The Effect of Financial Ratios on Capital Structure of Basic Material Firms in Indonesia

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Abstract:- The purpose of this study is to examine and analyze the effect of profitability, firm size, firm growth, tangibility, liquidity and business risk on the capital structure of firms engaged in the basic materials sector listed on the Indonesia Stock Exchange. Annual data are used in this study during the observation period from 2016 to 2020. The data used is in the form of panel data, in the form of a combination of annual time series data with cross sections. The population in this study are the basic materials sector firms listed on the Indonesia Stock Exchange for the period 2016 to 2020 as many as 42 firms. Samples were taken using purposive sampling technique, where a sample of 26 firms was obtained in a span of 5 years of observation so that a total of 130 observations were obtained. The data in the study were obtained from the Indonesia Stock Exchange. Analysis of the data in the study using panel data regression. Fixed Effect Model is the right model to be used in this study. The results of the analysis show that profitability has a negative effect on the capital structure that supports the Pecking Order theory. Firm size, tangibility, and business risk have a positive effect on the capital structure that supports the Trade-off Theory. Meanwhile, firm growth and liquidity have no effect on the capital structure of firms in the basic materials sector in Indonesia.

Keywords:- Capital Structure, Profitability, Firm Size, Firm Growth, Tangibility, Liquidity, Business Risk.

I. INTRODUCTION

In business activities, each firm aims to obtain the maximum profit. Judging from the development situation and increasingly tight competition between firms, especially after entering the era of globalization and the global market, the competition is getting tougher and each firm is required to continue to improve its business in order to survive. The demand for always innovate both in terms of technology, quality, human resources or the strategies implemented must be implemented by the firm to always be able to compete with other firms. According to Sihombing (2018), the firm's financial management target is to maximize shareholder value, selection of funding sources needs to be done, both from debt capital and share capital or a combination of debt and share capital. The effort to determine the source of funding is called the capital structure. The optimal capital structure is defined as a capital structure or a combination of debt and equity capital that is able to maximize the value of the firm.

The funding decision is one of the important decisions found by every firm financial manager related to the firm's operational activities. Good funding decisions from the firm can be observed from the capital structure, which is a financial decision related to the ratio of debt and capital to be used by the firm. Rapid economic development in the era of globalization requires firm management to be careful in making decisions regarding the capital structure. Decisions about the right capital structure can determine the best proportion between internal funding and external funding and minimize the risk of bankruptcy (Simatupang et al., 2019).

In firms, capital structure is one of the main problems of corporate finance, because it reflects most of the business decisions made by the firm's financial managers, which have an impact on the financial and economic value of the firm. In particular, Modigliani and Miller provide a theoretical basis for capital structure. They conclude that the market value of a firm is not affected by financial leverage. Since then, many researchers have begun to examine the effect of the relationship between debt and equity on capital structure. According to Šarlija and Harc (2016) research on capital structure is focused on two theories, namely trade-off theory and pecking order theory. From a theoretical point of view, many empirical studies use two models of capital structure: trade-off theory and pecking order theory. Trade-off theory implies that the firm's capital structure decisions involve a trade-off between the tax benefits of debt financing and the costs of financial distress. The pecking order theory suggests that there is a certain order in financing, starting from retained earnings as the main source of internal financing, then moving on to debt and using equity only as a last resort. Each of these theories shows how certain determinants affect capital structure.

Firms engaged in the basic materials sector are one of the supporting sectors in moving and developing other industrial sectors in Indonesia. And firms in this sector are being targeted by market players in uncertain conditions. The basic materials industry sector is an industry related to other industrial sectors that will produce products that are generally used in daily life, almost every product that we use and need comes from and is related to this sector. Firms in the basic materials industry sector include firms that sell products or services that will be used by other industries for raw materials in producing finished goods. Firms that enter the

basic materials industry sector include firms that produce chemical products, containers and packaging, non-energy metal and mineral mining, construction materials, and pulp & paper products.

Figure 1: Comparison of Capital Structure with Profitability of Firms in the Basic Materials Sector Year on the IDX in 2016 – 2020

Source: www.idx.co.id (Processed data)
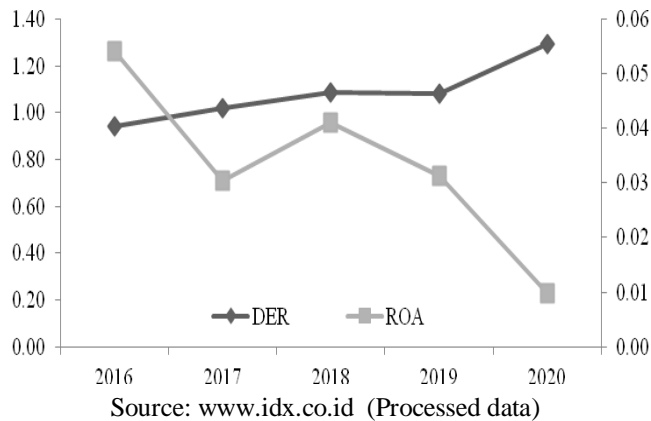
In Figure 1 it can be seen that in the last five years starting from 2016 to 2020 the ratio of capital structure in basic materials sector firms on the Indonesia Stock Exchange has increased. And profitability also decreased from 2016 to 2020. However, in 2017 to 2018 profitability increased but the capital structure also increased. Based on the Pecking Order Theory, firms with high profitability will use internal funds more for operational or project financing rather than seeking external financial sources (Myers, 1984), it means that firms with high profitability have low capital structure, but in Figure 1 the capital structure of basic materials firms in 2017 to 2018 has increased where in that year profitability is also increasing.

