

Prediction of Financial Distress in Companies on The Indonesian Stock Exchange

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Abstract

This research aims to determine the potential profit and cash flow by using the Altman Z-Score prediction model in predicting financial distress in manufacturing companies listed on the Indonesia Stock Exchange. Using the purposive sampling method, 98 manufacturing companies were obtained that were listed on the Indonesia Stock Exchange in the 2015-2019 period. The results of research on the sample show that profits and cash flow using the Altman Z-Score prediction model can predict financial distress in manufacturing companies listed on the Indonesia Stock Exchange in the 2015-2019 period.

Keywords: Financial Distress, Profit, Cash Flow, Altman Z-Score

1. Introduction

The fear of all business people is experiencing failure in the company. Keeping a company successful is not a simple matter. One of the main risks faced by business people is competition. If the company is unable to compete, then this will "resulting in a decrease in business volume, which can ultimately result in company failure." In fact, a company can end up going bankrupt if it faces large losses that complicate the company's finances or financial distress and force the cessation of operations.

financial distress can be interpreted as a situation that shows the company's total liabilities are greater than its total assets, which can result in the company experiencing an inability to fulfill its responsibilities to creditors, and the main goal of a company, which is to obtain profits, cannot be achieved (Almilia & Herdiningtyas, 2005). This can be determined by examining the income statement, which is created to reflect the company's financial status over a specific period. The income statement can be used as material for company evaluation because it shows whether the company is making a loss or making a profit by looking at the company's net income.

To continue carrying out business activities for a long period of time, a company is required to obtain maximum profits while maintaining the going concern assumption (Santosa & Wedari, 2017). In fact, financial distress means companies are often unable to maintain going concern assumptions. In this scenario,

investors can assess the company's financial health by examining its profits.

Apart from the profit and loss report, the cash flow report is also a report that shows the amount of cash income and expenditure in a certain period. If the amount of income is greater than expenditure, this situation can be called positive cash flow, whereas if the amount of income is smaller than expenditure, it is called negative cash flow (Hendriksen, 2008).

From this cash flow report, the collector can find out the company's ability to fulfill its responsibilities. If a company's cash flow has a large amount, the collector will have confidence in the company for the loan provided. And if a company's cash flow is small, the collector no longer has confidence in the company for the loan provided. Sufficient cash flow can prevent a company from financial distress (Sari & Utami, 2009).

In general, research on financial difficulties uses financial ratios as its focus. Many literatures have developed models to predict financial distress conditions in companies. These models hold substantial importance for different stakeholders who are interested in the company. One model put forward by Altman (1968) uses financial ratios to predict the potential for financial distress in the company.

In connection with this concept, researchers will investigate whether profits and cash flows by applying the Altman Z-Score prediction model have the potential to identify "financial distress situations in manufacturing firms listed on the Indonesia Stock Exchange between 2015 and 2019. This research uses

time series data, namely financial reports for 2015 - 2019. The reason for taking this time period is to see the consistency of research results over more than one year. In the context of this research, the researcher's main goal is to make a meaningful contribution. One of the benefits is that findings of this research are expected to contribute added value to the company under study. This research is anticipated to offer valuable insights and knowledge to companies regarding the potential relationship between profits and cash flow in an effort to predict the risk of financial distress, and ultimately be able to take appropriate and effective preventive steps.

2. Literature Review

Financial Distress

Financial distress or financial difficulty refers to a situation in which a company is unable to meet its obligations as they become due and causes company bankruptcy (Darsono & Ashari, 2005). Financial distress is a stage of decline in financial conditions that occurs before company bankruptcy (Platt & Platt, 2002). Whitaker (1999) defines financial distress as a situation where a company experiences negative operating profits. Meanwhile, Mc Cue (1991) defines financial distress as a situation where a company experiences negative cash flow.

financial distress This is an early symptom of a company experiencing bankruptcy if it is not resolved promptly and appropriately. Therefore, interested parties can view the signs from a different perspective. So, it can be hoped that this can help companies deal with financial distress (Fahmi, 2014).

Causes of Financial Distress

One of the internal factors that can cause a company to experience financial distress arises when a company struggles to effectively manage its core fundamentals. Apart from internal factors, external factors also influence, here are three situations that can cause financial distress or financial difficulties when viewed from a financial aspect (Rodoni & Ali, 2010):

- a. An imbalance in the receipt of funds with the funds spent on company operations results in a capital shortage.
- b. The large debt and interest burden resulting from the company's inability to fulfill its responsibilities.
- c. The company's inability to generate income to cover operating costs results in losses.

