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DEBT TO TOTAL ASSET RATIO, DEBT TO EQUITY RATIO, AND COMPANY'S VALUE WITH ROA AS MEDIATION

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Abstract

This study analyzes the effect of debt to asset ratio (DAR) and debt to equity ratio (DER) with price earning ratio (PER) and profitability as measured by return on assets (ROA) as the mediating variable. The research was conducted in mining sector companies on the Indonesia Stock Exchange (BEI) with a population of 50 companies. Sampling was done by using purposive sampling method, which takes into account the availability of data during the observation period, namely 2016 - 2019, so 19 companies were selected. The collected data were analyzed using evIEWS 10. The results of the analysis show that DER has no direct effect on ROA, DAR has a significant and negative effect on ROA, so that increasing DAR will reduce ROA. DAR and DER do not directly affect PER. ROA directly has a positive and significant effect on PER. ROA is not proven to be a variable that mediates the effect between DER, DAR and PER

Keywords: DAR, DER, ROA, Mediation

INTRODUCTION

The business environment that is constantly changing and becoming highly competitive requires managers to always look for ways to improve company performance. Determination in improving company performance leads to two ways, namely the importance of external conditions through a market based view (MBV) approach and internal factors with resources based view (RBV). The market based view (MBV) emphasizes that the success of a company is largely determined by factors outside the company namely the entry of new competitors, the bargaining power of consumers and suppliers, the existence of substitute goods, and the level of competition the company currently has in the industry. Resources based view (RBV) emphasizes that the success of a company is very dependent on the resources owned by the company, rarely owned by competitors, or difficult to imitate. This research focuses on the resources based view (RBV) approach by looking at the impact of capital structure using debt to equity ratio (DER) and debt to asset ratio (DAR) on company performance.

Managers for maximizing shareholder wealth can be done by determining the best combination of capital structure as the company's financial resources, to minimize the weighted average cost of capital (WACC). An irrelevant theory proposed by Modigliani & Miller, (1958, 1963) states that capital structure has no effect on a company's value with the assumption that there are no taxes, transaction costs, and an efficient capital market. The theory based on tax-free assumption raised a lot of criticism, therefore in subsequent research by Modigliani & Miller, (1963) that including tax as a deduction profit, it is concluded that capital structure has a positive effect on a company's value, the higher the capital structure, the higher the firm value.

Durand, (1989) indicates that there are three approaches in determining capital structure, namely the net profit approach, the net operating income approach, and the traditional approach. The net income approach holds that the cost of equity and the cost of debt is constant

so that a company can increase its debt to the point in which the average cost of capital approaches the cost of debt. The value of the company initially did not increase, so that If the lower the average capital made, the company's value will be increased.

The net income approach explains that the cost of debt and the average cost of capital remains so that the cost of equity increases in line with the increase of the company's risk. The traditional approach explained that the company has an optimal capital structure when the company's value is maximum or a capital structure has made the average cost of capital to a minimum. The company's capital structure is a combination of debt and equity used by the company. The combination of debt and equity will be affected the risk and value of the company, as a result, it must decide on the optimal combination (Ross, Westerfield, & Jordan, 2010). The use of debt in the company's capital structure is also known as financial leverage. The more debt the company has, the greater the level of financial leverage of the company. Financial leverage owned by a company can have the potential to increase profits as well as losses.

Research on the capital structure has provided many variations in its findings. Research results Aminah, Laba, & Pakki, (2019) show that DER has a significant negative effect on profitability. The results of research Sultan & Adam,(2015) in Iraq show that capital structure as measured by DER has a significant and positive effect on profitability. The results of research by Odelia & Wibowo, (2019) on the automotive industry show that the debt to equity ratio (DER) has no effect on the price earning ratio (P/E). Financial leverage has a positive effect on company performance (Fosu, 2013). Research Zeitun & Haq, (2015) confirms that long-term debt and short-term debt have a negative effect on company performance. The effect of leverage with an inverted U-shaped ROE shows that the higher the company's leverage level will increase the company's performance, but to a certain extent, the increase in leverage will decrease the company's performance (Tran Thi Phuong & Nguyen, 2019). The results of the research (Irawati, 2018) show that the debt ratio has no effect on return on assets. The effect of capital structure as measured by the debt to asset ratio (DAR) and debt to equity ratio (DER) has a negative and significant effect on company performance as measured by the price-earning ratio (PER) (Veronika & Kadarusman, 2020).

Based on the gap research above, this research will include profitability as a variable that mediates the effect between the dimensions of capital structure as measured by the debt to equity ratio (DER) and debt to asset ratio (DAR) with the company's value in mining industry companies on the IDX. The decision on the amount of DER and DAR is very vital because the profitability of a company is directly affected by these decisions. The increase in capital structure means that the company's ability to obtain funds from third parties is getting better so that it can increase the company's ability to earn higher company profits. The higher the company's profitability is the signal that the company's value is getting better.

