Determining Factors of Capital Structure and its Effect on the Value of Public Companies in Indonesia

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

The purpose of this study is to analyze the determinants of capital structure and how its affect firm value. The sample selected from public companies listed on the IDX which four (4) industries were selected by using stratified and purposive random sampling that have been selected 74 companies with 222 observations from 2017 to 2019. Estimation technique of panel data in this study by using the FEM approach. The results of hypothesis testing reveal that in the first model, three (3) variables that have a significant positive effect on the company's capital structure, namely AUR, LSIZE and ROA. Furthermore, in the second model, the company's capital structure has a negative effect on firm value. This study also reveals that companies tend to use debt as the first alternative when internal sources of funds are insufficient. Investors are advised to be careful in investing their funds in companies that have a very high debt utilization ratio, because in addition to burdening the company's cash flow, the company will also have the potential to lead to bankruptcy if the use of the debt is not managed properly.

Keywords: Capital structure; firm value; FEM; debt; equity.

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1. INTRODUCTION

The policy in determining the amount of capital sources used by the manager of a company will affect the value of the company. Adherents of the trade-off capital structure theory agree that if the source of capital used mostly comes from debt, it will increase the company's risk in the form of debt costs and have an impact on increasing the company's bankruptcy costs because of the possibility of default on the debt used. Therefore, if the company do errors in determining the capital structure resulted in the company being in a state of financial distress [1-3]. So determining the amount of capital sources is very important in an effort to achieve an optimal capital structure condition, namely where the combination of the amount of debt and equity at the same time will be able to minimize the company's cost of capital and maximize the value of the company which is reflected in the increase in the company's stock price in the market.

In determining the capital structure, there are several factors considered by companies in general, including profitability, liquidity, sales growth, asset turnover, tangibility, company age and company growth. However, in empirical studies, between researchers there is no agreement on what variables affect the capital structure of a company [4,5]. Specifically, the literature states that the determinants of capital structure can be grouped into two main factors, namely external factors and internal factors [4]. External factors relate to the macroeconomic conditions of a country, such as interest rates, inflation, national income, and exchange rates. While internal factors are specific matters directly related to the company's business, including profitability, wealth structure, wealth turnover rate, liquidity, tangibility, company size, ownership structure, growth opportunities and others.

Empirical studies on the determinants of capital structure in Indonesia have been carried out intensively using a variety of different variables [6-8]. The test results show that only certain variables have an effect on capital structure, while other variables are inconsistent in explaining the determinants of capital structure in Indonesia. For this reason, research was conducted to comprehensively examine what variables contribute to capital structure and its

effect on firm value using static and dynamic analysis approaches.

The goal to be achieved in using sources of funds for each company is to determine an optimal capital structure, so that by using this capital, the company's capital costs can be minimized. Various theories of capital structure explain how to determine the optimal capital structure, but empirical studies prove that there are many determining factors that influence the capital structure. The rate of percentage of capital structure utilization each industry is usually inter changed as show in the following Table 1.

Table 1 shows a comparison between debt and capital in 9 main industries in Indonesia. From these data it can be seen that there is no consistency in the comparison of the use of capital originating from debt and own capital, so that the ratio of debt to equity fluctuates quite large. As an example the comparison between debt and own capital for the agricultural industry (Agriculture) is very fluctuating, namely 10.23 times, -0.22 times and 0.75 times respectively from 2017 to 2019. Also for the various industrial sectors (miscellaneous) for three years from 2017 to 2019 consecutively from 35.53 times, -5.09 times, and 0.35 times. Then for the finance sector, in 2017 the ratio of debt to equity was 3.60 times, in 2018 it was -0.65 and in 2019 it was 3.54 times.

From the data above it can be shown that the condition of the capital structure in Indonesian public companies is still not in ideal conditions. The impact of using capital that is not optimal or close to optimal is that companies are forced to use relatively more expensive capital, which will reduce the competitiveness of the products and services produced by the company. Thus, consumers are burdened with the purchase price of products and services at relatively higher prices, so that competitiveness decreases both in the domestic market and in foreign markets.

The capital structure policy adopted by the company can also have an impact on the price or return of the company's stock. Empirical studies show that one of the factors of price fluctuations or company stock returns is also caused by the capital structure policies

Table 1. Capital structure of 9 main industries in Indonesia

No	Industry	2017			2018			2019		
		EPS (rp)	PER (x)	DER (x)	EPS (rp)	PER (x)	DER (x)	EPS (rp)	PER (x)	DER (x)
1.	Agriculture	77	2.56	10.24	30	19.27	-0.22	8.14	27	0.75
2.	Mining	6	17.54	1.24	270	-1.03	1.12	124.3	12	-1.91
3.	Basic Industry Chemicals	52	12.88	2.52	105	13.74	1.66	49.2	19	1.55
4.	Miscellaneous	52	5.00	35.53	143	16.15	-5.09	84.3	17	0.35
5.	Consumer Good	5.83	18.48	0.82	884	24.94	1.07	848.9	10	0.66
6.	Property, Real Estate and Building Construction	2.00	14.52	0.96	146	27.07	1.05	16.9	11	1.09
7.	Infrastructure Utilities & Transportation	36	15.80	1.36	7	9.50	0.71	26.8	23	0.73
8.	Finance	99	19.10	3.60	105	25.63	-0.65	125.0	24	3.54
9.	Trade, Services & Investment	178	17.44	1.29	59	5.25	1.03	82.2	15	0.40

Notes: Earning Per Share (EPS) in rupiah; Price Earning Ratio (PER) in time; Debt to Equity Ratio (DER) in time;
Source: IDX, 2020

implemented by the company. From the description of the data above, the question arises whether the company's capital structure in each of these sectors affects the company's value. So this research is considered important in an effort to analyze what factors can be used to explain the choice of company capital structure and how it affects company value by using static and dynamic analysis approaches to public companies listed on the Indonesia Stock Exchange.

