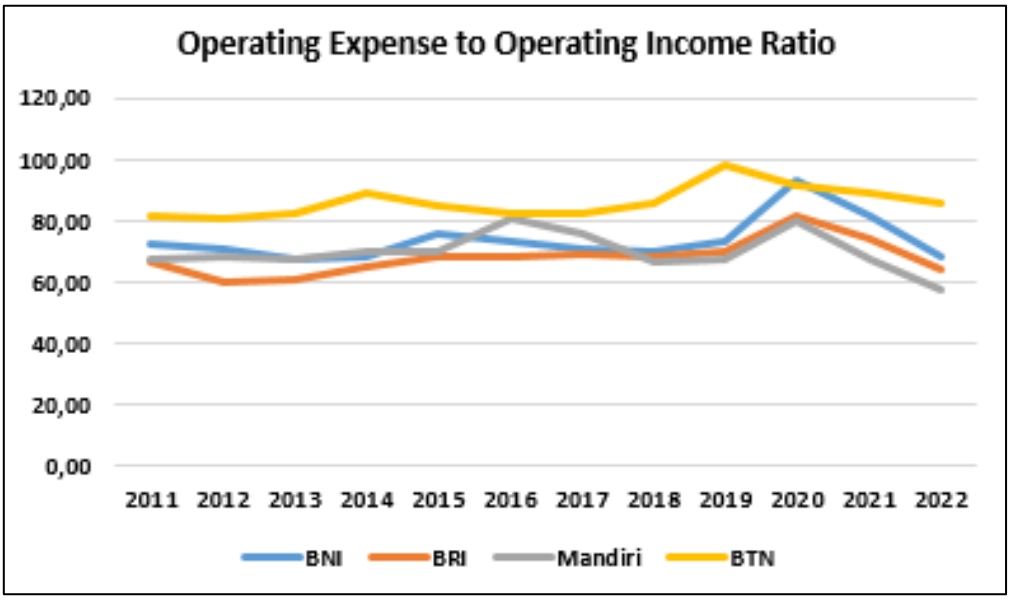

Figure 3: OER
Source: Data Processed (2023)

Table 1: Test Model Estimation

Chow Test			
Effects Test	**Statistic**	**d.f.**	**Prob.**
Cross-section F	14.416118	(3,42)	0.0000
Cross-section Chi-square	33.979161	3	0.0000
Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.451384	2	0.0089

Source: Data Processed (2023)

The panel data regression equation based on FEM (Table 2.) is:
$Y^t = 4{,}158341+7{,}165561X_1 - 0{,}101822X_2 + \varepsilon$

Table 2: Fixed Effect Model

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	4.158341	1.542156	2.696446	0.0100
X1	7.165561	1.559417	4.595025	0.0000
X2	-0.101822	0.007411	-13.73953	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.944841	Mean dependent var		2.680208
Adjusted R-squared	0.938274	S.D. dependent var		1.196880
S.E. of regression	0.297361	Akaike info criterion		0.528726
Sum squared resid	3.713777	Schwarz criterion		0.762626
Log likelihood	-6.689414	Hannan-Quinn criter.		0.617117
F-statistic	143.8868	Durbin-Watson stat		0.585794
Prob(F-statistic)	0.000000			

Source: Data Processed (2023)

H_1: Financial leverage and operating efficiency affect the return on assets.

Based on Table 2, it is known that the probability of the F-statistic is 0.0000 <0.05, it means that R_{YX1X2} significant, and H_1 accepted. Thus the values of return on assets can be explained well by financial leverage and operating efficiency. The R-squared value of 0.944841 implies that financial leverage and operating efficiency simultaneously have a significant effect on return on assets by 94.48%, and the rest (5.52%) is the influence of other factors outside the

estimation model used, such as liquidity, risk profile, or qualitative factors such as governance, and others. The results of this study strengthen the theory that the performance of return on assets is determined by the ability of bank management to manage debt to support profit achievement, and the ability of management to manage its business operations efficiently.

H_2: Financial leverage affects the return on assets.

Based on Table 2, βX1 (7.165561) has t-statistic probability of 0.0000 <0.05, which means it is significant, so H_2 can be accepted. The positive β value means that any increase in the return on assets ratio value can be estimated by an increase in the debt to assets ratio value. In this case, the use of greater debt to finance bank assets with the consequence of increased financial risk is able to contribute (have a positive effect) to the increase in return on assets. The results of this study strengthen the results of previous research by Shaik & Sharma (2021) which states that financial leverage has a positive effect on profitability/return on assets, where companies with high levels of debt have high profitability.

H_3: Operating efficiency affects the return on assets.

The statistical test results in Table 2, βX2 (–0.101822) produces a t-statistic probability of 0.0000 <0.05 which means significant, so H_3 can be accepted. The negative β value means that any increase in the return on assets ratio value can be estimated by a decrease in the operating efficiency ratio value, meaning that the more efficient the bank's operations (the smaller the operating efficiency ratio value) will result in a higher return on assets level, and vice versa. The results of this study are in line with the results of previous research by Santioso & Daryatno (2021) which states that high OER levels (inefficient bank operations) have an impact on the low achievement of return on assets.

CONCLUSION

Return on assets, financial leverage, and operating efficiency of state-owned commercial banks during 2011-2022 were at a healthy level. During the Covid-19 pandemic, there was a tendency for the return on assets to decrease in line with the decrease in the level of operating efficiency, although the state-owned commercial banks were still able to maintain the level of financial leverage at a safe limit. Bank performance improved during the economic recovery period, where state-owned commercial banks were able to increase return on assets in line with increased use of debt and improvements in operating efficiency.

Based on the results of hypothesis testing, financial leverage and operating efficiency have a significant effect on return on assets. In this case, state-owned commercial banks are able to increase their return on assets if they are simultaneously supported by an increase in financial leverage that is managed effectively, and an increase in operating efficiency. Based on FEM, an increase in financial risk (financial leverage) that is managed effectively is partially able to contribute to an increase in return on assets. Likewise, an increase in operating efficiency can partially increase return on assets.

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