The debate about capital structure and a company's value has always focused on whether the use of an optimal capital structure can increase a company's value. Theory Modigliani & Miller, (1958) present that without taxes, capital structure has not a affect company's value. Modigliani & Miller, (1963) states that with taxes capital structure can affect firm value. Antwi, Mills, & Zhao, (2012) states that if the capital structure affects the value of the company. Then, every company will always try to maximize its value. (Jensen & Meckling, 1976) stated that the optimal corporate capital structure would involve a trade-off between the effects of corporate and personal taxes, bankruptcy costs, and agency costs.

Capital structure is a funding decision that combines debt and equity which is expected to increase a company's value (Brealey, Myers, & Marcus, 2001). Capital structure is often measured by the debt to equity ratio (DER) which is the ratio between total debt and equity, and the debt to asset ratio (DAR) which is the ratio between total debt and total assets. Firm value is the price investors are willing to pay when the company is liquidated. A company's

value describes how management manages the company's wealth which can be seen from the measurement of financial performance (Ross et al., 2010). The measurement of company value that is often used by investors to determine whether a company has a low price or a high price is the price earnings ratio (PER) which is a comparison between the market price per share and earnings per share. A high price earning ratio (PER) indicates an expensive stock price and otherwise. Profitability is the company's ability to earn profits as measured by Return on assets (ROA), return on equity (ROE), net profit margin (NPM).

DER, DAR, and ROA

The debt to equity ratio (DER) is the company's ability to pay its debts using its capital, while the debt to asset ratio (DAR) is the company's ability to finance assets with debt.

A little amount in the debt to equity ratio (DER) indicates that the company's ability to pay its debts better and otherwise. A high debt to asset ratio (DAR) indicates that the company's ability to finance assets with debt is also high and having an impact on the high interest to be paid. Using high debt affected the higher company's business risk because of the high fixed costs of the company. Trade-of theory explains that the optimal capital structure will be obtained if there is a balance between the benefits derived from debt and the costs of bankruptcy. This research uses debt to equity ratio (DER) and debt to asset ratio (DAR) as proxies for capital structure. Based on trade-of theory represent that the higher the debt to equity ratio (DER) and debt to asset ratio (DAR) the higher the debt to equity ratio (DAR) have affected an increase the value of the company at an optimal level or until an optimal combination of debt, equity, and assets. Based on the above, the hypotheses in this research are:

H1a: DER has a positive and significant effect on profitability

H1b: DAR has a positive and significant effect on profitability

DER, DAR, ROA, and Company's Value

The company's ability to obtain debt shows the trust of creditors in the company. The company should take the advantage of this trust by carrying out operational efficiency. As a result, the company can pay interest expenses. The high level of debt reflects the company's high level of risk to pay the loan principal and interest expenses. The results of the research (Antwi et al., 2012) show that equity and debt are the determinants of increasing a company's value. (Fosu, 2013) concludes that leverage as measured by debt to assets (DAR) and the company's financial performance as measured by return on assets (ROA). (Sari & Sedana, 2020) state that profitability affects on company's value and capital structure measured by return on assets ROA) affect on company's value. Based on the above, the hypotheses in this research are:

H2a: DER has a significant effect on a company's value as measured by P/E ratio

H2b: DAR has a significant effect on a company's value as measured by P/E ratio

H2c: ROA has a significant effect on a company's value as measured by P/E ratio

ROA mediation on the influence between DAR, DER on PER

(Modigliani & Miller, 1963) explain that the company with high loan will pay more interest, affected to the lessing tax payment and earning after tax will greater. A high earning after tax indicates that the company's ability to earn higher profits with debt, which in turn will increase the value of the company. Trade-of theory states that the maximally use of debt will increase a company's value, but the high use of debt will also increase financial distress and agency costs. Companies must balance the results obtained from the use of debt with the costs to be borne. When the results of using the debt are higher than the costs, using the debt will

increase the company's profitability, which in turn will increase the value of the company too. Based on the above, the hypotheses in this research are:

H3a: ROA as a mediating variable of the effect between DAR and PER

H3b: ROA as a variable mediating the effect between DER and PER

Based on this, the following research model is proposed:

Figure 1: Research model

RESEARCH METHODS

The data of this research conducted on the Indonesia Stock Exchange (IDX) focus on the mining sector. There are 50 companies in the mining sector listed on the Indonesia Stock Exchange (IDX). The criteria used in determining the availability sample of DER, DAR, ROA, and PER data for all mining sector companies during 2016-2019. The qualified sample companies criteria are 19 companies in 2016, 2017, 2018, and 2019. The data collected was analyzed using the eviews 10 program. The operational definitions of variables in this research are as follows:

