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Production Cost Structure, Sales Growth, Inflation, and Profitability in Food and Beverage Companies

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ABSTRACT

Purpose: This study aims to analyze the effect of production cost structure and sales growth on profitability and examine the role of inflation as a moderating variable in food and beverage manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period.

Methodology: This study employed a quantitative approach using secondary data from 19 companies selected through purposive sampling, resulting in 57 observations. The data were analyzed using Moderated Regression Analysis (MRA) with the assistance of SPSS.

Results: The results show that the production cost structure has a significant negative effect on profitability, with a regression coefficient of -0.312 (p= 0.001). Meanwhile, sales growth has no significant effect on profitability, with a coefficient of 0.027 (p= 0.765). Furthermore, inflation does not moderate the effects of production cost structure or sales growth on profitability.

Conclusions: The findings indicate that company profitability is more strongly influenced by internal factors, particularly production cost efficiency, than by external factors such as inflation. The relationship between the main variables is direct and not influenced by inflationary conditions.

Limitations: This study is limited to a three-year observation period and uses a limited number of variables; therefore, it does not fully capture all factors that may influence profitability.

Contribution: This study contributes to the profitability literature and offers practical guidance for management and investors to assess performance through cost efficiency and sales growth.

Keywords: *Inflation, Production Cost Structure, Profitability, Sales Growth*

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1. Introduction

One sector that contributes significantly to Indonesia's economy is the manufacturing sector, particularly the food and beverage subsector, which produces primary goods with a relatively stable demand. However, such demand stability is not always accompanied by stable corporate performance, particularly in terms of profitability. This indicates that a company's ability to generate profit is not solely driven by market demand but also depends on effective internal resource management and economic conditions (Wijaya & Atahau, 2021). Profitability is an important indicator for evaluating a company's effectiveness in managing its resources to generate earnings. In food and beverage companies, fluctuations in profitability show that increased business activity does not always result in proportional profit growth. This condition indicates the presence of factors that influence a company's ability to maintain its financial performance (Lagaida & Novianti, 2022).

One factor related to profitability is the production cost. Production costs are a major operational component that determines company efficiency and profit margin. An increase in production costs that is not accompanied by higher revenue may reduce company profitability (Purwoko, Hadi, Gamal, & Prihartanti, 2022). In addition, sales growth is often used to describe a company's ability to increase its revenue and expand its market. However, sales growth is not always followed by increased profit because companies continue to face cost pressures during production (Nur'Aini & Mariani, 2024).

The empirical phenomenon in food and beverage manufacturing companies listed on the Indonesia Stock Exchange during the 2022–2024 period shows that the relationship between sales growth, production costs, and profitability is inconsistent. Some companies experienced increased sales, followed by profit growth, while others showed higher sales without proportional improvement in profitability. These findings indicate that changes in profitability are not only determined by sales growth but are also influenced by the efficiency of production cost management (PCM). Inflation, as an external factor, also affects corporate financial performance. Inflation may increase raw material costs, labor costs, and other operational expenses, thereby influencing a company's ability to maintain its profit margins. Therefore, inflation is considered a moderating variable that may change the strength of the relationship between the production cost structure and sales growth on profitability (Arzania & Nurhayati, 2025).

Previous studies have shown inconsistent findings; Purwoko et al. (2022) found that production costs affect profitability, whereas Jannah and Yogivaria (2020) reported an insignificant effect. Paramida and Rachmawati (2024) found that production costs negatively affect net income. Regarding sales growth, Fransisca and Widjaja (2019) and Utomo, Pahlevi, and Rahim (2023) showed an effect on profitability; however, the results remain inconsistent across different company conditions. These inconsistent findings indicate a research gap that provides an opportunity for further examination by incorporating inflation as a moderating variable in the analysis. Based on the empirical phenomenon and research gap, this study aims to analyze the effect of production cost structure and sales growth on profitability, with inflation as a moderating variable, in food and beverage manufacturing companies listed on the Indonesia Stock Exchange during the 2022–2024 period.

