

Modeling Sustainable Profitability in the Indonesian Banking Sector

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Abstract: This study justifies a predictive model of banking profitability in Indonesia. The model serves as a tool to assist bank management in making decisions during adverse conditions. A Partial Least Squares (PLS) approach within a Structural Equation Modeling (SEM) framework is used to analyze financial performance data from 2014 to 2018, covering the ten largest banks in Indonesia based on asset volume. The model predicts bank profitability using four latent variables: Operational Efficiency, Capital Adequacy, Asset Quality, and Firm Size. In total, these five latent variables are measured using 12 accounting, financial, and economic ratio indicators.

The findings demonstrate significant relationships between Operational Efficiency and Profitability, Capital Adequacy and Operational Efficiency, as well as Firm Size and Asset Quality. Additionally, Operational Efficiency is found to mediate the effect of Capital Adequacy on Profitability. However, the study finds no significant influence between Asset Quality and Profitability, nor between Firm Size and Profitability through Asset Quality (indirect effect).

Keywords: Partial Least Squares (PLS), Profitability, Operational Efficiency, Capital Adequacy, Asset Quality, Firm Size, Financial Ratios.

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I. INTRODUCTION

Definition of Bank according to Law of the Republic of Indonesia No. 7 of 1992 concerning Banking, which has been amended by Law No. 10 of 1998 "A bank is an institution that manages and distributes money from the public back to the public. in the form of credit, loans and or other forms in order to improve the standard of living of many people". A developed country can be seen from the level of the bank's ability to manage funds and can be in several aspects such as total assets, loans and third-party funds and financial performance ratios that continue to improve and stabilize globally. The bank's health level is an assessment of the condition of a bank's financial statements at a certain period and time. As well as considering the size of the company has become one of the most commonly used variables in the study of bank profitability. The significance of this variable is based on the idea that the larger the size of the bank, the smaller their exposure to existing credit risk and the more adequate their non-performing credit provisions will be. In general, one of the factors for the health of banks is seen from the performance and profitability ratio of banks. This happens because banks must generate the necessary revenue to cover operational costs incurred in banking activities (Ongore and Kusa, 2013). According to (Katrodia, 2012) Comparing the performance of one bank with another bank can be valued by comparing it to the previous year's profit.

II. MATERIALS AND METHODS

A. Profitability

The definition of the Profitability ratio according to Fahmi (2013) is a benchmark for the success of profits generated by the Company, this success can be produced by potential investors in analyzing financial statements so that they can optimize the profits that will be obtained.

➤ Return on Assets

Return on Asset or abbreviated as ROA is a comparison between profit before tax and total assets, or it can be said to be a comparison between net profit and total assets. A good company is one that is able to increase its ROA (Return on Assets). The higher the ROA generated, the more optimal the company is in managing its assets

➤ Return on Equity

According to Hanafi (2008), Return on Equity (ROE). A company's ROE (Return on Equity) is more focused on equity capital used to generate net profit. The greater the net profit produced, the more beneficial it is from the shareholders' perspective.

B. Operational Efficiency

➤ Net Interest Margin

Net Interest Margin (NIM) is one of the indicators taken into account in the assessment of Profitability aspects. The quality of a bank's management can be seen from how well the bank is able to manage its productive assets to optimally generate net interest income.

➤ Noninterest Expense/Average Assets

This ratio can be calculated based on salaries, building costs, and other annual expenditures that support the above variables, and then divided by the average assets generated.

➤ Recurring Earning Power

Recurring Earning Power is measured by the provisioned income to the average total assets. This ratio is a measure of pre-tax earnings that adds back provisions for bad loans as a percentage of total assets. Effectively this is a measurement of ROA performance without compromising the provisions. The purpose of this ratio is to measure the recurring earnings strength and efficiency of the banking sector.

C. Asset Quality

Asset quality assessment can be evaluated by how well credit risk management is able to manage the bank's asset condition to produce productive assets in accordance with Bank Indonesia's regulations. Asset quality assessment is used to ensure that the real value of the asset aligns with the value recorded by the bank. This is important because the level of asset quality can significantly impact various aspects, as previously mentioned above.

D. Capital Adequacy

Capital Adequacy is the bank's ability to withstand a decline in the real value of its assets that could lead to losses, as well as to meet its short-term obligations when they fall due.

