Does capital structure mediate the relationship between asset structure and company size on profitability?

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Abstract

The high value of the capital structure (DAR) among companies in the agricultural sector signifies a greater reliance on debt capital than equity capital. This research aims to examine the influence of asset structure and company size on capital structure, with the mediating role of profitability. The study is based on case studies of agricultural sector companies that became publicly listed during the period 2014-2019. Path analysis is employed as the analytical method. The findings reveal a positive and significant impact of company size on profitability within agricultural sector companies listed on the IDX. Concerning asset structure, company size, and profitability, all three factors display a positive and significant effect on the capital structure of agricultural sector companies listed on the IDX. However, the study determines that profitability does not act as a mediator in the relationship between asset structure and company size concerning the capital structure of agricultural sector companies listed on the IDX.

Keywords: Asset structure; Company size; Capital structure; Profitability

1. Introduction

Indonesia is a country that has abundant natural wealth, so most of the Indonesian population has a livelihood in agriculture or farming, that the country of Indonesia is known as an agricultural country. Indonesian agriculture produces various non-oil and gas export main commodity plants such as chili, rice, soybeans, corn, and vegetables. Indonesia is also known for its plantation products, including oil palm, tobacco, rubber, coffee, cotton, and sugarcane. Agriculture is divided into two fields, namely agricultural companies and smallholder agriculture With efficient processing techniques and scientific methods, agricultural enterprises produce certain products under a centralized management system to earn a profit.

Argita et al. (2018) stated that agriculture broadly includes plantations, forestry, smallholder agriculture, animal husbandry, and fisheries. Until 2019 there were 21 agricultural sector companies listed on the Indonesia Stock Exchange, agricultural sector companies were divided into several sub-sectors, such as plantations, fisheries, livestock, food crops, and others.

The capital structure has a very important contribution to the company as an aspect of funding decisions. If the company's capital structure is not managed optimally, it will impact financial difficulties for the company (Deviani & Sudjarni, 2018). Sources of company financing can come from the company's own or internal capital or external sources in the form of long-term debt. It will form a picture of the proportion of company finances. (Fahmi, 2017). The company's capital structure which is calculated using the debt-to-asset ratio (DAR) proxy found in companies engaged in the agricultural sector, can be seen in the Figure 1.
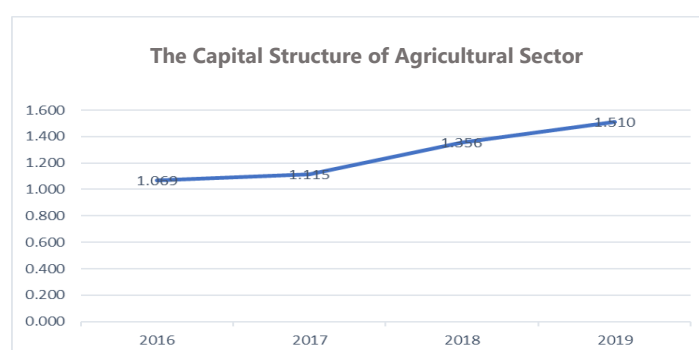

Figure 1. Average capital structure of agriculture sector companies
Source: IDX agricultural sector financial reports for the 2016-2019 period (processed), 2021

From Figure 1, it can be seen that there has been an increase in the capital structure every year from 2016 to 2019. The average value of the agricultural sector ratio is greater than number one. It reflects that if production increases as a result of debt financing, in the future, the company will incur interest costs and may experience debt default risks when economic conditions are unstable. Even though the use of debt can save corporate taxes, the use of high debt can also pose a high risk for the company. It is because the capital structure used by agricultural sector companies uses more debt than their capital. The high ratio indicates that the company's operational activities depend on debt.

The trade-off theory states that an optimal capital structure is needed to maximize stock prices. Whereas the Pecking Order Theory states that if a company has high profitability, it will use internal company funding from profits in the form of retained earnings. If internal funding is inadequate, the company will use debt, and the final option is stock issuance.

In addition to profitability, asset structure can also affect the size of the capital structure used by the company. Generally, in industrial companies where most of the capital is embedded in fixed assets, companies prioritize fulfilling capital from permanent capital sourced from their capital and debt only as a complement (Mulyawan, 2015). Companies with large current assets use debt to meet their funding needs.

