BANKRUPTCY PREDICTION ANALYSIS USING THE GROVER AND OHLSON MODELS IN WOOD AND ITS MANAGEMENT SUB-SECTOR COMPANIES THAT ARE LISTED ON THE IDX

Reni Restriani Utami[1], Muh. Ichwan Musa[2], Anwar[3]
Makassar State University / Management, Makassar
Email: [1]renirestriani0300@gmail.com, [2]ichwan.musa71@gmail.com, [3]anwar@unm.ac.id

Abstract
This study aims to predict bankruptcy and also to find out the differences in predictions in timber sub-sector companies and their management during 2017-2021 using the Grover and Ohlson models. The type of research used is quantitative research with the research population being wood sub-sector companies and their management listed on the IDX. The sample in the study was PT. SLJ Global Tbk (SULI) and PT. Tirta Mahakam Resources Tbk (TIRT). Data analysis techniques use Grover and Ohlson models.The results showed that by using the Grover PT. SLJ Global Tbk (SULI) in 2018-2021 and PT. Tirta Mahakam Resources Tbk (TIRT) in 2019-2021 is predicted to go bankrupt. Ohlson's own model predicts that in 2017-2021 both companies go bankrupt. Mann Whitney's test results found that there was no difference in predicting the potential bankruptcy of SULI and TIRT using the Grover model with Ohlson.

Keywords: Grover (G-Score), Ohlson (Y-Score) and Bankruptcy.

Introduction

There have been many types of companies that have grown and developed in Indonesia including industrial companies, extractive companies, service companies, agricultural companies, trading companies and manufacturing companies that are listed on the Indonesia Stock Exchange. The wood sub-sector company and its management which is part of the manufacturing sector with the company PT. SLJ Global Tbk., (SULI), and PT. Tirta Mahakam Resources Tbk., (TIRT) which is included in this sector. Both of these companies focus on their main product, namely the production of processed wood. The two companies had poor financial performance in 2017-2021. This can be seen in each company's financial statements. Good company performance can be used as one of the successes of a company that can be seen from the financial statements.(Made, 2020:16).

Based on the financial statements of PT. SLJ Global Tbk (SULI) it is known that the company's net profit has increased in 2018, but in 2019 and 2020 the company experienced a net profit deficit due to decreased sales of business products, increased prices of production raw materials coupled with a large amount of financing and the influence from Covid 19. Even so, in 2021 the company's net profit and sales have increased due to the large demand for products.

For PT. Tirta Mahakam Resources Tbk. (TIRT) there was a net profit deficit in 2018-2020 which was caused byrising prices of production raw materials and a decrease in selling prices at the beginning of the year. Until 2020, the decline in profit occurred due to reduced demand for products and order cancellations. In addition, the company has also felt the impact of the Covid-19 pandemic resulting in a 3-month operational cessation, as well as terminating employees which caused the company's performance to decrease. In 2021, due to the unstable market conditions, the company will again experience a profit deficit.

Because the last financial report shows negative equity because the company records continuous losses so that the minus profit balance recorded in the financial statements will erode equitycompanies, the two companies in 2020 and 2021 will receive a special notation from the Indonesia Stock Exchange.

Bankruptcy is one thing that every company doesn't want. According to Hadijah (2014:303) Bankruptcy is defined as "the company's failure to carry out company operations to generate profits. Bankruptcy is also often called company liquidation or company closure due to insolvency. As for according Desmawati et al., (2016:4). Bankruptcy is "a condition of financial difficulties that is so severe that the company is unable to run the company's operations properly".

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Bankruptcy can occur if the company does not optimize its finances or the company is said to be experiencing financial difficulties. Therefore it is necessary to predict bankruptcy in companies experiencing financial difficulties.

There are various bankruptcy prediction models including the Grover model (G-Score) (1968) and the Ohlson method (Y-Score) (1980). The reason for using these two models in this study is because these five models have an accuracy rate above 90%, where the greater the percentage of accuracy of the prediction model with the prediction model applied in year t + 1 after the research time period, the more accurate the model will be (Sumarna et al., 2020:115). The prediction results of bankruptcy models are used as indicators or benchmarks for shareholders and stakeholders in an effort to evaluate and improve company performance in the future.(Dahni, 2019: 67).