2. Literature Review and Hypothesis/es Development

2.1 Signaling Theory

Signaling Theory, proposed by Spence (1978), explains that internal parties of a company possess more complete information than external parties; therefore, signals are needed to reduce information asymmetries. In financial reporting, these signals are reflected in the information published by companies regarding their financial conditions and performance prospects (Gumanti, 2009). In this study, the production cost structure and sales growth are viewed as signals that reflect the effectiveness of a company's operational management. An efficient cost structure indicates management's ability to control resource utilization, whereas sales growth reflects the company's ability to maintain market demand and increase revenue. This information is used by investors to assess the company's future profitability prospects (Karimah & Mahroji, 2023; Yuniningsih, Hasna, Wajdi, & Widodo, 2018).

2.2 Production Cost Structure

Production costs refer to all costs incurred by a company in the process of producing goods or services until they are ready for sale. In manufacturing companies, production costs consist of raw material, direct labor, and factory overhead costs, which form the cost of goods manufactured and subsequently the cost of goods sold (Setiawan, Wardhani, & Yanto, 2025). Understanding the production cost structure is important because it relates to pricing, budget planning, efficiency measurement, and strategic decision making. Effective production cost management can help companies increase profit margins and strengthen market competitiveness (Chika, Promise, U, & Werikum, 2022).

Theoretically, the production cost structure consists of fixed and variable costs, which are influenced by changes in production and sales volumes (Ramadhani, 2023). The combination of these two types of costs forms a company's total production costs. Production cost efficiency reflects a company's ability to optimally control costs without reducing product quality. Good cost control can improve operational productivity and financial performance; therefore, differences in efficiency levels may cause variations in the production cost structures among companies (Tarigan & Yuliansyah, 2025).

2.3 Sales Growth

Sales growth refers to the rate of change in a company's sales from one period to the next, which describes the development of the company's operational activities (Fajriah et al., 2022). High sales growth indicates the company's ability to maintain market demand while expanding its market share (Laurence, Hutagalung, Sauh Hwee, & Noviyanti Simorangkir, 2025). Sales growth is influenced by internal and external factors. Internal factors include operational efficiency, production capacity, and marketing strategy, whereas external factors relate to market and economic conditions. Increased sales are generally expected to increase company profits; however, this depends on the company's ability to control costs incurred during operations (Prasetyaningrum et al., 2023). Investors often use sales growth as an indicator to assess company prospects because it reflects the company's ability to maintain business continuity and improve its financial performance (Rochendi & Nuryaman, 2022).

2.4 Profitability

Profitability refers to a company's ability to generate profits through the utilization of its resources. Profitability ratios are used to evaluate a company's effectiveness in managing assets, costs, and operational activities to generate earnings (Putri, Budiyanto, & Triyonowat, 2023). This study uses Return on Assets (ROA) as a proxy for profitability because it reflects a company's ability to generate profit from its total assets. The higher the ROA value, the better the company's ability to manage its assets productively to generate earnings (Awliya, 2022).

2.5 Inflation

Inflation is a condition in which the general prices of goods and services increase continuously over a certain period of time. The inflation rate is generally measured using price indices, such as the Consumer Price Index (CPI), which reflects changes in the price levels experienced by consumers over time (Simanungkalit, 2020). In manufacturing companies, inflation is an external factor that may affect financial performance through increases in production costs, distribution costs, and operational expenses. These cost increases may reduce profit margins if companies cannot adjust selling prices or improve operational efficiency. Therefore, changes in inflation rates may affect a company's ability to maintain profitability (Anugrah, Simanjorang, Hutabarat, Pakpahan, & Sipahutar, 2020). In addition to directly influencing company performance, inflation may affect the relationship between internal company variables and profitability. High inflation may alter the effectiveness of cost management and a company's ability to convert sales growth into higher profits. Thus, inflation is considered a moderating variable in this study (Lumbantobing, 2020).

