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Determination Of Return On Assets: Analysis Of Solvency Ratio And Liquidity Ratio

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ABSTRACT

The main objective of this study is to provide an in-depth understanding of how solvency and liquidity ratios affect a company's ability to use its assets efficiently in generating profits, as well as to make useful contributions to managerial decision-making and evaluation of company performance. Several indicators in the study were studied to analyze the determination of the solvency ratio consisting of (Debt to Asset Ratio and Debt to Equity Ratio) and liquidity ratio (Current Ratio) to Return on Assets (ROA) with a sample of several large industrial companies listed on the Indonesia Stock Exchange with a period of 2015-2020. Research with test analysis techniques analysis of test selection of Test models (chow, hausman and langrange multiplier), classical assumption test with Multicollinearity and Heteroscedasticity, Regression Test panel data, Correlation Test and hypothesis testing (partial / t-Test and simultaneous / F-Test). The results of research through partial tests and simultaneous tests with the main focus of industrial companies resulted in that the three variations of DAR, DER and CR had no influence on the Return on Assets of the company objects sampled.

INTRODUCTION

The development of technology is increasingly advanced today, all companies in Indonesia strive to advance and maintain the sustainability of the company to develop in the future. Currently, industrial companies in Indonesia are competing to advance their business. Based on data from the Ministry of Industry. The contribution of the industrial sector to gross domestic product (GDP) is increasing year by year.

Since 2010, the industrial sector continues to make the largest contribution to national GDP, even during the peak of the pandemic in 2020-2021, the industrial sector continued to make the largest contribution to GDP. In 2021, the GDP of the industrial sector was recorded at IDR 2,946.9 trillion, an increase compared to 2020 which reached IDR 2,760.43 trillion. In 2020, the contribution rate of Indonesia's industrial sector was 19.8%, higher than the global average of 16.5%. Based on this data, Indonesian manufacturing companies aim to maximize their corporate value. This value is reflected in the value of shares of companies listed on the IDX. A company's sales are an indicator of its growth, so an increase in sales is good for a company. (Kouser et al., 2012).

The increase or decrease in sales can be seen in the financial statements of each Company. Before investing, every investor always analyzes the securities statements of each company in which

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they invest. Financial statements can be used as a benchmark for the development of a company, whether the company is successful or not? Financial statements are useful for any business planning and can predict future financial status (Oktaviansah et al., 2023). Profitability is one of the performance evaluation parameters used by investors to evaluate business performance. The return on assets (ROA) approach is used by investors to measure profits because a company's ability to generate profits is a very important factor in attracting investors. Several ratios are used to evaluate the company. One of them is the solvency ratio through debt to assets ratio (DAR). DAR measures a company's ability to adapt to situations that result in reduced assets due to losses without reducing interest payments to creditors (Zaman et al., 2021). Ratio for debt to assets (DAR) of 35% (Kasmir et al., 2008). A high DAR ratio indicates an increasing ratio on the creditor side in the form of the company's inability to fulfill all its obligations. Therefore, it can be said that a higher DAR ratio value will lead to higher interest payments and ultimately lower dividend payments. Puspitasari et al. (2021) state that DAR has an impact on ROA for food and beverage manufacturers. However, this finding contradicts the research by Andi Kartika, Moch Irsad Mulyobudi Setiawan and Bambang Sudiyatno et al. (2023), which indicates that an increase in the debt to asset ratio (DAR) does not impact the return on assets (ROA) of transportation companies.

Another ratio that affects investors when assessing the performance of a company and further affects the stock of a company is the Current Ratio (CR). It represents the company's ability to meet short-term obligations that must be met immediately. On research, Irman et al. (2017) and Wahyuni et al. (2018) states that CR significantly affects Return on Assets (ROA), whereas Ardhefani et al. (2021) and Sari et al. (2022) report that some CRs have no effect on ROA. In measuring the amount of debt to equity used Debt to Equity Ratio (DER), if DER produces a high value, it can be said that the greater the total debt to the total equity of the Company which shows the use of debt in the Company's funding is greater to outside parties, so that later it can increase risks and expenses, this is a consideration for investors in investing in the Company. Oktaviansah et al. (2021) state that DER negatively affects ROA, while Agusti et al. (2012) find that DER has no effect on ROE but is inversely proportional. Conversely, Randy et al. (2018) report that DER has a partial effect on ROA.

