The Effect of Profitability, Leverage, Liquidity, Operating Capacity on the Altman Z Score Method in the Construction Industry Listed on the Indonesia Stock Exchange in 2015-2019

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Abstract:- The research purpose is to analyze the effect of profitability, leverage, liquidity, operating capacity on Altman Z Score Method. The population in this study are construction companies listed on the Indonesia Stock Exchange for the 2015-2019 period. The research data is secondary data with an observation period of 5 years. The sampling method used is purposive sampling, where from all construction companies listed on the Indonesia Stock Exchange 14 companies that report their financial statements during the study period are taken. The data analysis method used is Fixed Effect Model panel data regression. The results of this study indicate that the leverage has a significant negative effect and the profitability, liquidity, operating capacity has a significant positive effect on Altman Z Score Model.

Keywords:- Profitability, Leverage, Liquidity, Operating Capacity and Altman Z Score Method.

I. INTRODUCTION

Business growth over the past 5 years is facing a rapid increase. Excellent and experienced businesses will benefit more from the widespread effects of globalization. However, as a growing business or a national scale business, it is difficult to compete with foreign companies, so the impact is that small-scale companies experience a financial crisis in their companies.

A company will experience financial distress before the company goes bankrupt. Because the financial situation that occurs in the company is in a critical condition, it is said that a company is experiencing a decrease in funds in running its business due to a decrease in revenue.

The phenomenon that has occurred so far is that there are 14 construction industries listed on the Indonesia Stock Exchange and are samples. Based on data from the company's financial statements, it shows that the income received during the 2018 and 2019 periods decreased, resulting in a negative net profit. This phenomenon shows that the company is experiencing financial difficulties.
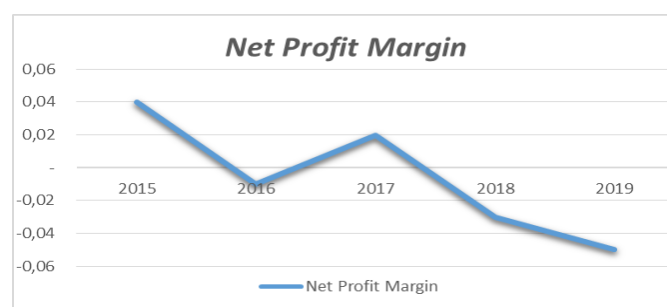
Source: Indonesia Stock Exchange 2015-2019 (www.idx.co.id)

The analysis of the company's financial difficulties provides an explicit explanation to stakeholders regarding the level of funding and in drawing conclusions. Thus, this analysis is not only beneficial for stakeholders but also beneficial for the company itself. Financial ratios are designed to retrieve information simply by examining financial statements (Ehrhardt and Brigham, 2011).

The results of observations carried out by Chrissentia, Syarief (2018), prove that the profitability ratio has a negative impact on financial difficulties. This means that high profitability proves the company's ability to manage assets properly and is able to cover costs and generate large profits.

Observations conducted by Ratna & Marwati (2018) prove that leverage has a negative impact on financial difficulties. Because all companies facing financial difficulties have large amounts of assets so that the company is able to pay off obligations using its assets. Then the results of observations made by Andre and Taqwa (2014) found that liquidity has a relevant impact in projecting financial difficulties.

The activity ratio shows how the company uses asset sources to drive the company's operations or the management of company assets. The existence of a high total asset turnover within the company shows that the company has an adequate budget for various operational needs of the company. Observations carried out by Widhiari & Merkusiwati (2015) found that TATO has a relevant negative impact on financial difficulties in the manufacturing industry listed on the IDX in 2010-2013. This observation aims to determine the effect of profitability ratios, leverage ratios, liquidity ratios, operating capacity on financial difficulties in

the construction industry listed on the Indonesia Stock Exchange 2015-2019.

II. LITERATUR REVIEW

A. Financial Distress

According to Platt (2002), financial distress is a company's financial condition when it is in a crisis position. So, financial distress is a situation when a company faces financial distress, especially with regard to financial liquidity so that the company cannot conduct its business properly and does not fulfill its obligations.

B. Altman Z-Score Method

Altman (1968) describes the Altman model based on discriminant multiplication analysis or MDA and the formula will be interpreted into a predetermined model. The Z-Score model (1968) is a multivariable formula to measure the potential for bankruptcy of a company.