2.6 Hypothesis Development

2.6.1 The Effect of Production Cost Structure on Profitability

Based on signaling theory, information regarding the production cost structure reflected in financial statements can be used by investors to assess the quality of a company's operational management. The production cost structure describes a company's ability to control resource utilization during the

production process. Efficient cost management enables companies to maintain their profit margins and improve their ability to generate earnings. Conversely, an increase in production costs that is not accompanied by an increase in revenue may reduce profitability because a large portion of the revenue is used to cover operational expenses (Utami, 2010). Jannah and Yogivaria (2020), Istan et al. (2021), and Azim (2025) show that production costs affect company profitability. In addition, Paramida and Rachmawati (2024), Ardiansyah, Mas'adah, and Astuti (2025), and Maharani and Hasanuh (2024) found that increased production costs tend to reduce company profits. These findings indicate that effective cost control is an important factor in determining profitability.

H_1: Production Cost Structure has a negative effect on Profitability

2.6.2 The Effect of Sales Growth on Profitability

Theoretically, sales growth is viewed as an indicator of a company's ability to maintain operational activities and expand its market. Increased sales growth indicates higher demand for a company's products, which may increase revenue and the ability to generate profit. However, increased sales are not always followed by increased profitability if the company faces operational or production cost increases that exceed revenue growth (Zhafiira & Andayani, 2019). Fransisca and Widjaja (2019), Utomo et al. (2023), and Ardiansyah et al. (2025) show that sales growth positively affects company profitability. Meanwhile, Dianti and Bawono (2024) found that this effect is not always significant under all company conditions. These findings indicate that the relationship between sales growth and profitability requires further examination.

H_2: Sales Growth has a positive effect on Profitability

2.6.3 The Role of Inflation in Moderating the Effect of Production Cost Structure on Profitability

Inflation is an external factor that may affect the effectiveness of company cost management through increases in raw material prices, energy costs and other operational expenses. From the perspective of signaling theory, external economic conditions determine how investors interpret a company's internal information. When inflation increases, companies with inefficient cost structures face greater cost pressure, which may reduce their ability to generate profits (Sukesti, 2008). Situmorang and Muchtar (2024) show that inflation can act as a moderating variable in the relationship between financial factors and firm performance. In addition, Azim (2025) shows that the effectiveness of cost management affects a company's ability to maintain profitability in certain economic conditions. Therefore, inflation is expected to strengthen or weaken the effect of the production cost structure on profitability.

H_3: Inflation moderates the negative relationship between Production Cost Structure and Profitability

2.6.4 The Role of Inflation in Moderating the Effect of Sales Growth on Profitability

Based on signaling theory, sales growth is an indicator that reflects a company's ability to increase revenues and maintain business continuity. However, the effectiveness of sales growth in generating profits may be influenced by macroeconomic conditions. Under high inflation, increased sales may occur because of price increases rather than higher sales volume; therefore, increased revenue does not necessarily lead to higher profitability. Utomo et al. (2023) show that sales growth is related to changes in company profits, while Ayuningrum, Mai, and Dewi (2021) show that inflation can influence the relationship between financial indicators and company performance. Thus, inflation is expected to affect a company's ability to convert sales growth into profit.

H_4: Inflation moderates the positive relationship between Sales Growth and Profitability

The research framework illustrates the relationship between the independent variables, namely Production Cost Structure (X_1) and Sales Growth (X_2), and the dependent variable, profitability (Y), with inflation (Z) as a moderating variable. The relationships among variables are examined through the direct effects of Production Cost Structure and Sales Growth on Profitability, as well as the role of inflation in moderating both relationships based on the proposed hypotheses.

