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by Made Gunadi

Application Of The Altman Z-Score Method For Predicting The Potential Bankruptcy Of Infrastructure Sector Companies Listed On The IDX For The 2019-2021 Period

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Abstract: This study aims to determine the potential for bankruptcy of infrastructure sector companies listed on the Indonesia Stock Exchange for the 2019-2021 period, namely PT Adhi Karya Tbk and PT Waskita Karya Tbk. This study uses qualitative methods and the research conducted is descriptive. Data analysis techniques in this study were carried out when data collection took place, namely data collection, analyzing data, categorizing data, and drawing conclusions. This study uses 2 companies in the infrastructure sector engaged in construction, namely PT Adhi Karya Tbk and PT Waskita Karya Tbk as research subjects. The results of the study show that PT Adhi Karya Tbk in 2019 is in a vulnerable condition while in 2020 and 2021 it has the potential to experience bankruptcy. Meanwhile, PT Waskita Karya Tbk in 3 years of research, namely in 2019 to 2021 has the potential to experience bankruptcy. The results of this study are expected to be taken into consideration regarding the financial condition of PT Adhi Karya Tbk and PT Waskita Karya so that later they can carry out evaluations and improvements that will benefit the company's sustainability in the future.

Keywords: Altman Z-Score, Bankruptcy, Financial Statements

Introduction

The development of the Indonesian economy can be seen from the presence of many emerging and competing companies in the business world. Basically the company in carrying out its operations aims to maintain the company's existence in the future. The infrastructure development of a country is a reflection of the progress of a country. The statement made by Sri Mulyani Indrawati as minister of finance (Kemenkeu) about infrastructure, namely that infrastructure has the potential to have a positive effect on making the economy stronger (Kemenkeu, 2021). In companies, problems that arise are usually due to internal factors and external factors, this will affect the condition of the company. Internal problems sometimes arise due to management strategy problems in dealing with changing conditions and the management of the company's resources cannot be maximized properly by the company. Meanwhile, those that affect the company from external factors sometimes arise due to social, cultural, political, legal, regulatory, technological, economic and other factors. As recently encountered, the factor of economic instability due to the impact of the pandemic from the Covid-19 virus. The corona virus which was designated by the Indonesian government as a national disaster, precisely on March 15, 2020, caused economic growth to be hampered, especially in Indonesia. This will have an impact on companies, especially companies engaged in infrastructure. The Covid-19 pandemic has caused construction activities to be delayed due to the very fast transmission of the virus. This is not impossible will lead to a decline in the company's financial performance continuously.

Table 1. Company Profit (Loss) Report

No	Name Company	Profit (Loss) Company		
		2019	2020	2021
1.	ADHI	665,607	64,908	82,866
2.	WSKT	962,757	(9,261,744)	(1,718,150)

In the last 3 years the profit of companies engaged in construction sector infrastructure, namely PT Adhi Karya Tbk (ADHI) and PT Waskita Karya Tbk (WSKT) tend to experience a decline in profits in the last 3 years, a continuous decline in a company's financial performance or known as *financial distress* is the cause of the possibility of bankruptcy of the company. Bankruptcy is the condition of an entity or a company that is no longer able to pay off all obligations that have been taken previously (Karina, 2014), while the other definition of bankruptcy is the condition of the company experiencing problems in the liquidity sector, namely financial and very fatal consequences, if it continues to happen the company can no longer run the company's operations and as a result the company will go out of business (Alif Fikri Alim, 2017). So it can be interpreted that if the company is no longer able to carry out its obligations, both short-term obligations or long-term obligations, then the company can be said to be bankrupt. Bankruptcy can be caused by external factors such as global economic conditions (Sulaeha, 2018). Management in the company is required to have a strategy to predict the possibility of company bankruptcy, by predicting early on the problems faced by the company, management can know and be better prepared in the event of bankruptcy risk. By analyzing the company's financial ratios using the *Altman Z-Scored* management can find out the company's financial condition. With this method, management can find out whether the company is indicated to be in bankruptcy or not. Bankruptcy analysis using the Altman Z-Score calculation accurately and reliably to predict bankruptcy in the final period of the company's bankruptcy (Ayu Damayanti et al, 2019). Prediction method with Altman-Z Score is not completely accurate because bankruptcy conditions are caused by several factors that are sometimes unexpected, but bankruptcy prediction models really help management in making decisions and policies in avoiding companies from bankruptcy (Pangkey et al, 2018).

