



Financial performance and profit growth: Examining the moderating role of leverage

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ABSTRACT

This study examines whether leverage moderates the relationship between financial performance and profit growth among food and beverage firms listed on the Indonesia Stock Exchange during 2021–2025. Using purposive sampling, 34 firms were retained from an initial population of 64, producing 170 firm-year observations. The study applies panel-data regression and moderated regression analysis in EViews 13. Model-selection tests support the common effect specification. The results show that NPM is positively associated with profit growth, ROA is negatively associated with profit growth, and ROE is statistically insignificant. In the interaction specification reported in the underlying analysis, $NPM \times DER$ and $ROE \times DER$ are positive and significant, whereas $ROA \times DER$ is negative and significant. These findings indicate that financing structure is relevant when interpreting profitability signals, although the baseline model explains only a modest share of profit-growth variation. The novelty of this study lies in examining DER not merely as a direct financial determinant, but as a moderating factor that alters the relationship between NPM, ROA, and ROE and profit growth in Indonesian food and beverage firms using recent 2021–2025 panel data. The findings should be interpreted cautiously because extreme observations may affect coefficient stability, while the interaction-only moderation specification limits inference about DER's moderating role. Future research should use robust outlier treatment and fully specified moderation models including both main and interaction effects.

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1. INTRODUCTION

Profit growth is an important summary of whether a company can convert operating activity, invested resources, and financing decisions into an expanding earnings base. For listed firms, this information is useful to investors and creditors because current profitability does not necessarily translate mechanically into future earnings. Recent studies show that accounting records and financial ratios retain explanatory value for corporate financial performance, while the information content of reported revenues and earnings can also be associated with subsequent operating

outcomes (Bawono & Handika, 2023; Wasan et al., 2022; Alhaddad et al., 2022). In this setting, profitability ratios are not merely descriptive measures; they can serve as signals about cost efficiency, resource utilization, and the sustainability of current earnings.

The issue is particularly relevant for Indonesian food and beverage-related firms. The 2021–2025 observation window spans the pandemic shock and the subsequent normalization of economic activity, when firms faced changes in demand, input costs, financing conditions, and working-capital requirements. Financial constraints and working-capital choices can materially shape operating performance in emerging markets (Jabbouri et al., 2024). More broadly, Indonesian evidence confirms that accounting choices, leverage, and activity-related ratios are associated with profitability, suggesting that performance assessment should combine operating and financing information rather than rely on one ratio in isolation (Bawono & Handika, 2023).

Net profit margin (NPM) measures the amount of net income generated from sales. A higher margin can reflect stronger pricing, lower operating costs, or a more favorable product mix. Accordingly, NPM should provide a direct operating signal for earnings expansion when improvements in margin are sustained. Recent Indonesian studies nevertheless report mixed evidence. Prasongko and Hirawati (2022) find that NPM, ROA, and ROE do not consistently explain profit growth in a food and beverage sample, while Siti Meisaroh et al., 2023 show that the relationship between profitability ratios and profit growth varies across indicators and moderation settings. More recent evidence from LQ45 companies again demonstrates that the relevance of NPM and ROA depends on sample and model specification (Priyono et al., 2024). These differences motivate a sector-specific reassessment using a more recent 2021–2025 window.

Return on assets (ROA) and return on equity (ROE) capture different dimensions of profitability. ROA evaluates how effectively the asset base generates earnings, while ROE relates earnings to shareholders' capital. Contemporary performance research continues to use these accounting measures because they reflect distinct operating and financing mechanisms (Bui & Krajcsák, 2024; Jape & Malhotra, 2023; Aydoğmuş et al., 2022). Their interpretation, however, is not identical. A high ROA may reflect efficient use of an established asset base, but rapid investment can temporarily reduce the ratio even when the firm is building future capacity. ROE is even more sensitive to financing structure because debt changes the equity base and fixed financing costs. Therefore, a profitability ratio that looks favorable in isolation may not carry the same implication for future profit growth after leverage is considered.