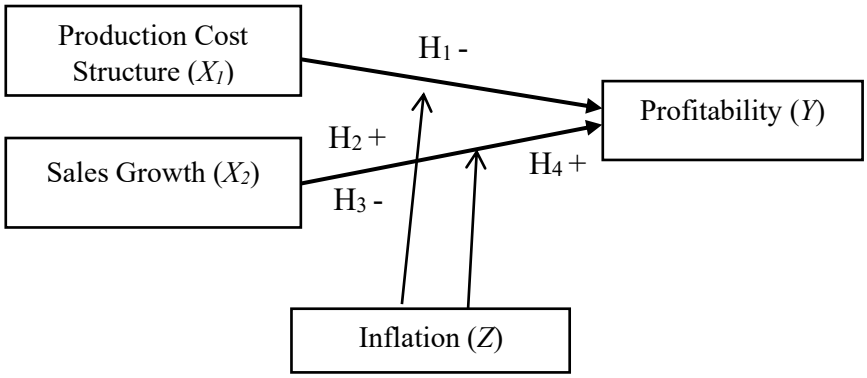

Figure 1. Research framework

3. Methodology

3.1 Research Approach

This study uses a quantitative approach to examine the effect of production cost structure and sales growth on profitability and test the role of inflation as a moderating variable. The data used are secondary and consist of the annual financial statements of companies and annual inflation data. The analysis was conducted to identify the relationships between variables and to test the research hypotheses.

3.2 Population and Sample

The population of this study includes all food and beverage manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period, totaling 98 companies in the sample. The sampling technique used is purposive sampling with the following criteria: the company's main activity is in the food and beverage sector, the company has complete financial statements for the study period, and the company did not change subsector during the observation period. Based on these criteria, 19 companies were selected as the research sample, resulting in 57 observations in total.

Table 1. Sample selection criteria

No.	Criteria	Amount
1	Food and beverage manufacturing companies listed on IDX	98
2	Companies not primarily engaged in food and beverage	(47)
3	Companies without complete financial data during 2022–2024	(31)
4	Companies that changed subsector during the study period	(1)
Sample		19
Total observations (19 × 3 years)		57

Table 1 shows that out of 98 food and beverage manufacturing companies listed on the Indonesia Stock Exchange, 47 companies were not primarily engaged in this sector, 31 companies lacked complete financial statements for the 2022–2024 period, and one company changed subsector during the study period. Based on these criteria, 19 companies were selected as the research sample, resulting in 57 observations over three years.

Table 2. List of sample companies

No.	Company Name	Code
1	Akasha Wira International Tbk	ADES
2	FKS Food Sejahtera Tbk	AISA
3	Sariguna Primatirta Tbk	CLEO
4	Cisarua Mountain Dairy Tbk	CMRY
5	Wahana Interfood Nusantara Tbk	COCO
6	Delta Djakarta Tbk	DLTA
7	Garudafood Putra Putri Jaya Tbk	GOOD

8	Buyung Poetra Sembada Tbk	HOKI
9	Indofood CBP Sukses Makmur Tbk	ICBP
10	Indofood Sukses Makmur Tbk	INDF
11	Mulia Boga Raya Tbk	KEJU
12	Multi Bintang Indonesia Tbk	MLBI
13	Mayora Indah Tbk	MYOR
14	Nippon Indosari Corpindo Tbk	ROTI
15	Sekar Bumi Tbk	SKBM
16	Sekar Laut Tbk	SKLT
17	Siantar Top Tbk	STTP
18	Jaya Swarasa Agung Tbk	TAYS
19	Ultra Jaya Milk Industry & Trading Co Tbk	ULTJ

3.3 Data Type, Source, and Collection Techniques

This study uses quantitative data obtained from secondary sources. Company financial statements were obtained from the Indonesia Stock Exchange, and inflation data were sourced from the official publications of Statistics Indonesia. Data were collected through the documentation of financial statements and official statistical publications. The data analyzed in this study include the cost of goods sold, net income after tax, total assets, current year sales, annual inflation rate (year-on-year), and previous year sales.

3.4 Definisi Operasional Variabel

Table 3. Operational definition of variables

Variables	Operational Definition	Measurement
Production Cost Structure	Ratio representing the proportion of production costs to company revenue	Production Cost Structure = Cost of Goods Sold / Net Sales
Profitability	Company's ability to generate profit from asset utilization	Return on Assets (ROA) = Net Income / Total Assets
Sales Growth	Company's growth in sales compared to the previous period	Sales Growth = (Salest – Salest-1) / Salest-1
Inflation	Annual general price change based on CPI	Inflation = (CPIt – CPIt-1) / CPIt-1

Table 3 shows that this study uses four key variables: production cost structure, profitability, sales growth, and inflation. The production cost structure measures the proportion of production costs to company revenue, reflecting operational efficiency. Profitability is represented by Return on Assets (ROA), which indicates a company's ability to generate profit from its assets. Sales growth captures the company's increase in sales compared to the previous period, while inflation represents the annual general price change based on the Consumer Price Index (CPI). These operational definitions provide a clear framework for analyzing the relationships between internal performance indicators and external economic conditions.