2. LITERATURE REVIEW

2.1 Capital Structure Theory

2.1.1 Miller and modigliani theory

Modern capital structure theory was started by Franco Modigliani and Merton H. Miller in 1958. Modigliani-Miller (MM) stated that the debt ratio is irrelevant and there is no optimal capital structure. The value of the company depends on the cash flow to be generated and not on the ratio of debt to equity. The essence of this theory is that there is no optimal debt ratio and the debt ratio does not explain firm value. The assumptions used in this theory are no taxes, no information asymmetry, and no transaction costs.

"However, this theory is considered less relevant because of the reduction in income tax on the use of debt, market conditions with information asymmetry, and transaction costs in the capital market which are not included in this MM theory. The positive side of debt is that debt lowers the agency cost of equity. The use of debt will also discipline managers not to arbitrarily use company assets for their interests because supervision by creditors is usually much stricter and more effective than the supervision of shareholders outside the company with relatively limited information" [9].

2.1.2 Agency theory

This theory was put forward by Jensen and Meckling in 1976, which states that management is an agent of the shareholders, as the owner of the company (principal). Shareholders expect agents to act on their behalf thereby delegating authority to agents. The costs arising from the supervision carried out by management are called agency costs.

According to Jensen & Meckling [10], "potential agency problems occur when the proportion of managers' ownership of company shares is less than 100%, so managers tend to act to pursue their own interests and not to maximize value in making funding decisions. This is due to the separation between the management function (decision maker) and the ownership function (risk bearer). Decision makers are relatively not at risk for errors in decision making. The risk is fully borne by the principal (owner). As a result, management as a decision maker in the company, does not bear the risk of its mistakes, tends to make consumptive and unproductive expenses for their benefit, such as increasing salaries and status".

There are three ways to minimize agency costs, namely (1) Increasing share ownership by management, (2) Reducing free cash flow controlled by management and (3) Increasing the company's leverage level as proposed by Jensen & Meckling [10]. With the holding of external funding in the form of debt, it is expected that the costs incurred by the shareholders in connection with management supervision can be reduced because the creditors who provide loans to the company in this case the management as organizational executives will carry out supervision in order to gain confidence about the company's ability to pay off its obligations. In other words, debt can reduce agency costs.

2.1.3 Trade off theory (Balancing theory)

This theory was developed by Haugen, Papas, and Rubenstain in 1969 and is also known as the balancing theory. This theory states that each company can determine the optimal target debt ratio (leverage). The optimal debt ratio is determined based on the balance between the benefits and costs of bankruptcy because the company has debt [11]. In principle, the company requires new equity funding if the company's debt ratio is above the target and increases debt if the company's debt ratio is below the target. The company will not achieve optimal value if all funding is debt or if there is no debt at all.

According to this theory, the optimal company capital structure describes the balance between tax benefits and bankruptcy costs because the company has debt. Debt causes the company to obtain tax benefits because interest costs can be charged from taxable income, while bankruptcy costs are administrative costs, legal fees, agency costs, and monitoring costs to prevent the company from going bankrupt.

This theory has a weakness, namely it ignores the existence of information asymmetry and the large cost to substitute debt to equity or equity to debt. The trade off assumes that investors and management have the same information. This is unacceptable because it is difficult for investors to obtain the same portion of information as the management.

2.1.4 Pecking order theory

This theory was first introduced by Donaldson in 1961, while the naming of the pecking order theory was carried out by Myers in 1984. This theory is called the pecking order because this theory explains why companies will determine the most preferred hierarchy of sources of funds. Pecking order theory sees that companies tend to choose funding according to the order of risk. This is done to be able to maximize the value of the company or in other words maximize the prosperity of the owner of the company

According to Myers and Majluf [12], the order of funding according to the pecking order theory is as follows:

a. Companies prefer internal financing (internal funds). The internal funds are obtained from profits generated from the company's activities. to pursue his own interests.
b. Companies adjust their target dividend payout ratio to their investment opportunities, while avoiding drastic dividend changes.
c. A sticky dividend policy plus fluctuations in profitability and unproxied investment opportunities mean that sometimes internal cash flow exceeds investment requirements but sometimes falls short of investment requirements.
d. If external funding is needed, the company will first issue the safest securities, starting from the issuance of convertible bonds, and the last alternative is shares.

2.1.5 Asymmetric information theory

Information asymmetry occurs when one party in the transaction has more complete information than the other party. For example, in terms of economic transactions, it is usually the case that all three sales of goods or services have better information than the buyer, but the opposite can also happen and generally all economic transactions involve asymmetric information. Akerlof [13] is one of the economists who developed asymmetric information theory. Asymmetric information arises when company managers know the company's conditions and prospects better than analysts or investors. This asymmetric information itself can occur in two extreme conditions, namely a small difference in information so that it does not affect management or the company's stock price, or a very significant difference in information that has a major impact on management and the company's stock price. For example, a research and development failure may not be published by the manager because it can affect the company's stock price [14].

Asymmetric information theory has a very large role in financial management. The existence of information gaps that occur between insiders and investors causes the policies issued by the company to be responded to with various responses, the response the company expects or does not expect. For example, companies selling new shares to obtain additional funds to finance profitable investments according to company managers are not always responded positively by the market [14]. On the other hand, the market tends to react negatively to the sale of the company's new shares. The market view of the sale of new shares as a signal that the company is experiencing financial difficulties, the company's capital structure is not good so it wants to be improved. The market also suspects that investors or company owners want to get out of business by diversifying in other businesses. This is done because the risk is too high. With a negative market reaction like this, new investors tend to suspect that old investors or company owners want to share risk with others and tend to be careful in investing their funds.

2.2 Previous Research

Research on the factors that influence debt policy has been carried out by several researchers with different results. These studies include:

Alipour et al. [4] conducted "research on the factors that influence the capital structure of public companies in Iran during the period 2003 to 2007. Using panel data, which was analyzed using pooled ordinary least squares techniques and econometric techniques, namely fixed effects and random effects models. It was found that variables, such as firm's size, financial flexibility, asset structure, profitability, liquidity, growth, risk and state ownership have a

significant effect on determining the capital structure of companies listed on the Tehran Stock Exchange during the period 2003-2007". Furthermore, Serghiescu and Vaidean [5] used "panel data of 20 companies in Romania during the 2009-2011 period. The results of data analysis using statistical techniques OLS and Fixed Effect Model (FEM), found that profitability and liquidity had a negative effect on the total debt ratio and it was also found that asset tangibility also had a negative effect on company leverage, this finding contradicts most previous studies".