➤ Total Capital Ratio

The Total Capital Ratio measures The amount of a bank's capital serves as a permanent guarantee against the level of risk it faces. A sound bank should hold at least 8% of its assets as risk-based capital, or at a minimum, 4%. This ensures that in the event of unexpected losses, the bank can manage them effectively before they lead to bankruptcy.

➤ Equity/Total Assets

Equity/Total Assets is a variable that measures how much capital a bank has in comparison to its total assets. The ratio reflects the most liquid portion of the bank's assets that can be converted into cash.

➤ Equity/Liabilities

Equity/Liabilities is a variable that measures how much capital a bank has when compared to the bank's liabilities or debts.

E. Company Size

The size of the company will affect the performance/performance of the company, including in the banking business. The banking business is a trust business that large banks will get more trust than banks with a small size. Unlike the previous variables which are reflective, the Company Size variable is formative. In a formative model, the indicator is not a reflection of the measured construct, but rather an antecedent or cause. Another difference is that in formative indicators, if one of the indicators disappears, this does not interfere with the other indicators because each is relatively independent. In this study, 3 indicators will be used as a proxy for Company Size, namely:

- Customer Deposits & Short-Term Funding
- Net Equity
- Number of Employees

III. RESEARCH METHODS

A. Research Object

The population in this study is the 10 banks with the largest assets in Indonesia for the period 2014-2018. The method used to determine samples is the *purposive sampling method*.

B. Measurement of Research Variables

➤ Profitability

ROA is one of the ratios used to measure a bank's level of soundness by calculating the return using net income after tax. However, in some studies and assessments—such as those using the CAMEL framework—ROA is calculated using pre-tax income. ROA can be calculated by the formula:

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Average value of total assets}} \times 100\%$$

➤ Return on Equity

ROE is the ability of a company to obtain profits available to the company's shareholders. ROE is very important for bank owners, as they will measure the skill and ability of the bank manager in engineering the available capital to earn a reasonable net income. ROE can be calculated with the formula:

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Average value of total equity}} \times 100\%$$

C. Operational

In this study, Operations uses observable variables, namely: *Net Interest Margin*, *Noninterest Expense/Average Assets*, and *Recurring Earning Power*.

➤ *Net Interest Margin*

The NIM formula according to Bank Indonesia Circular Letter No.13/24/DPNP dated October 25, 2011 is as follows:

$$\text{Net Interest Margin} = \frac{\text{Net Interest Earnings}}{\text{Average value of total assets}} \times 100\%$$

➤ *Noninterest Expense/Average Assets*

Noninterest Expense/Average Assets is a ratio calculated based on annual expenses for Operations compared to the average of the bank's assets. *Noninterest Expense/Average Assets* are calculated using the following formula:

$$\text{Noninterest Expense to Average Assets Ratio} = \frac{\text{Noninterest Expense}}{\text{Average Value of total assets}} \times 100\%$$

➤ *Recurring Earning Power*

The greater the fee-based income generated by the bank, the greater the bank's assets can be interpreted to be, indicating stronger recurring earning power. This reflects the bank's efficiency in utilizing its assets to generate consistent income beyond interest-based sources. Here is the formula:

$$\text{Recurring Earning Power} = \frac{\text{Provision profit}}{\text{Average Value of total assets}} \times 100\%$$

D. *Asset Quality*

In this study, Asset Quality uses one observable variable, namely Impaired Loans/Equity.

➤ *Impaired Loans/Equity*

Impaired Loans/Equity can be expressed in a formula.:

$$\text{Impaired Loans to Equity} = \frac{\text{Impaired Loans}}{\text{Equity}} \times 100\%$$

➤ *Total Capital Ratio*

Total Capital Ratio can be expressed in a formula.:

$$\text{Total Capital Ratio} = \frac{\text{Tier 1 Capital} + \text{Tier 2 Capital}}{\text{Risk Weighted Assets}} \times 100\%$$

➤ *Equity/Total Assets*

Equity/Liabilities can be expressed in a formula.:

$$\text{Equity to Total Assets Ratio} = \frac{\text{Total Equity}}{\text{Total Assets}} \times 100\%$$

E. *Company Size*

The size of a company consists of three variables, namely: Customer Deposits & Short-Term Funding, Net Equity, and Number of Employees.

