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# Research Title: The Effect of Financial Risk on the Profitability of Manufacturing Companies Listed on the IDX in 2020-2024

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**ABSTRACT**

*This study analyzes the effect of financial risk, as measured by the Debt to Asset Ratio and Debt to Equity Ratio, on profitability (Return on Assets - ROA) in manufacturing companies listed on the Indonesia Stock Exchange during the 2020-2024 period. Using multiple linear regression with SPSS software on 95 observations, descriptive statistics show an average DAR of 0.3686, DER of 0.8498, and ROA of 0.0953. The results of the simultaneous test (F test) show a Sig. value of 0.000, indicating that DAR and DER together have a significant effect on ROA. The coefficient of determination (Adjusted R Square) of 0.289 indicates that 28.9% of the variation in ROA is explained by the model. Partially (t-test), DAR (X1) has a negative and significant effect (Sig. 0.000, coefficient -0.325) on ROA, while DER (X2) has a positive and significant effect (Sig. 0.000, coefficient 0.074) on ROA. These findings highlight the complexity of the relationship between financial risk and profitability in the manufacturing sector.*

***Keywords:*** *Financial Risk; Profitability; Manufacturing Companies.*

## INTRODUCTION

The manufacturing sector is the backbone of the Indonesian economy, contributing significantly to Gross Domestic Product and providing employment.(Sudiyatno et al., 2021)The sustainability and growth of manufacturing companies are highly dependent on healthy financial performance, where profitability is one of the main indicators.(Prameswari et al., 2025; Rimadhani & Siagian, 2024)Profitability reflects a company's ability to generate profits from its assets, which is often measured using Return on Assets.(Prameswari et al., 2025; Suitri & Monoarfa, 2021). ROA shows how efficiently a company uses its assets to generate net profit.(Abdullah et al., 2023; Akinleye & Dadepo, 2019).

However, achieving an optimal level of profitability is not free from financial risks.(2022 Annual Report, 2022)Financial risk arises from a company's financing decisions, particularly those related to the use of debt. While debt can provide leverage that increases returns on equity, excessive use of debt can also increase financial burdens and the risk of default.(Kasozi, 2017)In this context, the Debt to Asset Ratio and the Debt to Equity Ratio are two key indicators used to measure a company's level of financial risk.(Evelyne et al., 2024; Prameswari et al., 2025). DAR shows the proportion of a company's assets that are funded by debt, while DER measures how much debt a company has compared to its equity.(Sari, 2021).

Previous research has extensively explored the relationship between financial risk and profitability, with varying results. Some studies suggest that high leverage levels can negatively impact profitability due to increased interest expenses.(Kasozi, 2017)For example, a study by Siregar et al. showed that DER can affect ROE, although the results varied across studies.(Siregar et al., 2025)On the other hand, some studies found positive or insignificant impacts, depending on market and industry conditions.(Akinleye & Dadepo, 2019; Shahfira & Hasanuh, 2021)Junaidi and Muksal also studied the influence of DER on ROA in manufacturing companies on the IDX.(Junaidi & Muksal, 2021).

Given the importance of the manufacturing sector and the volatility of the global economy following the COVID-19 pandemic, it is crucial to reanalyze the impact of financial risk on profitability in manufacturing companies in Indonesia. This research specifically focuses on the 2020-2024 period, a crucial period for companies to adapt to new economic challenges. Therefore, this study aims to analyze the effect of Debt to Asset (DAR) and Debt to Asset (DER) on ROA in manufacturing companies listed on the Indonesia Stock Exchange during the 2020-2024 period.

## METHODS

### Types of Research

This study uses a quantitative approach with a causal associative research design. The objective is to examine the relationship and influence between the independent variables (financial risk as measured by DAR and DER) on the dependent variable (profitability as measured by ROA).

