Ilomata International Journal of Tax & Accounting
P-ISSN: 2714-9838; E-ISSN: 2714-9846
Volume 3, Issue 4, October 2022
Page No. 461-473

Analysis of Financial Health Level Using the Z-Score (Altman) Method in Transportation Companies Listed on the Indonesia Stock Exchange for the 2019-2021 Period

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Received : August 8, 2022
Accepted : October 25, 2022
Published : October 31, 2022

Citation: Aidi, A., Setiawan, T, W., Junaidi, A., Budiwaluyo, A., Agoestyowati. (2022). Analysis of Financial Health Level Using the Z-Score (Altman) Method in Transportation Companies Listed on the Indonesia Stock Exchange for the 2019-2021 Period. Ilomata International Journal of Tax and Accounting, 3(4), 461-473.
https://doi.org/10.52728/ijtc.v3i4.605

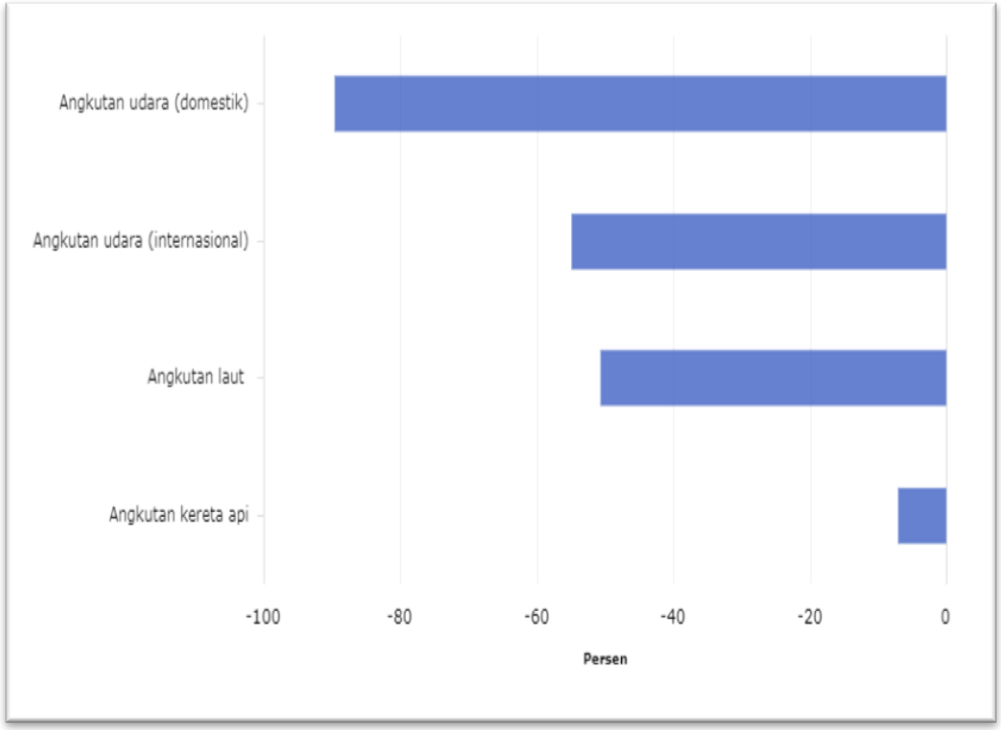
ABSTRACT: This study aims to determine the company's financial condition based on the Altman (Z-Score) method and the effect of the ratio of Working Capital to Total Assets, Retained Earning to Total Assets, Earning Before interest and tax to Total Assets and Market Value of Equity to Book Value of Debt on the company's financial soundness (Altman Z-score). The population in this study is the transportation sector listed on the Indonesia Stock Exchange for the period 2019-2021. Sampling in this study was to use the purposive sampling method so as to obtain a sample of 36 from 12 companies. The data used in this study is the company's annual financial statements obtained from the Indonesia Stock Exchange. The data is then grouped and entered into the Altman Z-score formula and analyzed using the multiple linear regression method using the SPSS version 23 program. The results from the Altman Z-score show that in 2019 there were 5 companies in good health, 4 companies in an emergency (grey area) and 3 companies in a potentially bankrupt condition. In 2020 there are 6 companies in good health, 4 companies in an emergency (grey area) and 2 companies in a potentially bankrupt condition. In 2021 there are 6 companies in good health, 3 companies in an emergency (grey area) and 3 companies in a potentially bankrupt condition. Meanwhile, the results of the analysis test show that the variables Working Capital to Total Assets, Retained Earning to Total Assets, Earning Before Interest and Tax to Total Assets and Market Value Of Equity to Book Value Of Debt, individually and jointly significant effect the level of financial health of the company (Altman Z-score).

