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# How to Predict Financial Distress in the Wholesale Sector: Lesson from Indonesian Stock Exchange

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## Abstract

Financial distress is a stage of decline in financial conditions experienced by a company before going bankrupt. This phenomenon in Indonesia in recent years since 2016 shows more and more companies are experiencing bankruptcy. The purpose of this study is to know what are the factors causing it using discriminant analysis. The population of this study is issuers in sub-sector wholesale listed on the Indonesia Stock Exchange 2010-2015 period. Results showed that all four variables those are leverage, activity, liquidity, and profitability have significance values and able to explain 72.42% of the variation distress and non-distress. The accuracy of the model is 96.8% on distinguishing companies that experience financial-distress with non-distress. Overall this research model is reliable and valid to be used for forecasting companies that will experience bankruptcy.

**Keywords:** Financial Distress, Discriminant Analysis

## I. INTRODUCTION

### I.1. Introduction and research rationale

Every company is established with a set of goals to be achieved. In general, companies have a goal to earn profits, increase sales, maximize share value, and improve shareholder welfare. A company is also expected to continue to grow and survive in the long term. So that it can provide sustainable economic value to its owners.

The ability of a company to be able to continue to compete is largely determined by the performance of the company itself. In general, the performance of a company is shown in the published financial statements. Companies that are unable to maintain their financial performance will slowly be evicted from their industries and potentially experience bankruptcy. So the company must continue to work to improve its financial performance to maintain its survival.

Bankruptcy is a problem that is often faced by a company. Bankruptcy experienced by companies harms not only internal parties but also external parties. According to Andriana & Rusli (2012) as for the parties who were harmed due to the bankruptcy of a company that is the parties that have an interest in the company such as investors, creditors, the government as the party who receives taxes and reduces unemployment. This makes bankruptcy

analysis important for all stakeholders and potential investors before deciding to invest in order to avoid losses. Therefore, the symptoms of a company's bankruptcy must be detected as early as possible, especially by management before it becomes late and difficult to control.

*Financial distress* is a condition where a company faces financial difficulties. Bankruptcy (*financial distress*) is an accumulation of mismanagement of the company to run its business operations in the long term in order to achieve its economic goals. In other words, bankruptcy does not occur suddenly. Rather, it begins with *financial distress warning* where companies experience financial difficulties in generating profits or earnings income, which continues to decline from year to year.

Harahap (2009) states that there are several signs that indicate a company that is experiencing *financial distress*, namely: a decrease in the number of dividends distributed, a decrease in profits continuously, closed/sold one or more subsidiaries, termination of employment on a large scale and prices in the market are constantly declining.

Whiteker (2000) further explains that there are several indications that a company that experiences *financial distress* is the termination of labor or loss of dividend payments and smaller cash flows than long-term debt or if for 2 years it experiences negative net operating profit and for more than 1 year does not pay dividends. Whereas Wahyujati (2000) in Nisita (2012) argues that a new company is said to experience *financial distress* when the company experiences *net income* negative for 3 years.

In general, *financial distress* can be caused by internal or external factors. Internal factors that can cause bankruptcy to include lack of knowledge and experience from management in managing *assets* and *liabilities* effectively. While external factors that can trigger bankruptcy include inflation, tax systems, law, and depression in foreign currencies.

According to Wruck (1990), *financial distress* is a situation in which operating cash flows are not sufficient to meet its current obligations, such as trade payables or interest costs. Furthermore, Platt and Platt (2002) add that *financial distress* is a step in decreasing financial conditions that occur before bankruptcy (liquidation). Whereas Brigham and Daves (2003) state that financial difficulties (*financial distress*) are caused by a series of improper decision-making errors and interconnected weaknesses that can contribute directly or indirectly to management and lack efforts to monitor the company's financial condition so that its useless in accordance with what is needed.

A total of 30 7-Eleven outlets were also closed at the beginning of 2017. The number of outlets closed increased from the previous year, which was around 20 outlets in 2016. Peak In June 2017, PT. Modern International Tbk (MDRN) as the holding company of 7-Eleven announced to close 7-Eleven outlets in Indonesia. This is because of its business entity, PT. Modern Sevel Indonesia (MSI) is unable to cover operating costs in Indonesia (www.detik.com).

The following is the profit and loss of data of PT. Modern International Tbk in 2010-2015.

Table 1: Profit - Loss of PT. Modern Internasional Tbk The year 2010 - 2015

Year	Profit / Loss
2010	Rp 41.976.947.256
2011	Rp56.715.758.740
2012	Rp.55.725.908.480
2013	Rp 50.145.687.551
2014	Rp 39.621.247.528
2015	- Rp 63.027.760.375

Source:idx.co.id

Based on table 1 above shows that PT. Modern International experienced a very significant decline in profits during the period of 2011-2015. Even in 2015 PT. Modern International suffered losses reaching Rp. 63.027.760.375.

PT. Modern International is one of 34 companies engaged in the sub-sector wholesale (durable and non-durable goods). During the period of 2010 - 2015, there were at least 6 companies (17.6%) in the sub-sectors wholesale (durable and non-durable goods) experiencing financial distress.