### Population and Sample

The study population comprised all manufacturing companies listed on the Indonesia Stock Exchange during the 2020-2024 period. Sampling was conducted using a purposive sampling method, which selects samples based on specific criteria. Based on the established criteria, 95 observational data sets met the requirements for analysis.

Operational Definition of Variables

Financial Risk:

Debt to Asset Ratio(X1): Measures the proportion of total debt to total assets. This ratio indicates how much of a company's assets are funded by debt. The higher this ratio, the higher the financial risk the company faces.

Debt to Equity Ratio(X2): Measures the ratio of total debt to total equity. This ratio indicates how much of a company's financing comes from debt compared to equity. A high DER indicates a greater reliance on external funding.

Profitability:

Return on Assets(Y): Measures a company's ability to generate net profit from its total assets. A higher ROA indicates greater efficiency in asset utilization in generating profits.

Data Collection Methods

The data used in this study is secondary data, obtained from the annual financial reports of manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the period 2020-2024. Data was accessed through public sources such as the official Indonesia Stock Exchange website and published company financial reports.

Data Analysis Techniques

Data analysis was conducted using multiple linear regression statistical methods with the aid of SPSS software. The analysis stages include:

1. Descriptive Statistics: Provides a brief overview of the characteristics of research variable data such as minimum, maximum, average, and standard deviation values.
2. Classical Assumption Test: Includes tests for normality, multicollinearity, heteroscedasticity, and autocorrelation to ensure the regression model meets the required statistical assumptions (assumed to have been carried out and meet the requirements).
3. Multiple Linear Regression Analysis: Used to estimate the simultaneous and partial influence of independent variables on dependent variables.
4. Coefficient of Determination Test (R Square): Measures how much of the proportion of variation in the dependent variable can be explained by the independent variables in the model.
5. Simultaneous Significance Test: Tests whether all independent variables together have a significant influence on the dependent variable. The regression model is said to fit if the significance value is <0.05.
6. Partial Significance Test: Testing the influence of each independent variable separately on the dependent variable. The influence is said to be significant if the significance value is <0.05.

## RESULTS AND DISCUSSION

### Results

Descriptive Statistics

The following is a descriptive statistics table of the research data, which includes 95 observations for each variable:

| | N | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|
| X1 | 95 | .07 | 1.00 | .3686 | .20882 |
| X2 | 95 | .11 | 6.47 | .8498 | .98674 |
| Y | 95 | .00 | .35 | .0953 | .07543 |
| Valid N (listwise) | 95 | | | | |

Interpretation:

The table above presents a basic statistical overview for variables X1, X2, and Y. The number of valid observations for each variable is 95.

X1: Has an average value of 0.3686, indicating that an average of 36.86% of company assets are funded by debt. The minimum value of 0.07 and the maximum value of 1.00 indicate a fairly wide range in debt-to-asset levels among the sample companies.

X2: The mean value of 0.8498 indicates that the average company's total debt is 84.98% of its total equity. The range from 0.11 to 6.47 indicates significant variation in the capital structure of the sample companies.

Y: The average ROA of 0.0953 indicates that the sample companies generated an average net profit of 9.53% of their total assets. ROA values ranged from 0.00 (break-even or loss) to 0.35 (35%).

Coefficient of Determination (R Square)

The following is a Model Summary table showing the results of the coefficient of determination test:

| Model | R | R Square | Adjusted R Square | Standard Error of the Estimate |
|---|---|---|---|---|
| 1 | .551[a] | .304 | .289 | .06362 |

Interpretation:

Based on the Model Summary table, the R Square value is 0.304. However, the Adjusted R Square value of 0.289 is more relevant for multiple regression. This means that 28.9% of the variation in profitability can be explained by variations in the financial risk variable. The remaining 71.1% is explained by other factors outside this research model. The R value of 0.551 indicates a moderate relationship between the independent and dependent variables.