Based on research results Nur et al., (2020) It is known that there are different analysis results from the Grover, Altman Z-Score, Springate and Zmijewski methods in predicting potential bankruptcy (financial distress) at PT Solusi Bangun Indonesia Tbk for the 2016-2018 period. The Grover, Altman Z-Score and Springate methods show the same prediction results, namely the bankruptcy condition of PT Solusi Bangun Indonesia Tbk. While the Zmijewski method gives an indication of the health of the company. Then the research conducted byArtati & Munjiyah, (2020)It is known that there are differences in the prediction results of bankruptcy analysis in food and beverage companies in 2015-2018 using the Altman, Springate, Ohlson and Zmijewski models. Then there is a bankruptcy prediction model for food and beverage companies in 2015-2018 with an accuracy rate of 100%, namely the Ohlson model with a type error of 0%.

The previous research that has been described explains the condition of the company whether bankruptcy occurs or not. Therefore, this study aims to find out how to predict bankruptcy potential and also to find out whether there are differences in predictions between the Grover model (G-Score) and the Ohlson method (Y-Score) in predicting the potential for bankruptcy of listed timber sub-sector manufacturing companies and their registered companies. on the IDX for the period 2017 – 2021.

Research Method

The type of research used is quantitative research. The research data is the company's financial statements consisting of income statements, balance sheets and cash flows. The population in this study is the financial statements of companies in the sub-sector of wood and its processing. The sample in this study was determined using a purposive sampling technique, namely a sampling technique with several criteria as consideration. The following are the sampling criteria in this study, namely timber sub-sector companies and their management that are registered on the IDX in 2017-2021 and provide annual financial reports for 2017-2021. Based on these sample criteria, there are two samples in this study, namely PT. SLJ Global Tbk., (SULI), and PT. Tirta Mahakam Resources Tbk., (TIRT).

Data analysis techniques begin by collecting research data in this case in the form of PT. SLJ Global Tbk., (SULI), and PT. Tirta Mahakam Resources Tbk., (TIRT) obtained from the official website of the Indonesia Stock Exchange (www.idx.co.id). Then do the calculations of the Grover and Ohlson model. Furthermore, data analysis was carried out which consisted of descriptive statistics, normality test, and Mann Whitney test which were used to answer the hypothesis.

Results and Discussion

The following table is presented which is the overall ratio analysis that has been obtained at PT. SLJ Global Tbk., (SULI), and PT. Tirta Mahakam Resources Tbk., (TIRT) listed on the Indonesia Stock Exchange in 2017 – 2015.

Table 1 Results of the Grover Model Analysis (G-Score) in SULI and TIRT for the 2017 – 2021 period

ISSUER	YEAR	X1	X2	X3	G-SCORE	CLASSIFICATION
SULY	2017	-0.02	0.01	0.02	0.05	Not Bankrupt
	2018	-0.49	0.01	0.03	-0.70	Bankrupt
	2019	-0.60	-0.09	-0.09	-1.23	Bankrupt
	2020	-0.96	-0.25	-0.25	-2.38	Bankrupt
	2021	-0.83	0.04	0.04	-1.17	Bankrupt

	2017	0.09	0.00	0.00	0.21	Not Bankrupt
	2018	0.05	-0.04	-0.04	0.01	Not Bankrupt
TIRT	2019	0.01	-0.06	-0.06	-0.12	Bankrupt
	2020	-0.71	-1.01	-1.05	-4.55	Bankrupt
	2021	-0.51	-0.44	-0.45	-2.30	Bankrupt

Table 1 shows that in 2017 SULI is predicted not to go bankrupt and in 2018-2021 it is predicted to go bankrupt while for TIRT it is predicted that in 2017-2018 it will not go bankrupt and in 2019-2021 it is predicted to go bankrupt. The ratio of working capital to total assets (X1) in SULI has decreased every year because the value of current liabilities is greater than the value of current assets so that the resulting working capital is smaller than the value of total assets. For TIRT itself in 2017-2019 there was an increase in working capital even though in 2020-2021 the company's working capital has decreased. For the ratio of profit before interest and tax to total assets (X2)both companies experienced fluctuations and were negative in 2019-2020 for SULI and 2018-2021 for TIRT due to a deficit in earnings before interest and taxes. Then the ratio of net profit to total assets (X3) at SULI experienced fluctuations and was negative in 2019-2020 due to a deficit in net profit. For TIRT itself, it has decreased every year due to a deficit in net profit obtained.

