

THE EFFECT OF SALES GROWTH, BUSINESS RISK, AND ASSET STRUCTURE ON CAPITAL STRUCTURE: EVIDENCE FROM METAL AND RELATED SUBSECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE DURING THE 2019–2022 PERIOD

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Abstract

This study aims to determine the simultaneous and partial effects of sales growth, business risk, and asset structure on the capital structure of companies in the metal and allied sub-sectors listed on the Indonesia Stock Exchange from 2019 to 2022. An associative research method was employed, utilizing a sample of 15 companies from the metal and allied sub-sectors selected via purposive sampling. Data analysis techniques included descriptive statistics, panel data regression modeling, multiple linear regression, the coefficient of determination, F-tests and t-tests, and classical assumption tests (normality, multicollinearity, heteroscedasticity, and autocorrelation). The F-test results indicate that sales growth, business risk, and asset structure simultaneously have a significant effect on capital structure. The t-test results show that sales growth has a partial effect on capital structure, whereas business risk and asset structure do not have a partial effect on capital structure.

Keywords: Sales Growth, Business Risk, Asset Structure, Capital Structure

A. INTRODUCTION

Economic activity functions to allocate various resources within an industrial process to produce goods and services that meet the needs of the general public; consequently, careful attention must be paid to ensuring that resource supply consistently aligns with production requirements and that there is a proper balance between human resources and capital within the industry. This process culminates in the output of products and services. A crucial component of a company's operational framework is its funding or capital structure. All companies require capital to cover operational expenses and to facilitate expansion. Capital structure is a critical issue for any company, as it directly impacts the firm's financial position.

Errors in determining capital structure can lead to significant consequences, particularly when a company relies on excessive debt. In such instances, the fixed obligations the company must bear intensify, thereby increasing financial risk such as the potential inability of the company to meet its financial commitments.

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High levels of debt increase the risk borne by shareholders while also leading to a higher return on equity (Brigham & Houston, p. 6). Consequently, companies adopt debt financing policies to maintain stability and achieve targeted earnings. An ideal capital structure requires a harmonious balance between risk and reward, aimed at maximizing the stock's market value (Kamaludin & Rini, p. 305).

Kamaludin and Rini (p. 325) note that, in financial literature, the factors frequently considered when making capital structure decisions include sales stability, asset structure, operating leverage, growth rate, and profitability. According to Brigham and Houston (p. 7), the primary factors influencing capital structure decisions include business risk, tax position, financial flexibility, and the degree of management conservatism or aggressiveness.

Companies experiencing high sales growth rates tend to utilize debt to a greater extent than those showing low sales growth rates (Halim, p. 124). According to Sudana (p. 162), a company with consistent sales exhibits consistent cash flows, thereby enabling it to leverage higher debt levels compared to a company experiencing fluctuations in its sales figures.

The concept of business risk refers to the level of risk associated with a company's stock in the absence of debt. The level of risk inherent in a company's operations directly influences its optimal debt ratio, resulting in a negative correlation between business risk and the debt ratio (Brigham and Houston, pp. 7–8). Companies whose products lack operational stability face high levels of business risk due to fluctuating demand for these goods. Similarly, the selling prices of these products are influenced by the volatility of the markets in which they are sold. Furthermore, companies facing instability in their input costs are also susceptible to high levels of business risk (Brigham and Houston, p. 11).

Companies possessing assets deemed suitable as loan collateral tend to utilize higher levels of debt (Brigham & Houston, p. 42). According to Kamaludin and Rini (p. 325), companies with substantial fixed assets can employ significant debt levels, as the value of these fixed assets serves as collateral.

