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Implementation of the Altman z-score model in predicting bankruptcy at PT. Garuda Indonesia, Tbk.

Eva Sriwiyanti*, Djuli Syafei Purba, Dendi Wahyudi, Wico Jontarudi Tarigan and Rensa Napitu

Abstract

Research aims: This study aims to forecast Garuda Indonesia's bankruptcy rate using the Altman Z-Score model analysis tool based on financial statement data for the 2012-2021 period.

Design/Methodology/Approach: A quantitative description method was used, with data sources from the Garuda Indonesia website.

Research findings: Based on the data analysis, Garuda Indonesia was in a "gray area" or financial difficulty in the overall observation year.

Theoretical contribution/Originality: Since 2020, Garuda Indonesia has implemented a statement of financial accounting standards (PSAK 73) on lease regulations. According to Institute of Indonesia Chartered Accountants (IAI, 2022), the objective of PSAK 73 on leases is to determine the principles for recognizing, measuring, presenting, and disclosing leases and determine whether the lessee and lessor provide relevant data with a method that presents transactions appropriately. PSAK 73 on leases categorizes assets from finance leases designated as right-of-use assets as part of property, plant, and equipment and lease liabilities as part of long-term liabilities that appear in the statement of financial position. Following the Institute of Indonesia Chartered Accountants (2022), right-of-use assets describe the tenant's right to use assets granted by the lessor to the lessee during the lease term.

Research limitation/Implication: This research has limitations since the reference sources only came from research journals conducted at manufacturing and service companies in Indonesia and researched by Indonesian researchers. The data studied was only for the last 10 years (2012-2021) and during that time the 2019 Covid pandemic occurred, resulting in a lockdown which caused the number of domestic and international flights to Indonesia to decrease drastically.

Keywords: Altman Z-Score; Bankruptcy; Financial Difficulties; Garuda Indonesia

AFFILIATION:
Department of Accounting, Faculty of Economics, Universitas Simalungun, North Sumatra, Indonesia

***CORRESPONDENCE:**
evasriwiyanti.s@gmail.com

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Introduction

The rapid growth of the business world has given rise to very tight competition. To be able to compete, companies must improve their performance (Prasetya, 2021). Companies that cannot improve their performance optimally, particularly in obtaining profits, will encounter financial distress and end up in bankruptcy. Bankruptcy and company performance levels can be seen from the company's financial condition by analyzing the company's financial statements (Rusman, 2021). Financial

information analysis is an activity to identify, estimate, supervise, and compare financial information to useful information (Hasanaj & Kuqi, 2019).

A financial statement is defined as a concise overview of the recorded transaction process of a business that holds economic and monetary significance within a specific period. The information presented in the financial statements benefits decision-making by the company's management.

Analyzing financial statements aims to assess the company's health and financial status over time, determining if financial performance has improved or declined (Nafisatin et al., 2015). One of the measuring tools in assessing a company's bankruptcy level is the Altman Z-Score Model analysis. This model was formulated by Edward I. Altman in 1968, popularizing the analysis known as Multiple Discriminant Analysis (MDA). Altman uses financial ratios in predicting a company's financial distress, including Working Capital to Total Assets Ratio, Retained Earning to Total Assets Ratio, Earning Before Interest and Tax to Total Assets Ratio, Market Value Equity to Book Value of Total Liabilities Ratio, and Sales to Total Assets Ratio (Thohari et al., 2015; Kadim & Sunardi, 2018).

Further, financial distress is characterized by the company's inability to pay off its current and long-term liability. Financial distress and early signs of bankruptcy can be identified through analysis of the data contained in the financial statements (Hikmah & Afridola, 2018)

Specifically, the Altman Z-score model can predict the bankruptcy rate with up to 95% accuracy (Al-Manaseer & Al-Oshaibat, 2018). This aligns with research conducted by Zaabi (2011), who found that the Z-score model is suitable for measuring Islamic banks' performance and the factors used in calculating the Z-score. Their findings are consistent with a study (Daniela et al., 2016), revealing that the Altman Z-score variable significantly influences the final evaluation of construction companies in Slovakia.

In this case, Garuda Indonesia is one of the national pride air transportation companies owned by Indonesia. Garuda Indonesia is a national airline that has remained operational in the air transportation industry despite experiencing financial losses in recent years, as seen in the Table 1.

Table 1 PT. Garuda Indonesia Tbk. Financial Statements from 2012 to 2021 (In USD)

Year	Total Assets	Total Liabilities	Total Equity	Profit (Loss) Netto
2012	2,517,997,766	1,403,037,688	1,114,960,078	110,842,573
2013	2,953,784,952	1,836,636,835	1,117,148,117	11,200,380
2014	3,113,079,315	2,233,611,724	879,467,591	-368,911,279
2015	3,310,010,986	2,359,287,801	950,723,185	77,974,161
2016	3,737,569,390	2,727,672,171	1,009,897,219	9,364,858
2017	3,763,292,093	2,825,822,893	937,469,200	-213,389,678
2018	4,155,474,803	3,515,668,247	639,806,556	-228,889,524
2019	4,455,675,774	3,873,097,505	582,578,269	-44,567,515
2020	10,789,980,407	12,733,004,654	-1,943,024,247	-2,476,633,349
2021	7,192,745,360	13,302,805,075	-6,110,059,715	-4,174,004,768

Based on Table 1, it can be seen that the total assets and total liabilities of Garuda Indonesia have increased from 2012 to 2020. Garuda Indonesia was financed from the company's debts in its business management. In addition, it can also be seen that the total equity from 2017 to 2021 decreased; even in 2020 and 2021, the total equity of Garuda Indonesia showed a negative value. In 2020, total liabilities amounted to about USD 12.7 billion, of which total liabilities to lessors and maintenance liabilities increased from previous years. This is because Garuda Indonesia has implemented PSAK 73 in recognizing leases since 2020, wherein the recognition of lease transactions is classified as a finance lease, which results in the emergence of right-of-use assets and lease liabilities so that the value of assets and liabilities in the statement of financial position increases and causes Garuda Indonesia's equity to decrease significantly.