There are three forms of discriminant functions, including:

- Model 1 (For IPO Manufacturing Industry)

This model was described in 1968 as indicated for the IPO manufacturing industry. According to Sihombing (2018) the formula includes:

$Z = 1.2\ X1 + 1.4\ X2 + 3.3\ X3 + 0.6\ X4 + 0.9999\ X5$

Information:

$X1$ = Working capital / Total Assets
$X2$ = Retained Earnings / Total Assets
$X3$ = Profit before interest and taxes/ Total Assets
$X4$ =Market value of equity/Total Amoun of debt
$X5$ = Income / Total assets

- Model 2 (Private Manufacturing Industry)

This model described in 1983 indicated the private manufacturing industry. The X4 variable in this model uses the book value of shareholder equity because the private manufacturing industry does not yet have a market value of equity. This is because not all industries have conducted an IPO and do not yet have a market value. According to Sihombing (2018) the formula for companies that are not IPOs include:

$Z = 0.717\ X1 + 0.847\ X2 + 3.107\ X3 + 0.420\ X4 + 0.988\ X5$

Information

$X1$ = Working capital / Total Assets
$X2$ = Retained Earnings / Total Assets
$X3$ =Profit before interest and taxes/Total Assets
$X4$ = Total Equity / Total Debt
$X5$ = Income / Total Assets

- Model 3 (Non-Manufacturing Industry)

This model was describted in 1995 to project bankruptcy on a wider range of industries, such as manufacturing, non-manufacturing. Form 3 for X5 or income/total assets is omitted. According to Sihombing (2018) the formula is as follows:

$Z = 6.56\ X1 + 3.26\ X2 + 6.72\ X3 + 1.05\ X4$

Information:

$X1$ = Working capital / Total Assets

$X2$ = Retained Earnings / Total Assets
$X3$ = Profit before interest and taxes/ Total assets
$X4$ = Total Equity / Total Debt

C. Profitability

According to Kasmir (2013) profitability is a scale that calculates the company's performance in order to generate profits within a certain time. Profitability ratios related to sales use the size of the profit margin and expenses ratio.

There are two kinds of profit margins, namely gross profit margins and net profit margins.

- Gross Profit Margin

Gross profit margin is calculating profit before tax with company sales, according to Kasmir (2016: 199) it can be formulated:

Gross profit
Income

$$\text{Gross Profit Margin} = \frac{\text{Gross profit}}{\text{Income}}$$

- Net Profit Margin

Net Profit Margin is calculating net profit after tax divided by company income, according to Kasmir (2016: 199) can be formulated:

Net profit after tax
Income

$$\text{Net Profit Margin} = \frac{\text{Net profit after tax}}{\text{Income}}$$

D. Leverage

Leverage is the company's ability to use a budget that has fixed costs in order to increase revenue for company owners. So, leverage is to calculate the non-current ability of the company to pay its debts. In this study, the proxy is DER, Kasmir (2016: 199) can be formulated:

$$\text{Debt to Equity Ratio} = \frac{\text{Total debt}}{\text{Total equity}}$$

E. Liquidity

The liquidity is a measure of the company's ability to pay current liabilities and reflects the financial strength or solvency of the current company. This ratio looks at the amount of current assets to current liabilities. This observation is proxied by the current ratio.

- Current Ratio

Current ratio namely calculating the company's ability to pay its current liabilities using current assets. According to Kasmir (2014:134) it can be formulated:

$$\text{Current Ratio} = \frac{\text{Short term assets}}{\text{Short term liabilities}}$$

F. Operating Capacity

Operating capacity is to calculate the effective size and efficiency of moving the budget or assets so that this ratio is also called the efficiency ratio. Efficient use of assets will be reflected in the speed with which assets or funds are converted into sales. The greater the turnover rate, the more efficient the company in the use of assets. In observations, the proxy is Total Asset Turnover.

- Total Asset Turnover

Total Asset Turnover is measured by dividing sales by the total assets in the company. According to Kasmir (2014:185) it can be formulated:

$$\text{Total Asset Turnover Ratio} = \frac{\text{Total sales}}{\text{Total Assets}}$$

G. Hypothesis

Based on the findings of previous research, the independent variable affects the dependent variable, the following hypothesis can be developed:

Hypothesis 1: Profitability Ratio is suspected to have a positive impact on the Altman Z Score Model.

Hypothesis 2: Leverage ratio is suspected to have an negative impact on the Altman Z Score Model.

Hypothesis 3: Liquidity Ratio is suspected to have a positive impact on the Altman Z Score Model.

