FINANCIAL PERFORMANCE ANALYSIS, EVALUATION, AND FINANCIAL HEALTHINESS OF PT GARUDA INDONESIA TBK (GIAA) BEFORE AND DURING COVID IN THE 2016-2023 PERIOD

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THESIS

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A THESIS

Submitted in a partial fulfillment of the requirements for the degree of Master of Business Administration

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We hereby declare that this Thesis is from student's work, has been read and presented to IPMI Institute Board of Examiners, and has been accepted as part of the requirements needed to obtain a Master of Business Administration Degree and has been found to be satisfactory.

Jakarta, ... 2024

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I am pleased to be the advisor of this thesis, and I certify that the students have faithfully achieved the requirements as specified in the *Guideline for the Preparation of Thesis 2023.*

NON-PLAGIARISM DECLARATION FORM

This Thesis is a presentation of our research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature and acknowledgement of collaborative research and discussions.

Also, this work is being submitted in partial fulfilment of the requirements for the Master of Business Administration degree, has not previously been accepted in substance for any degree, and is not being concurrently submitted in candidature for any degree.

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ABSTRACT

The COVID-19 pandemic has affected every sector in the world, particularly the economy. One sector that is closely related to tourism is the transportation sector. In Indonesia, the biggest air transport that has been affected by the pandemic is Garuda Indonesia. Garuda Indonesia flew 10.81 million passengers, down 66.11% in 2020 compared to 31.89 million passengers in 2019. This study aimed to measure and analyze PT Garuda Indonesia Tbk's (GIAA) financial performance and financial health before and during the COVID-19 pandemic. A quantitative research methodology is employed in this study, which makes use of secondary data from 28 GIAA quarterly financial statements covering the years 2016–2023. Evaluating the company's financial health based on Altman Z-Score was also carried out in 2016 – 2023. The methodology for measuring and analyzing financial performance is based on eight financial ratios and a statistical one-tailed two-dependent samples test was applied to validate significance. Key financial ratios such as ROE, Total Asset Turnover Ratio, Cash Ratio, and Debt to Equity Ratio, Total Equity to Total Asset Ratio, and Current Ratio, showed marked declines, indicating severe financial distress. While ROA and Collection Period ratios did not exhibit differences, Altman Z-Score demonstrated that Garuda's financial health was notably better before the pandemic. The Altman Z-Score, reflecting overall financial stability, also worsened during the pandemic, with a significant drops. This analysis underscores the pandemic's severe impact on Garuda Indonesia's financial stability.

Keywords: Airline Company; Altman Z-Score, Financial Performance, COVID-19

CHAPTER 1 : INTRODUCTION

1. 1 Background Research

According to WHO data, the current COVID-19 pandemic started in Wuhan, China, with the first recorded case on December 31, 2019. Following this, on January 30, 2020, the World Health Organization declared a global health emergency due to the virus's spread, turning the COVID-19 epidemic into a pandemic (Rababah, et al., 2020). This virus is spreading the planet pretty quickly, the first two COVID-19 cases in Indonesia were revealed by President Joko Widodo on March 2, 2020 (Daryanto, et al., 2021). All of Indonesia's provinces have reported confirmed cases, and the government of that country declared the COVID-19 outbreak a "national disaster" in April and started implementing countermeasures to lessen the pandemic's effects.

The COVID-19 pandemic has affected every sector in the world, particularly the economy. Significant economic effects are already evident as a result of decreased production, fatalities, company closures, disruptions to commerce, and a decline in the tourism sector (Pak, et al., 2020). Businesses, community centers, schools, and Non-Governmental Organizations (NGOs) have been asked to cease operations as part of social distancing; mass gatherings have been outlawed; and lockdown measures have been implemented in numerous countries to lessen or halt the exponential increase in the number of new COVID-19 cases that occur every day, thereby easing the burden on medical services (Tambunan, 2021).

The global gross domestic product (GDP) decreased by 3.4 percent in 2020. In 2020, the global GDP was estimated to be worth 84.9 trillion dollars. This means that a just 3.4 percent decline in economic growth translates into an economic output loss of almost two trillion dollars (Dyvik, 2024). Table 1.1 provides information on the COVID-19 pandemic's economic effects in the East Asia and Pacific area. It shows the anticipated real GDP growth (adjusted for inflation) for a number of nations between 2017 and 2021. With noticeably reduced GDP expectations for 2020 and 2021, most countries see a considerable slowdown in comparison to pre-pandemic forecasts released in January 2020. All of the region's

economies are affected by the epidemic, but the intensity varies, with smaller nations like Fiji suffering a more severe fall than China (World Bank, 2020).

Table 1. 1 East Asia and Pacific Country Forecasts

						Percentage point differences from January 2020 projections	
	2017	2018	2019e	2020f	2021f	2020f	2021f
Cambodia	7.0	7.5	7.1	-1.0	6.0	-7.8	-0.8
China	6.8	6.6	6.1	1.0	6.9	-4.9	1.1
Fiji	5.4	3.5	1.0	-4.3	1.9	-6.0	-1.0
Indonesia	5.1	5.2	5.0	0.0	4.8	-5.1	-0.4
Lao PDR	6.9	6.3	4.7	1.0	4.6	-4.8	-1.1
Malaysia	5.7	4.7	4.3	-3.1	6.9	-7.6	2.4
Mongolia	5.3	6.9	4.8	-0.5	4.9	-6.0	-0.3
Myanmar	6.2	6.8	6.3	1.5	6.0	-5.2	-0.8
Papua New Guinea	3.5	-0.8	6.0	-1.3	3.4	-4.2	0.5
Philippines	6.9	6.3	6.0	-1.9	6.2	-8.0	0.0
Solomon Islands	3.7	3.9	2.7	-6.7	-0.3	-9.5	-3.1
Thailand	4.1	4.2	2.4	-5.0	4.1	-7.7	1.3
Timor-Leste	-3.8	-0.8	3.4	-4.8	3.8	-9.4	-1.1
Vietnam	6.8	7.1	7.0	2.8	6.8	-3.7	0.3

Source : (World Bank, 2020)

Based on **Table 1.1**, before 2020, Indonesia's GDP grew steadily between 2017 and 2019 at a rate of about 5%. The epidemic affected all of the region's economies in 2020, bringing a brief downturn in the economy (World Bank, 2020). Large-scale social restrictions (PSBB) contributed to Indonesia's economic downturn by hindering several industries, including the travel and tourist sector (Restikadewi, et al., 2021). In many cities, regions, and countries, tourism is a critical component of the national GDP. The tourist and leisure industry contributes significantly to economic activity and customer happiness, but it has also become the most vulnerable industry member (Abbas, et al., 2021).

According to the UNWTO World Tourism Barometer (2021), in 2020, international tourist arrival statistics decreased by around 74 percent, namely from 1.5 billion in 2019 to around 381 million in 2020. Losses resulting from this decline in tourist arrivals reached around 1.3 trillion USD in international tourism expenditure. Losses due to the COVID-19 pandemic are equivalent to 11 times the losses due to the global crisis in 2009.

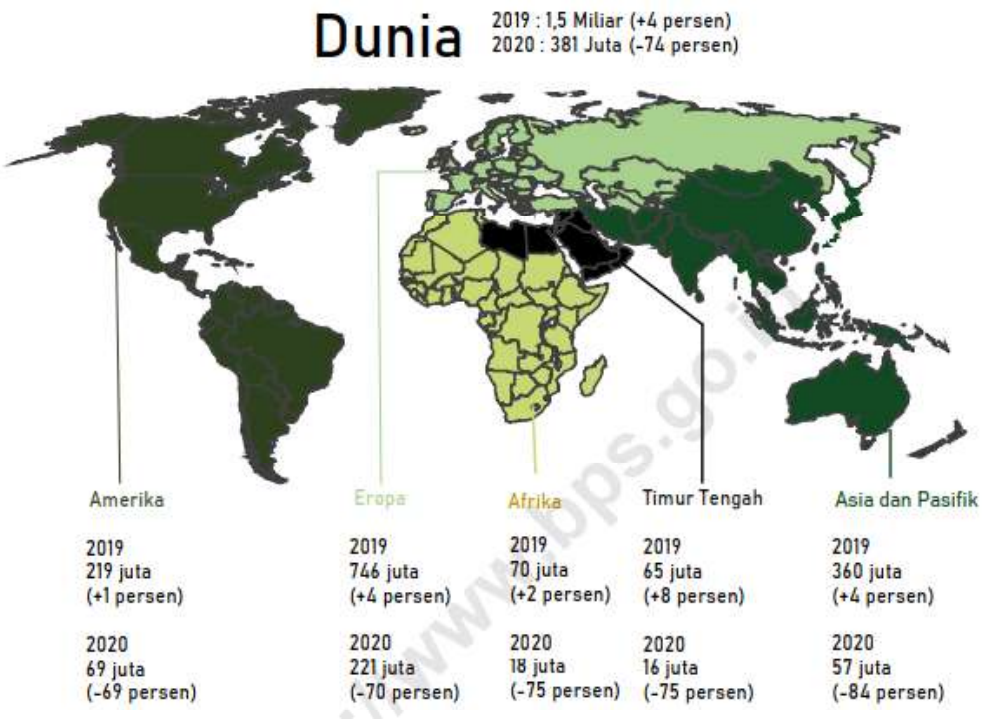

Figure 1. 1 International Tourist Visits in 2019 and 2020

Source : (BPS, 2021)

Based on **Figure 1.1**, it can be seen that the tourism sector in all parts of the world in 2020 was greatly impacted by the COVID-19 pandemic, countries in Asia and the Pacific experienced the strongest blow during this period, with a decline in international arrivals of 84 percent (BPS, 2021). One sector that is closely related to tourism is the transportation sector. Transportation is crucial for business and economic growth. The air transport sector serves individuals (passengers) and businesses (cargo). Air transport services have boosted business opportunities in hospitality, tourism, import/export, and online shopping (Aman & Altass, 2021). According to research, in 2004, as many as 40% of international tourists traveled by air, and 40% of transportation of goods or logistics contributed to both international and regional exports (Ratnawati, 2021).

This sector has also suffered a severe blow due to the COVID-19 pandemic. The International Civil Aviation Organization (ICAO) stated that aviation has been at its worst moment in history with the collapse of global air travel demand for air travel globally (BPS, 2021). Based on **Figure 1.2**, total passengers in 2020 dropped

by 60 percent due to the impact of the COVID-19 pandemic, from 4.5 billion in 2019 to 2.7 billion in 2020. As a result of the decline in air traffic, financial losses in airlines is estimated at USD 370 billion, with the largest losses in Asia/Pacific at 32 percent, followed by Europe (27 percent) and North America (24 percent) (BPS, 2021).