Even more, the COVID-19 pandemic in 2019 had a highly negative impact on Garuda Indonesia, which caused the current of passengers and cargo to decrease drastically due to government policies regarding restrictions on community activities. Consequently, revenues from scheduled flights for passengers and cargo also significantly declined. If the situation continued in the long term and caused revenue to decline, it was highly likely that Garuda Indonesia would go bankrupt. The Indonesian government, through the Deputy Minister of State-Owned Enterprises (BUMN) Kartika Wirjoatmodjo, on November 9, 2021, stated that Garuda Indonesia was technically bankrupt as it could not pay off its current and long-term liabilities. On July 28, 2021, Garuda Indonesia was reported to have escaped the bankruptcy risk, which was sued by one of its lessors, AerCap Ireland Limited. Then, PT. My Indo Airlines also reported a lawsuit related to the Suspension of Debt Payment Liabilities (PKPU). Even so, Garuda Indonesia escaped the bankruptcy lawsuit through the Central Jakarta Court Judge on October 21, 2021.

Therefore, in this study, the formulation of the problem to be answered is how to implement the Altman Z-Score model in predicting bankruptcy and the causes of bankruptcy at Garuda Indonesia in 2012 - 2021. Previously, research on bankruptcy with the Altman Z-Score model at Garuda Indonesia in 2016 - 2020 was carried out by Fau (2021). In that study, the researcher used the nominal value of the stock in measuring the equity ratio. The difference with this present study lies in the fact that the researchers used the stock's market value in measuring the equity ratio according to the ratio in the equation set by Altman. Moreover, since 2020, Garuda Indonesia has implemented a statement of financial accounting standards (PSAK 73) on lease regulations. According to Institute of Indonesia Chartered Accountants (IAI, 2022), the objective of PSAK 73 on leases is to determine the principles for recognizing, measuring, presenting, and disclosing leases and determine whether the lessee and lessor provide relevant data with a method that presents transactions appropriately. Also, PSAK 73 on leases categorizes assets from finance leases designated as right-of-use assets as part of property, plant, and equipment and lease liabilities as part of long-term liabilities that appear in the statement of financial position. Following the Institute of Indonesia Chartered Accountants (2022), right-of-use assets describe the tenant's right to use assets granted by the lessor to the lessee during the lease term.

In this research, the analysis of the Z-Score model was chosen because it is easy to use and has a high-quality level of predictive accuracy. In comparison, as evidenced by a study (Fatmawati, 2012), the Zmijewski model is a predictive model that is more accurate than the Altman Z-Score model and the Springate model. Prihanthini and Sari (2013) also found that the Grover model is the most accurate compared to the Springate, Zmijewski, and Altman Z-Score models. On the other hand, Prihanthini (2013) conducted a study using the Grover, Altman, Springate, and Zmijewski models to predict bankruptcy in food and beverage companies listed on the IDX, with the study results revealing that the Altman model has an accuracy rate of 80%. In addition, Purnajaya and Merkusiwati (2014) reported that the Altman Z-Score model and the Zmijewski model are the most accurate compared to the Springate model. According to Dahruji and Muslich (2022), the Altman Z-Score model has a very high level of accuracy (100%). Similarly, Aprillianto et al. (2014) stated that the Altman Z-Score model has a higher accuracy rate than Springate and Zmijewski. Besides Armini and Wirama (2015) demonstrated that the Altman Z-Score model has very high accuracy (95%), Laksmana (2017) also revealed that the accuracy of the Altman model reached an average of 90%. Deriving from those studies, it can be said that this model is suitable for predicting or anticipating business difficulties and bankruptcy. Compared to the Springate, Grover, and Zmijewsi models, the accuracy test of the bankruptcy prediction using the Altman Z-Score model has the highest quality accuracy, which is 53.33%.

Literature Review and Hypotheses Development

Financial Statements

According to Institute of Indonesia Chartered Accountants (IAI, 2022), financial statements are part of the financial reporting process consisting of a statement of financial position, income statement, statement of change in equity, cash flow statement, and notes to financial statements as well as explanatory material which is part of the financial statements. Financial statements also contain information about financial conditions for decision-making by internal and external parties within a certain period.

Kasmir (2018) mentions the objectives of preparing financial statements are: (1) Providing information on assets owned by the entity; (2) Providing information about liabilities and equity owned by the company; (3) Providing information about the income generated by the company; (4) Providing information about expenses incurred by the company; (5) Providing information about changes to the company's assets, liabilities, and equity; (6) Providing information about the company's management performance; and (7) Providing information about the records of the company's financial statements.

Analysis of Financial Statements

Financial statement analysis is the activity of analyzing financial statements to provide information on financial statements to interested parties for decision-making. According to Harahap (2013), financial statement analysis describes the relationship between the

items in the financial statements regarding the quality of information, audit opinions, procedures, and accounting principles used as information, which is to see the relationship between financial statement items to make the right decision.

Objective of financial statement analysis are as follows: (1) To determine the condition of the company's financial position, including assets, liabilities, and equity in a certain period; (2) To find out the company's strengths and weaknesses; (3) For evaluating the company's management performance in a specific period; and (4) To find out what evaluation steps to be carried out in the future.

Additionally, Safura et al. (2015) mention several financial statement analysis techniques, including the following: (1) Comparative analysis of financial statements: The analysis compares financial statements of more than one period. This analysis shows the changes that occur in the form of an increase or decrease in the analysis components; (2) Trend analysis, i.e., the analysis expressed in the form of a percentage. This analysis can show changes in the analysis components in the form of percentages; (3) Percentage per component analysis is carried out by comparing the components of the financial statements to determine the total percentage of investment to assets, capital structure, and composition of costs to sales; and (4) Ratio analysis is made to identify the relationship between items contained in financial information or the relationship between types of financial information. Ratio analysis evaluates the company's resources and assesses their efficiency and effectiveness.