Profit

Generally, profit is the difference of income above costs in one period. Profit information is useful as an indicator in assessing a company's capabilities and determining investment policies. Profit is usually used as a basis for tax imposition, dividend policy, investment guidelines for decision making and predictive elements (Harnanto, 2003).

Profit grouping is important in analyzing. Halsey (2005) groups profits based on two main dimensions, namely:

- a. Operating and non-operating profits
Operating profit or operating income is something measurement of company profits originating from ongoing operating activities. Operating profit excludes all items that are non-recurring or irrelevant to the company's core activities. Operating profit is useful in separating investment (and operating) decisions from financing decisions, while non-operating profit includes all profit components that are not included in operating profit. Profit is useful in separating components related to financial activities from components related to discontinued operations.
- b. Recurring and non-recurring profits
The need to group recurring and non-recurring profit components comes from the need to determine permanent and temporary profit components.
 1. Permanent profit.
The permanent (recurring) profit component is expected to occur over time.
 2. Temporary profit.
Temporary (non-recurring) components of profit are not expected to occur again. It is usually a one-time event.

Cash flow

Every company in carrying out its business operations will experience cash inflows and cash outflows. If cash inflow is greater than cash outflow then this indicates positive cash flow. Positive cash flows are a good sign. Although net income provides a long-term measure of a company's failure or success, cash is the lifeblood of a company (Kieso, Weygandt, & Warfield, 2011).

A cash flow statement is a financial report that shows the sources of cash and the use of cash coming in or out of a business or is a report about changes in financial position due to cash flow (Ardiyos, 2010). The purpose of cash flow reporting is to provide information on cash inflows and cash outflows for one period. Offers historical insights into a company's changes in cash and cash equivalents through its cash flow statements.

Capital Structure

Capital Structure or capital structure is the relative mix of debt and equity in a company's long-term funding structure (Megginson, 1997). The capital structure consists of short-term funding, long-term funding and equity. Both short-term and long-term debt can be sourced from external parties outside the company which is used to finance capital investment. Mortgage debt or secured debt and bonds are examples of long-term debt.

Companies should analyze a number of factors as a first step in determining the target capital structure.

Goals may change from time to time according to changing circumstances, but a specific capital structure must be in place in management at all times. If the debt ratio is below the target level, capital expansion will usually be carried out by issuing debt, and if the debt ratio is above the target level, equity will usually be issued (Brigham & Houston, 2006).

Agency Theory

Agency theory is a relationship based on a work contract between one or more people as principal and one or more people as agents. Agency theory highlights the significance of delegating authority from the principal to the agent, who is responsible for managing the company in alignment with the principal's interests (Jensen & Meckling, 1976).

Information from financial reports is very useful for the principal to assess the condition of the company because the principal can find out how much assets, debts and profits the company has (Ali, 2002). If the financial statements show a high debt ratio owned by the company, then this reflects that the company will have larger obligations in the future that must be paid off. The company also has the possibility that the debt ratio is due to the agent's wrong actions in managing the company, or worse, the agent deliberately takes actions that are only selfish and ignores the interests of the principal. With a high debt ratio owned by a company, it will increase the company getting into financial difficulties.

Financial Ratios

Financial ratios are technical analysis in the field of financial management (Irawati, 2005). Financial ratios are a tool to analyze, measure and assess the performance of a company using the company's condition parameters or financial data.

Several studies have been carried out to determine the utility of financial ratios in predicting company failure. One of which is Altman (1968) looked for the similarities of several financial ratios that are commonly used to predict company failure. Altman (1968) found four types of financial ratios that can be used to see whether a company is predicted to go bankrupt or not. This prediction model underwent several modifications to form the Z-Score formula created by Altman (1995):

$$Z\text{-Score} = 6.56 + 3.26 + 6.72 + 1.05X_1X_2X_3X_4$$

The financial ratios contained in the Z-Score formula consist of:

X1: Working Capital to Total Assets

X2: Retained Earnings to Total Assets

X3: Earnings Before Interest & Taxes / Total Assets

X4: Book Value of Equity to Book Value of Liabilities

The grouping of companies that are predicted to be in good condition or bankrupt is based on the Z-Score value of the Altman model (1983), namely:

- a. A Z-Score > 2.99 is categorized as a company that is very healthy or in a safe zone so it is not experiencing financial difficulties.
- b. $1.81 < Z\text{-Score} < 2.99$ is in the gray area, categorized as a company that has the possibility of being saved and the possibility of going bankrupt is equal depending on the policy decisions of the company's management as the decision maker.
- c. A Z-Score < 1.81 is categorized as a company that has very large financial difficulties and is at high risk so that the possibility of bankruptcy is very large.