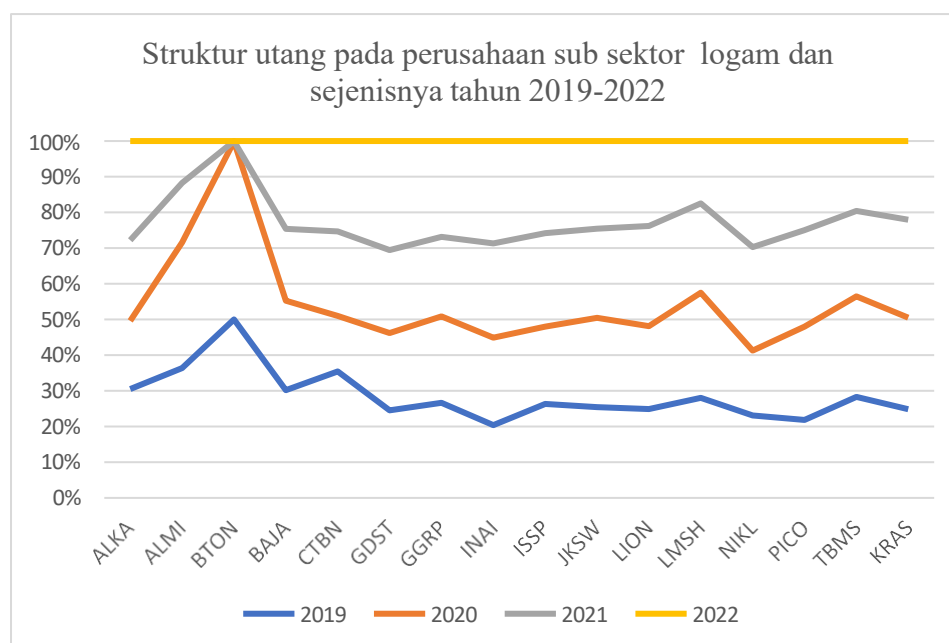


Figure 1. Debt Structure Graph for Companies in the Metal and Allied Sub-sector (2019–

2022)

Source: Processed by the author, 2026

Figure 1 shows that the debt structure graph indicates a 50% increase and a 25% decrease in 2019. Subsequently, in 2020, there was an increase approaching 100% followed by a 50% decrease. In 2021, there was an increase approaching 100% followed by an 80% decrease. By 2022, the companies' debt usage had stabilized. The high level of debt usage was driven by the COVID-19 pandemic; as the pandemic spread, public mobility was restricted, causing economic activity to come to a standstill. Given the background described above, the researcher aims to examine "The Influence of Sales Growth, Business Risk, and Asset Structure on the Capital Structure of Companies in the Metal and Allied Sub-sector Listed on the IDX (2019–2022)." Specifically, the study seeks to determine whether sales growth, business risk, and asset structure have a significant simultaneous effect on the capital structure of these companies, and whether these factors have a significant partial effect on said capital structure. Additionally, the study investigates whether store atmosphere has a significant partial effect on purchasing decisions at the KKV store in Mall of Indonesia?

B. LITERATURE REVIEW

Capital Structure

According to Brigham and Houston (p. 6), capital structure refers to the combination of debt and equity used to finance a company's operating activities. Similarly, Van Horne and Wachowicz (p. 176) define capital structure as the mix (proportion) of a company's permanent long-term financing, represented by debt, preferred stock, and common equity.

According to Brigham and Houston (p. 26), the optimal capital structure is the one that maximizes the firm's stock price by minimizing its weighted average cost of capital (WACC). Bambang Riyanto (p. 238) explains that, in general, a company's capital structure consists of two major components:

- Foreign Capital (Long-Term Debt)
- Bond financing
- Mortgage loans
- Equity Capital
- Owners' equity (shareholders' capital)

Sales Growth

Companies with relatively high sales growth rates are generally able to utilize greater amounts of debt than companies with lower sales growth because the additional profits generated from increased sales are expected to cover interest expenses on borrowed funds (Sudana, p. 162). According to Kasmir (p. 107), the indicator used to measure sales growth is the Sales Growth Ratio.

Business Risk

Companies with high business risk (earnings variability) generally tend to use less debt because creditors demand higher borrowing costs from firms with greater risk (Brigham & Houston, p. 388). According to Atmaja (pp. 225–273), business risk refers to the uncertainty associated with a company's operating income. The level of business risk can be assessed

based on several factors, including demand variability, price variability, input cost variability, the firm's ability to adjust selling prices in response to cost changes, the degree of fixed operating costs, exposure to foreign risks, and the ability to develop new products in a timely and cost-effective manner. The factors influencing business risk according to Atmaja (pp. 225–273) include:

- Demand variability
- Selling price variability
- Input cost variability
- Ability to adjust output prices in response to changes in input costs

Asset Structure

According to Yohanes (p. 49), asset structure refers to the composition or proportion between fixed assets and the total assets owned by an entity. Priatna R. Abdilah and Suryana (p. 36) define assets as all economic resources owned by a company to support its business operations.