Bankruptcy

In general, bankruptcy is a condition that indicates a company will encounter bankruptcy (Prasandri, 2018). According to Pranita and Kristanti (2020), financial distress is the state of the company in the stage of financial difficulties, which is marked by a decrease in profits and even negative profits, and bankruptcy is the stage of the situation where the company is legally filed as a bankrupt company.

Bankruptcy can be caused by many things, such as financial problems and poor management and products (Marlina, 2019). The causes of bankruptcy can be categorized into Internal and external factors causing the company's bankruptcy. The internal factors are: (1) Poor quality and quantity of human resources; (2) The resulting product does not satisfy consumer expectations; (3) Unrealistic selling price and budget; (4) The company's inability to keep up with technological and environmental developments; (5) Marketing activities that do not reach the target; and (6) Poor product distribution and not reaching the target market. Meanwhile, external factors that cause company bankruptcy include: (1) Changes in socio-cultural circumstances cause bankruptcy due to the inability of the industry to adapt to the socio-cultural environment in which the industry practices; (2) Macroeconomic conditions, such as inflation, fiscal, and monetary policies, cause the company to be in a state of financial difficulty; and (3) The applicable laws where the company operates can cause financial problems for the company.

As Nugroho (2018) stated, bankruptcy has several types as follows: (1) Economic distress, i.e., economic failure, occurs in the company when the company's income cannot cover the costs incurred; (2) Business failure: Is the state of business failure that occurs in the company when the company stops its business, causing losses to creditors; (3) Technical insolvency occurs when the company cannot fulfill its current liabilities when they fall due. This can be overcome by restructuring the company's debt; (4) Insolvency in bankruptcy occurs when the book value of the liabilities is greater than the book value of the assets. This situation indicates that the company will be liquidated; and (5) Legal bankruptcy: The company is said to be legally bankrupt when the company has been officially filed according to applicable laws and regulations.

Moreover, Hanafi and Halim (2016) asserted that bankruptcy analysis was conducted to obtain an early warning of a company's bankruptcy. The earlier the signs of bankruptcy, the sooner the stakeholders take preventive or corrective action so that bankruptcy does not occur. One of the solutions to facing bankruptcy is debt restructuring. Debt restructuring is an effort made by the company to improve its financial condition by rearranging all its debts and proposing new terms and conditions agreed upon by both parties. Debt restructuring is also an attempt to reschedule maturing debt.

Research Method

This study used a quantitative descriptive approach. According to Sugiyono (2016), it is an approach that seeks to describe the actual state of quantitative data, in this case, regarding the implementation of the Altman Z-score model in predicting bankruptcy at Garuda Indonesia. This study employed quantitative data in the form of financial statement data of Garuda Indonesia from 2012 to 2021, derived from secondary data sources. Generally, secondary data is data taken from records in the form of documents or other sources that have already been processed by third parties (Purba et al., 2021). The researchers utilized the Altman Z-Score model in the data analysis technique, i.e., the financial ratios.

Altman Z-Score Model

Altman Z-Score model is one method in predicting bankruptcy. This model was developed by an assistant professor in finance from New York University named Edward I. Altman (Rahmat, 2020). In 1968, Altman researched several companies that were about to go bankrupt. In his research, Altman took a sample of 66 companies consisting of 33 samples of bankrupt companies and 33 samples of companies that were not in bankruptcy (Altman, 1968).

Altman researched 22 financial ratios, which then resulted in five ratios: Working Capital to Total Assets Ratio (X1), Retained Earning to Total Assets Ratio (X2), Earning Before Interest and Tax to Total Assets Ratio (X3), Market Value Equity to Book Value of Total Liabilities Ratio (X4), and Sales to Total Assets Ratio (X5). These five ratios were selected

after the Multivariate Discriminant Analysis (MDA) test. MDA is a statistical technique that classifies a study into several groups to predict dependent variables (Fau, 2021).

In 1995, Altman conducted research again on the possibility of bankruptcy. As a result, Altman produced a formula for predicting bankruptcy in industries other than manufacturing companies (Gunawan et al., 2017). The formula for this model is:

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \dots (1)$$

The assessment criteria for the Altman Z-Score (revised) model are: (1) If the Z-score < 1.10, the company has the potential to go bankrupt; (2) If 1.10 < Z-score < 2.60, the company is in the gray area; and (3) If the Z-score > 2.60, the company is not potentially bankrupt.

Further, as Altman (1968) stated, each ratio used is as follows: (1) The working capital to total assets ratio (X_1) assesses the amount of net assets owned. Companies that experience operating losses will have current assets that shrink compared to total assets. Therefore, Altman stated that the best indicator for measuring net assets owned is the ratio of net working capital to total assets; (2) The retained earnings to total assets ratio (X_2) measure a company's cumulative profitability over time; (3) Earnings before interest and tax to total assets ratio (X_3) are utilized to measure asset productivity because a company's survival is based on the ability to earn income from the productivity of assets owned. This ratio relates to the bankruptcy of the company. Bankruptcy occurs when the value of the liabilities is higher than the value of the company's assets, which is determined by the productivity of assets; and (4) The market value equity to book value of the total liabilities ratio (X_4) measures the value of the decline in the company's assets before the liabilities exceed the assets and the company becomes bankrupt. This ratio uses the market value to measure the equity held.

In this study, the researchers used the following steps in analyzing the data: (1) Calculating the Altman Z-score model measurements by entering the data into the formula; (2) Comparing the z-score values obtained with the year of research; (3) Analyzing and discussing the state of financial distress of Garuda Indonesia; and (4) In conclusion, the analysis results are classified, and the bankruptcy criteria of the Altman Z-score model are discussed.