3.5 Data Analysis Techniques

Data analysis was performed using Moderated Regression Analysis (MRA) with IBM SPSS Statistics 25. Prior to hypothesis testing, descriptive statistics and classical assumption tests, including normality, multicollinearity, heteroskedasticity, and autocorrelation, were conducted. Hypothesis testing involved partial tests (t-test), simultaneous tests (F-test), and the coefficient of determination (R^2) at a 5% significance level. To reduce potential multicollinearity in the moderation model, mean centering was applied before forming the interaction variables. The regression model used was formulated as follows:

$$Y_{i.t} = \propto + \beta_1 SBP + \beta_2 SG + \beta_3 I + \beta_4 SBPI + \beta_5 SGI + \varepsilon_{i.t} \quad (1)$$

Description:
Y = Profitability
α = Constant

β1–β5 = Regression coefficients
SBP = Production Cost Structure
SG = Sales Growth
I = Inflation
SBPI = Interaction of Production Cost Structure and Inflation
SGI = Interaction of Sales Growth and Inflation
ε = Error term

4. Results and Discussion

4.1 Overview of Research Objects

This study was conducted on food and beverage manufacturing companies listed on the Indonesia Stock Exchange from 2022 to 2024. The sample was selected using purposive sampling based on the research criteria, resulting in 19 companies with 57 observations over three years. The food and beverage subsector was chosen because of its high production activity and cost management requirements, which affect companies' ability to achieve profitability. Research data were obtained from annual financial statements, and annual inflation data were used as a moderating variable.

4.2 Descriptive Statistical Analysis

Descriptive statistics were used to provide an overview of the characteristics of the research data using minimum, maximum, mean, and standard deviation values for each variable. This analysis helped us understand the data distribution patterns before conducting regression and hypothesis testing.

Table 4. Descriptive statistics test

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Production_Cost_Structure	57	0.141	0.944	0.64512	0.180520
Sales_Growth	57	-0.410	0.557	0.09799	0.195666
Profitability_ROA	57	0.000	0.332	0.11184	0.074920
Inflation	57	1.57	5.51	3.2300	1.68199

Table 4 shows that the total number of observations used in this study is 57. The production cost structure variable has a minimum value of 0.141 and a maximum value of 0.944, with a mean of 0.64512 and standard deviation of 0.180520. The sales growth variable has a minimum value of −0.410 and a maximum of 0.557, with a mean of 0.09799 and standard deviation of 0.195666. Profitability, proxied by ROA, has a minimum value of 0.000 and a maximum of 0.332, with a mean of 0.11184 and standard deviation of 0.074920. Meanwhile, the inflation variable has a minimum value of 1.57 and a maximum of 5.51, with a mean of 3.2300 and a standard deviation of 1.68199.

4.3 Classical Assumption Tests

Classical assumption tests were conducted to ensure that the regression model met the statistical requirements, allowing the estimation results to be interpreted accurately. The tests included normality, multicollinearity, heteroskedasticity, and autocorrelation.

4.3.1 Normality Test

The normality test checks whether the regression residuals are normally distributed. The Kolmogorov–Smirnov (K–S) test was used. The model satisfies normality assumptions if the Asymp. Sig. (2-tailed) value was greater than 0.05. Table 5 shows the results of the asymptotic. Sig. of 0.200, indicating that the residuals were normally distributed.

Table 5. Normality test

		Unstandardized Residual
N		57
Normal Parametersa[b]	Mean	.000
	Std. Deviation	.108
	Absolute	.099

Most Extreme Differences	Positive	.065
	Negative	-.099
Test Statistic		.099
Asymp. Sig. (2-tailed)		.200[c,d]

4.3.2 Multicollinearity Test

The multicollinearity test was used to identify whether there was a high correlation among the independent variables in the regression model. A model is considered free from multicollinearity if tolerance > 0.10 and VIF < 10.