➤ *Customer Deposits & Short-Term Funding*

The size of the Company can be seen from Customer Deposits & Short-Term Funding.

Size 2 = Customer Deposits & Short Term Funding➤ *Net Equity*

The size of the Company can also be seen from the net capital.

Size 3 = Net Equity➤ *Number of Employees*

The size of the company can also be seen from the number of employees. The more employees a bank has, the larger the size of the company or the size of the bank.

Size 4 = Number of EmployeesF. *Data Analysis Techniques*

In this study, the data analysis technique used is PLS (Partial Least Squares) with SmartPLS software. The analysis is carried out in 3 stages: (Ghozali, 2006), namely: **Measurement Model Analysis or Outer Model, and Structural Model Measurement Analysis or Inner Model (Hypothetical Model)**

IV. **RESULTS AND DISCUSSIONS**A. *Development of Models Based on Theory*

This study involves testing five research variables, namely: Profitability, Operational, Asset Quality, Capital Adequacy, and Company Size. This analysis presents a summary of research data which includes: **Measurement Model Analysis or Outer Model, and Structural Model Measurement Analysis or Inner Model (Hypothesis Model)**.

➤ *Hypothesis Test*• *Model Partial Least Square (PLS)*

In this study, the hypothesis test used the *Partial Least Square (PLS)* analysis technique with the smart PLS 3.3.2 program.