Previously, since 2010 there were at least 2 (two) companies delisting from the Indonesia Stock Exchange, namely PT. Dayaindo Resources Internasional (2013) and PT. Asia Natural Resources (2014). Most of the cases delisting occur indicated because the company in question experienced bankruptcy (financial distress) and only a few did mergers. The condition of financial distress repetitive attracts researchers to conduct research related to the phenomenon of financial distress in the sub-sector wholesale occurs on the Indonesia Stock Exchange.

Financial statements are tools that can be used by a prospective investor to get information about the financial position and results of operations that have been achieved by a company. Analysis of financial statements can provide an initial picture of the bankruptcy of a company. Financial statement analysis can be a very useful tool for management to evaluate business performance. Financial statement analysis can also be used by a prospective investor as a consideration in making investment decisions.

In the research that has been done before in the manufacturing industry, by Syaefudin (2016) it was noted that DER, CR, TATO, and ROA simultaneously had a significant effect in distinguishing the condition of financial distress of a company. Whereas Pahlefi (2017) who conducted research in the textile and garment sector stated that only variables Quick ratio had a significant effect in distinguishing company categories distress and non-distress. While DAR, TATO, and ROE have no significant effect on distinguishing company categories distress and non-distress.

Furthermore, Liani (2017), through her research in the mining sector, concluded that variables that have a significant effect in the discriminant function are CR, DAR, ROA, GPM, and PER. Whereas Ruslinawati (2017) who conducts research in the manufacturing sector states that only the variable partially Current ratio affects the financial distress. Whereas DER, Cash ratio, and Sales growth have no significant effect on financial distress.

The population of this study is the sub-sector wholesale (durable and non-durable goods) or also known as the big trade sector (manufactured & consumer goods) listed on the Indonesia Stock Exchange for the period 2010-2015. Unlike previous research. Previous research is more on the manufacturing, textile, and mining sectors. In research in these sectors, the causes of corporate bankruptcy are generally debt conditions. Are the main causes the same if in the sub-sector wholesale (durable and non-durable goods) as the sample chosen in this study.

This study chose the industry above because it wanted to reaffirm the notion that in the wholesale trade sector the most important thing that caused many companies to easily bankrupt was the mistake of managing liquidity that was over-liquid. What is such a guess is in accordance with the fact that this study was conducted? This industry was chosen because of its increasingly important position in the context of growth in consumption, investment, and the economy and employment in Indonesia. Moreover, it is linked to the government's desire to increase the number of small and medium enterprises (MSMEs), which are more in retail trade as well as the entrepreneurial spirit of entrepreneurs. Ignoring the problem of bankruptcy in the trade sector will have a negative impact on the economy and employment. This research is even more important because of its relation to the problems above.

This research is expected to contribute conceptually, especially regarding financial distress. Then provide input for companies, especially the sub-sectors wholesale (durable and non-durable goods) in making decisions to maintain the continuity of their business, which is related to preventive measures to avoid financial distress. And can be used as consideration in making decisions for investors before making an investment. While regulators and financial institutions provide information about any issues that need to support entrepreneurs in this sector and other related sectors.

Based on the description above, because there is a research gap between one study with another research, also want to confirm again and want to know how the application of this discriminant analysis in other sectors namely the trade sector, the authors are interested in conducting research with the title **"HOW TO PREDICT**

## **FINANCIAL DISTRESS IN THE WHOLESALE SECTOR: LESSON FROM INDONESIAN STOCK EXCHANGE”**

### **I.2.Problem Formulation**

Based on the background described earlier, the formulation of the problem for this study are:

- 1) How is the influence and ability of DER, TATO, CASH RATIO and ROA in distinguishing the condition of companies experiencing financial distress and non-distress in the wholesale sub-sector (durable and non-durable goods) on the Indonesia Stock Exchange in 2010-2015 ?.
- 2) How the ability of the discriminant function formed based on selected ratios (DER, TATO, CASH RATIO, and ROA) gives significant results in predicting companies that experience financial distress or non-distress in the wholesale sub-sector (durable and non-durable goods) on the Stock Exchange Indonesia in 2010-2015?

### **I.3.Research Objectives**

Based on the problem of the increasing number of companies in the Wholesale sub-sector experiencing bankruptcy, this study wants to overcome this problem by finding the cause through a prediction model using discriminant analysis. Specifically, the purpose of this study is:

- 1) Want to test how the influence and ability of DER, TATO, CASH RATIO and ROA in distinguishing the condition of companies experiencing financial distress and non-distress in the wholesale sub-sector on the Indonesia Stock Exchange in 2010 - 2015.
- 2) Want to test the ability of the discriminant function formed based on selected ratios able to provide significant results in predicting companies experiencing financial distress or non-distress in the wholesale sub-sector (durable and non-durable goods) on the Indonesia Stock Exchange in 2010 - 2015.

## **II. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESIS**

### **II.1. The relationship between financial ratios and financial distress**

#### **Leverage ratio with financial distress.**

The leverage ratio is a ratio that measures how far the company is financed by debt. This ratio is used to measure the company's ability to pay all its obligations, both long-term and short-term if the company is liquidated. The use of these funds will result in the company's obligation to repay the loan principal and interest.

The size of the company's debt must be balanced with a good level of revenue. If not, then this can potentially lead to financial distress. This has been proven in the research of Almilia and Kristijadi (2003), where leverage ratios are positively related to the condition of companies experiencing financial distress.