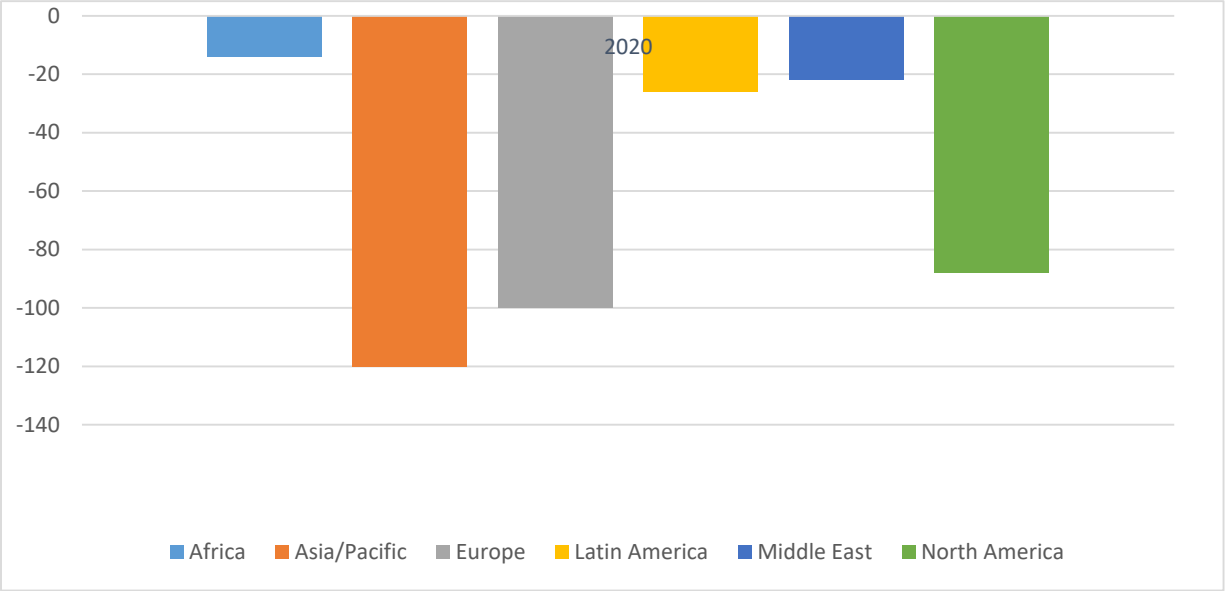

Figure 1. 2 Global Airline Revenue Losses (Million USD)

Source : (BPS, 2021)

The aviation industry in Indonesia has also experienced a significant decline in the COVID-19 pandemic. Based on **Figure 1.3** and **Figure 1.4** in 2020, the number of of air transportation passengers for international flights at the three main airports (Soekarno-Hatta, Ngurah Rai, and Juanda Airports) experienced a decline of more than 80 percent (y-on-y). As for domestic flights, the decline in the number of passengers at the three main airports reached more than 55 percent (y-on-y) (BPS, 2021).

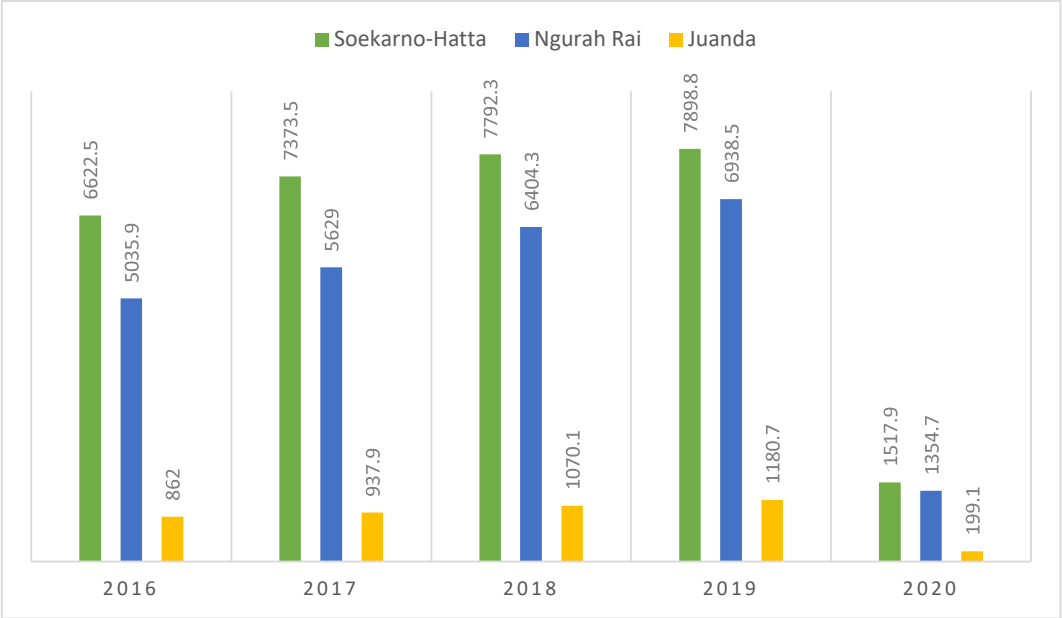

Figure 1. 3 Number of International Flight Air Transportation Passengers at Three Main Airports in Indonesia, 2016 - 2020 (Thousand People)

Source : (BPS, 2021)

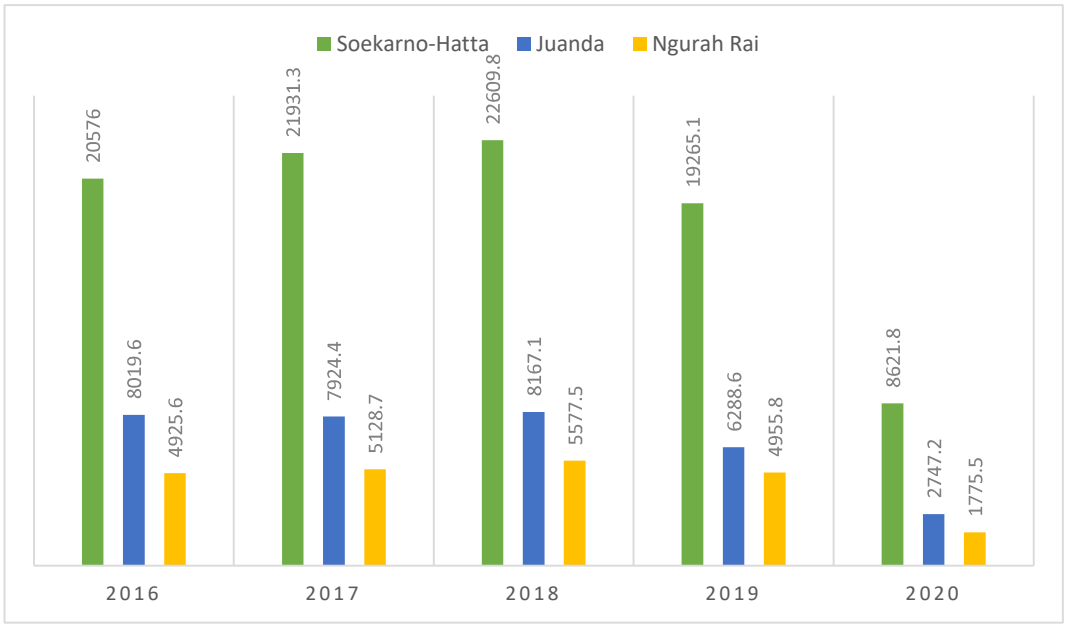

Figure 1. 4 Number of Domestic Flight Air Transportation Passengers at Three Main Airports in Indonesia, 2016 - 2020 (Thousand People)

Source : (BPS, 2021)

The decline in the number of passengers that occurred at several airports in Indonesia is related to the decline in the number of passengers using air transportation. Indonesia has several airlines operating domestically and

internationally, such as Garuda Indonesia, Air Asia, Batik Air, Lion Air, Citilink, Pelita Air, Sriwijaya Air, etc. Chairman of the Indonesia National Air Carrier Association (INACA), Denon Prawiraatmadja also stated that there was a drastic decrease in the number of airplane passengers as a result of the Covid-19 pandemic.

Table 1.2 Net Profit Growth of Aviation Companies in 2018-2021

Year	CMPP	GIAA
2018	-907,025	-3,314,549
2019	-157,369	-619,533
2020	-2,754,590	-34,932,913
2021	-2,337,876	-23,844,160

Source : (Rachmawati & Maulana, 2023)

The companies listed in **Table 1.2** which are PT Garuda Indonesia Tbk (GIAA) and PT Air Asia Indonesia (CMPP) are airline companies listed on the IDX in 2020, the net profit of the two aviation sector companies experienced negative growth, in other words, the losses are getting bigger (Rachmawati & Maulana, 2023). The decrease in net profit was caused by a huge drop in revenue from the previous year but many unavoidable expenses, such as airport expenses, depreciation expenses and other fixed expenses (Rachmawati & Maulana, 2022). Negative net income is an indicator of a decline in company performance in terms of profitability due to increased costs and decreased sales (Nurhayati, et al., 2017).

1. 2 Company Profile

1. 2. 1 PT Garuda Indonesia Tbk (GIAA)

Garuda Indonesia, established in 1949, is a prominent airline in Indonesia. On December 21, 1949, further negotiations were held between the Indonesian government and KLM regarding the establishment of a national airline. President Soekarno chose and decided "Garuda Indonesian Airways" (GIA) as the name of this airline. In preparing the Indonesian air staff, KLM was willing to temporarily place its staff on duty and train the Indonesian air staff. For this reason, during this transition period, GIA's first Managing Director was a Dutchman, Dr. E. Konijneburg. The first GIA fleet was also a relic of KLM-IIB (GIA, 2020).

The firm is a 5-star airline that offers both domestic and international flights (for people and cargo). For more than half a century, this flag carrier was entirely state-owned until its initial public offering in 2011, when approximately 28% of its shares were offered to the public (Investments, 2024). The number of employees of the Company and its subsidiaries (collectively referred to as the "Group") as of December 31, 2020 and 2019 was 21,774 and 27,913 respectively (GIA, 2020).

