Food and Beverage Company Bankruptcy Prediction in Indonesia as Result of Logistic Regression

Nia Yuniarsih[1], Anita Permatasari[2]

[1,2]Economics Department, Darma Cendika Catholic University
([1]niadanauni@gmail.com, [2]an_n1t4@yahoo.com)

Abstract- This study is a quantitative research that aims to reveal the effect of Current ratio, Leverage, Return on asset and Size toward financial distress. Analysis used in this study is using logistic regression. Data used in this study is secondary data that come from company's manufacture annual reports sector of food and beverage which is registered in Indonesia Stock Exchange (BEI) and ICMD (Indonesia Capital Market Directory) during 2016-2018. Result of study shows that suitability test of logistic regression is significant, it means that logistic regression could predict company's financial distress during the year. Hypothesis test results reveal that variable which affects company's financial distress is return on asset, while current asset, leverage, and size do not give impact toward financial distress.

Keywords- *Current Ratio, Leverage, Return on Asset, Size, Financial Distress*

I. INTRODUCTION

Bankruptcy is a problem that must be regularly watched by ever companies. Company will be bankrupt if they could not afford to perform operational act and pay its debt, both for long and short term debt. That is why company must perform numerous analyses in order to predict bankruptcy potential as early as possible. One of company that has high sale value are Sariwangi and Maskapai Perkebunan who are deemed as failed company by commercial court of central Jakarta on October of 2018. Sariwangi AEA Ltd is the creator of Sariwangi tea product. The company has been worked since 1973 and commerce first instant tea bag in Indonesia. Analysed form industrial side, the number of tea plantation in Indonesia is shrinking that makes tea production and export volume becomes decreased.

There are several factors that lead company into bankruptcy, they are ; (a) lack of company to follow consumer demand, (b) lack of company ability to diversification its product, (a) lack of innovation from its competitor. According to Brigham (2012), bankruptcy is a failure that could be found on companies who experience (a) economic distressed, it is a condition when company lost its income that make it unable to cover the expenditure, it means that the profit value is lower than capital in cash flow which is smaller. If this failure occurs, it will make value of cash flow become low than what was expected. (b) Financial distressed is a condition which a company could afford to find capital both cash and work capital. Some liability management asset play important role in regulating stability of financial status in order to prevent financial failure. Financial distress could also mean insolvency that could differ cash flow and basic stock (Altman, 1968).

Financial distress started from short term liquidity distress which is known as lowest symptom of financial distress that could lead into bankruptcy and financial distress as highest value (Brahmana, 2007). There is a temporary short term financial distress, if it is not overcame early, it will lead the company into liquidated and re-organized. Financial ratio is a good way to predict bankruptcy of a company in one to five year report. Some people, previously, prefer to use liquidity, solvability, profitability, activity, and sales development before bankruptcy occur (Naser and Aryati, 2000). Company that experience financial distress generally possesses negative value of profitability. According to Wahyu and Setiawan (2009), profitability reveals the efficiency of company asset use, because this ratio measure company to gain profit based on asset it used. By using company's asset in efficient way, it will decrease the cost used by company, thus the company could save some amount of assets and has enough resource to operate. That is why, the efficient use of asset will lower financial distress potency in feature. Tykvova and Borell (2012) and Korol (2013) use a set ratio of liquidity profitability, solvability, and activity. There are many literatures that state financial distress could be overcame by using simple precise prediction method, because they are better predictor of financial distress (Jones et al. 2017)

Meanwhile, ratio liquidity of company that experience financial distress generally shows under 1, it means that company current asset could not cover current debt of it. According to Hendra (2009), liquidity ratio is a ratio that can measure company's ability to perform its short term mandatory bill on due. Liquidity ratio used on most research is current ratio. Ashraf et al (2019) stated that identification of financial distress is better to perform before bankruptcy by analysing company financial report and perform significant investigation. Financial distress prediction model will give early warning in order to reconstruct the finance in mean time.

Leverage ratio of company who has financial distress is generally bigger than 1, it means that debt value of company is bigger than company total asset. According to Keown (2008), debt/leverage ratio shows number of debts which are used to

support company asset. Leverage ratio commonly used is debt ratio, it is total of debt divided by total asset. This debt ratio information is also important, because, by ratio debt, creditor could measure debt risk which is given to a company.

