

## Prediction Model *Financial Distress* (Bankruptcy) On The Company PT. Garuda Indonesia (Persero) Tbk With Model Altman, Springate, Zwijewski, Fullmer And Taffler

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### ABSTRACT

This investigate points to distinguish a liquidation show to foresee the condition of the PT company. Garuda Indonesia will involvement liquidation within the future. The models utilized in this inquire about are Altman Z-Score, Springate, Zwijewski, Fullmer and Taffler. The result of this demonstrate is to be able to decide whether the company is sound or on the skirt of insolvency. The information utilized in this investigate is the company PT Garuda Indonesia with yearly budgetary reports for the period 2019, 2020, 2021 and 2022. From the Expectation Comes about Investigation table for PT Garuda Indonesia (Persero) Tbk, 2019-2020, it can be seen that the normal esteem The normal of each budgetary trouble strategy appears that PT Garuda Indonesia (Persero) Tbk is declared to be within the destitute budgetary category and is in peril of going bankrupt, be that as it may agreeing to the Taffler strategy PT Garuda Indonesia, Tbk is within the Gray Zone, to be specific a company that's having monetary challenges In any case, the plausibility of being spared and the plausibility of going bankrupt similarly depends on the choice of the company administration as the choice creator.

**Keywords:** Altman Z-Score, Springate, Zwijewski, Fullmer and Taffler, Financial Distress.

### INTRODUCTION

BUMN or Badan Usaha Milik Negara is a type body law which are owned And executed by country as well as responsible for providing service public. One of the public sectors is the transportation sector. The transportation sector which is part of BUMN is PT. Garuda Indonesia (Persero) Tbk. PT Garuda Indonesia (Persero) Tbk is the first and largest national airline in Indonesia with the intention of For become one of the service providers tourist leading in the country in conjunction with provider transportation services air with "service oriented" approach. As a public service provider, PT. Garuda Indonesia (Persero) is required to be able to provide good financial performance, so thatit can be trusted by the public. The financial performance results achieved by PT Garuda Indonesia for the 2019-2022 period are as follows:

**Table 1.** Financial Position of PT Garuga Indonesia (Persero) Tbk 2019-2022

Year	Total Amoun of debt (USD)	Venture capital (USD)	Income (USD)	Profit and loss (USD)
2019	3,873,097,505	582,578,269	4,572,638,083	(44,567,515)
2020	12,733,004,654	(1,943,024,247)	1,492,331,099	(2,476,633,349)
2021	13,302,805,075	(6,110,059,715)	1,336,678,470	(4,174,004,768)
2022	7,770,110,129	(1,535,099,150)	2,100,079,558	3,736,670,304

Source : Financial Report PT. Garuda Indonesia (Persero), Tbk

Table above show during three year total debt incurred increase, but in 2022 it will experience decline. Seen that in four year income decrease Profit and loss in 2019-2021 decreased even precisely produce loss, while in 2022 it will be successful get return profit. The increase in total debt in 2019-2021 was due to an increase loan from banks and institutions finance related with working capital used for financing in provision material burn, tribe spare parts and maintenance assets, aircraft and increased commercial debt party third in the field service air, especially again in period time In this case, Indonesia is moderate experienced the Covid-19 Pandemic which affected all over operational from PT. Garuda Indonesia (Persero) Tbk. In the income column 2019-2022 shows decline from caused Because exists decrease in income from flight scheduled flights No scheduled , and others. Profit column make a loss show that in 3 years finally PT. Garuda Indonesia (Persero) Tbk experience losses caused decrease in income from flight scheduled, no scheduled, and upgrades cost operational. That matter interpret that performance company decreases, and if this is ignored it can have a negative impact on the business and risk bankruptcy or business failure. PT. Garuda Indonesia (Persero) Tbk. is said to be technically bankrupt, but not yet legally.