Ozkan (2001) conducted a study on the determinants of capital structure using a dynamic approach and a natural adjustment process for capital structure decisions in 390 companies in the UK. Using the Generalized Method of Moments (GMM) estimation technique, it was found that the Size variable had a significant positive effect on the capital structure, while the liquidity, profitability and growth opportunities variables had a significant negative effect on the company's capital structure. This study also reveals that there is a dynamic or long-term relationship in determining the target company's capital structure and they can quickly make adjustments to the target ratio of their capital structure, where cost is the main consideration in making adjustments to the company's capital structure.

Phooi M'ng, Rahman and Sannacy [15] conducted an examination of the factors determining the capital structure of public companies in 3 (three) Asean countries, namely Malaysia, Singapore and Thailand. By using 5 (five) variables, namely profitability, company size, asset tangibility, depreciation on total wealth, and inflation rate. The results of the study found that the variables used have a strong ability to explain the capital structure decisions adopted by public companies in the three countries. The findings of this study are also in line with the findings of previous studies and support the theory of trade-off and pecking order.

Furthermore, an empirical study on the effect of capital structure on company performance has been carried out by Dada and Ghazali [16]. They conducted a study of 100 non-financial companies in public companies listed on the Nigerian capital market during the period 2008-2009. By using Tobin'q and ROA variables as dependent variables to measure company performance. The results revealed that the asset turnover and asset tangibility variables had a significant positive relationship with Tobin's q, and the risk variable had a significant negative relationship with Tobin's q. Furthermore, the age of the company (age) has a significant negative relationship to ROA and sales growth has a significant positive effect on ROA.

Vy Le and Phan [17] conducted an empirical study of the impact of capital structure on the performance of non-financial public companies in Vietnam for the period 2007-2012. Using unbalanced panel data shows the results that all debt ratios have a significant negative effect on company performance. This result is different when compared to studies in developed markets where most studies show that debt ratios have a positive effect on company performance. However, this study is in line with the results of studies in developing capital markets, that the debt ratio has a negative effect on company performance. The rationale for this finding is that Vietnam's emerging capital market shows that the benefits of the tax protection value of using debt are less than the financial costs of distress. Then Chadha and Sharma [18] conducted a study of the impact of capital structure on the company's financial performance using a panel data sample of 422 public companies listed on the Bombay Stock Exchange (BSE) over a 10 year period from 2003 – 2013. The results of their study stated that financial leverage has no effect on the company's financial performance, which is measured using the ROA and Tobin's q variables. However, it has a significant negative effect on the company's financial performance if it is proxied by the ROE variable.

Many empirical studies on the effect of capital structure on firm value have been carried out, the latest of which is Abdullah and Tursoy [19]. By using all companies listed on the Frankfurt Stock Exchange which consisted of 2,448 companies during the 1993-2016 period. The results of the study found that there was a positive relationship between firm performance and capital structure. This study reveals that the performance of companies that have adopted International Financial Reporting Standards, IFRS is improving. One plausible reason there is a positive relationship between capital structure and firm performance is the benefit of the value of tax protection and lower costs of issuing debt securities compared to issuing equity.

Empirical studies on the factors determining capital structure in Indonesia have been

intensively carried out, but mostly using a limited number of samples and also the scope of the study is only in certain sectors. These studies include those conducted by Joni and Lina [20] who conducted research on capital structure with a total sample of 118 manufacturing companies listed on the Indonesia Stock Exchange in 2005-2007. Analysis using multiple regression. The results showed that asset growth and asset structure had a significant positive effect on leverage, while profitability had a significant negative effect on leverage, while firm size, business risk, and dividends had no effect on leverage. Next, Artini and Diantini [21] conducted research on corporate debt policy on the Indonesia Stock Exchange with a total sample of 15 companies included in the LQ 45 index. The analysis used was multiple regression with dividend payments, asset structure, profitability and tax rates as control variable. The results showed that insider ownership had a positive effect on the company's debt policy. Shareholder dispersion and institutional investors are negatively related to the company's debt policy.

Hardiningsih and Oktaviani [22] conducted a research on Debt Policy Determinants (in Agency Theory and Pecking Order Theory). The research sample is 135 manufacturing companies listed on the Indonesia Stock Exchange during 2007-2011. The analysis used is multiple regression. The results showed that profitability and asset structure had a significant positive effect on debt, company growth and retained earnings had a significant negative effect on debt, while free cash flow and managerial ownership had no significant effect on debt. Meanwhile, Steven and Lina [23] conducted research on the debt policy of manufacturing companies with a total sample of 39 manufacturing companies listed on the Indonesia Stock Exchange during 2007-2009. The analysis used is multiple regression. The results show that dividend policy, asset structure, and profitability have an effect on debt policy, but company investment, managerial ownership, company growth and company size have no effect on debt policy.

2.3 Identification Determining Factors of the Capital Structure and Hypothesis Statements

Based on the availability of data that the factors that affect the capital structure until now there is no general agreement that can be accepted. By combining various variables that have always been used by previous research, the research identifies several factors as follows.

2.3.1 Effective tax rate on capital structure

Most previous studies stated that the effective tax rate is estimated to affect the capital structure. Tax rates are expected to have a positive impact on debt [4]. The company benefits by maximizing the use of funding sources from debt at a high effective level of tax rates, so as to reduce tax payments on debt interest (Modigliani and Miller, 1963). Thus the benefits of debt will increase in line with the increase in tax rates, therefore it is predicted that there is a positive relationship between the effective tax rate and debt (DeAngelo and Masulis, 1980).

