

The Effect of Debt to Equity Ratio and Total Asset Turnover on Return on Assets with Profit Growth as a Moderating Variable in the Manufacturing Sector Listed on the Indonesia Stock Exchanged

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ABSTRACT

This study examines the effects of Total Asset Turnover (TATO) and Debt to Equity Ratio (DER) on Return on Assets (ROA), with Profit Growth as a moderating variable, in manufacturing companies listed on the Indonesia Stock Exchange during the 2022–2024 period. A quantitative approach was employed using secondary data obtained from companies' financial statements. The sample was determined through purposive sampling, resulting in 78 observations. Data were analyzed using multiple regression analysis and Moderated Regression Analysis (MRA). The results indicate that ROA is positively and significantly affected by TATO, while DER has a negative and significant effect on ROA. However, Profit Growth does not moderate the relationships between TATO and ROA or between DER and ROA, suggesting that asset efficiency and capital structure exert a greater influence on profitability than profit growth does.

INTRODUCTION

Due to its substantial GDP contribution, the manufacturing sector is strategically important to Indonesia's economy, creates employment opportunities, and drives national industrial growth. In facing global competition and increasingly complex economic dynamics, manufacturing companies are required to manage their resources effectively and efficiently to maintain financial performance and business sustainability (Khalifaturofi'ah & Setiawan, 2024). "In this context, ROA, a profitability ratio that shows a company's capacity to make money from all of its assets, is one component of financial performance, which is a crucial metric for evaluating a business's success" (Brigham & Houston, 2019; Kasmir, 2019).

"One important aspect affecting a company's profitability is asset use efficiency, which is measured by TATO. This ratio shows how well a business uses all of its assets to produce sales; the higher the TATO, the more effectively the business supports its operations and boosts revenue" (Kasmir, 2019). According to a number of studies (Mardiani, 2021; Rismanty et al., 2022). has a favorable impact on ROA, indicating that an increase in asset turnover improves a company's capacity to make money. Nevertheless, additional research suggests that TATO has no appreciable impact on ROA, suggesting inconsistencies in research results regarding the relationship between asset efficiency and profitability (Agustina & Pratiwi, 2021).

In addition to asset efficiency, capital structure is also a factor that influences a company's profitability, DER is used to quantify one of these. DER is a measure of how much debt is used in a business's financing structure; a higher DER denotes a greater reliance on outside funding (Ridwansyah et al., 2021). "Although using debt can boost profits for shareholders through the leverage effect, it also raises financial risk because of the principle and interest payments required" (Sodik & Manda, 2025). According to earlier research, DER significantly and negatively affects ROA; however, there are also findings indicating that optimal use of debt can, in fact, enhance a company's profitability (Andini & Romadon, 2024; Sodik & Manda, 2025).

These differing research findings indicate that Activity ratios and leverage and profitability may not necessarily have a direct link, which raises the potential of other factors that might either improve or decrease this relationship. Profit growth is one such metric that shows how well a business can raise its earnings over time (Alfiandi & Supadmi, 2024; Yadav et al., 2022). Businesses with strong profit growth typically have more effective operations and financing sources, thereby potentially strengthening the relationship between financial ratios and profitability (Handoyo et al., 2023; Laba & Rinaldi, 2021; Rahim et al., 2025).

However, research findings regarding the role of Profit Growth as a moderating variable are also inconsistent. Some studies find that Profit Growth is unable to moderate the relationship between financial variables and profitability, while others show that it has a significant moderating effect (Azra et al., 2024; Santoso et al., 2024). Therefore, Research on how activity ratios and leverage affect profitability, as well as how profit growth functions as a moderating factor, is still lacking.

Based on the above discussion, This study examines how TATO and DER affect ROA in manufacturing businesses listed on the IDX between 2022 and 2024, using Profit Growth as a moderating variable. While prior studies have generally examined TATO and DER as direct determinants of profitability, this study extends the literature by simultaneously testing whether Profit Growth strengthens or weakens these relationships in the manufacturing sector. By doing so, this research contributes to clarifying the inconsistent findings on the moderating role of Profit Growth and offers updated empirical evidence based on the most recent 2022–2024 period.

