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Analysis of financial ratios to predict financial distress in manufacturing companies listed on the IDX

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ABSTRACT

The purpose of this study is to determine the variables that can explain the prediction of financial distress in manufacturing companies. This research was conducted to test the hypothesis (hypotheses testing) proposed by researchers, where the variables EBITS, ROE, Fixed Assets Turnover, Size and Tax Expense can explain the prediction of financial distress in manufacturing companies. As well as the use of an analytical model to measure prediction accuracy which can explain the prediction of financial distress by the logit model. This research uses secondary data obtained from ICMD Indonesia Stock Exchange (IDX). A total of 11 healthy companies and 11 unhealthy companies were taken using the Z-score method. The samples were companies experiencing financial distress taken during the 2004-2009 period. The data used in this study include financial ratios which include TOAS, CATA, SETA, APNPTA, SCA, SWC, STFA, GPM, LTDTD, WCLTD, CASH, PHASE, ROE, EBITPC, EBITS, OIBOIA. The statistical method used to test the hypothesis is Logistic Regression analysis with the Stepwise method. The results of this study indicate that the CATA, APNPTA, and CASH variable analysis tools are variables that can explain the prediction of financial distress in manufacturing companies listed on the IDX for the 2004-2009 period.

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1. INTRODUCTION

Economic development cannot be separated from investment conditions in a country which are closely related to the capital market. With the existence of a capital market, it is easier for a company to obtain funds and raise funds in the form of its own capital by issuing shares. And for investors, the capital market will provide additional alternatives to invest the funds they have.

With the global financial crisis, causing the economy in developed countries to weaken. As a result, many people and the business world in Indonesia feel the impact, such as the weakening of the Rupiah exchange rate, closing companies, threats of layoffs and unemployment. Bankruptcy of a company cannot be avoided anymore, which is marked by a company that cannot pay its obligations or is illiquid. Therefore, companies are required to maintain financial performance in order to avoid business failure or experiencing financial distress which can lead to bankruptcy.

A warning system model to anticipate financial distress needs to be developed, because this model can be used as a means to identify and even improve conditions before reaching a crisis condition. Large manufacturing companies are very interested in the financial health of their suppliers to avoid any disruptions related to production and distribution schedules.

The financial statements issued by the company are a source of information regarding the company's financial position, performance and changes in the company's financial position, which are very useful to support the right decision making. Almilia and Kristijadi, (2003:1) By analyzing a financial statement, the bankruptcy of a company can be seen and measured. This bankruptcy can be detected early, because before bankruptcy occurs, the company will experience a condition, namely financial distress.

In order for the information presented to be more useful in making decisions, financial data must be converted into information that is useful in making economic decisions. The model that is often used in conducting this analysis is in the form of financial ratios. Manufacturing companies are chosen because manufacturing companies are a type of business engaged in the real sector which has a larger number of companies compared to other types of businesses, and manufacturing companies have the characteristics of financial reports. which resembles. The purpose of this study is to provide information for internal and external parties regarding the financial ratios that are very dominant in predicting financial distress. From the description above,

2. RESEARCH METHOD

The scope and object of this research are companies that are included in the consumer goods industry which are listed on the Indonesian Stock Exchange. The research conducted was indirect observation and used secondary data. The data used in this study were obtained from balance sheets, income statements and cash flow statements as well as year-end closing stock prices which were obtained and published. to examine the effect of the independent variables namely accounting profit, operating cash flow, investment cash flow, financing cash flow and return on assets on the dependent variable, namely stock returns. The sampling method used is non-probability sampling, namely a sampling technique that does not provide opportunities or opportunities for each element or member of the population to be selected as a sample. The technique used to determine the sample to be used in this study is purposive sampling or judgment sampling, namely the selection of non-random sampling whose information is obtained using certain considerations (generally adjusted to the objectives or research problems). Secondary data is data obtained from other parties in the form of annual and idx montly reports obtained from IDX publications through the website www.idx.co.id. The data collection method is carried out by studying and analyzing literature whose sources are books, journals, articles and others related to the problems encountered. The analytical method used to test the hypothesis in this study is the method of multiple regression analysis (multiple regression analysis). The multiple linear regression analysis method aims to test two or more independent variables on the dependent variable. In this study, multiple linear regression was used to determine the relationship between the dependent variable, namely stock returns, and the independent variables, namely accounting profit reports, cash flow statements and returns on assets.

3. RESULTS AND DISCUSSIONS

Research result

1. Descriptive Statistics Test

In this chapter, we will discuss the data obtained and present the results of calculating a number of variables and then analyzing them. Data analysis is a process in solving problems so that the objectives of a research can be achieved. The population in this study were all manufacturing companies listed in the Indonesia Stock Exchange publications in 2004–2008. The data is then processed based on the level of profitability to distinguish healthy and unhealthy companies.