Table 6. Multicollinearity test

Variables	Tolerance	VIF	Description
Production_Cost_Structure	0.828	1.208	No multicollinearity
Sales Growth	0.760	1.315	No multicollinearity
Inflation	0.511	1.958	No multicollinearity
X_1_Z	0.733	1.364	No multicollinearity
X_2_Z	0.691	1.447	No multicollinearity

Table 6 shows that all variables have tolerance values above 0.10 and VIF below 10, indicating that the regression model is free from multicollinearity.

4.3.3 Heteroskedasticity Test

The heteroskedasticity test identifies whether there is an unequal variance of residuals across observations. The Glejser test was applied, where a significance value of > 0.05 indicates no heteroskedasticity.

Table 7. Heteroskedasticity test before SQRT_Y transformation

Variables	Sig.	Description
Production_Cost_Structure	0.003	Heteroskedasticity detected
Sales Growth	0.293	No heteroskedasticity
Inflation	0.748	No heteroskedasticity
X_1_Z	0.570	No heteroskedasticity
X_2_Z	0.315	No heteroskedasticity

Table 7 shows the heteroskedasticity in the production cost structure variable; therefore, a square root (SQRT) transformation was applied to the dependent variable.

Table 8. Heteroskedasticity test after SQRT_Y transformation

Variables	Sig.	Description
Production_Cost_Structure	0.376	No heteroskedasticity
Sales Growth	0.524	No heteroskedasticity
Inflation	0.980	No heteroskedasticity
X_1_Z	0.426	No heteroskedasticity
X_2_Z	0.754	No heteroskedasticity

Table 8 shows that after transformation, all variables had significance values above 0.05, indicating that the model was free from heteroskedasticity.

4.3.4 Autocorrelation Test

The autocorrelation test identifies correlations among residuals across the observation periods. The Durbin–Watson (DW) test was also used. The model is considered free from autocorrelation if dU < DW < (4−dU).

Table 9. Autocorrelation test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.496[a]	.246	.172	.11366	1.930
a. Predictors: (Constant), X_2_Z, X_1_Z, X_1_MC, X_2_MC, Z_MC					
b. Dependent Variable: SQRT_Profitabilitas_Y					

Table 9 shows that the Durbin–Watson value of 1.930 is within the acceptable range, indicating no autocorrelation in the regression model.

4.4 Moderated Regression Analysis

Table 10. Moderated regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.282	0.025		11.462	0.000		
	X_1_MC	-0.312	0.092	-0.451	-3.372	0.001	.828	1.208
	X_2_MC	0.027	0.089	0.042	0.300	0.765	.760	1.315
	Z_MC	-0.013	0.013	-0.172	-1.008	0.318	.511	1.958
	X_1_Z	-0.089	0.057	-0.220	-1.552	0.127	.733	1.364
	X_2_Z	0.034	0.056	0.089	0.607	0.546	.691	1.447
a. Dependent Variable: SQRT_Profitabilitas_Y								

Based on the MRA results presented in Table 10, the moderated regression equation can be expressed as follows:

$$Yi.t = 0.282 - 0.312SBP + 0.027SG - 0.013I - 0.089SBPI + 0.034SGI + \varepsilon_{i.t} \quad (2)$$

The regression equation shows a constant value of 0.282, indicating that when all independent, moderating, and interaction variables are held constant, profitability is estimated to be 0.282. The production cost structure variable has a regression coefficient of −0.312, indicating a negative relationship with profitability. This means that an increase in the proportion of production costs relative to sales tends to reduce a company's ability to generate profit. Meanwhile, sales growth has a positive coefficient of 0.027, suggesting a tendency for profitability to increase, although the statistical significance of this effect must be considered.

Inflation, as a moderating variable, has a coefficient of −0.013, indicating a negative relationship with profitability, but it is not significant. Additionally, the interaction term of production cost structure × inflation has a coefficient of −0.089, while the interaction of sales growth × inflation has a coefficient of 0.034. The significance values for both interaction terms are above 0.05, indicating that inflation does not strengthen or weaken the relationship between the production cost structure and sales growth with profitability. Therefore, in this study, inflation is classified as a homologiser moderator, meaning it does not show a direct or interaction effect on the dependent variable.