THEORETICAL REVIEW

Signaling Theory

According to signaling theory, “businesses use financial reports to communicate information to outside parties about their performance and prospects for the future. According to this hypothesis, management has access to more information than external stakeholders, and financial information serves as an important signal for decision-making. In the context of financial management, information related to asset efficiency and profitability reflects the company’s ability to manage resources effectively and generate optimal returns” (Khalifaturofi’ah & Setiawan, 2024). Therefore, financial ratios such as TATO and ROA can serve as indicators that signal the firm’s operational performance and efficiency (Brigham & Houston, 2019; Kasmir, 2019).

Trade-Off Theory

According to trade-off theory, “businesses choose the best capital structure by weighing the advantages and disadvantages of using debt. According to this idea, using debt offers tax benefits (a tax shield), but having too much debt raises financial risk and the likelihood of bankruptcy. In practice, companies use debt as a source of financing to support operational and investment activities. Therefore, firms must manage their capital structure carefully to ensure that the benefits of leverage outweigh the associated risks” (Sodik & Manda, 2025). The DER is commonly used to measure the extent to which a company relies on external financing (Kasmir, 2019; Rismanty et al., 2022).

Total Asset Turnover and Return on Assets

“An activity ratio called TATO gauges how well a business uses all of its assets to produce revenue. Greater asset use efficiency is indicated by a higher TATO, which is anticipated to increase the profitability of the business” (Kasmir, 2019). According to Signaling Theory, a company's operational success and profitability are communicated to investors through effective asset usage. The following formula is used to do the measurement:

$$\text{Total Asset Turn Over (TATO)} = \frac{\text{Sales}}{\text{Total Assets}}$$

A profitability ratio called ROA gauges a company's capacity to produce net income from all of its assets (Brigham & Houston, 2019; Kasmir, 2019). “Better financial success and efficient resource management are indicated by a greater

ROA. According to earlier research, TATO significantly and favorably affects ROA, indicating that more asset turnover raises profitability” (Mardiani, 2021; Rismanty et al., 2022). There are conflicting results in the literature, nevertheless, since other research claim that TATO has no discernible impact on ROA. The following formula is used to do the measurement:

$$\text{Return On Asset (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}}$$

H1: “Total Asset Turnover has a positive effect on Return on Assets.”

Debt to Equity Ratio and Return on Assets

“A leverage ratio called the DER calculates the ratio of debt to shareholders' equity. Greater dependence on outside funding is indicated by a larger DER, which raises financial risk” (Kasmir, 2019; Ridwansyah et al., 2021). Trade-Off Theory states that while using debt can improve business performance through leverage effects, too much debt might (Sodik & Manda, 2025). The measurement is conducted using the following formula:

$$\text{Debt to Equity Ratio (DER)} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

“Empirical evidence shows mixed results regarding the effect of DER on profitability. Some studies indicate that DER has a negative and significant effect on ROA, implying that higher debt levels reduce profitability due to financial burdens” (Andini & Romadon, 2024). Conversely, other studies find that optimal debt usage can improve profitability when returns exceed borrowing costs (Christina et al., 2025; Sodik & Manda, 2025).

H2: “Debt to Equity Ratio has a negative effect on Return on Assets”.

Profit Growth as a Moderating Variable

“Profit Growth reflects a company's ability to increase its earnings over time and indicates sustainable financial performance” (Alfiandi & Supadmi, 2024; Yadav et al., 2022). Firms with higher profit growth tend to have better operational efficiency and stronger capability in managing assets and financial resources (Handoyo et al., 2023; Laba & Rinaldi, 2021; Rahim et al., 2025). The measurement is conducted using the following formula:

$$\text{Profit Growth} = \frac{\text{Current Profit} - \text{Previous Profit}}{\text{Previous Profit}} \times 100\%$$

In the context of this study, Profit Growth is expected to moderate the relationship between financial ratios and profitability. The impact of capital structure and asset efficiency on profitability may be amplified in businesses with robust profit growth. However, there are still conflicting empirical results about Profit Growth's moderating effect. While some research demonstrate a strong moderating impact, others indicate that Profit Growth does not significantly regulate the association between financial factors and company performance (Azra et al., 2024; Santoso et al., 2024)

H3: “Profit Growth moderates the relationship between Total Asset Turnover and Return on Assets.”