Table 2 Results of the Ohlson Model Analysis (Y-Score) in SULI and TIRT for the 2017 – 2021 period

ISSUER	YEAR	X1	X2	X3	X4	X5	X6	X7	X8	X9	Y-SCORE	CLASSIFICATION
SULY	2017	-4	0.99	0.02	1.05	0	0.02	0.02	0	0.56	6.09	Bankrupt
	2018	-4	0.95	0.03	2.20	0	0.03	0.05	0	0.44	5.88	Bankrupt
	2019	-4	0.96	-0.09	2.91	0	0.09	0.05	0	-2.16	5.48	Bankrupt
	2020	-4	1.21	-0.25	5.86	1	0.25	0.03	1	0.40	4.62	Bankrupt
	2021	-4	1.16	0.04	3.82	1	0.04	-0.04	1	-1.40	4.15	Bankrupt
TIRT	2017	-4	0.86	0.00	0.87	0	0.00	-0.02	0	-0.95	6.09	Bankrupt
	2018	-4	0.91	-0.04	0.98	0	0.04	-0.01	0	1.06	5.49	Bankrupt
	2019	-4	0.96	-0.06	2.95	0	0.06	0.01	1	0.17	4.79	Bankrupt
	2020	-5	1.99	-1.05	2.95	1	1.05	-0.05	1	0.78	11.67	Bankrupt
	2021	-5	2.82	-0.45	3.72	1	0.45	-0.08	1	-0.53	15.54	Bankrupt

Table 2 shows that during 2017-2021 the two companies are predicted to go bankrupt. The SIZE ratio (X1) shows a negative value, then the value of the ratio of total debt to total assets (X2) for SULI has fluctuated and for TIRT has increased. The ratio of working capital to total assets (X3) at SULI has decreased every year because the value of current liabilities is greater than the value of current assets so that the working capital generated is smaller than the total value of assets. For TIRT itself in 2017-2019 there was an increase in working capital even though in 2020-2021 the company's working capital has decreased. The ratio of current debt to current assets (X4) for both companies has increased due to the high value of the company's current debt. The X5 ratio itself describes the condition of the company where total debt is greater than total assets in 2020-2021 for the two companies. The ratio of net income to total assets (X6) fluctuated for SULI and decreased for TIRT. Then the ratio of cash flows from operating activities to total debt (X7) for the two companies fluctuated. The X8 ratio shows the condition of the company if during the last 2 years net profit experienced a deficit in 2019-2020 for SULI and 2018-2021 for TIRT. And the ratio of changes in net income (X9) of the two companies has fluctuated. Then the ratio of cash flows from operating activities to total debt

(X7) for the two companies fluctuated. The X8 ratio shows the condition of the company if during the last 2 years net profit experienced a deficit in 2019-2020 for SULI and 2018-2021 for TIRT. And the ratio of changes in net income (X9) of the two companies has fluctuated. Then the ratio of cash flows from operating activities to total debt (X7) for the two companies fluctuated. The X8 ratio shows the condition of the company if during the last 2 years net profit experienced a deficit in 2019-2020 for SULI and 2018-2021 for TIRT. And the ratio of changes in net income (X9) of the two companies has fluctuated.

Table 3 Descriptive Statistical Results

	N	Minimum	Maximum	Means		std. Deviation
	Statistics	Statistics	Statistics	Statistics	std. Error	Statistics
GROVER	10	-4.55	.21	-1.2185	.47417	1.49945
OHLSON	10	3.76	15.54	6.8101	1.20171	3.80014
Valid N (listwise)	10					

Based on table 3, it is known that the Grover model has a minimum value of -4.55, a maximum value of 0.21 and a mean value of -1.2185 with a standard deviation of 1.49945. The Ohlson model has a minimum value of 3.76, a maximum value of 15.54 and a mean value of 6.8101 with a standard deviation of 3.80014.

Table 4 Normality Test Results

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
GROVER	.197	10	.200*	.864	10	085
OHLSON	.375	10	.000	.744	10	003

*. This is a lower bound of the true significance.

Based on table 4 it is known that the Kolmogorov-Smirnov test results for the Grover model have a Sig value > 0.05, so the data is normally distributed. Then for the Kolmogorov-Smirnov test results the Ohlson model has a Sig value <0.05, so the data is not normally distributed. Because there are some data that are not normally distributed, then non-parametric testing is carried out.

Table 5. Mann Whitney Test Results for Grover and Ohlson Models

	GROVER & OHLSON
Mann-Whitney U	21,000
Wilcoxon W	27,000
Z	-.476
asymp. Sig. (2-tailed)	.634
Exact Sig. [2*(1-tailed Sig.)]	.689b

a. Grouping Variable: ASSESSMENT

Based on the SPSS output results in table 5, the Asymp.Sig (2-tailed) value is 0.634, it can be concluded that the hypothesis is rejected, meaning that there is no significant difference between the Grover model and the Ohlson model

Research Discussion
Potential Bankruptcy Prediction Results Using the Grover and Ohlson Models