Based on these problems, the researcher formulated a problem formulation, namely how to predict the potential for bankruptcy of a company using the Altman Z-Score method in the infrastructure sector listed on the Indonesia Stock Exchange for the 2019-2021 period?

Method

Type of research used is qualitative and descriptive research. The research was conducted to obtain data to complete the research at 2 (two) construction companies listed on the Stock Exchange or BEI, namely www.idx.co.id, namely PT Adhi.Karya Tbk (ADHI) and PT Waskita. Karya Tbk (WSKT). The planned research time is from February 2022 to July 2022. The types and sources of data collected are secondary data types, namely in the form of company financial statements for the 2019-2021 period which can be obtained on the official website of the Indonesia Stock Exchange. www.idx.co.id. According to sugiyono data obtained by reading, studying and understanding the focus of research through media sourced from literature, books, and documents are defined as secondary data (Sugiyono, 2012). The researcher collected the data of this research by means of documentation. Documentation technique according to Sugiyono is a technique used to collect or obtain data and information in archives, documents, books, figures and pictures in the form of reports and information that can support research (Sugiyono, 2015). In this documentation technique, researchers obtain the company's annual financial statements in the form of income statements and statements of financial position in 2019-2021. This research was conducted to test the validity of the data by using triangulation. The triangulation technique used in this study is source triangulation by comparing the financial statements obtained from the official website of the Indonesia Stock Exchange with the financial statements on the company's official website. While the data analysis techniques in this study are collecting data, analyzing data, categorizing company conditions, and drawing conclusions.

Result and Discussion

A. Description of Research Results

1. Brief History of PT Adhi Karya Tbk

Initially PT Adhi Karya was a company owned by the Netherlands which was formed in 1960 on March 11. The company in the name of the Netherlands was then nationalized and renamed PN Adhi Karya. With the nationalization of this company to trigger Indonesia's infrastructure development. With the approval from the Minister at that time, namely on June 1, 1945, the company with the name Adhi changed its status to a limited liability company and was shortened to PT which at that time in 2004 PT Adhi Karya became a public company and became a company on the stock exchange or go public.

2. Brief History of PT Waskita Karya Tbk

PT Waskita Karya Tbk initially participated in working on a project related to water, dredging, port construction and irrigation. From the change in its legal status, the company began to develop its business into a general contractor that involved itself in construction activities with a wider scope, such as road construction, airport construction, bridge construction, sewage treatment plants as well as cement factories and other industrial facilities. Waskita started working on various projects using advanced technology in 1980. There is an interpretation of technology that will be carried out through the process of business alliances and also through joint activities with joint efforts with well-known foreign companies and have achievements that will be a source of pride. Soekarno Hatta Airport, Cengkareng.

3. Overview of Research Objects

Researchers use financial statements from infrastructure sector companies in the construction subsector, namely PT Adhi Karya Tbk and PT Waskita Karya Tbk as research. After that, the financial statements of each company will be analyzed using the Modified Altman Z-Score method. According to measurement with the Altman Z-Score is an analysis that uses statistical techniques that are often applied to find out what the level of bankruptcy experienced by the company is (Rahayu et al, 2016). Altman in his research combines several ratios into the form of a predictive model with statistical techniques.This method uses 4 ratios that will become one formula to determine the potential for bankruptcy, including: Working capital to total assets, Retained Earnings to Total Assets, Profit Before Interest and Taxes to Total Assets, Book Value of Equity to Book Value of Debt (Noviandani dan Putri, 2018). The following is the result of the calculation of variables X1-X4 PT Adhi Karya Tbk and PT Waskita Karya Tbk.