#### **Activity ratio to financial distress.**

Activity ratio is a ratio used to assess a company's ability to carry out daily activities or the company's ability to sell, collect receivables and utilize assets owned (Munawir, 2010).

The higher the asset turnover value of the company signifies the effectiveness of asset management in generating income. Conversely, the lower the company's asset turnover is an indication of the inefficient management of company assets. The low asset turnover illustrated through the activity ratio is also a negative signal for potential investors. Where this can be an indication of the company's poor performance.

This is evident from the results of a study by Simanjuntak et al. (2017) which states that the ratio of activity to indicator variables total assets turnover has a negative effect on the possibility of financial distress companies.

**Liquidity ratio with financial distress.**

According to Subramanyam (2010) and Kasmir (2010) liquidity is the company's ability to generate cash in the short term in order to fulfill its obligations, and that ability depends on cash flows, components of assets and current liabilities.

The research of Almilia and Kristijadi (2003) in the manufacturing industry with logistic regression notes that liquidity (with the indicator current ratio) has a positive influence on the conditions financial distress company's. Where the greater the ratio, the less likely the company experiences financial distress. But does this affect the trade sector ?. This research will confirm this.

**Profitability ratio with financial distress.**

According to Munawir (2010) and Kasmir (2010), profitability is a variable that shows the company's ability to generate profits in a certain period of time. Based on these definitions, it can be concluded that the higher the profit generated shows, the more efficient management of the company's assets. So that the possibility of companies experiencing financial distress will be smaller.

This is evidenced by research conducted by Liani (2017) and Syaefudin (2016), who note that the variable Return on assets has a significant effect in distinguishing companies that experience financial distress and non-distress.

**II.2. Financial Distress**

Financial distress is a situation where operating cash flow is not enough to fulfill its smooth obligations such as trade debt or interest costs (Wruck, 1990)

Platt and Platt (2002; 2006) define financial distress as a stage of decreasing financial conditions that occur before occurrence bankruptcy or liquidation. The condition of financial distress experienced by companies is illustrated by the inability of companies or unavailability of funds to pay their obligations that have matured.

Whitaker (1999) states that a company can be said to be in a state of financial distress or financial difficulties if the company has a net profit negative for several years.

Whereas Elloumi and Gueyie (2001) categorize a company experiencing financial distress if the company for two consecutive years has a negative net profit. In line with the opinion of Elloumi and Gueyie (2001), Almilia and Kristijadi (2003) state that companies that experience financial distress are companies that for several years experience net income operations negative and for more than one year did not pay dividends.

Brahmana (2007) states that financial distress can start from the difficulty of liquidation (short-term), which is financial distress the lightest to the statement of bankruptcy, which is financial distress the most severe.

Brigham and Daves (2003) explain that financial difficulties occur in a series of errors, inadequate decision making and interconnected weaknesses that can contribute directly or indirectly to management and lack of efforts to monitor the company's financial condition so that its use is not in accordance with what is needed.

Brahmana (2007) further adds that financial distress occurs because companies are unable to manage and maintain the stability of their company's financial performance which stems from the failure to promote their products which results in lower sales. So that with a decrease in income from at least sales, it allows the company to experience operating losses and net losses for the current year.

Furthermore, the ongoing losses will result in capital deficiencies due to a decrease in the value of the retained earnings used to make dividend payments to shareholders. So that the total equity as a whole will experience a deficiency.

If this continues to occur continuously, it does not rule out the possibility that someday the total liabilities of the company will exceed the total assets owned by the company. The conditions mentioned above associate a company experiencing financial difficulties (financial distress) which in the end if the company is not able to get out of the conditions described above, then the company will experience bankruptcy or bankruptcy. (Brahmana: 2007).

Fachrudin (2008) states that there are several definitions of financial difficulties according to the type, including the following:

a. Economic Failure

Economic failure is a condition where the company's income is not enough to cover the total cost, including the cost of capital. This business can continue its operations as long as the creditor is willing to accept a rate of return that is below the market.

b. Business Failure

Business failure is defined as a business that stops operations by reason of a loss.

c. Technical Insolvency

The company can be said to be in a technical insolvency condition if a company cannot fulfill its current liability when it is due. The inability to pay debts technically shows that the company is experiencing a temporary shortage of liquidity, where if given some time, it is likely that the company can pay the debt and interest. On the other hand, if technical insolvency is an early symptom of economic failure, this might be a sign of the first step towards bankruptcy.

d. Insolvency in Bankruptcy

Insolvency in bankruptcy can occur in a company if the book value of the company's debt exceeds the current asset market value. This condition can be considered more serious when compared to technical insolvency, because in general, this is a sign of economic failure, even leading to business liquidation. Companies that are experiencing a situation like this do not need to be involved in the demands of legal bankruptcy.

e. Bankruptcy Legal

Companies can be said to experience legal bankruptcy if the company officially submits a claim in accordance with applicable laws (Brigham and Gapenski: 1998).

