

THE EFFECT OF DEBT-TO-EQUITY RATIO (DER) AND INVENTORY TURNOVER (ITO) ON RETURN ON ASSETS (ROA) IN FOOD AND BEVERAGE SUB-SECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE IN THE 2020-2024 PERIOD



Selvi Meiviani Redianti¹

Universitas Swadaya Gunung Jati, Cirebon, Indonesia

selvi.122020181@ugj.ac.id

Erwin Budianto²

Universitas Swadaya Gunung Jati, Cirebon, Indonesia

erwinbudianto@ugj.ac.id

Agustina³

Universitas Swadaya Gunung Jati, Cirebon, Indonesia

agustina@ugj.ac.id

Abstract

It analyzes how financial measures like DER and ITO influence the profitability indicator Return on Assets (ROA). Food and beverage companies listed on the Indonesia Stock Exchange (IDX) face manufacturing cost pressure and profitability fluctuations in 2020–2024. This causal quantitative study uses Indonesia Stock Exchange annual financial records. Purposive sampling generated 22 businesses and 110 observations. Data were processed using descriptive statistics, classical assumption tests, and multiple linear regression in SPSS 24. The hypothesis using partial t-tests and simultaneous F-tests. The incomplete data show that DER is significantly unfavorable on ROA, suggesting that increased leverage may reduce profitability owing to financial obligations. The beneficial but modest impact of ITO on ROA suggests that changes in inventory turnover were not proven to be a major determinant of profitability during the study period. Simultaneously, DER and ITO had a significant effect on ROA. This study has limitations because it only used DER and ITO as explanatory variables for profitability, measured by ROA, so other financial factors that could potentially influence company performance have not been fully accommodated. The observation period was 2020–2024, and only Indonesian food & beverage enterprises were studied. Therefore, the results have limitations in describing long-term conditions and in terms of generalization to other sectors and countries.

Keywords: Debt to Equity Ratio, Food & beverage, Inventory Turnover, Profitability, Return on Assets

INTRODUCTION

Changes in global and domestic economic conditions have a direct impact on the sustainability of a company's business activities. Increasingly intense competition between companies demands that every business actor develop appropriate strategies to maintain their market position while simultaneously expanding their business capacity. A company's main purpose is sustained earnings, making financial performance growth statistics vital for internal operational review and external economic decision-making. Profitability shows a company's resource management and financial structure. Thus, profitability ratios (Kasmir, 2017) demonstrate the company's capacity to make profits from sales, assets, and capital.

Manufacturing, especially food and beverage, confronts severe operational demands in today's global competitive environment. Rising raw material and manufacturing costs are common issues. Media Indonesia (2025) highlighted that rising raw material costs since the end of the previous year have reduced manufacturing sector competitiveness, particularly food and beverage subsector competitiveness. Under these conditions, companies face a dilemma between raising selling prices, which could potentially reduce consumer purchasing power, or maintaining prices, resulting in reduced profit margins. This aligns with the Indo Premier (2025) report, which shows that although manufacturing companies' revenues increased by 25.80% in the first half of 2025, net profit actually decreased by 48.02%. This phenomenon demonstrates that increasing production costs can depress profitability even though sales continue to grow.

Besides that, CNBC Indonesia (2025) reported that manufacturing companies experienced declining sales, while fixed costs and material prices continued to rise. This situation resulted in production not meeting targets and the company experiencing financial difficulties, resulting in it being unable to pay its suppliers. This shows the company's poor capital structure and profitability. In line with these circumstances, the company's food and beverage subsector profit performance fluctuated and declined over the observation period. This profit volatility and declining trend suggest that the firm has struggled to sustain profitability during the research period.

This phenomenon illustrates the unstable financial condition of manufacturing companies, which is partly related to capital structure management and efficient asset utilization. The Debt to Equity Ratio (DER) indicates how much a firm depends on debt to fund its operations. High DERs imply strong external financial dependency, which may raise interest costs and default risk, particularly when sales decrease. Inventory Turnover (ITO) also shows a company's inventory management efficiency. Slow inventory turnover may lead to hoarding and higher storage costs, limiting liquidity and profitability. If the firm manages production and sales well, it may maintain cash flow stability and improve financial performance with an effective inventory turnover rate.

DER and ITO have had mixed effects on ROA in previous studies. Kurniawati & Waluyo (2024) found DER affects ROA. Fianti et al. (2022) find no DER influence on ROA. The ITO variable had similar results, with Alnaim & Kouaib (2023) finding an impact on ROA and Hidayah et al. (2023) finding no effect. These inconsistent study findings suggest a research need. Thus, this research examines how DER and ITO affected ROA in Indonesia Stock Exchange (IDX)-listed food & beverage subsector firms during 2020–2024, when production costs rose significantly. This research should provide light on how capital structure and inventory management efficiency effect profitability.