Figure 2: Comparison of Capital Structure with Firm Size of Firms in the Basic Materials Sector on the IDX in 2016 – 2020
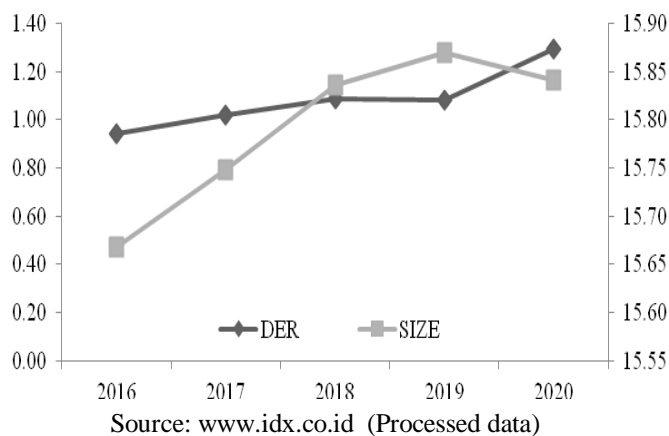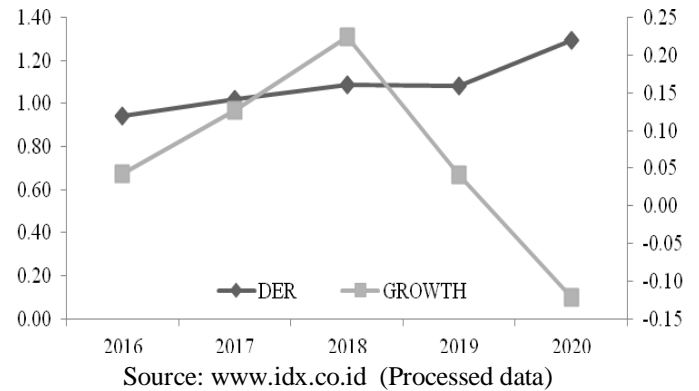

Source: www.idx.co.id (Processed data)

Figure 3: Comparison of Capital Structure with Firm Growth of Firms in the Basic Materials Sector on the IDX in 2016 – 2020

Source: www.idx.co.id (Processed data)

In the comparison between capital structure and firm size of basic material firms in Indonesia in 2016 to 2019 where the capital structure and firm size have increased, but in 2020 the firm size has decreased while the capital structure has increased significantly. And the business growth of basic material firms in 2016 to 2018 increased, but decreased in 2019 to 2020, meanwhile the capital structure continued to increase. The decline in firm size and growth in 2020 was due to the Covid-19 pandemic which had a significant impact on the dynamics of the world economy in 2020, including Indonesia, and put strong pressure on the Indonesian economy in 2020 with sources of turmoil that had never been experienced before. The impact of Covid-19 put a heavy pressure on the Indonesian economy in the first semester of 2020. Uncertainty in global financial markets due to the pandemic has prompted adjustments to global portfolio investment placements. Investment in developing countries, including Indonesia has declined, and has shifted to assets that are considered safe by investors (Bank Indonesia, 2021). Meanwhile, in the Covid-19 pandemic situation starting from the first quarter of 2020, the basic materials industry sector showed a fairly good performance, where the utilization of the raw goods sector was highest compared to other sectors during the Covid-19 situation and was not too affected by the pandemic. In the report of the Kementerian Perindustrian (2020) the development of the chemical industry which is one of the sub-sectors of the raw goods industry is included in the "eight main issues of industrial development and efforts to solve them". Therefore, the basic materials sector is very interesting to study on how funding activities in operating activities affect the firm's performance.

The purpose of this study is to analyze and provide empirical evidence about the effect of profitability, firm size, firm growth, tangibility, liquidity and business risk on the capital structure of basic material firms listed on the Indonesia Stock Exchange during the period 2016 to 2020. The benefits obtained in this study are expected to be able to describe the actual conditions between the theory studied and the real conditions in the field so that it can support or reject the theory of capital structure. This study is expected to provide an overview and information that will be used as considerations in making investment decisions that will be made by investors as well as what variables need to be

considered when investing in firm shares in the basic materials sector. It is also expected to be one of the things that must be considered for creditors when making decisions in providing loans and interest to firms in the basic materials sector.