Hypothesis 4: Operating Capacity is suspected to have a positive impact on the Altman Z Score Model.

H. Framework
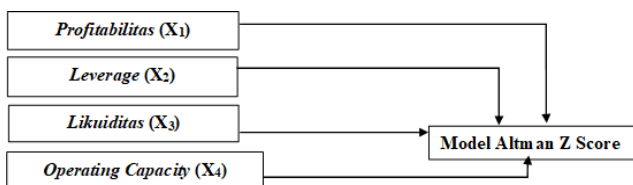
The conceptual framework for this research is as follows:

Fig.1 Conceptual Framework

III. RESEARCH METHOD

This research proves the effect of profitability, leverage, liquidity, operating capacity on financial distress in the construction industry listed on the Indonesia Stock Exchange. This research is classified as quantitative research using purposive sampling technique from 19 construction companies listed on the Indonesia Stock Exchange as many as 14 companies as samples. The list of names of the construction company selected as samples include:

NO	EMITEN	CODE
1	Acset Indonusa Tbk	ACST
2	Adhi Karya (Persero) Tbk	ADHI
3	Bukit Darmo Property Tbk	BKDP
4	Nusa Konstruksi Enjiniring Tbk	DGIK
5	Indonesia Pondasi Raya Tbk	IDPR
6	Jaya Konstruksi Manggala Pratama Tbk	JKON
7	Nusa Raya Cipta Tbk	NRCA
8	Paramita Bangun Sarana Tbk	PBSA
9	PP (Persero) Tbk	PTPP
10	Surya Semesta Internusa Tbk	SSIA
11	Total Bangun Persada Tbk	TOTL
12	Wijaya Karya Bangunan Gedung Tbk	WEGE
13	Wijaya Karya (Persero) Tbk	WIKA
14	Waskita Karya (Persero) Tbk	WSKT

Table 1: List of Construction Companies

Source: Indonesia Stock Exchange 2015-2019
(www.idx.co.id)

In this research, the author uses the Panel Data Method using Eviews 11. The method formula used includes:

$Y \text{ (Financial Distress)} = O + \beta 1 NPMit + \beta 2 DERit + \beta 3 CRit + \beta 4 TATOit + e$

Where e is intercept , i = 1,2,3, 70 N = number of company data processed and t = 1,2,3,4,5 years. All calculations were carried out using Eviews version 11.

IV. RESULT AND DISCUSSION

A. Descriptive Analysis Results

The results of data analysis are presented descriptively of each variable obtained from company data during this research period and the results can be seen as follows :

- Net Profit Margin. The average Net Profit Margin value of the construction companies during the 2015-2019 period was -0.01 with a standard deviation of 0,24. The lowest value of Net Profit Margin in 2018 with a value of -1.02 was from BKDP. The highest NPM value in the 2017 period of 0.38 was from SSIA.

- Debt to Equity Ratio. The average Debt to Equity Ratio value of the construction companies during the 2015-2019 period was 2.11 with a standard deviation of 2.69. The lowest value of Debt to Equity Ratio in 2018 with a value of 0.22 was from PBSA. The highest DER value in the 2019 period of 35.47 was from ACST.

- Current Ratio. The average Current Ratio value of the construction companies during the 2015-2019 period was 1.60 with a standard deviation of 0.69. The lowest value of Current Ratio in 2016 with a value of 0.21 was from BKDP. The highest Current Ratio value in the 2018 period of 4.29 was from PBSA.

- Total Asset Turn Over Ratio. The average Total Asset Turn Over Ratio value of the construction companies during the 2015-2019 period was 0.68 with a standard deviation of 0.33. The lowest value of Total Asset Turn Over Ratio in 2019 with a value of 0.04 was from BKDP. The highest Total Asset Turn Over Ratio value in the 2015 period of 1.80 was from NRCA.

- Altman Z Score. The average Altman Z Score value of the construction companies during the 2015-2019 period was 3.19 with a standard deviation of 2.21. The lowest value of Altman Z Score in 2019 with a value of 1.24 was from ACST. The highest Altman Z Score value in the 2018 period of 9.06 was from PBSA.

B. Panel Data Linear Regression Analysis

Hypothesis Testing or Panel Data Linear Regression Analysis in this research uses the Fixed Effects method (Least Squares Dummy Variable) for the diagrammatic model. The selection of the Fixed Effects method (Least Squares Dummy Variable) as a method of panel data analysis in this research was previously tested through the chow test, and the Hausman test first, so that finally the Fixed Effect method (Least Squares Dummy Variable) was the most appropriate.