Leverage is therefore central to the interpretation of profitability signals. Recent capital-structure evidence indicates that debt can support performance when it finances productive investment or disciplines resource allocation, but excessive leverage can increase financial distress risk, constrain flexibility, and erode profitability (Kalash, 2023; Khan et al., 2024; Wang & Ahmad, 2024). Studies across emerging markets also show that leverage-performance relationships are heterogeneous rather than universally positive or negative (Kijkasiwat et al., 2022; Nikmah & Hung, 2024; (M. N. et al., 2024). Economic uncertainty can slow leverage adjustment, and firm-specific financing choices respond to profitability, growth opportunities, and macroeconomic conditions (Chakradhar & Gupta, 2024; Khan et al., 2024). These findings are consistent with a trade-off view in which debt provides potential benefits only up to the point at which financing costs and risk begin to dominate.

A moderating role of leverage is also plausible from recent evidence. Financial leverage has been shown to mediate or moderate relationships between governance, reporting environments, and firm performance (Kijkasiwat et al., 2022; Huynh et al., 2022; M N et al., 2024). Research using broader performance settings also emphasizes that capital structure interacts with managerial choices and innovation rather than operating as an isolated determinant (Shoaib & Siddiqui, 2022; Cuevas-Vargas et al., 2022; Tian & Kohar, 2024). Accordingly, the same NPM, ROA, or ROE may imply different profit-growth prospects at different debt levels. For NPM, debt can magnify growth when strong margins generate sufficient returns to service borrowed funds. For ROA, higher debt can absorb part of the asset-generated return through financing costs. For ROE, leverage can

mechanically and economically amplify shareholder returns, but only when the return generated by financed assets exceeds the effective cost of debt.

This study addresses two gaps. First, it provides evidence for the Indonesian food and beverage-related sector over 2021–2025, a period characterized by unusually large variation in operating and financing conditions. Second, instead of examining profitability ratios only as direct predictors, it evaluates leverage as a boundary condition in the relationship between profitability and profit growth. The study therefore connects financial-ratio analysis with recent capital-structure research emphasizing nonlinearity, heterogeneity, and context dependence (M. N. et al., 2024; Chakradhar & Gupta, 2024; Nikmah & Hung, 2024). It also responds to the practical need for financial statement users to interpret profitability and debt jointly rather than treating them as independent signals.

Previous empirical findings concerning the relationship between profitability and profit growth in the food and beverage sector remain inconsistent. Some studies report that NPM significantly influences profit growth, whereas others find no significant effect. Similar inconsistencies are observed for ROA and ROE, which have been reported as significant, insignificant, or varying in direction across different observation periods and samples. These mixed findings suggest that profitability ratios alone may not fully explain differences in profit growth. Moreover, most previous studies have examined NPM, ROA, and ROE primarily as direct determinants of profit growth, with relatively limited attention to financial conditions that may alter these relationships. This study addresses this empirical gap by introducing leverage, measured by DER, as a moderating variable to examine whether the relationship between profitability and profit growth depends on firms' financing structures.

The research tests six hypotheses: NPM, ROA, and ROE are associated with profit growth (H_1 – H_3), and leverage moderates the respective relationships between NPM, ROA, and ROE and profit growth (H_4 – H_6). The objective is to determine whether reported profitability ratios explain profit growth and whether the direction or strength of these relationships changes when debt exposure is incorporated. The expected contribution is not to establish a universal optimal ratio, but to show how operating profitability and financing structure jointly inform the assessment of earnings growth in an emerging-market setting.

The novelty of this study lies in positioning leverage, measured by the debt-to-equity ratio (DER), as a moderating variable rather than merely a direct determinant of profit growth. Unlike prior studies that predominantly examine NPM, ROA, ROE, and leverage independently, this study investigates whether DER changes the relationships between each profitability indicator and profit growth. It further contributes recent panel evidence from Indonesian food and beverage firms during 2021–2025, thereby extending the literature on how capital structure conditions the interpretation of profitability signals in an emerging-market context.