Springate Model

Gordon L. V Springate, in 1978, conducted research on the prediction model of the potential for a company's financial distress. Initially, Springate used 19 financial ratios, but four ratios were picked up after testing. The formula for the Springate model is as follows:

$$S - score = 1.03X_1 + 3.07X_2 + 0.66X_3 + 0.4X_4 \dots (2)$$

The working capital to total assets ratio (X_1) assesses the amount of net assets owned. Earnings before interest and tax to total assets ratio (X_2) are utilized to measure asset

productivity because a company's survival is based on the ability to earn income from the productivity of assets ownedEarnings before tax to current liabilities (X_3) is used to measure capabilities company in paying off its short-term debt Sales to total asset (X_4) This ratio shows the level of company efficiency in use the assets they own to generate sales.

The evaluation criteria for the Springate (revised) model are: (1) If S-score < 0.862, the company has the potential to go bankrupt; (2) If 0.862 < S-score < 1.802, the company is in the gray area; and (3) If the value of S-score > 1.802, the company is not potentially bankrupt.

Result and Discussion

Garuda Indonesia is the only Indonesian airline that serves the best full-service flights with the 'Garuda Indonesia Experience' concept, which prioritizes Indonesian hospitality and the richness of Indonesian culture (Yunus et al., 2021). The establishment of Garuda Indonesia started due to a collaboration between the Indonesian government and *Koninklijke Luchtvaart Maatschappij* (KLM), a Dutch-owned airline with the airline name Indonesian Airways. In 1949, Indonesian Airways changed its name to Garuda Indonesia Airways. President Soekarno gave this name in coincide with President Soekarno's first flight with Garuda Indonesian Airways from Yogyakarta to Jakarta using DC-3 aircraft with registration RI-001.

Ratio Calculation

Working Capital to Total Assets Ratio shows the company's ability to obtain net working capital from the total assets owned. This ratio is calculated by dividing working capital by total assets (Aprillianto et al., 2014). The smaller value of this ratio indicates that the company's liquidity is worsening.

The Working Capital to Total Assets Ratio calculation (Table 2) revealed that the company could not pay off its current liabilities using its current assets. This occurred because the number of current assets owned was smaller than current liabilities.

Retained Earnings to Total Assets Ratio informs the company's total income or loss from investment activities. This ratio is determined by dividing the amount of retained earnings by total assets.

From the calculation results (Table 3), from 2014 to 2021, the Retained Earnings to Total Assets Ratio decreased and obtained a negative value. The decrease in Retained Earnings to Total Assets Ratio occurred because the company suffered losses since 2014, and the impact of these losses did not decrease even though profits were obtained in 2015-2016.

Table 2 Working Capital to Total Assets Ratio in USD (Altman Model)

Year	Total Current Assets (A)	Total Current Liabilities (B)	Working Capital (C = A-B)	Total Assets (D)	WCTA (E = C/D)
2012	636,566,218	754,207,052	(117,640,834)	2,517,997,766	(0.04672)
2013	819,133,923	983,890,767	(164,756,844)	2,953,784,952	(0.05578)
2014	810,514,943	1,219,365,356	(408,850,413)	3,113,079,315	(0.13133)
2015	1,007,848,005	1,195,849,121	(188,001,116)	3,310,010,986	(0.05680)
2016	1,165,133,302	1,164,096,050	1,037,252	2,727,672,171	0.00038
2017	986,741,627	1,921,846,147	(935,104,520)	2,825,822,893	(0.33091)
2018	3,075,529,677	3,061,396,001	14,133,676	3,515,668,247	0.00402
2019	1,133,892,533	3,395,880,889	(2,261,988,356)	3,873,097,505	(0.58403)
2020	536,547,176	4,294,797,755	(3,758,250,579)	12,733,004,654	(0.29516)
2021	305,725,029	5,711,313,185	(5,405,588,156)	7,192,745,360	(0.75153)
Total					(2.24786)
Average					(0.22479)

Note: WCTA = Working Capital to Total Assets Ratio

The Earnings Before Interest and Tax (EBIT) to Total Assets Ratio measures the company's ability to earn and generate profits from the company's operations relative to the total assets owned. This ratio indicates the efficiency of the assets processed by the company. The greater the value of this ratio, the better the company's performance in using its assets.

Table 3 Retained Earnings to Total Assets Ratio in USD (Altman Model)

Year	Retained Earnings (A)	Total Assets (B)	RETA (C = A/B)
2012	110,598,370	2,517,997,766	0.04392
2013	118,391,074	2,953,784,952	0.04008
2014	(293,955,127)	3,113,079,315	(0.09443)
2015	(220,046,387)	3,310,010,986	(0.06648)
2016	(221,069,730)	3,737,569,390	(0.05915)
2017	(449,484,287)	3,763,292,093	(0.11944)
2018	(482,523,596)	4,155,474,803	(0.11612)
2019	(799,660,846)	4,455,675,774	(0.17947)
2020	(3,263,966,450)	10,789,980,407	(0.30250)
2021	(7,418,846,826)	7,192,745,360	(1.03143)
Total			(1.88501)
Average			(3.81394)

Note: RETA = Retained Earnings to Total Assets Ratio

Based on Table 4, the decline in the value of the earnings before interest and tax to total assets ratio was due to the company experiencing a loss, or it could be said that the operating costs incurred were greater and not proportional to the company's. This denotes that the company could not manage its assets effectively.

The Market Value Equity to Book Value of Total Liabilities Ratio measures the company's ability to fulfill long-term liabilities or the company's capital ability to finance all of its liabilities.