Bankruptcy is necessary matters pay attention, because When the company is on point difficulty financial distress exists possibility company will experience bankrupt. Bankruptcy influenced by internal and external factors. Internal factors that can influential is lack of source Power people and internal cooperation management company. Apart from that, external factors like condition economy, disaster natural or even epidemic disease affecting the country like covid-19. The company should do analysis difficulty finance as soon as possible possible to find out reason difficulty finances so that it doesn't happen bankruptcy. Analytical models required in evaluate level difficulty financial (financial distress) a company are Altman Z-Score, Springate, Zwijski, Fullmer and Taffler. Lack of understanding about importance financial distress analysis, especially in companies big will can plunge party third both investors and creditor in take decisionor policy.

PT Garuda Indonesia is go-public company whose shares Still sold to the public. PT Garuda Indonesia (Persero) Tbk needs to be analyzed more carry on again to see condition finance company and see who becomes reason from the occurrence of financial distress experienced to minimize error in taking decision for investors, creditors or party third other. Refers to the setting behind above, then writer interested to choose title in In this research, the Prediction Model of Financial Distress ( Bankruptcy ) in the PT Garuda Indonesia Company uses the Altman, Springate, Zwijski, Fullmer, and Taffler Models.

## LITERATURE REVIEW

### Bankruptcy

Agreeing to UU No 37 of 2004 article 1 section (1), what is implied by insolvency may be a common reallocation of all the Bankrupt Debtor's resources, the administration and settlement of which is carried out by a guardian beneath the supervision of a Supervisory Judge as directed in this Law.

Agreeing to Toto (2013) in (Sudarman; et al, 2020) liquidation could be a condition where a company is not able to pay off its commitments. This condition as a rule does not fair show up in companies. There are early signs of the company which can as a rule be recognized prior in the event that the budgetary explanations are analyzed more carefully in a certain way.

Bankruptcy as a failure that occurs in a company is defined in several terms according to Martin in (Sudarman; et al, 2020) , namely:

- 1) Economic Failure ( *Economic Distressed* ).  
Failure in economics means that the company loses money or the company's income is not able to cover its own costs, this means that the rate of profit is less than the cost of capital or the present value of the company's cash flows is less than its liabilities.
- 2) Financial Failure ( *Financial Distressed* ).  
The definition of financial distress means difficulty with funds, either in the sense of funds in the sense of cash or in the sense of working capital.

### **Financial Distress**

According to Platt and Platt (2002) in (Komarudin et al., 2019) *Financial distress* is the stage of decline in financial condition experienced by a company, which occurs before bankruptcy or liquidation. *Financial distress* is a situation that can be experienced by various companies, both large-scale companies and small-scale companies from various industrial sectors (Gunawan et al., 2020) .

In an exertion to anticipate money related trouble and overcome and minimize liquidation, companies can screen budgetary conditions by analyzing money related reports. Budgetary reports can be utilized as a source of data with respect to the company's budgetary position, administration execution, and can be utilized as a reference in choice making. Liquidation discovery from the begin to get an sign of whether liquidation will happen or not so that administration can make advancements and expect so that liquidation does not happen within the Company.

The potential for *financial distress* can be known from the value or index calculated through the *financial distress prediction model* . *Financial distress* prediction models were developed using the *Multiple Discriminant Analysis* (MDA) technique by combining several types of financial ratios in an equation (Komarudin et al., 2019) .

### **Bankruptcy Prediction Model Altman**

In 1983 and 1984, Altman surveyed bankruptcy prediction models developed in several countries. Through this research, a new Z-score was found for companies that went public, and it turned out that Altman's Z-Score method had a fairly good prediction level of up to 95% (Hanafi & Halim, 2016 in Masdiantini & Warasniasih, 2020).

It is said that the Altman Model according to Altman & Hotchkiss, 2005 in (Siswanto & Romadon, 2021) is the first multivariate credit scoring called Z-Score using financial ratios. Because the Altman model uses a multivariate assessment model, the final result of the model is a linear equation that is able to differentiate between two states of the dependent variable.

Altman Z-Score is determined using the following formula:

$$\text{Z-Score} = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 1.0$$

### **Bankruptcy Prediction Model Springate**

This model was developed in 1978 by Gorgon LV Springate. The Springate model is a ratio model that uses *Multiple Discriminate Analysis* or MDA to select 4 ratios from 19 financial ratios that are popular in the literature, which are able to best differentiate between bankrupt and non-bankrupt sound businesses. The Springate model formula is:

$$S = 1.03X_1 + 3.07X_2 + 0.66X_3 + 0.4X_4$$

### **Bankruptcy Prediction Model Zmijewski**

This bankruptcy prediction model was discovered by Zmijewski in 1984 which was the result of 20 years of research. The model uses financial ratios that measure the company's financial performance, leverage and liquidity. The probit model is an alternative regression analysis that uses a cumulative normal probability distribution.