Besides, it will measure the total asset owed by company. Company that has big value of asset will be ease to perform diversification and will have lower threat of bankruptcy (Supriyanto and Flikhatun, 2008). The bigger asset owned by company, the bigger expectation for it to pay its future debt, thus it will make the company prevent future financial distress (Fachrudin, 2011).

II. LITERATURE REVIEW

A. Financial Distress

Financial distress provide picture of two extreme points during operational action of company which are short term liquidity problem until long term insolvable mandatory debt payment (Mamduh; 2007). Financial distress indicator could be found from cash flow analysis, company strategy analysis, and company financial report. If a company experience a problem in liquidity, it means that the company will enter state of financial distress, and it will lead company into bankruptcy if it is not overcame as soon as possible (Fahmi, 2012). Tinoco and Wilson (2013) stated that financial difficulty is a high price for company creditor, and they would love to minimize cost by taking significant acts. That is why, a good financial distress predictor must be able to predict all phase of company finance, early distress, and advanced financial distress.

According to Platt (2002), criteria of company who has financial distress; (1) possess net profit within negative operation in several years; (2) decide to stop paying dividend; and (3) perform big reconstruction or stop operation. Financial distress could be interpreted into inability of company to pay the mandatory debt on due that will result in bankruptcy (Darsono and Ashari, 2005). There are several factor that create financial distress that come from internal and external side of company. The internal factors are; (a) cash income received by company could not cover operational cost of the company; (b) company could not pay its short term payment; (c) operational loss that create negative cash flow.

Financial distress model need to be developed, in order to find early possibility of bankruptcy, it will ease the company to do prevention. Financial distress predictor is important for many sectors such as; (a) creditor, the analysis result will decide whether it will give the loan and it decide policy to supervise given loan. (b) Investor, it will help investors to measure possible problem of a company in returning the capital and its interest. (c) Stake holders, it is a regulator institution that supervises a company ability to pay the debt and stabilize individual company. (d) Auditor it could be a tool for auditors in taking scores of going concern score of a company. (e) company management, a preventive action to avoid direct fee such as accountant and lawyer and indirect fee such as loss sale or forced loss as result of court enforcement.

There are five types of financial distress, they are; (a) economic failure, it is a condition that total profit of a company could not cover total capital. (b) Business failure, it is condition when company stop its operation in order to minimize loss for creditor. (c) Technical insolvency, a condition when company could not pay bill which is on due. (d) Insolvency in bankruptcy, it is a condition that a book value exceed asset value of company in market. (e) Legal bankruptcy it is condition when a company is already bankrupt in the eye of law (Gamayuni, 2011).

B. Current Ratio

Liquidity is a ratio that shows in what extent a company could cover its short term debt. Liquidity could be measured by using current ratio according to Hapsari (2012), current ratio is found by dividing current asset with current debt. The bigger current ratio value, the lower possibility for a company to have financial distress because company had enough resource such as cash and asset that could pay its debt and support its operation both in transaction period that will make company free from financial issue and operational threat.

C. Leverage

Solvability ratio is a ratio to measure how many asset which is supported with debt. One of solvability ratio is debt ratio. According to Widhiari and Aryami (2015), debt ratio is total debt divided by total asset. Leverage provides a picture of relationship between debt and asset. The ratio could predict how much time left for company to rely on debt in supporting their operation which is known as equity. If company overuse debt, it will create a bigger debt on future, it will put the company on fragile state with its financial condition. The lower leverage, the better condition of company. That is why, leverage plays important role toward financial distress.

Financial distress defines as inability of a company to pay its current on due. It is connected with leverage decision of company, within its main problem, operational act of company which is not efficient. That is why, all equity of company could only be under pressure of economic sector, because there is no creditor who is involved. The main problem that creates such economic chaos for this industry is high value of leverage (Shilpa and Amulya, 2017).

D. Return on Asset

Profitability is a ratio that shows the power of company to make profit. This ratio could use return on asset as set of measurement. According to Widarjo and Setiawan (2009), this ratio could be done by dividing net profit with total asset. Profitability is the level of successful or failure of company for particular period. Harahap (2013) stated that profitability ratio shows the ability of company to make profit. This ratio is known as operating ratio. There are several parts of profitability ratio which are margin profit, return on asset, return on total asset, and return on equity. The lower value of return of asset, the lower value of working performance efficiency of company in operating the current asset in order to make profit, it causes loss on profit that will result on negative cash flow, and company will experience financial distress if it occurs for several years. Because, the instability between operational burden and total income.