Keywords: WCTA, RETA, EBITA, MVBV, Altman Z-Score.

INTRODUCTION

In an effort to support the development of the Unitary State of the Republic of Indonesia (NKRI), the transportation sector in Indonesia has an important role in achieving three goals, namely: supporting economic movement, national stability, and reducing development gaps between regions by expanding the distribution of goods and services to all corners of the archipelago. . Transportation in Indonesia is divided into 3 types, namely land transportation, water transportation and air transportation (Bilal et al., 2021; Kadarisman et al., 2015; Nafi'ah, 2021; Widiyatmoko, 2018).

Land transportation is a mode of transportation that operates on land lines. Types of land transportation, namely motorbikes, cars, buses, trucks, trains and so on (Listantari et al., 2022; Mu'allimah & Mashpufah, 2022). Water transportation is a mode of transportation that operates on rivers and seas. Examples of water transportation are passenger ships, motor ships, and others (Samuel & Pardosi, 2022; Sugeng, 2010). While air transportation is a mode of transportation that operates in the air. Examples are planes and helicopters (Darwis, 2014; Ikhsan et al., 2019).



Percentage of Decrease in the Number of Public Transportation Passengers in May 2020

Source: Badan Pusat Statistik (2020)

From the picture above, it is explained that there was a decrease in the number of transportation passengers in May 2020. The decline occurred as a result of the Implementation of Restrictions on Community Activities or PPKM (Masitha, 2022). The decline in the number of passengers occurred quite significantly where domestic air transportation passengers' fell drastically by up to 90% and international passengers fell by 55% compared to last month. The decrease in passengers also occurred in sea transportation which decreased by up to 50% compared to the previous month. Meanwhile, rail transportation decreased by about 10% (Badan Pusat Statistik, 2021). As a result of the decrease in the number of passengers above, it can indicate the

occurrence of financial distress in the transportation company (Pitalokananta, 2022; Sembe et al., 2021).

The most popular research on financial distress and bankruptcy prediction is done by Edward Altman (Qiu et al., 2020; Wu et al., 2022). There are five financial ratios that are considered the most contributing to the bankruptcy prediction model using one equation model (Altman, 1968; Altman et al., 2019; Altman & Hotchkiss, 2005; Gilson & Altman, 2010). The Z-score model is a model that can be used to predict financial difficulties. The Z-score value is used to classify whether a company is bankrupt or not (Almamy et al., 2016; Elliott et al., 2014; Pratama, 2022; Rim & Roy, 2014).

From the background and limitations of the problem above, this research can be formulated as follows: (1) What is the financial health condition of transportation companies listed on the Indonesia Stock Exchange based on the Altman (Z-Score) model for the 2019-2021 period? (2) Is there a significant effect of the ratio of Working Capital to Total Assets on the Altman value? (3) Is there a significant effect of the Retained Earning to Total Assets ratio on the Altman value? (4) Is there a significant effect of the ratio of Earning before Interest and tax to Total Assets on the Altman value? (5) Is there a significant effect of the ratio of Market Value of Equity to Book value of total debt on the Altman value? (6) Is there a significant effect of the ratio of Working Capital to Total Assets, Retained Earning to Total Assets, Earning before Interest and tax to Total Assets and Market Value of Equity to Book value of total debt on Altman value?