Zmijewski's probit analysis uses financial ratios that measure performance, leverage and liquidity to predict a company's financial difficulties. "Zmijewski's probit model is based on 40 bankrupt companies and 800 non-bankrupt companies." From the results of previous research, the accuracy of Zmijewski's analysis for predicting company bankruptcy was 84 percent.

According to Zmijewski (1984) in (Siswanto & Romadon, 2021) states that companies that are considered to experience financial distress in the future are companies whose X value is greater than 0 and companies whose X value is smaller than 0 are predicted not to experience financial distress. Zmijewski's formula is:

$$X = -4.3 X_1 + 5.7 X_2 + 0.004 X_3$$

### **Bankruptcy Prediction Model Fullmer**

Fulmer (1984) used the *step-wise Multiple Discriminate Analysis* (MDA) method to evaluate 40 financial ratios used in a sample of 60 companies, consisting of 30 failed companies and 30 successful companies (Masdiantini & Warasiasih, 2020) . Fulmer reported 98% accuracy on companies one year before failure and 81% accuracy more than one year before bankruptcy.

$$\text{H-Score} = 5.52X_1 + 0.212X_2 + 0.073X_3 + 1.27X_4 - 0.12X_5 + 2.335X_6 + 0.575X_7 + 1.082X_8 + 0.894X_9 - 6.075$$

### **Bankruptcy Prediction Model Taffler**

According to Taffler, 1993 in (Prakoso & et al, 2022) the Taffler model was first formulated in 1993 for a manufacturing company in London. In this model, there are 4 financial ratio variables used, namely the ratio of profit before tax to current liabilities, current assets to total liabilities, current liabilities to total assets, and net profit after tax to total assets. This model is based on the previous model, namely the Altman z score.

The Taffler model has a prediction accuracy rate of 95.7% for companies that go bankrupt and 100% for companies that do not go bankrupt. There are similarities to the Taffler model, namely:

$$\text{Taffler} = 0.53 (X_1) + 0.13 (X_2) + 0.18 (X_3) + 0.16 (X_4)$$

## **RESEARCH METHOD**

PT. Garuda Indonesia (Persero) Tbk is the subject that will be studied in this research. Meanwhile approach quantitative is the approach used in this research with a descriptive research type by analyzing a company's subsequent financial statements tabulated to determine the company category category of healthy company or financial distress. The data source used is secondary data.

In this research using techniques collection of library study data to obtain a theoretical basis and documentation by accessing the official PT website. Garuda Indonesia (Persero) Tbk. namely [www.garuda-indonesia.com](http://www.garuda-indonesia.com) and Stock Exchange The

Indonesian effect is [www.idx.co.id](http://www.idx.co.id). Data analysis techniques used to predict financial distress namely the Altman, Springate, Zwijewski, Fullmer, and Taffler models. Model equation Altman Z-Score is determined using the following formula:

$$Z\text{-Score} = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 1.0$$

Information:

X1 = Working Capital to Total Assets

X2 = Retained Earned to Total Assets

X3 = Earnings Before Interest and Tax to Total Assets

X4 = Market Value of Equity to Book Value to Total Debt

X5 = Sales to Total Assets

Altman in (Melina & Susetyo, 2021) states that if a company has a bankruptcy index :

- 1) A Z-Score > 2.60 is categorized as a very healthy company that is not experiencing financial difficulties.
- 2)  $1.10 < Z\text{-Score} < 2.60$  is in the gray area so it is categorized as a company that is having financial difficulties, but the possibility of being saved and the possibility of going bankrupt is equally large depending on the decision of the company's management as the decision maker.
- 3) A Z-Score < 1.10 is categorized as a company that has very large financial difficulties and is at high risk so that the possibility of bankruptcy is greater.