Furthermore, Graham (1996) and Zimmerman (183) show that there is a relationship between the company's effective tax rate and long-term debt. Research by Antoniou et al. (2008 there is a negative relationship between effective tax rates and debt ratios and the level of influence depends on each country's tax policy. In fact, Karadeniz et al. (2009) and Sogorb-Mira and How (2005) reveal that there is a negative relationship between tax rates effective tax and debt ratio.In contrast to the previous results that Huang and Song (2006) concluded that there is no effect between the effective tax rate and the amount of debt in the company's capital structure.So the hypothesis in this study is as follows:

H1: It is suspected that there is an effect of the effective tax rate on the debt ratio.

2.3.2 Company growth on debt policy

Companies with frequent sales growth need to expand their long-term operating assets [4]. Furthermore, Myers (1977), states that high growth companies may have more options for investment in the future than companies with low growth rates. However, companies are more likely to face profitable investment opportunities because, according to theory, companies that expect high future growth should use larger equity.

An increase in assets followed by operating results will increase the confidence of outsiders, especially creditors, to the company. Thus, due to creditors' trust in the company, the proportion of debt will increase the company's ease of

obtaining additional debt. This is based on creditors' confidence in the funds invested in the company which are guaranteed by the amount of assets owned by the company (Ang et al. 1997).

Brigham and Gapenski (1996) state that companies with high growth rates tend to require larger external sources of funds. To meet the needs of external funds, companies are faced with the consideration of cheaper sources of funds. In this case, the issuance of debt securities is preferable to issuing new shares because the new costs are greater than the costs of debt. Thus, a high growth rate tends to use more debt so that it has a positive and significant relationship with debt policy.

This is supported by research conducted by Joni and Lina [20], Marsella (2014), Susanti and Mayangsari [24] which show the positive influence of company growth on the company's debt level. Different results are shown negatively by Indahningrum and Handayani [25], the study states that company growth has an effect on the level of leverage and the effect is not significant.

Based on the description above, the hypotheses of this research are as follows:

H2: It is suspected that the company's growth opportunities have a positive effect on policy Debt.

2.3.3 Company profitability on debt policy

"Profitability reflects the company's income for investment funding. Companies with very high levels of profitability usually use relatively small amounts of debt. Because the high rate of return allows the company to do most of its funding through internally generated funds" [26].

This is in line with the pecking order theory suggested by Myers [12] for making corporate funding decisions. The pecking order establishes a sequence of funding decisions in which managers will first choose to use retained earnings, debt and issue of stock as a last resort. Research conducted by Indahningrum and Handayani [25], Joni and Lina [20], showed uniform results that profitability had a significant negative effect on debt policy.

Based on the description above, the hypothesis of this research is formulated as follows:

H3: Profitability has a negative effect on the company's debt policy.

2.3.4 Firm size on debt policy

The size of the company is predicted to have a positive impact on the level used by the company. For large companies, the risk of bankruptcy is relatively smaller and tends to use larger debt. Therefore, the debt ratio has a positive relationship with firm size, and the company's ability to diversify is better and has a lower income variance, thus enabling companies to use debt with a higher ratio (Titman and Wessels, 1988) [4].

On the contrary, it is easier for large companies to access funding from their own capital compared to small companies and large companies tend to cause greater information asymmetry so they tend to use smaller debt (Marsh, 1982; and Suto, 1982) [4]. 2003; Driffield et al. 2007). So there is a negative relationship between firm size and capital structure. This is possible because large companies have the financing ability to issue shares to replace debt financing in their capital structure (Deloof and Overfelt, 2008) [4]. Empirical studies reveal the fact that most find that there is a positive effect of firm size on capital structure (Al-Fayoumi and Abu Zayed, 2009; Eriotis et al. 2007; Ezeoha, 2011) [27].

Based on the results of previous research studies, it is concluded that there are two main conclusions, that the size of the company has a positive and negative effect on the company's capital structure. So the hypothesis in this study is stated as follows:

H4: It is suspected that there is a negative effect of firm size on capital structure company.

2.3.5 Asset utility to capital structure

The use of debt in the capital structure creates agency costs (Sheikh and Wang, 2011). Calculating the asset utility ratio for the strategic importance of agency costs. The higher this ratio, the more efficient managers will be in providing and utilizing assets (Eldomiaty and Azim, 2008) as well as reducing costs and operating efficiency (Jermias, 2008). Therefore, this ratio is expected to have a negative relationship with the debt use ratio, along with an increase in this ratio, the efficiency of managers in using assets increases and it results in more cash flow in the company therefore no need for external financing [4]. Thus, the research hypothesis can be formulated as follows:

H5: It is suspected that there is a negative influence between asset utilization and capital structure.

2.3.6 Capital structure on firm value

Empirical studies on the effect of capital structure on firm value have developed and with varying results. Most studies have a positive effect on the performance of publicly listed companies in developed country capital markets (see, for example, [28,29,30], but a recent study by Abdullah and Tursoi (2019) showed a relationship between weak relationship between capital structure and company performance. Furthermore, the wisdom of empirical studies in developing country capital markets produces different things, namely that capital structure has a negative effect on company performance (for example, see studies from Le and Phan, 2017; Salim and Yadav, [17]; and Tong and Green, [31])

So in the research proposed the following hypothesis:

H6: It is suspected that the capital structure has a negative effect on firm value.

2.4 Research Method

2.4.1 Population and sample

The population in this study are companies listed on the Indonesia Stock Exchange. The research sample was taken by purposive sampling and 73 companies were selected with a total of 222 observations in 4 sectors during 2017-2019. The data used is data that has been processed and is available on the websites of the Indonesia Stock Exchange, Ok Stock and Yahoo Finance.

2.4.2 Research variables and data analysis

2.4.2.1 Dependent variable

-Total Debt to Total Equity Ratio (DER).