This study has a sample of companies and a different time range from the previous study by focusing on industrial companies with a time range of 2015-2020 as well as its analysis of the solvency ratio and liquidity ratio of companies. The results of the study are expected to contribute to providing an in-depth understanding of how solvency and liquidity ratios affect a company's ability to use its assets efficiently in generating profits, as well as to make a useful contribution to managerial decision-making and evaluation of company performance. Based on the basic factors and the results of gap research discussed above, it was found that research related to DAR, DER, and CER on ROA still obtained different results. Therefore, the author is interested in conducting research on DAR, DER, and CR regarding ROA. This study examines the consequences of the influence of these variables on the Indonesian manufacturing industry listed on the Indonesia Stock Exchange during the period 2015-2020 and provides knowledge on the results achieved.

Profitability is the end result of the policies and management decisions of a company, and is a combination of the effects of liquidity, asset management, and debt on business performance, and is called the profitability ratio (Brigham et al., 2019). According to Sartono (2012) Profitability refers to a company's ability to make a profit with respect to sales, total assets, and capital. Profitability is the ability of a company to generate profits within a certain period of time (Munawir, 2010).The low return on assets (ROA) is due to the company's low revenue and high interest costs due to the use of debt capital. According to research conducted by Oktiwiati (2020) Profitability has a positive effect on the value of the company. The return on assets formula is a comparison between net income and total assets.

Return on Assets (ROA) = Earning After Tax / Total Asset

Brigham (2019)

Debt to Asset Ratio (DAR) is the ratio of total debt to total assets and focuses on debt equity using the proportion of a company's assets that are backed by the value of debt. Based on the results of the ratio measurement, if the percentage of DAR increases, the company's capacity to obtain additional loans from creditors will decrease (Heri, 2021). According to Hanafi (2011) the DAR formula is as follows:

Debt to Asset Ratio= Total Liabilities / Total Asset

Hanafi (2011)

The debt-to-equity ratio is included in the solvency ratio. According to Van Horne and Wachowicz (2013) Debt to Equity Ratio to find out the extent to which a company uses debt is determined by the debt to equity ratio. The debt-to-equity ratio is calculated by dividing a company's total debt (including short-term debt) by the company's equity. According to Brigham (2019) The leverage ratio is used to measure how far a company is trying to use funding through the debt system. Receiving outside capital allows investors to maintain control over the company. On the creditor's side, capital is considered the margin of safety. The more equity you have, the lower the risk to creditors. The higher the debt-to-equity ratio (DER), the greater the risk and the more investors demand higher returns. The debt-to-equity ratio is calculated in the following formula:

Debt to Equity Ratio= Total Liabilities / Total Equity

Baker and Powell (2015)

The current ratio is included in the current ratio. The current ratio compares assets that can be converted to cash within one year with liabilities that must be repaid within that year. A company with a low current ratio has no liquidity in the sense that it cannot reduce its current assets to cash to meet maturning obligations. It should rely on operating income and outside financing (Higgins et al., 2016). According to Brigham & Houston (2021) The current ratio is a ratio that shows how much current liabilities can be covered by the size of assets that are expected to be converted into cash in the near future.

Current Ratio = Current Assets/ Current Liabilities

Brigham & Houston (2021)

Research Hypothesis

Table 1
Research Hypothesis Table

Hypothesis	Independent Variable	Type of Ratio	Expected Relationship with ROA	Hypothesis Statement
H1	Debt to Asset Ratio	Solvency Ratio	Negative	Higher Debt to Asset Ratio is negatively related to Return on Assets (ROA).
H2	Debt to Equity Ratio	Solvency Ratio	Negative	Higher Debt to Equity Ratio is negatively related to Return on Assets (ROA).
H3	Current Ratio	Liquidity Ratio	Positive	Higher Current Ratio is positively related to Return on Assets (ROA).