Table 1: Operational definitions of variables

Variable	Definition	Formula
Price-Earning ratio (PER)	Comparison between market price per share and earnings per share (EPS)	$PER = \frac{\text{Market price per share}}{\text{Earnings per share}}$
Debt to Equity Ratio (DER)	Comparison between total debt and Total equity	$DER = \frac{\text{Total debt}}{\text{Total equity}}$
Debt to asset Ratio (DAR)	Comparison between total debt and total assets	$DER = \frac{\text{Total debt}}{\text{Total assets}}$
Return on Asset (ROA)	Comparison of Earning after tax with total assets	$ROA = \frac{\text{EAT}}{\text{Total asset}}$

The analysis of this research used the eviews program 10, with the following analytical steps:

1. Model selection

The model selection test was conducted to determine the most appropriate model among the common effect (CE), fixed effect (FE) and random effect (RE). The test was carried

- out using the Chow test to determine the most appropriate model between the fixed effect (FE) and the common effect (CE). Chow test criteria, when the probability of cross section F is greater than 0.05 then the common effect (CE) model is better, and when the probability of cross section F is less than 0.05 then the fixed effect (FE) model is better.
2. The Classical Assumption Testing
Classical assumption testing is carried out with three test instruments, namely the first multicollinearity test which is used to test the correlation between independent variables, with the criteria that when the correlation between independent variables is less than 0.8 then there is no indication of multicollinearity and if the data more than 0.8, it means that multicollinearity occurs. Second, the autocorrelation test is used to test whether there is a correlation of variables in the prediction model over time. The criteria for testing autocorrelation are carried out by calculating the Durbin Watson (DW) value, with the criteria that there is no autocorrelation if the Durbin Watson (DW) value is between the Durbin Upper (DU) and 4 – DU values.
 3. Goodness of fit
The goodness of fit test is carried out to test whether there is a match sample regression function in estimating the actual value (Ghozali & Latan, 2014). The goodness of fit test is carried out using R², the higher R², the higher the independent variable explaining the variation of the dependent variable. The second test is carried out with the F test, with the criteria that if the probability value of F is less than 0.05 then the model can be used to predict the dependent variable.
 4. Test the hypothesis with path analysis
Tests are carried out to test the hypothesis, with the models analyzed are as follows:
Model 1: $ROA = \alpha + \beta \text{ DAR} + \beta \text{ DER}$
Model 2: $PER = \alpha + \beta \text{ DAR} + \beta \text{ DER} + \beta \text{ ROA}$

RESULTS AND DISCUSSION

1. Model selection by Chow test

The results of the model selection test with the Chow test are as follows:

Table 2: Fixed Effects cross cross-section test

Effects Test	Model 1			Model 2		
	Stast.	d.f.	Prob.	Stast.	d.f.	Prob.
Cross-section F	6.69	(18,55)	0.00	2.11	(18,53)	0.02
Cross-section Chi-square	88.13	18.00	0.00	40.57	18.00	0.00

Source: processed data

Based on the results of the chow test, the results of the cross-section F probability values for all models obtained values less than 0.05. As a result, a good model is to use the fixed effect.

2. The Classical Assumption Test

1) Multicollinearity test

This test is used to test whether there is a significant relationship between the independent variables. The results of the multicollinearity test are below:

Table 3: Multicollinearity Test

	ROA	DER	DAR
ROA	1.00	(0.02)	(0.39)
DER	(0.02)	1.00	0.44
DAR	(0.39)	0.44	1.00

Source: processed data

Based on table 3, there is no correlation between independent variables more than 0.7, As a result, the data has not a multicollinearity between variables.

2) Autocorrelation test

The results of the autocorrelation test with Durbin Watson (DW) test are below:

Table 4: Durbin Watson (DW)

Model	Durbin Watson (DW)	Durbin Upper (DU)	4 - DU
Model 1	2.037	1.6819	2.3181
Model 2	1.944	1.7104	2.2896

Source: processed data

3) Goodness of fit (GOF) testing

The model suitability test is carried out using the R² test and the F test, the results are in table 4 and table 5. The R² model 1 test value of 0.74 means that the DAR and DER variables can explain the ROA variable by 74%, the remaining 26% is explained by other variables. While model 2, the variables DAR, DER and ROA can explain the PER variable by 66%, the remaining 34% is explained by other variables. The statistical F test of the two models has an F value of 7.93 and 5.05, respectively with a probability of 0.00 less than 0.05. As a result, models 1 and 2 explained the dependent variable.