Capital structure as the dependent variable, which is measured by comparing the amount of debt divided by the amount of own capital, with the formula:

$$DER = \frac{Total\ Debt}{Total\ Equity} = \dots\dots\ \%$$

-Price to Book Value (PBV)

Firm value as the dependent variable is measured by the comparison between the market price of shares per share divided by the book value per share. Measured by the following formula:

$$PBV = \frac{Price\ per\ share}{Book\ Value\ per\ share} = \dots\dots\ \%$$

2.4.2.2 Independent variable

-Effective Tax Rate (ETR)

Used to measure the effective tax rate paid by the company. The ETR variable is measured by dividing the tax paid by the profit before tax. The calculation formula is as follows:

$$ETR = \frac{Paid\ taxes}{Profit\ before\ tax} = \dots\dots\ \%$$

-Price Earning Ratio (PER)

This ratio is used to measure the company's growth opportunities, where the capital requirements needed depend on the prospects for the company's growth in the future. This variable is measured by the following formula:

$$PER = \frac{Stock\ price\ per\ share}{Earnings\ per\ share} = \dots\dots\dots times$$

-Return on Assets (ROA)

To measure the level of profitability of the company, namely to measure the company's ability to generate net profit after tax from each of the total assets invested. The ROA variable is an important indicator for companies and investors in assessing the company's ability to survive in the long term. ROA is calculated by the following formula.

$$ROA = \frac{Earnings\ After\ Tax}{Total\ Asset} = \dots\dots\%.$$

- Company Size (SIZE)

Companies with large assets indicate the company has a large cash flow and is captured as a positive signal for investors (Sutanto, 2007). The way to calculate company size is by

transforming the logarithm of the company's total wealth with the formula:

SIZE = Natural Logarithm of total assets

-Asset Utilization Ratio (AUR)

This variable is used to measure the efficiency level of wealth used in generating income or sales. This ratio is measured using the following formula:

$$AUR = \frac{Total\ Sales}{Total\ Asset} = \dots\dots times$$

2.4.2.3 Data analysis method

2.4.2.3.1 Descriptive analysis method

According to Siregar (2011: 125) "descriptive analysis method is a method that reviews by describing, describing, elaborating or outlining data so that it is easy to understand". Specifies the size of the data such as mode, mean and median values. Determine the size of data variability such as: variation (variance), level of deviation (standard deviation) and distance (range). Determine the size of the data form: skewness, kurtosis and box plots

2.4.2.3.2 Regression model

In this study the regression model is divided into two regression models as follows:

Model I (Capital Structure as dependent variable):

$DER_{i,t} = α + β_1RO_{i,t-1} + β_2ETR_{i,\ t-1} + β_3SIZE_{i,\ t-1} + β_4PER_{i,\ t-1} + β_5AUR_{i,\ t-1} + u_{it}$

Model II (Capital Structure as an independent variable):

$PBV_{i,t} = α + β_1ROA_{i,t-1} + β_2ETR_{i,t-1} + β_3SIZE_{i,t-1} + β_4PER_{i,t-1} + β_5DER_{i,t-1} + β_6AUR_{i,t-1} + u_{it}$

2.4.2.3.3 Model specifications

In the regression model estimation method using panel data can be done through three approaches.

a. Common Effect Model (CEM).

The regression model equation with Common Effect estimation can be written as follows:

$Yit = β0 + β1X1it + β2X2it + eit$

Where: Yt = dependent variable
β0 = intercept
β1, β2 = discriminating intercept
X1, X2 = independent variables
i = company name
t = year
e = errors

b. Fixed Effect Model (FEM)

This model is often also called the Least Squares Dummy Variable (LSDV) technique with the following equation:

$Yit = β0 + β1X1it + β2X2it + β3D1i + β4D2i + β5D3i + eit$

Where:
D1i, D2i and D3i are dummy variables for objects 1,2,3 and 0 for other objects.

c. Random Effect Model (REM)

This model is also called the Error Component Model (ECM) or the Generalized Least Square (GLS) technique with the following equation:

$Yit = 0 + β1X1it + β2X2it + vit$

Where: 0 is an unknown parameter indicating the average intercept of the population and vit is the disturbance variable.

In determining which the most appropriate estimate of the panel regression model to use, then the Chow Test, Hausman Test and LM Test were carried out.

2.4.3 Hypothesis testing

Hypothesis testing aims to explain the strength and direction of the influence of several independent variables on the dependent variable. Hypothesis testing is done by testing the significance of the independent variable (X) on the dependent variable (Y) either partially or jointly. In statistics, the hypothesis that we want to test will be compared with other hypotheses that are wrong and will be rejected later. The incorrect hypothesis is called the null hypothesis (Ho) and the correct hypothesis is called the alternative hypothesis (Ha). There are 3 tests performed, namely the t statistical test, or the partial test aims to test the regression coefficients individually. The F statistic test aims

to test whether all the independent variables included in the model have a joint effect on the dependent variable and the Coefficient of Determination test (R2), is used to measure how far the model's ability to explain the variation of the dependent variable [32:98].

3. RESULTS

3.1 Descriptive Statistical Analysis

Table 2 presents the results of the descriptive statistical analysis of the variables used in this study. The average or mean value for EPS is IDR 36.12, with a maximum and minimum value of IDR 784.00 and IDR -1,433.00, at PT. Hexindo Adiperkasa Tbk in 2019 and PT. Acset Indonusa Tbk in 2019. The average PER value is 294 times, the PER with a maximum and minimum value is 35,505 at PT. Sitara Propertindo Tbk in 2018 and a minimum PER value of -781 at PT. Ayana Land International Tbk in 2019. The mean PBV value is 4.44 times, with a maximum and minimum PBV value of 617 times at PT. Bintang Oto Global Tbk in 2019 and -15 times at PT. Trikomsel Ok Tbk in 2018. For the ROA variable with an average (mean) value of 0.74 percent, the maximum and minimum ROA values are 32 percent respectively at PT. Indonesian Paradise Property Tbk in 2019 and -149 percent at PT. Bakrie Telecom Tbk in 2018.

