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Effect of Capital Structure on Profitability with Liquidity as a Moderating Variable: Empirical Study on Food and Beverage Companies

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Abstract

This study investigates the effect of capital structure on profitability with liquidity as a moderating variable in food and beverage companies listed on the Indonesia Stock Exchange during 2019-2023. Using a quantitative approach, this study uses secondary data from 26 companies selected by purposive sampling. Profitability is measured using return on assets, return on equity, and net profit margin, while capital structure and liquidity are represented by debt to equity ratio and current ratio. The study applies panel data regression and moderated regression analysis using Eviews 13. The novelty of this study lies in explicitly integrating liquidity as a moderating variable in the relationship between capital structure and profitability, which has hardly been addressed in previous studies. The findings show that capital structure has a negative effect on return on assets and net profit margin but has a positive effect on return on equity. Liquidity does not significantly moderate the effect of capital structure on return on assets and net profit margin; however, it significantly moderates the relationship with return on equity, indicating that high liquidity may weaken the positive effect of leverage on shareholder returns. This study concludes that capital structure decisions should consider liquidity conditions to ensure sustainable profitability, especially in industries with operating cash flow volatility. Future research is recommended to explore non-linear relationships and use broader financial indicators to strengthen the generalizability of findings across sectors.

Keywords: Capital structure; Liquidity; Profitability.

Introduction

In the last decade, global market volatility has increasingly put pressure on the financial stability of companies, especially in the consumption sector such as the food and beverage industry. Data from McKinsey Global Institute (2023) shows that more than 62% of global companies experience margin pressure due to the instability of an unbalanced financial structure. One of the main contributing factors is suboptimal capital structure decisions, which

have a direct impact on long-term profitability. On the other hand, the IMF's 2022 survey noted that the food and beverage industry continued to record consumption growth of 5.4% despite inflation and logistics cost pressures. This phenomenon places capital structure as a crucial determinant in maintaining the sector's competitiveness amid economic uncertainty.

Trade-Off Theory and Pecking Order Theory become the main framework in understanding the relationship between capital structure and profitability. According to Modigliani & Miller (1963), under perfect market conditions, capital structure does not affect profitability. However, the Trade-Off Theory approach introduces the concept of financial costs and tax benefits of debt as factors forming the optimal equilibrium (Tanuraharja & Wi, 2023). On the other hand, Pecking Order Theory assumes that firms prefer internal funding before external, so capital structure is strongly influenced by prior profitability (Adelin et al., 2024). However, this effect is not linear and tends to be influenced by moderating factors such as firm liquidity.

Methodological issues in the literature also show significant differences in approach. Research such as by Dianti & Bawono (2024) uses a quantitative approach with a moderated regression model using firm size, while other studies such as by Fadhilsyah et al. (2025) used activity and solvency ratios in testing the indirect effect on firm value. This shows that there is still a gap in the methodology to integrate liquidity factor as a moderating variable in the relationship between capital structure and profitability, especially in the context of food and beverage companies in Indonesia.

Most previous studies focus on the direct effect of capital structure on firm value or profitability, but not many explicitly examine the moderating role of liquidity in the relationship. For example, Mandasari (2024) used liquidity only as an independent variable, without examining how this variable can strengthen or weaken the relationship between capital structure and profitability. This creates a significant research gap, especially in the context of food and beverage sector companies that have unique operational cash cycles.

In the Indonesian context, the food and beverage industry recorded a growth of 3.64% in the third quarter of 2023 (BPS, 2023), making it a strategic sector in national economic growth. Nevertheless, BEI reports show that only 40% of food and beverage companies managed to maintain profitability levels above the sector average (Dianti & Bawono, 2024). The imbalance of debt structure and liquidity is considered as the main factor suppressing margins. Therefore, understanding how capital structure interacts with liquidity in influencing profitability is of strategic importance.

Several studies such as Giawa et al. (2024) and Handini & Susilo (2025) concluded that when firms have high liquidity, their ability to manage debt burden increases, thus the negative impact of leverage on profitability can be minimized. However, a study by Yuditia & Suhaedi (2024)shows that in companies with high liquidity, leverage leads to overcapitalization and inefficient use of assets. This difference in findings emphasizes the need for a more contextual empirical approach, especially in sectors that have demand volatility such as food and beverages.