Debt to Asset Ratio (H_1):
Hypothesis Statement: A higher Debt to Asset Ratio, which indicates greater financial leverage, is expected to negatively impact ROA because high debt levels may increase financial risk and reduce profitability.
Debt to Equity Ratio (H_2):
Hypothesis Statement: A higher Debt to Equity Ratio suggests a higher proportion of debt relative to equity, which may lead to lower ROA due to increased interest expenses and financial risk.
Current Ratio (H_3):
Hypothesis Statement: A higher Current Ratio, which indicates better liquidity, is expected to positively impact ROA as it reflects a company’s ability to meet short-term obligations and potentially invest in opportunities for higher returns

MATERIALS AND METHODS

Types of Research and Research Data

Judging from the purpose of this study, it is a type of validation research conducted to verify the truth of existing science (education) in the form of concepts, principles, procedures, postulates and educational practices themselves. The research data obtained will help prove the existence of doubts about information or educational problems (Haidir, 2019). Based on the approach used, this study is a

quantitative research using panel data. According to Basuki (2017) Panel data is a combination of time series data and cross-sectional data. Quantitative research is used to seek answers to questions that arise through careful measurement techniques of certain variables and can be generalized regardless of the time, context of the situation, and the type of data collected, especially quantitative data (Setyosari, 2016)**.**

Analysis, Data Collection and Sample Techniques

The data collection process uses literature research and documentation techniques. The data analysis method used is a classical assumption test consisting of a normality test, an autocorrelation test, a heteroscedasticity test, and a multicollinearity test. In addition, regression analysis of panel data, hypothesis test, t test, and F test was carried out. The type of data in this study is quantitative data obtained from secondary and indirect data from the financial statements of manufacturing industry subsector companies. The technique used uses statistics with E-Views 13. In this study, the operational discussion used is as follows.

Table 2
Operationalization of Variables

Variable	Indicators	Size Ratio	Scale
Debt to Asset Ratio	*Debt to Asset Ratio*	*Total Liabilities / Total Asset*	Ratio
Debt to Equity Ratio	*Total Liabilities Total Equity*	*Total Liabilities / Total Equity*	Ratio
Current Ratio	*Current Assets Current Liabilities*	*Current Assets/ Current Liabilities*	Ratio
Return on Assets	*Earning After Tax Total Assets*	*Earning After Tax / Total Assets*	Ratio

Sampling in this study was purposive sampling. Samples that meet the criteria of the research problem produce five samples of manufacturing subsector company data covering the total assets of the five largest companies listed on the Indonesia Stock Exchange.

1. Industrial subsector companies listed on the Indonesia Stock Exchange and audited between 2015 and 2020
2. Companies that published financial statements between 2015 and 2020
3. Financial ratios of financial elements required for calculation are available in the financial statements
4. Financial statements are expressed in rupiah

Table 3
Research Samples

No	Code	Company Name
1	ASII	Astra International Tbk
2	AUTO	Astra Otoparts Tbk
3	GDYR	Goodyear Indonesia Tbk
4	ARGO	Argo Pantes Tbk
5	AMIN	PT Ateliers Mecaniques D Indonesie Tbk.

The sample was selected from 5 large companies that have completed all financial report ratio indicators so that the solvency ratio and liquidity ratio can be calculated.

RESULTS AND DISCUSSION

Research Results

Test Results

Chow Test Model Selection (F-Test / Chow Test) The Chow test is conducted to compare which model

is the best between common effect (CE) and fixed effect (FE). The test was conducted by comparing the cross-sectional probability value F with alpha (a) of 0.05 (Baltagi, 2005).

Table 4
Chow Test Model

Effects Test	Statistic	d.f.	Prob.
Cross-section F	7.639391	(4,22)	0.0005
Cross-section Chi-square	26.125997	4	0.0000

The probability value in cross section F is 0.0000 < 0.05, then the Fixed Effect (FE) model is chosen. Because what is selected in the chow test is the Fixed Effect Model, it must be continued with the Hausman test.

The Hausman test

The Hausman test is performed to compare whether a fixed effect (FE) or random effect (RE) model is best. The test was conducted by comparing the probability value of random cross section with alpha (a) of 0.05.

Table 5
The Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	21.601736	3	0.0001

Based on the cross-section random effect test table, a probability value of 0.0001 < 0.05 (alpha) was obtained, it was concluded that the Fixed Effect (FE) model was selected. Based on two model selection tests, namely the Chow test and the Hausman test, the fixed effect model is more accurate than the common effect (CE) model and the random effect model Therefore, it can be concluded that the FE model is selected and does not need to be continued with the Lagrannge multiplier (LM) test (Widarjono, 2007).

Classical assumption test results

After obtaining the model used in the study, classical assumption testing is carried out to ensure that the regression equation obtained is correct, unbiased, and the estimates are consistent. Since the model chosen is FEM, classical assumptions must be tested. The classic assumption test used is multicollinearity (Basuki & Yuliadi, 2014) (Napitupulu et.al., 2021).