2. RESEARCH METHOD

This study uses a quantitative explanatory design based on secondary financial-statement data. The unit of analysis is the firm-year. The initial population comprises 64 companies classified in the source study as food and beverage-related firms listed on the Indonesia Stock Exchange during 2021–2025. Purposive sampling was applied to retain firms that consistently published the required financial statements and reported positive profits over the observation period. The selected firms were required to remain listed throughout the observation period and provide complete financial statements. These data were necessary to calculate NPM, ROA, ROE, DER, and profit growth. Consequently, the final sample consisted of 34 companies, generating 170 firm-year observations.

The dependent variable is profit growth (PG), calculated as the change in net income from year $t-1$ to year t divided by net income in year $t-1$. Financial performance is represented by NPM, ROA, and ROE. NPM equals net income after tax divided by net sales; ROA equals net income after tax divided by total assets; and ROE equals net income after tax divided by total equity. Leverage is measured by the debt-to-equity ratio (DER), calculated as total liabilities divided by total equity.

These ratios permit the operating margin, asset-efficiency, shareholder-return, and financing dimensions of performance to be considered simultaneously.

Table 1. Variable definitions and measurement

Variable	Role	Measurement
Profit growth (PG)	Dependent	(Net income _t – Net income _{t-1}) / Net income _{t-1}
Net profit margin (NPM)	Independent	Net income after tax / Net sales
Return on assets (ROA)	Independent	Net income after tax / Total assets
Return on equity (ROE)	Independent	Net income after tax / Total equity
Debt-to-equity ratio (DER)	Moderator	Total liabilities / Total equity

The empirical analysis was conducted in EViews 13. Descriptive statistics were first used to assess the distribution of each variable. Panel-model selection compared common, fixed, and random effects. The Chow test did not reject the common effect model relative to fixed effects (cross-section $F_p = 0.7527$), and the Lagrange multiplier test did not support random effects over pooled estimation (Breusch-Pagan both $p = 0.3512$). The Hausman test also produced $p = 0.7830$. Based on the reported selection procedure, the common effect model (pooled OLS) was retained for the main estimation.

The baseline model is $PG_{it} = \alpha + \beta_1 NPM_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \varepsilon_{it}$. The source analysis then evaluates moderation using a separate interaction specification containing $NPM \times DER$, $ROA \times DER$, and $ROE \times DER$. This article reports that specification faithfully because it is the model estimated in the underlying study. At the same time, the interpretation is deliberately limited to the sign and significance of the reported interaction terms. A conventional hierarchical moderation model would ordinarily retain the constituent main effects and the moderator together with all interaction terms; this point is addressed explicitly in the limitations and future-research section.

The moderation model in this study was specified primarily to test the interaction between profitability indicators and leverage. Therefore, the analysis focused on the interaction terms $NPM \times DER$, $ROA \times DER$, and $ROE \times DER$ rather than including all main effects and interaction terms simultaneously in one full hierarchical model. This specification was intended to identify whether DER changes the relationship between each profitability measure and profit growth. Nevertheless, the approach represents a limitation because a fully specified moderation model would normally retain the main effects of NPM, ROA, ROE, and DER together with their respective interaction terms. Future research should therefore employ a full moderation specification to provide more robust and interpretable estimates of the moderating role of leverage.

Statistical significance is evaluated at the 5% level. The signs of β_1 – β_3 indicate the direction of the direct association between profitability ratios and profit growth. For the reported interaction model, a significant positive interaction is interpreted as leverage strengthening the corresponding relationship, while a significant negative interaction indicates that leverage weakens or reverses the association. Because the design is observational, the results are described as associations rather than causal effects. Recent research similarly emphasizes model heterogeneity and the importance of financing conditions when interpreting leverage-performance estimates (Kalash, 2023; M. N. et al., 2024; Chakradhar & Gupta, 2024).

3. RESULTS AND DISCUSSIONS

Descriptive statistics

Table 2 shows substantial dispersion in the dependent variable and leverage. Mean profit growth is 1.417, while the median is only 0.078; the maximum reaches 170.606. DER has a mean of 2.744 but a median of 0.708 and a maximum of 292.842. The large gaps between means and medians, together with very high reported skewness and kurtosis, show that the sample contains extreme observations. NPM, ROA, and ROE are less extreme but remain positively skewed. This distributional pattern matters because pooled regression coefficients can be sensitive to high-leverage observations, especially when interaction terms multiply two already dispersed variables. The descriptive evidence therefore supports cautious interpretation of coefficient magnitudes.