E. Size

Size of company provides pictures total asset possessed by the company. A company with big total asset will be easy to perform diversification and it will lower risk of bankrupt (Rajan and Sigalez, 1995). The bigger total asset owned by company, it is expected, the bigger power to pay its debt, it will bring the company out of bankruptcy zone and financial problem. From those statement, it is concluded that the size of company affect toward financial distress.

1) Hypothesis Development

H1: Current Ratio affects Financial Distress

H2: Leverage affects Financial Distress

H3: Return on Asset affects Financial Distress

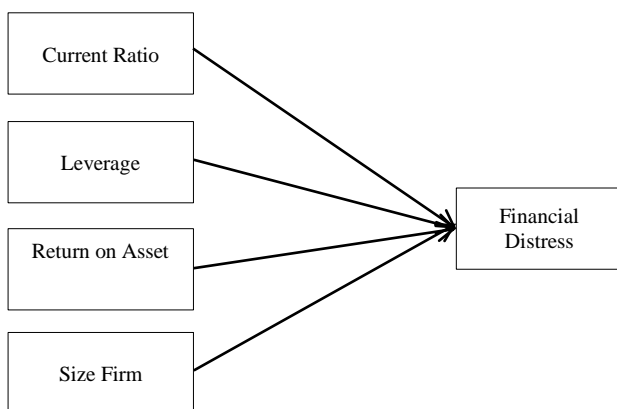H4: Size Firm affects Financial Distress

Figure 1. Conceptual Mindmaping

III. RESEARCH METHOD

A. Population and sample

Population in this study is manufacture company registered in Indonesian stock exchange. Sample collecting technique applies purposive sampling with several criteria as follow:

TABLE I. SEVERAL CRITERIA OF SAMPLE COLLECTING TECHNIQUE

1	Manufacture company with sub sector of beverage and food registered in Indonesia Stock Exchange in 2016-2018	26
2	Publish annual financial report in Rupiah currency which is available on Indonesian Capital Market Directory (ICMD) or by www.idx.co.id	(0)
3	Company which provide loss report during research from 2016 to 2018.	(1)
	total	25

B. Operational Definition

a) Current Ratio $= \frac{current\ Asset}{current\ debt}$

b) Leverage $= \frac{total\ debt}{Total\ Asset}$

c) ROA $= \frac{net\ profith}{Total\ Asset}$

d) Firm size

Size of company is a value of a company that can show level of its firm. The size of company could be levelled by its total sale, asset book total value, net total asset, and number of employees (Parwati and Suhardjo, 2009). Size firm could be measured by using total asset and dummy variable. Code 1 is for value of Ln total asset is bigger than median Ln total asset, code 0 is used for vice versa.

Dependent variable is a variable which determined by independent variable. The dependent variable used in this study is financial distress. In this study, a company is considered in financial distress status if the company experience net operating income for two years, meanwhile a company that has no net operating income two years in a row means that it has no financial distress. Determining the year used in this study, it is determined by year stated in variable X and year after variable X. The study uses dummy variable within formula of ;

1 (one) = financial distress

0 (zero) = non financial distress

IV. ANALYSIS AND DISCUSSION

A. Discriptive Statistic

Samples of this study are 75 companies from research year of 2016 to 2019. In 2016, there is one company that experience financial distress, and there are 3 companies that experience financial distress in 2017.

TABLE II. DESCRIPTIVE STATISTICS

	N	Minimum	Maximum	Mean	Std. Deviation
CR	75	0.00	1.88	0.7165	0.57201
LEV	75	0.00	1.79	0.4236	0.35731
ROA	75	0.00	0.92	0.4047	0.24896
SIZE	75	0.00	1.00	0.7467	0.43785
FD	75	0.00	1.00	0.0533	0.22621
Valid N (listwise)	75				

Meanwhile, average current ratio of food and beverage company in 2016-2018 is 0,7165. Liquidity value of food and beverage company is not good enough as it goes lower than 1. Leverage average of food and beverage company in 2016-2018 is 0,4236. Leverage value which is lower than 60%, thus the company could make a significant profit compared with their debt. Return on asset value is 0,4047, it means that company could not perform efficient use with its asset to make net profit.

B. Regression logistic analysis result

1) Fit model feasibility test

TABLE III.   HOSMER AND LEMESHOW TEST

Step	Chi-square	df	Sig.
1	5.566	7	0.591

According to Hosmer and Lemeshow's goodness of fit test on table 3, it is revealed that Chi Square value is 5,566 within sigse value of 0,591. Chi Square estimation is aimed to find effect from current asset, leverage, ROA, and size in predicting financial distress. From the result above, it is concluded that Sig value is higher than alpha (0.05), it means there is no significant different between predicted classification with researched classification. Thus, logistic regression model can be used for next analysis.