METHOD

The method and type of research used, namely the research conducted by the author, cannot be separated from the knowledge of the experts, and an in-depth and systematic preparation has been carried out. This study uses a quantitative approach method (Creswell, 2017). This study will use a cross-sectional study. Cross-sectional is research conducted at a certain time and with several different objects (Sugiyono, 2019).

In this study, the independent variables used were

(1). Liquidity Ratio (WCTA) (X1), which measures liabilities by comparing net liquid assets with total assets. Net liquid assets or working capital are defined as current assets minus total current liabilities (current assets – current liabilities). Usually companies experience financial difficulties, working capital will decrease faster than total assets, causing this ratio to fall (Rudianto, 2013).

$$\text{WCTA} = \frac{Current\ aset - Current\ liabilities}{Total\ Asset}$$

(2).Profitability Ratio (RETA) (X2)

This ratio is a profitability ratio that detects the company's ability to generate profits. This ratio measures the size of a company's ability to earn profits, in terms of the company's ability to earn a profit compared to the operating assets turnover speed as a measure of business efficiency or in other words, this ratio measures the accumulated profits during the company's operations (Rudianto, 2013).

$$\text{RETA} = \frac{Retained\ Earning}{Total\ Asset}$$

(3).Profitability Ratio (EBITA) (X3)

This ratio measures profitability, which is the rate of return on assets calculated by dividing the company's annual earnings before interest tax by the total assets of the balance sheet at the end of the year (Rudianto, 2013).

$$\text{EBITA} = \frac{Earning\ Before\ Interest\ and\ Tax}{Total\ Asset}$$

(4).Solvency Ratio (MVBV) (X4)

This ratio is a ratio that measures the company's activities. This ratio measures the company's ability to provide guarantees for each of its debts through its own capital (Leki, 2021).

$$\text{MVBV} = \frac{Market\ Value\ of\ Equity}{Market\ Value\ Liabilities}$$

(5). Dependent Variable

The dependent variable is the variable caused or influenced by the independent variable. The existence of this variable as a variable described in the focus/topic of research . In this study the dependent variable is the Z-Score.

Z-Score is a ratio model that uses multiple discriminate analysis (MDA). The MDA method requires more than one financial ratio related to corporate bankruptcy to form a comprehensive model. By using discriminant analysis, the final discriminant function is used to predict the bankruptcy of the company based on the financial ratios used as the variables (Rudianto, 2013).

Z=6,56(X1)+3,26(X2)+6,72(X3)+1,05(X4)

In this research, the data sources used are data from various books, financial reports and previous research journals that can support this research. The source of data that will be processed in the analysis of this research is from the official website of the Indonesia Stock Exchange (Bursa Efek Indonesia, 2022). In this study, the object of research raised in this paper is a transportation company listed on the Indonesia Stock Exchange in 2019-2021.

The population in this research are transportation companies that go public and have been listed on the Indonesia Stock Exchange in 2019-2021, namely:

No	Company's Code	Company's name
1	APOL	Arpeni Pratama Ocean Line Tbk
2	ASSA	Adi Sarana Armada Tbk
3	BBRM	Pelayaran Nasional Bina Buana Raya Tbk
4	BIRD	Blue Bird Tbk
5	BLTA	Berlian Laju Tanker Tbk
6	BPTR	Batavia Prosperindo Trans Tbk.
7	BULL	Buana Listya Tama Tbk