3. Hypothesis Development

In this research there are 2 hypotheses which can be explained as follows:

H1: Profit using the Altman Z-Score prediction model has the potential to predict financial distress in Manufacturing Companies listed on the Indonesia Stock Exchange for the 2015-2019 period.

This hypothesis shows that in manufacturing companies listed on the Indonesia Stock Exchange from 2015 to 2019, profits if analyzed using the Altman Z-Score prediction model can predict the occurrence of financial distress.

H2: Cash flow through operating activities using the Altman Z-Score prediction model has the potential to predict financial distress in Manufacturing Companies listed on the Indonesia Stock Exchange for the 2015-2019 period.

This hypothesis shows that "in manufacturing companies listed on the Indonesia Stock Exchange between 2015 and 2019, the cash flow generated through the company's operational activities can predict the occurrence of financial distress.

4. Research methods

This research utilizes secondary data as its primary source, which means the data used was taken indirectly or from other parties. The data used in this research are financial reports belonging to manufacturing companies listed on the Indonesia Stock Exchange (BEI) for the 2015-2019 period which can be obtained via www.idx.co.id or the company's personal website.

The sample uses in this study was divided into two, which is analysis sample and holdout sample. *Analysis samples* are data that are processed to determine the predictions of a model, while the holdout sample is data that is used to compare predictions and the reality of the model. To obtain a sample that meets the criteria, this research uses a purposive sampling method. The criteria for selecting samples in this research are manufacturing companies that are listed on the Indonesia Stock Exchange (BEI)

and have published consecutive audited financial reports in 2015-2019.

Analysis samples in this research is a manufacturing company that is listed on the BEI and has published consecutive audited financial reports in 2015-2018. Meanwhile the holdout sample in this research is manufacturing companies that are listed on the Indonesia Stock Exchange (BEI) and have published consecutive audited financial reports in 2019.

Hypothesis testing in this research uses discriminant analysis which is used for a model that can clearly display differences and group several cases of independent variables into two dependent groups. This research groups the dependent variables into two different groups, namely financial distress and non-financial distress using computer program tools, namely the SPSS program.

In this research, 2 equation models are used, namely equation one (1) for the profit model and equation two (2) for the cash flow model.

$$EBT = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \quad (1)$$

$$CF = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \quad (2)$$

Information:

EBT: Negative or positive profit (dummy variable)

CF: Negative or positive Cash Flow (dummy variable)

X1: Working Capital to Total Assets

X2: Retained Earnings to Total Assets

X3: Earnings Before Interest and Taxes to Total Assets

X4: Market value of common and preferred stock to book value of debt

5. Results and Discussion

Descriptive statistics

Table 1. Descriptive Statistics for Model 1

	N	Min.	Max.	Mean	Std. Deviation
EBT	325	0	1	.98	.123
X1	325	-.7529	4.46790	.2762980	.32904811
X2	325	-2.0899	8.73790	.3426839	.59016007
X3	325	-.08707	3.14569	.1192199	.20183371
X4	325	-.6385	161.3422	2.497662	9.0234726
Valid N	325				

Source: Data Processing - SPSS

Based on table 1, it is known that for the Profit variable (dummy) the average is 0.984615. So based on the average value, it shows that the company's average profit was 98.46% compared to the previous year.

The average Working Capital to Total Assets variable is 0.276298. So based on the average value of 0.276298, it shows that on average equity influences assets by 27.63% more than in the previous period.

The average Retained Earnings to Total Assets variable is 0.342684. So based on the average value of 0.342684, it shows that on average Retained Earnings affects the company's Total Assets by 34.26%, growing compared to the previous year.

The average variable Earnings Before Interest and Taxes to Total Assets is 0.119220. So based on the average value, it shows that on average Earnings Before Interest affects the company's Total Assets by 11.92% compared to the previous year.

The average market value of common and preferred stock to book value of debt variable is 2.497662. So based on the average value, it shows that on average the market value of common influencing the company's preferred stock to book value of debt is 2.49% compared to the previous year.

Table 2. Descriptive Statistics for Model 2

	N	Min	Max	Mean	Std. Deviation
Cash flow	315	0	1	.95	.013
X1	315	-.341	.92126	.2503390	.21395194
X2	315	-.352	.94195	.2993032	.25827869
X3	315	-.239	.30225	.0610006	.08327144
X4	315	-.019	14,030	2.1621838	1.99041219
Valid N	315				

Source: Data Processing - SPSS

Based on the table 2, it is known that for the Cash Flow variable (dummy) the average is 0.95. So based on the average value, it shows that on average the company's cash flow is 95% compared to the previous year.