### **Factors Causing Financial Distress**

According to Damodaran (2002), the causes of financial distress from within the company are more due to micro factors. The factors from within the company are as follows:

a. Difficulties in cash flows

Occur when the receipt of company income from the results of operating activities is not enough to cover business expenses arising from the company's operating activities. In addition, cash flow difficulties can also be caused by management errors when managing the company's cash flow in paying company activities, which can worsen the company's financial condition.

b. The amount of debt

The policy of taking a company's debt to cover costs incurred as a result of the company's operations will create an obligation for the company to repay the debt in the future. When the bill is due, while the company does not have enough funds to pay off the bills, the likelihood that the creditor is doing is confiscating the company's assets to cover the lack of payment of the bill.

c. Losses in the company's operational activities for several years.

In this case, it is the operational loss of the company, which can cause negative cash flow in the company. This can occur because the operating burden is greater than the income received by the company.

However, even though a company can overcome the three problems mentioned above, the company may not necessarily be able to avoid financial distress. This is because there are still external factors which can cause financial distress.

According to Damodaran (2002), the external factors of the company are more macro, where the scope is broader. External factors can be in the form of government policies that can add to the business burden borne by the company, for example, increased tax rates can add to the burden of the company. In addition, there is still an increasing interest rate policy, which can cause an increase in interest expense borne by the company.

### II.3. Discriminant Analysis

Discriminant analysis is a statistical analysis technique for classifying objects into a particular group based on their independent variables (Dillon and Goldstein: 1984). So discriminant analysis is a technique of analyzing data, where the dependent variable is categorical or qualitative data (ordinal or ratio), while the independent variable is quantitative data (interval or ratio).

A similar opinion is conveyed by Johnson and Wichern (1992) which states that discriminant analysis is a statistical technique used to classify an individual or observation into a class or group based on a set of variables.

Johnson and Wichern (1992) state that the purpose of the discriminant analysis is to describe the characteristics of observation of various populations that are known, both graphically and algebraically by forming a discriminant function. In other words, discriminant analysis is used to classify individuals into one of two or more groups.

#### Altman Z-Score

The study of predictions of financial distress using Multiple discriminant analysis was first pioneered by Altman (1968). The research was conducted with a sample of 66 companies, consisting of 33 bankrupt companies and 33 companies that did not go bankrupt in the manufacturing industry. Altman uses 22 financial ratios (liquidity, profitability, leverage, solvency, and performance) that are most likely to distinguish between companies that are bankrupt and not bankrupt.

Altman's research produced the first bankruptcy model using an index a score intended to predict a public company in the manufacturing sector. The equation of the Altman model is:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$$

Where:

Z = bankruptcy index

X1 = working capital / total assets

X2 = retained earnings / total assets

X3 = earnings before interest and taxes / total assets

X4 = market value of equity / book value of total debt

X5 = sales / total assets

The z value is the overall index of functions multiple discriminant analysis generated from the formed equation model. Altman explained that there are cut-off values for the value of Z, which can explain whether the company will experience bankruptcy or not in the future with the following conditions:

- If the value of  $Z < 1.8$  then includes companies that are bankrupt.
- If the value is  $1.8 < Z < 2.99$ , then it includes the gray area (it cannot be determined whether the company is healthy or has a bankruptcy).
- If the value of  $Z > 2.99$ , this includes companies that are not bankrupt.

### II.4. The Research Hypothesis

H1: DER, TATO, CASH RATIO, and ROA were able to distinguish the condition of companies experiencing financial distress and non-distress in the wholesale sub-sector (durable and non-durable goods).

H2: The discriminant function formed based on selected ratios (DER, TATO, CASH RATIO, and ROA) is able to provide significant results in predicting companies experiencing financial distress or non-distress in the wholesale sub-sector (durable and non-durable goods).



### III. RESEARCH METHODS

#### III.1. Population and Sample

The population of this study is sub-sectors wholesale (durable and non-durable goods) listed on the Indonesia Stock Exchange for the period 2010-2015. The technique of selecting samples of this study using a non-probability sampling technique with the purposive sampling method. Purposive sampling is a technique of determining samples with certain considerations (Sugiyono: 2011).

The sampling criteria for this study are as follows:

1. Sub-sectors wholesale (durable and non-durable goods) listed on the Indonesia Stock Exchange in 2010-2015.
2. Have a complete financial report that has been audited and published.
3. Samples with distress company categories are companies that have net income negative for at least two consecutive years.
4. While the sample category of non-distress companies is a company that has a net income positive.

This study uses secondary data. Secondary data is data that has been processed by the relevant institution which is sourced from the financial statements of the related company that has been audited and published to the general public. The financial report data is obtained from the website of the Indonesia Stock Exchange through [www.idx.co.id](http://www.idx.co.id).

#### III.2. Definition of Operational Variables

The definition of operational variables is very important in research. This is intended to avoid misunderstandings or differences in perceptions regarding the data to be collected.

##### Dependent Variables

The dependent variable in this study is the financial condition of the sub-sectors wholesale listed on the Indonesia Stock Exchange for the period 2010-2015, the companies are grouped into two parts, namely:

- a. Categories Distress are companies that have a net income negative of at least two years in a row.
- b. The category non-distress is a company that has a positive net income.

##### Independent Variables

##### Leverage Ratio

The leverage ratio is a financial ratio that describes the amount of debt used by the company to fund its business operations compared to its own capital. In this study, researchers used the Debt to equity ratio (DER) as an indicator of the leverage ratio.