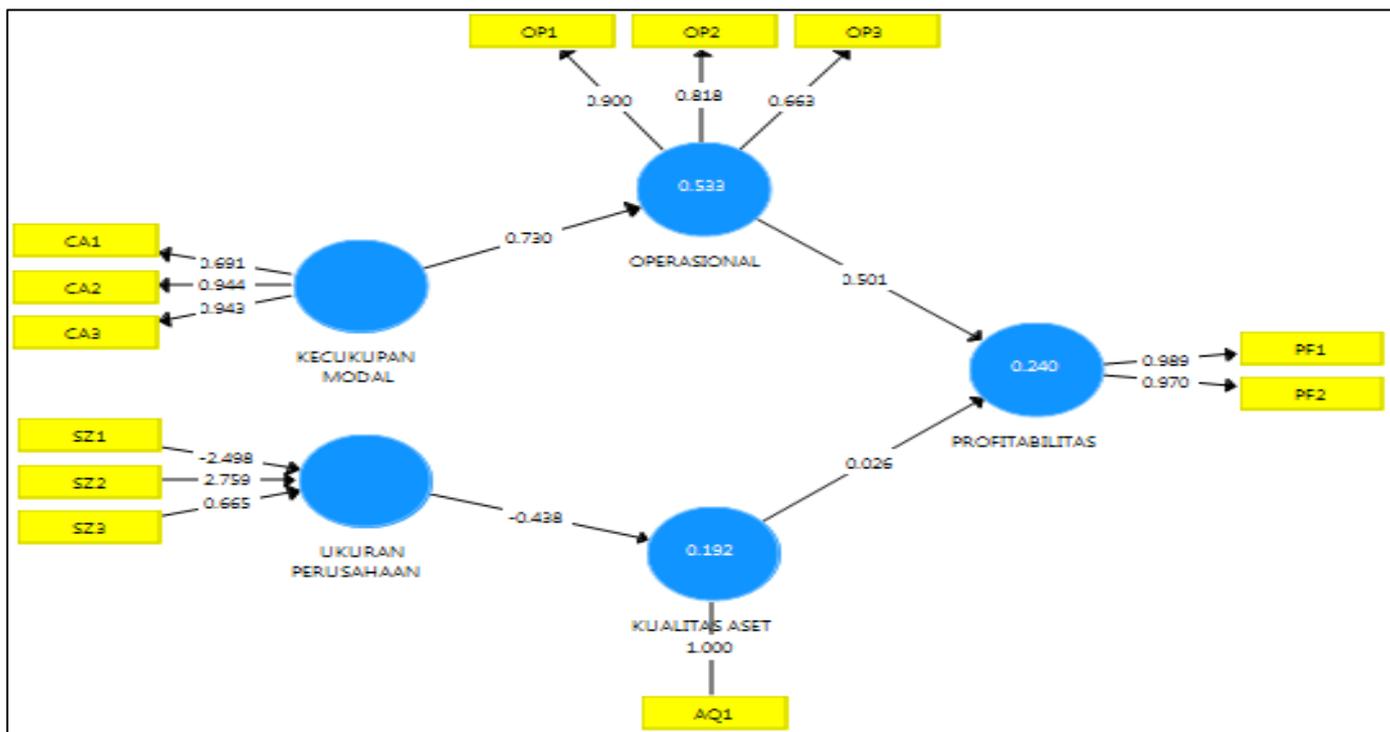


Fig 1: Outer Model

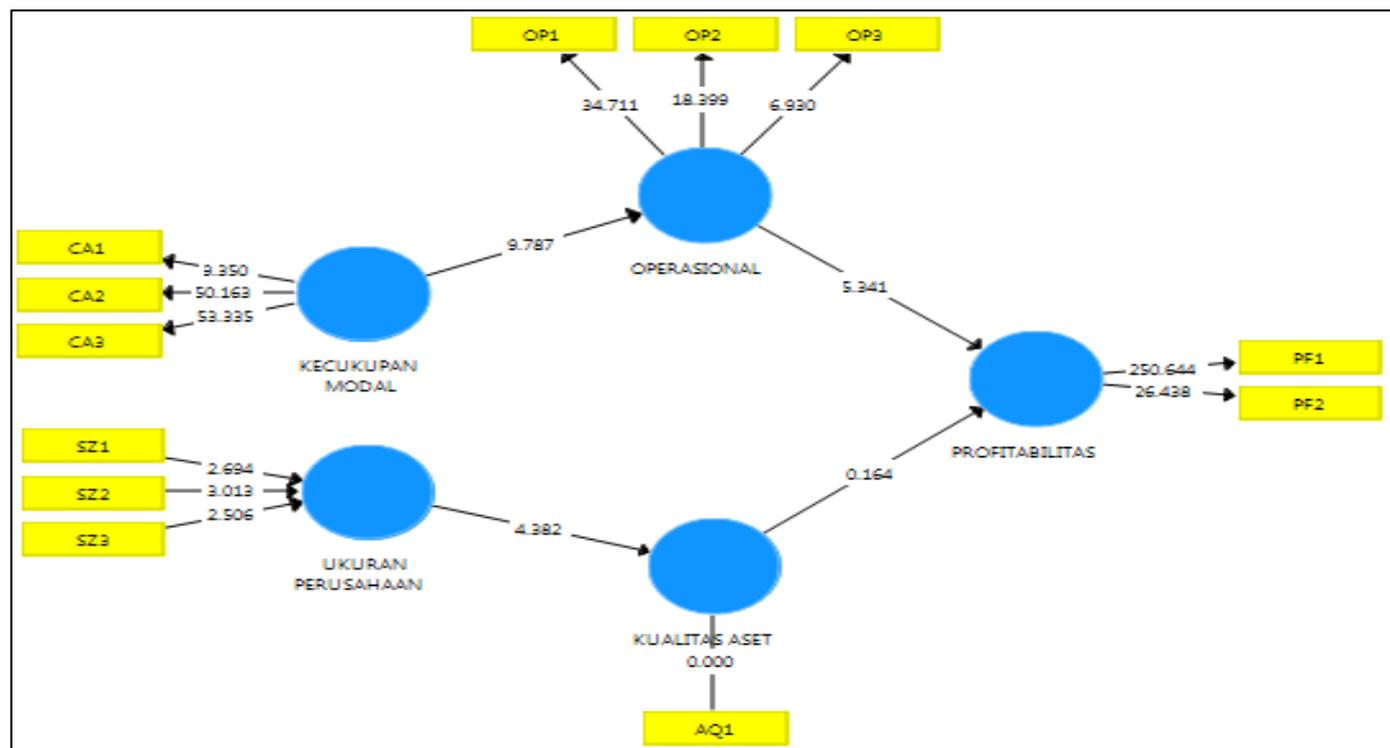


Fig 2: Inner Model

B. Evaluation of the Outer Model

In this study, the results of the *Convergent Validity*, *Discriminant Validity*, *Average Variant Extracted (AVE)*, *Composite Reliability*, and *Cronbach Alpha* tests will be explained.

- **Convergent Validity:** In this study, as shown in Table 4.3, the outer loading values are greater than 0.7, which is considered to be in the good category.

