Analysis of Capital Structure Determinants of Property Companies Listed on Indonesia Stock Exchange Using Internal, External, and Lag-One Variables to Measure Speed of Adjustment

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ABSTRACT

The goal of the paper is to determine the impact of lag-one, liquidity, land bank, interest coverage ratio, asset turnover, risk, cashflow, world oil prices, currency exchange rates, and economic growth to capital structure. Data were retrieved from 26 listed property companies in Indonesia Stocks Exchange 2010 – 2019. The data analysis is conducted using Microsoft Excel and Eviews 10 Software. Results of the analysis were lag-one, land bank, risk, cashflow, and currency exchange rates have significant impact on capital structure. It can be concluded that property companies have considered lag-one, land bank, risk, cashflow, and currency exchange rates in determining the capital structure.

CCS CONCEPTS

• **Mathematics of computing** → Number-theoretic computations.

KEYWORDS

debt to equity ratio, lag-one, liquidity, land bank, interest coverage ratio, asset turnover, risk, cashflow, world oil prices, currency exchange rates, and economic growth

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1 INTRODUCTION

1.1 Research Background

Nowadays, capital structure is an interesting topic to be discussed. Capital structure (Debt to Equity Ratio) is one of the indicators to know whether the company has managed its debt and capital effectively and optimally, so that it can be a good capital for the company to evolve the business and increase its profits. Recent years, the capital structure of property companies in Indonesia, especially those listed on the Indonesia Stock Exchange continues to decline until 2019, the capital structure of these companies only grew by 2.64%, continuing to fall since 2015 after earlier in 2014, the capital structure of these companies grew by 23.46%. Low growth of capital structure in 2019 indicates a decrease in debt growth in corporate financing. In fact, increasing debt is a one solution for corporate's financing, especially for land bank's financing that support the company's business. Increased debt is also a component in achieving an optimal capital structure, where through debt, the company is able to reduce its cost of capital. The phenomenon raises the question, if so, what exactly affects the company in suckling the composition of its capital structure? Many theories about capital structure and many studies have been conducted on determining the structure of corporate capital in order to form an optimal capital structure of a company. However, we do not know clearly what and how the determinants of capital structure affect the company in arranging the capital structure which in this research described by the debt to equity ratio of property companies in Indonesia. Novelty of this paper is discussion of speed adjustment in industry property.

1.2 LITERATURE REVIEW

Capital structure is important in every business and company. According [1] concluded through the results of their research that the structure of capital has an influence on the performance of property

companies in Indonesia. Regarding the structure of capital, [2] continued the theory of the capital structure in which he concluded that the company would issue shares (to meet the permanent needs of capital) and bonds (as the company's long-term debt capacity). [3] found that property companies in Vietnam prefer to use debt over equity to finance their capital structures. [4] proves that property companies tend to issue new shares in capital structure because the level of ownership of shares by management still tends to be low.

Furthermore, in composing of optimal capital structure, it must be known first the components that form a capital structure. According to [5], the company's sources of funds are divided into two types, such as internal and external sources. From the internal side there is retained earnings and from the external side, the company can issue debt or issue new shares. From the components, it must be chosen appropriately to achieve an optimal capital structure. However, it's possible if capital structure not always achieve optimal position, because there are many changes that require the company to make adjustments to restore its capital structure back to optimal position. A company that experiences a deviation in its capital structure will return its capital structure to an optimal structure [6]. This research supported by [7] where this study proves that there is a difference in speed of adjustment to the excess or deficiency of capital structure, especially in the debt section. If there is a difference, then there should be a relationship between the speed of adjustment and the capital structure.

Taggart [2] has started research on capital structure using mathematical calculations based on data from the company's balance sheet. In his research, he concluded the ratio of the market value of debt and equity as determinants of capital structure, including variables that are interconnected with the company's balance sheet. [8] examined the determination of capital structure in Pakistan using samples from the automotive, machinery and electricity industries. They use the new variables of liquidity, tax, and cost of debt. As a result, companies with good liquidity conditions and depreciation allowances will use retained earnings every year, followed by financing from debt for company's growth and using equity issuance (shares) as the last step. This is supported by research by [9] where quick ratio and current ratio as a liquidity measurement tool have an influence on the capital structure of the company. [10] also found that 58.9% of determinants of property capital structure in Indonesia are size, liquidity, growth, opportunity, tangibility, and business risk.