The number of Garuda Indonesia destinations currently totals 15 international and 48 domestic, with the number of countries directly flown by Garuda Indonesia totaling 10 countries. In addition, the number of fleets owned by Garuda Indonesia currently totals 142 aircraft with an average age of 8.54 years. As well as the number of daily departures in 2020 reaching 199 flights per day and also received awards from Trip Advisor as Travelers Choice Major Airline Asia and The Best Airline in Indonesia, and was named one of the airlines with the best health and safety protocol standards in the world by Safe Travel Barometer (GIA, 2020).

Figure 1.1 Domestic Destinations of Garuda Indonesia

Source : GIA Annual Report, 2020

Garuda Indonesia, a well-known airline, strategically uses subsidiaries to strengthen its operations across multiple industries. These subsidiaries, including PT Aerowisata, PT Sabre Travel Network Indonesia, PT Garuda Maintenance Facility Aero Asia (GMFAA), PT Aero Systems Indonesia (ASYST), PT Citilink Indonesia, PT Gapura Angkasa, and Garuda Indonesia Holiday France, operate as separate legal entities under the parent company's umbrella (GIA, 2020). Despite their autonomy in day-to-day operations, they are nonetheless firmly under the direction and supervision of Garuda Indonesia. This decentralized structure seen in **Figure 1.6** allows each subsidiary to specialize in a particular area, thus improving efficiency and effectiveness.

Nama Name	Kegiatan Usaha Business Activities	Kepemilikan Saham Share Ownership	Tahun Pendirian Year of Incorporation	Status Operasi Operation Status	Jumlah Aset (USD) Total Assets (USD)	Domisili Domicile
PT Aero Wisata	Perhotelan, Jasa Boga dan Penjualan Tiket Hospitality, Catering and Ticket Sales	99,99%	1973	Beroperasi Operating	125.536.687	Indonesia
PT Sabre Travel Network Indonesia	Penyedia jasa sistem Komputerisasi reservasi System Service Providers Computerized Reservation	95,00%	1996	Beroperasi Operating	10.587.882	Indonesia
PT Garuda Maintenance Facility Aero Asia Tbk	Perbaikan dan Pemeliharaan Pesawat Aircraft Repair and Maintenance	89,99%	2002	Beroperasi Operating	520.855.088	Indonesia
PT Aero Systems Indonesia	Penyedia Jasa Teknologi Informasi Information Technology Services	99,99%	2005	Beroperasi Operating	9.160.279	Indonesia
PT Citilink Indonesia	Angkutan Udara Niaga Commercial Air Transport	99,99%	2012	Beroperasi Operating	2.448.118.522	Indonesia
Garuda Indonesia Holiday France	Biro Perjalanan Wisata, Penjualan Tiket, dan Jasa Penyewaan Pesawat Travel Agency, Ticket Sales, and Aircraft Rental Services	100,00%	2014	Beroperasi Operating	5.053.234.770	Prancis

Figure 1. 2 Garuda Indonesia and Its Subsidiaries

Source : GIA Annual Report, 2020

Garuda Indonesia's vision is to become a sustainable aviation group by connecting Indonesia and beyond while delivering Indonesian hospitality (GIA, 2020). This vision underlines the company's long-term objective of not only leading

the aviation sector, but also ensuring that its growth and operations are founded on sustainability principles, as well as serving as a global representation of Indonesian hospitality. Garuda Indonesia's mission is to strengthen its business fundamentals through strong revenue growth, implementation of cost leadership, organizational effectiveness, and reinforcement of group synergy while focusing on high standards of safety and customer-oriented services delivered by professional and passionate employees (GIA, 2020). This purpose demonstrates the company's dedication to attaining long-term growth, managing expenses economically, enhancing service quality, and keeping safety and customer pleasure as top objectives.

The year 2020 was a year full of challenges for the company because of the pandemic COVID-19. Garuda Indonesia flew 10.81 million passengers, down 66.11% compared to 31.89 million passengers in 2019 (GIA, 2020). Meanwhile, the amount of cargo in 2020 was 235.40 thousand tons, a decrease of 29.89% compared to 2019 of 335,764 tons. In 2020, Garuda Indonesia earned USD1.49 billion in operating sales, a 67.36% decline from USD4.57 billion in 2019 (GIA, 2020). The COVID-19 epidemic led to a drop in performance, although attempts have been made to boost interest in air travel, particularly in the domestic market, through the #becauseyoumatter campaign. In April 2020, Garuda Indonesia launched a campaign to enhance its New Normal services from pre-flight to post-flight using the Indonesian Hospitality concept. The campaign prioritizes passenger safety and comfort while adhering to COVID-19 protocols (GIA, 2020).

1. 3 Research Problem

The aviation industry had a huge influence by COVID-19 pandemic, including company like PT Garuda Indonesia Tbk (GIAA). The company is confronted with unprecedented challenges and uncertainties, necessitating the ability to maintain success in turbulent times. Due to a sharp decline in passenger traffic and cargo demand, Garuda Indonesia experienced a significant drop in revenue during COVID-19. It is critical to assess, analyze, and evaluate their financial performance and overall health in order to reduce risks and assure market sustainability. Shareholders, stakeholders, and investors must be informed about how the pandemic would affect Garuda Indonesia's financial performance and health.

An analysis of pre-pandemic (2016-2019) and during-pandemic (2020-2023) financial data will reveal the pandemic's impact on key financial metrics such as revenue, profitability, liquidity, and solvency. Furthermore, reviewing the steps adopted by Garuda Indonesia to manage the crisis will provide useful insights and recommendations for improving resilience and sustainability in the aviation industry.

1. 4 Research Questions

1. How is the financial performance condition of Garuda Indonesia before and during the COVID-19 pandemic in terms of profitability, liquidity, solvency, and activity ratio?
2. Are there any significant differences in the financial performance measures of Garuda Indonesia before and during the COVID-19 pandemic, especially in terms of liquidity, solvency, activity, and profitability?
3. How was the financial healthiness of the company before and during the COVID-19 pandemic?
4. Are there any significant differences in the financial healthiness measures of Garuda Indonesia before and during the COVID-19 pandemic?

1. 5 Research Objectives

1. To analyze and evaluate the financial performance condition of Garuda Indonesia before and during COVID-19.
2. To identify and analyze any significant differences in Garuda Indonesia's financial performance measures before and during the COVID-19 pandemic.
3. To assess Garuda Indonesia's financial health before and during the COVID-19 pandemic.
4. To identify and analyze any significant differences in Garuda Indonesia's financial healthiness measures before and during the COVID-19 pandemic.

1. 6 Scope and Limitation of Study

This research aims to provide a comprehensive financial performance analysis of the aviation company, Garuda Indonesia (GIAA), based on financial ratio analysis and evaluation of financial health using the Altman Z-Score. The

study will focus on assessing the financial performance and health condition of GIAA. The variables used in this study will primarily be financial ratios, which include profitability, liquidity, activity, and solvency ratios for GIAA. These ratios will be calculated and examined to fully understand the company's financial performance over 28 quarters from 2016 to 2023.

Furthermore, the Altman Z-Score approach will be used to assess GIAA's financial health. This method will evaluate the company's financial stability and bankruptcy risk between 2016 and 2023. The study focusing on Garuda Indonesia (GIAA) within the aviation sector encounters several limitations. Firstly, the study focuses just on these organizations, which may limit the findings' applicability to the larger aviation sector landscape. Moreover, the analysis is limited to the period 2016–2023, with a particular emphasis on quarterly financial statements. The COVID-19 pandemic, which began in the first quarter of 2020, acts as a cutoff point for paired t-Test statistics, perhaps neglecting the pandemic's long-term financial repercussions.

Moreover, the study's financial ratio measurements, which include liquidity, solvency, activity, and profitability, may leave out other critical indicators required for a complete knowledge of financial performance. In the end, the study's sampling data for measuring financial healthiness is limited to the last eight years, with quarterly reports spanning 2016 to 2023, thus restricting insights into long-term trends or cyclical patterns in the aviation sector. Despite these constraints, the study intends to provide useful insights into the financial dynamics of GIAA, allowing stakeholders to make educated decisions in the aviation industry.

1. 7 Research Gap and Novelty

Numerous studies have been performed to assess the effects of COVID-19 on businesses in **Table 1.3** , particularly airline companies, and their customer base. The novelty of this study lies in its detailed examination of financial parameters such as liquidity, solvency, activity, and profitability. By focusing on these critical factors and employing the Altman Z-Score method for financial health evaluation, this study provides a new methodology for assessing Garuda Indonesia's (GIAA) financial performance and stability. Additionally, this study introduces the use of

the t-Test to statistically in financial performance and Altman Z-Score before and during COVID-19, further enhancing the robustness and validity of the findings.

Table 1. 3 List of Previous Related Research

Author	Title of Research	Methodology	Results
Rachmawati, D & Maulana, A.D (2023)	Financial distress condition of Indonesian aviation sector companies before and during the Covid-19 pandemic	1. The study utilized quantitative financial statements from four airline firms listed on the IDX between 2018 and 2021. 2. A two-way ANOVA test was performed on the data using Minitab 20 software.	Altman, Grover, and Springate models reveal CMPP, GIAA, and IATA consistently face disruptions for at least four years, while HELI experienced health issues in 2018 and 2019.
Handayani, D. P (2022)	Comparison of Company's Financial Performance Before and During The Covid-19 Pandemic for Land and Air Transportation Service Companies in IDX	The data analysis utilized descriptive statistics, a Kolmogorov-Smirnov test for normality, a paired sample t-Test for difference, and a Wilcoxon Signed Rank for non-normal distribution.	Despite the Covid-19 pandemic, net profit margins, return on assets, and debt-to-equity ratios for ground and air transportation companies remained consistent in 2018-2019 and 2020-2021.
Daryanto, W.M, Rizki, M. I, & Mahardhika (2021)	Pre-and Post-COVID-19 condition, performance and future of the	The framework predicts the normalization of aviation industry capacity during COVID-19 recovery using ratio	The airline industry's performance was good before the COVID-19 pandemic, with an average annual tax

	airline industry: Evidence from accounting data	analysis and financial evaluation considering operational profit margin, net profit margin, ROIC, revenue trend, aircraft fleet, and tax contributions.	revenue of $118 billion and acceptable operational profit margins, net profits, and returns.
Daryanto, W.M, Rizki, M. I, & Mahardhika (2021)	Financial Performance Analysis Of Construction Company Before And During Covid-19 Pandemic In Indonesia	The study analyzes a company's financial performance before and during the COVID-19 pandemic using Altman Z-Score and data from quarterly financial statements from 2019 to 2020.	PT PP Properti's financial performance significantly deteriorated during the pandemic, falling from a grey zone in Q3 2019 to a weaker position, as per Altman Z-score.
Wulaningsih, D.U & Daryanto, W.M (2023)	Financial Distress Analysis for Garuda Indonesia Uses the Altman Z-Score Method in the 2018-2022 Period	The Altman Z-Score model is used to analyze a company's bankruptcy tendency using financial ratios from Garuda Indonesia reports.	Research indicates Garuda Indonesia may face potential bankruptcy due to financial difficulties, as evidenced by a Z-Score value below the cut-off point of >1.10.