The urgency of this research is also driven by the absence of analytical models that explicitly integrate liquidity variables as moderators in the context of the food and beverage industry in Indonesia post-COVID-19 pandemic. Kartika & Wiagustini (2024) noted that the sector's recovery tends to be slow due to financial structure constraints, while the operational cost structure has increased significantly. This reinforces the need to identify the optimal combination of capital structure and liquidity to maintain sustainable financial performance.

This study aims to answer the gap by empirically testing how capital structure affects the profitability of food and beverage companies listed on the IDX for the 2019-2023 period, as well as how liquidity acts as a moderating variable. By using panel data and moderation regression interaction analysis, it is expected that the results of this study can make a theoretical contribution to the development of moderation-based financial models, as well as a practical contribution for company management in designing capital structures that are adaptive to liquidity fluctuations. Theoretically, this study expands the scope of Trade-Off Theory by including dynamic aspects of liquidity as a leverage risk mitigation tool. Practically, this study provides guidance for financial managers in the food and beverage sector in making balanced funding decisions, especially in post-crisis and economic recovery conditions.

Literature Review

Trade-Off Theory

Trade-Off Theory explains that companies determine the optimal capital structure by considering the tax benefits of debt (tax shield) and the costs of bankruptcy or financial distress. Starting from the correction of Modigliani & Miller (1963), this theory states that firms should increase debt up to a certain point, where the benefits are maximized before the risk of bankruptcy depresses the value of the firm (Kraus & Litzenberger, 1973). Two main approaches evolved from this theory: static trade-off, which suggests a permanent equilibrium, and dynamic trade-off, which accounts for fluctuations in financial conditions and capital markets (Ross et al., 2022). Recent research confirms that firms in capital-intensive industries such as food and beverages use this principle to maintain financial flexibility (Nguyen et al., 2020; Ichwanudin et al., 2023).

Empirically, Trade-Off Theory is widely used to explain the relationship between debt structure and profitability. Profitable companies tend to have the capacity to take on more debt, but they balance it with the risk of interest costs and liquidity (Habibniya et al., 2022). In the food and beverage sector, where raw material cost fluctuations are high, the trade-off approach is particularly relevant to design a capital structure that is not only efficient but also resilient to operational pressures.

Pecking Order Theory

Pecking Order Theory (POT) was developed by Myers & Majluf (1984) inresponse to the weakness of Trade-Off Theory in explaining the funding behavior of companies based on asymmetric information. This theory states that companies will prefer internal funding

(retained earnings), then debt, and finally equity, because the use of external funding raises negative signals to the market. In this context, profitability becomes the main determinant of capital structure, because more profitable companies do not need to seek external funding. This theory emphasizes that there is no optimal point in capital structure; funding decisions are more a response to order preference and information costs (Gunawan et al., 2021).

Applications of this theory in the food and beverage industry show that highly profitable firms tend to reduce debt and increase equity accumulation through retained earnings (Nguyen et al., 2020; Arianti & Cahyaningtyas, 2022). Several empirical studies show a negative relationship between profitability and leverage, consistent with the POT, including in the food and beverage sector in Southeast Asia and West Africa (Adusei & Dacosta, 2016;Umobong, 2019). Nonetheless, some researchers underline that in practice the funding sequence may change if liquidity factors and market pressures increase.

Profitability

Profitability is a key indicator of financial performance that reflects a company's ability to generate profits from its operational activities. In the context of the food and beverage industry, profitability is strongly influenced by cost efficiency, production scale, and dynamic working capital management (Hong & Ruangchoengchum, 2024). Key indicators often used to measure profitability include Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM). ROA measures the effectiveness of using assets to generate net income, while ROE reflects the rate of return earned by shareholders on their investment (Gunawan & Ramli, 2023). NPM, as a measure of profit margin against sales, is crucial in assessing operational efficiency especially in high price-competitive sectors such as food and beverages.