8	CANI	Capitol Nusantara Indonesia Tbk
9	CASS	Cardig Aero Services Tbk
10	CMPP	AirAsia Indonesia Tbk
11	DEAL	Dewata Freightinternational Tbk.
12	GIAA	Garuda Indonesia (Persero) Tbk
13	HELI	Jaya Trishindo Tbk
14	HITS	Humpuss Intermoda Transportasi Tbk
15	IATA	Indonesia Air Transport & Infrastruktur Tbk
16	INDX	Tanah Laut Tbk
17	IPCM	Jasa Armada Indonesia Tbk
18	JAYA	Armada Berjaya Trans Tbk.
19	KARW	ICTSI Jasa Prima Tbk
20	KJEN	Krida Jaringan Nusantara Tbk.
21	LEAD	Logindo Samuderamakmur Tbk
22	LRNA	Ekasari Lorena Transport Tbk
23	MBSS	Mitra Bantera Segara Sejati Tbk
24	MIRA	Mitra International Resources Tbk
25	NELY	Pelayaran Nelly Dwi Putri Tbk
26	PURA	PT Putra Rajawali Kencana Tbk
27	PORT	Nusantara Pelabuhan Handal Tbk
28	PTIS	Indo Straits bk
29	RIGS	Rig Tenders Indonesia Tbk
30	SAFE	Steady Safe Tbk
31	SAPX	Satria Antaran Prima Tbk.
32	SDMU	Sidomulyo Selaras Tbk
33	SHIP	Sillo Maritime Perdana Tbk
34	SMDR	Samudera Indonesia Tbk
35	SOCI	Soechi Lines Tbk
36	TAMU	Pelayaran Tamarin Samudra Tbk
37	TAXI	Express Transindo Utama Tbk
38	TCPI	Transcoal Pacific Tbk.
39	TMAS	Pelayaran Tempuran Emas Tbk
40	TNCA	Trimuda Nuansa Citra Tbk.
41	TPMA	Trans Power Marine Tbk
42	TRAM	Trada Maritime Tbk
43	TRUK	Guna Timur Raya Tbk.
44	WEHA	Weha Transportasi Indonesia Tbk
45	WINS	Wintermar Offshore Marine Tbk
46	ZBRA	Zebra Nusantara Tbk

Source: Sahamu.com (data is processed by the author)

The sampling method in this research is a purposive sample. Purposive sampling is a sampling technique with certain considerations. The criteria used are

a) Perusahaan Transportation sector companies listed on the IDX
   In this study, the transportation sector is a company that provides goods and services transportation services.

b) Have an IPO (Initial Public Offering) and publish its financial statements for 3 consecutive years.
This study uses a time span of 3 years on the grounds that in that time span before the onset of the Covid-19 pandemic and the ongoing Covid-19 pandemic, it greatly affected the results of the financial statements.

c) The company did not suffer any losses during the 2019-2021 period
As for the sampling above, a sample of 12 companies from the transportation sector was obtained, namely:

No	Company's Code	Company's Name
1	**ASSA**	**Adi Sarana Armada Tbk**
2	**BPTR**	**Batavia Prosperindo Trans Tbk.**
3	**HELI**	**Jaya Trishindo Tbk**
4	**IPCM**	**Jasa Armada Indonesia Tbk**
5	**JAYA**	**Armada Berjaya Trans Tbk**
6	**NELY**	**Pelayaran Nelly Dwi Putri Tbk**
7	**PTIS**	**Indo Straits Tbk**
8	**SAPX**	**Satria Antaran Prima Tbk.**
9	**SHIP**	**Sillo Maritime Perdana Tbk**
10	**SOCI**	**Soechi Lines Tbk**
11	**TCPI**	**Transcoal Pacific Tbk.**
12	**TPMA**	**Trans Power Marine Tbk**

Based on the sample criteria above, so that the number of samples obtained is 12 companies. All of the selected companies have met the sampling criteria conducted by the author.

RESULT AND DISCUSSION

To answer the formulation of the first problem and the first hypothesis regarding the company's financial health condition, a Z-score analysis was carried out as follows:

Ratio Calculation Results of WCTA(X1)				
No	Company's Code	2019	2020	2021
1	ASSA	-0,121201108	-0,156499829	-0,020050566
2	BPTR	-0,234028013	-0,219685468	-0,133055891
3	HELI	0,177624078	0,040686418	0,009207947
4	IPCM	0,439505693	0,376571923	0,410595403
5	JAYA	-0,039802418	0,102503578	0,392385816
6	NELY	0,210123495	0,21929619	0,133494909
7	PTIS	-0,005572709	0,118915244	0,160984693
8	SAPX	0,58111727	0,516551412	0,509436248
9	SHIP	-0,019022008	-0,008380691	-0,011555853
10	SOCI	0,105429495	0,099798867	0,099102365
11	TCPI	-0,00110738	-0,059725799	-0,067505451
12	TPMA	0,797830989	0,838434105	0,847460073