##### Activity Ratio

The activity ratio is a ratio that reflects the efficiency of the company in using assets. It has to run its operations. In this study, using the ratio of Total Assets Turnover (TATO) as an indicator of activity ratios.

##### Liquidity Ratio

An activity ratio is a ratio that describes a company's ability to pay its short-term obligations. In this study, using the Cash ratio as an indicator of liquidity ratios.

##### Profitability Ratio

Profitability ratios are ratios that describe a company's ability to generate profits. In this study, using return on assets as an indicator of profitability ratios.

### III.3. Data Analysis

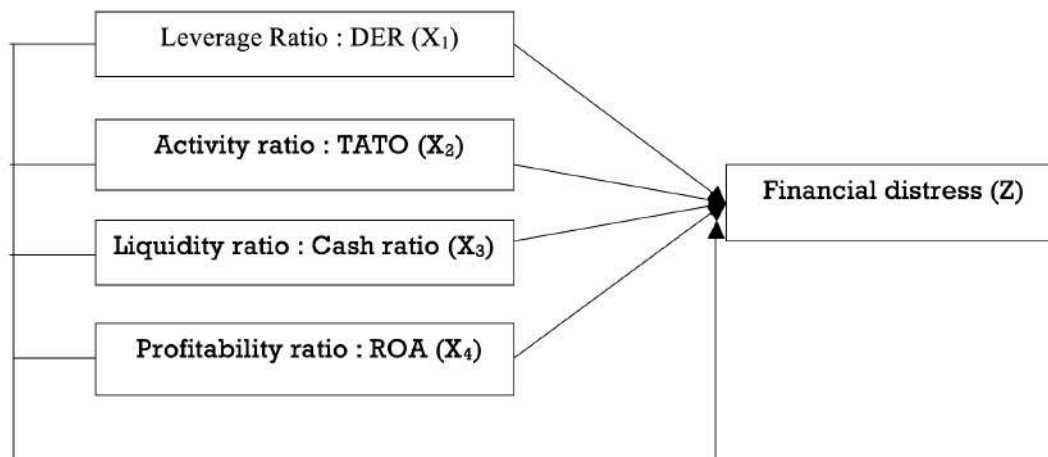
The analysis technique used in this study is discriminant analysis. Before the discriminant analysis is carried out, the assumption of discriminant analysis must first be carried out. The assumption of discriminant analysis consists of tests of normality, multicollinearity, and homogeneity. This analysis technique is used to determine the ability of DER ( $X_1$ ), TATO ( $X_2$ ), Cash ratio ( $X_3$ ), ROA ( $X_4$ ) in distinguishing companies that experience financial distress and non-distress ( $Y$ ). The discriminant analysis model is as follows:

$$Z = a + W_1 X_1 + W_2 X_2 + W_3 X_3 + W_4 X_4$$

Where:

Z	= Discriminant value of the company
a	= intercept
$W_1$	= DER coefficient / weight
$X_1$	= DER
$W_2$	= TATO coefficient / weight
$X_2$	= TATO
$W_3$	= Cash ratio coefficient /weight
$X_3$	= Cash ratio
$W_4$	= ROA coefficient / weight
$X_4$	= ROA

Figure 1: Framework for Research Models



Source: Previous research

## IV. RESULTS AND DISCUSSION

### A TEST OF BASIC ASSUMPTIONS OF DISCRIMINANT ANALYSIS

Before conducting statistical analysis, the data to be processed first must meet the discriminant assumptions. According to Ghozali (2013), the assumptions that must be fulfilled in the discriminant analysis include:

1. **Normality Test:** this research data is distributed normally because of the Kolmogorov Smirnov value  $0.200 > \alpha = 0.05$ .
2. **Multicollinearity test:** there is no multicollinearity between independent variables because based on the table, coefficient multicollinearity test the value standard error of the independent variable is less than one, the value coefficient beta is also less than one. Next is the value Tolerance fourth of the independent variable, all  $> 0.01$ . Likewise with the VIF value  $< 10$ .

3. **Test Homogeneity:** based on the Box's M test results show the value of F is 5.840 with a significance of  $0.000 < 0.05$  so that  $H_0$  is rejected or the covariances of the two groups are different. This violates the assumption of discriminant analysis. However, the discriminant analysis remains robust and can be continued even though the homogeneity of variances requirements are not fulfilled provided that there is no outlier data. (Ghozali: 2013)

## TESTING OF RESEARCH HYPOTHESIS

Table 2: Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
DER	.870	4.339	1	29	.046
TATO	.829	5.990	1	29	.021
CASH RATIO	.817	6.486	1	29	.016
ROA	.339	56.665	1	29	.000

Source: [www.idx.co.id](http://www.idx.co.id); data processed.

The test results of the test of equality of group mean in Table 2 above shows that the four variables have a significant value of  $< 0.05$ . So that it can be concluded that the four variables, namely DER, TATO, CASH RATIO, and ROA each have a significant effect in differentiating or classifying the conditions of companies that experience financial distress and non-distress. This test is to test hypothesis 1 (one) in this study. The results of this test are consistent with the hypotheses. So that this financial ratio can be used as a discriminator variable in the discriminant function, which will be proposed as a prediction model.

Table 3: Eigenvalues

Function	Eigenvalue%	of Variance	Cumulative%	Canonical Correlation
1	2,636 <sup>a</sup>	100.0	100.0	.851

a. First canon discriminatory functions were used in the analysis.