2)   Overall model fit test

TABLE IV.   OVERALL MODEL FIT TABLE

Block 0: Beginning Block			
Iteration History(a,b,c)			
Iteration	-2 Log likelihood	Coefficients	
		Constant	
Step 0	1	37.525	-1.787
	2	31.767	-2.520
	3	31.242	-2.827
	4	31.232	-2.875
	5	31.232	-2.876
	6	31.232	-2.876

a. Constant is included in the model.
b. Initial -2 Log Likelihood: 31.232
c. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

From Iteration History table above, Block 0 or when independent variable is not included into model: N=75 has value of -2 Log Likelihood: 31,232. Value of Degree of Freedom (DF) = N – 1 = 75-1=74. Chi-Square (X2) on column DF = 74 and probability 0.05 = 95,08147. Value -2 Log Likelihood (31,232) < X2 table (95,08147) it accepts H0, it concludes that pre-entry independent variable model is FIT with data.

Block 1: Method = Enter						
Iteration History(a,b,c,d)						
Iteration	-2 Log likelihood	Coefficients				
		CR	LEV	ROA	SIZE	Constant
Step 1	1	35.345	-1.992	0.160	0.223	0.746	-0.409
	2	26.702	-3.195	0.418	0.542	1.944	-0.996
	3	24.237	-4.348	0.721	0.818	3.414	-1.579
	4	23.812	-5.085	0.888	0.918	4.343	-1.875
	5	23.792	-5.288	0.925	0.936	4.600	-1.947
	6	23.792	-5.300	0.927	0.937	4.616	-1.951
	7	23.792	-5.300	0.927	0.937	4.616	-1.951

a. Method: Enter
b. Constant is included in the model.
c. Initial -2 Log Likelihood: 31.232
d. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

On Iteration history table block 1 or pre-entry independent variable in model: N=75. Degree of Freedom (DF) = N – total independent variable – 1 = 75-4-1=197. Chi-Square (X2) Table DF 70 and Prob 0.05 = 90,53123. value -2 Log Likelihood (23,792) < X2 table (90,52123) H0 is accepted, it concludes that pre-entry independent variable model is FIT with data.

3)   Qualification Matrix

TABLE V.   CLASSIFICATION TABLE (A)

Observed			Predicted		
			FD		Percentage Correct
			Non Financial Distress	Financial Distress	Non Financial Distress
Step 1	FD	Non Financial Distress	71	0	100.0
		Financial Distress	3	1	25.0
	Overall Percentage				96.0

Classification table shows power of regression model in order to predict financial distress of a company. According to table 5, there are 4 companies that are predicted to meet financial distress status; meanwhile field observation stated there is only one company that has financial distress. It means that the accuracy of this model is ¼ or 25%. In other hand, predicted companies who will not suffer from financial distress are 71 companies, field observation stated that there are 71 companies who does not suffer from financial distress. Thus, the accuracy of this model is 71/71 or 100%.

4)   Coefficient determination test

TABLE VI.   COEFFICIENT DETERMINATION TABLE (SUMMARY MODEL)

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	23.792(a)	.094	.277

A Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Coefficient determination is applied to reveal the level of variability of independent variables that could explain variability of dependent variable. Coefficient determination within logistic regression could be find on Nagelkarke R Square column. Table 5 shows value of Nagelkarke R Square which is 0,277, it means that dependent variable could be explained by independent variable for about 27,7%, and the rest 72,3% is explained by another variables outside research

5)   logistic regression analysis test

Concern with the applied of test hypothesis, logistic regression is used toward all variable which are Current ratio, Leverage, ROA and Size in predicting financial distress.

		B	S.E.	Wald	df	Sig.	Exp(B)
		Lower	Upper	Lower	Upper	Lower	Upper
Step 1(a)	CR	.927	1.007	.848	1	.357	2.527
	LEV	.937	1.323	.502	1	.479	2.553
	ROA	4.616	2.927	4.265	1	.012	9.118
	SIZE	-1.951	1.211	2.596	1	.107	.142
	Constant	-5.300	1.918	7.634	1	.006	.005

a Variable(s) entered on step 1: CR, LEV, ROA, SIZE.