II. LITERATURE REVIEW

Trade Off Theory

The trade off theory is one of the basic theories that dominate the theory of capital structure by recommending that the optimal level of debt is the marginal benefit from debt financing equals the marginal cost. According to Sofat and Singh (2016) the trade off theory explains if the firm chooses the optimal composition of the capital structure by equalizing the tax benefits of debt and the costs of financial difficulties. Trade off theory shows the consideration of the firm's decision to choose how much debt and equity financing is needed based on a balance between the costs and benefits of each form of funding. There are advantages to financing through debt, namely the interest tax shield benefit. But it is necessary to consider the existence of financial difficulties, namely the existence of financial distress including bankruptcy costs when using debt and non-bankruptcy costs. This theory aims to explain that firms are generally funded partly using debt and partly using equity. The additional profit (marginal benefit) obtained from the increase in debt will decrease along with the increase in debt, while the marginal cost increases, so that firms that optimize the overall value will focus on balance when determining the selection of the amount of debt and equity in their funding (Hadinugroho, et al., 2018).

Pecking Order Theory

Donaldson initially introduced this theory in 1961, meanwhile the term pecking order theory was given by Myers in his journals in the Journal of Finance volume 39 entitled "The Capital Structure Puzzle" in 1984, which explains if there is a pecking order by the firm in the use of capital. Pecking order theory from Myers (1984) and Myers and Majluf (1984) states that firms with high growth rely more on retained earnings to finance new projects rather than seeking outside financial sources, with the result that developing firms have a tendency for relatively low debt ratios. If internal finance is not available, good quality firms choose debt to invest in new projects (Nguyen, et al., 2019). This theory further explains that firms make larger debt loans when internal funds are insufficient to fund investment needs (Sihombing, 2018). Because managers are aware of internal information, announcements of equity or issuance of debt instruments can signal information about the firm's prospects to investors. It means, the issuance of shares can be considered an indication of overvaluation, thus signaling bad news and issuing debt usually conveys the manager's prospective view of the firm's future. Therefore, the asymmetric information associated with issuing additional shares that signal bad news also creates other potential costs: the possibility that the firm will not have enough money to finance the project due to the decision not to issue additional shares (Thanh and Huong, 2017). Combining asymmetric information costs and transaction costs, the "modified pecking order" in Myers (1984) states that: (a) Firms will choose internal funds because they do not want to be in the dilemma of either rejecting a positive NPV project or selling their new stock too cheaply. (b) There must be a relationship between dividend policy and financial policy so that the normal level of equity investment can be met by internal funds. (c) Firms also maintains a safe level of debt to avoid the material costs of financial difficulties, reserves its borrowing capacity so that debt can be used in the case of excellent investment opportunities.

Agency Theory

Jensen and Meckling in 1976 defined agency relationship as a contract or agreement between the owner and another party (agent) in carrying out service activities for the interests of the owner, where at the time of the implementation of the service in question there is a transfer of power in decision making to the agent of the owner. For agency theory, there is an optimal capital structure derived from various funding options, including equity, debt and other securities because it determines the benefits for suppliers and capital managers (Nguyen, et al., 2019). Agency theory has a focus on costs created by conflicts of interest between shareholders, firm managers and debt holders. Conflicts that occur between managers and shareholders due to disagreements over operating decisions (Acaravci, 2015). Jensen and Mackling (1976) said that the relationship between agent and manager in the firm is to avoid the first problem between firm managers and firm shareholders, firm management leaders must have the authority to make conclusions that can maximize shareholder profits. And also must be able to pay some incentives to agents to fulfill their obligations at good interest. The costs incurred in this transaction are called agency costs (Khan, et al., 2015). Debt in the firm's capital structure will cause agency costs. The use of debt as a source of funding in agency theory is a form of overcoming agency problems. The presence of creditors who become third parties in supervising the firm is further enhanced. Debt as an external source of funds can control management behavior when managing firm activities. Therefore, shareholders will not be harmed. Debt used for funding sources will have a positive impact on firm value (Chandrarin and Cahyaningsih, 2018). In addition, Arilyn (2016) states that agency costs can be reduced by giving or increasing management ownership in the firm (insider shareholders) so that management also owns and directly feels the results of the decisions made.

Effect of Profitability on Capital Structure

Profitability can be the main independent variable that determines the capital structure and represents the pecking order theory and trade off theory quite clearly. The trade off theory says the firm recognizes the target debt ratio by comparing the benefits and costs of the capital structure (Khan, et al., 2015). Trade off theory predicts a positive relationship between profitability and debt to equity ratio. Profitable firms can have more use of debt in their capital structure, as they have great potential to absorb large amounts of interest and gain tax protection arising from high debt ratios. However, pecking order theory predicts a negative relationship between profitability and debt equity

ratios because high profits lead to more retained earnings and less dependence on external funds, indicating that in the presence of asymmetric information, firms adopt certain fixed patterns to rank different financial alternatives. (Sofat and Singh, 2016). Asymmetric information provides another theoretical approach for determining capital structure, especially through pecking order theory, which is a consequence of information asymmetry between firm insiders and outsiders. Specifically, internal funds do not have very high informational costs when issuing new capital, while debt is in an intermediate position (Balios, et al., 2016). Profitable firms have abundant cash flow generated by the firm internally, therefore the firm prioritizes the use of internal funds before using external funds. As a result, from the pecking order theory point of view, profitable firms tend to use less external funds. So the first hypothesis in this study to be tested:

H_1 : Profitability has a negative effect on capital structure in basic materials sector firms

The Effect of Firm Size on Capital Structure

Firm size can be another important determinant in determining capital structure. Many previous studies have suggested that capital structure is related to firm size. But, there are conflicting results between the relationship between firm size and capital structure (Acaravci, 2015). Large firms tend to have many lines of business and diversified cash flows which reduce the likelihood of bankruptcy. This firms will be closely monitored by competent authorities and the public so that based on the predictions of the trade off theory, firm size is positively related to capital structure ratios. However, in relation to pecking order theory, the transaction costs of small firms are relatively large compared to the emission value because small firms tend to be exposed to more serious information asymmetry and lack of bargaining power. These problems make equity issuance more expensive for small firms. Therefore, pecking order theory predicts that small firms have a preference for debt instruments over equity (Thanh and Huong, 2017).