Source: [www.idx.co.id](http://www.idx.co.id); data processed .

Table 3 shows the value of the canonical correlation in table Eigenvalues is 0.851. These results indicate a fairly high closeness between discriminant scores with the group (financial distress and non-distress). If the value is squared then square canonical correlation  $(0.851^2) = 0.7242$ . This means that this study produces a discriminant model where 72.4% of the variation between groups of companies that experience financial distress and non-distress can be explained by the variable discriminant ratio DER, TATO, CASH RATIO, and ROA. It can also be explained that the independent variable is able to explain variations of the dependent variable (distress and non-distress) of 72.4%.

Table 4: Wilks 'Lambda

Test of Function (s)	Wilks' Lambda	Chi square	df	Sig.
1	.275	34.854	4	.000

Source: [www.idx.co.id](http://www.idx.co.id); data processed.

The test results in table 4, Wilks' lambda show a value of 0.275 with a significance of 0,000. So it can be concluded that there are significant differences in the discriminant score average value between the two groups due to the influence of the four independent variables. In other words, the variable DER, TATO, CASH RATIO, and ROA simultaneously influence the discriminant function that is formed. This shows that **the discriminant function** formed from the four discriminator variables above is statistically significant. This test is to test hypothesis 2 (two) in this study. The results of this test are consistent with the hypotheses.

Table 5: Standardized Canonical Discriminant Function Coefficients

	Function 1
DER	.447
TATO	-.135
CASH RATIO	.552
ROA-	-.808

Source: [www.idx.co.id](http://www.idx.co.id); data processed .

Based on Table 5 the Standardized Canonical Discriminant Function Coefficients above, it can be seen that the independent variable (discriminator) has the largest contribution as discriminating power between groups of companies that experience financial distress and non-distress. Relatively, the discriminator who has the biggest "standardized coefficient" is the most decisive variable and influences the grouping (financial distress or non-distress). In the most influential research is CASH RATIO, DER, TATO, then ROA.

Table 6: Canonical Discriminant Function Coefficients

	Function 1
DER	.240
TATO	-.145
CASH RATIO	.225
ROA	-.267
(Constant)	-.042

Unstandardized coefficients

Source: [www.idx.co.id](http://www.idx.co.id); data processed .

Based on Table 6 above, the method simultaneous estimation produces the discriminant function as follows:

$$Z = -0.042 + 0.240 \text{ DER} - 0.145 \text{ TATO} + 0.225 \text{ Cash ratio} - 0.267 \text{ ROA}$$

The Cutt off value is 2.436, which is obtained from the Centroid Function at group value obtained through SPSS. This score can be used as a cut off to predict in the future whether certain respondents will enter a group of Financial distress or non-distress based on scores obtained through the discriminant function. If the value of Z Score is  $\geq 2.436$ , then the company is included in the category of company distress while  $< 2.436$ , the company is included in the category of companies non-distress.

Table 7: Classification Results for

		FINANCIAL CONDITIONS	Predicted Group Membership		Total
			DISTRESS	NON DISTRESS	
Original	Count	DISTRESS	5	1	6
		NON DISTRESS	0	25	25
	%	DISTRESS	83.3	16.7	100.0
		NON DISTRESS	.0	100.0	100.0
Cross- validated	Count	DISTRESS	5	1	6
		NON DISTRESS	0	25	25
	%	DISTRESS	83.3	16.7	100.0
		NON DISTRESS	.0	100.0	100.0

- 96.8% of original correctly classified grouped cases.
- Cross-validation is only done for those cases in the analysis. In cross-validation, each case functions are from all cases other than those cases.
- 96.8% of cross-validated correctly classified grouped cases.

Source: [www.idx.co.id](http://www.idx.co.id); data processed

Based on the value cut-off calculated, Table 7 shows the accuracy of the classification of the determinant function formed is 96.8%. Where there is one company that experiences a classification error. The company was originally categorized as company distress, but in the validation test it turned out to be in the category non-distress. Because the accuracy rate is high above 50%, the discriminant model above can be used to predict in the future, whether a particular company will experience financial distress or non-distress.

#### The accuracy of Statistics:

To test whether statistically, the classification using the discriminant function above is accurate or not, then Press'Q Statistic is used as follows:

$$\text{Press's } Q = [N - (nK)]^2 / N (K-1)$$

Where N = size total sample = 31

n = number of cases diklassifikasikan precisely = 30,

K = number of groups = 2

Therefore this research has a discriminant function value Press's Q =  $[31 - (30 \times 2)]^2 / 31 (2-1) = 27.12$ . At  $\alpha = 0.05$  and dof = 1, the value of tables = 3.84. This result shows that the discriminant function obtained in this study is statistically accurate. These results support the level of classification above, which states a high level of accuracy of 96.8%.

#### Evaluation of the Research Discriminant Function Model.

This study produces the discriminant function as follows:

$$Z = -0.042 + 0.240 \text{ DER} - 0.145 \text{ TATO} + 0.225 \text{ Cash ratio} - 0.267 \text{ ROA}$$

So before it is used as a model to predict financial distress problems in the future, the above model needs to be evaluated from several aspects shows the model above is good or not.