$$\text{ROA} = \frac{\text{Net income}}{\text{Assets}}$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Equity}}$$

$$\text{NPM} = \frac{\text{Net income}}{\text{Revenue}}$$

Capital Structure

Capital structure refers to the proportion of debt and equity used by a company in financing its operational and investment activities. In contemporary studies, capital structure is not only seen as a combination of financial rationales but also reflects risk adaptation strategies and resource allocation efficiency (Bui et al., 2022; Gazzola et al., 2024). In the food and beverage sector, a capital structure that is too heavy on debt has the potential to disrupt cash flow due to fluctuations in raw material costs and market uncertainty (Njoki et al., 2024). Wai (2024)'s study also emphasizes that companies in this sector tend to maintain moderate leverage to maintain financial resilience. This structure consists of short-term debt, long-term debt, and equity capital, each of which has different implications for risk and cost of capital. Capital structure measurement in research is generally measured by debt to equity Ratio (DER).

$$\text{DER} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Liquidity

Liquidity is the company's ability to fulfill its short-term obligations and plays an important role in maintaining the company's operational continuity. In the context of capital structure and profitability, liquidity is not only seen as an independent financial indicator but also as a moderating variable that can strengthen or weaken the relationship between leverage and profitability (Dianti & Bawono, 2024). With high liquidity, the company has the flexibility to pay debt interest without sacrificing operations, so that the negative impact of leverage can be suppressed (Giawa et al., 2024). In contrast, companies with low liquidity face the risk of cash flow pressures, which potentially exacerbate the negative effects of debt-based capital structure on profitability (Sulfati & Jamali, 2025).

$$\text{CR} = \frac{\text{Current assets}}{\text{Curent liabilities}}$$

Research Hypothesis

The hypothesis of this study are:

H1: Capital structure negatively affects the firm's profitability proxied by return on assets

H2: Capital structure has a positive effect on company profitability as proxied by return on equity

H3: Capital structure negatively affects the profitability of the company as proxied by net profit margin

H4: Liquidity moderates the effect of capital structure on firm profitability proxied by return on assets

H5: Liquidity moderates the effect of capital structure on firm profitability firm profitability proxied by return on equity

H6: Liquidity moderates the effect of capital structure on profitability proxied by net profit margin

Research Method

This study uses a quantitative approach by utilizing secondary data to evaluate the relationship between capital structure variables and profitability, as well as testing the role of liquidity as a moderating variable. The population in this study were all food and beverage subsector companies listed on the Indonesia Stock Exchange (IDX) for the 2019-2023 period. The purposive sampling technique is used in selecting samples based on certain criteria that are relevant to the research objectives.

Sample Selection Criteria

No	Sample Criteria	Criteria Violation	Number of Companies
1	Food and beverage companies listed on the Indonesia Stock Exchange 2019-2023.		95
2	Companies that report financial statements for the period 2019-2023	(43)	44
3	Companies that earn profits during the research period year.	(17)	27
4	Companies that use rupiah currency.	(1)	26
Number of companies in the sample			**26**
Research period 5 years (2019-2023)			**5**
Total sample data (26 x 5)			**130**

Source: www.idx.co.id, data processed by researchers, 2025

Source and Method of Data Collection

The type of data used in this study is secondary data. Data sources are obtained from the annual reports of food and beverage subsector companies published on the official website of the Indonesia Stock Exchange (www.idx.co.id) and the official website of each company. The data collection technique was carried out through the documentation method.

Data Analysis Method

The analysis was carried out using panel data regression and Moderated Regression Analysis (MRA) with the help of Eviews 13 software, according to the methods used in previous studies (Adelin et al., 2024;Diastanova & Marsoem, 2023). The panel data regression model is processed through three stages of model testing: Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM), as suggested by Resti & Marsoem (2023). The classic assumption test and interaction test are used to determine the moderating effect of liquidity in the relationship between capital structure and profitability, as suggested by (Akhmadi et al., 2023;Nur'aini et al., 2020).

Results

Model Selection Test

The panel regression model selection process is carried out through three main stages: Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test. The aim is to determine the most appropriate estimation model among three alternatives: Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM).