The company's size can be classified in various ways, such as total assets, Log size, market value of shares, and others (Prasetyorini, 2013). Large companies tend to diversify their business more than small companies. Therefore, the possibility of failure in running a business or bankruptcy has a smaller risk. Companies with large sizes are seen as capable of dealing with crises in their business; also, companies with large sizes have goodwill and stable funding.

[10]

Research conducted by Chinaemerem & Anthony (2012) and Nursatyani et al. (2014) and argued that there is a relationship between asset structure and profitability. Asset structure is a comparison between fixed assets divided by total assets. The amount of fixed assets in the asset structure reflects the wealth owned by the company. Research conducted by Abiodun (2013), Doğan (2013), and Liargovas & Skandalis (2010) states that there is a significant influence between company size on profitability. In line with the research conducted by Wijaya & Jessica (2017), Gunardi et al. (2020), and Watiningsih (2018), which states that asset structure has a significant effect on capital structure. Research conducted by Watiningsih (2018) and Wibowo (2017) states that company size positively affects capital structure. Research conducted by Wijaya and Jessica (2017), Gunardi et al. (2020), and Watiningsih (2018) found that there was a significant influence between profitability and capital structure. Research conducted by Susantika and Mahfud (2019) shows that profitability can mediate the effect of asset structure on capital structure. Karyawati et al. (2017) research shows that profitability can mediate company size on capital structure.

On the other hand, several research results are inversely proportional to the research that has been stated previously. Among them is research conducted by Chandra et al. (2018) and Mudjijah & Hikmanto (2019), which state that asset structure has no significant effect on profitability. Chandra et al. (2019) research states that asset structure has no significant effect on capital structure. Research conducted by Cahyani & Handayani (2017) and the company size results did not significantly affect capital structure. Research conducted by Umam & Mahfud (2016) revealed that company size has a significant negative effect on capital structure through profitability. This study aims to investigate the influence of asset structure and company size on profitability and to identify whether capital structure mediates the impact of both factors.

2.   Method, Data, and Analysis

The approach to this type of research is to use quantitative research methods to examine certain populations or samples. In this study, the description of the population that will be examined is a company engaged in the agricultural sector, which is listed on the Indonesian Stock Exchange. The population in this study amounted to 17 companies engaged in the agricultural sector. The population criteria in this study are 1. Manufacturing companies in the agricultural sector. In this study, no sampling technique was used because the entire population in the agricultural sector will be analyzed. The total sample to be studied is 102 (17 companies x 6 years of financial statements). In this study, secondary data is the type of data to be used. The secondary data collection technique used was obtained from the Indonesia Stock Exchange. The data is an annual financial report, balance sheet, and profit and loss. The data used in this research is cross-section and time series data called panel data. In this study, the use of the time series from 2014 to 2019.

The endogenous variable to be examined uses capital structure proxied by DAR (Y), profitability proxied by ROA is used as an intervening variable (Z), and endogenous variables use asset structure (X_1) also firm size (X_2).

The measurement used to measure the capital structure of agricultural sector companies uses the Debt to Asset Ratio (DAR) with the Eq. 1:

$$Debt\ to\ Asset = \frac{Total\ Debt}{Total\ Assets} \quad\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Its ratio shows the ability of agricultural sector companies to use their assets to generate net profit after tax with the Eq. 2:

$$Return\ on\ Assets = \frac{Net\ profit\ after\ tax}{Total\ Assets}\ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\ (2)$$

Asset structure (tangibility) is a comparison of current assets and fixed assets in agricultural sector companies in the period 2014 to 2019 using the Eq. 3:

$$Asset\ Structure = \frac{Fix\ Assets}{Total\ Assets}\ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\ (3)$$

Company size is a scale to measure how big a company is in the agricultural sector in the period 2014 to 2019. Company size can be measured by Ln Total Assets or Log assets of the company's total assets with Eq. 4:

$$Size\ =\ Ln(Total\ Assets)\ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\ (4)$$

Data were processed using path analysis used to examine the closeness of the relationship between variables in the model based on theoretical considerations or explanatory functions, and the relationship between the variables tested is generally a relationship of dependency or causality statistically. The statistical program used to complete the path analysis is Analysis Moment of Structure (AMOS).