LITERATURE REVIEW

Working Capital Theory

Work capital theory states that working capital is needed to fund short-term activities including buying raw materials, paying current obligations, and operational expenditures, which keeps operations running smoothly and boosts profits. Working capital management helps organizations run effectively and reduce liquidity risk. Working capital management includes decisions about optimal cash, receivables, inventory, and short-term debt levels. Working capital that is too large can cause idle funds and reduce efficiency, while working capital that is too small increases the risk of inability to meet short-term obligations (Brigham & Houston, 2019). Working capital efficiency can be measured by inventory turnover ratio, cash conversion cycle, and liquidity ratio. The more efficient management, the greater the company's opportunity to increase profits as reflected in the profitability ratio. Thus, working capital theory states that good working capital management increases corporate profitability and financial stability, particularly in industrial enterprises with high inventories and receivables.

Trade of Theory

According to trade of theory, corporations would choose the best debt level by weighing the pros and cons of borrowing. Debt saves taxes (tax shield), yet bankruptcy and agency charges are costs. The capital structure is optimum when marginal gains equal marginal costs. Debt benefits must be weighed against financial hardship dangers, according to Brigham & Houston (2019), since a suboptimal capital structure may lower a company's profitability. Additionally, financial ratios analyze a company's financial performance using financial reports. Management, investors, and creditors may assess asset management, capital structure, and profitability using ratio calculations (Kasmir, 2017).

Types of Financial Ratios

Solvency, activity, and profitability ratios assess a company's finances. Solvency ratios show a company's debt dependency and long-term financing capabilities (Kasmir, 2017). High debt may raise return and financial risk, harming corporate stability and profitability. This is reflected in the Debt to Equity Ratio (DER), which compares debt and equity. The activity ratio also measures the company's efficiency in managing operational assets to generate income Gitman & Zutter (2021), including Inventory Turnover (ITO), which shows inventory turnover and management effectiveness. A high ITO value reduces storage costs and boosts profitability Kurniawati & Waluyo (2024). Profitability ratios, such as Return on Assets (ROA), reflect a company's operational effectiveness in making money from its assets (Kasmir, 2018). This ratio is crucial to a company's performance, particularly in capital-intensive sectors, according to Hery (2021).

RESEARCH METHOD

This quantitative, causal associative research examines the link between independent and dependent variables. Debt to Equity Ratio (DER) and Inventory Turnover (ITO) are independent factors, whereas Return on Assets is dependent. This technique was selected because statistical analysis can objectively and demonstrably explain variable causality.

In this research, firm annual financial reports from Indonesia Stock Exchange publications were utilized to gather data. Secondary data was collected from third parties

who released the company's financial records. This research used quantitative data from financial reports, such as total assets, debt, equity, sales, and inventories, to calculate financial ratios DER, ITO, and ROA. Analyses employed descriptive and inferential statistics. Normality, multicollinearity, heteroscedasticity, and autocorrelation were tested to validate regression models. Next, multiple linear regression analysis was used to investigate how DER and ITO influenced ROA, utilizing the t-test and f-test. Data was processed using SPSS software, therefore analysis findings should accurately reflect this study's variable connections.

RESULTS AND DISCUSSION

Table 1.
List of Sample Companies in the Food & Beverage Subsector Listed on the IDX 2020-2024

No	Code Company	Company name	IPO Date
1	AALI	Astra Agro Lestari Tbk.	December 9, 1997
2	BISI	BISI International Tbk.	May 28, 2007
3	CAMP	Campina Ice Cream Industry Tbk	December 19, 2017
4	CPIN	Charoen Pokphand Indonesia Tbk	March 18, 1991
5	DLTA	Delta Djakarta Tbk.	February 27, 1984
6	DSNG	Dharma Satya Nusantara Tbk.	June 14, 2013
7	ICBP	Indofood CBP Sukses Makmur Tbk	Oct 7, 2010
8	INDF	Indofood Sukses Makmur Tbk.	July 14, 1994
9	JPFA	Japfa Comfeed Indonesia Tbk.	October 23, 1989
10	CHEESE	Mulia Boga Raya Tbk.	November 25, 2019
11	LSIP	PP London Sumatra Indonesia Tb	July 5, 1996
12	MYOR	Mayora Indah Tbk.	July 4, 1990
13	PSGO	Palma Serasih Tbk.	November 25, 2019
14	BREAD	Nippon Indosari Corpindo Tbk.	June 28, 2010
15	SIMP	Salim Ivomas Pratama Tbk.	June 9, 2011
16	SKLT	Sekar Laut Tbk.	September 8, 1993
17	SMAR	Sinar Mas Agro Resources and T	November 20, 1992
18	SSMS	Sawit Sumbermas Sarana Tbk.	December 12, 2013
19	STTP	Siantar Top Tbk.	December 16, 1996
20	TBLA	Tunas Baru Lampung Tbk.	February 14, 2000
21	TGKA	Tigaraksa Satria Tbk.	June 11, 1990
22	ULTJ	Ultrajaya Milk Industry & Trad	July 2, 1990