H4: “Profit Growth moderates the relationship between Debt to Equity Ratio and Return on Assets.”

Taken together, Signaling Theory and Trade-Off Theory provide complementary explanations for the relationships proposed in this study. Signaling Theory suggests that efficient asset utilization, as reflected in TATO, signals favorable firm prospects and is therefore expected to increase ROA, while Trade-Off Theory explains why excessive reliance on debt, as reflected in DER, raises financial risk and tends to reduce ROA. Profit Growth is positioned as a contextual factor that may strengthen or weaken these signaling and risk mechanisms: firms experiencing strong profit growth are expected to have greater flexibility in managing assets and debt, which could amplify the effects of TATO and DER on ROA. However, because prior studies report inconsistent evidence on whether Profit Growth actually performs this moderating function (Azra et al., 2024; Santoso et al., 2024), Hypotheses 3 and 4 are formulated to empirically test this moderating role within the manufacturing sector, thereby linking the theoretical foundations directly to the hypotheses examined in this study.

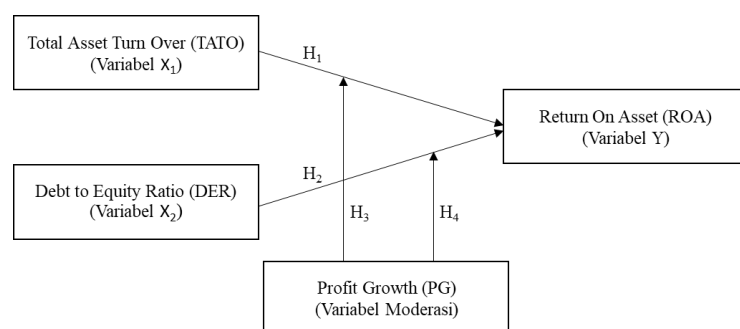


Figure 1. Conceptual Framework

METHODOLOGY

In order to look at the connections between variables, this study uses a quantitative method with an associative research strategy. The information utilised in this research is secondary data culled from the 2022–2024 financial accounts of manufacturing businesses traded on the IDX. In this study, we employ purposive sampling to pick a subset of manufacturing enterprises that meet certain requirements. These criteria include regular financial statement publishing, usage of the Indonesian Rupiah currency, and full data availability for the research variables. A grand number of 78 observations were retrieved using these criteria.

The study's variables are TATO and DER, which are used as independent variables; ROA, which is used as the dependent variable; and PG, which is used as a moderator, is the third variable. With the help of SPSS software, data is analyzed using multiple regression analysis and MRA. To guarantee the regression model is correct, classical assumption tests are run before hypothesis

testing. These tests include normality, multicollinearity, heteroscedasticity, and autocorrelation.

RESULTS

Descriptive Statistics

Tabel 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TATO	78	.112	3.576	.95915	.762118
DER	78	-1.769	4.964	.78202	1.115930
ROA	78	.001	.332	.08400	.065789
Profit_Growth	78	-1.009	11.661	.43902	1.724069
Valid N (listwise)	78				

Descriptive statistics are used to provide an overview of the research variables. Based on Table 1, “all variables show variation across the 78 observations. Total Asset Turnover (TATO), Debt to Equity Ratio (DER), Return on Assets (ROA), and Profit Growth (PG) exhibit different ranges of minimum, maximum, mean, and standard deviation values, indicating diversity in company performance.”