Ratio Calculation Results of RETA(X2)				
No	Company's Code	2019	2020	2021
1	ASSA	0,096942645	0,108466257	0,118550733
2	BPTR	0,051679118	0,065221186	0,061480748
3	HELI	0,214640341	0,143220503	0,171009872
4	IPCM	0,157854071	0,137302089	0,169560475
5	JAYA	0,010134354	0,043668981	0,069964332
6	NELY	0,391619305	0,428163103	0,427491161
7	PTIS	-0,04859182	-0,04908494	-0,04231438
8	SAPX	-0,18300732	0,009393744	0,089403528
9	SHIP	0,209128478	0,217169231	0,222081793
10	SOCI	0,230786125	0,279022497	0,302509206
11	TCPI	0,162316919	0,190199807	0,212004653
12	TPMA	0,409109278	0,419898043	0,439648524

Ratio Calculation Results of EBITA(X3)				
No	Company's Code	2019	2020	2021
1	ASSA	0,024205351	0,01324626	0,036990974
2	BPTR	0,023241096	0,011649039	0,021001712
3	HELI	0,147115537	0,025482114	0,016519858
4	IPCM	0,10335826	0,079308055	0,119734243
5	JAYA	0,030147426	0,052024355	0,051321385
6	NELY	0,107002547	0,083731319	0,099908205
7	PTIS	0,007489257	0,000473668	0,00114655
8	SAPX	0,253958087	0,193956582	0,211765122
9	SHIP	0,091791639	0,088555464	0,07402547
10	SOCI	0,018943509	0,047293652	0,012280944
11	TCPI	0,087716305	0,021032544	0,038735699
12	TPMA	0,078930901	0,02469353	0,045010356

Value Calculation Results of MVBV(X4)				
No	Company's Code	2019	2020	2021
1	ASSA	0,381123626	0,385713766	0,413813041
2	BPTR	0,687860067	0,7198165	0,427810833
3	HELI	1,851915366	0,648811371	0,880514666
4	IPCM	5,399967637	3,447564866	4,259942584

Value Calculation Result of Z-Score

No	Company's Code	Year		
		2019	2020	2021
1	ASSA	0,1	-0,2	0,9
2	BPTR	-0,5	-0,4	-0,1
3	HELI	4,8	1,6	1,7
4	IPCM	9,8	7,1	8,5
5	JAYA	2,3	5,7	13,0
6	NELY	10,8	11,0	11,4
7	PTIS	0,8	1,6	1,8
8	SAPX	7,1	6,7	7,2
9	SHIP	2,1	2,1	2,1
10	SOCI	2,6	3,2	3,2
11	TCPI	2,0	1,5	1,7
12	TPMA	9,6	10,1	10,9
5	JAYA	2,255877421	4,318128106	9,395265409
6	NELY	7,060762939	7,19709758	8,083029799
7	PTIS	0,852394518	0,889672423	0,839614516
8	SAPX	2,121694592	1,904838293	2,026482376
9	SHIP	0,910928329	0,84504663	0,863970667
10	SOCI	0,951221771	1,208577755	1,403744382
11	TCPI	0,878127252	1,083977396	1,178458987
12	TPMA	2,426833407	2,877836306	3,472849431

The results of the research show that the transportation companies that have been studied from 2019-2021 are many companies that are in good health. PT IPCM, NELY, SAPX, and TPMA are companies that do not experience financial difficulties and are in good health based on the Altman Z-score value. PT SHIP is one of the companies that are in a potentially bankrupt condition (gray area) for 3 consecutive years. At PT HELI, in 2019 it was in good health but in 2020-2021 it was in a potentially bankrupt condition (grey area). In 2019 PT JAYA, SOCI, and TCPI experienced a potentially bankrupt condition (gray area) but in 2020-2021 the company could recover and be in good health. At PT PTIS in 2019 the results of the Altman Z-score value showed that the company went bankrupt then in 2020-2021 it could improve even though it was still in a potentially bankrupt condition (grey area). And finally, PT ASSA and BPTR from the results of the Altman Z-score value show that the two companies went bankrupt from 2019-2021.