Source: www.idx.co.id

Table 2.
Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
ROA	110	.01	.19	.0867	.04529
DER	110	.07	6.35	.8762	.95466
ITO	110	.64	20.86	6.3796	3.52887
Valid N (listwise)	110				

Source: SPSS Output Results (2025)

Table 2's descriptive statistics reveal 110 samples (N) from the company's 2020–2024 financial reports. The average ROA value is 0.0867 and the standard deviation is 0.04529. The range is 0.01 to 0.19. With an average of 0.8762 and a standard deviation of 0.95466, the DER variable ranges from 0.07 to 6.35. The ITO variable averages 6.3796 and has a standard deviation of 3.52887, ranging from 0.64 to 20.86.

Table 3.
Normality Test Results
One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		110
Normal Parameters a, b	Mean	.0000000
	Standard Deviation	.54269753
Most Extreme Differences	Absolute	.084
	Positive	.049
	Negative	-.084
Test Statistics		.084
Asymp. Sig. (2-tailed)		.053c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Source: SPSS Output Results (2025)

From table 3, the Kolmogorov-Smirnov test shows that the significance value is 0.053, which is larger than 0.05, indicating that the data is regularly distributed.

Table 4.
Multicollinearity Test Results

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2,918	.175		-16,717	.000	
	LnDER	-.298	.060	-.472	-4,983	.000	.839
	LnITO	.087	.089	.093	.978	.330	.839

a. Dependent Variable: LnROA

Source: SPSS Output results (2025)

The table displays multicollinearity test results for two independent variables, with a tolerance of (0.839 > 0.10) and a VIF of (1.192 < 10). Thus, the regression model does not reveal DER-ITO multicollinearity.

Table 5.
Multiple Linear Regression Analysis Test Results
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	-2,918	.175		-16,717
	LnDER	-.298	.060	-.472	-4,983
	LnITO	.087	.089	.093	.978

a. Dependent Variable: LnROA

Source: SPSS Output Results (2025)

Multiple linear regression analysis yielded $ROA = -2.918 - 0.298 \text{ DER} + 0.087 \text{ ITO}$. ROA is -2.918 when DER and ITO are zero. The coefficient of -0.298, significance value of 0.000 (<0.05), estimated t value of -4.983 indicate a significant negative impact of DER on ROA. Higher debt-to-equity ratios reduce business profits. Inventory turnover affects ROA positively but negligibly, with a coefficient of 0.087, a significance value of 0.330 (>0.05), and an estimated t value of 0.978. ITO has little impact on ROA, while DER does.

Table 6.
Partial Test Results (t-Test)
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	-2,918	.175		-16,717
	LnDER	-.298	.060	-.472	-4,983
	LnITO	.087	.089	.093	.978

a. Dependent Variable: LnROA

Source: SPSS Output Results (2025)

Based on the partial test findings in table 6, the Debt to Equity Ratio (DER) variable has a computed t value of -4.983 with a significance level of 0.000, supporting the H1

hypothesis. The H2 hypothesis is rejected because Inventory Turnover (ITO) does not influence ROA since its calculated t value is 0.978 and its significance level is 0.330.

Table 7.
Simultaneous Test Results (f-Test)
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7,822	2	3,911	13,035	.000b
	Residual	32,103	107	.300		
	Total	39,924	109			

a. Dependent Variable: LnROA

b. Predictors: (Constant), LnITO, LnDER

Source: SPSS Output Results (2025)

The table above showed that the computed F value was 13.035 and the F table value was 3.93, hence $F > F_{table}$. The significance threshold of $0.000 < 0.05$ indicates that both DER and ITO factors impact ROA simultaneously.

Table 8.
Results of the Coefficient of Determination (R2) Test
Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.443a	.196	.181	.54775

a. Predictors: (Constant), LnITO, LnDER

b. Dependent Variable: LnROA

Source: SPSS Output Results (2025)

Table 8 shows 0.196 R-square. Just 19.6% of ROA is explained by DER and ITO. The remaining 80.4% is explained by factors outside the research model.