Large firms are better at using debt to finance their operations because they have the ability to diversify risk and minimize bankruptcy. It will be easier for large firms to obtain loans from creditors, the reason is that the large assets that the firm owns can be used as collateral in obtaining debt (Kadek and Bagus, 2019). According to Hadinugroho, et al., (2018) large firms have a risk of bankruptcy and relatively lower bankruptcy costs. So that large firms can have easier access to borrow at more favorable interest rates. Large firms can obtain loans with relatively lower interest rates. This condition results in a tendency to use larger debt. Based on the opinion above, we sets the second hypothesis to be tested:

H_2 : Firm size has a positive effect on capital structure in basic materials sector firms

The Effect of Firm Growth on Capital Structure

In their study, Jensen and Meckling (1976) and Myers and Majluf (1984) stated that if firms with high future growth opportunities need to add equity financing, because firms that have higher leverage are more likely to ignore profitable investment opportunities. The prediction from the trade off theory is that firms that have many investment opportunities will obtain a lower capital structure because they have more internal funds to avoid a shortage of investment funds and substitution of assets owned. Trade off theory predicts a negative relationship between capital structure and investment opportunities. Growth opportunities are seen as assets that can add value to the firm, but cannot be guaranteed and are not subject to taxable income. The agency problem shows a negative relationship between capital structure and firm growth. High growth opportunities in firms may not initially issue debt, and capital structure is expected to have a negative relationship with growth opportunities (Acaravci, 2015). This is also proven in the research of Nguyen, et al. (2019), Szomko (2020) and Hadinugroho et al. (2018). Based on the opinion above, we sets the third hypothesis to be tested:

H_3 : Firm growth has a negative effect on capital structure in basic materials sector firms

Effect of Tangibility on Capital Structure

Firms that have more physical assets can borrow at a lower cost of debt capital than firms that have fewer physical assets. The tangible nature of the asset indicates the bargaining power of the firm. Firms that have large amounts of fixed assets can receive loans with an average percentage of interest by bringing fixed assets as collateral (Khan, et al., 2015). By pledging assets as collateral, firms have less incentive to use the funds for wrong purposes; Tangibility is believed to reduce agency costs and information asymmetry (Thanh and Huong, 2017). M'ng, et al. (2017) added an explanation that having a high ratio of tangible assets can offer a high level of security as well, because creditors are able to liquidate collateral assets in the event of bankruptcy. Nguyen, et al. (2019) adds tangible assets representing collateral that a firm can guarantee for its debts. Jensen and Meckling (1976) state that bondholders tend to suffer from overinvestment by firms, leading to the classic conflict between bondholders and shareholders. When a firm can offer an existing asset as collateral, it can increase a repayment guarantee to creditors. Therefore, in trade off theory, the positive relationship between asset structure and capital structure can help solve the agency-related problem. Based on the opinion above, we sets the fourth hypothesis to be tested:

H_4 : Tangibility has a positive effect on capital structure in basic materials sector firms

Effect of Liquidity on Capital Structure

Liquidity is the firm's efforts to meet short-term obligations that have matured. The greater the current assets will show the firm's ability to pay off short-term debt, so that it will result in a decrease in the use of debt in the capital structure. The liquidity ratio is the ratio used to measure the firm's ability to pay short-term debts that have matured with current asset ownership. With high liquidity, the firm gives a signal that the firm has sufficient funds to be used to pay off short-term debt. Therefore, if the level of liquidity is higher, then the capital structure used will be lower (Hamidah, et al., 2016). In particular, the trade off theory suggests that firms with good liquidity conditions to avoid a liquidity crisis should take advantage of debt, whereas pecking order theory

emphasizes internally raised funds, by claiming that the firm first withdraws retained earnings, cash balances or marketable portfolios before external financial instruments, so that liquidity is negatively related to debt ratios (Thanh and Huong, 2017). The firm's funding needs will be met with internal funding sources that come from profits and depreciation first. If it is not enough, it will use external sources of funds, including debt. So it is predicted that liquidity has a negative relationship with capital structure (Hadinugroho, et al., 2018). The negative relationship between liquidity and capital structure can also be found in previous studies (Thanh and Huong, 2017; Nguyen, et al., 2019; Szomko, 2020; Kuč and Kaličanin, 2020; Hamidah, et al., 2016; Hadinugroho, et al., 2018; Gunawan, 2019). Based on the opinion above, the writer sets the fifth hypothesis to be tested:

H_5 : Liquidity has a negative effect on capital structure in basic materials sector firms