F Test

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| 1 Regression | .162 | 2 | .081 | 20,068 | .000[b] |
| Residual | .372 | 92 | .004 | | |
| Total | .535 | 94 | | | |

Interpretation:

The F-test results show an F-count value of 20.068 with a significance value of 0.000. Since the Sig. (0.000) value is less than 0.05, it can be concluded that the DAR and DER variables simultaneously (together) have a significant influence on ROA in manufacturing companies listed on the IDX for the 2020-2024 period. This confirms that the regression model used is fit or appropriate to explain the relationship between variables.

Hypothesis Testing (t-Test – Partial Significance Test)

The following is a table of coefficients showing the results of the partial significance test:

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|
| | B | Std. Error | Beta | |
| 1 | .152 | .015 | | 10,138 |
| X1 | -.325 | .056 | -.901 | -5,806 |
| X2 | .074 | .012 | .966 | 6,229 |

Interpretation:

The effect of DAR (X1) on ROA (Y):

The regression coefficient (B) for X1 is -0.325 with a significance value of 0.000. Since the Sig. (0.000) value is less than 0.05, it can be concluded that DAR partially has a significant effect on ROA. A negative coefficient indicates that an increase in DAR will cause a decrease in ROA. This result is consistent with the literature stating that a high debt burden can reduce profitability due to increased interest costs.(Kasozi, 2017; Pardosi & Siagian, 2021).

The effect of DER (X2) on ROA (Y):

The regression coefficient (B) for X2 is 0.074 with a significance value of 0.000. Since the Sig. (0.000) value is less than 0.05, it can be concluded that DER partially has a significant effect on ROA. A positive coefficient indicates that an increase in DER will lead to an increase in ROA. This result may indicate that the use of leverage through debt to equity can increase returns on assets, especially if the cost of debt capital is lower than the resulting return on investment, although it is still necessary to pay attention to the optimal limit of debt use.(Lumbantobing et al., 2020).

## Discussion

The results of this study provide important insights into the relationship between financial risk and profitability in manufacturing companies on the Indonesia Stock Exchange.

Simultaneous Effect of DAR and DER on ROA

The finding that DAR and DER simultaneously significantly influence ROA (F-test Sig. = 0.000) confirms that capital structure decisions, particularly those related to debt, have a substantial collective impact on a company's ability to generate profits from its assets. This is in line with research by Kartikasari and Merianti, who found that the overall leverage ratio has a positive and significant influence on the profitability of manufacturing companies in Indonesia.(Kartikasari & Merianti, 2016). Similarly, Damayanti and Chaerudin's study also showed that Current Ratio, DER, and Total Asset Turnover were simultaneously significant to ROA in multi-sector industrial companies.(Damayanti & Chaerudin, 2021). A study by Irsan and Rambe also supports this finding, stating that simultaneously the Current Ratio and Debt to Asset Ratio have a significant influence on ROA in food and beverage companies listed on the IDX.(Irsan & Rambe, 2021)This shows that the financial risks measured by these two ratios cannot be ignored in analyzing profitability performance.

Partial Effect of DAR on ROA

This study found that the Debt to Asset Ratio has a negative and significant effect on Return on Assets. The negative coefficient of -0.325 indicates that the higher the proportion of a company's assets funded by debt, the lower its asset profitability. This result is consistent with many previous studies. Rambe and Datuk found that DAR has a negative and significant effect on ROA in food and beverage companies listed on the IDX, explaining that an increase in DAR leads to a decrease in ROA because companies may have difficulty obtaining additional loans and ineffective asset management can reduce

net income.(Rambe & Datuk, 2021)Pardosi and Siagian also stated that a very high DAR will reduce profitability because it increases interest costs and the risk of default, although at a certain level DAR can help fund operations to increase profitability.(Pardosi & Siagian, 2021). Vithessonthi and Tongurai also found that leverage is generally negatively related to firm performance.(Vithessonthi & Tongurai, 2015). Increasing interest expenses due to high debt can erode the company's net profit, thereby reducing ROA.(Kasozi, 2017; Rimadhani & Siagian, 2024).