Results of Chow Test, Hausman Test, and LM Test

Chow Test			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.882368	(25,101)	0.627595
Cross-section Chi-square	25.68087	25	0.424782

Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.98342	3	0.80526

LM Test			
	Test Hypothesis	Test Hypothesis	Test Hypothesis
Breusch-Pagan	0.25101	0.78075	1.03176
	(0.6164)	(0.3769)	(0.3097)

Source: Data processed with Eviews 13, 2025

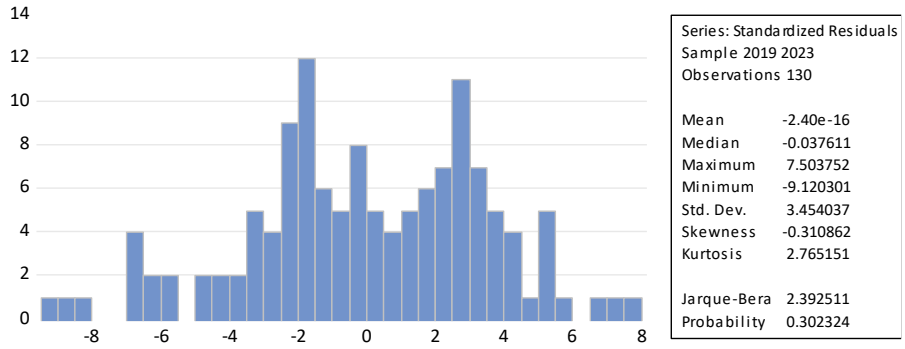
The Chow test shows a probability value of 0.6276 (> 0.05), so the Common Effect Model (CEM) is more appropriate than the Fixed Effect Model (FEM). The Hausman test gives a probability of 0.8053 (> 0.05), indicating that the Random Effect Model (REM) is more appropriate than the FEM. The LM (Breusch-Pagan) test yields a probability value of 0.6164 (> 0.05) for the cross-section effect, indicating that the Common Effect Model (CEM) remains superior to REM.

Classical Assumption Test

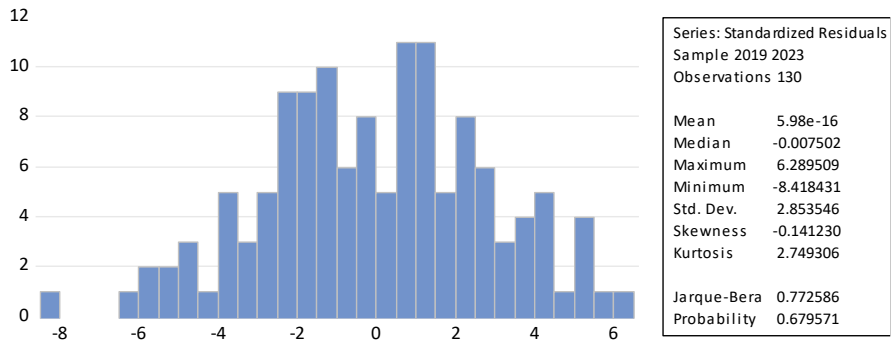
Normality Test

The normality test is carried out to ensure that the residual data is normally distributed. The criterion for the success of this test is to see the probability number of the J-B statistic > 0.05.

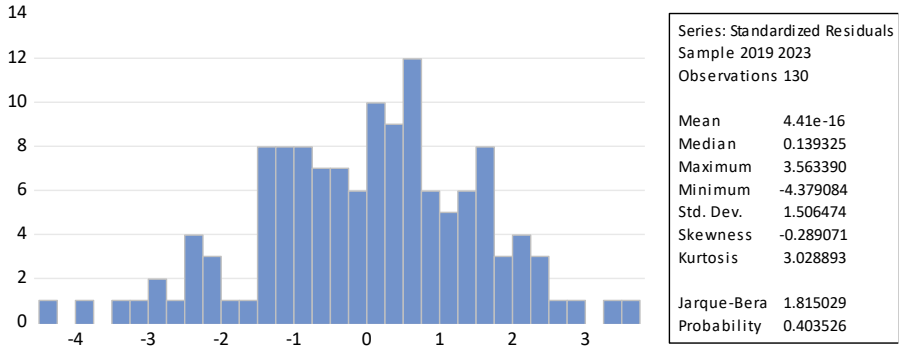
Normality Test with Jarque-Bera Test: DER (X) on ROA (Y1)



Normality Test with Jarque-Bera Test: DER (X) on ROE (Y2)



Normality Test with Jarque-Bera Test: DER (X) on NPM (Y3)



Source: Data processed with Eviews 13, 2025

Summary of Normality Test Results

Normality Test	*Probability*	Result
X to Y1 (ROA)	0.302324	Prob > 0.05 (Normality assumption is met)
X to Y2 (ROE)	0.679571	Prob > 0.05 (Normality assumption is met)
X to Y3 (NPM)	0.403526	Prob > 0.05 (Normality assumption is met)

Based on summary, all probabilities > 0.05, it can be concluded that the entire model has met the assumption of normality.