Effect of Business Risk on Capital Structure

Business risk is also considered as one of the other important determinants of the firm's capital structure in the financial distress approach. In particular, riskier firms, in terms of income volatility, have to face a relatively higher degree of difficulty in accessing capital financing. This expected negative relationship is also explained in the perspective of pecking order theory, namely firms that have high income volatility will try to accumulate cash to avoid the problem of investment shortages in the future (Balios, et al., 2016). Trade off theory shows a positive relationship between business risk and leverage. But pecking order theory shows a negative relationship between business risk and capital structure. Debt involves periodic fund commitments, firms with a high debt structure are sensitive to the costs of financial distress. Because firms that have unstable income tend to be underutilized. Thus, higher variability in income implies an increased probability of bankruptcy. Therefore, it is expected that firms with higher income variability have lower debt structures. Firms that have high operating risk (earnings volatility) can reduce the volatility of net income by reducing the level of debt (Sofat and Singh, 2016). According to (Gharaibeh and Al-Tahat, 2020) firms that are risky and have a high debt ratio are more likely to suffer from high costs of financial distress and problems of underinvestment. Therefore, firms with high business risk tend to be underutilized. Moreover, the negative relationship between business risk and debt ratio is in line with the trade off theory, where risky firms perceive debt as a less attractive option. According to the trade off theory, firms cannot pay off their debts because of higher bankruptcy costs and financial difficulties. Previous research has found a negative correlation between business risk and capital structure (Khokher and Alhabshi, 2019; Szomko, 2020; Gharaibeh and Al-Tahat, 2020; Gunawan, 2019). Based on the opinion above, we sets the sixth hypothesis to be tested:

H_6 : Business risk has a negative effect on capital structure in basic materials sector firms

III. METHODOLOGY

Data

The data collected in this study used secondary data. Secondary data is data obtained from other parties or indirectly from research subjects. The data is in the annual financial statements of Basic Materials firms listed on the Indonesia Stock Exchange (IDX) for the period 2016 to 2020 issued by the Indonesia Stock Exchange through the website (www.idx.co.id). We exclude data on firms that are not listed on the Indonesia Stock Exchange (IDX) in the study observation period, firms whose financial statements are incomplete and firms that have negative equity in the period 2016 to 2020. Our final sample data consists of 26 basic materials sector firms observed during 2016 to 2020, resulting in 130 observational data.

Methodology

This type of research is quantitative research, a research method that emphasizes objective phenomena and is studied quantitatively. The use of numbers, statistical processing, structure and controlled experiments were carried out to maximize the objectivity of the research design (Hamdi and Bahruddin, 2014). Furthermore, quantitative research is used to describe controlled phenomena for theory testing, questioning variables according to the researcher's view with linear/unidirectional and statistical/inferential data tests (Barlian, 2016). Quantitative research observes the relationship of object variables in research is more causal, therefore in this study there are independent and dependent variables. Then look for the influence of the independent variable on the dependent variable. Capital structure is the dependent variable in this study which is proxied by the debt to equity ratio (DER). While the independent variables in this study are profitability (ROA), firm size (SIZE), firm growth (GROWTH), tangibility (TANG), liquidity (CR) and business risk (RISK). Detailed information on each variable can be seen in Table 1.

Table 1: Variable Operation

Variable	Indicator	Source
DER	$\dfrac{Total\ Liabilities}{Total\ Equity}$	Simatupang, et al., 2019
ROA	$\dfrac{Net\ Income}{Total\ Assets}$	Sutomo, et al., 2020
SIZE	$Size = \text{Ln}(Total\ Assets)$	Sofat dan Singh, 2016; Nguyen, et al., 2019
GROWTH	$Sales\ Growth = \dfrac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$	Simatupang, et al., 2019; Kuč dan Kaličanin, 2020
TANG	$Tangibility = \dfrac{Fixed\ Assets}{Total\ Assets}$	Thanh dan Huong, 2017; Sutomo, et al., 2020

CR	$Curent\ Rasio = \dfrac{Current\ Assets}{Current\ Liabilities}$	Hamidah, *et al.*, 2016; Gunawan, 2019; Kuč dan Kaličanin, 2020
Risiko Bisnis	$Bussines\ Risk = Std\ Dev\ \dfrac{EBIT}{Total\ Assets}$	Natalia, 2015; Gunawan, 2019; Kuč dan Kaličanin, 2020

Source: Processed data

Regression Model

The data analysis model in this study uses inferential statistical analysis with multiple regression analysis. Regression test was conducted to determine the effect of the relationship between the independent variable and the dependent variable and to determine the direction of the relationship. The aim is to estimate and/or predict the population mean or the mean value of the dependent variable according to the known value of the independent variable. The model of the regression equation used in testing the research hypothesis is as follows:

$$DER_{it} = \propto + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 TANG_{it} + \beta_5 CR_{it} + \beta_6 RISK_{it} + e_{it}$$

Where DER is capital structure, α is constant, β1-6 is regression coefficient of independent variable, ROA is profitability, SIZE is firm size, GROWTH is firm growth, TANG is tangibility, CR is liquidity, RISK is business risk and e is coefficient error. Determination of decisions taken in multiple regression analysis will use the coefficient of determination, simultaneous significance test (F statistic test) and partial significance test (t statistical test).