If the company does prefer debt financing compared to equity issuance in accordance with the pecking order theory then interest coverage is an aspect that also affects the structure of capital in accordance with the emipirical study conducted by [11] mentioned that there is a positive relationship between interest charges coverage and the company's capital structure. [12] found that interest coverage has no relation to capital structure. In fact, debt financing is used to finance assets, one of which is a land bank that becomes a unique variable in property companies. [3] used this variable in research, determining the capital structure of property companies in Vietnam and found a positive relationship to the structure of capital. On the other hand, [13] also found that there was a positive significant relationship between land banks and capital structures. Similarly, with other assets, if debt is used for asset financing then the effectiveness of the use of assets will be the company's provision to pay interest on its debt. The effectiveness of asset use is measured through asset turnover. [14] states that this variable has a positive influence on the structure of capital on energy companies in Russia. On the other hand, [15] found that asset turnover had no significant influence on the capital structure.

Interest payments on debt and principal must be ensured to run well by ensuring that the company's cash flow is not deficit. [16] revealed from his research that cashflow has a negative relationship to capital structure. In addition, there is also a relationship between the company's cashflow to the capital structure (7]. If the company is unable to pay its debt through cash flow it will increase the risk of the company.

Externally, [13] states that GDP has a significant positive influence on the capital structure of the company while [16] said that economic growth has no influence on the capital structure of the company. A good economy is also reflected in foreign exchange rates and [16] examined the relationship of foreign exchange rates to capital structures and found negative relationships. According to him, there are times of crisis and exchange rates increase, companies tend to reduce loans so as not to burden the company. In addition to currency exchange rates, the world's oil is also associated with a good economy because its fluctuations depend on the economy. [17] found that world oil prices have a negative influence on the capital structure of companies.

All this variable lead to how to measure speed of adjustment. Usually, it used to measure how long it takes for debt side (in Debt to Equity Ratio / Structure Capital) to reach its optimal capital structure. [20] calculated by finding the difference between 1 and the regression coefficient of leverage lag one, which in this case uses the debt to equity ratio. Then, the results is multiplied by 12 (1 years / 12 months). This show how long it takes (in month) speed of adjustment to reach optimal capital structure.

2 METHODS

The model used in this study is panel data model to measure and know the relationships of independent variables to determine the structure of capital. The method used in this panel data model is the fixed effect model because the data used in this study is not random according to Gujarati & Porter and Greene (in Manurung, 2020). Fixed effect model can be written through the following formula:

$$Y_{i,t} = \beta_{1i} + \beta_2 X_{1i,t} + \beta_3 X_{2i,t} + \mu_{i,t}$$

$$\mathrm{i} = 1, 2, \ldots, \mathrm{k};\ \mathrm{t} = 12, \ldots, \mathrm{n}$$

In this study, the above model can be interpreted through mathematical models more specifically as follows:

$$DER_{i,t} = b_0 + b_1 DER_{i,t-1} + b_2 LIQ_{i,t} + b_3 LBA_{i,t} + b_4 ICR_{i,t}$$

$$+ b_5 ATR_{i,t} + b_6 RIS_{i,t} + b_7 CFL_t + b_8 OIL_t + b_9 XCR_t + b_{10} GDP_t + \varepsilon_{i,t}$$

Where DER represents the structure of corporate capital. DERt-1 describes variable lag-one, LIQ is liquidity as measured through current ratio, LBA describes land bank, ICR describes interest coverage ratio, ATR describes asset turnover, RIS describes Risk, CFL describes Cashflow, OIL describes the world oil price, XCR describes currency exchange rates, GDP describes economic growth, while b0, b1,..., b10 is the model coefficient.

This study did not use the classical assumption test, this is because the use of panel data in this study has advantages according to Batalgi [18] so that through excess the classic assumption test can be eliminated. Furthermore, in this study uses 3 stages namely the first, hypothesis testing through the significance test F-test and t-test to find out whether variable independent together/simultaneous for F-test and partially/each, while for t-test has an effect on dependent variables. There is also a determination correlation coefficient test to show the ability of regression lines in explaining variations in dependent variables.