Table 2. Result of calculation of variable X1-X4

COMPANY	VARIABLE	YEAR		
		2019	2020	2021
PT ADHI KARYA TBK	X1	0.1594	0.0790	0.0119
	X2	0.0146	-0.0386	-0.0356
	X3	0.0324	0.0094	-00.2303
	X4	0.0111	0.1714	0.1652
COMPANY	VARIABLE	YEAR		
		2019	2020	2021
PT WASKITA KAR-YA TBK	X1	-0.0031	-0.1966	0.1476
	X2	0.0355	-0.0648	-0.0743
	X3	0.0113	-0.0896	-0.0105
	X4	0.2522	0.1279	0.1754

After knowing the variables X1 to X4 then apply it to the modified Altman Z Score formula with the formula $6.56X1 + 3.26 X2 + 6.72 X3 + 1.05X4$. The results of these calculations will be categorized where if the Z-Score value is above 2.6 then the company is categorized as not bankrupt or the company is in a healthy condition, if $1.1 < Z < 2.6$ then the company is in a vulnerable condition or gray (gray) area while if $Z < 1.1$ then the compa-

ny has the potential to go bankrupt. The following is the classification of the conditions of the companies PT Adhi Karya Tbk and PT Waskita Karya Tbk.

Table 3. Classification of company conditions in 2019-2021

COMPANY	YEAR	Z-SCORE VAL-UE	COMPANY CLAS-SIFICATION
PT ADHI KARYA TBK	2019	1.5531	Gray Area
	2020	0.6348	Bankruptcy
	2021	0.2099	Bankrupt
COMPANY	YEAR	Z-SCORE VAL-UE	COMPANY CLAS-SIFICATION
PT WASKITA KARYA TBK	2019	0.2522	Bankrupt
	2020	-1.9682	Bankrupt
	2021	0.8396	Bankrupt

B.   Discussion and Findings

1.   Company Condition PT Adhi Karya Tbk

The calculation of the ratio of *working capital to total assets of* PT Adhi Karya Tbk for the last 3 years is positive but has decreased over the past 3 years the last 3 years due to a significant decrease in working capital. From the calculation of the ratio of *retained earnings to total assets* for 3 years, the study experienced a decrease in the value of the Z-Score even being negative in 2020 and 2021. In 2020 and 2021 the amount of retained earnings of PT Adhi Karya Tbk was negative, which caused the X_2 variable to tend to be negative. The calculation of *earnings before interest and tax to total assets of* PT Adhi Karya Tbk obtained the highest result in 2019 which was 0.0324. The Z-Score value for 3 years from 2019 to 2021 has always decreased. The decline in the value of the Z-Score in 2020 and 2021 was due to a decrease in profit before interest and taxes in that year. The decrease in this ratio indicates the company's ineffectiveness in earning profits before interest and taxes. The smaller this ratio indicates the greater the risk of the company going bankrupt. The calculation of the *book value of equity to book value of debt of* PT Adhi Karya Tbk has decreased during the 3 years of the study. The highest Z-Score value is 0.2303 in 2019 while the lowest Z-Score is 0.1652 in 2021. The decline in the Z-Score for 3 years was caused by a significant decrease in the book value of equity. The smaller the value of this ratio indicates the greater the risk of the company going bankrupt. It is known that the Z-Score value of PT Adhi Karya Tbk in 2019 was in a gray area or gray area, while in 2020 and 2021 it was in a dangerous condition or in a bankrupt condition. Seeing conditions like this, company management is required to overcome problems that cause companies to tend to be in a state of bankruptcy. Looking at the *Z-Score* from the calculation of the *ratio of retained earnings to total assets* which is negative for the last 2 years, management is expected to focus more on managing retained earnings so that it is not negative because it affects the decisions of investors.