The average Working Capital to Total Assets variable is 0.2503390. So based on the average value of 0.2503390, it shows that on average equity influences assets by 25.03% more than in the previous period.

The average Retained Earnings to Total Assets variable is 0.2993032. So based on the average value of 0.2993032, it shows that on average Retained Earnings affects the company's Total Assets by 29.93%. It means that the total assets are increasing compare to the assets on the previous year.

The average variable Earnings Before Interest and Taxes (EBIT) to Total Assets is 0.610006. Therefore, based on this average value, average Earnings Before Interest affects the company's Total Assets by 61% compared to the previous year.

The average market value of ordinary and preferred stock to book value of debt variable is 2.1621838. Therefore, based on this average value, it shows that on average the market value of common influencing the company's preferred stock to book value of debt is 2.16% compared to the previous year.

Normality test

Normality testing is carried out to assess whether the regression model for all variables (dependent variable and independent variable) distribution. This test was carried out using the Kolmogorov-Smirnov method. This test will show whether the residual distribution will be normally distributed if the significance value is more than 0.05 or 5% (Ghozali, 2016).

Table 3. Tests of Normality Model 1

	Statistics	Df	Sig.
Unstandardized Residuals	,091	325	,079

Source: Data Processing - SPSS

Based on table 3, it can be concluded that the normality test results in model 1 show a Sig. Kolmogorov-Smirnov is 0.079. This figure exceeds the value of 0.05, so it can be concluded that the data has a distribution that can be considered normal.

Table 4. Tests of Normality Model 2

	Statistics	df	Sig.
Unstandardized Residuals	,125	315	,072

Source: Data Processing - SPSS

Based on table 4, it can be concluded that the normality test results in model 2 show a Sig value. Kolmogorov-Smirnov is 0.072. This figure exceeds the value of 0.05, so it can be concluded that the data has a distribution that can be considered normal.

Multicollinearity Test

Multicollinearity testing is a situation where there is a correlation between the dependent variable and the independent variable. This situation can be identified by the existence of a significant correlation between the independent variables. Multicollinearity is tested with Tolerance Value and Variance Inflation Factor (VIF). If the Tolerance Value is greater than 0.10 and the Variance Inflation Factor is below 10 then there is no multicollinearity condition (Ghozali, 2016).

Table 5. Multicollinearity of Model 1

Model	Tolerance	VIF
1 (Constant)		
X1	,374	2,673
X2	,265	3,767
X3	,266	3,766
X4	,167	5,990

Source: Data Processing - SPSS

Based on Table 5 shows that the results of the multicollinearity have a Tolerance value for each independent variable > 0.1 and a VIF value < 10, it means the variable being studied does not exhibit multicollinearity.

Table 6. Multicollinearity of Model 2

Model	Tolerance	VIF
2 (Constant)		
X1	,241	4,149
X2	,301	3,322
X3	,345	2,934
X4	,229	4,336

Source: Data Processing - SPSS

Based on the data from table 6, it shows multicollinearity test has a Tolerance value for each independent variable > 0.1 and a VIF value < 10, it means that the variable does not have multicollinearity.

Autocorrelation Test

The autocorrelation test was carried out for determining the presence of autocorrelation in the model of s regression using the Durbin Watson (DW) test.

Table 7. Autocorrelation Model 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,872a	,761	,758	,061	2,043

Source: Data Processing - SPSS

Based on the value in the table 7, we can see that the test results for Model 1, the test result of autocorrelation are 2.043, which is between 1.5 and 2.5, it means that the variable in this study does not have autocorrelation.

Table 8. Autocorrelation Model 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	,995a	,991	,990	,006	2,032

Source: Data Processing - SPSS

Based on the value in the table 8, we can see that the test results for Model 2 autocorrelation are 2.032, which is between 1.5 and 2.5, it means that the variable are free from autocorrelation.

Heteroscedasticity Test

Heteroscedasticity testing is carried out to find out which residual variances are not the same from one observation to another so that we can see the distribution of residual variances. If the data meets the heteroscedasticity assumption, the residual causes will be irregular and will not form any pattern either below or above the Y axis (0 axis) (Ghozali, 2016).

In this study, to test heteroscedasticity, the Glejser test was used. In the Glejser test, the absolute value of

the residual ($|u|$) is regressed on the independent variable.