1. 8 Research Benefits

1. Theoretical Benefits

The research helps improve financial theories by studying how well airlines are doing financially. Extensively examining airlines' financial health and the issues they confront, may improve existing financial theories and gain a deeper understanding of how money works in various sorts of enterprises.

By assessing financial statistics and employing tools such as the Altman Z-Score, the study supports the correctness of airline-specific financial models. This confirmation makes these models more reliable and valuable for decision-making and risk management in the airline industry.

2. Practical Benefits

Financial performance analysis provides key stakeholders, such as investors, management, and regulators, with useful information on the financial health of the companies. This data enables educated decisions about investment plans, operational improvements, and regulatory compliance.

GIAA can manage risks more effectively by recognizing areas of financial strength and weakness, such as liquidity, solvency, profitability, and activity. For example, if liquidity ratios suggest possible cash flow issues, management might take steps to increase cash reserves or gain access to finance.

CHAPTER 2: LITERATURE REVIEW

2. 1 Theoretical Framework

Numerous empirical research have examined financial ratios in various businesses worldwide. A firm's financial performance describes its financial situation throughout time, including both providing and distributing funds. This strategy is commonly used by companies to benchmark their performance against competitors (Daryanto C., 2019). Financial performance is one of the most important factors in a firm, both internally and externally. Financial statements are important indicators of a company's economic performance and future viability (Sari & Daryanto, 2021).

2. 1. 1 Financial Ratio Analysis

Ratio analysis analyzes and monitors a company's performance by calculating and understanding its financial ratios (Ross N. L., 2021). Financial ratios are calculated by dividing two accounting data. Financial ratios are used to assess a company's financial health and performance. This can provide insight into a company's health. This method evaluates management performance against specified targets over a given period. Management's ability to properly utilize corporate resources can also be evaluated (Aprilia & Daryanto, 2021). Financial statements are the primary source of data used for calculating a company's financial ratios. Gitman and Zutter (2015) state that financial statements indicate a company's financial health (performance).

Financial ratio analysis is important for administration, owners, staff, clients, providers, competitors, administrative offices, citizens, and loan specialists to assess a company's financial health and make decisions. Financial ratio analysis focuses on financial results that align with the proprietors' perspective (Daryanto, Widjaya, & Hakim, 2021). Financial ratios used to assess a company's performance include the liquidity ratio, solvency ratio, activity ratio, and profitability ratio.

2. 1. 1. 1 Profitability Ratio

Profitability ratios compare a company's earnings to its revenue, operational costs, balance sheet assets, and shareholder equity over a specific period (Daryanto, Maharani, & Wiradjaja, 2021). Profitability is crucial for a company's long-term

survival as it reflects future opportunities (Yusuf & Suratmadja, 2018). There are two types of profitability ratios: margin ratios and return ratios. Margin ratios assess a company's ability to convert sales income into profits, whereas return ratios assess a company's profitability for shareholders (Daryanto, Maharani, & Wiradjaja, 2021). The profitability ratios include Net Profit Margin (NPM), Gross Profit Margin (GPM), ROIC, ROA, and ROE. These ratios measure a company's profitability and financial performance (Coulon, 2020). In this study, the author used ROA and ROE.

1. **Return on Equity (ROE)** measures a company's capacity to make a return on equity investments. The ROE ratio indicates how much profit each dollar of common stockholders' equity generates (Ross, et al., 2012).

$$\textbf{ROE} = \frac{\text{Income after tax}}{\text{Shareholder's Equity}} \text{ x } 100\%$$

Formula 2.1 Return on Equity (ROE) (Daryanto, Maharani, & Wiradjaja, 2021)

2. **Return on Assets (ROA)** is the ratio of net income to total assets that assesses management's ability to maximize profits from available assets (Коршунова, et al., 2019). A higher ROA suggests improved performance, perhaps leading to more capital gains or dividends for shareholders (Atidhira & Yustina, 2017). It will encourage investors to put money into the company.

$$\textbf{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \text{ x } 100\%$$

Formula 2.2 Return on Assets (ROA) (Daryanto, Maharani, & Wiradjaja, 2021)

2. 1. 1. 2 Liquidity Ratio

Liquidity ratios, often known as "short-term solvency," measure a company's ability to make payments in the short term without experiencing financial difficulty. These ratios primarily measure current assets and liabilities (Ross, Westerfield, & Jordan, 2010). The liquidity ratio is the ratio of liquid assets to current obligations. The liquid ratio assesses liquidity more rigorously than the current ratio, as it excludes inventories and prepaid expenses from current assets (Bhunia, et al., 2012). Low or deteriorating liquidity is a common precursor to financial trouble

and insolvency, therefore these ratios might indicate potential cash flow issues and business collapse (Gitman & Zutter, 2015). The following are the most typical liquidity ratios. Liquidity ratios include cash ratio, acid test ratio, current ratio, working capital ratio, and times interest earned ratio. In this research, the author used the current ratio and cash ratio.

1. **Current Ratio** measures the company's ability to pay down short-term creditors with present assets (Ross, et al., 2012). The Current Ratio is a financial metric that measures a company's ability to meet its short-term liabilities with short-term assets. The calculation involves dividing current assets by current liabilities. A firm's current assets, including cash, receivables, and inventories, support its short-term operations (John, et al., 2021).

$$\textbf{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \text{ x } 100\%$$

Formula 2.3 Current Assets (Daryanto, Lazuardi, & Rachman, 2020)

2. **Cash Ratio** measures a company's capacity to meet current obligations using its cash and cash equivalents. It also serves as a warning for outstanding debts or unused cash (Daryanto, Leonard, & Wijaya, 2020).

$$\textbf{Cash Ratio} = \frac{\text{Cash+cash equivalents}}{\text{Current Liabilities}} \text{ x } 100\%$$

Formula 2.4 Cash Ratio (Daryanto, Leonard, & Wijaya, 2020)

2. 1. 1. 3 Solvency Ratio

Solvency ratios assess a company's financial leverage and capacity to satisfy obligations over time. As a result, they are sometimes referred to as leverage ratios. Solvency ratios and liquidity ratios both assess a company's capacity to meet obligations, but solvency ratios prioritize long-term sustainability over present liabilities (Ross, Westerfield, & Jordan, 2010). Solvency refers to a company's capacity to meet its obligations in the case of liquidation or sale. A firm may be considered bankrupt if its shareholders' equity becomes negative. This indicates that it owes more than it owns (Vernimmen & Quiry, 2005). Research reveals that a higher solvency ratio reduces the incidence of financial trouble, whereas a lower ratio increases the risk of bankruptcy (Coulon, 2020).

The most frequent solvency ratios are: Debt to Equity Ratio, Debt to Asset Ratio, Long Term Debt to Equity Ratio, and Total Equity to Total Asset Ratio.

Particularly in this study, the author used only Debt to Equity Ratio and Total Equity to Total Asset Ratio.

1. **Debt to Equity Ratio** compares a company's obligations to its equity. The calculation involves dividing a company's total liabilities by its entire equity. This ratio measures a company's debt-to-equity ratio. A higher debt-to-equity ratio indicates a corporation with more debt than equity, perhaps indicating increased financial risk. A lower debt-to-equity ratio indicates lesser financial risk (Daryanto, Lazuardi, & Rachman, 2020).

$$\textbf{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Shareholders' Equity}} \text{ x } 100\%$$

Formula 2.6 Debt to Equity Ratio (Daryanto, Leonard, & Wijaya, 2020)

2. **Total Equity to Total Assets Ratio** measures the proportion of a company's assets earned through equity share issuance versus debt. A lower ratio indicates a corporation has utilized more debt to pay for its assets. It also indicates the potential payout for shareholders if the company is liquidated. Companies with a ratio close to 100% have more assets financed with stock rather than debt (Kenton, 2020).

$$\textbf{Total Equity to Total Assets Ratio} = \frac{\text{Total Equity}}{\text{Total Assets}} \text{ x } 100\%$$

Formula 2.7 Total Equity to Total Assets Ratio (Daryanto, Leonard, & Wijaya, 2020)

2. 1. 1. 4 Activity Ratio

The Activity Ratio is a financial ratio that assesses a company's effective utilization of assets to overall sales (Ross N. L., 2021). It assesses how effectively a corporation manages its resources to maximize revenues. The activity ratio measures a company's ability to transform assets into sales or cash flow. This comprises inventory turnover ratios, accounts receivable turnover ratios, and total asset turnover ratios. These ratios offer insight into the company's operational efficiency, inventory management, and revenue creation skills (Spanò, 2019). In this study, the author used total asset turnover and collection periods.

1. **Total Assets Turnover** is a financial indicator that assesses a company's ability to generate revenue from its assets. The calculation involves dividing the

company's sales by its total assets. The ratio measures how effectively a company uses its assets to create revenue (Spanò, 2019).

$$\textbf{Total Asset Turnover} = \frac{\text{Net Sales}}{\text{Capital Employed}} \text{ x } 100\%$$

Formula 2.9 Total Assets Turnover (Mulia & Daryanto, 2021)

2. **Collection Periods** is the length of time it takes a company's accounts receivable (AR) to get payments from clients who owe it. Companies determine the Collection Periods to ensure they have enough money on hand to cover their debts (Ross N. L., 2021).

$$\textbf{Collection Periods} = \frac{\text{Account Receivables}}{\text{Sales}} \text{ x } 365$$

Formula 2.10 Collection Periods (Mulia & Daryanto, 2021)

2. 1. 2 Altman Z- Score

Z-Score is one of the multivariate analysis models first created and introduced by Edward Altman based on his research in 1968, which serves to assess and determine the tendency of corporate bankruptcy and can also be used as a measure of overall financial performance and a relatively reliable level of accuracy (Fau, 2021). The Z-score assesses a company's financial health by analyzing multiple indicators from balance sheets and corporate income statements (Panigrahi, 2019). The formula of Altman Z-Score will be explained in **Figure 2.1.**

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

X_1 = Working Capital/Total Assets

X_2 = Retained Earnings/Total Assets

X_3 = Earnings before Interest and Taxes/Total Assets

X_4 = Market Value of Equity/Book Value of Total Liabilities

X_5 = Sales/Total Assets

Z = Overall Index/Score

Figure 2.1 The Altman Z-Score Formula

Source : (Altman & Hotchkiss, 1993)

Altman and Hotchkiss (1993) found that a Z-Score of 2.9 or higher reflects a company's financial soundness. A score between 1.23 to 2.9 indicates the

company's financial performance is in the grey zone. A score of less than 1.23 indicates the company is in distress.