4.5 Hypothesis Testing

4.5.1 Partial Regression Coefficient Test (t-test)

A t-test was used to determine the effect of each independent variable on the dependent variable. Decisions were based on a 5% significance level (α= 0.05). If the significance value is less than 0.05, the hypothesis is accepted; if it is greater than 0.05, the hypothesis is rejected. The results of the partial testing of the MRA model are as follows.

1. Effect of Production Cost Structure on Profitability
   The production cost structure variable has a regression coefficient of −0.312 with a significance value of 0.001. Since the significance is less than 0.05, H_1 is accepted. This indicates that the

production cost structure has a negative and significant effect on the profitability of food and beverage manufacturing companies listed on the Indonesia Stock Exchange.

2. Effect of Sales Growth on Profitability
   The sales growth variable has a regression coefficient of 0.027, with a significance value of 0.765. Since the significance is greater than 0.05, H_2 is rejected. This shows that sales growth has no significant effect on profit.
3. Moderating Role of Inflation on the Effect of Production Cost Structure on Profitability
   The interaction variable, production cost structure × inflation, has a regression coefficient of −0.089 with a significance value of 0.127. Since the significance was greater than 0.05, H_3 was rejected. This indicates that inflation does not moderate the effect of the production cost structure on profitability.
4. Moderating Role of Inflation on the Effect of Sales Growth on Profitability
   The interaction variable sales growth × inflation has a regression coefficient of 0.034, with a significance value of 0.546. Since the significance is greater than 0.05, H_4 is rejected. This shows that inflation does not moderate the effect of sales growth on profits.

4.5.2 Simultaneous Significance Test (F-test)

The F-test was used to determine whether all independent and interaction variables simultaneously affected profitability. The model is considered feasible if the significance value is less than 0.05.

Table 11. F-test results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.215	5	.043	3.323	.011[b]
	Residual	.659	51	.013		
	Total	.874	56			
a. Dependent Variable: SQRT_ Profitabilitas_*Y*						
b. Predictors: (Constant), *X₂_Z*, *X₁_Z*, *X₁_MC*, *X₂_MC*, *Z_MC*						

Table 11 shows that the F value is 3.323 with a significance of 0.011. Since the significance is less than 0.05, the regression model is considered feasible, and all variables in the model simultaneously affect the profitability.

4.5.3 Coefficient of Determination Test (Adjusted R²)

The coefficient of determination measures the ability of the independent and moderating variables to explain the variation in the dependent variable. A higher Adjusted R^2 indicates a better model fit.

Tabel 9. Uji Koefisien Determinasi

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.496[a]	.246	.172	.114
a. Predictors: (Constant), *X₂_Z*, *X₁_Z*, *X₁_MC*, *X₂_MC*, *Z_MC*				

Table 12 shows that the Adjusted R^2 value is 0.172, indicating that 17.2% of the variation in profitability can be explained by production cost structure, sales growth, inflation, and their interaction variables in the model, while the remaining 82.8% is influenced by other factors outside the model.

4.6 Discussion

4.6.1 Effect of Production Cost Structure on Profitability

The results show that the production cost structure has a negative and significant effect on profitability in food and beverage manufacturing companies listed on the Indonesia Stock Exchange during 2022–2024. This is indicated by a regression coefficient of −0.312, with a significance level of 0.001 (<0.05). The higher the proportion of production costs relative to sales, the lower the company's ability to generate profits from its assets. Theoretically, this supports the concept of cost efficiency, which states that an increase in production costs without a proportional increase in revenue will reduce the profit margins. In the food and beverage industry, production costs, such as raw materials, energy,

distribution, and operational processes, have a major impact on profit. Therefore, controlling the cost structure is crucial for maintaining company profitability. These findings align with those of previous studies by Istan et al. (2021), Jannah and Yogivaria (2020), Paramida and Rachmawati (2024), and Azim (2025), which showed that production costs significantly affect profitability.