Table 4 Earnings Before Interest and Tax to Total Assets Ratio in USD (Altman Model)

Year	EBIT	Total Assets	EBIT/Total Assets
2012	168,072,104	2,517,997,766	0.06675
2013	56,448,275	2,953,784,952	0.01911
2014	(395,228,121)	3,113,079,315	(0.12696)
2015	168,745,441	3,310,010,986	0.05098
2016	99,103,939	3,737,569,390	0.02652
2017	(76,181,178)	3,763,292,093	(0.02024)
2018	(199,105,549)	4,155,474,803	(0.04791)
2019	95,989,390	4,455,675,774	0.02154
2020	(2,203,059,625)	10,789,980,407	(0.20418)
2021	(1,272,343,890)	7,192,745,360	(0.17689)
Total			(0.39129)
Average			(0.03913)

According to Table 5, the market value equity to book value of the total liabilities ratio showed that the company could still guarantee or fulfill its liabilities with its equity from 2012 to 2019. In 2020, the company's equity value could only fulfill the amount of 0.81728 of its total liabilities, and in 2021, it decreased in value by 0.43200. This was caused by fluctuating stock market value. It happened because of suffering losses continuously.

Table 5 Market Value Equity to Total Liabilities Ratio in USD (Altman Model)

Year	Outstanding Shares (A)	Market Value (B)	Total Liabilities (C)	(A x B) / C
2012	22,640,995	655	1,403,037,688	10.56982
2013	22,640,995	491	1,836,636,835	6.05276
2014	22,640,995	555	2,233,611,724	5.62575
2015	25,868,926	309	2,359,287,801	3.38810
2016	25,886,576	338	2,727,672,171	3.20774
2017	25,886,576	300	2,825,822,893	2.74822
2018	25,886,576	298	3,515,668,247	2.19423
2019	25,886,576	498	3,873,097,505	3.32848
2020	25,886,576	402	12,733,004,654	0.81728
2021	25,886,576	222	13,302,805,075	0.43200
Total				38.36438
Average				3.83644

The Ratio of Earnings Before Tax to Current Liabilities could be calculated by comparing net income before tax with current liabilities. The following is the calculation of the Earnings Before Tax to Current Liabilities Ratio.

As Table 6 displays, the average value obtained by Garuda Indonesia from 2012 to 2021 was 0.16327, meaning that the company could no longer fulfill its current liabilities with the resulting profit. Garuda Indonesia did not make a profit or suffered losses almost every year.

Next, Sales to Total Assets Ratio measures how effectively a company uses its assets to generate sales or revenue. A high ratio indicates an effective use of assets. The following is the calculation of the Sales to Total Assets Ratio.

Table 6 Earning Before Tax to Current Liabilities Ratio in USD (Springate Model)

Year	Earnings Before Taxes	Current Liabilities	EBT / Current Liabilities
2012	151,530,554	754,207,052	0.20091
2013	8,815,603	983,890,767	0.00896
2014	(456,453,104)	1,219,365,356	(0.37434)
2015	106,660,147	1,195,849,121	0.08919
2016	17,790,700	1,164,096,050	0.01528
2017	(158,180,637)	1,921,846,147	(0.08231)
2018	(286,393,449)	3,061,396,001	(0.09355)
2019	1,235,153	3,395,880,889	0.00036
2020	(2,592,583,535)	4,294,797,755	(0.60366)
2021	(4,532,553,816)	5,711,313,185	(0.79361)
Total			(1.63275)
Average			(0.16327)

Table 7 exhibits that Garuda Indonesia's ability to manage its assets to earn revenue from 2012 to 2021 has decreased. The highest score was obtained in 2012, which was 1.37906. In other words, the assets owned could only generate 1.37 sales.

Table 7 Sales to Total Assets Ratio in USD (Springate Model)

Year	Sales	Total Assets	Sales/Total Assets
2012	3,472,468,962	2,517,997,766	1.37906
2013	3,712,076,586	2,953,784,952	1.25672
2014	3,933,530,272	3,113,079,315	1.26355
2015	3,814,989,745	3,310,010,986	1.15256
2016	3,863,921,565	3,737,569,390	1.03381
2017	4,177,325,781	3,763,292,093	1.11002
2018	4,330,441,061	4,155,474,803	1.04210
2019	4,572,638,083	4,455,675,774	1.02625
2020	1,492,331,099	10,789,980,407	0.13831
2021	1,336,678,470	7,192,745,360	0.18584
Total			9.58821
Average			0,95882

Comparison of Altman Z-Score and Springate Models

Companies indicated to be going bankrupt can be known by measuring financial ratios. A comparison of the use of the Altman and the Springate Models in measuring the ratio is as follows.

Table 8 indicates that the company's financial condition was not good. Using the Altman model, the company got an average value of 1.47460. Meanwhile, using the Springate model, the average value was 0,23153. This happened because the company's working capital was negative. This means that total current assets were lower than total current liabilities owned. Then, the company could not fulfill its current liabilities by using the current assets.

Table 8 Comparison of Ratio Calculation X_1 Using the Altman and Springate Models

Year	Altman Model			Springate Model		
	Coefficient	X_1	Result	Coefficient	X_1	Result
2012	6.56	(0.04672)	(0.30648)	1.03	(0.04672)	(0.04812)
2013	6.56	(0.05578)	(0.36591)	1.03	(0.05578)	(0.05745)
2014	6.56	(0.13133)	(0.86155)	1.03	(0.13133)	(0.13527)
2015	6.56	(0.05680)	(0.37259)	1.03	(0.05680)	(0.05850)
2016	6.56	0.00038	0.00249	1.03	0.00038	0.00039
2017	6.56	(0.33091)	(2.17080)	1.03	(0.33091)	(0.34084)
2018	6.56	0.00402	0.02637	1.03	0.00402	0.00414
2019	6.56	(0.58403)	(3.83121)	1.03	(0.58403)	(0.60155)
2020	6.56	(0.29516)	(1.93624)	1.03	(0.29516)	(0.30401)
2021	6.56	(0.75153)	(4.93006)	1.03	(0.75153)	(0.77408)
Average			(1.47460)	Average		(0.23153)

Based on the calculation of X_2 (Table 9) with the Altman and Springate models, the average of earnings to total assets had a negative value. This was because the company suffered a loss or did not profit. This loss was caused by the amount of income lower than the total expense incurred. Thus, it did not generate profit and could not contribute retained earnings.