The Z-Score model is modified to exclude X5 sales/total assets to reduce the impact of industry-sensitive variables like asset turnover on the model's accuracy. The classification accuracy results match the revised (Z-Score) five-variable model (Altman & Hotchkiss, 1993). The updated Z-Score model is:

$$\text{Z-Score} = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

In this z-score formula, if the z-score value is below 0 then the company is in distressed condition. All of the coefficients for variables X_1 through X_4 differ from the original Z-Score model, as do the group means and cutoff scores. Altman and Hotchkiss (1993) argue that this model is better suited for non-manufacturers than the original Z-Score model.

2. 1. 2. 1 Working Capital/Total Assets (X1)

Working capital refers to net working capital. Net working capital is defined as the difference between a company's total assets and liabilities over a given period (Fau, 2021). Working capital is important to businesses because it demonstrates how effectively they manage their money. The company's status can be considered healthy if the difference between its short-term assets and debt is increasing. However, if the entire amount of debt exceeds the asset ceiling to the point that the nominal working capital is negative, the business is in distress.

2. 1. 2. 2 Retained Earnings/Total Assets (X2)

The company's retained earnings include both operational and non-operational activities. Although the corporation retains its income, this cash will still be needed in the future. Retained earnings can still be given to shareholders or used to expand the business in the future. Retained earnings might be used to settle debts, carry out operational tasks, or invest in the future growth of the company's business (Altman, 2017). When retained earnings are minimal, a company must seek additional funding, such as debt or cash from shareholders. Retained earnings reflect a company's ability to invest in business growth.

2. 1. 2. 3 Earning Before Interests and Taxes/ Total Assets (X3)

EBIT is a measure of a company's ability to earn income from its operations during a given year. It is calculated by subtracting the company's revenue from its expenses (such as overhead), but not deducting any tax liabilities or loan interest. EBIT indicates money available to repay creditors in the event of bankruptcy and is closely monitored, especially when the company incurs little depreciation or amortization (Joshi, 2015). This ratio shows a company's ability to produce revenue, maintain profitability, finance operations, and service debt.

2. 1. 2. 4 Market Value of Equity/Total Liabilities (X4)

This ratio assesses the company's ability to meet obligations based on the market value of its equity. The market value of equity, also known as market capitalization, is calculated by multiplying the current stock price by the number of outstanding shares. Total liabilities include both current and non-current obligations (Al-Sulaiti & Almwajeh, 2021).

2. 1. 3 The Inferential of Statistics

2. 1. 3. 1 Determine A Statistical Test

The method of statistical test depends on the study design, data structure, and scientific question that needs to be addressed. The question to be addressed and the null hypothesis must be formulated before the data is collected and the statistical test is applied. Before the study is carried out, the test and the degree of significance must be established in the protocol. Whether the test should be two-tailed or one-tailed must be decided.

The direction of the expected difference is uncertain if the test is two-tailed. The effectiveness of the new medication compared to a placebo, for example, may differ; this is unknown. It's unclear which way the difference could be. It is only appropriate to do a one-tailed test in situations where it is abundantly evident that the intervention should only have one possible outcome (Prel, et al., 2010).

The formulation of the question to be answered coincides with the definition of the result variable (endpoint). The choice of statistical test is determined by two factors:

1. The scale of measurement of the test variable (continuous, binary, categorical)
2. The type of study design (paired or unpaired)

According to the type of study design, there are often two treatments:

1. Paired samples. If every samples can receive findings under every experimental circumstance, the study design is paired (dependent). For instance, two measurements could be compared, or other attributes may be used to pair the two groups. Studies conducted on a single subject's arm or eye are typical instances of pairs. Pre- and post-treatment comparisons are prevalent in paired designs (Prel, et al., 2010).
2. Unpaired samples or independent samples are the condition where the subjects in both groups are independent of each other (persons in first group are different from those in second group). With an unpaired or independent study design, results for each patient are only available under a single set of conditions. The results of two (or more) groups are then compared. There may be differences in the sizes of the groups (Prel, et al., 2010).

Figure 2.2 illustrates the decision procedure for statistical test selection of continuous endpoint, as reported by Du Prel & Röhrig (2010).

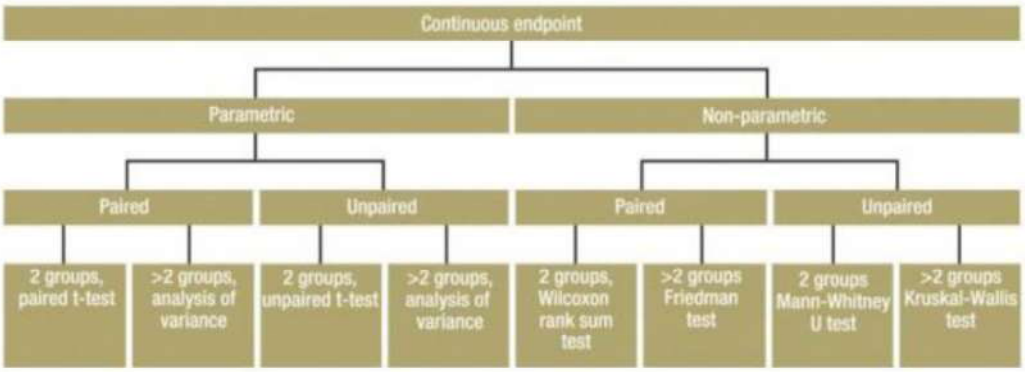

Figure 2.2 Decision algorithm for statistical test selection

Source : (Prel, et al., 2010)

The distribution of variables is a key factor in selecting the right statistical tests when assessing data from clinical trials and other research projects.

Normally distributed variables—parametric tests : If there is a normal distribution at the endpoint, parametric tests may be employed. A trial outcome value that is measured for every patient is called an endpoint. Continuous Endpoints, on the other hand, refer to endpoints that are quantified, such as changes in tumor size in clinical oncology research, blood pressure reduction, and walking distance within a specific amount of time. Binary (such as yes-or-no questions) and categorical (such as multiple category choices and Likert-type scale measurements) endpoints are the other types.

Non-normally distributed variables—non-parametric tests : Non-parametric statistical tests are performed if the parameter of interest is not normally distributed, but is at least scaled ordinally. One of these tests, known as the "rank test," is based on the rank numbers that are produced rather than the actual values. This means assigning a running number to each value and sorting them according to size. These rank numbers are then used to calculate the test variable. Parametric tests are more powerful than non-parametric tests if the required prerequisites are met. However, if the requirements are not met, parametric test power may substantially decrease.

2. 1. 3. 2 Assessing Normality of Distribution

Most statistical approaches need the assumption of normalcy to be evaluated. Assessing the normalcy assumption is crucial, and one of the best ways to demonstrate this is through parametric statistical analysis. A specific distribution of the data is assumed by parametric statistical analysis, typically the normal distribution. Validity and reliability of interpretation and inference may be compromised if the assumption of normalcy is broken. Thus, before beginning any pertinent statistical methods, it is crucial to verify this assumption (Razali & Wah, 2011).

The skewness and kurtosis coefficients are two examples of numerical approaches, whereas the normality test is a more formal procedure that determines whether a given set of data has a normal distribution. The literature contains a substantial number of normality tests. However, the Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling, and Lilliefors tests are the most widely used normality test procedures that may be found in statistical programs (like SPSS, for example).

The Shapiro-Wilk test is the most effective test for all distribution types and sample sizes, according by Razali & Wah (2011).

When assessing a distribution's form, statisticians have focused primarily on two factors: tail weight, or the percentage of data in the distribution's extreme tails, and the degree of skewness, or departure from symmetry. Statistics on skewness are intended to capture deviations from symmetry. The values of skewness would have been zero in the event if the distributions were fully symmetric. If a distribution or data set has the same appearance to the left and right of the center point, it is said to be symmetric (Mayers & Well, 2003).

Kurtosis is a metric used to determine how close the data are to a normal distribution and how heavy or light the tails are. This is because heavy tails, or outliers, are typically present in data sets with significant kurtosis. Low kurtosis data sets typically have light tails, or very few outliers. The worst-case scenario would be a uniform distribution. Any symmetric data should have a skewness close to zero since the skewness of a normal distribution is zero. Data that are skewed left are indicated by negative skewness values and slanted right by positive skewness values. The left tail is longer than the right tail when it is said to be tilted left. Similar to this, a right-skewed distribution indicates that the right tail is longer than the left. Skewness and kurtosis values between -2 and +2 are regarded as appropriate for demonstrating a normal univariate distribution (George & Mallery, 2010).

The Shapiro-Wilk test determines whether a random sample is representative of a normal distribution by calculating the W and W' statistics, respectively. W or W' values that are minimal imply a deviation from normality. It is only possible to compute the Shapiro-Wilk W statistic with a sample size of 3–5000 (inclusive) (Razali & Wah, 2011). The test's result, collectively with the P value, is reported as either "accept Normality" or "reject Normality." It can be considered that the data have a normal distribution if P is greater than 0.05. The hypothesis that the distribution of the observations in the sample is normal should be rejected if P is less than 0.05 (UOL, 2022).

2. 1. 4 Hypothesis Testing

Hypothesis testing determines the probability of an event occurring by chance. If the change did not cause an event, the treatment likely had an impact on the measured outcome (Allua & Thompson, 2009). Hypothesis testing distinguishes between two sorts of hypotheses: the null hypothesis, which is accepted without evidence, and the research hypothesis, which requires convincing evidence for acceptance. The decision rule in hypothesis testing determines which test statistic values will invalidate the null hypothesis and support the alternative hypothesis. Hypothesis testing gives a p-value, showing the level of surprise if the null hypothesis produced the data. In hypothesis testing, there are two sorts of errors: type I mistake, which involves incorrectly rejecting the null hypothesis, and type II error, which involves incorrectly accepting the research hypothesis (Siegel & Wagner, 2012).