Table 9. Heteroscedasticity of Model 1

Model		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
1	(Constant)	,051	,003		18,308	,000
	X1	,044	,009	,395	1,169	,155
	X2	-,062	,006	-1,006	-1,077	,354
	X3	,010	,016	,057	,628	,531
	X4	,002	,000	,469	,709	,540

Source: Data Processing - SPSS

Based on table 9, it can be seen that the heteroscedasticity test results for each independent variable have a significance value above 0.05 ($\text{sig} > 0.05$) so it means that heteroscedasticity does not occur.

Table 10. Heteroscedasticity of Model 2

Model		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
2	(Constant)	,002	,000		10,429	,000
	X1	,000	,001	-,039	-,466	,642
	X2	,001	,001	,119	1,183	,238
	X3	-,005	,002	-,192	-,137	,334
	X4	,000	,000	,340	1,584	,070

Source: Data Processing - SPSS

Based on table 10, it shows that the heteroscedasticity test results for each independent variable have a significance value above 0.05 ($\text{sig} > 0.05$) so it can be said that heteroscedasticity does not occur.

Hypothesis test

From the test result of the classical assumptions, it shows that the existing data is normally distributed, there is no autocorrelation and heteroscedasticity, so it meets the requirements for conducting discriminant analysis.

a. Profit Model

Table 11. Wilks' Lambda Model 1

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,906	38,510	4	,000

Source: Data Processing - SPSS

The results of the discriminant analysis of the profit model are shown in table 11, where the output shows a p-value (Sig) $0.000 < 0.050$ level of significance so that the profit model is strong enough

to be used to predict the company's financial distress condition.

Table 12. Model 1 Prediction Results in Analysis Sample

	Count	Predicted Group Membership		Total
		EBT	0	
Original	0	35	38	73
	1	56	263	319
%	0	47.9	52.1	100.0
	1	17.6	82.4	100.0

a. 76.0% of original grouped cases correctly classified.

Source: Data Processing - SPSS

Based on the value in the table 12, the success rate of the profit model in predicting the financial distress condition of a company reporting negative profits or positive profits is 76% for original grouped cases.

To further test, the predictive ability of the profit model, predictions are made on the sample used. From the results of discriminant analysis, the following prediction model is obtained:

Table 13. Canonical Discriminant Function Coefficients Model 1

	Function 1
X1	-1,945
X2	1,032
X3	2,153
X4	-,013
(Constant)	,110

Unstandardized coefficients

Source: Data Processing - SPSS

$$Z = 0.11 + -1.94X1 + 1.03X2 + 2.15X3 + -0.13X4$$

Information:

X1: Working Capital to Total Assets

X2: Retained Earnings to Total Assets

X3: Earnings Before Interest and Taxes to Total Assets

X4: Market value of common and preferred stock to book value of debt

Table 14. Functions at Group Centroids Model 1

Profit	Function 1
0	-,674
1	,54

Unstandardized canonical discriminant functions evaluated at group means

Source: Data Processing - SPSS

Based on the results of discriminant analysis, the centroids value was -0.674 for the group of companies that reported negative profits and 0.54 for the group of companies that reported positive profits. This centroid value is used to determine the cutoff point between companies that report positive profits and companies that report negative profits.

If there are only two groups and the size of each group is the same, then the optimal intersection point

is midway between the centroids of the two groups. Thus it can be determined as follows:

$$Z_{CE} = Z_A + Z_B - 2$$

Information:

Z_{CE} : Critical cut point value for groups of the same size

Z_A : Centroid for group A

Z_B : Centroid for group B

The intercept value obtained is $Z = (-0.674 + 0.54) / 2 = -0.067$. This means that if a company has a score of less than -0.067 , the company is predicted to report negative profits, and vice versa. The results of calculating the scores of the companies in the holdout sample I in the 1 year time period, namely 2019, along with profit predictions are presented as follows.

Table 15. Prediction of Company Profit in Holdout Sample Model 1

No	Code	Score	Predicted Profit	Reported Profit
1	ADES	0.0080926	1	1
2	AKPI	0.1637505	1	1
3	ALDO	-0.1023001	0	1
4	ALKA	-0.1247531	0	1
5	ALMI	0.1389543	1	0
6	ALTO	-0.0780664	0	0
7	AMFG	0.3188768	1	0
8	APLI	0.0821993	1	1
9	ARNA	0.3798401	1	1
10	ASII	0.4205638	1	1
11	AUTO	0.0982850	1	1
12	BAJA	0.1678288	1	1
13	BATA	-0.3003071	0	1
14	BIMA	-0.9649242	0	1
15	BOLT	-0.2558886	0	1
16	BRNA	0.0070696	1	0
17	BTON	-0.8794362	0	1
18	BUDI	0.1991365	1	1
19	CEKA	-0.5464532	0	1
20	CINT	-0.5457475	0	1