Based on table 1, it is known that the position of potential bankruptcy at PT. SLJ Global Tbk., (SULI) and PT. Tirta Mahakam Resources Tbk., (TIRT) for the period 2017 – 2021 using the Grover analysis model (G-Score). In 2017 SULI is in a position where it is predicted not to experience potential bankruptcy. However, in the following year, the company is predicted to experience potential bankruptcy because the company's working capital has decreased every year. For 2018, even though profit before tax and interest, net income and total assets of the company increased compared to the previous year, the company is in a position predicted to experience the potential for bankruptcy because the value of the company's working capital in that year is negative. Then in 2019 and 2020 the company experienced a deficit in profit before tax and interest and the company's net profit and total assets decreased so that the company was again predicted to experience the potential for bankruptcy. In 2021 the company will experience an increase in profit before tax and interest, net income and total assets, but the company is still predicted to experience the potential for bankruptcy due to the company's high current debt. Then for TIRT in 2017 the company is predicted not to experience bankruptcy potential, then for 2018 there will be an increase in the value of the company's working capital and total assets, however, the value of profit before tax and interest as well as the company's net profit experienced a deficit even though it was predicted that the company would not have the potential for bankruptcy. Then for 2019 to 2021 the company is predicted to experience the potential for business bankruptcy, where this is due to the acquisition of profit before tax and interest and net income experiencing a higher deficit than the previous year and also a decrease in the company's total assets, besides that in In 2020 and 2021 the company's current debt will increase.

Based on table 2 it is known that by using the Ohlson analysis model (Y-Score) PT SLJ Global Tbk., (SULI) and PT. Tirta Mahakam Resources Tbk., (TIRT) during the 2017 – 2021 period is predicted to experience potential bankruptcy, which means that the two companies have poor financial performance. SULI is predicted to experience bankruptcy potential in 2017, this is due to the low value of net profit and cash flow from the company's operations. Meanwhile, in 2018 the company experienced an increase in terms of total assets, total debt, net profit, and operating cash flow, even though the prediction results showed that the company experienced a potential for business bankruptcy due to a negative SIZE value and working capital. Then in 2019 and 2020 total debt increased but there was a decrease in terms of total assets, operating cash flow and for company sales that experienced a deficit, this was due to the influence of the Covid - 19 pandemic where many sales were canceled business products, raw material prices rising as well as weakening market forces. In 2021 the company's assets have succeeded in increasing the value of assets and net profit, but the company's total debt has also increased coupled with a deficit in operating cash flow and a minus SIZE value and company working capital so that in that year the company is predicted to experience potential bankruptcy. Then TIRT in 2017 is predicted to experience potential bankruptcy caused by the SIZE value, negative working capital and a deficit operating cash flow. In addition, the value of operating profit generated by the company is also quite low.

Then in 2018, there was an increase in the company's total assets but the company's total debt also increased. In addition, the company's net profit and operating cash flow experienced a deficit coupled with the SIZE value and the company's working capital which was negative so that in that year the company was predicted to experience potential bankruptcy. In 2019 the company's total debt has increased, besides that operating cash flow has also increased after the last two years experienced a deficit. Total assets themselves have decreased compared to last year, then the company's net profit has returned to a deficit so that in that year the company is predicted to experience potential bankruptcy. In 2020 and 2021 the company's total debt will increase again, meanwhile the company's total assets will decrease, In addition, operating profit and operating cash experienced a deficit as a result of reduced demand for products and order cancellations. In addition, as a result of the Covid-19 pandemic, the company halted operations for 3 months, as well as laid off employees, which caused the company's performance to decrease and market conditions to be unstable. So that in 2020 and 2021 the company is predicted to experience potential bankruptcy.

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Hypothesis Test Results

Based onn hypothesis testing that has been carried out using the Mann Whitney test, it is known that H1 is rejected, so it can be concluded that there is no difference in predicting the potential for bankruptcy of companies in the wood sub-sector and their management using Grover and Ohlson. This is not in line with the results of research conductedOktaviandri et al., (2017)argues that, there are significant differences between the Springate and Ohlson models and the Ohlson and Grover models.

Conclusion

The results of the study show that SULI in 2018-2021 and TIRT in 2019-2021 are predicted to experience potential bankruptcy using the Grover model. For the Ohlson models in 2017-2021 both companies are predicted to go bankrupt. The results of the Mann Whitney test show that there is no difference in predicting the potential for bankruptcy of SULI and TIRT using the Grover and Ohlson models. Company management needs to manage the company's financial performance better and more carefully. In addition, more attention should be paid to the management of internal and external company risks, especially those that can threaten business operations and those that impact the company's liquidity.

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