Developing and testing hypotheses is an important aspect of statistical analysis. Typically, hypothesis testing involves four steps. First, define the null (H_0) and alternative research (H_a) hypotheses. The null hypothesis assumes no difference between treatment and control groups. The research hypothesis suggests that there is a difference between treatment and control groups (Allua & Thompson, 2009). The alternative hypothesis assumes the mean to be greater than, less than, or not equal to zero. A left-tailed test is used when the alternative hypothesis predicts a mean less than zero. H_a states that the mean is bigger than zero, indicating that it is right-tailed. The two-tailed test occurs when the mean is not equal to zero, as stated by H_a.

Compute a test statistic as the second step in the hypothesis testing process. The P value from the table of z-distributions, which is based on the normal distribution known as the bell curve, can be found based on the value of the test statistic. You will decide whether or not to reject the null hypothesis based on the p-value.

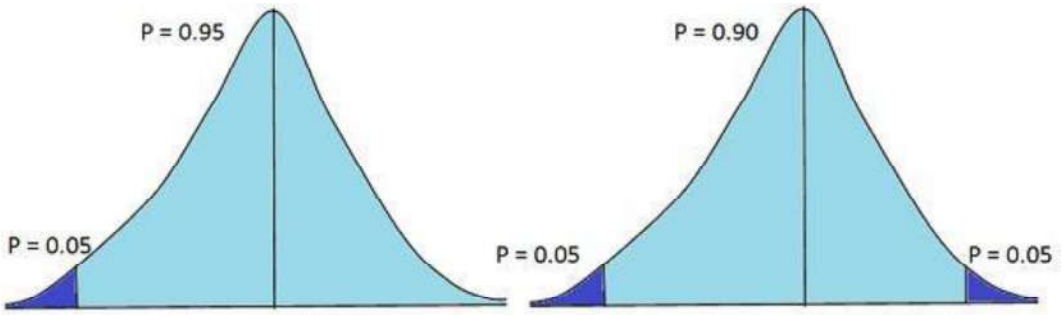

Figure 2.3 One-Tailed and Two-Tailed Test

Source: Mark and Workman (2003)

Based on Figure 2.3, the calculated P-value is compared with the significance level, α (alpha). The probability of making a Type I error determines the level of importance. Rejecting H_0 while it is true is a Type I mistake. A mistake is referred to be a Type II error if H_0 is accepted even though it is false. One less confidence level equals the alpha level. The area under the curve represents the confidence level. The confidence level typically has values of 0.90, 0.95, and 0.99. Having a confidence level of 0.95, it is the most often used of the three. This implies a 95% confidence level in the validity of the null hypothesis. Therefore, 0.05 (ranging from 1 to 0.95) is the generally used level of significance. Therefore, α set at 0.05 indicates a 5% probability of committing a Type I error (S & I, 2024).

According to Wilkerson (2008), the null hypothesis must be rejected if the p-value is less than or equal to α. If the p-value exceeds α, H_0 ought to be accepted. A statistical metric called the p-value is employed in hypothesis testing to ascertain whether or not the null hypothesis has to be rejected. It shows the likelihood that, under the null hypothesis, outcomes as extreme as those observed will occur. The test's results and the analysis's conclusions are explained in the final phase.

2. 1. 4. 1 t-Test for Dependent and Independent Samples

The t-Test is one of the most popular statistical techniques used to test whether the mean difference between two groups is statistically significant. The alternative hypothesis proposed that the two means are statistically distinct from one another rather than statistically equal, which is the null hypothesis. There are

three different kinds of t-Tests: paired samples, independent samples, and one sample (Mishra, et al., 2019).

The t-Test necessitates that observations come from a normally distributed population, and for the two-sample t-Test, it is required that both populations have equal variances. Traditional parametric tests should not be utilized with very small samples, because these tests are based on several strong assumptions that cannot be tested with tiny sample sizes (Mishra, et al., 2019). After estimating the sample sizes needed for two-group comparisons, Campbell et al. (1995) concluded that N = 5 per group would be appropriate if one is willing to tolerate extremely low statistical power.

The general formula for the t-statistic is as follows :

$$t = \frac{difference\ of\ means}{standard\ error}$$

Formula 2.11 t-Test formula (Ambrosius, 2007)

In which the numerator's standard error is the standard error. The t-distribution does not presume any knowledge of the true parameters, making it a "sampling" distribution. It's crucial to keep in mind that the t-distribution is a family of distributions, with each one being distinguished by a sample size-related parameter known as the degrees of freedom (df). The t distribution and the normal distribution are fairly similar, as **Figure 2.4** illustrates. The primary distinction is that the t-distribution has thicker tails than the normal distribution, indicating a higher likelihood of extreme values. The t-distribution resembles the normal distribution more and more as sample size and degrees of freedom rise.

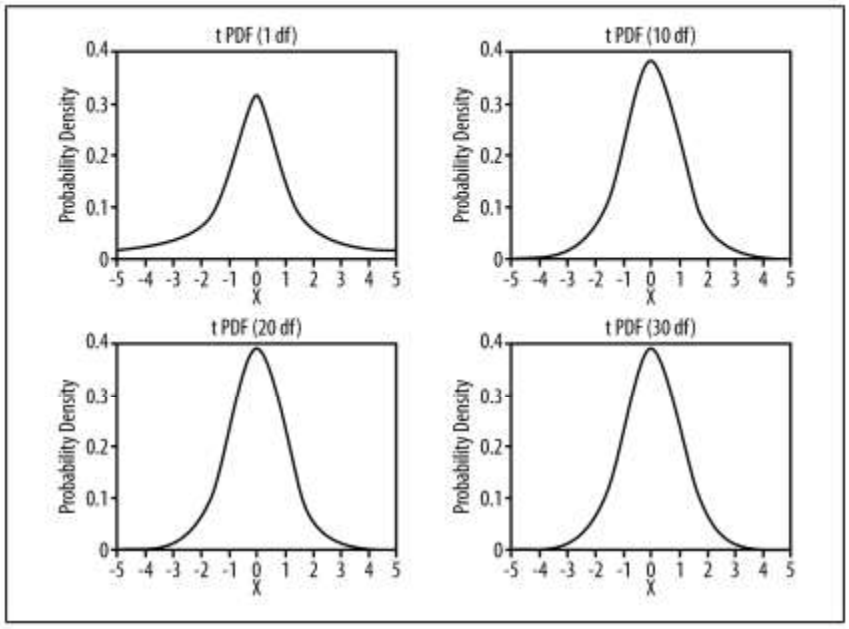

Figure 2.4 The t-distributions

Source: (Boslaugh, 2013)

2. 1. 4. 1. 1 The One-Sample t-Test

A statistical test called the one-sample t-Test is used to ascertain if a sample of data is representative of the population. It determines the ratio between the estimated value of a parameter's deviation from its predicted value and its standard error. The ratio of the standard error of the sample mean to the difference between the sample mean and the population mean is computed using the t-Test. The statistical significance of the difference is then ascertained by comparing this ratio, sometimes referred to as the t-statistic, with a critical value.

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

Formula 2.12 One-sample t-Test

Source: (Boslaugh, 2013)

The sample standard deviation is denoted by S. After that, the t-value that is generated can be compared to the crucial t-value can can be found in the t-distribution table for the necessary degree of significance and appropriate degrees of freedom (number of cases minus 1). The null hypothesis, or hypothesis of no

difference, should not be rejected if the computed t-value is smaller than the critical t-value and there is no discernible distinction between the sample mean and population mean.

On the other hand, the null hypothesis should be rejected and a significant difference in means should be noted if the estimated t-value is greater than the critical t-value. In the scenario when the population standard deviation is known, the normal curve statistic (z) is substituted for t in the formula above, and σ, the known value, for s. The measured significance of the z-statistic is then compared with the intended level using the normal distribution as a reference (Boslaugh, 2013).

To compute the t-value and ascertain significance, one can utilize a graphing calculator, an Excel spreadsheet, SPSS, or an alternative software application. The importance of the difference is indicated by the p-value, which may also be computed using these methods. The researcher may proclaim a significant difference (and reject the null hypothesis) if the p-value is less than the level of significance. Usually, a 0.05 level is applied. Remember that the chance that we could obtain an odd sample that, although abnormal and producing an extreme mean, actually comes from the distribution with the assumed mean m is 0.05. In 5% of the randomly selected samples from the population, this may occur (Boslaugh, 2013).

2. 1. 4. 1. 2 Independent t-Test

A statistical test used to compare the means of two groups is the independent t-Test, sometimes referred to as the student's t-Test. When comparing a single measured variable between two breakout groups, it is frequently employed. For each group, the data are intervals. The two standard deviations are assumed to be equal, but there is no assumption of a normal distribution (the t-Test will not produce meaningful findings with uneven sample sizes if the distribution of one or both groups is extremely uncommon). Even that assumption will not be true if the sample sizes are equal or extremely similar. The t-value's general formula can be expressed as follows:

$$t = \frac{\overline{X_1} - \overline{X_2}}{s_{\overline{X_1} - \overline{X_2}}}.$$

Formula 2.13 Independent t-Test (Boslaugh, 2013)

Using the following formula, equal sample sizes can be determined:

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Formula 2.14 Independent Sample t-Test with Same Sample Size (Boslaugh, 2013)

On the other hand, a pooled variance estimate is applied in cases where the sample sizes differ, yielding the following formula:

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Formula 2.15 Independent Sample t-Test with Different Sample Sizes (Boslaugh, 2013)

According to Ross and Wilson (2018), if the ratio of the bigger standard deviation to the smaller standard deviation is less than 2, it can be used as an acceptable rule of thumb to determine whether or not the standard deviations are equal. It won't matter if sample sizes are equal, but if they are not, there may be an issue with how to interpret the t-test if the smaller sample size has a higher standard deviation. In that instance, the significance level may differ significantly from your expectations; therefore, to overcome the requirement violation, the researcher should set the alpha level very low, perhaps as low as 0.001. Fortunately, it is possible to compute this t-value using a graphing calculator or software program.

2. 1. 4. 1. 3 Paired t-Test

Paired Samples are as follows: two sets of samples, no unpaired samples in either group and each set of samples in the first group is connected to exactly one

sample in the second group. The sample size, n, is the same for both groups. Pre- and post-intervention measurements on the same subject are the most typical forms of paired samples. We must first calculate the difference between each of the paired values to get the t-statistic (Ambrosius, 2007).