Partial Effect of DER on ROA

The results of the study show that the Debt to Equity Ratio has a positive and significant effect on Return on Assets, with a positive coefficient of 0.074. This finding indicates that in manufacturing companies listed on the IDX during the 2020-2024 period, an increase in DER tends to be accompanied by an increase in ROA. This can be explained within the Trade-Off Theory framework, where the use of debt can increase returns for shareholders if the cost of debt is lower than the rate of return on investment generated by the debt funds.(Kuncoro et al., 2025; Suzulia et al., 2020)In other words, a company may use financial leverage to finance productive assets that generate higher returns than the cost of debt.

However, these results differ slightly from several other studies that found a negative effect of DER on ROA. For example, Chandra et al. found that DER had a negative and significant effect on ROA in manufacturing companies listed on the IDX.(Chandra et al., 2021)Junaidi and Muksal also found similar results, where DER had a negative and significant effect on ROA.(Junaidi & Muksal, 2021)These differences may be due to various factors, such as sample characteristics, the study period, macroeconomic conditions, or differences in the efficiency of debt use by companies. Under certain market conditions, companies may be able to optimize their capital structure by increasing DER to achieve higher profitability, as long as default risk can be managed well.(Lumbantobing et al., 2020).

Coefficient of Determination

The Adjusted R Square value of 0.289 indicates that 28.9% of the variation in ROA can be explained by DAR and DER. This means that approximately 71.1% of the variation in ROA is explained by factors outside this model. These other factors may include company size, liquidity, operational efficiency, asset management, sales growth, dividend policy, innovation, and the economic conditions of the industry.(-, 2025; Aryantini & Jumono, 2021; Handriani, 2020; Hayati et al., 2022; Istan et al., 2021)Further research incorporating these variables could provide a more comprehensive understanding of the determinants of manufacturing company profitability.

**CONCLUSION**

Based on multiple linear regression analysis of 95 observations of manufacturing companies listed on the IDX during the 2020–2024 period, this study concludes that financial risk, measured by the Debt-to-Asset Ratio (DAR) and Debt-to-Equity Ratio (DER), significantly affects profitability as measured by Return on Assets (ROA). Simultaneously, the F-test results show a significance value of 0.000, indicating that DAR and DER together have a significant impact on ROA. The explanatory power of DAR and DER on ROA is 28.9% (Adjusted $R^2$), while the remaining 71.1% is influenced by other variables outside the scope of this study. Partially, DAR has a negative and significant

effect on ROA, with a significance value of 0.000, suggesting that an increase in the proportion of debt to assets tends to reduce a company's ability to generate profits, consistent with literature highlighting the risks of higher debt and interest expenses. In contrast, DER has a positive and significant effect on ROA, also with a significance value of 0.000, indicating that the strategic use of debt relative to equity can enhance profitability, likely due to effective financial leverage. These results emphasize the importance of careful financial risk management for manufacturing companies in Indonesia, as DAR and DER affect profitability differently, highlighting the need to balance debt usage to optimize returns without incurring excessive risk.

## CONCLUSIONS

In energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2023 period, Corporate Social Responsibility (CSR), leverage, company size, and profitability play a significant role in influencing company value. CSR has been shown to have a positive effect on company value, confirming that socially responsible activities significantly contribute to increasing market value. Conversely, leverage has a negative effect, indicating that a high proportion of debt increases investors' risk perception and lowers company value. Company size has been found to have a positive effect, reflecting that companies with larger asset scales tend to achieve higher market values. Profitability has been shown to significantly moderate the effects of CSR, leverage, and company size on company value; high profitability strengthens the positive effects of CSR and company size, and reduces or even reverses the negative effects of leverage. Therefore, ROA plays a strategic role in determining the extent to which these fundamental variables are able to create value for energy companies in Indonesia.

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