Table 1: Outer Loading

<i>Outer Loading</i>		
Variabel	Indikator	Outer Loading
Profitabilitas	PF1	0,989
	PF2	0,970
Operasional	OP1	0,900
	OP2	0,818
	OP3	0,663
Kualitas Aset	AQ1	1,000
Kecukupan Modal	CA1	0,691
	CA2	0,944
	CA3	0,943
Ukuran Perusahaan	SZ1	0,653
	SZ2	0,768
	SZ3	0,770

According to Chin (1998), an *Outer Loading* value between 0.5 – 0.6 is considered sufficient to qualify for *Convergent Validity*.

• *Discriminant Validity*

Discriminant validity test is considered satisfactory if the cross-loading value of an indicator on its own variable is greater than its loadings on other variables.

Table 2: Cross Loading

Indikator	Variabel				
	Profitabilitas	Operasional	Kualitas Aset	Kecukupan Modal	Ukuran Perusahaan
PF1	0,989	0,567	-0,265	0,352	0,533
PF2	0,970	0,338	-0,042	0,035	0,289
OP1	0,517	0,900	-0,303	0,598	0,713
OP2	0,098	0,818	-0,252	0,691	0,570
OP3	0,517	0,663	-0,450	0,465	0,630
AQ1	-0,184	-0,419	1,000	-0,478	-0,438
CA1	0,236	0,589	-0,117	0,691	0,481
CA2	0,183	0,646	-0,564	0,944	0,623
CA3	0,198	0,656	-0,532	0,943	0,634
SZ1	0,600	0,468	-0,286	0,134	0,653
SZ2	0,577	0,546	-0,336	0,298	0,768
SZ3	0,534	0,703	-0,337	0,279	0,770

Based on the research results, it can be seen that each indicator’s AVE value must be > 0.5 to be considered a good model.

Table 3: Average Variant Extracted Loading

<i>Average Variant Extracted (AVE)</i>	
Variabel	AVE
Profitabilitas	0,960
Operasional	0,639
Kualitas Aset	1,000
Kecukupan Modal	0,753

Based on the data presented in table 3, it is known that the AVE value of the variables Profitability, Operations, Asset Quality and Capital Adequacy > 0.5. Thus, it can be stated that each variable has a good Discriminant Validity.

- *Composite Reliability*
A variable can be declared to meet Composite Reliability if it has a Composite Reliability value >0.6.

Table 4: Composite Reliability

<i>Composite Reliability</i>	
Variabel	Composite Reliability
Profitabilitas	0,980
Operasional	0,840
Kualitas Aset	1,000
Kecukupan Modal	0,900

Based on the data presented in table 4, it can be seen that the Composite Reliability value of all research variables >0.6. These results show that each variable has met the Composite Reliability so it can be concluded that the entire variable has a high level of realism.

- *Cronbach Alpha*
A variable can be declared reliable or meet Cronbach Alpha if it has a Cronbach Alpha value >0.7.

Table 5: Cronbach Alpha

<i>Cronbach Alpha</i>	
Variabel	Cronbach Alpha
Profitabilitas	0,961
Operasional	0,707
Kualitas Aset	1,000
Kecukupan Modal	0,824

Based on the data presented in Table 4.7, it can be seen that the Cronbach Alpha value of each research variable > 0.7. Thus these results can show that each of the research variables has met the requirements of the Cronbach Alpha value, so it can be concluded that All variables have a high level of reliability.

- *Significance of Weights and Multicollinearity*
In this study, there is 1 variable with a formative construct, namely Company Size with 3 indicators, namely

Customer Deposits & Short-Term Funding (SZ1), Net Equity (SZ2), and Number of Employees (SZ3).

VIF scores were also obtained from model measurements using the PLS algorithm. According to Santoso (2012), multicollinearity is considered serious at the VIF value >30. The following Table 5 presents the results of the Reliability Indicator and Colinearity Indicator of each indicator from the Company Size variable.

Table 6: Reliability Indicator and Colinearity Indicator

<i>Reliability Indicator dan Colinearity Indicator</i>		
Indikator	Outer Weight	VIF
SZ1	-2,498	21,507
SZ2	2,759	20,050
SZ3	0,665	1,939

Table 6 shows the SZ2 and SZ3 indicators meet the Significance of Weights. Meanwhile, the SZ1 Indicator does not meet the criteria because the value is below the specified score of 0.2, but the theoretical basis on which it is based is very strong. Formative constructs basically only require a logical analysis of what constitutes the construct (Haryono, 2015).

