



Altman Z-Score Model, Springate, Grover, Ohlson and Zmijweski to Assess the Financial Distress Potential of PT. Garuda Indonesia Tbk During and After the Covid-19 Pandemic

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ABSTRACT

This study aimed to assess PT. Garuda Indonesia Tbk's potential for financial distress during and after the covid-19 pandemic. This research employed descriptive quantitative type; it described the potential for financial distress at PT. Garuda Indonesia Tbk. Secondary data were utilised, namely the financial statements of PT. Garuda Indonesia Tbk for the years 2018-2021. Data collection approaches involving documentation and literature study. The data analysis method utilised descriptive analysis with the research variable of financial distress. This study's five models used to measurement financial distress were Z-Score Altman, Springate, Grover, Ohlson, and Zmijweski. The findings indicate that PT. Garuda Indonesia Tbk is in a condition of financial distress or has the potential to declare bankruptcy between 2018 and 2021, which determined using the Z-Score Altman, Springate, Grover, Ohlson, and Zmijweski methods

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INTRODUCTION

Profit is one of the primary reasons for the foundation of a business .A sound business planning and management strategy is required to attain this objective, but there are still hazards that might lead a firm to incur losses even if it has been planned and managed correctly. External risks, such as the unanticipated Covid-19 pandemic, are one of the dangers that might lead a corporation to incur losses.

The covid-19 pandemic in 2019 has disrupted corporate operations; airlines are one of the company types most impacted by the covid-19 pandemic; during the covid-19 pandemic, airlines were compelled to cease operational activities due to widespread social constraints. Big. Several

airline firms' profits have unquestionably decreased due to the lengthy suspension of their operational activities. On the other hand, corporations must suffer fixed costs; consequently, it is anticipated that several aviation companies will experience financial distress.

Financial distress is a situation in which a company's finances are in poor shape (Dewi et al., 2019; Zhafirah & Majidah, 2019). Financial distress is one of the earliest predictors of a company's impending bankruptcy (Fatmawati & Wahidahwati, 2017). Financial distress can be caused by several factors, including a company's unfavourable financial condition, adverse economic or external company conditions, such as the Covid-19 pandemic (Armadani et al., 2021), inadequate corporate governance, technological innovation failure, liquidity & funding shock, poor operating performance, and high financial leverage (Altman et al., 2019). PT. Garuda Indonesia Tbk is projected to endure financial distress due to the Covid-19 pandemic.

PT. Garuda Indonesia Tbk is an Indonesian government-owned airline with the majority of ownership held by the Indonesian government. The emergence of the Covid-19 pandemic has not only diminished PT. Garuda Indonesia Tbk, but it has also exacerbated its financial state. Before the Covid-19 pandemic, it is known that PT. Garuda Indonesia Tbk encountered financial difficulties, as the company's operations from 2017 to 2018 before the covid-19 pandemic consistently incurred losses. On the other hand, short-term liabilities that must be fulfilled between 2016-2018 have increased continually, although the increase in assets has matched.

During the Covid-19 pandemic, this condition deteriorated as PT. Garuda Indonesia Tbk's total debt climbed annually; in 2019, the total debt was US\$ 3,735 million, rising to US\$ 12,733 million in 2020 and US\$ 13,302 million in 2021. PT must bear not only its entire debt but also its current liabilities. During the Covid-19 pandemic, Garuda Indonesia Tbk's revenue climbed from \$3,257 million in 2019 to \$4,294 million in 2020 and subsequently to \$5,774 million in 2021

Increasing firm liabilities without a corresponding increase in company assets signals the possibility of liquidity issues (Armereo et al., 2020). The liquidity ratio quantifies a company's capacity to satisfy its short-term obligations, and a corporation has sufficient liquidity if it can meet its present obligations with its existing assets (Ariwibowo et al., 2022). Moreover, liquidity is a financial distress component (Altman et al., 2019).