Multicollinearity Test

The multicollinearity test is used to determine whether there is a high correlation between each independent variable. If there is a correlation between independent variables in the research model, the relationship between independent and dependent variables will be disrupted (Ansofino, 2016).

Table 6
Multicollinearity Test

	X1	X2	X3
DAR X1	1.000000	-0.767128	-0.855663
DER X2	-0.767128	1.000000	0.572419
CR X3	-0.855663	0.572419	1.000000

The correlation coefficients DAR (X_1) and DER (X_2) of -0.767128< 0.85 (std the limit of the regression multicollinearity test) and DAR (X_1) and CR (X_3) of -0.855663 < 0.85 and DER (X_2) and CR (X_3) 0.572419 < 0.85, it can be concluded that free from multicollinearity or pass the multicollinearity test (Napitupulu, 2021).

Heteroscedasticity Test

The heteroscedasticity test is used to analyze whether the variation of the error is constant (homoscedastic) or variable (heteroscedastic), if there is heteroscedasticity then the OLS estimator is not the best linear Unbiased Estimator (BLUE) (Rosadi, 2012).

Table 7
Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.076273	0.040093	1.902398	0.0683
DAR X1	-0.030274	0.027214	-1.112469	0.2761
DER X2	-0.009711	0.006056	-1.603467	0.1209
CR X3	-0.013980	0.022764	-0.614121	0.5445

R-squared	0.092629	Mean dependent var	0.039803
Adjusted R-squared	-0.012067	S.D. dependent var	0.032051
S.E. of regression	0.032244	Akaike info criterion	-3.907408
Sum squared resid	0.027031	Schwarz criterion	-3.720582
Log likelihood	62.61112	Hannan-Quinn criter.	-3.847641
F-statistic	0.884741	Durbin-Watson stat	1.464486
Prob(F-statistic)	0.461932		

DAR (X_1), DER (X_2), CR (X_3) passes heteroscedasticity test due to probability more than 0.05

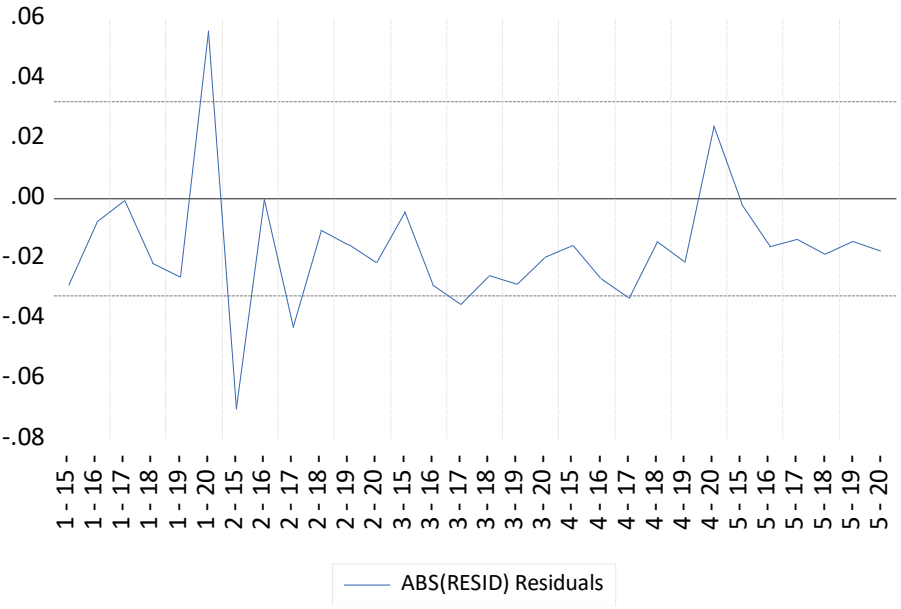

FIGURE 1.
Residual Chart

You can see from the residual chart (blue) that the lines (500 and -500) are not crossed. his means that the residual variants are the same. Therefore, it has no symptoms of heteroscedasticity and does not pass the heteroscedasticity test. (Napitupulu, 2021).

Panel data regression equation

$Y= 0.08 - 0.03*X_1 - 0.01*X_2 - 0.01*X_3$

The explanation is as follows:

Constant explanation

1. A constant value of 0.08 means that the variable ROA (Y) increases by 8% without variables DAR (X_1), DER (X_2), and CR (X_3).