21	CPIN	-0.0381437	1	1
22	DLTA	-0.7028515	0	1
23	DVLA	-0.2258289	0	1
24	EKAD	-0.9014029	0	1
25	FASW	0.6766605	1	1
26	GDST	0.1521715	1	1
27	GGRM	0.2570677	1	1
28	GJTL	0.0613973	1	1
29	HDTX	-3.8973363	0	0
30	HMSP	-0.7245252	0	1
31	ICBP	0.2213719	1	1
32	IGAR	-1.1822028	0	1
33	IKAI	-0.6151819	0	0
34	IMAS	0.3379666	1	1
35	IMPC	-0.3469558	0	1
36	INAF	-0.4924570	0	1
37	INAI	0.2355596	1	1
38	INCI	-0.9063140	0	1
39	INDF	0.1588459	1	1
40	INDS	-1.1461333	0	1
41	INTP	-0.3818454	0	1
42	JECC	0.2809955	1	1
43	JKSW	-2.4236879	0	0
44	JPFA	-0.1850951	0	1
45	KAEF	-0.1824355	0	1
46	KBLI	-0.0249831	1	1
47	KBLM	-0.1082031	0	1
48	KBRI	-2.2835021	0	0
49	KDSI	0.3112411	1	1
50	KLAS	-2.1897424	0	0
51	KICI	-1.2946779	0	0
52	KINO	0.2334070	1	1
53	KLBF	-0.1975478	0	1
54	LION	-0.5907727	0	1
55	LMPI	-0.6368047	0	0
56	LMSH	-0.6540100	0	0
57	LPIN	-1.6247260	0	1
58	MAIN	0.2596560	1	1
59	MERK	-0.0817222	0	1
60	MLBI	1.9164784	1	1
61	MLIA	-4.8099816	0	1
62	MYOR	-0.1512492	0	1
63	MYTX	-0.3536439	0	0
64	PICO	0.5505278	1	1
65	PRAS	0.3851642	1	0
66	PSDN	0.0577098	1	1
67	PYFA	-0.3554164	0	1
68	RICY	-0.1659338	0	1
69	RMBA	-1.0564335	0	1
70	ROTI	0.0401583	1	1
71	SCCO	-0.2281590	0	1
72	SIAP	-0.1919459	0	1
73	SIDO	-0.6209136	0	1
74	SIPD	-0.8538535	0	1
75	SKBM	-0.8538535	0	1
76	SKLT	-0.8297509	0	1
77	SMBR	-0.3609373	0	1
78	SMCB	0.0739511	1	1
79	SMGR	0.8679977	1	1
80	SMSM	-0.2280364	0	1
81	SPMA	1.5070201	1	1
82	SRSN	-0.6268009	0	1
83	SSTM	-0.7543401	0	0
84	STAR	-2.1962898	0	1
85	STTP	0.3823774	1	1
86	TALF	-0.4280559	0	1
87	TCID	-0.4151389	0	1
88	TIRT	-0.2614065	0	0
89	TOTO	-0.0298984	1	1
90	TRIS	-0.4467841	0	1
91	TRST	0.2057190	1	1
92	TSPC	-0.1872268	0	1
93	ULTJ	-0.3099682	0	1
94	UNIT	0.0174399	1	1

95 UNVR 1.7764501 1 1

96	VOKS	-0.1853028	0	1
97	WIIM	-1.1005395	0	1
98	WTON	0.1979487	1	1

Source: Data Processing

Based on table 15, it can be seen that the success of the profit model classification for the holdout sample is 50%, namely 49 companies out of a total of 98 companies are classified correctly.

b. Cash Flow Model

Table 16. Wilks' Lambda Model 2

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,958	16,835	4	,002

Source: Data Processing - SPSS

The results of the discriminant analysis of the cash flow model are shown in table 11, where the output shows a p-value (Sig) $0.002 < 0.050$ level of significance so that the cash flow model is strong enough to be used to predict the company's financial distress condition.

Table 17. Model 2 Prediction Results in Analysis Sample

Original	Count	Predicted Group Membership			Total
		EBT	0	1	
	0	32	36	68	
	1	87	237	324	
%	0	47.1	52.9	100.0	
	1	26.9	73.1	100.0	

a. 68.6% of original grouped cases correctly classified.

Source: Data Processing - SPSS

Based on table 17, the success rate of the cash flow model in predicting financial distress conditions for a company reporting negative cash flow or positive cash flow is 68.6% for original grouped cases.