- The test results in table 2 Tests of Equality of Group Means, the four variables DER, TATO, Cash ratio, and ROA proved to have an effect on the Z-score. Hypothesis 1 is acceptable and proven.
- The test results in table 4, Wilks' lambda show a value of 0.275 with a significance of 0,000. So that it can be concluded that the variables hypothesis DER, TATO, Cash ratio, and ROA simultaneously influence the discriminant function formed. The second hypothesis has proven. The discriminant function of this study is significant.

- 3) Table 3 shows that the value of the Canonical correlation in the tables Eigenvalues is 0.851. Then the Canonical Correlation Square ( $0.851^2$ ) = 0.7242. This means that the independent variables in this study, namely DER, TATO, Cash ratio, and ROA are able to explain the variation of the dependent variable (distress and non-distress) which is quite large, namely 72.4%.
- 4) Table 6 shows that the discriminant function formed has a high level of accuracy of 96.8%. Statistically using Press's Q statistics, the function proved to be accurate.

The conclusion of the evaluation of the discriminant function model formed in this study is that the model is quite good, satisfying, and has accurate predictive abilities. Therefore the model can be used to predict and explain the events or phenomena of this research and their discussion.

## DISCUSSION

### Leverage Ratio

In hypothesis 1 (one) this study states that the variable Debt to Equity (DER) thought to be able to distinguish or group the conditions of companies experiencing financial distress and non-distress in the sub-sector wholesale (durable and non-durable goods) listed in Indonesia Stock Exchange 2010-2015.

Based on the results of the test of equality of group means it turns out that the variable Debt to equity has a significance value of 0.046 or  $< 0.05$ . The results of the study are in line with the research hypothesis and in line with the research conducted by Syaefudin (2016).

The DER ratio measures the extent to which a company is financed by debt. The higher the DER, the greater the composition of total debt (short term and long term) compared to total equity. So that the impact of the greater burden of the company on external parties (creditors). This is because the greater the interest expense that must be paid by the company. Increasing the burden on creditors can reduce the number of profits received by the company.

The greater the DER ratio of the company will make the Z-Score obtained through the equation formed to be greater than 2.436 (cut-off). So that most likely, the company will experience financial distress. The relationship between DER and Z-score (distress) is expected to be positive.

The results of this study are not only in accordance with the research hypothesis and the expected relationship above but also theoretically and logically (Damodaran, 2002; Altman, 1968)). So in the sub-sector industry wholesale (durable and non-durable goods), also known as the large trade sector (manufactured goods & consumer goods), debt is the reason why companies experience bankruptcy.

### Activity Ratios

Hypothesis 1 (one) besides DER, also states that the variable Total Assets Turnover (TATO) is able to distinguish the condition of companies that will experience financial distress and non-distress in the sub-sector wholesale (durable and non-durable goods) on the Indonesia Stock Exchange.

Based on the results of the Test of equality of group means, the variable total assets turnover has a significance value of 0.021 or  $< 0.05$ . This shows that the TATO variable has a significant effect, and the coefficient has a negative sign in distinguishing companies that experience financial distress and non-distress.

The results of this study are not in accordance with the research conducted by Pahlefi (2017) and Syaefudin (2016) which states that the variable total turnover effect does not have a significant effect in distinguishing companies that experience financial distress and non-distress. The differences in results occur because the trade companies (wholesale) that are the object of this research have different characteristics from the manufacturing companies that are the object of their research. Where the large trading company (wholesale) only sell goods from suppliers to the buyer (retailer). Because the coefficient is negative, the greater the TATO (sales), the higher the profit and the Z-score of the equation is getting smaller. It means that the less likely the company experiences financial distress, or the company is getting healthier (non-distress) While manufacturing companies focus more on the

activity of processing raw materials into finished products, not on sales. As a result, if TATO is chosen as a discriminator variable, then the effect on Z- the score is influential, but statistically, the effect is not significant. This study proves that different industries that are the object of research also differ in variables and indicators that influence research problems (Kisman, 2017).

But the results of this study are in accordance with existing theories (Damodaran, 2002; Altman, 1968), the research hypothesis and in line with the research of Simanjuntak et al. (2017) in the transportation sector which states that the variable total assets turnover affects companies experiencing financial distress.

### **Liquidity Ratio**

Hypothesis 1 (one) also states that the variable cash ratio is able to distinguish the condition of companies that will experience financial distress and non-distress in the sub-sectors wholesale (durable and non-durable goods) on the Indonesia Stock Exchange.

Based on the results of the test of equality of group means, the variable cash ratio has a significance value of 0.016 or  $< 0.05$ . This shows that the variable cash ratio has a significant effect in distinguishing companies that experience financial distress and non-distress.

The results of this study are in line with the research hypothesis and theory (Damodaran, 2002; Altman, 1968) but are not in line with the research conducted by Ruslinawati (2017) in the manufacturing sector which states that the variable Cash ratio does not significantly influence financial distress a company's.

Cash ratio is the most stringent and conservative liquidity ratio to the company's ability to repay short-term debt and liabilities when compared to other liquidity ratios. This is because the cash ratio only calculates the most short-term assets and current assets liquid and the easiest and fastest way to use it to pay off its short-term debts.