Table 9 Comparison of Ratio Calculations X_2 Using the Altman and Springate Models

Year	Altman Model			Springate Model		
	Retained Earnings to Total Assets Ratio			Earnings Before Interest and Taxes to Total Assets Earnings Before Interest and Taxes to Total Assets		
	Coefficient	X_2	Result	Coefficient	X_2	Result
2012	3.26	0.04392	0.14319	3.07	0.06675	0.20492
2013	3.26	0.04008	0.13066	3.07	0.01911	0.05867
2014	3.26	(0.09443)	(0.30783)	3.07	(0.12696)	(0.38977)
2015	3.26	(0.06648)	(0.21672)	3.07	0.05098	0.15651
2016	3.26	(0.05915)	(0.19282)	3.07	0.02652	0.08142
2017	3.26	(0.11944)	(0.38937)	3.07	(0.02024)	(0.06214)
2018	3.26	(0.11612)	(0.37854)	3.07	(0.04791)	(0.14708)
2019	3.26	(0.17947)	(0.58507)	3.07	0.02154	0.06613
2020	3.26	(0.30250)	(0.98615)	3.07	(0.20418)	(0.62683)
2021	3.26	(1.03143)	(3.36248)	3.07	(0.17689)	(0.54305)
Average			(0.61451)	Average		(0.12012)

In Table 10, it can be seen that the average value of X_3 showed negative results. This happened because the increase in total assets and current liabilities had not effectively generated the expected profit. The increased assets and liabilities caused additional burdens for the company, especially operating, maintenance, and repair expenses.

Table 11 shows that the Market Value Equity to Book Value Total Liabilities Ratio used in the Altman model decreased significantly from 2012 to 2021. The ability of equity to cover company debt was still positive, but from 2020 to 2021, the value of this ratio was below 1 (one). On average, the equity owned by the company could cover its debts at a rate of 4.02.

Table 10 Comparison of Ratio Calculations X_3 Using the Altman and Springate Models

Year	Altman Model			Springate Model		
	Earnings Before Interest and Taxes to Total Assets			Earning Before Tax to Current Liability		
	Coefficient	X_3	Result	Coefficient	X_3	Result
2012	6.72	0.06675	0.44855	0.66	0.20091	0.13260
2013	6.72	0.01911	0.12842	0.66	0.00896	0.00591
2014	6.72	(0.12696)	(0.85315)	0.66	(0.37434)	(0.24706)
2015	6.72	0.05098	0.34259	0.66	0.08919	0.05887
2016	6.72	0.02652	0.17818	0.66	0.01528	0.01009
2017	6.72	(0.02024)	(0.13603)	0.66	(0.08231)	(0.05432)
2018	6.72	(0.04791)	(0.32198)	0.66	(0.09355)	(0.06174)
2019	6.72	0.02154	0.14477	0.66	0.00036	0.00024
2020	6.72	(0.20418)	(1.37207)	0.66	(0.60366)	(0.39841)
2021	6.72	(0.17689)	(1.18872)	0.66	(0.79361)	(0.52378)
Average			(0.26294)	Average		(0.10776)

The results of calculating the ratio of Sales to Total Assets using the Springate model show a decrease every year. This denotes that, from 2012 to 2021, the company's sales continued to decline and were not proportional to the increase in the company's assets. It can be interpreted that Garuda Indonesia could not use its assets efficiently and effectively to obtain maximum sales or revenue.

Table 11 Comparison of Ratio Calculations X4 Using the Altman and Springate Models

Year	Altman Model			Springate Model		
	Market Value Equity to Total Liabilities			Sales to Total Assets		
	Coefficient	X4	Result	Coefficient	X4	Result
2012	1.05	10.56982	11.09831	0.4	1.37906	0.55162
2013	1.05	6.05276	6.35540	0.4	1.25672	0.50269
2014	1.05	5.62575	5.90704	0.4	1.26355	0.50542
2015	1.05	3.38810	3.55750	0.4	1.15256	0.46102
2016	1.05	3.20774	3.36813	0.4	1.03381	0.41352
2017	1.05	2.74822	2.88563	0.4	1.11002	0.44401
2018	1.05	2.19423	2.30395	0.4	1.04210	0.41684
2019	1.05	3.32848	3.49490	0.4	1.02625	0.41050
2020	1.05	0.81728	0.85814	0.4	0.13831	0.05532
2021	1.05	0.43200	0.45360	0.4	0.18584	0.07433
Average			4.02826	Average		0.38353

Bankruptcy Prediction Results with Altman Z-Score Model

To predict the bankruptcy level with the Altman z-score model, the results of each ratio in the Altman z-score model were then accumulated and classified into predetermined criteria. If a company obtains a Z-score of > 2.6, it is classified as not having the potential for bankruptcy. Meanwhile, if a company obtains a Z-score of < 1.1, it is classified as having a potential for bankruptcy. Then, if the company attains a score between 1.1 and 2.6, it is classified as a company in the gray area. The results of bankruptcy prediction using the Altman z-score model are presented in Table 12.

Since the average value of the Altman Z-score calculation was 1.74504 (between 1.10 <Z<2.60), it can be categorized that Garuda Indonesia was not bankrupt but was in financial distress.