The simple correlation between the two constructs can be described as the sum of the compound paths of the causality relationship, which is the path with the child variable causality relationships. It can be written as Figure 2.
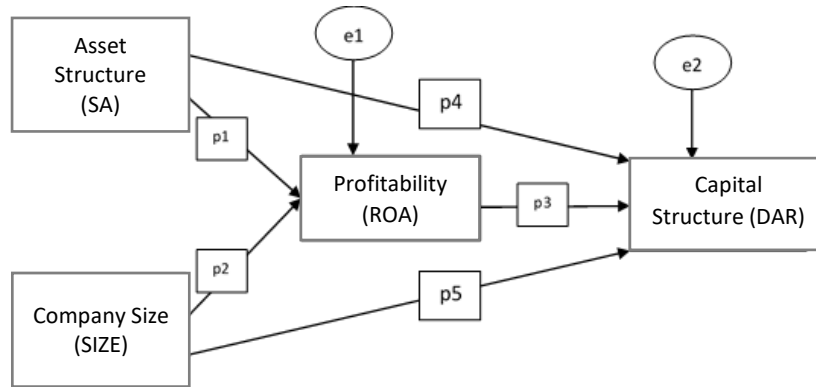

Figure 2. Path diagram model

Systematic Equation

Sub structural 1 (Eq. 5):

$ROA = p1\ SA + p2\ Size + e1$ .... (5)

Sub structural 2 (Eq. 6):

$DAR = p4\ SA + p5\ Size + p3\ ROA + e2$ .... (6)

In the model equation test, several conditions must be met in structural modeling, including: (1) The data normality test, the multivariate normality assumption, is one of the assumptions using parametric statistics. The data normality test determines whether each variable's research distribution is normal. The normality test can be seen from the critical

ratio with a magnitude of ±2.58 at a significance level of 5%. The data is normal if the critical ratio value in each dimension ratio table is less than ±2.58; (2) Singularity and multicollinearity tests can be seen through the determinants of the covariance matrix. There is a singularity problem. If the resulting determinant value is very small or near zero, then these results cannot be used in research; (3) The model outlier test used in this study is tested by applying path analysis.

3. Results

Model Equation Test

After testing the validity and reliability of each variable, several prerequisites that must be met in structural modeling are the normal multivariate assumption, the assumption that there is no multicollinearity or singularity, and outliers.

Normality test

The data's normality is a requirement in the Path Analysis modeling. The normality test emphasizes multivariate data by looking at the skewness and kurtosis values; statistically, it can be seen from the Critical Ratio (CR) value. If a significance level of 5% is used, then the CR value is between -2.580 to 2.580 (-2.580 ≥ CR ≤ 2.580). It can be said that the data tested is normally distributed, both univariately and multivariate.

Table 1.

Normality test

Variable	Min	Max	Skew	C.R.	Kurtosis	C.R.
Size	2.509	7.969	-.756	-3.118	.253	.521
Asset Structure	.146	1.516	-.471	-1.940	1.477	3.046
Profitability	-.678	.188	-3.189	-13.148	3.332	2.486
DAR	.127	4.945	1.236	5.097	2.272	4.684
Multivariate					3.696	1.426

Singularity and Multicollinearity Test

Singularity can be seen through the determinants of the covariance matrix. A very small determinant value or close to zero indicates an indication of a singularity problem, so it cannot be used for research. The results of the study provide a determinant value of the sample covariance matrix of 0.237. This value is still above 0 (zero). So, it can be said that there is no singularity problem in the data being analyzed. So indirectly all variables have no multicollinearity.

Outlier Model Test

Outlier test results in this study are presented at Mahalanobis distance or Mahalanobis d-square. This study used a sample of 102, so the value of x for a sample of 102 at a significance level of 0.05 was 126.620. The biggest Mahalanobis d-square value is 13.272. It appears that this value is still far below the value of 2. Thus, it can be concluded that there are no outliers' problems.

There is a direct relationship between asset structure and size exogenous variables with endogenous variables (profitability) as intervening variables and endogenous variables (capital structure). This relationship is through a study, to see whether there is a direct relationship between these variables. The result of a direct relationship (direct) is a direct relationship that occurs between exogenous and endogenous variables. In detail or in detail through the studies in this study, this direct (direct) relationship has been

explained in Table 2. It can be explained that the direct effect of exogenous variables on endogenous variables can be explained. Size has the greatest direct effect on profitability.