To further test the predictive ability of the cash flow model, predictions were made on the holdout sample. From the results of discriminant analysis, the following prediction model is obtained:

Table 18. Canonical Discriminant Function Coefficients Model 2

	Function 1
X1	-1,991
X2	,798
X3	2,751
X4	-,016
(Constant)	,133

Unstandardized coefficients

Source: Data Processing - SPSS

$$Z = 0.13 + -1.99X1 + 0.798X2 + 2.75X3 + -0.16X4$$

Information:

X1: Working Capital to Total Assets

X2: Retained Earnings to Total Assets

X3: Earnings Before Interest and Taxes to Total Assets

X4: Market value of common and preferred stock to book value of debt

Table 19. Functions at Group Centroids Model 2

Profit	Function 1
0	-,458
1	,096

Unstandardized canonical discriminant functions evaluated at group means

Source: Data Processing - SPSS

Based on the results of the discriminant analysis, the centroids value was -0.458 for the group of companies that reported negative cash flows and 0.096 for the group of companies that reported positive cash flows. This centroid value is used to determine the cutoff point between companies that report positive cash flows and companies that report negative cash flows.

If there are only two groups and the size of each group is the same, then the optimal intersection point is midway between the centroids of the two groups. Thus it can be determined as follows:

$$Z_{CE} = Z_A + Z_B - 2$$

Information:

Z_{CE} : Critical cut point value for groups of the same size

Z_A : Centroid for group A

Z_B : Centroid for group B

The intercept value obtained is $Z = (-0.458 + 0.096) / 2 = -0.362$. This means that if a company has a score of less than -0.362, the company is predicted to report negative cash flow, and vice versa. The results of calculating the scores of the companies in the holdout sample 1 in the 1 year time period, namely 2019, along with profit predictions are presented as follows.

Table 20. Company Cash Flow Prediction in Holdout Sample Model 2

No	Code	Score	Predicted Profit	Reported Profit
1	ADES	-0.040187	1	1
2	AKPI	0.1393049	1	1
3	ALDO	-0.096592	1	1
4	ALKA	-0.117394	1	1
5	ALMI	0.0928282	1	1
6	ALTO	-0.047571	1	1
7	AMFG	0.22956	1	0
8	APLI	0.0565274	1	1
9	ARNA	0.290692	1	0
10	ASII	0.3682425	1	1
11	AUTO	-0.025503	1	1
12	BAJA	0.2406563	1	1
13	BATA	-0.541771	0	1
14	BIMA	-0.75997	0	0
15	BOLT	-0.296984	1	1
16	BRNA	-0.031684	1	1
17	BTON	-1.170053	0	1

No	Code	Score	Predicted Profit	Reported Profit
18	BUDI	0.1837546	1	1
19	CEKA	-0.708305	0	1
20	CINT	-0.660023	0	1
21	CPIN	-0.100407	1	1
22	DLTA	-0.911486	0	1
23	DVLA	-0.323222	1	1
24	EKAD	-1.174529	0	1
25	FASW	0.6964893	1	0
26	GDST	0.1620197	1	0
27	GGRM	0.1686639	1	1
28	GJTL	0.0202501	1	1
29	HDTX	-2.96359	0	0
30	HMSP	-0.663923	0	1
31	ICBP	0.1665953	1	1
32	IGAR	-1.425562	0	1
33	IKAI	-0.601374	0	0
34	IMAS	0.3521045	1	0
35	IMPC	-0.431499	0	1
36	INAF	-0.610124	0	1
37	INAI	0.2590341	1	1
38	INCI	-1.094566	0	1
39	INDF	0.134731	1	1
40	INDS	-1.378644	0	1
41	INTP	-0.661754	0	1
42	JECC	0.3139789	1	1
43	JKSW	-1.920092	0	0
44	JPFA	-0.208795	1	1
45	KAEF	-0.163114	1	1
46	KBLI	-0.053579	1	0
47	KBLM	-0.150782	1	0
48	KBRI	-1.753764	0	1
49	KDSI	0.2648816	1	1
50	KIAS	-2.319948	0	0
51	KICI	-1.33236	0	1
52	KINO	0.2296676	1	1
53	KLBF	-0.412219	0	1
54	LION	-0.793364	0	0
55	LMPI	-0.620025	0	1
56	LMSH	-0.993655	0	0
57	LPIN	-2.135616	0	1
58	MAIN	0.2242313	1	1
59	MERK	-0.201104	1	0
60	MLBI	2.1711824	1	1
61	MLJA	-4.936975	0	1
62	MYOR	-0.214085	1	1
63	MYTX	-0.191567	1	0
64	PICO	0.5389058	1	0
65	PRAS	0.3762226	1	1
66	PSDN	0.136798	1	1
67	PYFA	-0.458023	0	1
68	RICY	-0.169095	1	0
69	RMBA	-0.987734	0	0
70	ROTI	-0.038894	1	1
71	SCCO	-0.325199	1	0
72	SIAP	-0.085124	1	1
73	SIDO	-0.670838	0	1
74	SIPD	-0.882377	0	1
75	SKBM	-0.882377	0	0
76	SKLT	-0.977257	0	1
77	SMBR	-0.428863	0	1
78	SMCB	0.0863679	1	1
79	SMGR	0.7232854	1	1
80	SMSM	-0.32571	1	1
81	SPMA	1.5098682	1	1
82	SRSN	-0.676582	0	1
83	SSTM	-0.714657	0	1
84	STAR	-2.378666	0	1
85	STTP	0.2679399	1	1
86	TALF	-0.54914	0	1
87	TCID	-0.640183	0	1
88	TIRT	-0.229608	1	1
89	TOTO	-0.186666	1	1
90	TRIS	-0.466101	0	1