2.   Company Condition of PT Waskita Karya Tbk

the calculation of the ratio of *working capital to total assets of* PT Waskita Karya Tbk for the last 3 years tends to be negative. In 2020 the value of *working capital to total assets* decreased by 0.1935, while in 2021 it increased to 0.1476. The value of the ratio of *working capital to total assets* in 2019 and 2020 which is negative because the amount of short-term debt is greater than the total current assets owned by the company, this indicates the company is having difficulty fulfilling its obligations. This condition requires the company's management to anticipate that the amount of short-term debt is not greater than the total current assets so that the company's liquidity can be guaranteed. The calculation of the ratio of *retained earnings to total assets* from PT Waskita Karya Tbk for 3 years of research experienced a decrease in the value of the *Z-Score* even

negative in 2020 and 2021. In 2020 and 2021 the amount of retained earnings of PT Waskita Karya Tbk was negative which caused the X2 variable to tend to negative value. The calculation of *earnings before interest and tax to total assets of* PT Waskita Karya Tbk obtained the highest result in 2019 which was 0.0113. The *Z-Score* for 3 years from 2019 to 2021 always decreases and is negative in 2020 and 2021. The decline in the *Z-Score* in 2020 and 2021 is due to a decrease in profit before interest and taxes in that year. The decrease in this ratio indicates that the company is less effective in obtaining profit before interest and taxes. The smaller this ratio indicates the greater the risk of the company going bankrupt. The calculation of the *book value of equity to book value of debt* which is the X4 variable of PT Adhi Karya Tbk has decreased and has a positive value for 3 years of research. The *Z-Score* value is 0.2522 in 2019 while the *Z-Score* is 0.1279 in 2021. The decline in the *Z-Score* for 3 years was caused by a significant decrease in the book value of equity. The smaller the value of this ratio indicates the greater the risk of the company going bankrupt. From the *Altman Z-Score* , it can be seen that the Z-Score value of PT Waskita Karya Tbk for the last 3 years, 2019, 2020 and 2021 is in a dangerous condition or in a bankrupt condition. Seeing conditions like this, company management is required to overcome problems that cause companies to tend to be in a state of bankruptcy. Looking at the *Z-Score* from the calculation of the *working capital to total assets* ratio, the ratio of *retained earnings to total assets* and *earnings before interest and tax to total assets* which tend to be negative, management is expected to focus more on managing working capital, retained earnings and earnings before interest and taxes so that they are not negative because they affect the decisions of investors.

Conclusion

The main objective of this study is to determine the level of potential bankruptcy of companies engaged in the construction sector infrastructure. By analyzing the level of bankruptcy of the Altman Z-Score Modified model, it can be seen that the level of potential bankruptcy during the research period, namely 2019, in 2020 and 2021, is it experiencing potential bankruptcy, gray area or gray area or the company is not in good condition or healthy.

Based on the results of the discussion in the previous chapter, PT Adhi Karya Tbk tends to experience potential bankruptcy for 3 (three) years of research, namely 2019 to 2021. In 2019 PT Adhi Karya Tbk has a potentially vulnerable or gray area with a Z-Score value of 1.5531. In 2020 the Z-Score value of PT Adhi Karya Tbk is 0.6348 while in 2021 the Z-Score value of PT Adhi Karya Tbk is 0.2099 then in 2020 and 2021 PT Adhi Karya Tbk is in potential bankruptcy because of the Z-Score from PT Adhi Karya less than 1.1 (Z < 1.1).

Based on the results of the discussion in the previous chapter, PT Waskita Karya Tbk in 3 years of research, namely in 2019 to 2021 has the potential to experience bankruptcy. In 2019 the Z-Score of PT Waskita Karya Tbk was 0.2522. In 2020 the Z-Score value of PT Waskita Karya Tbk is negative, namely -1.9682 and is in the potential for bankruptcy, while in 2021 the Z-Score value of PT Waskita Karya Tbk is 0.839. PT Waskita Karya Tbk is in potential bankruptcy because the Z-Score value of PT Waskita Karya Tbk is less than 1.1 (Z < 1.1).

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