Relationships Among Variables

The Relationship Between Sales Growth and Capital Structure

Sales growth has a positive and significant effect on capital structure. The study conducted by Miswanto, Aditia Yusuf Setiawan, and Aprih Santoso (2022) found that sales growth has a significant positive influence on a firm's capital structure.

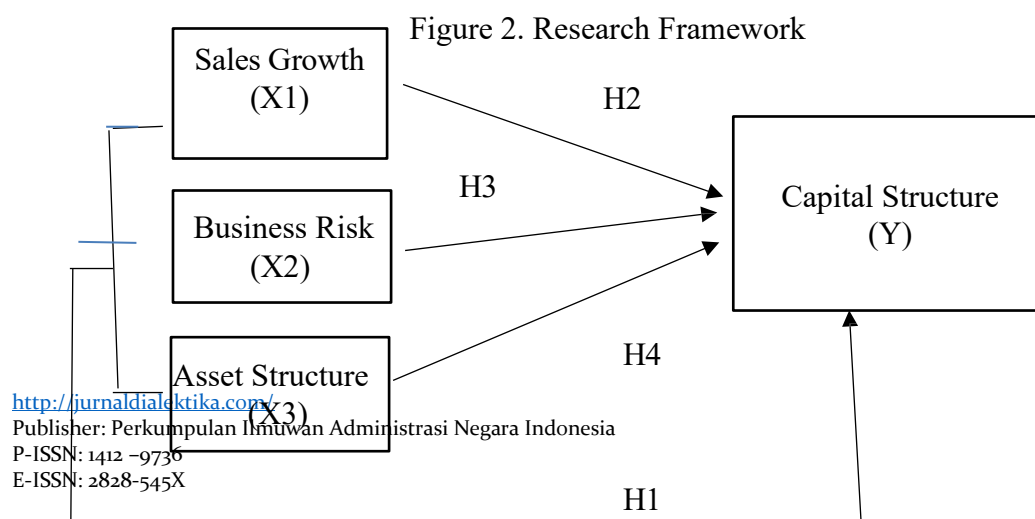
The Relationship Between Business Risk and Capital Structure

Business risk refers to a condition in which a company is unable to finance its operational activities due to insufficient funding (Mufidah et al., p. 51). The higher a company's business risk, the more difficult it becomes to repay debt obligations, making creditors less willing to provide financing. The research conducted by Khoirul Annas and Nungki Pradita (2022) found that business risk has a negative effect on capital structure.

The Relationship Between Asset Structure and Capital Structure

Asset structure represents the proportion of fixed assets relative to a company's total assets (Yohanes, p. 50). When a company has an increasing proportion of fixed assets, it becomes easier to obtain external financing because these assets can serve as collateral. Consequently, firms tend to rely more heavily on debt as a source of financing. The study conducted by Yan Irianis, Dwi Eriyanto, Syahrul, and Sarpan (2023) found that asset structure has a significant effect on capital structure.

Based on the discussion above, the research framework is developed as illustrated in the following figure.



Source: Processed by the researcher, 2026

C. RESEARCH METHODOLOGY

The research method employed in this study is the associative research method. According to Sugiyono (p. 36), associative research examines the relationship between two or more variables. The population for this study consists of manufacturing companies in the metal and related sub-sectors listed on the Indonesia Stock Exchange (IDX) between 2019 and 2022.

A sample represents a subset of the population, reflecting its size and characteristics. If the population is large and it is not feasible for the researcher to examine every member due to limitations in funds, time, or manpower, a sample drawn from that population may be used (Sugiyono, p. 81). The sampling technique used to select the sample is purposive sampling a non-random selection method based on specific criteria (Indriantoro & Supomo, p. 131).