The Effect of Debt to Equity Ratio (DER) on Return on Assets (ROA)

Hypothesis testing reveals that DER negatively affects ROA, lowering company profitability as DER grows. High debt ratios raise interest expenditures and payment responsibilities, lowering net income and asset earnings, notably in the food and beverage subsector, which requires stable operational costs like raw materials, production, and distribution. According to capital structure theory, poor debt utilization increases financial risk and bankruptcy costs notwithstanding tax shield advantages, lowering profitability and investor views. This study confirms (Kurniawati & Waluyo, 2024) that DER negatively impacts ROA, so companies must optimally balance debt and equity to maintain profitability and financial performance.

The Effect of Inventory Turnover (ITO) on Return on Assets (ROA)

Inventory Turnover (ITO) positively but insignificantly affects profitability in Indonesia Stock Exchange-listed food and beverage sub-sector firms, but not ROA. This suggests that suboptimal inventory management, high storage costs, or an imbalance between inventory volume and sales levels may have prevented high or low inventory turnover from directly affecting company profits. This study shows that ITO does not affect profitability,

which is consistent with studies (Hidayah et al., 2023) showing ITO does not affect ROA. Companies must examine other aspects than inventory turnover to boost profitability.

The Influence of Debt to Equity Ratio (DER) and Inventory Turnover (ITO) on Return on Assets (ROA)

The study hypothesis is approved because simultaneous hypothesis testing shows that DER and ITO significantly affect ROA in Indonesia Stock Exchange-listed food and beverage subsector enterprises. Even though ITO has a little impact on ROA, DER and ITO might affect corporate profitability. This simultaneous effect suggests that debt usage policy and inventory management effectiveness affect company profitability, so companies must balance their capital structure and improve inventory management efficiency to optimize asset use and profitability.

CONCLUSION

Research and debates show that the Debt to Equity Ratio (DER) negatively impacts Return on Assets (ROA) in Indonesia Stock Exchange-listed food & beverage subsector enterprises, indicating that increasing debt tends to lower profitability. We found no significant influence of inventory turnover on ROA, hence it did not affect profitability in our research. However, both DER and ITO have a major influence on ROA, therefore both factors still affect the company's profitability.

REFERENCES

- Alnaim, M., & Kouaib, A. (2023). *Inventory Turnover and Firm Profitability: A Saudi Arabian Investigation*. 1–14.
- Brigham, E. F., & Houston, J. F. (2019). *Fundamentals of Financial Management* (15th Editi). Cengage Learning.
- Fianti, F. O., Mayasari, I., & Juniwati, E. H. (2022). Pengaruh CR dan DER Terhadap ROA Pada Perusahaan Makanan & Minuman. *Indonesian Journal of Economics and Management*, 2(2), 266–276. <https://doi.org/10.35313/ijem.v2i2.3684>
- Gitman, L. J., & Zutter, C. J. (2021). *Principles of Managerial Finance*. Pearson.
- Hery. (2021). *Analisis Kinerja Keuangan*. PT Grasindo.
- Hidayah, N. . ., Hermuningsih, S., & Maulida, A. (2023). *J-MAS*. 8(1), 21–29. <https://doi.org/10.33087/jmas.v8i1.888>
- Industri Manufaktur RI Makin Genting, Badai PHK Tak Terbendung*. (2024). CNBC Indonesia. <https://www.cnbcindonesia.com/research/20240915143554-128-571999/industri-manufaktur-ri-makin-genting-badai-phk-tak-terbendung>
- Kasmir. (2017). *Analisis Laporan Keuangan* (1st Editio). RajaGrafindo Persada.
- Kasmir. (2018). *Analisis Laporan Keuangan*. RajaGrafindo Persada.
- Kurniawati, F. A., & Waluyo, D. E. (2024). *On Asset (Study On Food And Beverage Subsector Manufacturing Companies Listed On The Indonesia Stock Exchange For The Period 2020 – 2022) Pengaruh Current Ratio , Debt To Equity Ratio , Dan Inventory Turnover Terhadap Return On Asset (Studi Pada Perusa*. 5(2), 4582–4596.
- Laba PTMR Merosot 48,02% di Semester I 2025 Meski Pendapatan Naik 25,80%*. (n.d.). https://www.indopremier.com/ipotnews/newsDetail.php?jdl=Laba_PTMR_Merosot_48_02__di_Semester_I_2025_Meski_Pendapatan_Naik_25_80_&news_id=201752&group_news=IPOTNEWS&news_date=&taging_subtype=STOCK&name=&sea

rch=y_general&q=ptmr&halaman=1

Mahalnya Bahan Baku Jadi Problem Utama Industri Manufaktur. (n.d.). Media Indonesia.
<https://mediaindonesia.com/ekonomi/731471/mahalnya-bahan-baku-jadi-problem-utama-industri-manufaktur>