Classical Assumption Tests

Tabel 2. Normality Test

		Unstandardized Residual
N		44
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.63777577
Most Extreme Differences	Absolute	.125
	Positive	.125
	Negative	-.079
Test Statistic		.125
Asymp. Sig. (2-tailed) ^c		.084

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Table 2 displays the results of the normalcy test, which reveal an Asymp. Sig. (2-tailed) value of 0.084, which is > the significance level of 0.05. Both the data and the regression model satisfy the normalcy assumption, as shown above.

Tabel 3. Multicollinearity

Variable	Tolerance	VIF
TATO	.926	1.080
DER	.859	1.164
Profit Growth	.831	1.204

All tolerance values are > 0.10, and all VIF values are < 10, according to the multicollinearity test findings (Table 3). This proves that the independent variables in the regression model do not exhibit any signs of multicollinearity.

Tabel 4. Heteroscedasticity

Variable	Sig.
TATO	.981
DER	.232
ROA	.696
Profit Growth	.602

All of the significance values are higher than 0.05, according to the heteroscedasticity test findings (Table 4). As a result, the regression model does not suffer from heteroscedasticity.

Tabel 5. Autocorrelation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.568 ^a	.323	.272	.66126	2.308

a. Predictors: (Constant), Profit Growth, TATO, DER

b. Dependent Variabel: ROA

The autocorrelation test results (Table 5) show that the Durbin-Watson value is 2.308, which indicates that there is no autocorrelation in the regression model.

Moderated Regression Analysis (MRA)

Tabel 6. F-Test

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	9.531	5	1.906	4.447	.003 ^b
	Residual	16.289	38	.429		
	Total	25.821	43			

a. Dependent Variable: ROA

b. Predictors: (Constant), INT_DER, INT_TATO, Profit Growth, TATO, DER

The F-test results (Table 6) show that the significance value is 0.003, which is less than 0.05. This indicates that the independent variables and moderating variable simultaneously have a significant effect on Return on Assets (ROA).

Tabel 7. Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.608 ^a	.369	.286	.65472

a. Predictors: (Constant), INT_DER, INT_TATO, Profit Growth, TATO, DER

The coefficient of determination results (Table 7) show that the R Square value is 0.369. This indicates that 36.9% of the variation in Return on Assets (ROA) can be explained by the independent variables and moderating variable, while the remaining 63.1% is explained by other variables outside the model.

Tabel 8. T-Test

Variable	t	Sig.
TATO	3.057	.004
DER	-2.232	.032
Profit Growth	.194	.847
INT_TATO	1.046	.302
INT_DER	-.949	.349

The t-test results (Table 8) show that Total Asset Turnover (TATO) has a positive and significant effect on Return on Assets (ROA) (Sig. = 0.004 < 0.05); therefore, H1 is accepted. Debt to Equity Ratio (DER) has a negative and significant effect on Return on Assets (ROA) (Sig. = 0.032 < 0.05); therefore, H2 is accepted.

Furthermore, Profit Growth does not moderate the relationship between TATO and ROA (Sig. = 0.302 > 0.05); therefore, H3 is rejected. Profit Growth also does not moderate the relationship between DER and ROA (Sig. = 0.349 > 0.05); therefore, H4 is rejected.

DISCUSSION

The Effect of Total Asset Turnover on Return on Assets

The results indicate that Total Asset Turnover (TATO) has a positive and significant effect on Return on Assets (ROA). This finding implies that higher efficiency in asset utilization leads to higher profitability. "This result is consistent with Signaling Theory, which suggests that efficient asset utilization serves as a positive signal of firm performance. Furthermore, this finding is in line with previous studies showing that TATO has a positive effect on ROA (Mardiani, 2021; Rismanty et al., 2022). However, this result contradicts other studies that found that TATO does not have a significant effect on ROA" (Agustina & Pratiwi, 2021).

The Effect of Debt to Equity Ratio on Return on Assets

The findings show that ROA is significantly and negatively impacted by the DER. "This suggests that higher debt levels lower a company's profitability because of higher interest costs. The Trade-Off Theory, which argues that excessive debt utilization raises financial risk and reduces corporate profitability, is supported by this study. This outcome is in line with other studies showing that DER has a detrimental impact on ROA" (Andini & Romadon, 2024). However, it differs from other studies that found a positive relationship between DER and ROA (Christina et al., 2025).