This study involves two research variables: the dependent variable and the independent variable. The following is an explanation of the variables used in this study: The dependent variable is the variable that is influenced or affected by the independent variable (Sugiyono, p. 39). The dependent variable in this study is as follows: The dependent variable in this study is the Capital Structure variable, with the following formula:

$$DER = \frac{TD}{EQUITY}$$

Information:

DER= debt to equity ratio

TD= total debt (total debt)

Equity= ekuitas (own capital)

Independent Variables

An independent variable is a variable that influences or causes changes in, or the emergence of, the dependent variable (Sugiyono, p. 39). The independent variables in this study are sales growth, business risk, and asset structure. The following is an explanation of these three independent variables:

- **Sales Growth**

Kasmir, p. 114. It can be systematically formulated as follows:

Sales Growth =

$$\frac{TS_t - TS_{t-1}}{TS_{t-1}}$$

Information:

Sales growth = Sales Growth

TS_t = total sales Current period (sales)

TS_{t-1} = total sales (Sales) of the previous period

- **Business Risk**

Business risk is measured using the DOL (Degree of Operating Leverage) formula, which represents the ratio of the growth in earnings before interest and taxes (EBIT) to the growth in sales volume.

Business risk =	EBIT
	SALES

Source: Setiawati & Veronica, p. 302

- Asset Structure

The formula used is from Husnan, p. 289:

$$FA \text{ to } TA = \frac{FA}{TA}$$

Information:

FA to TA = fixed asset to total asset

FA = fixed asset

TA = total asset

The data analysis began with descriptive statistical analysis, which aimed to provide an overview of the characteristics of each research variable. According to Sugiyono (2022, p. 147), descriptive statistics are used to describe data without intending to draw generalized conclusions. This analysis was conducted by presenting the mean, standard deviation, maximum value, and minimum value for each research variable, namely sales growth, business risk, asset structure, and capital structure. Through descriptive statistics, preliminary information regarding the distribution and characteristics of the data was obtained before proceeding to inferential analysis.

Subsequently, this study employed panel data regression analysis because the dataset consisted of a combination of time-series and cross-sectional data. According to Duwi Priyatno (2022, pp. 5–6), panel data regression is used to examine the partial and simultaneous effects of one or more independent variables on a dependent variable. The data were processed using EViews 12, considering three panel data estimation models: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The Common Effect Model applies the Ordinary Least Squares (OLS) approach, the Fixed Effect Model accounts for individual differences through dummy variables using the Least Squares Dummy Variable (LSDV) technique, while the Random Effect Model captures individual-specific effects through the error component using the Generalized Least Squares (GLS) method. The most appropriate model was selected through a series of specification tests to ensure that it best fit the characteristics of the research data.

Before performing the regression analysis, classical assumption tests were conducted to ensure that the regression model satisfied the required statistical assumptions. These tests included the normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test. According to Algifari, the normality test is required when the regression model is estimated using the OLS approach, whereas models estimated using the Maximum Likelihood method do not require this test. Multicollinearity was assessed by examining the correlation coefficients among the independent variables, with correlation coefficients below 0.80 indicating the absence of multicollinearity. In the Random Effect Model estimated using the GLS method, heteroscedasticity is generally corrected automatically; therefore, an additional heteroscedasticity test is not required. Likewise, in panel datasets dominated by

cross-sectional observations, autocorrelation is generally not considered a major concern.

The primary analysis in this study employed multiple linear regression to examine the effects of the independent variables on the dependent variable. Multiple linear regression was used to determine the effects of Sales Growth (X_1), Business Risk (X_2), and Asset Structure (X_3) on Capital Structure (Y).

To evaluate the explanatory power of the regression model, the coefficient of determination (Adjusted R^2) was employed. The Adjusted R^2 value indicates the proportion of variation in capital structure that can be explained jointly by sales growth, business risk, and asset structure. Unlike the conventional R^2 , the Adjusted R^2 has been adjusted for the number of independent variables included in the model, making it more appropriate for regression models containing three or more predictors (Duwi Priyatno, 2022, p. 68). A higher Adjusted R^2 value indicates a greater ability of the regression model to explain variations in the dependent variable.