IV. RESULTS AND DISCUSSION

Research Data Regression Model

Panel data modeling is carried out using three method approaches, including: 1) The Common Effect Model (CEM) method, neither time nor individual dimensions are considered in this model, so that the assumption is obtained that the behavior of firm data is the same in various time periods. 2) Fixed Effect Model (FEM), the intercept in this model is distinguished between individuals, because it is assumed that each individual has its own characteristics. 3) Random Effect Model (REM), this model has a difference between individual characteristics and the time accommodated by the error of the model. Selection of the right model can be done by testing the three existing models. Table 2 describes the testing of these models.

Table 2: Result of analysis with panel data regression model

	CEM	FEM	REM
C	2.5067 (0.0004)	-21.4033 (0.0000)	0.5005 (0.6591)
ROA	-2.6136** (0.0117)	-3.5248*** (0.0000)	-4.2334*** (0.0000)
SIZE	-0.0145 (0.7413)	1.3725*** (0.0000)	0.0826 (0.2503)
GROWTH	-0.3072 (0.2485)	0.0967* (0.5569)	0.0004 (0.9980)
TANG	-1.4148*** (0.0000)	1.7757** (0.0453)	-1.0385** (0.0237)
CR	-0.2910*** (0.0000)	-0.0601 (0.2820)	-0.1511*** (0.0008)
RISK	8.7859*** (0.0000)	12.1160*** (0.0000)	10.1723*** (0.0000)
R-squared	0.5677	0.8911	0.6194
Adjusted R-squared	0.5466	0.8567	0.6008
F-statistic	26.9239	25.8686	33.3630
Prob(F-statistic)	0.0000	0.0000	0.0000

Notes: *** Significant in 0.0 1, ** Significant in 0.05, * Significant in 0.10
Source: Processed data

Selection of Research Data Regression Model

There are three tests in determining the panel data model technique. First, the Chow test is used to determine between the Common Effect Model or the Fixed Effect Model. Second, Hausman test is used in determining between the Fixed Effect Model or the Random Effect Model. Third, the Lagrange Multiplier test is used in determining between the Common Effect Model or the Random Effect Model. Table 3 shows the results of the model selection test.

Table 3 : Panel data model selection test results

Test	Coefficient	Probability	Result
Chow	179,2236	0,0000	FEM
Hausman	42,7331	0,0000	FEM

Source: Processed data

From the results of the Chow test and Hausman test (table 5), the results of the model follow the Fixed Effect Model. Meanwhile, the Lagrange Multiplier test was not carried out because the two previous test methods showed the right model to be used in this study, namely the Fixed Effect Model.

Panel Data Regression Analysis

From the results of the panel regression model selection, the best model used in this study is the Fixed Effect Model, so that the panel data regression equation is as follows:

$$DER_{it} = \propto + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 RISK_{it} + e_{it}$$

The model of the panel data regression equation is formulated as follows:

$$DER_{it} = -21.4033 - 3.5248ROA + 1.3725SIZE + 1.7757TANG + 12.1160RISK$$

Research Hypothesis Testing

The next step is to test the hypothesis. The results of hypothesis testing using the Fixed Effect Model in this study can be observed in table 4. By doing the F-test to see whether the independent variables simultaneously affect the dependent variable. With a probability level of 95 percent (α = 5%) then the p-value = 0.0000 is smaller than 0.05 and the F-statistic value (25.8686) is greater than the F-table (2.17), which means that the independent variables (ROA, SIZE, TANG, and RISK) simultaneously affect the dependent variable (DER).

In table 2 the R-squared (R^2) value is 0.8911 which shows that 89.11% of the capital structure variance (DER) can be explained by changes in profitability (ROA) variables, firm size (SIZE), tangibility (TANG), and business risk (RISK). While the remaining 10.89% will be described by other factors outside of this research model.

Furthermore, by performing a partial significance test (t-test) which shows how much influence one independent variable (ROA, SIZE, TANG, and RISK) has exclusively in explaining the variation of the dependent variable (DER). Table 4 shows the relationship of the independent variables to the capital structure.

Table 4 : The relationship of the independent variable to the capital structure

Variable	Effect	Probability	Significance
ROA	Negative (-)	0,0000	Significant
SIZE	Positive (+)	0,0000	Significant
GROWTH	Positive (+)	0,5569	Not significant
TANG	Positive (+)	0,0453	Significant
CR	Negative (-)	0,2820	Not significant
RISK	Positive (+)	0,0000	Significant

Source: Processed data

Results of the Effect of Profitability on Capital Structure

The results of panel data regression on the profitability (ROA) variable on capital structure (DER) show that the ROA variable is a variable that has a significant effect on DER and has a negative relationship. This results shows that every increase in the value of profitability will cause a reduction in the value of the capital structure. Myers (1984) in Pecking Order Theory explains that if firms with high profitability rely more on retained earnings to finance new projects rather than seeking outside financial sources, with the result that developing firms have a tendency for

relatively low debt ratios. Firmss that have high profitability tend to use internal funds in financing the firm's operational activities, so that the use of debt will decrease. With high profitability, it means that the firm's internal funds will increase and the use of the firm's internal funds can finance the firm's operations and even reduce the previous firm's debt so that with a high level of profitability the firm's debt ratio will decrease. This shows that the results of this study and regression analysis support the first hypothesis (H$_1$) which states that profitability has a negative effect on the capital structure of the Basic Materials industrial sector firms listed on the Indonesia Stock Exchange (IDX) in the period 2016 to 2020.