Beta explanation

2. The value of the beta coefficient of variable DAR (X_1) is -0.03 if the value of other variables is constant and variable DAR (X_1) increases by 1%, then variable ROA (Y) will decrease by 3%, and vice versa if the value of other variables is constant and variable DAR (X_1) decreases by 1% then variable ROA (Y) will decrease by 3%
3. The value of the beta coefficient of variable DER (X_2) is -0.01 if the value of other variables is constant and variable DER (X_2) increases by 1%, then variable ROA (Y) will decrease by 1%, and vice versa if the value of other variables is constant and variable DER (X_2) decreases by 1% then variable ROA (Y) will decrease by 1%.
   The value of the beta coefficient of variable CR (X_3) is -0.01 if the value of other variables is constant and variable CR (X_3) increases by 1%, then variable ROA (Y) will decrease by 1%, and vice versa if the value of other variables is constant and variable CR (X_3) decreases by 1% then variable ROA (Y) will decrease by 1%.

Partial test results (t)

Partial significance test results are used to test research hypotheses conducted by testing partial (individual) variables to determine the significance of the influence of independent variables with dependent variables (Nani, 2022).

The hypothesis in this study is as follows:

H_0: Partially there is no significant influence of the independent variable on the dependent variable

H_a: Partially there is a significant influence of the independent variable on the dependent variable.

Table 8
Partial Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.076273	0.040093	1.902398	0.0683
X1	-0.030274	0.027214	-1.112469	0.2761
X2	-0.009711	0.006056	-1.603467	0.1209
X3	-0.013980	0.022764	-0.614121	0.5445

The effect of the independent variable on the dependent variable partially is as follows:

a. The results of the t test on the variable DAR (X_1) obtained a calculated t_{value} of 1.112 < t_{table}, which is 2.048 and a sig value of 0.2761 > 0.05, then H_a is rejected and H_0 is accepted, meaning that variable DAR (X_1) has no effect on ROA (Y)
b. The result of the t test on the variable DER (X_2) obtained a calculated t_{value} of 1.603 < t_{table}, which is 2.048 and a sig value of 0.1209 > 0.05, then H_a is rejected and H_0 is accepted, meaning that variable DER (X_2) has no effect on ROA (Y)
c. The results of the t test on the variable CR (X_3) obtained a calculated t_{value} of 0.614 < t_{table}, namely 2.048 and the sig value of 0.5445 > 0.05, then H_a is rejected and H_0 is accepted meaning that the variable CR (X_3) has no effect on ROA (Y)

Simultaneous Test (f)

Simultaneous testing is the testing of hypotheses simultaneously (Together), and free varibael of more than one (Nani, 2022).

Table 8
Simultaneous Test

R-squared	0.092629	Mean dependent var	0.039803
Adjusted R-squared	-0.012067	S.D. dependent var	0.032051

S.E. of regression	0.032244	Akaike info criterion	-3.907408
Sum squared resid	0.027031	Schwarz criterion	-3.720582
Log likelihood	62.61112	Hannan-Quinn criter.	-3.847641
F-statistic	0.884741	Durbin-Watson stat	1.464486
Prob(F-statistic)	0.461932		

The hypothesis in this study is as follows:

H_0: Partially there is no significant influence of the independent variable on the dependent variable

H_1: Partially there is a significant influence of the independent variable on the dependent variable

The calculated F_{value} is 0.8847 < F_{table} is 2.975 and the sig value is 0.461 > 0.05 Then H_0 is accepted and H_a is rejected meaning that the variables DAR, DER, CR have no effect on the ROA of industrial companies in Indonesia.

Discussion

Partial Discussion

Based on the results of the t-test on the variable Debt to Asset Ratio (X_1) obtained a calculated value of 1.112 < t_{table}, which is 2.048 and a sig value of 0.2761 > 0.05, then H_{a1} is rejected and H_{01} is accepted, meaning that the variable DAR (X_1) has no effect on ROA (Y) in industrial companies and the results of this study have similarities with research (Agusti et al., 2012) which results in that DAR has no significant effect on Return on Assets (ROA) but is different from the study (Zaman et al., 2021) which resulted in research that the Debt to Asset Ratio has a significant influence on Return on Asset (ROA). Based on the results of the t-test on the variable Debt to Equity Ratio (X_2) obtained a calculated value of 1.603 < t_{table}, which is 2.048 and a sig value of 0.1209 > 0.05, then H_{a2} is rejected and H_{02} is accepted, meaning that the variable DER (X_2) has no effect on ROA (Y) in industrial companies and the results of this study produce the same results as the study (Firmansyah et al., 2021) which states that DER has no effect on ROA but is different from research (Jurlinda et al., 2022) that DER (X_2) has a significant positive effect on Return on Assets (ROA).