Equality Springate models are :

$$S = 1.03X1 + 3.07X2 + 0.66X3 + 0.4X4$$

Where:

X1: Ratio of working capital to total assets

X2: Ratio of income before interest and tax to total assets.

X3: Ratio of income before tax to total current debt.

X4: Ratio of sales to total assets.

Next do The following assessment standard analysis is: method assess the viability of the company:

- 1)  $Z > 0.862$  is categorized as a healthy company.
- 2)  $Z < 0.862$  categorizes the company as being in financial difficulty and potentially experiencing bankruptcy.

Model is:

$$X = -4.3 X1 + 5.7 X2 + 0.004 X3$$

The variables used in the Springate Model are Return On Assets (X1), Debt Ratio (X2), Current Ratio (X3). According to Zmijewski (1984) in (Siswanto & Romadon, 2021) states that companies that are considered to experience financial distress in the future are companies whose X value is greater than 0 and companies whose X value is smaller than 0 are predicted not to experience financial distress.

Equation model Fullmer

$$H\text{-Score} = 5.52X1 + 0.212X2 + 0.073X3 + 1.27X4 - 0.12X5 + 2.335X6 + 0.575X7 + 1.082X8 + 0.894X9 - 6.075$$

Where:

- X1 = Retained Earnings/Total Assets
- X2 = Revenue/Total Assets
- X3 = EBIT/Total Equity
- X4 = Cash Flow from Operations/Total Liabilities
- X5 = Total Liabilities/Total Equity
- X6 = Current Liabilities/Total Assets
- X7 = Log (Fixed Asset)
- X8 = Working Capital/Total Liabilities
- X9 = Log (EBIT)/Interest Expense

With The analysis criteria are :

- 1) If  $H < 0$ , it is predicted that the company will go bankrupt or that the company will be in an unhealthy condition
- 2) if  $H > 0$  it is predicted that the company's condition is in good or healthy condition (Sudarman; et al, 2020) .

Equation is:

$$\text{Taffler} = 0.53 (X1) + 0.13 (X2) + 0.18 (X3) + 0.16 (X4)$$

Information:

- X1 = Earnings before tax / Current Liabilities
- X2 = Current Assets / Current Liabilities
- X3 = Current Liabilities / Total Assets
- X4 = Sales / Total Assets

With criteria indicators \_ evaluation :

- 1) If the results of the Taffler model have a value of  $T < 0.2$ , the company is categorized as a company that is predicted to go bankrupt.
- 2) If the result of the taffler model is  $T > 0.3$ , it is categorized as not experiencing bankruptcy.

## RESULTS

Based on the table below, companies that are indicated to be experiencing *financial distress* based on the calculation of the predictor model formula are:

**Table 2.** Summary Company Experience *Financial Distress*

Year	<b>ALTMAN</b>	<b>SPRINGATE</b>	<b>ZMIJEWSKI</b>	<b>FULLMER</b>	<b>TAFFLER</b>
2019	1.387636	0.546	4,998	0.666353	0.322
2020	-0.808713	-1,266	7,714	1.348707	-0.210
2021	-2.853588	-3,254	13,038	1.281999	-0.235
2022	2.289130	3,364	4,528	0.430986	1,405

Source : Processing Data , 2024

Based on results calculation above , then can is known condition bankruptcy of PT Garuda Indonesia (Persero) Tbk in accordance with criteria that have been determined. The following is interpretation from criteria for each bankruptcy model.

**Table 3.** Analysis of Prediction Results for PT Garuda Indonesia (Persero) Tbk, 2019-2020

Year	2019	2020	2021	2022	Average
<b>ALTMAN</b>	1.387636	-0.808713	-2.853588	2.289130	0.003616
Prediction	Gray area	Distress	Distress	Gray Area	Distress
<b>SPRINGATE</b>	0.546	-1,266	-3,254	3,364	-0.1525
Prediction	Distress	Distress	Distress	Safe Area	Distress

ZWIJEWSKI	4,998	7,714	13,038	4,528	7.5695
Prediction	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
FULMER	0.666353	1.348707	1.281999	0.430986	0.9320
Prediction	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
TAFFLER	0.322	-0.210	-0.235	1,405	0.3205
Prediction	<i>Gray Area</i>	<i>Distress</i>	<i>Distress</i>	<i>Gray Area</i>	<i>Gray Area</i>

Source : Processed data , 2024

The company's financial performance was influenced by the global economic slowdown which had an impact on national economic growth conditions which affected the level of consumer purchasing power and the growth of the aviation industry. From 2019 to 2022 the company's Z-score value is in the bankruptcy category, this condition is generally caused by an increase in current liabilities from year to year which continues to increase and a decrease in profits.