$D_i = x_{i1} - x_{i2}$

Following that, determine the differences' mean and standard deviation, or x_D and s_D. The distribution of the D_i is thought to be typical. If it is assumed that both groups originate from underlying normal distributions, then this is assured. Since the difference is often compared to zero, the alternative and null hypotheses are,

H0: $\delta = 0$, or $\mu 1 = \mu 2$

HA: $\delta \neq 0$, or $\mu 1 \neq \mu 2$

Where δ is the (unknown) true value of the mean difference.

When assessing the null hypothesis for the t-Test for two dependent samples, the following rules are applied. If the alternative hypothesis with a positive direction is used, the null hypothesis can be rejected if the absolute value of t that is achieved is higher than the critical one-tailed value that is given at the predetermined level of significance (Sheskin, 2003).

2. 1. 4. 2 Wilcoxon Matched-Pairs Signed-Ranks Test

The nonparametric Wilcoxon Matched-Pairs Signed Ranks Test is used for ordinal data or data that significantly deviates from any semblance of normal distribution. It is frequently thought of as being comparable to the paired t-Test for two dependent sample tests. Even though the Wilcoxon Matched-Pairs Signed Ranks Test and the Student's paired t-Test for Matched Pairs have comparable objectives, many would contend that comparing them is just too simple.

Both tests address group differences when there are two matched pairs. The Student's paired t-Test is typically used with interval data that rise to the level of parametric distributions (with attention to means), whereas the Wilcoxon Matched-Pairs Signed Ranks Test is frequently used with ordinal data and/or data that are viewed as being nonparametric (with attention to medians). Between gender-equivalent twins who received an otherwise-unidentified supplement during the

same treatment period as their gender-equivalent twin counterparts who not only experienced regular conditions but also saw regular field conditions, there is no statistically significant difference ($p <= 0.05$) in weight between the treatment group and the control group of ewes.

In this exploratory investigation, $p <= 0.05$ is used for the Null Hypothesis (H_0). In the biological sciences, it is usual for better-organized and strictly regulated investigations to employ a more restrictive p-level, such as $p <= 0.01$ or even $p <= 0.001$. However, it is reasonable to select $p <= 0.05$ as the qualifying p-value given the nature of this course and how it illustrates an exploratory study under field conditions. Then, more stringent p-values might make sense when there is replication and more controls.

2. 2 Hypothesis Development

2. 2. 1 Financial Performance of the Company

The implementation of measures to address the COVID-19 pandemic was expected to impact the financial performance of Garuda Indonesia significantly. The pandemic led to unprecedented disruptions in global travel, presenting both challenges and opportunities for the airline. The changes will unavoidably impact the company's finances and overall health. The significant changes between the before and after conditions will be assessed using the paired t-Test.

2. 2. 2 Financial Healthiness of the Company

Financial Distress is the state in which a business's finances aren't performing well. One of the first indicators of a company's approaching bankruptcy is financial distress (Fatmawati & Wahidahwati, 2017). Numerous factors, including a company's unfavorable financial situation, unfavorable economic conditions, or external circumstances like the COVID-19 outbreak, can result in financial difficulty (Seto, 2022).

Financial healthiness and financial distress are closely related. Companies with financial healthiness are less likely to experience financial distress. Conversely, companies with financial distress are more likely to have financial health issues. The Altman Z-score, a widely recognized tool for predicting corporate bankruptcy, quantifies this relationship by assessing a company's

financial health (Al-Sulaiti & Almwajeh, 2021). The Z-score combines five financial ratios, which include:

X1: Working Capital/ Total Assets

X2: Retained Earnings/ Total Assets

X3: Earning Before Interest and Tax/ Total Assets

X4: Market Value of Equity/ Total Liabilities

2. 3 Research Framework

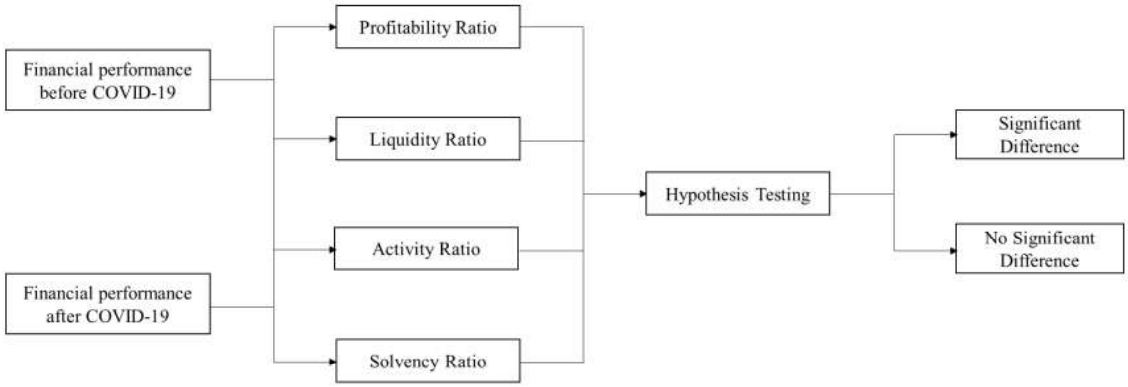

Figure 2.5 Research Model for Financial Performance

Source: (Daryanto & Meriana, 2019)

The research model based on **Figure 2.5** is adapted from research on financial performance analysis to compare the significant differences between a specific situation and another. In the same way that Daryanto and Nurfadilah (2018) looked at financial performance analysis prior to and during Indonesia's drop in oil production, Daryanto and Meriana's 2019 study investigated the financial performance analysis of state-owned businesses. In order to bring some innovation to the research, the author used the Altman Z-score model to analyze financial healthiness.

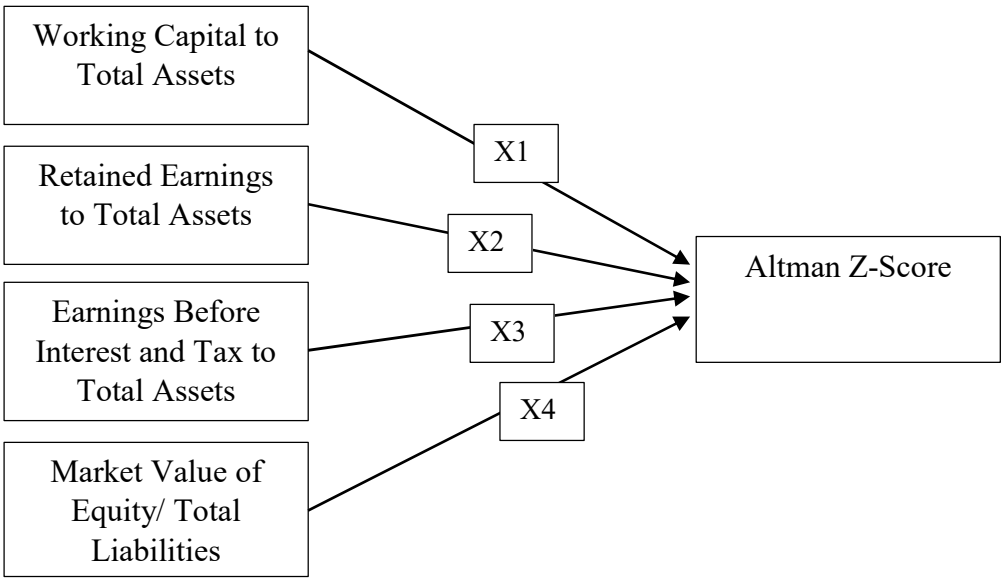

Figure 2.6 Altman Z-Score Research Framework

Source: (Altman, et al., 2017)

It considers four ratios to ascertain whether Garuda Indonesia has a good indicator of the Altman Z-score. It is possible to assess the company's level of good financial health for the years 2016 through 2023 using the Altman Z-score.

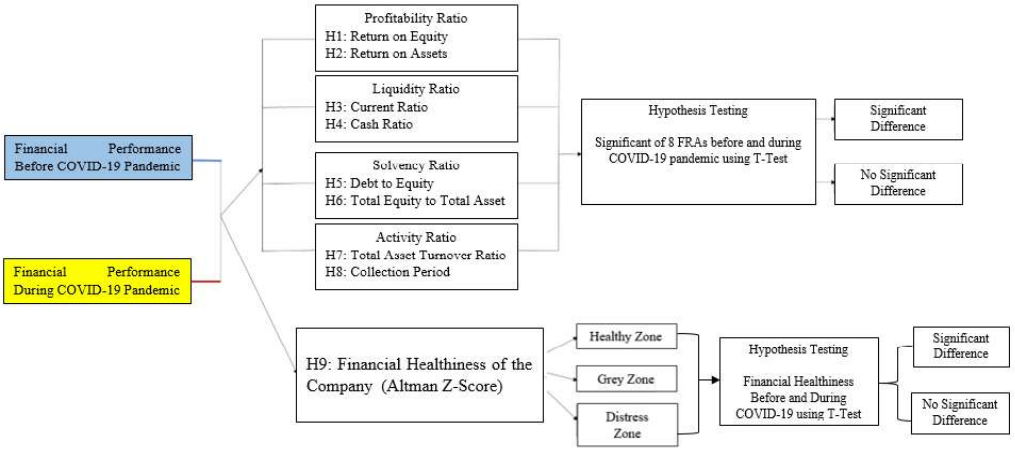

Figure 2.7 Research Framework (2024)

The research framework used in this study is depicted in **Figure 2.7**. The Altman Z Score, which measures financial healthiness, and financial performance comprises the two variables that comprise the study framework. Financial performance measures the company's profitability, activity, liquidity, and solvency ratios both before and after the COVID-19 pandemic. The significance of which

variable is superior will be determined using one-tailed (right tail) two-dependent samples test statistics. In addition, the ratios of working capital to total assets, retained earnings to total assets, earnings before interest and tax to total assets, market value of equity to total liabilities, and sales to total assets are used to evaluate financial health.

The financial data was gathered from GIAA's publicly available audited financial reports. The eight assumptions were then addressed by the financial ratio analysis using the data. Using the Altman Z-score indicators, the author then calculated the overall score to determine the company's financial health.

2. 3 Theoretical Hypothesis (H_a)

Therefore, the alternate hypotheses are as follows:

H_1: Return on Equity in Profitability Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_2: Return on Assets in Profitability Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_3: Current Ratio in Liquidity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_4: Cash Ratio in Liquidity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_5: Debt to Equity Ratio in Solvency Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_6: Total Equity to Total Assets Ratio in Solvency Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_7: Total Assets Turnover Ratio in Activity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_8: Collection Period in Activity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_9: The financial health of Garuda Indonesia before COVID-19 is better than during the COVID-19 pandemic.