Heteroscedasticity Test

Heteroscedasticity testing is done by regression on the absolute value of the residual (ABS(RESID)). The criterion used is the probability value > 0.05 which indicates that the residual variance is homogeneous.

Heteroscedasticity Test Results

Dependent Variable: ABS(RESID)
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.39886	0.0838310	4.7579625	5.26582
X	-0.05370	0.110207	-0.487289	0.62689
Z	-0.02517	0.01879	-1.33934	0.18287
XZ	0.02636	0.06904	0.3818	0.70324

Based on the table above, all probability values are greater than 0.05, so the model is declared free from heteroscedasticity symptoms.

Autocorrelation Test

Durbin-Watson is used to detect autocorrelation. If the Durbin-Watson value is in the range of 1 < DW < 3, then there is no autocorrelation.

Durbin-Watson Test Results: DER (X) to ROA (Y1)

Log likelihood	-345.1007	Hannan-Quinn criter.	5.357937
F-statistic	2.308971	Durbin-Watson stat	2.103466

Based on DW Table, the DW value is very close to 2 (1 < 2.103466 < 3), indicating no autocorrelation.

Durbin-Watson Test Results: DER (X) to ROE (Y2)

Log likelihood	-320.2732	Hannan-Quinn criter.	4.975975
F-statistic	0.004378	Durbin-Watson stat	1.612554

Based on DW table, the value of the Durbin-Watson statistic is between 1 and 3 (1 < 1.612554 < 3), indicating no autocorrelation.

Durbin-Watson Test Results: DER (X) to NPM (Y3)

Log likelihood	-237.2304	Hannan-Quinn criter.	3.698394
F-statistic	0.155244	Durbin-Watson stat	1.172236

Based on DW table, the value of Durbin-Watson statistic is between 1 and 3 (1< 1.172236 < 3), indicating no autocorrelation.

1. Hypothesis Testing and Moderation Testing: DER (X) on ROA (Y1)

In hypothesis testing, the coefficient of determination, simultaneous effect test (F test), and partial effect test (t test) are analyzed. The statistical values of the three tests are presented in table below.

Statistical values of the coefficient of determination, F test, and t test

Dependent Variable: Y1
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.111655	0.007945	14.05391	0.0000
X	-0.016504	0.006872	-2.401409	0.0178

R-squared	0.043111	Mean dependent var	0.098392
Adjusted R-squared	0.035635	S.D. dependent var	0.066308

S.E. of regression	0.065116	Akaike info criterion	-2.610025
Sum squared resid	0.542733	Schwarz criterion	-2.565909
Log likelihood	171.6516	Hannan-Quinn criterion.	-2.592100
F-statistic	5.766766	Durbin-Watson stat	0.587525
Prob(F-statistic)	0.017770		

Coefficient of Determination (R^2)

Based on the table above, the coefficient of determination (R-squared) = 0.043. This value shows that DER (X) is able to influence ROA (Y1) by 4.3%, the remaining 95.7% is influenced by other factors.

Simultaneous influence test (F test)

The F test is used to test the effect of exogenous variables together or simultaneously on endogenous variables. Based on the table, the prob. (F-statistic) value is shown, which is 0.017770 < 0.05, so it can be concluded that all exogenous variables, namely DER (X) simultaneously affect the ROA variable (Y1).

Panel Data Regression Equation and Partial Effect Test (t-test)

Based on the table above, the regression equation is obtained as follows.

$$Y1= 0.111655 - 0.016504 + e$$

The regression results show that DER (X) has a negative effect on ROA (Y1), with a coefficient value of -0.0165 and a Prob value of 0.0178 < 0.05. The coefficient of -0.0165 indicates that every one unit increase in DER (X) will decrease ROA (Y1) by 0.0165 points, with significance at the 5% level. The first hypothesis (H1) is accepted.