This condition is related to the results of obtaining indicators experienced a decrease which occurred due to an increase in current liabilities which occurred due to an increase in bank and financial institution debt related to an increase in the company's working capital facilities to finance fuel payments and aircraft asset maintenance. Meanwhile, in 2022 the company will have the highest total assets compared to previous years.

In table above, yes seen that low Z-Score value can be caused by fluctuations that occur in earnings *earnings before interest and taxes*. Company profits earned from period 2019 to 2022 is likely experience loss. Causing factors company experience loss caused by low income business due to the Covid-19 pandemic and also the increase cost operational related expansion carried out by the Company and transactions outside what usually happens like cost forgiveness taxes and fines contingency cartel cargo.

The factor of insufficient capital or shortage is one of the causes of financial distress. An imbalance occurs can affect the EBIT value because the flow of cash or capital receipts originates from income or collection of receivables with the expenditure of money to finance the company's operations unable to meet the lack of funds, causing the company to be in an illiquid position.

Based on the calculation results in the table above, the Springate value with an S-Score is obtained which states that from 2019-2022 it has the potential for bankruptcy or is in a distressed position. This result is reflected in the financial report of the net loss experienced by PT Garuda Indonesia during 2019-2022. 2019 to 2021 was a difficult year for the aviation industry, including PT. Garuda Indonesia. The increase in the price of fuel oil, Avtur, has contributed significantly to expanding operational costs , up to issue the Covid-19 widespread that happened paralyze all working hours flight result PSBB arrangement from government.

The begin of the Covid-19 widespread in Indonesia in 2019 caused the flying industry to involvement the most prominent affect. Approach changes made by the central and territorial governments to overcome the spread of the Covid-19 infection have caused a few businesses that back the country's economy to moreover involvement a decrease. The execution of PSBB (Large-Scale Social Limitations) has caused numerous laborers to ought to do work from domestic or work shape domestic. This circumstance brought about within the transportation industry encountering a major affect, due to decreased travelers and no travel exercises exterior the locale. This circumstance too caused the flying industry to experience a period of vacuum during the implementation of the PSBB period. This situation makes PT. Garuda Indonesia

experienced a decline in revenue during the implementation of the PSBB, this situation will ultimately affect the increase in current assets and profits generated by PT. Garuda Indonesia. Garuda Indonesia's deteriorating financial condition, especially due to the Covid-19 pandemic, has caused a critical diminishment in discuss travel and has had an affect on operations and liquidity. This affect has straightforwardly influenced Garuda Indonesia's capacity to fulfill its monetary commitments to critical banks and merchants, such as suppliers. fuel, air terminal administrators, and flying machine lessors.

The decay in commerce pay caused by the Covid-19 widespread was felt exceptionally altogether within the 2nd quarter of 2020, seen from the execution of development limitation approaches and territorial limitations. In a few nations as portion of endeavors to anticipate the spread of Covid-19. PT. Garuda Indonesia too able to diminish household transportation misfortunes permitted to optimize its operations since the 3rd quarter of 2020. PT. Garuda Indonesia has strived for working incomes to reach the level of 33.38% of working incomes some time recently the Covid-19 widespread. These troublesome conditions caused very large misfortunes, particularly within the to begin with semester of 2020, but PT. Garuda Indonesia at last can return reestablish condition Where will the financials be in 2022 ? this year PT Garuda Indonesia got it return get benefit as huge as 3.7 M USD.