The Moderating Effect of Profit Growth on the Relationship between Total Asset Turnover and Return on Assets

The findings show that the connection between TATO and ROA is not moderated by Profit Growth. This indicates that the link between asset efficiency and profitability is unaffected by profit growth. "These results imply that regardless of the company's profit growth, asset utilization efficiency is still the key to increasing profitability. This outcome is in line with other research showing that the association between financial factors and profitability is not moderated by profit growth" (Azra et al., 2024).

From a theoretical perspective, this result can be explained through Signaling Theory. TATO primarily signals operational efficiency, that is, how effectively a firm converts its assets into sales, and this signal is conveyed to the market regardless of how rapidly the firm's profits are currently growing. In other words, the informational value of asset-utilization efficiency is largely independent of the firm's profit trajectory, so a high-growth firm and a low-growth firm with similar TATO levels would be expected to translate that efficiency into ROA in a similar way. Additionally, the relatively short observation period (2022–2024) and the wide variation in Profit Growth across firms in the sample (ranging from -1.009 to 11.661) may have limited the ability of Profit Growth to act as a stable contextual condition strong enough to systematically alter the TATO–ROA relationship.

The Moderating Effect of Profit Growth on the Relationship between Debt to Equity Ratio and Return on Assets

The findings show that the link between DER and ROA is not moderated by Profit Growth. This suggests that the link between capital structure and company profitability is unaffected by profit growth. “These results show that the impact of debt on profitability is constant regardless of the state of the company's profit growth. This outcome is in line with other research showing that profit growth is not a moderating factor” (Azra et al., 2024). However, it differs from other studies that found Profit Growth to moderate the relationship between financial variables (Santoso et al., 2024).

This finding can be interpreted through the lens of Trade-Off Theory. The negative effect of DER on ROA primarily reflects the fixed financial burden associated with debt, namely interest and principal obligations, which must be met regardless of how quickly the firm's profits are growing. Because these obligations are contractually fixed rather than contingent on profit performance, the financial risk created by a high DER does not become proportionally lighter or heavier simply because a firm's profit is growing faster or slower. Consequently, Profit Growth does not appear to alter the fundamental trade-off between the tax benefits and the financial-risk costs of debt that underlies the DER–ROA relationship. This suggests that, within the manufacturing firms examined, capital-structure decisions and their profitability consequences are driven more directly by the level of leverage itself than by short-term fluctuations in profit growth.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, which looked at the impact of TATO and DER on ROA in manufacturing companies listed on the IDX between 2022 and 2024 with Profit Growth as a moderating variable, it can be concluded that TATO has a positive and significant effect on ROA, suggesting that higher asset utilization efficiency leads to higher profitability. In the meantime, ROA is negatively and significantly impacted by the DER, which means that higher debt levels often result in worse business profitability. Furthermore, the link between TATO and ROA cannot be moderated by profit growth, suggesting that the impact of asset efficiency on profitability is neither strengthened nor weakened by profit growth. Similarly, the link between DER and ROA cannot be moderated by profit

growth, indicating that profit growth has no effect on the relationship between capital structure and business profitability.

Based on the findings of this study, several recommendations can be proposed. Companies are expected to improve the efficiency of asset utilization to enhance profitability and manage their capital structure more optimally so that the use of debt does not create risks that may reduce financial performance. For investors, it is recommended to consider activity and leverage ratios, particularly Total Asset Turnover (TATO) and Debt to Equity Ratio (DER), as important indicators in making investment decisions. Furthermore, future researchers are suggested to include additional variables that may influence profitability, such as liquidity, firm size, or sales growth, and to use a longer observation period to obtain more comprehensive and accurate results.

FURTHER STUDY

The use of few variables and a brief observation period are two of the study's many shortcomings. In order to provide more reliable and broadly applicable results, future research is advised to broaden the research model by adding more variables and prolonging the study duration.

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