Hypothesis testing was conducted using both the simultaneous significance test (F-test) and the partial significance test (t-test). The F-test was performed to determine whether sales growth, business risk, and asset structure jointly have a significant effect on capital structure (I Made Laut Mertha Jaya, 2021, p. 100). The decision criterion was based on comparing the calculated F-value with the critical F-value or examining the significance level; specifically, the alternative hypothesis was accepted when $\text{Sig.} < 0.05$. Furthermore, the t-test was used to determine the partial effect of each independent variable on capital structure. According to Ghozali (2021, p. 97), a hypothesis is accepted when $\text{Sig.} < 0.05$ or when the calculated t-value exceeds the critical t-value. Conversely, the null hypothesis is accepted when $\text{Sig.} > 0.05$ or when the calculated t-value is lower than the critical t-value. Accordingly, these statistical tests were used to examine both the simultaneous and individual effects of the independent variables on capital structure.

D. RESULT AND DISCUSSION

Descriptive Statistical Analysis

Descriptive statistics are used to provide an overview of the data. The results of the descriptive statistical analysis, generated using EViews 12, are presented in Table 1 below.

Table 1. Descriptive Statistics Test

	Sales Growth	Business Risk	Capital Structure	
Mean	0.415767	0.027950	0.278117	2.089983
Median	0.059000	0.017500	0.234500	1.133000
Maximum	8.391000	0.374000	0.736000	10.28100
Minimum	-0.600000	-0.209000	0.018000	0.187000
Std. Dev.	1.559409	0.090643	0.209773	2.150459
Sum	24.94600	1.677000	16.68700	125.3990
Observations	60	60	60	60

Source: EViews 12 Output, 2024

The Sales Growth variable has a maximum value of 83.91%, indicating that the company achieved a sales growth of 83.91%, calculated as the difference between total sales

in the current year and total sales in the previous year divided by total sales in the previous year. The minimum value is -0.600% , indicating the lowest sales growth recorded among the sampled companies. The variable has a mean value of 0.415767% and a standard deviation of 1.559409% , suggesting that the sales growth values deviate from the mean by approximately 1.559409% .

The Business Risk variable has a maximum value of 0.374% , indicating that the highest level of business risk among the sampled firms is 0.374% , measured as the percentage change in Earnings Before Interest and Taxes (EBIT) relative to the percentage change in sales. The minimum value is -0.209% , representing the lowest level of business risk observed. The variable has a mean value of 0.027950% and a standard deviation of 0.090643% , indicating a deviation of business risk values from the mean by approximately 0.090643% .

The Asset Structure variable has a maximum value of 0.736 , indicating that the highest proportion of fixed assets to total assets among the sampled companies is 0.736 . The minimum value is 0.018 , representing the lowest asset structure ratio observed. The variable has a mean value of 0.278117 and a standard deviation of 0.209773 , indicating that the asset structure values vary from the mean by approximately 0.209773 .

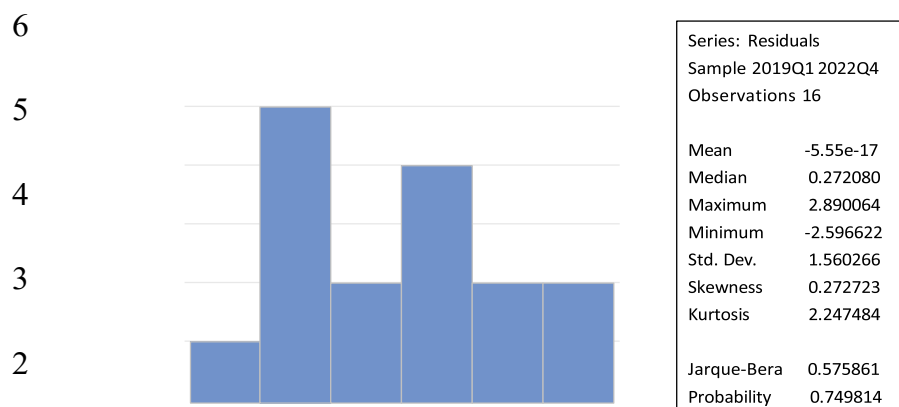
The Capital Structure variable has a maximum value of 10.281 , indicating that the company with the highest leverage used debt amounting to 10.281 times its equity. The minimum value is 0.187 , representing the lowest debt-to-equity ratio among the sampled firms. The mean value is 2.089983 , while the standard deviation is 2.150459 , indicating that the capital structure values deviate from the mean by approximately 2.150459 .