4.6.2 Effect of Sales Growth on Profitability

The results indicate that sales growth does not significantly affect profitability, with a regression coefficient of 0.027 and a significance level of 0.765 (>0.05). Thus, the increase in sales among the sample companies did not result in a significant increase in profit. Conceptually, sales growth is often linked to improved company performance; however, profitability may not increase if operational, distribution, promotional or production costs also rise. In such cases, the additional revenue is insufficient to generate higher profits. These results differ from those of Fransisca and Widjaja (2019), Utomo et al. (2023), Ardiansyah et al. (2025), and Dianti and Bawono (2024), who found a positive effect of sales growth on profitability.

4.6.3 Moderating Role of Inflation on the Effect of Production Cost Structure on Profitability

Inflation does not moderate the effect of the production cost structure on profitability, indicated by an interaction coefficient of −0.089 with a significance of 0.127 (>0.05). Changes in inflation during the study period did not significantly alter the strength of the relationship between the production cost structure and profitability. This may be due to the use of the same annual inflation data for all companies in the same year, resulting in limited variation. Additionally, food and beverage companies can adjust their selling prices, operational efficiency, and cost management strategies to mitigate economic impacts. These findings indicate that the effect of production cost structure on profitability is more influenced by internal company factors than inflation.

4.6.4 Moderating Role of Inflation on the Effect of Sales Growth on Profitability

Inflation does not moderate the effect of sales growth on profitability, with an interaction coefficient of 0.034 and a significance of 0.546 (>0.05). This indicates that inflation changes do not significantly alter the relationship between sales growth and profitability. Although inflation may theoretically affect consumer purchasing power and product pricing, its effect in this study was not strong enough to influence the company's ability to convert sales growth into profit. This suggests that profitability is more influenced by internal factors such as operational efficiency, cost control, and pricing strategy, rather than inflation. These results differ from those of Ayuningrum et al. (2021), who found a moderating effect of inflation.

5. Conclusions

5.1 Conclusion

This study examined the effects of production cost structure and sales growth on profitability, as well as the moderating role of inflation in food and beverage manufacturing companies listed on the Indonesia Stock Exchange during 2022–2024. The results show that the production cost structure negatively affects profitability, indicating that higher production costs relative to sales reduce profitability, making cost efficiency a key factor in improving financial performance. Sales growth does not significantly affect profitability, suggesting that increased sales do not automatically lead to higher profits without effective cost control measures. Additionally, inflation does not moderate the relationship between production cost structure and profitability or between sales growth and profitability, indicating that internal company factors have a direct effect on profitability, which is unaffected by inflation during the study period. Simultaneously, production cost structure, sales growth, inflation, and their interactions significantly influence profitability; however, the model explains only part of the variation in profitability, leaving 82.8% to be influenced by other factors. Overall, internal company factors, particularly production cost efficiency, play a more dominant role in determining profitability than do external factors such as inflation..

5.2 Research Limitations

This study had several limitations. First, the observation period only covered 2022–2024 and may not reflect long-term conditions. Second, the variables are limited to the production cost structure, sales

growth, and inflation, excluding other factors that may affect profitability. Third, the study is limited to food and beverage manufacturing companies listed on the Indonesia Stock Exchange; therefore, the results may not be generalizable to other sectors.

5.3 Suggestion and Directions for Future Research

Based on the results and limitations of this study, several recommendations can be made for future research. For companies, it is important to improve efficiency in managing production costs by controlling raw materials, labor, and overhead costs to optimize profitability. For investors, investment decisions should consider not only sales growth but also the company's cost structure, as increased sales do not always guarantee higher profits. For the government, maintaining inflation stability remains essential to macroeconomic policy. Although inflation was not shown to be a moderating variable in this study, price stability still affects production costs and consumer purchasing power. Future researchers are recommended to include additional variables, such as operational efficiency, company size, and capital structure, and to extend the observation period to obtain more comprehensive results. Moreover, the use of advanced analytical methods, such as panel data regression or Structural Equation Modeling (SEM) can also be considered to strengthen the study findings.

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