Table 2. Descriptive statistics (n = 170)

Variable	Mean	Median	Minimum	Maximum	Std. dev.
Profit growth	1.4166	0.0780	-2.0933	170.6060	13.1598
NPM	0.1256	0.1072	0.0012	0.4475	0.0927
ROA	0.0935	0.0813	0.0001	0.3431	0.0646
ROE	0.1617	0.1378	0.0035	0.8674	0.1409
DER	2.7444	0.7075	0.0720	292.8420	22.4888

Direct associations with profit growth

Table 3. Common effect model for profit growth

Variable	Coefficient	Std. error	t-statistic	p-value	Decision
Constant	0.6245	1.7945	0.3480	0.7283	—
NPM	55.1969	13.4023	4.1185	0.0001	H ₁ supported
ROA	-74.4038	28.6621	-2.5959	0.0103	H ₂ supported
ROE	5.0188	11.6051	0.4325	0.6660	H ₃ not supported

Model statistics: $R^2 = 0.0986$; adjusted $R^2 = 0.0823$; $F = 6.0512$; $Prob(F) = 0.0006$.

The main-effect regression in Table 3 is jointly significant ($F = 6.051$, $p < 0.001$), but its adjusted R^2 is 0.082. Thus, NPM, ROA, and ROE jointly explain about 8.2% of the observed variation in profit growth. This modest explanatory power is economically plausible because annual profit growth is affected not only by profitability ratios but also by sales growth, commodity prices, exchange rates, financing costs, firm size, investment, and one-off gains or losses. Recent studies likewise show that performance is shaped by multiple operational and financial channels rather than a single profitability metric (Jabbouri et al., 2024; Bui & Krajcsák, 2024; Nikmah & Hung, 2024).

The relatively low adjusted R^2 indicates that the model has limited explanatory power in explaining variations in profit growth. Although NPM, ROA, ROE, and leverage provide useful information, a substantial proportion of profit-growth variation is likely influenced by other factors not included in the model. These may include firm size, sales growth, operating efficiency, liquidity, asset structure, inflation, interest rates, and broader economic conditions. Therefore, the findings should not be interpreted as suggesting that profitability and leverage are the only major determinants of profit growth. Future studies should incorporate additional firm-specific and macroeconomic variables to improve the explanatory capacity and robustness of the model.

NPM is positively and significantly associated with profit growth ($\beta = 55.197$, $p < 0.001$), supporting H₁. The positive sign is consistent with the view that stronger margins indicate greater capacity to convert sales into bottom-line earnings. In a period of cost and demand volatility, a firm that preserves or improves net margin may have more room to absorb shocks and still expand profit. This result differs from Adi Prasongko & Hirawati (2022) and Siti Meisaroh et al. (2023), who report weak or insignificant NPM effects in other Indonesian samples, but it is consistent with the broader proposition that financial statement components contain information about subsequent profitability (Wasan et al., 2022). The inconsistency across studies reinforces the importance of sector, period, and model specification.

The NPM coefficient of 55.197 indicates a positive and economically meaningful relationship between net profit margin and profit growth. Assuming NPM is expressed as a decimal ratio, a one-percentage-point increase in NPM is associated with an approximately 0.552 increase in the profit-growth measure, holding other variables constant. This suggests that improvements in a firm's ability to convert sales into net income can be associated with substantial increases in profit growth. However, the relatively large coefficient should be interpreted cautiously because its economic magnitude depends on the scaling of the variables and may also be influenced by extreme observations in the sample.

ROA is negative and statistically significant ($\beta = -74.404$, $p = 0.010$), supporting H₂ with a direction opposite to the conventional expectation that greater asset profitability always accompanies stronger profit growth. One interpretation is that high contemporaneous ROA can characterize firms operating an established asset base efficiently but with less incremental

reinvestment, while firms investing for future capacity may temporarily show lower ROA. Another possibility is mechanical: when profit growth is volatile and the asset base changes more slowly, the relationship can become negative in a short panel dominated by unusual years. Recent Indonesian banking evidence also shows that the ROA-profit-growth link can vary by setting (Ketaren et al., 2025), while international studies find that the leverage-performance relation is heterogeneous across profitability levels and financial-distress conditions (Kalash, 2023; M. N. et al., 2024). The negative coefficient should therefore be read as a sample-specific association rather than a universal prescription to reduce asset efficiency.