Classical Assumption Tests

The classical assumption tests were conducted to ensure that the estimated regression model is unbiased, efficient, and consistent. These tests consisted of the normality test, multicollinearity test, and heteroscedasticity test.

Normality Test

The normality test was performed to determine whether the residuals (error terms) in the regression model follow a normal distribution. The analysis was conducted using EViews 12. The decision criterion for the normality test is based on the significance value: if the probability (p-value) is greater than 0.05 , the residuals are considered to be normally distributed, indicating that the normality assumption has been satisfied.



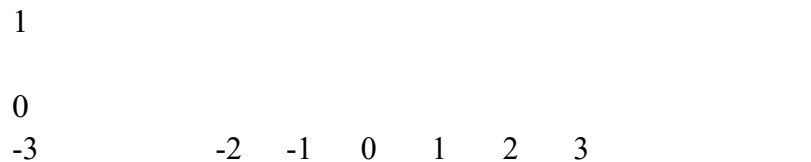


Figure 3. Normality Test Curve

Source: EViews 12

Figure 3 above shows a symmetrical curve, indicating that the data is normally distributed. The Jarque-Bera probability value is 0.749814, which is greater than the significance level of 0.05 used for the Jarque-Bera test. This means the null hypothesis (H0) is accepted, implying that the model's residuals are normally distributed.

Multicollinearity Test

The multicollinearity test is assessed based on correlation values; if the values are less than 0.80, it can be concluded that there is no multicollinearity issue. The test results show correlation values below 0.80; therefore, it can be concluded that none of the independent variables in this study exhibit multicollinearity problems.

Heteroskedasticity Test

This test is conducted to determine the potential presence of a heteroskedasticity problem. The criterion for this test is that if the Prob. Chi-Square (Obs*R-Squared) value is greater than 0.05, then no heteroskedasticity problem exists. The calculation results above show an F-statistic of 2.764896, with a corresponding probability value of 0.050269. Since the F-statistic probability value (0.050269) exceeds 0.05 and the Obs*R-Squared value (0.129010) is also greater than 0.05, it is indicated that there is no heteroskedasticity problem in this study.

Autocorrelation Test

The autocorrelation test aims to determine whether there is a correlation between observations in a data series ordered by time or space. The purpose of this test is to detect the presence or absence of autocorrelation, which can be assessed statistically using the Lagrange Multiplier test. The results of the autocorrelation test are presented in Table 3 below:

Table 3. Correlation Test			
Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	1.263211	Prob. F(2,9)	0.3284
Obs*R-squared	3.287778	Prob. Chi-Square(2)	0.1932

Source: EViews 12 Output, 2024

Based on the regression analysis results shown in the table above, the Chi-Square probability value is 0.1932, which is greater than 0.05; therefore, there is no autocorrelation issue.

Multiple Regression Analysis

The panel data model analysis employs a significance level of 0.05 (or 5%). The Fixed Effect Model derived from the panel data regression analysis is as follows:

$$LM\ SM = 2.036754 + 0.519134X_1 + 1.187185X_2 - 0.703991X_3$$

The regression equation above is interpreted as follows:

- The constant value obtained is 2.036754; this implies that if the independent variable increases by one unit on average, the dependent variable will decrease by 2.036754.
- The regression coefficient for variable X1 is positive (+), at 0.519134; this implies that if variable X1 increases, variable Y also increases by 0.519134, and vice versa.
- The regression coefficient for variable X2 is positive (+), at 1.187185; this implies that if variable X2 increases, variable Y also increases by 1.187185, and vice versa.
- The regression coefficient for variable X3 is negative (-), at -0.703991; this implies that if variable X3 increases, variable Y decreases by 0.703991, and vice versa.

Adjusted R-Square (R^2)

The coefficient of determination (adjusted R^2) measures the extent to which the model can explain the variation in the dependent variable. The calculation results for Adjusted R^2 are presented in Table 6:

Table 4. Adjusted R-Square (R^2)

R-squared	0.869585	Mean dependent var	2.089983
Adjusted R-squared	0.816798	S.D. dependent var	2.150459

Source: EViews 12 Output, 2024

The Coefficient of Determination test results show an Adjusted R-Squared value of 0.869585 (87%), indicating that the dependent variable Capital Structure is influenced by the independent variables (Sales Growth, Business Risk, and Asset Structure) by a total of 87%. Meanwhile, the remaining 13% ($100\% - 87\% = 13\%$) is explained by variables outside this research model.