The results of this study support the statement of Acaravci (2015) that firms that have high profits will use less debt. Firms with high profitability will take advantage of internal financing, while firms with low profitability will use more debt because internal funds are insufficient. Šarlija and Harc (2016) also state that profitable firms will use retained earnings as the main source of funding and thereby reduce borrowing rates. Sutomo, et al. (2020) also adds that firms which have high profitability tend to take advantage of funding from internal sources, namely using profits rather than debt when they need funding. Kuč and Kaličanin (2020), Ghozali and Setyawan (2018), Gunawan (2019) and Simatupang, et al. (2019) also found similar results, that profitability has a negative effect on capital structure.

Results of the Effect of Firm Size on Capital Structure

Based on the results of panel data regression from the firm size variable (SIZE) to the capital structure (DER) shows that the SIZE variable is a variable that has a significant effect on DER and has a positive relationship. This shows that every increase in the size of the firm will result in an increase in the value of the capital structure. This study also shows the results that with a large firm size the use of debt will also increase, because in financing to enlarge the firm the use of internal funds is not enough, so external funds are needed to increase or expand its business activities. If seen from the results of the study, the firm size in the Basic Materials sector has increased every year, followed by an increase in its capital structure. Where with increasing capital owned firm size will increase. The results of this study are in line with the Trade Off Theory, which is an idea if a firm will determine the amount of funding with debt and the amount of funding with equity by paying attention to the balance between costs and profits. With a large firm size, it will be easier to obtain external funding because of the guarantee of the total assets owned and a large firm has a good reputation. The results of the study and regression analysis support the second hypothesis (H$_2$) which states that firm size has a positive effect on capital structure in the Basic Materials industrial sector firms listed on the Indonesia Stock Exchange (IDX) in the period 2016 to 2020.

The results of this study support the statement of Balios, et al. (2016) which states that larger firms have higher debt ratios. Thanh and Huong (2017) state that firm size can generate bargaining power and large firms are more

reputable and well known to the public, so their bond issuance may be attractive to both individual and institutional investors. The size of the firm also increases the long-term borrowing capacity of commercial banks. Kadek and Bagus (2019) added that large firms are better at using debt to finance their operations because they have the ability to diversify risks and minimize bankruptcy.

Result of the Effect of Firm Growth on Capital Structure

According to the results of panel data regression on the firm's growth variable (GROWTH) on capital structure (DER) it shows that the GROWTH is a variable that has no effect on DER. This finding shows that the firm's growth has no effect on the value of the capital structure. If sales growth increases but the profit earned decreases because the profit is used to pay debts and is used for the firm's operating capital. The firm will not use external funding but will use profits to finance the firm. The results of the study and regression analysis rejected the third hypothesis (H_3).

The results obtained are in line with research conducted by Šarlija and Harc (2016) where firms that invest more rely on long-term funding than funds obtained from internal sources. Kadek and Bagus (2019) added that firms that have high growth will tend to have higher profits. High profits can be used to finance operational and investment activities so that the level of debt will be lower. Hiya, et al. (2019) also found that the firm's growth did not have a significant effect, the growth opportunity should be an unreal guarantee for the ability to repay the loan. Kuč and Kaličanin (2020), Arilyn (2016) and Simatupang, et al. (2019) also gets results if the firm growth has no effect on the capital structure.

Result of the Effect of Tangibility on Capital Structure

From the results of panel data regression on the tangibility variable (TANG) on the capital structure (DER) it shows that the tangibility is a variable that has a significant effect on DER and has a positive relationship. This shows that the increase in the tangibility will result in an increase in the value of the capital structure. The results show that with the increase in the tangibility, the use of debt will also increase, because the firm in adding assets will take advantage of the use of external funds and these assets can be used as collateral. Firms with more physical assets can borrow at a lower cost of debt capital than firms with fewer physical assets. The high value of fixed assets will show the bargaining power of the firm when making loans. The results of this study are in accordance with the Trade Off Theory which is a view that a firm will choose the amount of funding with debt and the amount of funding with equity that balances costs and profits to be obtained. This research is also in line with agency theory, where the source of funding in the form of debt is an effort to overcome agency problems. The presence of creditors who become third parties has a more optimized supervisory function of the firm. Utilization of external sources of funds (debt) can be used as control of management behavior when the firm is managed so that shareholders are not harmed. Utilization of debt as a source of financing guaranteed by the firm's assets will be able to have a positive influence on the value of the

firm. The results of the study and regression analysis support the fourth hypothesis (H_4) which states that the tangibility has a positive effect on the capital structure of the Basic Materials industrial sector firms listed on the Indonesia Stock Exchange (IDX) in the period 2016 to 2020.