Table 12 Bankruptcy Rate Altman Z-Score Model

Year	X_1	X_2	X_3	X_4	Z_{score}	Category
2012	(0.30648)	0.14319	0.44855	11.09831	11.38356	Non-Bankrupt
2013	(0.36591)	0.13066	0.12842	6.35540	6.24858	Non-Bankrupt
2014	(0.86155)	(0.30783)	(0.85315)	5.90704	3.88452	Non-Bankrupt
2015	(0.37259)	(0.21672)	0.34259	3.55750	3.31078	Non-Bankrupt
2016	0.00182	(0.19282)	0.17818	3.36813	3.35531	Non-Bankrupt
2017	(1.63003)	(0.38937)	(0.13603)	2.88563	0.73019	Bankrupt
2018	0.02231	(0.37854)	(0.32198)	2.30395	1.62573	Grey Area
2019	(3.33028)	(0.58507)	0.14477	3.49490	(0.27568)	Bankrupt
2020	(2.28491)	(0.98615)	(1.37207)	0.85814	(3.78498)	Bankrupt
2021	(4.93006)	(3.36248)	(1.18872)	0.45360	(9.02765)	Bankrupt
Avg	(1.40577)	(0.61451)	(0.26294)	4.02826	1.74504	Grey Area

On the other hand, to predict the bankruptcy level with the Springate model (Table 13), the results of each ratio in the Springate model were then accumulated and classified into predetermined criteria. If a company obtains an S-score > 1.802, it is classified as one with no bankruptcy potential. Conversely, a company that gets an S-score < 0.862 is classified as having the potential to experience bankruptcy. Then, if the company gets a score between 0.862 and 1.802, it is classified as a company in the grey area

Table 13 Bankruptcy Rate Using Springate Model

Year	X_1	X_2	X_3	X_4	S_{score}	Category
2012	(0.04812)	0.20492	0.13260	0.55162	0.84103	Bankrupt
2013	(0.05745)	0.05867	0.00591	0.50269	0.50982	Bankrupt
2014	(0.13527)	(0.38977)	(0.24706)	0.50542	(0.26668)	Bankrupt
2015	(0.05850)	0.15651	0.05887	0.46102	0.61790	Bankrupt
2016	0.00039	0.08142	0.01009	0.41352	0.50542	Bankrupt
2017	(0.34084)	(0.06214)	(0.05432)	0.44401	(0.01329)	Bankrupt
2018	0.00414	(0.14708)	(0.06174)	0.41684	0.21216	Bankrupt
2019	(0.60155)	0.06613	0.00024	0.41050	(0.12468)	Bankrupt
2020	(0.30401)	(0.62683)	(0.39841)	0.05532	(1.27394)	Bankrupt
2021	(0.77408)	(0.54305)	(0.52378)	0.07433	(1.76658)	Bankrupt
Avg	(0.23153)	(0.12012)	(0.10776)	0.38353	(0.07589)	Bankrupt

Based on the calculation of the bankruptcy rate using the Springate model (Table 3), since 2012, Garuda Indonesia experienced bankruptcy. Compared to the Altman and Springate model result, it was vastly different. Altman's model stated that from 2012 to 2016, Garuda Indonesia did not go bankrupt. The difference in these results was influenced by the respective ratios used by each model, especially in the fourth ratio. The Altman model employs the ratio of market value of equity to total liabilities, while the Springate model uses the ratio of sales to total assets. Springate's model is more dominant in assessing bankruptcy in terms of liquidity and company profitability.

Cause of Losses at Garuda Indonesia

The following is the net profit obtained by PT Garuda Indonesia Tbk. In Table 14, Garuda Indonesia's profit decreased and even experienced a loss. The company suffered a loss due to soaring operating and other expenses in 2014. The impact of the large losses that occurred in 2014 affected the following years. Although there was a profit in 2015-2016, the amount was not enough to overcome the impact of these losses.

Table 14 Garuda Indonesia Net Profit (Loss) Year 2012 – 2021

Year	Income	Operating Expense	Profit (Loss) Bruto	Other Income (Expense)	Profit (Loss) Netto	Bankrupt
2012	3,472,468,962	3,294,422,707	178,046,255	-67,203,682	110,842,573	Bankrupt
2013	3,712,076,586	3,709,750,230	2,326,356	8,874,024	11,200,380	Bankrupt
2014	3,933,530,272	4,292,344,955	-358,814,683	-10,096,596	-368,911,279	Bankrupt
2015	3,814,989,745	3,731,785,485	83,204,260	-5,230,099	77,974,161	Bankrupt
2016	3,863,921,565	3,795,927,643	67,993,922	-58,629,064	9,364,858	Bankrupt
2017	4,177,325,781	4,237,773,332	-60,447,551	-152,942,127	-213,389,678	Bankrupt
2018	4,330,441,061	4,593,782,601	-263,341,540	34,452,016	-228,889,524	Bankrupt
2019	4,572,638,083	4,457,045,303	115,592,780	-160,160,295	-44,567,515	Bankrupt
2020	1,492,331,099	3,303,826,643	-1,811,495,544	-665,137,805	-2,476,633,349	Bankrupt
2021	1,336,678,470	2,321,963,130	-985,284,660	-3,188,720,108	-4,174,004,768	Bankrupt

In 2017, the company loss was caused by increased operating expenses, which were not proportional to the income earned. The company also lost in 2018 due to increased operating expenses, especially post-flight operating expenses. In 2019, the company suffered a loss. This loss was caused by an increase in tax expenses. Then, in 2020, Garuda Indonesia increasingly experienced a very large loss; this very large loss was because, in that year, the world was experiencing the COVID-19 pandemic. It has caused the world to carry out policies limiting community activities. Likewise, the Indonesian government's policy limited the public from traveling by land, sea, or air. Consequently, in 2020 and 2021, the company experienced a significant decline in ticket sales.