Second, correlation matrix table is carried out with the aim of knowing how independent variables affects each other. Finally, multiple linear regressions is performed using fixed effect models to determine the influence and significance of independent variable influences on dependent variables.

3 RESULTS AND DISCUSSION

Based on the table 1, as a result of the classical assumption test, the probability data (F-statistic) is worth 0.000000 which when compared to a significance value, smaller than 0.05. Thus, simultaneous significance tests in this study showed that independent variables (lag-one, liquidity, landbank, interest coverage ratio, asset turnover, risk, cashflow, oil price, exchange rate and economic growth) together had a simultaneous influence on the dependent variables in this study, namely capital structure. Related to the coefficient of determination correlation of R-squared adjusted value obtained by 0.954229 or 95.42% which means that dependent variables can be explained by independent variables used in this study, namely liquidity, land bank, interest coverage ratio, asset turnover, risk, oil price, exchange rate and economic growth while the rest is worth 4.58% is explained by variables other than regression equations created or other variables that are not included in the study.

Continue the classical assumption test, on the t-test to examine the value of the effect of the independent variable partially on the dependent variable. Through the table above, it can be concluded that variable lag one, land bank, risk, cash flow, and exchange rate have a partially significant effect on the variable structure of capital. While variable liquidity, interest coverage ratio, asset turnover, oil price, and GDP have significance greater than 0.2 and have no partially significant effect on capital structure variables.

The last step is a multiple linear regression test, which the model describes the relationship of the increase or decrease of an independent variable to a dependent variable. At lag-one coefficient is positive, each increase in speed of adjustment by 1% then the capital structure increases by 65.38 points. This research is in accordance with [6] where it is stated that the structure of capital that undergoes deviation will also return to the optimal capital structure. Thus, a company that is able to control its speed adjustment well indicates that the company has a good capital structure, so it does not take long to return to its ideal position.

The liquidity's coefficient is negative, means that every 1% liquidity addition, the capital structure will be reduced by 0.09 points. This research is also in line with [10], where they found that liquidity negatively affects the capital structure. The negative relationship between liquidity and capital structure also proves that pecking order theory also applies to property companies in Indonesia. In another variable, the land bank's coefficient is negative. Thus, every land bank addition of 1% will reduce the capital structure by 0.2 points. This research is in line with [3] where land banks have a positive influence on capital structure, this is because the more land banks company has, will increase company needs of funds for land acquisition and treatment cost. Similar to land banks, the interest coverage ratio has a negative and insignificant coefficient value where every addition of interest coverage ratio of 1% then the capital structure will be reduced by 6.19E-05 points, in line with [12] where their interest coverage ratio does not have a significant relationship to the structure of capital. This situation can happen because the company's interest coverage ratio is considered sufficient so, it can cover the loan interest on a regular basis. Similar to the interest coverage ratio, asset turnover has a negative coefficient where every addition of asset turnover by 1% then the capital structure will be reduced by 5,436 points. This research is in line with [15] where they found that asset turnover has no significant influence on capital structure. Furthermore, risk also has a negative and significant value coefficient where every addition of risk of 1% then the capital structure will be reduced by 6.25E-05 points. The negative relationship between risk and capital structure indicates that this condition is in line with the trade-off theory where the higher risk of the company will make the creditur hesitates to provide loans to the company. The cashflow variable has a negative value effect where each addition of cashflow 1% will bring down the capital structure by 1.57 points. This research is in line with [19], [15], and [7] where they found that cashflow has an influence on the capital structure of the company, which means that if the company has a good financial management it will also support management of the company's capital structure. Unlike cashflow, oil has a positive and insignificant coefficient. This finding is not in line with [17] where they found the influence of world oil prices on the structure of capital, but the companies studied are energy sector companies, so they have a direct relationship with the world's oil price. In property sector in Indonesia, in fact the world oil price does not have a significant relationship to capital structure. Currency exchange rate also have a positive and significant influence. Healthy currency exchange rate growth can drive the growth of capital structure. Along with the rising exchange rate of currencies, it indirectly describes good international trade as well. This will encourage, especially the property sector in Indonesia to continue to grow. Lastly, variable GDP has a negative and insignificant influence, in line with [16] which states that economic growth has no influence on the capital structure.