ROE is not statistically associated with profit growth ($\beta = 5.019$, $p = 0.666$), so H_3 is not supported. ROE combines operating profitability with capital-structure effects; it can rise because of improved earnings, a smaller equity base, or greater leverage. This makes it less direct as a standalone signal of future profit expansion. DuPont-oriented research similarly shows that ROE reflects multiple components and can be particularly sensitive to profitability and financing decisions (Jape & Malhotra, 2023). Evidence from emerging markets also suggests that leverage can alter the meaning of accounting performance measures (Huynh et al., 2022; M N et al., 2024). The insignificant coefficient therefore supports evaluating ROE jointly with the firm's financing structure.

Leverage as a moderating variable

Table 4. Interaction-term moderated regression analysis

Term	Coefficient	Std. error	t-statistic	p-value	Interpretation
Constant	2.0397	0.9879	2.0646	0.0405	—
NPM $\times$ DER	61.9646	12.3349	5.0235	<0.001	Positive / strengthens
ROA $\times$ DER	-112.1696	22.8199	-4.9154	<0.001	Negative / weakens
ROE $\times$ DER	8.1570	3.2125	2.5391	0.0120	Positive / strengthens

Interaction-only specification reported in the source analysis. $R^2 = 0.1326$; adjusted $R^2 = 0.1169$; $F = 8.4584$; $\text{Prob}(F) < 0.001$.

Table 4 reports the interaction-only moderation specification estimated in the source study. The NPM $\times$ DER coefficient is positive and significant (61.965, $p < 0.001$), supporting H_4 as reported. This pattern is consistent with the proposition that debt can amplify the earnings-growth implications of strong operating margins when borrowed funds support productive activity and the resulting return exceeds financing costs. Recent studies find that leverage can support performance in some settings, but the benefit depends on debt level, governance, and firm characteristics (Huynh et al., 2022; Kijkasiwat et al., 2022; Wang & Ahmad, 2024). The result should not be interpreted as evidence that more debt is always desirable; rather, the association suggests that margin performance and financing structure interact in the sample.

The ROA $\times$ DER coefficient is negative and significant (-112.170, $p < 0.001$), supporting H_5 in the direction that leverage weakens the ROA-profit-growth relationship. This is consistent with the financial-distress channel: fixed financing costs can absorb part of the operating return generated by assets, making asset efficiency less likely to translate into earnings growth at higher debt levels. Kalash (2023), Chakradhar & Gupta, 2024, Nikmah & Hung, 2024, and M N et al., 2024 all provide recent evidence that high leverage can reduce financial performance or strengthen adverse performance effects under particular conditions. Economic policy uncertainty can further affect leverage adjustment and financing costs (Chakradhar & Gupta, 2024), making this moderating pattern especially relevant in a period that includes pandemic-related disruption.

The ROE $\times$ DER coefficient is positive and significant (8.157, $p = 0.012$), supporting H_6 as reported. The result is economically plausible because ROE is directly connected to the equity base and therefore to leverage. When debt is used productively, returns accruing to equity holders can be magnified; when debt becomes excessive, however, the same mechanism can increase downside risk. Recent cross-country and emerging-market studies consistently emphasize this duality and the need for an optimal or context-specific financing mix rather than a uniformly high leverage ratio (Shoaib & Siddiqui, 2022; Tian & Kohar, 2024; Khan et al., 2024). Research on innovation and capital structure

also indicates that performance consequences can operate indirectly through how firms allocate financed resources (Cuevas-Vargas et al., 2022; Tian & Kohar, 2024).