Effect of Working Capital to Total Assets (WCTA) on Altman Z-score

Based on the results of the study, it showed that WCTA had a significant effect on the Altman Z-score value. The effect is shown by the value of t-count of 201,051 with a significance of 0.000 while the t-table of 1.694 with a significance of 0.05. Then the value of t-count is greater than t-table, in this case it indicates that the ratio of Working Capital to Total Assets has a significant effect on the Altman Z-score (Y) value variable in transportation companies listed on the Indonesia Stock Exchange in 2019-2021. The results of testing the second hypothesis show that Working Capital to Total Assets has a significant effect on the Altman z-score value.

This is in line with research conducted by (Putri & Diyani, 2016), which shows that the ratio of Working Capital to Total Assets affects the level of financial health of the company which is marked by the larger current assets owned by the company than current liabilities, the company's short-term debt can be guaranteed by current assets owned by the company.

Effect of Retained Earning to Total Assets (RETA) on Altman Z-score

Based on the results of the research, it shows that RETA has a significant effect on the Altman Z-score value. The effect is shown by the value of t-count of 114.683 with a significant 0.000 while the t table is 1.694 with a significant 0.05. Then the value of t-count is greater than t-table, in this case it indicates that the ratio of Retained Earning to Total Assets (X2) has a positive and significant effect on the Altman Z-score (Y) value variable on transportation companies listed on the Indonesia Stock Exchange in 2019-2021. The results of testing the third hypothesis show that Retained Earning to Total Assets has a significant effect on the Altman z-score value.

This is in line with research conducted by (Asia & Irwan, 2015), which shows that the results of the t-count are 5.052 with a significance of 0.000 while the t-table is 1.694 with a significant 0.05 of 1.681. The calculation results show that t-count is greater than t-table (5.052 > 1.681). The significance value of 0.000 is smaller than the 0.05 significance level. Thus indicating that at a significance level of 5%, RETA has a significant effect on bankruptcy prediction.

Effect of Earning Before Interest and tax to Total Assets (EBITA) on Altman Z-score

Based on the results of the research, it shows that EBITA has a significant effect on the Altman Z-score value. The effect is shown by the value of t-count of 71.477 with a significance of 0.000 while the t-table of 1.694 with a significance of 0.05. Then the value of t-count is greater than t-table, in this case it indicates that the ratio of Earnings Before Interest and tax to Total Assets (X3) has a positive and significant effect on the Altman Z-score (Y) value variable on transportation companies listed on the Indonesia Stock Exchange in 2019-2021. The results of testing the fourth hypothesis show that Earnings Before Interest and tax to Total Assets have a significant effect on the Altman z-score value.

This is in line with research conducted by It is in line with research conducted by (Asia & Irwan, 2015), which shows that the results of the t-count are 3.737 with a significance of 0.001 while the t-table is 1.681 with a significance of 0.05. The calculation results show that t-count is greater than t-table (3.737 > 1.681). The significance value of 0.001 is smaller than the 0.05 significance level. Thus, it shows that at the 5% significance level, EBITA has a significant effect on bankruptcy prediction.

Effect of Market Value of Equity to Book value of total debt (MVBV) on Altman Z-score

Based on the results of the research, it showed that MVBV had a significant effect on the Altman Z-score value. The effect is shown by the value of t-count of 457.064 with a significance of 0.000 while the t-table of 1.694 with a significance of 0.05. Then the value of t-count is greater than t-table, in this case it indicates that the ratio of Market Value of Equity to Book value of total debt (X4) has a positive and significant effect on the Altman value variable Z-score (Y) in transportation companies listed on the Indonesia Stock Exchange in 2019-2021. The results of testing the fifth hypothesis show that the Market Value of Equity to Book Value of total debt has a significant effect on the Altman z-score value.