Table 2.
Direct effect of research variables

Direct Effect		Endogenous Variables	
		Profitability	Capital Structure
Exogenous Variables	Asset Structure	0.141	0.538
	Size	0.729	0.660
	Profitability	0.000	0.352

There is an indirect relationship between exogenous variables tangibility and size with endogenous variables (profitability) as intervening variables and endogenous variables (capital structure). This is whether indirectly there is a relationship between these variables. The result of the indirect relationship is the indirect relationship that occurs between exogenous and endogenous variables. In detail, through the studies in this study, there is an indirect relationship between the variables described in Table 3.

Table 3.
Indirect effect of research variables

Indirect Influence		Endogenous Variables	
		Profitability	Capital Structure
Exogenous Variables	Asset Structure	0.000	0.050
	Size	0.000	0.275

Based on Table 3, it can be explained the magnitude of the indirect effect on the exogenous variables on the endogenous variables. Size has the greatest indirect effect on capital structure through the profitability variable with a value of 0.275 and the variable in second place is the asset structure variable.

The total effect is a sum of the direct and indirect influences between the exogenous variables asset structure and size with the endogenous variable (profitability) as the intervening variable and the endogenous variable (capital structure). This relationship is through a study, to be able to see whether directly or indirectly the relationship between these variables. The results regarding the direct and indirect relationships that occur between the exogenous and endogenous variables in this study will be explained in detail in Table 4.

Table 4.
Direct effect of research variables

Direct Effect		Endogenous Variables	
		Profitability	Capital Structure
Exogenous Variables	Asset structure	0.141	0.587
	Size	0.729	0.917
	Profitability	0.000	0.352

Based on Table 4, the total influence of exogenous variables on endogenous variables, namely size, has the greatest influence on profitability and capital structure. On profitability gives effect to the variable capital structure.

Hypothesis Test

Based on Table 5, it can be described the relationship between each variable using the path coefficient value.

Table 5.

Hypothesis test results

Hypothesis	Coefficient	CR	P-Value	Information
Asset Structure to Profitability	0.141	0.701	0.484	Not significant
Company Size to Profitability	0.729	3.619	0.000	Significant
Asset Structure to Capital Structure	0.538	3.073	0.002	Significant
Company Size to Capital Structure	0.660	3.561	0.000	Significant
Profitability to Capital Structure	0.352	4.084	0.000	Significant
Asset Structure to Capital Structure through Profitability	0.050	0.501	0.617	Not significant
Company Size to Capital Structure through Profitability	0.257	0.539	0.590	Not significant

Hypothesis Testing Results

Based on Table 5, the following hypothesis testing results are obtained. Asset structure (X_1) has a significant effect on profitability (Z). From this hypothesis test, a coefficient of 0.141 is obtained with a critical ratio (CR) of 0.701, which is less than the cut-off value of 1.960, and a p-value of 0.484, is greater than the cut-off value of 0.05, indicating that the asset structure variable has no significant effect on profitability with the direction of a positive relationship. Size (X_2) has a significant effect on profitability (Z). The hypothesis test obtained a coefficient of 0.729 with a critical ratio (CR) of 3.619, greater than the cut-off value of 1.960 and a p-value of 0.000 less than the cut-off value of 0.05, indicating that the size variable has a significant effect on profitability with the direction of the relationship positive.

Asset structure (X_1) significantly affects capital structure (Y). The hypothesis test obtained a coefficient of 0.538 with a critical ratio (CR) of 3.073 greater than the cut-off value of 1.960 and a p-value of 0.002 smaller than the cut-off value of 0.05, indicating that the size variable has a significant effect on the capital structure in the direction positive relationship. Size (X_2) significantly affects capital structure (Y). From this hypothesis test, a coefficient of 0.660 is obtained with a critical ratio (CR) of 3.561, greater than the cut-off value of 1.960, and a p-value of 0.000 which has a value smaller than the cut-off value of 0.05, indicating that the variable size significantly affects the structured capital with a positive relationship direction. Profitability (Z) has a significant effect on capital structure (Y). From this hypothesis test, a coefficient of 0.352 is obtained with a critical ratio (CR) of 4.083 greater than the cut-off value of 1.960 and a p-value of 0.000 less than the cut-off value of 0.05, indicating that profitability has a significant effect on capital structure in the direction positive relationship.