Based on the results of the t-test on the Current Ratio (X_3) variable, a calculated value of 0.614 < t_{table} is 2.048 and a sig value of 0.5445 > 0.05, then H_{a3} is rejected and H_{03} is accepted meaning that the variable CR (X_3) has no effect on ROA (Y) in industrial companies and the results of this study produce the same results as the study (Satria et al., 2023) which in his research states that CR has no effect and is not significant on ROA but is different from research (Firmansyah et al., 2021) there is a partial effect of CR on ROA.

Based on the results of the study, industrial companies face a situation where the management of current assets and current debt together does not affect the level of profitability obtained through assets, some of the factors that may explain why this is the case because the company may have reached an optimal balance between current assets and current debt, where these two factors are well managed so that it does not affect profitability significantly. This means that current debt is managed in proportion to the company's current assets. The company has also conducted efficient cash management ensuring that it has sufficient liquidity to meet its short-term obligations without adding significant cost burdens. The company may have implemented a highly efficient current asset and current debt management strategy, so that it does not affect profitability. The management of operational costs and debt-related expenses has been well managed, so the management of current assets and current debt may not have a significant impact on profitability.

Managing current assets and current liabilities simultaneously does not necessarily affect a company's profitability directly due to various internal and external factors that can affect results. These factors include management balance, variability in profitability, management effectiveness, capital structure, industry conditions, competition, and analysis methods. Therefore, it is important for companies to consider all relevant variables and conduct a thorough analysis to understand the relationship between asset management, debt, and profitability.

Simultaneously

Based on the results of the Simultaneous Test, the $F_{calculate}$ value of 0.8847 < F_{table} is 2.975 and the sig value is 0.461 > 0.05 Then H_0 is accepted and H_a is rejected meaning that the variables Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), Current Ratio (CR) simultaneously do not affect the Retrun on Asset (ROA) of industrial companies in Indonesia. Based on the results of the study, it shows that in managing current assets and current debt, debt management with capital and the ability of industrial companies to manage current assets with liabilities simultaneously do not affect the level of profitability of companies obtained through assets

CONCLUSIONS AND SUGGESTIONS

Based on the analysis in the study, the results of the t-test on the variable Debt to Asset Ratio (X_1) obtained a calculated value of 1.112 < t_{table}, namely 2.048 and a sig value of 0.2761 > 0.05, it was concluded that the variable Debt to Asset Ratio (X_1) did not affect the Return on Asset (Y) in industrial companies on the Indonesia Stock Exchange in 2015-2020**.** Based on the analysis in the study, the results of the t-test on the variable Debt to Equity Ratio (X_2) obtained a calculated value of 1.603 < t_{table}, namely 2.048 and a sig value of 0.1209 > 0.05, it was concluded that the variable Debt to Equity Ratio (X_2) had no effect on not affecting the Return on Asset (Y) of industrial companies on the Indonesia Stock Exchange in. Next on the analysis in the study, the results of the t-test on the Current Ratio (X_3) variable obtained a calculated value of 0.614 < t_{table}, which is 2.048 and a sig value of 0.5445 > 0.05, it is concluded that the Current Ratio (X_3) variable has no effect on no effect on the Return on Asset (Y) in industrial companies on the Indonesia Stock Exchange in 2015-2020. Based on the analysis in the study, the results of the Simultaneous Test obtained a $F_{calculate}$ value of 0.8847 < F_{table}, which is 2.975 and a sig value of 0.461 > 0.05, so it is concluded that the variables Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), Current Ratio (CR) simultaneously have no effect on Return on Asset (Y) in industrial companies on the Indonesia Stock Exchange in 2015-2020.

For external parties / Investors: Investors are expected to conduct in-depth analysis related to financial ratios outside of research ratios in industrial companies and other sector companies. For internal parties / companies: In managing assets, especially assets, they can recalculate all financial ratios that are interrelated to the Company's Health, in order to facilitate financial management in the future. For other researchers: Researchers who will conduct further research related to financial ratios in the study can add samples and years of research samples and contribute other ratios in seeing the Health Level of the Company to be studied.

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