F-Test

The F-test is intended to assess parameters simultaneously; in other words, it measures the extent of the simultaneous influence exerted by the independent variables on the dependent variable. The results of the F-test are presented in Table 5.

Table 5. F Test

F-statistic	16.47346	Durbin-Watson	2.105266
	stat		
Prob(F-statistic)	0.000000		

Source: EViews 12 Output, 2024

The F-test results, conducted at a significance level of 0.05, show a probability value (F-statistic) of 0.000000 which is less than 0.05 and a calculated F-value (16.47346) that exceeds the F-table value (3.158843). Overall, these results indicate that the independent variables Sales Growth, Business Risk, and Asset Structure simultaneously exert a significant influence on the dependent variable, Capital Structure, for companies in the metal and allied sub-sectors listed on the Indonesia Stock Exchange (IDX) during the 2019–2022 period.

T-Test

The T-test is a statistical test used to determine whether the independent variables individually (partially) have a significant effect on the dependent variable. The results of the T-test are presented in Table 6.

Table 6. T- Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.036754	0.444944	4.577554	0.0000
X1	0.519134	0.172053	3.017301	0.0038
X2	1.187185	2.981467	0.398188	0.6920
X3	-0.703991	1.286772	-0.547098	0.5865

Source: EViews 12 Output, 2024

The t-test is conducted to determine whether the independent variables have a significant partial effect on the dependent variable. The results of the t-test are presented in the following table:

- The t-test results, using a significance level of 0.05, show a t-statistic of 3.017301 and a probability value of 0.0038 (< 0.05) for the Sales Growth variable; the calculated t-value (3.017301) exceeds the t-table value (2.000). Consequently, β_1 is accepted, indicating that Sales Growth has a significant effect on the Capital Structure of companies in the Metal and Allied Products sub-sector listed on the IDX from 2019 to 2022.
- For the Business Risk variable, the t-statistic is 0.398188; the t-table value (2.000) exceeds the calculated t-value (0.398188), and the probability value is 0.6920 (> 0.05). Therefore, β_2 is not accepted, indicating that Business Risk does not have a significant effect on the Capital Structure of companies in the Metal and Allied Products sub-sector listed on the IDX from 2019 to 2022.
- For the Asset Structure variable, the t-statistic is -0.547098; the t-table value (2.000) exceeds the calculated t-value (-0.547098), and the probability value is 0.5865 (> 0.05). Therefore, β_3 is not accepted, indicating that Asset Structure does not have a significant effect on the Capital Structure of companies in the Metal and Allied Products sub-sector listed on the IDX from 2019 to 2022.

E. CONCLUSION

Based on the problem formulation established in the previous chapter, the following conclusions can be drawn: Based on the F-test results, the calculated F-value (16.47346) exceeds the F-table value (3.158843), or the probability value ($p = 0.000000$) is less than α (0.05); thus, H_1 is accepted, indicating a significant influence of sales growth, business risk, and asset structure on the capital structure of companies in the metal and related sub-sectors listed on the Indonesia Stock Exchange from 2019 to 2022. Based on the t-test results, the sales growth coefficient (β_1) shows a calculated t-value of 3.017301, which exceeds the t-table value of 2.000; thus, H_0 is rejected and H_1 is accepted, indicating a significant partial influence of sales growth on the capital structure of companies in the metal and related sub-sectors listed on the Indonesia Stock Exchange from 2019 to 2022. Based on the t-test results, the business risk coefficient (β_2) shows a t-table value of 2.000, which exceeds the calculated t-value of 0.398188; thus, H_1 is accepted and H_0 is rejected, indicating no significant partial influence of business risk on the capital structure of companies in the metal and related sub-sectors listed on the Indonesia Stock Exchange from 2019 to 2022. Based on the t-test results, the asset structure coefficient (β_3) shows a t-table value of 2.000, which exceeds the calculated t-value of -0.547098; thus, H_1 is accepted and H_0 is rejected,

indicating no significant partial influence of asset structure on the capital structure of companies in the metal and related sub-sectors listed on the Indonesia Stock Exchange from 2019 to 2022.

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