According to Santoso (2012), multicollinearity is considered serious at the VIF value > 30. Table 4.8 shows that the indicators SZ1, SZ2 and SZ3 do not occur with serious multicollinearity due to the VIF value < 30.

C. Inner Model Evaluation

In this study, the results of the Path Coefficient Test, Goodness of Fit Test and Hypothesis Test will be explained.

➤ *Hypothesis Test*

The research hypothesis can be declared acceptable if the T-Statistics value > 1.96 and the P-Values < 0.05. The following Table 4.0 presents the Path Coefficient Direct Effect and Table 4.10 presents the Path Coefficient Indirect Effect of this study.

Table 7: Path Coefficient Direct Effect

<i>Path Coefficient Direct Effect</i>							
Hipotesis	Pengaruh	Path Coefficient	Sample Mean	Std. Dev	T-Statistics	P-Values	Hasil
H1	Operasional → Profitabilitas	0,501	0,506	0,094	5,341	0,000	Diterima
H2	Kecukupan Modal → Operasional	0,730	0,736	0,075	9,787	0,000	Diterima
H3	Kualitas Aset → Profitabilitas	0,026	-0,010	0,160	0,164	0,870	Ditolak
H4	Ukuran Perusahaan → Kualitas Aset	-0,438	-0,449	0,100	4,382	0,000	Diterima

The first hypothesis tests whether Operations have an effect on Profitability. Based on Table 7, it can be seen that the first hypothesis is accepted. Or it can be stated that Operations affect Profitability.

Then in the second hypothesis, Capital Adequacy has an effect on Operations. In the third hypothesis, it can be stated that Asset Quality has no effect on Profitability. The fourth hypothesis is accepted. Or it can be stated that the size of the company affects the quality of the assets.

Table 8: Path Coefficient Indirect Effect

<i>Path Coefficient Indirect Effect</i>							
Hipotesis	Pengaruh	Path Coefficient	Sample Mean	Std. Dev	T-Statistics	P-Values	Hasil
H5	Kecukupan Modal → Operasional → Profitabilitas	0,365	0,371	0,072	5,102	0,000	Diterima
H6	Ukuran Perusahaan → Kualitas Aset → Profitabilitas	-0,011	0,004	0,077	0,149	0,882	Ditolak

The fifth hypothesis tests whether Capital Adequacy affects Profitability through Operations. In Table 8, it can be seen that the fifth hypothesis is accepted or can be stated that Capital Adequacy affects Profitability through Operations. Then the sixth hypothesis tests whether Company Size affects Profitability through Asset Quality. In table 8, it can be seen that the sixth hypothesis is rejected. Or it can be stated that the size of the company has no effect on Profitability through Asset Quality.

➤ *Path Coefficient Test*

Based on table 7, it can be explained that the largest Path Coefficient Direct Effect value is shown by the effect of Capital Adequacy on Operations of 0.730. Then the second largest influence is the influence of Operations on Profitability of 0.501. And the third largest influence is the effect of Asset Quality on Profitability of 0.026, but this hypothesis is rejected so that it can be stated that Asset Quality does not have a significant influence on Profitability. Then the smallest influence is shown by the influence of Company Size on Asset Quality of -0.438.

Furthermore, based on table 7, it can be explained that the largest Path Coefficient Indirect Effect value is shown by the effect of Capital Adequacy on Profitability through Operations of 0.365. Then the second largest influence is the Company Size on Profitability through Asset Quality of -0.011, but this hypothesis is stated to be rejected so that the Company Size does not have a significant effect on Profitability through Asset Quality.

➤ *Model Goodness Test (Goodness of Fit)*

In general, the R2 values = 0.75, 0.50 and 0.25, indicating successively strong, medium and weak measures of influence (Sarstedt and Mooi, 2014).