Speed of adjustment in this study is calculated by 1 – 0.653829 (coefficient of model). Speed of adjustment is 4.15405 or 4 months 5 days. It means, that debt to equity ratio will go back for the target / optimal in around 4 months 5 days. From this numbers, we can conclude that debt to equity ratio will always return to target when it in not in optimal (not static).

4 CONCLUSION AND RECOMMENDATIONS

After conducting research and analysis of 26 property companies in Indonesia listed on Indonesia Stock Exchange based on the

Table 1: Classical assumption test (F-statistic)

Dependent Variable: DER?

Method: Pooled EGLS (Cross-section weights)
Date: 01/24/21 Time: 22:47
Sample (adjusted): 2011 2019
Included observations: 9 after adjustments
Cross-sections included: 26
Total pool (balanced) observations: 234
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.647281	0.578698	-1.118513	0.2647
DER?(-1)	0.653829	0.038144	17.14111	0.0000
LIQ?	-0.000862	0.003257	-0.264688	0.7915
LBK?	-0.001990	0.000981	-2.029182	0.0438
ICR?	6.19E-07	2.98E-06	0.207382	0.8359
ATR?	-0.054635	0.050371	-1.084651	0.2794
RIS?	-6.25E-07	4.65E-07	-1.345519	0.1800
CFL?	-0.015688	0.007082	-2.215278	0.0279
OIL	0.003303	0.018983	0.173983	0.8621
XCR	0.090409	0.054018	1.673704	0.0958
GDP	-0.162592	1.847252	-0.088019	0.9300
Fixed Effects (Cross)				
_1–C	0.184340			
_2–C	-0.101621			
_3–C	-0.003584			
_4–C	-0.047827			
_5–C	0.876389			
_6–C	0.017165			
_7–C	-0.041288			
_8–C	0.105773			
_9–C	-0.118326			
_10–C	-0.048267			
_11–C	-0.107545			
_12–C	-0.035109			
_13–C	-0.138291			
_14–C	0.074155			
_15–C	-0.129285			
_16–C	0.021877			
_17–C	0.125654			
_18–C	-0.059461			
_19–C	-0.129874			
_20–C	-0.099762			
_21–C	-0.080149			
_22–C	-0.058558			
_23–C	-0.132233			
_24–C	-0.106801			
_25–C	-0.122121			
_26–C	0.154748			

Table 1: *Continued*

Effects Specification			
Cross-section fixed (dummy variables)			
Weighted Statistics			
R-squared	0.961104	Mean dependent var	0.672974
Adjusted R-squared	0.954229	S.D. dependent var	0.866056
S.E. of regression	0.164527	Sum squared resid	5.359656
F-statistic	139.7873	Durbin-Watson stat	1.881126
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.880437	Mean dependent var	0.360716
Sum squared resid	7.178581	Durbin-Watson stat	1.519858

company's financial statement data published in 2010-2019, there are some conclusion in this research. First, variable lag-one (speed of adjustment), risk, and currency exchange rates have a positive and significant impact on the capital structure of property companies in Indonesia. Second, variable land banks and cashflow have a significant and negative influence on the capital structure of property companies in Indonesia. Third, variable liquidity, asset turnover, and economic growth have an insignificant and negative influence on the capital structure of property companies in Indonesia. Fourth, variable interest coverage ratio and world oil prices have an insignificant and positive influence on the capital structure of property companies in Indonesia.

Some suggestions may be given in relation to the conclusions resulting from this study. First, the company is able to focus on internal variable management such as land banks, risk and cashflow to maintain an optimal capital structure. Second, lenders can consider lending by focusing on three variables that have significant capital structure, namely land bank, risk, and cashflow. Third, for regulators, can issue rules that support the development of property companies in Indonesia such as risk management. Finally, for academics, research can be developed into a wider realm such as property companies that are not listed on the Indonesia Stock Exchange.

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