After these companies are classified, the financial ratios of the independent variables used in the study will be calculated. Based on existing data, 22 companies were obtained as a research sample consisting of 11 unhealthy companies and 11 healthy companies, with a total population (22 companies x 5 years) of 110.

Table 1. Classification of Observations

object	Amount
Manufacturing company	135
Sample	22

Healthy Company	11
Unhealthy Company	11
Number of Observations	110

As described in the previous chapter, this study aims to find financial ratios that can predict financial distress in manufacturing companies. The ratios in question are the financial ratios used in Ugurlu's research (2006:14), which total 22 financial ratios. However, based on data availability, only 16 financial ratios are used.

Table 2. Independent Variable Selection Stage

Financial Ratios	Amount
Used By Urgula (2006)	22
Based on the availability of deleted data	6
The number of variables used in the research	16

Based on the table, it shows that the supporting variables of the study can be accepted by logit regression and are suitable for independent reduction to 16 ratios. processed. From the table it can also be seen that the number of variables.

Table 3. Case processing summary results

Unweighted Cases(a)		N	percent
Selected Cases	Included in Analysis	110	100.0
	Missing Cases	0	,0
	Total	110	100.0
Unselected Cases		0	,0
Total		110	100.0

Based on the results of table 3, it is known that the number of regression cases included in the analysis is 110 samples. With a visible percentage of 100%, so it is feasible to be processed in logit regression.

Table 4. Accuracy of Logit Model Classification

Step 1	Financial Distress	.00	41	14	74.5
		1.00	16	39	70.9
	Overall Percentage				72.7
Step 2	Financial Distress	.00	44	11	80.0
		1.00	10	45	81.8
	Overall Percentage				80.9
Step 3	Financial Distress	.00	46	9	83.6
		1.00	8	47	85.5
	Overall Percentage				84.5

In table 4, it can be seen that the predictive value for the healthy company category (0) is 11 companies x 5 years = 55, while the observation results are only 46 with a classification accuracy of 83.6% and for unhealthy companies 11 companies x 5 years = 55 and the observation results was 47 with a classification accuracy of 85.5%. overall classification accuracy was 84.

2. Classic test results

Table 5. Multicollinearity test

Model	Unstandardized Coefficients		standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	std. Error	Betas			tolerance	VIF
1 (Constant)	.148	.281		.528	.599		
ROE	040	.035	.201	1,144	.255	.173	5,782
PHASE	.004	005	.119	.700	.486	.183	5,458
NOTE	.639	.388	.252	1,645	.103	.227	4,408
CASH	.165	.098	.142	1679	.097	.739	1,353

LTDTD	-.227	.201	-.104	-1,133	.260	.630	1,588
WCLTD	001	002	.067	.685	.495	.564	1,773
EBITPC	-.079	083	-.083	-.954	.343	.711	1,407
EBITS	-.031	.116	-.024	-.269	.789	.688	1,454
SETA	-.078	.066	-.114	-1,183	.240	.574	1,742
APNPTA	.347	.145	.242	2,392	.019	.520	1924
SCA	-.039	047	-.078	-.825	.412	.592	1690
SWC	003	002	.130	1,655	.101	.869	1,150
STFA	.017	010	.189	1,778	079	.471	2,121
GPM	.027	.025	094	1,072	.286	.692	1,446
OBIOLA	-.002	.004	-.037	-.494	.622	.939	1,064
TOAS	-.007	.004	-.171	-1,585	.116	.458	2,183

The results of calculating the Tolerance value also show that there are no independent variables that have a Tolerance value of less than 0.10, which means there is no correlation between the independent variables whose value is more than 95%. The results of calculating the Variance Inflation Factor (VIF) values also show the same thing. There is not one independent variable that has a VIF value of more than 10. If it can be concluded that there is no multicollinearity between the independent variables in the regression model.

Table 6. Glejser test

Model	Unstandardized Coefficients		Standardized Coefficients	Q	Sig.
	B	std. Error	Betas		
1(Constant)	.501	.121		4.146	.000
ROE	.000	.015	-.003	-.017	.986
PHASE	-.001	002	-.072	-.372	.711
NOTE	-.027	.167	-.028	-.160	.873
CASH	-.026	042	-.060	-.626	.533
LTDTD	-.317	086	-.380	-3,668	.125
WCLTD	-.001	001	-.138	-1,265	.209
EBITPC	.021	.036	058	.596	.553
EBITS	-.085	.050	-.169	-1,702	092
SETA	-.026	.029	-.098	-. 904	.369
APNPTA	-.195	062	-.357	-3,130	.157
SCA	012	.020	061	.567	.572
SWC	001	001	.090	1025	.308
STFA	.000	.004	-.004	-.033	.974
GPM	-.014	011	-.132	-1,330	.187
OBIOLA	.000	002	-.013	-.153	.879
TOAS	-.009	002	-.550	-4,529	.137

3. Hypothesis test

Based on the case processing summary in the appendix, it can be seen that the number of regression cases included in the regression analysis is 110 samples. And if seen from the percentage of cases, it is 100 percent feasible to be processed with a logit model.