4) Hypothesis test

The results of hypothesis testing with the eviews 10 program explained in table 5 and figure 2, below:

Table 5: Path coefficient Model 1 (Dependent Variable = ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Explanation
C	3.61	0.43	8.32	0.00	
DAR	(1.17)	0.59	(1.99)	0.05	Accepted
DER	0.80	0.43	1.87	0.07	Unaccepted
Effects Specification					
Cross-section fixed (dummy variables)					
R-squared	0.74	Mean dependent var	3.15		
Adjusted R-squared	0.65	S.D. dependent var	1.61		
S.E. of regression	0.96	Akaike info criterion	2.98		
Sum squared resid	50.28	Schwarz criterion	3.62		
Log likelihood	(92.14)	Hannan-Quinn criter.	3.23		
F-statistic	7.93	Durbin-Watson stat	2.04		
Prob(F-statistic)	0.00				

Model 2 (Dependent Variable = PER)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Explanation
C	1.03	0.51	2.01	0.05	
DAR	0.01	0.48	0.02	0.99	Unaccepted
DER	(0.12)	0.35	(0.33)	0.74	Unaccepted
ROA	0.51	0.11	4.82	0.00	Accepted

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.66	Mean dependent var	2.55
Adjusted R-squared	0.53	S.D. dependent var	1.10
S.E. of regression	0.75	Akaike info criterion	2.50
Sum squared resid	30.37	Schwarz criterion	3.17
Log likelihood	(72.99)	Hannan-Quinn criter.	2.77
F-statistic	5.05	Durbin-Watson stat	1.94
Prob(F-statistic)	0.00		

Source: processed data

Figure 2: Path Diagram

Based on table 4 and figure 2, the results of the structural equations of model 1 and model 2 are belows:

$$ROA = 3.61 - 1.17 \text{ DAR} + 0.80 \text{ DER}$$

$$PER = 1.03 + 0.01 \text{ DAR} - 0.12 \text{ DER} + 0.51 \text{ ROA}$$

The value of β coefficient of the effect between DER on ROA obtained results of 0.8 with a probability value of 0.07. The probability value is $0.07 > 0.05$, which shows that DER has not a direct effect on the ROA. The result of this research is supported by (Odelia & Wibowo, 2019) research. The increasing proportion of debt and equity has not always affected the increasing the company's ROA and otherwise. The value of the positive DER coefficient on ROA means that DER has a unidirectional trend of influence. When the proportion of debt to equity increases, the company's ROA will increase too. The value of β coefficient has an affected between DAR and ROA around 1.17 with a probability of 0.05 with a t statistic of 1.98. This result shows a having tendency to have a negative influence between DAR and ROA. The increasing proportion between debt and total assets tends to decrease the company's profitability (ROA). The Increasing of the DER variable affected the increase of debt amount compared with the company's assets. Therefore, the company's business risk is getting higher. Companies that have a high risk tend to have a weighted average cost of capital (WACC).

The effect of PER on ROA, DER, DER shows the coefficient values of 0.51, 0.12 and 0.01, respectively, with profitability values of 0.00, 0.74 and 0.99,

respectively. The probability value of the effect of PER on ROA is $0.00 < 0.05$, therefore, ROA significantly affects PER, The higher ROA of the company's value affects the higher PER and otherwise. The probability value of the influence between PER with DER and DAR shows a value greater than 0.05. As a result, DAR and DER have no significant effect on PER.

Mediation Testing DAR – ROA – PER and DER – ROA – PER

Mediation testing is conducted to detect whether ROA is a mediating variable of the effect between DAR and PER. The mediation test was carried out using the Sobel test, with the results of the Sobel test value of $1.763 < 1.96$ ($\alpha = 5\%$) therefore that ROA has not a variable that mediates the effect of DAR and PER. Sobell test the effect between DER and PER mediated by PER of $1.746 < 1.96$ ($\alpha = 5\%$), meaning that ROA has not a variable that mediates the effect between DER and ROA.

CONCLUSION

Conclusions and suggestions from the results of the analysis of the data obtained from this research are below:

1. Debt to equity ratio (DER) has no effect on return on assets (ROA)
2. Debt to asset ratio (DAR) has a significant effect on return on assets (ROA) with the direction of the coefficient value negative. Therefore, the increasing of debt to asset ratio (DAR) has a tendency to reduce return on assets (ROA).
3. Return on asset ratio (ROA) has a direct positive and significant effect on price earning ratio (PER). The increase of return on assets (DAR) tends to increase the price earning ratio (PER).
4. Debt to asset ratio (DAR) and debt to equity (ratio) have no effect on price earning ratio (PER). Debt to asset ratio (DAR) has a positive coefficient which means that increasing debt to asset ratio (DAR) has a tendency to increase the price earning ratio (PER). The debt to equity ratio (DER) has a coefficient of negative, which means that an increase in debt to equity ratio (DER) will reduce the price earning ratio.

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