Asset structure (X_1) has a significant effect on capital structure (Y) through profitability (Z). From this hypothesis test, a coefficient of 0.050 is obtained with a critical ratio (CR) of 0.501, which is less than the cut-off value of 1.960, and a p-value of 0.616, is greater than the cut-off value of 0.05, indicating that the asset structure variable has no significant effect on capital structure through profitability with a positive relationship direction. Size (X_2) has a significant effect on capital structure (Y) through profitability (Z). From this hypothesis test, a coefficient of 0.257 is obtained with a critical ratio (CR) of 0.539, which is smaller than the cut-off value of 1.960 and a p-value of 0.590, which is smaller

than the cut-off value of 0.05, indicating that the size variable has an indirect and not significant effect on capital structure through profitability

4. Discussion

The effect of asset structure on profitability

Based on the results of hypothesis testing regarding the variable "asset structure" and its impact on profitability, the findings indicate that there is no significant influence of asset structure on profitability. Therefore, Hypothesis 1, positing a relationship between asset structure and profitability, is rejected. It should be noted that a high proportion of fixed assets necessitates substantial funding sources, potentially leading to increased capital costs for the company, subsequently affecting its profit (Mudjijah & Hikmanto, 2018). These results are consistent with prior research conducted by Chandra et al. (2019) and Mudjijah & Hikmanto (2018), both of which contend that asset structure has an insignificant effect on profitability, as proxied by ROA.

The effect of company size on profitability

The results of testing the impact of company size on profitability reveal a clear and positive connection. This means that Hypothesis 2, suggesting that company size affects profitability, is supported. The study's data highlights a noteworthy pattern: as a company's size increases, there is also an increase in its profitability. In practical terms, this implies that larger companies tend to generate higher profits compared to smaller ones. This alignment between company size and profitability findings reinforces the conclusions drawn in separate studies by Abiodun (2013), Doğan (2013), and Liargovas & Skandalis (2010). Each of these studies independently underscores the role of company size in supporting its profitability prospects.

The effect of asset structure on capital structure

The results of testing the asset structure variable show that it affects the capital structure positively and significantly. This supports the idea from Research Hypothesis 3 that asset structure has an impact on how a company's capital is set up. When companies have more tangible assets, like physical property, they tend to use more debt in how they finance their operations. This is because these assets can be used as a backup for the debt. This approach follows the trade-off theory, where companies balance debt to gain benefits like tax protection without taking on excessive risk. Essentially, having valuable assets allows a company to build a stronger capital structure (Watiningsih, 2018).

The study's results highlight the importance of this relationship, showing that a good mix of assets can indeed enhance a company's financial setup (Wartiningsih, 2018). Other studies by Wijaya and Jessica (2017) and Gunardi et al. (2020) also found similar results – that the kind of assets a company has significantly affects how it structures its capital.

The effect of company size on capital structure

The results of testing the impact of company size on capital structure reveal a positive and significant link. This supports the idea from Research Hypothesis 4 that a company's size affects how it structures its capital. Company size can be gauged by looking at both its assets and financial strength. Bigger companies, which can make sizable profits and own substantial assets, fall into the large company category.

The study shows that as a company's size increases, it tends to shape its capital structure by using more outside funding, like foreign capital (Halim, 2015). This fits with

the trade-off theory, which says that larger companies take on more debt up to a point where the benefits like tax protection outweigh the risks.

The findings of this study emphasize the importance of the link between company size and capital structure (Halim, 2015). This aligns with what was found by other researchers like Watiningsih (2018) and Wibowo (2017), who also concluded that company size has a significant impact on how a company's capital is set up..