Table 7. Statistical Assessment Results with -2 LogL

Iterations	-2 log likelihoods	Coefficient			
		Constant	NOTE	APNPTA	CASH
Step1	98,585	-3,475	5,290	2098	.801
2	91,847	-4,968	7.162	3,600	1,508
3	90,892	-5,595	7,794	4,517	2029
4	90,857	-5,711	7,893	4,718	2,183

	5	90,857	-5,715	7,895	4,726	2,192
	6	90,857	-5,715	7,895	4,726	2,192

Table 8. Results of the Fit Model Assessment

step	-2 log likelihoods	Cox & Snell R Square	Nagelkerke R Square
1	114,900	.289	.386
2	97,687	.392	.523
3	90,857	.429	.572

Table 9. Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7,266	8	.508
2	5.120	8	.745
3	4,960	8	.762

The assessment of the fit model (table 8) of the logistic regression model can be seen from the statistical value -2Log L (table 7), that is, without the constant independent variable of 152,492 after entering six new variables, the -2LogL value drops to 90,857 or there is a decrease (152,492 – 90,857) of 61,635. This means that the addition of independent variables can improve the fit model by 61,635. The Cox & Nagelkerke R Square value is 0.503 and the Nagelkerke R Square is 0.572, this means that the variability of the dependent variable can be explained by the variability of the independent variables of 57.2%.

Table 10. Parameter Estimation Results and Interpretation

		B	SE	Wald	df	Sig.	Exp(B)	95.0% CIfor EXP(B)	
								Lower	Upper
step3(c)NOTE		7,895	1,700	21,565	1	.000	2685.162	95,886	75194772
CASH		2,192	1.177	3,471	1	062	8,957	.892	89,922
	APNPTA	4,726		10,949	1	001	112,875	6,867	1855.320
			1,428						
	Constant	-5,715	1,096	27,211	1	.000	003		

The CATA variable, APNPTA, is significant at 0.05, from the logit model equation it can be seen from the log odds' variables that can predict financial distress are negatively influenced by the APNPTA, CATA variables and positively influenced by the CASH variable. So that it can be concluded, if the CATA variable, APNPTA, has a large value, the probability that the company will experience financial distress will increase. If the CASH variable has a large value, the probability that the company will experience financial distress will decrease. The Ha hypothesis that financial ratios have a significant effect on the prediction of financial distress only applies to the CATA, CASH and APNPTA ratios. As for ROE, PHASE, LTDTD, WCLTD, EBITPC, EBITS, SETA, SCA, SWC, STFA, GPM,

Discussion result

From the results of the SPSS output in the stepwise logistic regression analysis, it can be seen that there are only three financial ratios that affect the level of occurrence of financial distress. These ratios are CATA and APNPTA where if CASH has a large value, the profitability of companies experiencing financial distress will decrease. The CATA and APNPTA ratios can negatively affect financial distress because the results displayed on the SPSS output show a less significant level at 0.05, namely 0.00 and 0.01, in contrast to the CASH ratio which has a significant level more at 0.05, which is 0.62, so it affects financial distress positively .

In contrast to previous research conducted by (Yulia Purwanti, 2005) all the ratios used were 33. None of them were significant which could be used to predict the financial distress of a company except for using the Almatn method. It is also different from the research conducted by (Amalia and Kristijadi, 2003), the most dominant ones used to predict financial distress are profit margins, liquidity, financial leverage and growth.

So that only the ratio of the Almatn method is the most significant in determining financial distress, there are five ratios namely, Working capital to Total assets, Retained earnings to Tatal assets, EBIT to Total assets, MVE to BVTD and Total Assets Turnover.

4. CONCLUSION

Variables that can explain financial distress with a logistic regression model consisting of CATA and APNPTA. If the CASH variable increases, the probability that the company will experience financial distress increases. So it can be concluded that there is a significant influence between the independent variables on the dependent variables including CATA, CASH and APNPTA. However, the ratios of ROE, PHASE, LTDTD, WCLTD, EBITPC, EBITS, SETA, SCA, SWC, STFA, GPM, OBIOLA and TOAS are not significantly used to predict financial distress.

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