Moderated Regression Analysis (MRA) Test

Next, the moderation test is conducted, namely testing CR (Z) moderates the effect of DER (X) on ROA (Y1).

Moderation Testing

Dependent Variable: Y1
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.108912	0.013045	8.349224	0.0000
X	0.010633	0.017149	0.620010	0.5364
Z	0.003186	0.002925	1.089244	0.2781
XZ	-0.018556	0.010744	-1.727118	0.0866

$$Y1 = 0.109 + 0.011*X + 0.003*Z - 0.018*XZ + e$$

Based on the table, the interaction between DER (X) and CR (Z) shows a negative coefficient (-0.0186) with marginal significance (p = 0.0866). This means that CR (Z) does not moderate the effect of DER (X) on ROA (Y1). The fourth hypothesis (H4) is not accepted**.**

2. Hypothesis Testing and Moderation Testing: DER (X) on ROE (Y2)

Statistical value of the coefficient of determination, F test, and t test

Dependent Variable: Y2
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018389	0.026202	0.701838	0.4841
X	0.210269	0.022665	9.277131	0.0000

R-squared	0.402051	Mean dependent var	0.187369
Adjusted R-squared	0.397380	S.D. dependent var	0.276639
S.E. of regression	0.214751	Akaike info criterion	-0.223408
Sum squared resid	5.903114	Schwarz criterion	-0.179292
Log likelihood	16.52152	Hannan-Quinn criterion.	-0.205482
F-statistic	86.06516	Durbin-Watson stat	0.722741
Prob(F-statistic)	0.000000		

Coefficient of Determination (R^2)

Based on the table above, the coefficient of determination (R-squared) = 0.40. This value shows that DER (X) is able to influence ROE (Y2) by 40%, the remaining 60% is influenced by other factors.

Simultaneous influence test (F test)

The F test is used to test the effect of exogenous variables together or simultaneously on endogenous variables. Based on the table above, the prob. (F-statistic) value is shown, which is 0.000000 < 0.05; it can be concluded that all exogenous variables, namely DER (X) simultaneously affect the ROE variable (Y2).

Panel Data Regression Equation and Partial Effect Test (t-test)

The regression equation is obtained as follows.

$$Y2= 0.018389 + 0.210269 + e$$

The regression results show that DER (X) has a positive effect on ROE (Y2), with a coefficient value of 0.210269 and a Prob value of 0.0000 < 0.05. The positive coefficient of 0.2103 indicates that an increase in DER (X) by one unit will increase ROE (Y2) by 0.2103 points. The second hypothesis (H2) is accepted.

Moderated Regression Analysis (MRA) Test

Furthermore, moderation testing is carried out, namely testing CR (Z) moderates the effect of DER (X) on ROE (Y2).

Moderation Testing

Dependent Variable: Y2
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.064126	0.039988	-1.603628	0.1113
X	0.432427	0.052570	8.225788	0.0000
Z	0.038451	0.008968	4.287838	0.0000
XZ	-0.138163	0.032936	-4.194898	0.0001

$$Y2 = -0.064 + 0.432*X + 0.038*Z - 0.138*XZ + e$$

The table shows that the interaction between capital structure and liquidity shows a negative coefficient (-0.1381) with marginal significance (p = 0.0001). This means that CR (Z) moderates the effect of DER (X) on ROE (Y2). The fifth hypothesis (H5) is accepted.

3. Hypothesis Testing and Moderation Testing: DER (X) on NPM (Y3)

Statistical value of the coefficient of determination, F test, and t test

Dependent Variable: Y3
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.125254	0.010025	12.49446	0.0000
X	-0.019498	0.008672	-2.248496	0.0263

R-squared	0.037997	Mean dependent var	0.109585
Adjusted R-squared	0.030481	S.D. dependent var	0.083446
S.E. of regression	0.082164	Akaike info criterion	-2.144936
Sum squared resid	0.864117	Schwarz criterion	-2.100820
Log likelihood	141.4208	Hannan-Quinn criterion.	-2.127010
F-statistic	5.055735	Durbin-Watson stat	0.349838
Prob(F-statistic)	0.026255		

Coefficient of Determination (R^2)

Based on the table above, the coefficient of determination (R-squared) = 0.038 is shown. This value shows that DER (X) is able to influence NPM (Y3) by 3.8%, the remaining 96.2% is influenced by other factors.