The mean ROE value is 5.33 percent, with a maximum and minimum ROE value of 42 percent at PT. Indonesian Paradise Property Tbk in 2019 and -149 percent at PT. Acset Indonusa Tbk in 2019. The average value of the NPM variable is -206.15 percent, with the maximum and minimum NPM values being 380 percent respectively at PT. Indonesian Paradise Property Tbk in 2019 and -22.558 percent at PT. Bakrie Telecom Tbk in 2017. The average value of the ETR variable is -0.03 (3 percent) with a maximum and minimum value of 1.00 (100 percent) each between PT. Fortune Mate Indonesia Tbk, PT. Mitra Energi Persada Tbk, and PT. Visi Media Asia Tbk in 2017. The minimum ETR value is -6 (600 percent) at PT. Hero Supermarket Tbk in 2019. The average value of the AUR variable is 0.63 times. The maximum and minimum values of the AUR variable are 9 times each at PT. Alakasa Industrindo Tbk in 2019 and your minimum AUR value is 0.00 times that of PT. Indocement Tunggal Perkasa bk, PT. Waskita Beton Precast Tbk, and PT. Asahimas Flat Glass Tbk.

The average value of the LSIZE variable is 7.92 with a maximum and minimum value of 12.00 respectively at PT. Telekomunikasi Indonesia Tbk in 2017, 2018 and 2019. The average value of the DER variable is 0.9549 or 95.49 percent with a maximum and minimum value of 14 times or 1,400 percent respectively at PT. Acset Indonusa Tbk in 2019 and a minimum DER value of -1.00 or -100 percent at PT. Bakrie Telecom Tbk, PT. Telekomunikasi Indonesia Tbk and PT. Arpeni Pratama Ocean Tbk Line Tbk in 2017. Finally, the average DAR value is 0.9504 or 95.04 percent. The maximum and minimum values of the DAR variable are respectively 23.00 or 2.300 percent at PT. Bakrie Telecom Tbk in 2017 and 0.00 is at PT. Indocement Tunggal Perkasa Tbk, PT. Asahimas Flat Glass Tbk and PT. Mark Dynamics Indonesia Tbk in 2017.

3.2 Estimation Model Testing

The research was conducted by taking samples of the 4 largest industries listed on the IDX, using panel data from 2017 to 2019. Panel data is a combination of cross-section data with time-series data. Thus, 3 panel data estimation models are used, namely the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM). The estimation results of the regression model using the three estimation models are presented in the following description.

3.2.1 Estimation model selection test

The first step is to choose between CEM and FEM by conducting the Cho test for Model 1 and Model 2 which are presented in Table 3. The results of the cho test above show that in model 1, the F test value is 6.8761 with a probability value of 0.0000 <0.05, and in model 2, the F test value is 1.4796 with a probability value of 0.0248 <0.05, it can be concluded that FEM is more appropriate to use to estimate the model in this study.

The next step is to compare FEM with REM by testing the Hausman test. From the results of the Hausman test presented in Table 3 that in model 1, the chi-square statistical value is 14.5544 with a probability of 0.03966 <0.05, and in model 2, the chi-square statistical value is 11.3023 with a probability of 0.04917 <0.05 indicating that Ho is rejected and Ha alternative is accepted, then the right model to estimate the model in this study is

Table 2. Descriptive statistics of research variables

	EPS	PER	PBV	ROA	ROE	NPM	ETR	AUR	LSIZE	DER	DAR
Mean	36.12613	294.4730	4.441441	0.743243	5.328829	-206.1577	-0.031532	0.630631	7.927928	0.954955	0.950450
Median	18.50000	12.00000	1.000000	2.000000	4.000000	4.000000	0.000000	0.000000	8.000000	1.000000	0.000000
Maximum	784.0000	34505.00	617.0000	32.00000	42.00000	380.0000	1.000000	9.000000	12.00000	14.00000	23.00000
Minimum	-1433.000	-781.0000	-15.00000	-149.0000	-149.0000	-22558.00	-6.000000	0.000000	4.000000	-1.000000	0.000000
Std. Dev.	149.0353	2505.436	41.37735	18.20799	15.36126	1938.522	0.619368	1.164544	1.612798	1.367942	2.910781
Skewness	-3.429665	12.06197	14.71351	-5.884450	-4.399875	-9.999934	-5.477514	4.196241	0.130131	4.450291	5.761174
Kurtosis	47.45491	160.0390	218.3278	45.01340	47.94681	105.6449	48.93400	27.42173	2.703902	39.60871	37.44417
Observations	222	222	222	222	222	222	222	222	222	222	222

Table 3. Estimation model testing results

Cho-test:						
Redundant Fixed Effect Tests	**Model 1**			**Model 2**		
Effects Test	**Statistic**	**d.f**	**Prob**	**Statistic**	**d.f**	**Prob**
Cross-section F	6.876***	(73.139)	0.0000	1.479**	(73.138)	0.0248

Hausman Test:						
Correlated Random Effects-Hausman Test	**Model 1**			**Model 2**		
Test Summary	Chi-Sq. Statistic	Chi-Sq d.f	Prob	Chi-Sq Statistic	Chi-Sq d.f	Prob
Cross-section random	14.554**	9	0.0396	11.302**	9	0.04917

*Notes: ** = indicates the significance of the coefficients at the 5% level.*

FEM. The next step after obtaining the right estimation model to estimate the model in this study, namely by using FEM, is to test the classical assumptions of the FEM.

3.2.2 Hypothesis test results

The t test or partial test aims to test the regression coefficients individually. This test was conducted to determine how far the influence of one explanatory variable individually in explaining the dependent variable [32: 98]. The results of the t test are shown in Table 4. The results showed that of the 9 (five) independent variables used in this study, all have a significant effect on the dependent variable.

The constant value (α) is -0.793297, meaning that if, X1=X2=X3=X4=X5 = 0, then the value of Y = -0.793297. Based on the t statistical test, the regression coefficient of the AUR variable is 0.323955 and with the results of the t-value is 15.36866. So by using a confidence level of 95% (α = 0.05), it can be concluded that the AUR variable has a positive and significant effect. This means that if there is an increase of 1 percent in the increase in the use of assets in generating sales, it will increase the ratio of the use of debt to equity by 0.323955 percent as measured by the DER variable.