From table Analysis of the Prediction Results of PT Garuda Indonesia (Persero) Tbk , 2019-2020 can be is known that The average value of each financial distress method shows that PT Garuda Indonesia (Persero) Tbk stated enter into the less financial category good and medium threatened bankrupt , however according to method *Taffler PT Garuda Indonesia, Tbk is within the Gray Range, ie companies that have monetary challenges, but the plausibility of being spared and the plausibility of going bankrupt are similarly subordinate on the choices of the company's administration as choice creators.*

## CONCLUSION

Based on the results of data analysis and discussion that the author has described previously, the author can draw the conclusion that The average value of each financial distress method shows that PT Garuda Indonesia (Persero) Tbk stated enter into the less financial category good and medium threatened bankrupt . PT. Garuda Indonesia, Tbk is experiencing the potential for bankruptcy because in 2019-2022 its current assets are quite low so the company does not have the ability to pay its debts. Company profits earned from period 2019 to 2022 is likely experience loss. Causing factors company experience loss caused by low income business due to the Covid-19 pandemic and also the increase cost operational related expansion carried out by the Company and transactions outside what usually happens like cost forgiveness taxes and fines contingency cartel cargo. PT Garuda Indonesia's money related execution requires firm, clear and fitting activity to overcome the effectiveness of operational costs which are very expansive, particularly for fuel and misfortunes within the Rupiah-US trade rate. PT Garuda Indonesia experienced misfortunes not as it were since of the need of exact trade procedures executed but too since of variables from The Covid-19 widespread has had a major affect on operations company, in any case agreeing to strategy Taffler PT Garuda Indonesia, Tbk is within the Gray Zone, companies that have budgetary troubles, but the plausibility of being spared and the plausibility of going bankrupt are similarly subordinate on the choices of the company's administration as choice producers.

## REFERENCES

- Barry, H. (2019). Prediksi Model Financial Distress (Kebangkrutan) Pada Perusahaan Ritel Bursa Efek Dengan Model Altman Dan Springate Indonesia Periode 2012-2016. *Account*, 6(1), 941–947. <https://doi.org/10.32722/acc.v6i1.1376>
- Gunawan, A. W., Assagaf, A., Sayidah, N., & Mulyaningtyas, A. (2020). Financial Distress Di Bum Indonesia Dan Faktor-Faktor Yang Mempengaruhi. *EKUITAS (Jurnal Ekonomi Dan Keuangan)*, 3(2), 226–243. <https://doi.org/10.24034/j25485024.y2019.v3.i2.4135>
- Komarudin, Syafnita, & Ilmiani, A. (2019). Analisis Komparasi Prediksi Financial Distress Metode Grover, Altman, Springate, Zmijewski, dan Ohlson pada Perusahaan Pertambangan di BEI. *Jurnal Ekonomi Dan Bisnis*, 22(2), 36–43. <https://jurnal.unikal.ac.id/index.php/jebi/article/view/991>
- Masdiantini, P. R., & Warasnasih, N. M. S. (2020). Laporan Keuangan dan Prediksi Kebangkrutan Perusahaan. *Jurnal Ilmiah Akuntansi*, 5(1), 196–220.
- Melina, I., & Susetyo, A. (2021). Analisis Perbandingan Model Altman, Springate, dan Zmijewski untuk Memprediksi Kebangkrutan pada Perusahaan Tekstil dan Garmen. *Jurnal Ilmiah Mahasiswa Manajemen, Bisnis Dan Akuntansi (JIMMBA)*, 3(5), 1020–1029. <https://doi.org/10.32639/jimmba.v3i5.951>
- Prakoso, W. H., & Dkk. (2022). Analisis Perbandingan Model Taffler, Springate, Dan Grover Dalam Memprediksi Kebangkrutan Perusahaan. *Jurnal Akuntansi, Perpajakan Dan Auditing*, 3(1), 1–5.
- Siswanto, P., & Romadon, S. (2021). Analisis Prediksi Kebangkrutan Menggunakan Model Altman, Springate, dan Zmijewski pada Perusahaan Farmasi. *Jurnal Bisnis Dan Manajemen*, 1(2), 93–102.
- Sudarman; dkk. (2020). Perbandingan Analisis Prediksi Kebangkrutan Model Springate's, Fulmer, Foster dan Altman Z-Score (Studi pada Perusahaan Sektor Non Keuangan yang Terdaftar di Bursa Efek Indonesia). *Jurnal Ekonomi KIAT*, 31(1), 15–21.