Simultaneous influence test (F test)

The F test is used to test the effect of exogenous variables together or simultaneously on endogenous variables. Based on the table above, the prob. (F-statistic) value is shown, which is 0.026255 < 0.05; it can be concluded that all exogenous variables, namely DER (X) simultaneously affect the NPM variable (Y3).

Panel Data Regression Equation and Partial Effect Test (t Test)

The regression equation is obtained as follows.

$$Y3= 0.125254 - 0.019498 + e$$

The regression results show that DER (X) negatively affects NPM (Y3), with a coefficient value of -0.019498 and a Prob value of 0.0263 < 0.05. The negative coefficient of -0.019498 indicates that the greater the proportion of debt, the smaller the net profit margin that can be generated. The third hypothesis (H3) is accepted.

***Moderated Regression Analysis* (MRA) Test**

Furthermore, moderation testing is carried out, namely testing CR (Z) moderates the effect of DER (X) on NPM (Y3).

Moderation Testing

Dependent Variable: Y3
Method: Panel Least Squares
Sample: 2019-2023
Periods included: 5
Cross-sections included: 26
Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.101484	0.016308	6.222771	0.0000
X	0.017135	0.021440	0.799204	0.4257
Z	0.008433	0.003657	2.305835	0.0228
XZ	-0.020455	0.013432	-1.522784	0.1303

$$Y3 = 0.101 + 0.017*X + 0.008*Z - 0.020*XZ + e$$

The table shows that the interaction between capital structure and liquidity shows a negative coefficient (- 0.020) with marginal significance (p = 0.1303). This means that CR (Z) does not moderate the effect of DER (X) on NPM (Y3). The sixth hypothesis (H6) is not accepted.

Discussion

The Effect of Capital Structure on Profitability Proxied by ROA

The analysis shows that DER has a negative and significant influence on ROA (p = 0.0178). Theoretically, this supports Pecking Order Theory, which states that companies prefer internal funding over external. When debt increases without efficiency in capital utilization, interest expense can reduce the rate of return on corporate assets. In this context, excessive debt suppresses asset productivity and weakens the ROA ratio.

This finding is in line with the research of Kurniawan et al. (2025) who found that DER has a negative effect on ROA in the primary consumption sector. Research by Rosalina (2024) also shows that an increase in DER tends to reduce the company's ROA due to increased financial burden. Fauzi & Rochmatullah (2024) also supported this, stating that debt-based capital structure reduces the efficiency of the company's assets. In addition, a study by Colline (2022) concluded that high leverage can limit financial flexibility and negatively impact ROA.

Effect of Capital Structure on Profitability Proxied by ROE

The test results show that DER has a significant positive effect on ROE (p = 0.0000), which supports Trade-Off Theory. This theory states that companies can benefit from the use of debt in the form of a reduction in tax burden (tax shield) if the capital structure is managed efficiently. In this case, optimal leverage increases return for shareholders because the portion of funds used for financing comes from loans with fixed costs, while the profit generated increases.

This finding is consistent with research by Pramastha & Sulistiyowati (2025), who found that an increase in DER encourages an increase in ROE in the context of manufacturing companies. Setiawan & Amelia (2024) also showed that debt-based capital structure can improve equity performance if supported by operational efficiency. Kurniawan et al. (2025) support the same thing, with evidence that DER gives a positive boost to ROE. This result is also in line with the study of Rialdy & Lubis (2024), which concluded that high leverage could improve shareholder performance as long as the company maintains liquidity and cost efficiency.

Effect of Capital Structure on Profitability Proxied by NPM

The results showed a negative and significant influence between DER on NPM (p = 0.0263). Theoretically, an increase in debt creates interest expenses that can erode net profit margins, so the higher the leverage, the smaller the portion of net profit to sales. This leads to reduced operating profit efficiency because most of the profit is used to meet financial obligations.