Dependent Variable: Y				
Method: Panel EGLS (Cross-section weights)				
Date: 07/19/21 Time: 20:51				
Sample: 2015 2019				
Periods included: 5				
Cross-sections included: 14				
Total panel (balanced) observations: 70				
Linear estimation after one-step weighting matrix				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.930115	0.351837	-2.643592	0.0108
X1	0.038556	0.007296	5.284529	0.0000
X2	-0.051992	0.018184	-2.859176	0.0061
X3	2.181620	0.165298	13.19809	0.0000
X4	1.084265	0.284250	3.814480	0.0004
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
Root MSE	0.344983	R-squared		0.978330
Mean dependent var	4.515434	Adjusted R-squared		0.971245
S.D. dependent var	3.379744	S.E. of regression		0.400262
Sum squared resid	8.330912	F-statistic		138.0936
Durbin-Watson stat	2.165336	Prob(F-statistic)		0.000000
Unweighted Statistics				
R-squared	0.970022	Mean dependent var		3.187714
Sum squared resid	9.783392	Durbin-Watson stat		2.138899

Table 2: Results Of Analysis Of Least Squares Dummy Variable

Source: Results of data processing using Eviews 11 (2021)

Based on the table above, the panel data regression equation is obtained as follows:

$$Y = -0.930115 + 0.038556 X_1 - 0.051992 X_2 + 2.181620 X_3 + 1.084265 X_4$$

The panel data regression equation can be concluded that:

- The constant coefficient value is -0.930115, which means that if the NPM (X_1), DER (X_2), CR (X_3) and TATO (X_4) variables are 0, then the amount of the Altman Z Score (Y) is -0.930115.
- The regression coefficient value of the NPM varible (X_1) is positive, which is equal to 0.038556, meaning that if the NPM variable (X_1) increases by 1 unit, the value of the Altman Z Score (Y) will increase by 0.038556 units.
- The regression coefficient value of the DER varible (X_2) is negative, which is equal to - 0.051992, meaning that if there is a decrease in the DER variable (X_2), the value of the Altman Z Score (Y) will increase by - 0.051992 units.
- The regression coefficient value of the CR varible (X_3) is positive, which is equal to 2.181620, meaning that if the CR varible (X_3) increases by 1 unit, the value of the Altman Z Score (Y) will increase by 2.181620 units.
- The regression coefficient value of the TATO varible (X_4) is positive, which is equal to 1.084265, meaning that if the TATO varible (X_4) increases by 1 unit, the value of the Altman Z Score (Y) will increase by 1.084265 units.

C. *Hypothesis Test Results*
   a) Simultaneous Significance Test Result (Test F)
      Based on the results of the calculation of Eviews, it is obtained that Fcount value of 138.0936. For the Ftable value, it can be obtained by using a significance level of of 0.05 with a df1 value of $5 - 1 = 4$ (df1 = number of variables – 1) and a df2 value of $70 - 5 - 1 = 64$ (df2 = number of samples – total variable – 1), then the Ftable value is 2.52. The test criteria in the simultaneous

significance test (F) by comparing Fcount with Ftable with the following hypothesis:
- If the probability value > 0.05 then H0 is accepted.
- If the probability value < 0.05 then H0 is rejected.

This shows that the value of Fcount > Ftable is 138.0936 > 2.52 and the significance value is less than 0.05. Thus H_0 is rejected and H_0 is accepted. This means that the profitability, leverage, liquidity and operating capacity together have an effect on the Altman Z Score in construction companies in 2015-2019.

   b) Coeficient of Determination (R2) Test Result
      Based on the results of the calculation of Eviews, it is obtained that the number R^2 (R Square) is 0.9783296396956029 or (97.83%). This shows that 97.83% the Altman Z Score variable is influenced by the variables of profitability, leverage, liquidity and operating capacity, while the remaining 2.17% is affected by other variables outside of this resarch.

   c) T Test Result
      Based on the results of the Eviews calculation, the results of the T test can explain the influence between variables as follows:

- The profitability (X_1) which is represented by the net profit margin has a t count of 5.284528 > 1.66864 and the prob value is obtained. net profit margin of 0.000 < 0.05, then H_0 is rejected, which means that the profitability represented by the net profit margin has a positive effect on the Altman Z Score. So it can be concluded that the hypothesis H_1 in this research is accepted.
- The leverage (X_2) represented by the debt to equity ratio has a t count of |-2.859176| > 1.66864 and the prob value is obtained. debt to equity is 0.0061 < 0.05, then H_0 is rejected, which means that the leverage represented by the debt to equity ratio an negative on the Altman Z Score, so hypothesis H_2 in this research is accepted.
- The liquidity (X_3) represented by the current ratio has a t count of 13.19809 > 1.66864 and the prob value is obtained.current ratio of 0.000 <0.05 then H0 is rejected, which means that the liquidity ratio represented by the current ratio has a positive effect on Financial Distress, so the hypothesis H_3 in this research is accepted.
- The operating capacity ratio (X_4) represented by the total asset turnover ratio has a t count of 3.81448 > 1.66864 and the prob value is obtained. total asset turn over ratio is 0.004 < 0.05, then H_0 is rejected, which means that the operating capacity ratio represented by the total asset turn over ratio has a positive effect on Financial Distress, so the hypothesis H_4 in this research is accepted.

D. *Discussion of Research Results*
   a) Effect of profitability on financial distress
      The company's large profitability proves the recovery of capital from the company's assets is good. The profit obtained by the company is feasible and is able to repatriate the capital of the investors.

Proving that the company's financial condition is far from bankruptcy. The higher the profit obtained by the

company, it can prove the company's performance is good from the state of financial distress.

This reflects that it is important for construction companies to increase profitability in an effort to overcome financial distress in the future.The results of observations are the same as the results of observations carried out by Srikalimah (2017), Aisyah, et al (2017), Antikasari, Djuminah (2017) prove that Net Profit Margin has a positive impact on financial distress.

b) Effect of leverage on financial distress
The higher the leverage ratio, the smaller the company's budget prepared by shareholders. So, a low level of leverage can reduce the occurrence of bankruptcies in the company.

This resarch is in accordance with the research carried out by Younas, Udin dkk (2020), Curry dan Banjarnahor (2018), Soedarmono, Chandra dkk (2019) it can be concluded that leverage has an negative impact on financial distress.

c) Effect of liquidity on financial distress
Companies that have a large liquidity ratio have the ability to pay off current debt using existing current assets. This proves that the company's financial condition is in good condition so that it is able to pay current debts that are due. So, a high level of liquidity will reduce the company's financial distress. This proves that a construction company with high liquidity means that the company can settle current debts from its assets, which automatically does not face bankruptcy.

This research is in accordance with reserarch made by Soedarmono, et al (2019), Indriaty, et al (2019) Kusuma and Sumani (2017), concluded that the liquidity ratio has a positive impact on financial distress.

d) Effect of operating capacity on financial distress
The higher the level of sales of the company by utilizing the assets it has, it is able to reduce the possibility of the company in financial distress. The construction company's ability to utilize its assets effectively to generate sales can reduce the company's level of financial distress.

The higher the level of activity of the company which is described by the high total asset turnover, the smaller the level of bankruptcy of the company. This supports profit growth so that the construction industry can avoid the risk of financial distress. This reserach is the same as that carried out by Lumbantobing (2019), Ratna & Marwati (2018), proving that Operating Capacity has a positive impact on financial distress.

V. CONCLUSIONS AND SUGGESTIONS

A. Conclusions
Based on the results of the analysis & discussion, it can be concluded, among others:
- The profitability ratio has a positive and significant effect on the Altman Z Score in 2015-2019.

- The leverage ratio has an negative and significant effect on the Altman Z Score in 2015-2019.
- The liquidity ratio has a positive and significant effect on the Altman Z Score in 2015-2019.
- Operating Capacity has a positive and significant effect on the Altman Z Score in 2015-2019.

B. Suggestions
Based on the results of the assessment analysis and conclusions, the opinions that can be given to complement the results of these observations include:
a) Theoretical Suggestions
For further observers to add other variables that are relevant and have an effect on financial distress, including macroeconomic variables and good corporate governance (GCG), and are expected. using the object of research is not only limited to the construction sector. So that further observations can be used widely.

b) Practical Advice
- financier
➢ If the company's current ratio is low, investors can also see the construction company's cash flow so that they can further explore the company's liquidity level.

c) By looking at the leverage ratio, creditors can see how much debt the company has. In addition, creditors can measure the risk that the company poses to this sector.

d) Company Management
The company management should pay attention to the liquidity ratio because these variables are the most influential in reducing the company's financial distress level in the future. Due to high liquidity, the company is able to settle its current liabilities when they fall due from the assets owned, which automatically means that the company does not experience financial distress.

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