The effect of profitability on capital structure

Based on the results of hypothesis testing on the variable company size on the capital structure has a positive and significant effect. Then hypothesis 5 in the study, which states that profitability affects asset structure, is accepted. The profitability ratio proxied by ROA aims to determine how much a company's ability to generate profits in a certain period is also to measure the level of management effectiveness in carrying out the company's operational activities. Profitability is a ratio that can describe a company's ability to generate profits through its resources and capabilities derived from sales activities, use of assets, and use of capital (Henry, 2016). The capital structure proxied by DAR is the ratio between the total debt and the total assets owned by the company; assets can increase if the profitability generated by the company increases, and profits will add to the company's capital. A good capital structure is needed for long-term survival for companies to increase profits (Arthur, 2019). The results of the research hypothesis show significance. It is in line with research conducted by Wijaya and Jessica (2017), Gunardi et al. (2020), and Watiningsih (2018) found results of a significant influence between profitability on capital structure.

Effect of Asset Structure on Capital Structure Mediated by Profitability

Based on the results of hypothesis testing on the asset structure variable on the capital structure mediated by profitability, the effect is positive but insignificant. So hypothesis 6 in the study was rejected. The study's results prove that profitability cannot mediate the influence between asset and capital structures. It is due to high fixed assets in companies that do not generate profits, so they cannot pay the company's debts or obligations. Fixed assets are a burden on the company due to high service concession receivables where assets in the form of receivables cannot be used at that time; there is a certain period for these assets to be used while the company needs funds at this time which ultimately has an impact on decreasing company profits. So profitability cannot mediate the influence between asset structure and capital structure. Using inefficient working capital will reduce the company's ability to obtain profitability (Nuriyanto, 2019). Suppose the structure of fixed assets can be used effectively and efficiently. In that case, these fixed assets can be used as collateral for creditors to obtain larger loan funds that can be used for the company's operational activities so that the company's profit rate of return will also increase. This study's results align with research conducted by Umam and Mahfud (2016), which states that profitability cannot mediate the effect of asset structure on capital structure.

The Effect of Firm Size on Capital Structure is Mediated by Profitability

Based on the results of hypothesis testing on the variable company size on capital structure which is mediated by profitability shown in Table 11, the effect is positive but insignificant. So hypothesis 7 in the study, which stated that firm size affected capital structure mediated by profitability, was Rejected. The study's results prove that profitability is not the main factor that can mediate the effect of company size on capital

structure. The addition of profitability does not affect the company's capital structure (Pitriyani et al., 2018). Because the larger the company's size, the costs required by the company will also increase, even the greater the company's obligations to carry out its operational activities, and it is also possible that high debt will reduce company profits. This result aligns with research conducted by Hardinis (2019) and Umam and Mahfud (2016), which state that profitability cannot mediate the effect of company size on capital structure.

5. Conclusion

The conclusions that can be drawn and suggestions based on the findings the results in this study, namely, based on the data obtained and the tests that have been carried out on research problems, the conclusions that can be drawn are that the asset structure has no significant positive effect. Meanwhile, firm size has a significant positive effect on profitability. Asset structure, company size, and profitability significantly positively affect the capital structure of agricultural sector companies listed on the Indonesian Stock Exchange. Profitability cannot mediate the relationship between asset structure and company size on the capital structure of agricultural sector companies listed on the Indonesian Stock Exchange. The implications of the theory in this study are the trade-off theory regarding bankruptcy costs which explains that increasing corporate debt will enjoy increased savings from taxes, but funding from debt can increase the possibility of companies experiencing bankruptcy due to additional interest expenses that must be met appropriately: time and amount. A failure occurs in fulfilling interest payment obligations due to insufficient cash, which can result in the company bearing a financial burden. The heaviest financial burden for the company is bankruptcy; Firm size has a dominant influence on total capital structure. It implies that human resources that have great quality and competitiveness are needed in the future so that the company can continue to grow to be large and advanced. In addition, it is necessary to use sophisticated farming tools with good agricultural techniques. So that the yields obtained will be of higher quality and have competitiveness with imported products, and can meet any supply needs within the country to foreign countries, which will affect the goodwill of the company. The limitations in conducting this research included: The relatively small the population used; only 17 populations of agricultural sector companies were sampled in the study because the number of agricultural sector companies listed on the IDX was not as many as other industrial sectors; the capital structure variable uses the DAR proxy, to describe the capital structure there are two other proxies to obtain different results, namely debt to equity and time interest earned; the variable profitability uses a proxy return on asser, to describe profitability there are other proxies such as return on investment, net profit margin, earnings per share, and also gross profit margin which can be used so that it is possible to get different results.

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