Causes of Increase in Assets and Liabilities and Decrease in Equity at Garuda Indonesia

The summary of the financial position statement in Table 1 demonstrates that Garuda Indonesia's total assets and liabilities increased continuously until 2019. However, its total equity decreased. In 2016, the company's assets and total liabilities increased due to the increase in total bank and financial institution loans.

Furthermore, total assets in 2017 increased. A significant increase was made in the post of aircraft maintenance funds and security deposits in total non-current assets. On the other hand, total current assets decreased, especially in cash and cash equivalents. Total liabilities in 2017 increased in current liabilities, where the items that increased were bank loans and bonds payable, which matured in one year. The company's equity in 2017 decreased. This happened because, in that year, the company suffered a loss, so retained earnings, which were used to fulfill the company's operational liabilities, decreased.

In 2018, the assets owned by the company increased. A significant increase in assets occurred in non-current assets, where the items that most appeared to increase were

maintenance reserve funds and security deposits. Then, the post of net fixed assets also increased. Moreover, the company's liabilities also increased, especially its current liabilities. Almost all items in current liabilities experienced an increase, especially in current loans, trade payables, both accounts payable to related parties and trade payables from third parties, and factoring liabilities, which also experienced an increase.

In 2020, assets owned increased significantly from the previous year, where the increase occurred in non-current assets, especially in net fixed assets. If traced, the increase in net fixed assets occurred due to the revaluation of acquisition costs under PSAK 73 on leases, so the value of fixed assets increased.

Then, the increase in assets was also because, in 2020, Garuda Indonesia implemented PSAK 73. This PSAK 73 regulates leasing. According to INSTITUTE OF INDONESIA CHARTERED ACCOUNTANTS , the objective of PSAK 73 on leases is to determine the principles for recognizing, measuring, presenting, and disclosing leases and determine that the lessee and lessor provide relevant data with a method that presents transactions appropriately. This information provides a basis for users of financial information to estimate the effect of leases on the company's monetary position, financial performance, and cash flows. PSAK 73 on leases further categorizes assets from finance leases designated as right-of-use assets as part of property, plant, and equipment and lease liabilities as part of long-term liabilities that appear in the statement of financial position. According to the Indonesian Institute of Accountants (2022), right-of-use assets describe the tenant's right to use assets granted by the lessor to the lessee during the lease term. Therefore, in 2020, the total assets and liabilities owned by Garuda Indonesia increased due to the addition of right-of-use and lease liabilities due to adjustments to PSAK 73 leases in the statement of financial position.

Finally, in 2021, Garuda Indonesia's total assets decreased. This was because, in 2021, Garuda Indonesia managed to restructure its debt to lessors. This signifies that the success of debt restructuring, especially for leases, will directly reduce the value of right-of-use assets in the statement of financial position, meaning that the agreement causes the total rental value to decrease due to an agreement with the lessor to lower the rental value from the normal value. Debt restructuring is the company's effort to improve its financial condition by reorganizing all its debts and submitting new terms and conditions agreed upon by both parties. Debt restructuring is also an effort to reschedule maturing debts. This very large debt occurs in aircraft rental debt. This is the fault of the management of Garuda Indonesia for years. Where does the management make the mistake of making an aircraft rental agreement with a value above the average market value?

Conclusion

The average value of the Altman Z-Score calculation in predicting the bankruptcy rate of Garuda Indonesia for the research year 2012-2021 could be categorized as Garuda Indonesia not being bankrupt but being in the gray area of financial distress. Based on the research results on the bankruptcy level with the Altman Z-Score Model at Garuda

Indonesia in 2012-2021, it can be concluded that the Altman Z-Score Model can be used as a bankruptcy analysis tool. Prediction results obtained by Garuda Indonesia were influenced by the company's inability to earn a profit, as seen in Garuda Indonesia's financial statements for 2012-2021.

This research has limitations because reference sources only came from journals conducted at manufacturing and service companies in Indonesia and researched by Indonesian researchers. Moreover, the causes of bankruptcy can be viewed from two factors, namely external and internal factors. Here, research using the Altman Z-Score method only examined external factors.

The researchers provide the following suggestions based on the bankruptcy level results of the Altman Z-Score Model of Garuda Indonesia in 2012-2021. Garuda Indonesia's management has tried to overcome bankruptcy through debt restructuring. To further increase sales and minimize the costs incurred so that the company gains profits by using its assets effectively and efficiently, unprofitable flight routes may be closed.

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About the Authors

Eva Sriwiyanti (E.S.) is a lecturer at Department of Accounting, Universitas Simalungun, Pematangsiantar. Her research interests cover manegerial accounting, public sector accounting, taxation; email address: eva.sriwiyanti@yahoo.co.id

Djuli Sjafei Purba (D.S.P.) is a lecturer at Department of Accounting, Universitas Simalungun, Pematangsiantar. His research interests cover auditing, fraud mitigation, public sector accounting; email address: djulipurba484@gmail.com

Dendi Wahyudi (D.W.), is a student at Department of Accounting, Universitas Simalungun, Pematangsiantar. email address: dendiwahyudi0611@gmail.com

Wico Jontarudi Tarigan (W.J.T.), is a lecturer at Department of Accounting, Universitas Simalungun, Pematangsiantar. His research interests cover Behavioral in Investment and Finance, auditing, public accounting; email address: ico180285@gmail.com

Resna Napitu (R.N.) is a lecturer at Department of Management, Universitas Simalungun, Pematangsiantar. Her research interests cover marketing, organizational behavior; email address: resnanapitu@gmail.com

Author(s) Contributions

Conceptualisation, E.S., D.W.; Methodology, E.S., D.S.P. ; Investigation, D.W., D.S.P.; Analysis, E.S., D.W.; Original draft preparation, E.S.; Review and editing, E.S., W.J.T.; Visualization, E.S.; Project administration, R.N.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.