Financial distress is vital for evaluating a firm's financial health as a preventative measure against company insolvency (Gamayuni, 2011). The Altman Z-Score model can forecast firm default with up to 95% precision (Burhanudin & Widayanti, 2017; Effendi, 2018; Gamayuni, 2011). In addition, the Zmijewski, Grover, and Springate models have an accuracy rate of up to one hundred per cent for predicting bankruptcy (Sari & Yunita, 2019). The Ohlson model is often used to predict corporate insolvency and has an accuracy of up to 90% (Sembiring, 2016; Suryawardani, 2015). Even though the past study has discussed the accuracy of evaluating each bankruptcy model, there is still a need for additional research on financial distress utilising all models for airlines due to the covid-19 pandemic.

RESEARCH METHOD

This research employed quantitative and descriptive; it describes the potential for financial distress at PT. Garuda Indonesia Tbk. The data was secondary data from PT's annual financial report. The 2018-2021 forecast for Garuda Indonesia Tbk was published on the Indonesia Stock Exchange. The data was collected involving documentation and literature study. The data analysis method utilised descriptive analysis with the research variable of financial distress. This research utilising 5 measurement models to measure financial distress, namely:

a. Model Z-Score Altman

Namely, a financial distress evaluation model using a step-wise multivariate discriminant analysis statistical technique. The Altman Z-score model is measured using the following formula (Altman et al., 2019):

$$Z = 0,717X_1 + 0,847X_2 + 3,107X_3 + 0,420X_4 + 0,988X_5$$

Where :

- X_1 : Working capital as a percentage of total assets
 X_2 : Retained earnings as a percentage of total assets
 X_3 : EBIT to total assets
 X_4 : Equity market value/debt book value
 X_5 : Total assets/sales

Concerning decision-making criteria:

- If Z-Score > 2,675 then the company is declared healthy
- If Z-Score $1,81 \leq Z \leq 2,675$ then the company is in a grey area
- If Z-Score < 1,81 then the company is in bankruptcy.

b. Model Springate

The Springate model is a bankruptcy prediction model employing the Multiple Discriminate Analysis approach. The Springate model utilises many financial ratios to predict bankruptcy; where the Springate model is formulated as follows (Aadilah & Hadi, 2022):

$$S = 1,03X_1 + 3,07X_2 + 0,66X_3 + 0,4X_4$$

Where :

- X_1 : Assets to working capital
 X_2 : EBIT / total assets
 X_3 : EBT / current liabilities
 X_4 : Total assets/sales

The Decision-Making Basis (Wulandari & Dp, 2014):

If the value of $S > 0,862$ then the company is in good health

If the value of $S < 0,862$ then the company is in financial distress

c. Model Grover

Specifically, the model created by Jeffrey Grover in 1968 was based on a sample of the Altman Z-Score model (Priambodo & Pustikaningsih, 2018), where the selection was rebuilt by adding 13 financial ratios and then evaluated to obtain the Grover model equation (Sudrajat & Wijayanti, 2019). The formulation of the Grover model is as follows:

$$G = 1,650X_1 + 3,404X_2 - 0,016X_3 + 0,057$$

Where :

- X_1 : Working capital to total assets
 X_2 : EBIT / total assets
 X_3 : Net income / total assets

Decision-making criteria:

- If $G \leq -0,02$ is included in the bankrupt category
- If $G \geq 0,01$ is included in the non-bankrupt category

d. Model Zmijewski

The Zmijewski model includes the validity of financial ratios in its model equation to predict company insolvency (Komarudin et al., 2019). The following equation expresses the Zmijewski model:

$$Z_m = -4,3 - 4,5X_1 + 5,7X_2 - 0,004X_3$$

Where :

- X_1 : Return on asset
 X_2 : Debt Ratio
 X_3 : Current Assets / Current Liabilities

Decision-making criteria:

- If $Z_m \geq 0$ the company is in financial distress

- If $Z_m < 0$ then the company is in good health

e. Ohlson Model

This model is one of the models that include a conditional logit factor to forecast bankruptcy developed by James Ohlson. The advantages of adopting this dependent logit element make it unnecessary to assume MDA constraints, allowing unnecessary samples to be evaluated (Widiasmara & Rahayu, 2019). The Ohlson model is stated in the following equation:

$$O = -1,32 - 0,407X_1 + 6,03X_2 - 1,43X_3 + 0,0757X_4 - 2,37X_5 - 1,83X_6 + 0,285X_7 + 1,72X_8 - 0,521X_9$$

Where :

X_1	:	Log Total asset /GNP
X_2	:	Total liabilities / total assets
X_3	:	Working capita / total assets
X_4	:	Current Liabilities / current assets
X_5	:	Score 1 if total liabilities > total assets
X_6	:	Net income / total assets
X_7	:	Cash flow / total liabilities
X_8	:	Score 1 if total liabilities > total assets, 0 otherwise
X_9	:	(Net income year t - Net income year t-1) / (Net income year t + Net income year t-1)

Decision-making criteria

- If score $O > 0,38$ then the company is in financial distress

- If score $O < 0,38$ then the company is in a healthy position

RESULTS AND DISCUSSIONS

Prediction of PT. Garuda Indonesia Tbk using the Altman Z-Score model

Altman's Z-Score is a modified version of Edward L. Altman's method for estimating a company's likelihood of bankruptcy, which can be applied to private and public corporations (Nurchayanti, 2015). Based on the results of computations on the assessment indicators on the Altman Z-Score model, the following conclusions are obtained:

Table 1. Results of the Altman Z-Score Model Assessment

Indikator	Tahun			
	2018	2019	2020	2021
Working capital to assets (X1)	-0.4768	-0.4767	-0.3483	-0.7599
Retained earning to total assets (X2)	0.0201	0.0036	-0.0003	-0.0005
EBIT to total assets (X3)	-0.0551	0.0014	-0.2042	-0.5508
Market value of equity / book value of debt (X4)	0.3727	0.3508	0.1040	0.1006
Sales / total assets (X5)	1.0421	1.0263	0.1113	0.1447
Score	0.6902	0.8271	-0.7307	-2.0716
Interpretation	Bankrupt	Bankrupt	Bankrupt	Bankrupt

The results of the Altman Z-Score assessment of PT. Garuda Indonesia Tbk in 2018-2021 shows that PT. Garuda Indonesia Tbk is expected to experience bankruptcy where the Altman Z-Score value every year starting from 2018-2021 is below the minimum limit of <1.81. Potential default of PT. Garuda Indonesia Tbk is reflected in several Altman Z-Score indicators which are in an unfavourable position, such as the value of working capital assets (X1) which is in a minus position from 2018-2021 and EBIT to total assets (X3), which is in a minus position in 2018, 2020 and 2021. A negative number of EBIT to complete investments implies that PT. Garuda Indonesia Tbk suffers losses from its operational activities, raising the likelihood of bankruptcy. PT Garuda

Indonesia may be unable to meet its short-term obligations due to the negative value of its working capital assets, resulting from the company's substantial current liabilities to be paid relative to its current asset ownership.

PT condition Garuda Indonesia Tbk, which is in a state of financial difficulty and is predicted to experience bankruptcy, certainly requires several alternative improvement strategies (Altman et al., 2019) reveals that companies in the grey zone and the bankruptcy zone can carry out several improvement plans, such as through asset restructuring and financial restructuring. Asset restructuring can be done by selling unproductive assets. In contrast, financial restructuring can be carried out by paying off and evaluating loans that burden capital expenses so that the company's capital costs are lower (Armadani et al., 2021).