Logistic regression formula in this study;

LN P/(1-P) = -5,300 + (0,927) CR+ (0,937) LEV + 4,616 -- ROA – 1,951 SIZE + e

From the result of logistic regression analysis, it is shown that the constantan is 5,300, it shows that there is no relationship from independent variable which is current ratio, leverage, ROA, and size. It will lower the financial distress probability for 5,300. Current ratio variable has regression coefficient for about 0,927, it means that if the current ratio variable increased for about one number, financial distress probability will also increase for about 0,937. ROA variable has regression coefficient of 4,616, it means that ROA variable increase for one number, the financial distress probability will also increase for about 4,616. Size variable has coefficient regression of -1,951, it means that if number of size variable increased for one number, it will also increase financial distress probability will decrease into 4,616 value.

The result of logistic regression shows that current ratio does not affect in predicting financial distress. Sig value on regression test has value of 0,357 which is bigger than α = 0,05, and wald test gives 0,848 which is smaller than X2 table df 1, it is 3.841. This result is supported by research conducted by Mas'ud and Srenga (2012) and Nora (2016) that stated current ratio does not give impact toward financial distress. Current ratio is used to measure the power of company to fulfil their short term payment. Insignificant impact between liquidity and financial distress is occurred as result of samples that are able to pay their short term bill and also able to support their financial operation with current asset owned by company, it makes company able to pay their debt on due.

Sig leverage value is 0,479 is bigger than α = 0,05 and wald test value is 0,502 which is smaller than X2 table df 1, it is 3.841. Thus, this regression result shows that leverage does not partially affect in predicting financial distress. It is supported by research conducted by (Widhiari and Merkusiwati, 2015). The stated that leverage has no effect on financial distress. Company will prefer to choose capital with less risk, it will lower the risk inability to pay debt on due and it will be overcome earlier. Leverage is used to measure the portion of financial aid which is supported from debt. Analysis tool used in this study is debt to equity ratio, it is a ratio which is used to measure the portion of debt within the capital. The higher debt to equity ratio, the bigger long term proportion owned by the company will be which will increase inability to pay the debt.

ROA sig value is 0012 which is lower than α = 0,05 and wald test result is 4,265 which is higher than X2 table df 1, it is 3.841. Thus, this regression result shows that ROA variable is partially affected in predicting financial distress. The result of this analysis is supported by research conducted by Almilia (2006) which is stated that profitability could be used in predicting financial distress. Companies who suffer from financial distress generally have negative ROA. ROA shows efficiency of using asset in making profit for company. Negative ROA means that there is not efficient use of company asset in order to earn net profit. Thus, if profit of company goes downhill and even negative, the probability of bankruptcy is bigger.

Sig size value is 0,107 which is higher than α = 0,05 and wald test result is 2,596 which is higher than X2 table df 1, it is 3.841. it means that size variable does not give partially impact toward financial distress prediction. This result is supported by a previous study conducted by Cinantya and Merkusiwati (2015). Firm size provides a picture of total asset of a company. Insignificant relation between firm size and financial distress is occurred because this study does not make classification among companies who are developing, stabile, or in recession state. A small company with stabile financial condition with a lot of networks, it will increase trust of financial institution, and it will increase recommendation form external sector about this company. A big firm with big asset and profit value will not free them from financial threat which is fluctuation of currency exchange toward US dollar, interest rate and inflation, all of them will threaten financial condition of company and it will lower public demand. It is possible for company to suffer from paying its debt which is on due.

V. CONCLUSION

1. Current Ratio has no Influence in predicting Financial Distress. The sample company has the ability to fund all of its operational activities and is able to meet its short-term obligations with current assets owned by the company, so the company can pay its debts on time.

2. Leverage has no partial Influence in predicting Financial Distress. The company will choose funding with little risk. Therefore, the uncertainty in debt repayment could be well anticipated. The amount of the debt to equity ratio shows the large composition of long-term liabilities the company has can increase the risk of default.

3. ROA influences the predicting of Financial Distress. Profitability ratios can be used in predicting financial distress. Negative corporate ROA does not show any effectiveness concern with the use of company assets to generate net income, so that if the profitability of a company continues to decline and even negative amount, then the possibility of a bankrupt company will be even greater.

4. Size has no partial Influence in predicting Financial Distress. This research does not separate companies between companies that are growing, stable, or experiencing a recession. A financially stable company despite the small size of the company with many working partners, high level of trust

from financial institutions towards the company and recommendations from consumers and external parties.

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