The moderation model has an adjusted R^2 of 0.117, which remains modest. This is an important substantive result: leverage helps explain how profitability ratios relate to profit growth, but a large share of annual earnings variation remains outside the model. The findings therefore support joint ratio analysis rather than a deterministic prediction rule. They also align with recent work showing that financial performance is contingent on governance, reporting quality, investment choices, and broader strategic conditions (Mahmood et al., 2023; Bui & Krajcsák, 2024). For investors and analysts, the implication is to avoid interpreting a high NPM, ROA, or ROE without examining the debt burden that supports the underlying assets and equity. For managers, the results emphasize preserving operating margins while matching debt commitments with cash-generating capacity.

From a signaling perspective, the findings suggest that profitability ratios provide different informational content about prospective earnings growth. NPM offers the clearest positive signal in the baseline model, while ROA carries a negative sample-specific association and ROE provides little standalone information. From a trade-off perspective, the interaction results imply that debt changes the economic meaning of these signals. This interpretation is consistent with contemporary capital-structure research that rejects a one-size-fits-all leverage policy and instead emphasizes heterogeneity across firms and profitability regimes (Kalash, 2023; M. N. et al., 2024; Khan et al., 2024). It is also consistent with evidence that stronger reporting and governance environments can alter the leverage-performance connection (Huynh et al., 2022; M N et al., 2024).

4. CONCLUSION

This study examines the association between financial performance and profit growth and the moderating role of leverage for 34 Indonesian food and beverage-related firms over 2021–2025. The baseline pooled model shows that NPM is positively associated with profit growth, ROA is negatively associated with profit growth, and ROE is not statistically significant. In the interaction specification reported in the underlying analysis, leverage strengthens the NPM-profit-growth and ROE-profit-growth relationships and weakens the ROA-profit-growth relationship. These findings indicate that profitability ratios should not be interpreted independently from financing structure.

The study contributes by integrating three commonly used profitability ratios with leverage in a recent emerging-market period. The main contribution of this study is the evidence that the relationship between profitability and profit growth is not uniform and should be interpreted together with a firm's leverage position. NPM has a positive and significant relationship with profit growth, ROA has a negative and significant relationship, while ROE does not show a significant direct relationship. Furthermore, the significant interaction terms between DER and the profitability indicators indicate that financing structure is relevant in explaining how profitability is associated with profit growth. These findings extend previous research by showing that leverage should not only be considered as an independent financial indicator, but also as a factor that may condition the relationship between profitability and future profit growth.

The practical implication is that managers should evaluate whether debt-funded assets generate returns sufficient to cover financing commitments rather than pursuing leverage mechanically. Investors and creditors can improve financial-statement interpretation by reading margin, asset returns, equity returns, and DER as an interconnected set of signals. The results also reinforce the relevance of ratio-based evidence to current profit-growth research in Indonesia, where findings continue to differ across sectors and model specifications (Priyono et al., 2024; Ketaren et al., 2025).

Several limitations are material. First, the study is restricted to one sectoral sample and 170 firm-year observations. Second, profit growth and DER contain extreme values, so pooled OLS coefficients may be sensitive to outliers. Third, the baseline models have modest explanatory power. Fourth, the source moderation analysis estimates interaction terms in a separate interaction-only equation rather than a full hierarchical specification containing NPM, ROA, ROE, DER, and all

interactions simultaneously. Consequently, the interaction coefficients should be interpreted as evidence from the reported specification, not as definitive causal moderation estimates.

Future research could include variables that capture operating performance, firm characteristics, and macroeconomic conditions, because profit growth is likely influenced by factors beyond profitability and leverage. Future research should extend the sample across consumer sectors, incorporate variables such as firm size, sales growth, liquidity, asset turnover, macroeconomic controls, and audit-related variables, and use robust or winsorized estimators to test sensitivity to extreme observations. A fuller moderation design should retain all constituent main effects and DER before adding interaction terms, with centered variables and robust standard errors. Dynamic-panel or quantile approaches may also be useful because recent evidence shows that leverage-performance relationships vary across profitability regimes and financing conditions (Chakradhar & Gupta, 2024; M. N. et al., 2024). Such extensions would provide stronger evidence on when leverage enhances, rather than constrains, the conversion of operating performance into sustainable profit growth.

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