Prediction of Bankruptcy of PT. Garuda Indonesia Tbk using the Springate model

The Springate model is a bankruptcy prediction model employing the Multiple Discriminate Analysis approach. Based on the calculation results of the Springate model, the following findings are obtained:

Table 2: Springate Model Assessment Year Indicator Results

Indicator	Year			
	2018	2019	2020	2021
Working capital to assets (X1)	-0.4768	-0.4767	-0.3483	-0.7599
EBIT / total assets (X2)	-0.0551	0.0014	-0.2042	-0.5509
EBT / current liabilities (X3)	-0.0748	0.0020	-0.5130	-0.6865
Sales / total assets (X4)	1.0421	1.0263	0.1113	0.1447
Score	-0,29	-0,07	-1,28	-2,87
Interpretation	Financial distress	Financial distress	Financial distress	Financial distress

Based on the Springate score model, it is determined that PT. Garuda Indonesia Tbk is in a situation of financial distress, which allows for the potential for bankruptcy when the Springate model score for 2018-2021 is between -0.07 to -2.87. Financial distress experienced by PT. Garuda Indonesia caused losses (EBIT and EBT are negative) suffered by PT. Garuda Indonesia Tbk, which made the indicators X2 and X3 on the Springate model hostile. A negative EBIT and EBT figure implies that a management failure in managing its operational activities resulted in losses. Losses PT. Garuda Indonesia Tbk, mainly in 2020-2021, owing to pandemic conditions which hindered the company's operating activities. This outcome is in line with a study which showed that the Covid-19 pandemic resulted in financial issues for some companies (Rahmah & Novianty, 2021).

Prediction of Bankruptcy of PT. Garuda Indonesia Tbk using the Grover model

The Grover model is a bankruptcy prediction model established by Jeffrey Grover in 1968, utilising data in the Altman Z-Score model (Priambodo & Pustikaningsih, 2018). Based on the findings of calculating many ratios, which are indications of the Grover model, the following results are obtained:

Table 3. Results of the Grover Model Assessment

Indicator	Tahun			
	2018	2019	2020	2021
Working capital to assets (X1)	-0.4768	-0.4767	-0.3483	-0.7599
EBIT / Assets (X2)	-0,0625	0.0206	-0.2295	-0.5803
Net Income / total assets (X3)	-0.0551	0.0014	-0.2042	-0.5509
Score	-0.9162	-0.7249	-1.2091	-3.0626
Interpretation	Bankrupt	Bankrupt	Bankrupt	Bankrupt

Based on the findings of calculations using the Grover model, PT. Garuda Indonesia Tbk. is classified as a firm projected to file for bankruptcy during 2018-2021, as its Grover Score from 2018-

2021 is always less than -0.02. Grover Score PT. Garuda Indonesia Tbk saw a substantial fall during the pandemic, namely in 2020 and 2021, as its Grover Score value dropped from -0.7249 in 2019 to -1.2091 in 2020 and then to -3 061 in 2021. PT caused this drop in Grover's Score. Garuda Indonesia Tbk consistently recorded losses during the pandemic (2020-2021) in its operating activities, causing the EBIT/Assets and Net Income/Total Assets indicators to continue to record negative values. If studied further, the loss of operational activities is caused by restrictions on flight operations owing to the pandemic, notably in 2020 and 2021, therefore PT. Garuda Indonesia Tbk had a fall and could not meet its operational expenses.

Prediction of Bankruptcy of PT. Garuda Indonesia Tbk using the Ohlson Model

The Ohlson model contains a conditional logit component to predict bankruptcy. The following results are derived from calculations performed using the Ohlson model:

Table 4. Results of the Ohlson Model Assessment Year Indicator

Indicator	Year			
	2018	2019	2020	2021
Log Total asset /GNP (X1)	3.0239	3.0264	3.4389	3.2185
Total liabilities / total assets (X2)	0.8460	0.8383	1.1801	1.8495
Working capital / total assets (X3)	-0.4768	-0.4767	-0.3483	-0.7599
Current Liabilities / current assets (X4)	2.8348	2.8731	8.0045	18.8775
Score 1 if total liabilities > total assets (X5)	0.0000	0.0000	1.0000	1.0000
Net income / total assets (X6)	-0,0625	0.0206	-0.2295	-0.5803
Cash flow / total liabilities (X7)	0.0720	0.0801	0.0156	0.0041
Score 1 if net income is negative and 0 if it is positive (X8)	1.0000	0.0000	1.0000	1.0000
(NI year t - NI year t-1) / (NI year t + NI year t-1) (X9)	0.0982	-2.0883	1.0768	0.2552
Score	3.8873	3.1121	3.7176	9.1450
Interpretation	Bankrupt	Bankrupt	Bankrupt	Bankrupt

Based on the calculation of the Ohlson model score, it is known that PT. Garuda Indonesia will be in a condition of financial distress from 2018 to 2021, with an Ohlson score of 3.8873 in 2018, 3.1121 in 2019, 3.7176 in 2019, and 9.1450 in 2021. The Ohlson score, constantly > 0.38, implying that the financial condition of PT. Garuda Indonesia Tbk is in a state of financial difficulties. The high value of Ohlson Score PT. Garuda Indonesia Tbk above the specified threshold, especially in 2021, is due to several factors, such as the value of debt which tends to be higher than assets, causing the value indicators X4, X2 and X5 to be highly poor.

Prediction of PT. Garuda Indonesia Tbk's Bankruptcy using the Zmijweski model

The Zmijewski model is a model for predicting firm bankruptcy that incorporates the validity of financial ratios into its model equation (Komarudin et al., 2019). The following is the result of calculating the Zmijweski model for PT. Garuda Indonesia Tbk in 2018-2021.

Table 5. Results of the Zmijweski Model Assessment

Indicator	Year			
	2018	2019	2020	2021
ROA (X1)	-0,0625	0.0206	-0.2295	-0.5803
Debt Ratio (X2)	0.8460	0.8383	1.1801	1.8495
Current Assets / Current Liabilities (X3)	0.3528	0.3481	0.1249	0.0530
Score	0.8024	0.3842	3.4588	8.8532
Interpretation	Financial distress	Financial distress	Financial distress	Financial distress

Calculations using the Zmijweski model indicate that PT. Garuda Indonesia Tbk will be in financial distress from 2018 to 2021, as indicated by a Zmijweski Score > 0. The Zmijweski score, which is constantly greater than 0, is due to the ROA values in 2018, 2020, and 2021, which recorded a negative value, indicating that PT. Garuda Indonesia Tbk recorded a net loss in those

years. In addition to the ROA factor, the positive value of PT. Garuda Indonesia Tbk is also caused by the high debt ratio, which exceeds 83% annually, and in 2020 and 2021, 118% and 184%, respectively. According to the Zmijewski model, PT. Garuda Indonesia Tbk will likely experience financial distress due to its high level of debt and ineffective to generate profits.

CONCLUSION

The study's findings demonstrates that employing five bankruptcy prediction methods, PT. Garuda Indonesia Tbk was in a state of financial distress from 2018 to 2021. This is evidenced by the results of the five bankruptcy prediction methods, which produce an interpretation score below the benchmark for good financial health. This study found that PT. Garuda Indonesia Tbk's financial condition tends to deteriorate during the COVID-19 pandemic, as indicated by the score of the prediction model during the pandemic (2020 and 2021), which is lower than before the COVID-19 pandemic. To avoid potential bankruptcy based on the calculation results; it is recommended that PT. Garuda Indonesia Tbk's management takes strategic steps for improvement, such as submitting a suspension or renegotiating debt payments (financial restructuring), restructuring assets to obtain lower capital costs, streamlining operational activities by eliminating several ineffective flight routes to enhance revenue companies, and making various efforts to obtain funding sources through the issuance of rights issues.

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