In the earnings per share (EPS) variable with a regression coefficient of -0.002759 and the

results of the t-count statistic are -5.00283. This means that if there is an increase of Rp. 1.00 in earnings per share, it will be able to decrease the use of debt by 0.002759. Then the variable effective tax rate (ETR) shows a significant negative result, with a regression coefficient of -0.095753, and t- value of -2.229183. This means that if there is an increase in the effective tax rate by 1 percent, it will reduce the use of debt by -0.095753 percent. Furthermore, the LSIZE variable also has a significant positive effect on the ratio of debt usage. If there is an increase in the company's total assets by 1 percent, the debt-to-equity ratio will increase by 0.220580. The variable net profit margin (NPM) has a significant negative effect on the use of debt, if there is an increase of 1 percent in NPM, it will reduce the ratio of use of debt by -0.000141 percent.

Furthermore, the PBV variable has a significant negative effect on debt, that is, if there is a decrease in PBV by 1 percent, it will result in a decrease in the ratio of debt usage by -0.001021. Then, for the variable stock price ratio to earnings per share (PER) also has a significant negative effect on the ratio of debt usage. Where if there is an increase of 1 percent in PER, it will cause a decrease in the use of debt by -0.000827 percent. ROA and ROE variables have a significant positive and negative effect on the ratio of debt usage. Where if the rate of return on assets (ROA) increases by 1 percent it will

Table 4. Hypothesis test results

Dependent Variable: DER
Cross-sections included: 74
Total panel (balanced) observations: 222

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.7932	0.092	-8.600***	0.0000
AUR	0.3239	0.0210	15.368***	0.0000
EPS	-0.0027	0.000	-6.5002***	0.0000
ETR	-0.0957	0.042	-2.2291**	0.0274
LSIZE	0.2205	0.014	15.630***	0.0000
NPM	-0.0001	5.99E	-2.356**	0.0198
PBV	-0.0010	1.81E.	-56.391***	0.0000
PER	-8.27E-	3.92E	-2.111**	0.0365
ROA	0.0301	0.006	4.640***	0.0000
ROE	-0.0245	0.002	-9.595***	0.0000
R-squared	0.833379	Mean dependent var		1.541715
Adjusted R-squared	0.735084	S.D. dependent var		2.091391
S.E. of regression	1.023261	Sum squared resid		145.5418
F-statistic	8.478367	Durbin-Watson stat		3.052711
Prob(F-statistic)	0.000000			

*Notes: ***, **, and * indicate the significance of the coefficients at the 1%, 5%, and 10% levels, respectively*

increase the ratio of using debt by 0.030161, whereas if there is an increase of 1 percent the rate of return on equity (ROE) will reduce the ratio of using debt by -0.024533.

Table 5 presents the results of the t-test statistic for Model 2, firm value as measured by the PBV variable as the dependent variable shows that capital structure (DAR) has a significant negative effect on firm value with a t-value of -4.169549 and a regression coefficient of -0.161674. This value indicates that if there is an increase in the ratio of debt to total assets by 1 percent, it will reduce the value of the company by -0.161674. For the AUR variable, there is a significant positive effect on firm value, with t-value of 7.548899 and a regression coefficient of 0.375009. This value states that if there is an increase in the ratio of assets used in generating income by 1 percent, it can increase the value of the company by 0.375007. The EPS, ETR, LSIZE and NPM variables also show a significant negative effect on firm value. If there is an increase of 1 percent in the four variables, it can reduce the company's value by -0.013716 percent, -0.451818 percent, -0.884406 percent, and -0.001423 percent. Then, for the two variables ROA and ROE have a significant positive effect on firm value with t-valuesof 3.619565 and 7.081100 respectively and regression coefficients of 0.187165 and 0.089934. The value reveals that if there is an increase in ROA and ROE by 1 percent, it will be able to increase the company's value by 0.187165 percent and 0.089934 percent.

Table 4 for model 1 and Table 5 for model 2 above shows the results of the simultaneous test (F test) having F-value of 8.478367 respectively with a probability result of 0.000 <0.05, and 5.55444 with a probability of 0.000 <0.05, so it can be it can be concluded that there is a significant influence of the independent variables simultaneously on the dependent variable.

Based on Table 4 for model 1 and Table 5 for model 2 above, the coefficient of determination (R2) is 0.833379 and 0.769623 percent, respectively. In conclusion, the ability of the independent variables to explain the capital structure used and firm value is quite large in the two models, namely 83.33 percent and 76.96 percent respectively, while the rest are influenced by factors other than the variables used in this study.

Table 5. Hypothesis test results

Dependent Variable: PBV
Cross-sections included: 74
Total panel (balanced) observations: 222

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.969	1.8124	6.052	0.0000
AUR	0.3750	0.0496	7.548***	0.0000
DAR	-0.161	0.0387	-4.169***	0.0001
DER	-0.046	0.2648	-0.176	0.8605
EPS	-0.013	0.0025	-5.360***	0.0000
ETR	-0.451	0.0900	-5.018***	0.0000
LSIZE	-0.884	0.2543	-3.476***	0.0007
NPM	-0.001	0.0005	-2.749	0.0068
PER	5.03E	8.66E-	0.581	0.5621
ROA	0.187	0.0517	3.619***	0.0004
ROE	0.089	0.0127	7.081***	0.0000

R-squared	0.769623	Mean dependent var		20.36404
Adjusted R-squared	0.631063	S.D. dependent var		62.83450
S.E. of regression	26.23361	Sum squared resid		94971.89
F-statistic	5.554444	Durbin-Watson stat		2.712939
Prob(F-statistic)	0.000000			

*Notes: ***, **, and * indicate the significance of the coefficients at the 1%, 5%, and 10% levels, respectively*

4. DISCUSSION

The results of statistical analysis of panel data in this study using FEM in both panel data regression models namely model 1, using the DER variable as a proxy for the company's capital structure and in model 2 using the DER variable as a proxy for firm value. The results of the study have revealed that the factors that influence the capital structure are the variables AUR, EPS, ETR, LSIZE, NPM, PBV, PER, ROA and ROE in model 1. There are three (3) variables that have a significant positive effect on the company's capital structure namely the variables AUR, LSIZE and ROA. The results of the research reveal valuable information that if the company is able to optimize the use of assets in generating sales and increasing the number of assets and increasing the ability to generate returns on assets, then the company gains the trust of capital owners and creditors to invest capital and provide loans to the company.