Cash ratio that is too high (over liquid) can indicate the use of assets that are not optimal or unproductive because the company holds too much cash in its balance sheet. As a result, it will reduce the company's ability to generate profits. Even it will cause large losses and bankruptcy if this condition lasts two consecutive years or more. The results of this study are not only positive coefficients, but when tested also significant. In accordance with the hypothesis. Where the larger the cash ratio company's, will make the Z-Score obtained through the equation formed becomes greater than 2.436. So that the company will be included in the category of distress. So this study provides evidence that over liquid conditions are the cause of companies in the research sector to become bankrupt.

### **Profitability Ratio**

In this study, hypothesis 1 (one) also states that the variable Return on Asset (ROA) can distinguish the condition of companies financial distress and non-distress in the sub-sectors wholesale (durable and non-durable goods) on the Indonesia Stock Exchange.

Based on the results of the test of equality of group means, the variable Return on Asset has a significance value of 0.000 or  $< 0.05$ . These results indicate the ROA variable has a significant effect in distinguishing companies that experience financial distress and non-distress.

The results of this study are in accordance with the theory (Damodaran, 2002; Altman, 1968), the research hypothesis (hypothesis 1) and in line with research conducted by Liani (2017) and Syaefudin (2016) which states that the variable Return on assets has a significant effect in distinguishing or grouping companies that experience financial distress and non-distress.

High return on assets shows companies are able to use assets owned to generate profits. So that the higher the value of ROA shows the more effective management of company assets. Conversely, the lower the value of ROA indicates inefficient management of company assets. Where the lower the ROA indicates that, the greater the possibility of companies experiencing financial difficulties (financial distress).

This study notes that ROA has a significant and negative effect in distinguishing companies that experience financial distress and non-distress as expected. In this study, the greater the ROA ratio of the company, the healthier. Because the ROA coefficient in the discriminant function is negative, it will make the Z-Score obtained through the equation formed to be smaller than 2.436. So that the company will be included in the category non-distress. So this study reinforces the number of companies that are bankrupt in this sector, one of the causes is the ability of profit (ROA) that is negative (loss). Profitability decreases due to low TATO, high DER, and over liquid (high cash ratio). Which variable or discriminator has the most influence on the company's bankruptcy will be discussed in the following section below.

#### **Most Influential Discriminator.**

Based on table 5 of the Standardized Canonical Discriminant Function Coefficients, during this research period 2010-2015, the variables that most influence the possibility of companies will experience financial distress or non-distress in the sub-sector wholesale (durable and non-durable goods) also known as large trade sector (production & consumer goods) namely liquidity (Cash ratio), Leverage (DER), Activity (TATO) then profitability (ROA). Cash ratio has the most important influence because the object of this research is the large trade sector (wholesale). If the cash ratio is too high, it means that the company's TATO (sales turnover) is low and profitability (ROA) decreases. As a result, the company will lose. Losses will be greater if the company's debt is high.

### **V. MANAGERIAL IMPLICATIONS FROM RESEARCH RESULTS**

The following section will briefly discuss the future implications of the results of this study on stakeholders:

- 1) To obtain a discriminant function that has a good Goodness of Fit, it is recommended that in the selection of discriminator variables pay attention to previous research and the industry. Each industry has a unique variable as a cause. This effort was made in order to obtain a significant and logical cause of bankruptcy variables.
- 2) Every company that will bankrupt does not occur suddenly but is marked by signs of bankruptcy. In the sub-sector wholesale (durable and non-durable goods), also known as the large trade sector (manufactured goods & consumer goods), it can be seen from the Cash ratio indicator which is greater than the normal demand. TATO is getting down, and this can be seen in the sales trend, which is continuously decreasing. Debts are increasing for purposes that are not clear (reasonable).
- 3) For investors, if you invest in stocks or bonds, pay attention to the signs described above (no. 2).
- 4) For practitioners, not always use the Altman model. Because in fact, this research has explained that the Altman model is only suitable for manufacturing industries in America. While in Indonesia or other developing countries, a discriminant function can be obtained by forming or arranging according to the sample at the place where the research was conducted. So that the function formed has high accuracy and is significant statistically.
- 5) For regulators, reform in this large trade sector is by making regulations and legal certainty. So that SMEs do not need to hold cash in excessive amounts beyond necessity. Give a climate that is conducive to increasing sales and does not need to be in debt beyond ability.

### **VI. CONCLUSION**

Based on the results of statistical tests obtained after data collection, data processing, hypothesis testing, and analysis and discussion related to the research hypothesis, the researcher draws the conclusions as follows:

1. The variable DER, TATO, Cash ratio, and ROA can distinguish the condition of companies experiencing financial distress and non-distress in the sub-sectors wholesale (durable and non-durable goods) on the Indonesia Stock Exchange in 2010 - 2015. Hypothesis 1 is proven  
Based on the table Canonical discriminant function coefficient shows that the discriminant function equation is formed, namely:  $Z = -0.042 + 0.240\text{DER} - 0.145\text{TATO} + 0.225\text{Cash ratio} - 0.267\text{ROA}$ .
2. Discriminant functions formed based on selected ratios (DER, TATO, CASH RATIO, and ROA) are able to provide significant results in predicting companies that experience financial distress or non-distress on the sub- wholesale sector (durable and non-durable goods). Hypothesis 2 is proven.



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