No	Code	Score	Predicted Profit	Reported Profit
91	TRST	0.1387075	1	0
92	TSPC	-0.332486	1	1
93	ULTJ	-0.533637	0	1
94	UNIT	-0.018265	1	1
95	UNVR	2.027596	1	1
96	VOKS	-0.200548	1	1
97	WIIM	-1.298461	0	1
98	WTON	0.2025709	1	1

Source: Data Processing

Based on table 20, it can be seen that the success of the cash flow model classification for the holdout sample is 54%, namely 53 companies out of a total of 98 companies are classified correctly.

6. Analysis of Research Results

financial distress This is an early symptom of a company experiencing bankruptcy if it is not resolved promptly and appropriately. Therefore, interested parties can view the signs from a different perspective. So, it can be hoped that this can help companies deal with financial distress (Fahmi, 2014).

External parties to the company such as investors, creditors and the government also need information about the financial distress condition of a company so that they can make the right economic and business decisions to face the possibility of company bankruptcy in the future. Based on the results of this research, it can be explained that if external parties to the company will predict the company's financial distress, then profits and cash flow through operating activities can be used to predict financial distress.

As shown in table 12, The success rate of the profit model in predicting the financial distress condition of a company reporting negative profits or positive profits in the analysis sample is 76% for original grouped cases. Further testing was carried out by testing the holdout sample which can be seen in table 15, namely the success of the profit model classification for the holdout sample was 50%, namely 49 companies out of a total of 98 companies were classified correctly.

Thus, the results of this research are the same as research conducted by Atmini (2005), Wahyuningtyas (2010), Zulandari (2015), and Nailufar, Sufitrayati, & Badaruddin (2018) who concluded that profit can be used to predict the financial distress of a company.

Meanwhile, for cash flow based on table 17, the success rate of the cash flow model in predicting the financial distress condition of a company reporting negative cash flow or positive cash flow in the analysis sample is 68.6% for original grouped cases. Further testing was carried out by testing the holdout sample which can be seen in table 20, namely the success of the cash flow model classification for the holdout sample was 54%, namely 53 companies out of a total of 98 companies were classified correctly.

Thus, the results of this research are the same as research conducted by Nailufar, Sufitrayati, & Badaruddin (2018) which concluded that cash flow can be used to predict the financial distress of a company.

7. Conclusion

This study was performed to analyze the influence of profits and cash flow through operating activities in predicting financial distress in manufacturing companies listed on the BEI for the 2015-2019 period. The following are the conclusions that can be drawn from this research:

1. The first hypothesis is accepted, which means that profits using the Altman Z-Score prediction model have the potential to predict company failure in Manufacturing Companies listed on the Indonesia Stock Exchange for the 2015-2019 period.
2. The second hypothesis is accepted, which means that cash flow through operating activities using the Altman Z-Score prediction model has the potential to predict company failure in Manufacturing Companies listed on the Indonesia Stock Exchange for the 2015-2019 period.

8. Suggestion

In the research presentation described in this article, the researcher suggests further research to:

1. It is recommended that future research be carried out using a longer period.
2. It is recommended that future research expand the sample so that the conclusions drawn are not only for manufacturing companies.
3. It is recommended that future research add funding cash flow and investment cash flow variables.
4. Future research is expected to include more non-financial explanatory variables into the model.

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