Table 9: R-square

<i>Nilai R-Square</i>	
Variabel	R-Square
Profitabilitas	0,240
Operasional	0,533
Kualitas Aset	0,192

Based on the data presented in Table 9, it can be seen that the R-Square value for the Profitability variable is 24% or the influence of Operations and Asset Quality on Profitability = 24%, Then the R-Square value obtained by the Operational variable is 53.3%. Finally, for the R-square value obtained by the Asset Quality variable of 19.2%, The results of the calculation of the Q-Square value are as follows:

$$\begin{aligned}
 Q\text{-Square} &= 1 - [(1 - R^2_1) \times (1 - R^2_2) \times (1 - R^2_3)] \\
 &= 1 - [(1 - 0,240) \times (1 - 0,533) \times (1 - 0,192)] \\
 &= 1 - (0,760 \times 0,467 \times 0,808) \\
 &= 1 - 0,287 \\
 &= 0,713
 \end{aligned}$$

Based on the calculation results above, the Q-Square value is 0.713. This means that 71.3% of the data variability in the study can be explained by the research model. The remaining 28.7% is explained by factors outside the model. Therefore, the research model can be considered to have a good Goodness of Fit.

D. Operational Impact on Profitability

The first hypothesis of this study is that Operations affect Profitability, If explained in theory this is because the operational efficiency of a good bank will increase the bank's net income which is where Profitability is measured using the net income of a bank. Likewise, poor operational efficiency can cause the bank's net income to decrease so that it can reduce the bank's profitability level.

E. The Effect of Capital Adequacy on Operations

The second hypothesis of this study is that Capital Adequacy affects Operations, if explained in theory this is because Capital Adequacy is an aspect that measures whether the capital owned by a bank is adequate to support its Operational activities. Therefore, the better a bank's capital is managed, the more efficient its operational activities will be. Likewise, vice versa, if the bank's capital is not managed properly, it will reduce the bank's operational efficiency. These two variables are closely related and influence each other.

F. The Effect of Asset Quality on Profitability

The results of the three hypotheses of this study show that Asset Quality is proven to have no influence on Profitability. This can be because the indicator of the Asset Quality variable in this study is Impaired Loans/Equity measured by Impaired Loans divided by capital (Equity). Bad loans at a bank have certainly been backed up so that they do not significantly affect the bank's net opinion. The bank still has other sources of income, namely Fee based income (FBI) or service opinions, income from spot and derivative transactions, dividend income and other income such as the proceeds of the sale of fixed assets, building rents, or the execution of customer collateral that has been controlled by the bank.

G. The Effect of Company Size on Asset Quality

In this case, firm size has an influence on asset quality. A larger firm is generally considered to be more stable in managing the bank's capital, which in turn leads to a lower level of non-performing loans. As a result, the risk of losses for the bank becomes smaller.

H. The Effect of Capital Adequacy on Profitability through Operations

The fifth hypothesis of this study is that Capital Adequacy has an effect on Profitability through Operations. From the second hypothesis, we know that Capital Adequacy and Operations are mutually influential. And it turns out that after being tested, Capital Adequacy also affects Profitability indirectly, through Operations. In theory, this is because the better the Capital Adequacy will cause the bank's operations to also run better and more efficiently, so that directly resulting in the bank's revenue also increases. This increased bank income is what causes the bank's profitability to also increase.

I. The Effect of Company Size on Profitability through Asset Quality

The sixth hypothesis is that there is no effect of Company Size on Profitability indirectly or through Asset Quality. This is because the mediation variable, namely Asset

Quality using the Impaired Loans/Equity indicator, is measured by Impaired Loans divided by capital (Equity). Bad loans at a bank have certainly been backed up so that they do not significantly affect the bank's net opinion or profitability. The bank also still has other sources of income, namely Fee based income (FBI) or service opinions, income from spot and derivative transactions, dividend income and other income such as the proceeds of the sale of fixed assets, building rents, or the execution of customer collateral that has been controlled by the bank. So it can be concluded that Asset Quality cannot be said to be an intervening variable because it does not affect independent variables and dependent variables indirectly.

V. CONCLUSIONS

Based on the research findings on the sustainable profitability model of Indonesian banking, it can be concluded that Operational Efficiency, Capital Adequacy, and Firm Size have a significant influence on Profitability. Meanwhile, Asset Quality does not have a significant effect on Profitability.

Furthermore, Firm Size has a significant influence on Asset Quality. Operational Efficiency also acts as an intervening variable in the relationship between Capital Adequacy and Profitability. However, Firm Size does not significantly affect Profitability through Asset Quality. Therefore, Asset Quality does not serve as an effective intervening variable in the relationship between Firm Size and Profitability.

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