The results of the study are in line with previous research conducted by Alipour et al. [4], which revealed that the factors that influence the capital structure of public companies in Iran are Firm SIZE, ROA, AUR and Tax rate, but the influence of Firm SIZE, ROA and Tax rate variables is a significant negative effect on capital structure, and only AUR has a significant positive effect on capital structure. Meanwhile, research conducted by Arief et al. [33] found that SIZE and tax rate had a significant positive effect on the capital structure of public companies in Indonesia. Mursalim, et al. [7] revealed that the variables Profitability and SIZE also have a positive effect on capital structure in 3 Asean countries, namely Indonesia, Malaysia and Thailand. In contrast to Delceure's study (2007) that ROA has a significant negative effect on capital structure, while total assets have a significant positive effect on capital structure.

The results of this study also partially support the study conducted by Ming et al. (2017), namely that company size has a significant positive effect on capital structure for all countries (Malaysia, Singapore and Thailand), while the profitability variable has a significant negative effect on capital structure for Malaysia. and Singapore, but insignificant for Thailand. Furthermore, this study also supports the study of Baker and Wurgler [34] which states that the company's capital structure is closely related to the historical market value of the company's equity, as measured by the PBV variable.

In model 2, that capital structure variable, which is proxied as the ratio of total debt to total assets (DAR) has a significant negative effect on firm value which is proxied by stock price to book value of own capital (PBV). The research results support the studies conducted by Le and Bich, [17], and Dada and Ghazali [16]. According to Le and Bich (2017) they state that in contrast to developed countries, there is a tendency in the capital markets of developing countries that the impact of using debt has a negative effect on firm value, because the benefits of tax savings may be smaller than the costs of financial difficulties. In addition, the role of debt monitoring is not substantial due to severe information asymmetries and underdeveloped financial systems. Meanwhile, Chadha and Sharma's [18] study revealed that capital structure has no influence on company performance in manufacturing companies listed on the Bombay Stock Exchange (BSE) in India [35,36].

The development of the ratio of debt to equity in public companies in Indonesia, shows a very fluctuating trend, from 2017 to 2019 in eight (8) industries, outside the financial industry the average was 674.50 percent, 16.62 percent, and 45, 50 percent. The largest contribution of the three (3) uses of debt to equity in 2017 was Meiscelianeus Industry with 35.53 times, Agriculture industry with 10.24 times, and Basic Industry and Chemicals with 2.52 times. In 2018, there were 1.66 times in Basic Industry and Chemicals, 1.12 times in Mining Industry, and 1.07 times in the Consumer Goods Industry. Then in 2019 the ratio of debt to equity was greatest in Basic industry and Chemical by 1.55 times, Property, Real Estate and Building by 1.09 times and Agriculture industry by 0.75 times (IDX, 2020).

The very high ability to borrow (674.50 percent) in 2017 shows that the trust in creditors for public companies in Indonesia is very good, so that certain sectors benefit from using debt sources from various parties. In line with the Pecking order theory, companies tend to choose funding according to the order of risk. From the development of the debt ratio used, companies tend to use debt as the first alternative when internal funding sources in the form of retained earnings are insufficient. Furthermore, the trade-off theory states that the risk level of using debt will increase in line with the increase in debt issued, so the company then adjusts the level of debt used, so that in the following year the ratio of using debt decreases to an average

level, reaching a range of 45.50 percent in 2019.

5. CONCLUSIONS AND RECOMMENDA-TIONS

Based on analysis and discussion using a panel data approach on public companies in the 4 largest sectors listed on the IDX, 73 companies were selected with a total of 222 observations during 2017-2019. The proper estimation model in explaining the relationship between the independent variable and the dependent variable is using the Fixed Effect Model estimation method. All nine (9) independent variables used are able to explain the determinants of the company's capital structure in model 1. The independent variables that have a significant positive effect on capital structure are the variables AUR, LSIZE and ROA, while the independent variables that have a significant negative effect are EPS, ETR, NPM, PBV, PER and ROE. For model 2, that of the ten (10) independent variables used to explain firm value, there are eight (8) that have a significant effect. The independent variables that have a significant positive effect are the AUR, ROA and ROE variables, while the independent variables that have a significant negative effect are the DAR, EPS, ETR, LSIZE, and NPM variables.

The statistical test results above reveal valuable information that if the company is able to optimize the use of assets in generating sales and increasing the number of assets and increasing the ability to generate returns on assets. Then there will be a positive response from the owners of capital and creditors to invest capital and distribute loans to the company.

The development of the use of debt in public companies in Indonesia tends to be high and fluctuating. Companies tend to use debt as the first alternative when internal funding sources in the form of retained earnings are insufficient. The risk level of using debt will increase in line with the increase in debt issued, so the company then adjusts the level of debt used, so that in the following year the ratio of using debt decreases to an average level, reaching a range of 45.50 percent in 2019.

Based on the results of the analysis and discussion, it is suggested that in determining its capital structure the company should pay attention to the variables that have a positive and negative impact on the decision to determine the ratio of using its debt. As long as the company is able to achieve a growth trend with good business prospects, it is recommended to use sources of funding from debt, but if the company's growth trend tends to decrease, it is better to seek funding sources from its own capital.

To the capital market authorities and decision makers to always monitor developments in the use of public company debt because of fears that using very high debt ratios can be feared that there will be manipulative actions by providing unreasonable information about the company's financial condition, because a high level of debt use will increase risk. financial distress and default to the detriment of creditors.

Investors are advised to pay attention to the significant factors in determining a company's capital structure and how it affects the ratio of debt usage to company value. Investors are also advised not to invest their funds in companies that have a very high debt ratio, because in addition to burdening the company's cash flow, it will also have the potential to lead to bankruptcy if the use of debt is not managed properly.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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