This finding is in line with the study by Fauzi & Rochmatullah (2024), which states that debt has a negative impact on net profit margins. Research by Kurniawan et al. (2025) also shows that a high capital structure in DER suppresses the company's ability to maintain profit margins. High leverage can reduce the company's ability to maintain NPM due to financial cost

pressures. In addition, Rosalina (2024) also concluded that DER reduces NPM in electronic companies due to dependence on external debt.

Effect of Capital Structure on ROA with Liquidity as Moderating Variable

The moderation test shows that Current Ratio (CR) does not significantly moderate the effect of DER on ROA (p = 0.0866), although the interaction coefficient is negative. Theoretically, this can be explained because ROA reflects the efficient use of the company's assets, while CR reflects the short-term ability to meet liabilities. Thus, liquidity does not always play a role in strengthening or weakening operational efficiency reflected in ROA.

This finding is consistent with research by Wahyuni & Fanny (2025), which states that liquidity has a limited impact on the relationship between DER and ROA. Kuncoro et al. (2025) also showed no significant interaction between CR and capital structure on asset efficiency. Zaharani & Lessy (2024) concluded that liquidity only has a significant impact on ROE, not ROA. Similar findings were found in the study of Ulandari et al. (2025), which states that companies with high liquidity do not necessarily have better ROA if interest expenses remain high.

Effect of Capital Structure on ROE with Liquidity as Moderating Variable

The regression results show that CR significantly moderates the effect of DER on ROE (p = 0.0001), with negative interaction direction. This means that in high liquidity conditions, the effect of leverage on return on equity tends to weaken. This is consistent with Pecking Order Theory, which states that companies with high cash reserves will rely more on internal funding, so the effect of leverage on ROE becomes lower.

This finding is reinforced by research by Setiawan & Amelia (2024), which found that CR can weaken the DER-ROE relationship in the infrastructure sector. Research by Lestari (2021) also states that companies with high liquidity levels are more careful in utilizing debt. Similar findings were presented by Ho (2024), and Ibrahim et al. (2024), which showed a significant interaction between CR and DER on ROE.

Effect of Capital Structure on NPM with Liquidity as Moderating Variable

The moderation test results show that CR does not moderate the effect of DER on NPM significantly (p = 0.1303). The negative interaction coefficient indicates a weakening direction, but it is not statistically strong enough. The theory that can explain this result is that NPM is more sensitive to operating cost efficiency and interest expense than short-term liquidity conditions. Therefore, CR is not a factor that directly affects the relationship between DER and net profit margin.

Fitrilia & Nilwan's (2025) research corroborates this finding by showing that liquidity does not have a significant moderating role on NPM. Suryana & Syarif (2022) also showed that the role of CR in the DER-NPM effect tends to be weak. Similar findings were reported by Salim & Pratama (2021), and Susilo (2022), who stated that profit margins are more influenced by cost structure efficiency than liquidity ratios.

Conclusion

This study aims to examine the effect of capital structure on the profitability of food and beverage companies listed on the Indonesia Stock Exchange during the 2019-2023 period, and assess the role of liquidity as a moderating variable. The results showed that the capital structure proxied by the Debt to Equity Ratio (DER) has a significant effect on the three profitability indicators. DER has a negative effect on Return on Assets (ROA) and Net Profit Margin (NPM), indicating that an increase in debt can reduce the efficiency of asset use and reduce net profit margins. Conversely, DER has a positive effect on Return on Equity (ROE), indicating that proper use of leverage can increase returns to shareholders. In testing the role of liquidity as a moderating variable, only the relationship between DER and ROE is significantly moderated by Current Ratio (CR), where high liquidity weakens the impact of leverage on ROE. Meanwhile, CR is not proven to moderate the relationship between DER and ROA or NPM significantly.

This study has several limitations, including the limitations of secondary data because not all companies present complete financial reports during 2019-2023. Variable measurements only use DER and CR ratios, so they do not represent all aspects of capital structure and liquidity. In addition, external factors such as economic conditions are not analyzed, and time constraints limit the depth of the study.

Future research is suggested to consider other moderating variables, such as operational efficiency or sales growth, to obtain a more comprehensive understanding of the relationship between capital structure and profitability. In addition, the use of more diverse financial indicators and the addition of external factors such as macroeconomic conditions can enrich the analysis and increase the relevance of research results.

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