This is in line with research conducted by (Karlingsih, 2021), which shows that the results of the t-count are 120.543 with a significant 0.000 while the t-table is 1.669 with a significant 0.05. The calculation results show that t-count is greater than t-table (120.543 > 1.669) and a positive t-

count indicates that the Market Value of Equity to Book value of total debt has an effect on financial distress in Islamic Commercial Banks for the 2015-2019 period.

Effect of Working Capital to Total Asset (WCTA), Retained Earning to Total Asset (RETA), Earning Before Interest and tax to Total Asset (EBITA) and Market Value of Equity To Book value of total debt (MVBV) on Altman Z-score

Based on the results of the research, it showed that WCTA, RETA, EBITA AND MVBV had a significant effect on the Altman Z-score value. The effect is shown by the value of Fcount of 227994.790 with a significance of 0.000 while F-table is 2.668 with a significance of 0.05. Then the value of Fcount is greater than F-table, in this case it indicates that the ratio of Working Capital to Total Assets (WCTA), Retained Earning to Total Assets (RETA), Earning Before Interest and tax to Total Assets (EBITA) and Market Value of Equity To Book value of total debt (MVBV) has a significant effect on the altman Z-score (Y) value variable in transportation companies listed on the Indonesia Stock Exchange in 2019-2021. The results of testing the sixth hypothesis show that Working Capital to Total Assets, Retained Earning to Total Assets, Earning Before Interest and tax to Total Assets and Market Value of Equity To Book value of total debt together have a significant effect on the altman z-score value.

CONCLUSION

Based on the results of the discussion above, the conclusions obtained are as follows:

1. Based on research results from transportation companies in 2019-2021, itcan be categorized into 3 assessments, namely healthy, potentially bankrupt (Grey Area) and bankrupt with the following details:
   a) In 2019 there were 5 companies in healthy condition, namely PT HELI, IPCM, NELY, SAPX and TPMA. Furthermore, there are 4 companies in a potentially bankrupt condition (Grey area), namely PT JAYA, SHIP, SOCI and TCPI and 3 companies in a state of bankruptcy, namely PT ASSA, BPTR and PTIS.
   b) In 2020 there are 6 companies in healthy condition, namely PT IPCM, JAYA, NELY, SAPX, SOCI and TPMA. Furthermore, there are 4 companies in a potentially bankrupt condition (Grey area) namely PT HELI, PTIS, SHIP and TCPI and 2 companies in a state of bankruptcy namely PT ASSA and BPTR.
   c) In 2021 there are 6 companies in healthy condition, namely PT IPCM, JAYA, NELY, SAPX, SOCI and TPMA. Furthermore, there are 3 companies in a potentially bankrupt condition (Grey area), namely PT PTIS, SHIP and TCPI and 3 companies in a state of bankruptcy, namely PT ASSA, BPTR and HELI.
2. Based on the results of the research above, it is proven that Working Capital to Total Assets (WCTA) has a significant effect on the Altman Z-score value.
3. Based on the results of the research above, it is proven that Retained Earning to Total Assets (RETA) has a significant effect on the Altman Z-score value.
4. Based on the results of the research above, it is proven that Earning Before Interest and tax to Total Assets (EBITA) have a significant effect on the Altman Z-score value.
5. Based on the results of the research above, it is evident that the Market Value of Equity to Book value of total debt (MVBV) has a significant effect on the Altman Z-score value.
6. Based on the results of the research above, it is proven that Working Capital to Total Assets (WCTA), Retained Earning to Total Assets (RETA), Earning Before Interest and tax to Total Assets (EBITA) and Market Value of Equity To Book value of total debt (MVBV) has a significant effect on the Altman Z-score value.

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