The results obtained are in line with the study of Sofat and Singh (2016) that the composition of assets and debt equity ratios has a direct relationship. A large number of tangible assets leads to a higher debt ratio. M'ng, et al. (2017) also add that the availability of collateral assets provides a high level of security over debt payments because creditors can continue to liquidate assets in the event of bankruptcy. Hadinugroho, et al. (2018) also found that the greater the guarantee, the greater the firm's ability to obtain debt. The view from the lender's perspective is that the greater the proportion of tangible assets, the more lenders will want to lend so that the capital structure is higher. Sibindi (2018), Kadek and Bagus (2019) and Sutomo, et al. (2020) also found a positive effect between tangibility and capital structure.

Results of the Effect of Liquidity on Capital Structure

From the results of panel data regression on the liquidity variable (CR) on capital structure (DER) it shows that the CR is a variable that has no effect on DER and has a negative relationship. This finding shows that increasing liquidity will not affect the value of capital structure. The results show that the increase in the current ratio will not affect the use of debt. The value of current assets has no effect in reducing the level of the firm's debt value because high liquidity will lead to idle firm funds, therefore, the firm will use it to reduce debt (short term and/or long term) as well as to finance the firm's operations so that the use of external funds or debt becomes the last option. The results of the study and regression analysis rejected the fifth hypothesis (H_5).

The results obtained are in line with research conducted by Kadek and Bagus (2019) where high firm liquidity means that the firm is able to pay its long-term debts that have matured without having to use long-term financing sources. Hiya, et al. (2019) adds that the existence of high liquidity which can actually be used as collateral in obtaining loans has no effect on the capital structure. Ghozali and Setyawan (2018) also observed in their research that liquidity using the current ratio which only looks at short-term assets and short-term debt to get liquidity results has an effect but is not significant.

Results of the Effect of Business Risk on Capital Structure

The results of panel data regression from the business risk variable (RISK) on the capital structure (DER) show that the RISK is a variable that has a significant effect on DER and has a positive relationship. The findings show that if the firm's business risk increases, the value of its capital structure will also increase. With the increase in the firm's business risk, the firm's use of debt will increase, because firms that have high business risk will need external funding for their firm's operations. This can be caused by a decrease

in firm income or a decrease in profit due to the firm's inability to manage assets and capital owned, therefore the use of external funds or debt will increase in financing the firm's operations. The results of the study are in line with the Trade Off Theory, which is an idea that a firm will choose the amount of funding with debt and the amount of funding with equity can pay attention to the balance between costs and profits to be obtained. There are advantages to financing through debt, namely the interest tax shield benefit. But it is necessary to consider the cost of financial distress, namely the existence of financial distress including the cost of bankruptcy when using debt. This is due to the fact that the firm faces uncertain conditions that can result in firm bankruptcy. The results of the study and regression analysis rejected the sixth hypothesis (H_6).

The results obtained are in line with the research by Sofat and Singh (2016) that with the use of debt the higher the business risk, the greater the business risk. Sibindi (2018) also found that with increasing business risk there will be an increase in cash flow volatility. Cash flow volatility implies the volatility of retained earnings. Therefore, firms are required to do debt financing before using equity. Gunawan (2019) and Febriyanty, et al. (2020) added that business risk has a positive relationship with capital structure because the increase in the capital structure used to finance the firm's growth will lead to an increase in the value of the firm's business risk.

V. CONCLUSION

Based on the results of data testing using the E-views 10.0 tool, the best model was obtained using the Fixed Effect Model, after the F-test, the independent variable has a significant effect on the dependent variable. The value of R-squared (R2) = 0.8911 shows that 89.11% of the capital structure variance can be explained by changes in the variables of profitability, firm size, tangibility, and business risk in basic materials sector firms. Meanwhile, the remaining 10.89% will be described by other factors outside the model. From the results of the analysis and discussion, the following conclusions can be obtained:

a. Profitability has a negative effect on the capital structure of Basic Materials firms in Indonesia. High profitability means that the firm's internal funds will be more and more and the use of the firm's internal funds can finance the firm's operations and even reduce the firm's debt so that the firm's debt ratio will decrease.

b. Firm size has a positive effect on the capital structure of Basic Materials firms in Indonesia. Firms with large sizes will find it easier to obtain external funding, because there is a guarantee of total assets owned and large firms will have a good reputation.

c. Firm growth has no effect on the capital structure of the Basic Materials firms in Indonesia. The increase or decrease in the firm's growth will not affect the firm's capital structure policy because if sales growth increases but the profits obtained decrease, it is caused because the profit is used to pay debts and is used for the firm's operating capital.

d. Tangibility has a positive effect on the capital structure of Basic Materials firms in Indonesia. With the increase in the

tangibility, the use of debt will also increase, because firms in adding assets will take advantage of the use of external funds and these assets can be used as collateral.

e. Liquidity has no effect on the capital structure of Basic Materials firms in Indonesia. The value of current assets has no effect in reducing the level of the firm's debt value because with high liquidity it will lead to unemployed firms. Therefore, the firm will use it to reduce debt (short term and/or long term) as well as to finance the firm's operations so that the use of external funds or debt becomes the last option.

f. Business risk has a positive effect on the capital structure of Basic Materials firms in Indonesia. The increase in the firm's business risk indicates the use of debt will increase, because risky firms tend to have high levels of debt and can pose a risk of bankruptcy due to their inability to pay long-term debt as a result of the firm's inability to bear operating costs that arise in its operating activities.

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