CHAPTER 3 : RESEARCH METHODOLOGY

3. 1 Research Design

The financial performance of Garuda Indonesia both before and during the COVID-19 pandemic will be examined in this quantitative analysis. Financial ratios will make use of eight indicators that are based on Gitman and Zutter (2015) and the Altman Z-score, which measures the company's financial health. Through the use of various statistical research methodologies, quantitative analysis aims to examine the hypotheses put forward in this study and determine the significance of differences in whether one variable is better than another. Quantitative research enhances a study's validity by utilizing statistical techniques to measure findings conclusively (MSU, 2023).

This research design aims to give the study's framework for addressing the research questions, conducting an analysis, and ultimately developing study results in answer to the research problem. The entire research design process is depicted in **Figure 3.1**, beginning with the selection of the research topic, followed by the definition of the problem, literature review, research question and objectives, research methodology, research framework, data collection and statistical approach, the data analysis, conclusion, and recommendation.

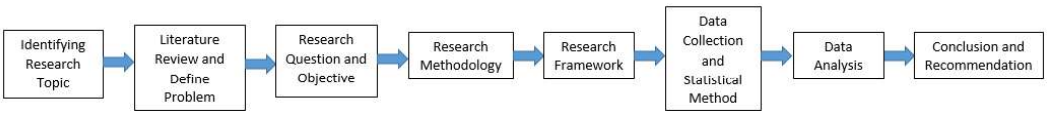

Figure 3. 1 Research Design

Source: (Author, 2024)

3. 2 Data Collection

The secondary data used in this study came from Garuda Indonesia's audited financial statements that were posted on the Indonesia Stock Exchange (IDX) and the company's official website. The resource can be accessed resources at https://web.garuda-indonesia.com/ and www.idx.co.id. The data type used is quantitative data presented in the form of numbers.

The first quarter financial report of 2020 will be utilized as the cut-off time (COVID-19 stated as a pandemic), as shown in **Table 3.1**. GIAA has 28 quarterly

financial statements from the third quarter of 2016 to the third quarter of 2023 for financial performance assessment and analysis. The GIAA quarterly financial statements for the Q2 2016 to Q4 2023 will be collected to assess the company's health using the Altman Z-Score, which is displayed in **Table 3.2.**

Table 3.1 Financial Statements Data for Financial Performance

FINANCIAL STATEMENTS FOR FINANCIAL PERFORMANCE							
2016	2017	2018	2019	2020	2021	2022	2023
	Q1	Q1	Q1	Q1	Q1	Q1	Q1
	Q2	Q2	Q2	Q2	Q2	Q2	Q2
Q3	Q3	Q3	Q3	Q3	Q3	Q3	Q3
Q4	Q4	Q4	Q4	Q4	Q4	Q4	

Before COVID-19 Pandemic
Cut-Off (COVID-19 Pandemic)
During COVID-19 Pandemic

Table 3.2 Financial Statements Data for Financial Healthiness

ALTMAN Z-SCORE ANALYSIS							
2016	2017	2018	2019	2020	2021	2022	2023
	Q1	Q1	Q1	Q1	Q1	Q1	Q1
Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2
Q3	Q3	Q3	Q3	Q3	Q3	Q3	Q3
Q4	Q4	Q4	Q4	Q4	Q4	Q4	Q4

Before COVID-19 Pandemic
Cut-Off (COVID-19 Pandemic)
During COVID-19 Pandemic

3. 3 Research Procedure

The purpose of this study is to assess GIAA's financial performance before and during the COVID-19 pandemic and its financial health. To evaluate the company's financial performance using financial ratios that will be assessed based on their quarterly financial statements for the years 2016 through 2023, the research approach will employ statistical techniques. Additionally, the Altman Z-score will

be used in this study to determine the health of the companies overall. The research's analysis, which is depicted in **Figure 3.3**, will be divided into two key phases: evaluating the company's financial health and assessing and analyzing its financial performance.

In order to measure financial ratios, 28 quarterly financial statements will be collected. After that, all necessary data will be acquired to understand the situation better and begin the distribution normality test using Saphiro-Wilk. A hypothesis test model right-tailed two-dependent samples test will then be run to see whether one variable was significantly better before the COVID-19 pandemic than it was during. An additional measure involves assessing the company's financial healthiness using the Altman Z-score computation for the eight-year annual report period from Q2 2016 to Q4 2023.

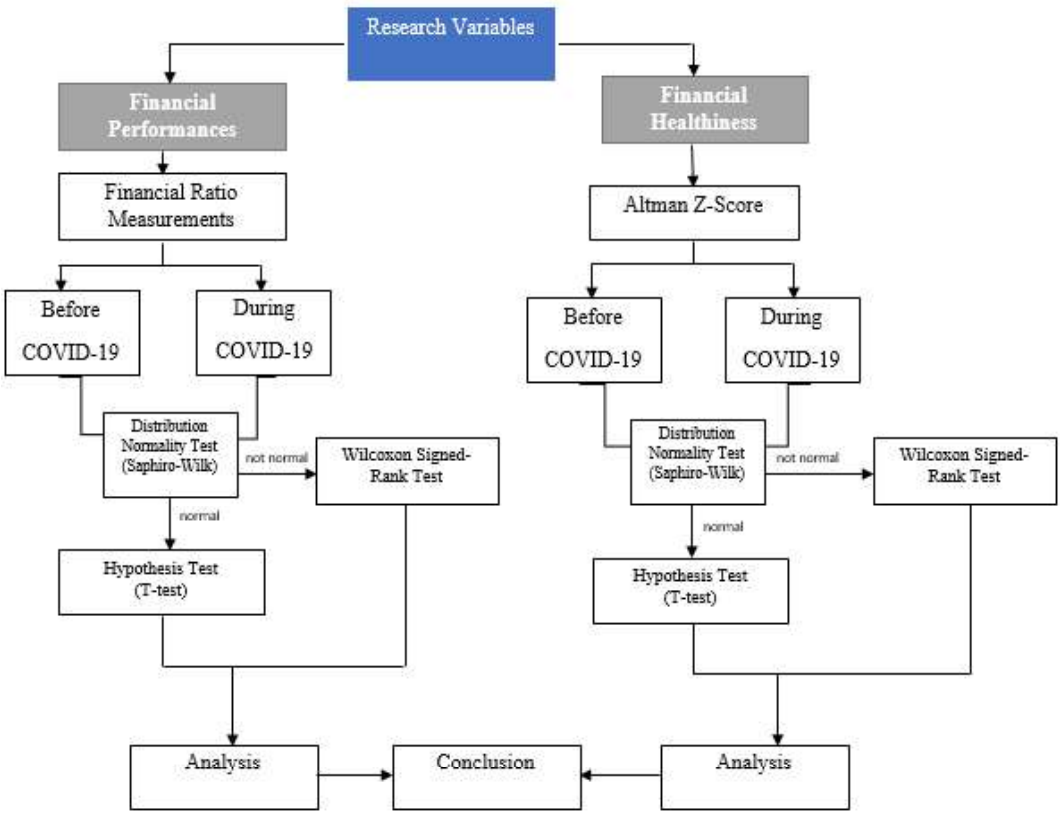

Figure 3.2 Research Procedure

3. 4 Distribution Normality Test

In statistics and data analysis, normality tests are crucial for evaluating the distribution of data and establishing if it has a normal distribution. For data samples with up to 50 individuals, the Shapiro-Wilk test is advised; for samples with more than 50 values, the D'Agostino & Pearson omnibus normality test should be used (Manik, et al., 2023). The Shapiro-Wilk test was applied by the author. The author made the computation easier by using SPSS software. Criteria to interpret the assessment result Shapiro-Wilk test; Referred to the hypothesis below ($\alpha = 0.05$):

H_0 = data are normally distributed.

H_a = data are not normally distributed.

If the p-value is less than 0.05, then H_0 is rejected, indicating that the samples are not normally distributed.

3. 5 Hypothesis Test

1. 5. 1 Two Dependent Samples Test

One of the most widely used statistical techniques to determine if a difference between two variables from the same cases or group at two separate times is statistically significant is the two-dependent samples test. For a one-tailed (right tail) distribution, the alternative hypothesis proposed that the means are statistically greater than zero, whereas the null hypothesis claimed that the means are statistically less or equal to zero. In the study, the author may check whether the statistical computation fails to conclude that the alternative hypothesis is accepted; in other words, there is statistically one variable greater than another variable for the same group (Sheskin, 2003). To determine if the data in this study are normally distributed or not, two dependent sample tests will be used: the Wilcoxon test and the Paired Sample T-Test.

A paired-sample t-Test compares the means of two matched groups of individuals or cases, or it compares the means of one group that is analyzed twice (Ross & Willson, 2018). The nonparametric Wilcoxon Matched-Pairs Signed Ranks Test is used for ordinal data or data that significantly deviates from any kind

of normal distribution. It is frequently thought of as being comparable to the Student's paired t-Test for two dependent sample tests. While the Student's paired t-Test is typically used with interval data that approach the level of parametric distributions (with attention to means), the Wilcoxon Matched-Pairs Signed Ranks Test is frequently used with ordinal data and/or data that are considered to be nonparametric (with attention to medians) (Mishra, et al, 2019).

The following presents the hypothesis analysis for the Wilcoxon matched-pairs signed ranks test or the one-tailed (right-tail) Paired t-Test:

$H_0 = \delta \leq 0$, or $\mu_2 \leq. \mu_1$

$H_a = \delta > 0$, or $\mu_2 > \mu_1$

Criteria that will be used to measure the hypothesis of this study:

- If $p < 0.05$, H_0 is rejected, which means financial ratios during COVID-19 before the pandemic were better than during the pandemic.
- If $p > 0.05$, H_0 is accepted, which means financial ratios before COVID-19 pandemic were worse than or equal to during the pandemic.

There are eight hypotheses (H1 to H8) examined by this method: whether financial ratios of ROE, ROA, current ratio, cash ratio, debt to equity, total equity to total assets, total assets turnover, collection period before COVID-19 pandemic better than during the pandemic.

The hypothesis is described as follows:

H_1: Return on Equity in Profitability Ratio before COVID-19 is better than during the COVID-19 pandemic.
H_2: Return on Assets in Profitability Ratio before COVID-19 is better than during the COVID-19 pandemic.
H_3: Current Ratio in Liquidity Ratio before COVID-19 is better than during the COVID-19 pandemic.
H_4: Cash Ratio in Liquidity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_5: Debt to Equity Ratio in Solvency Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_6: Total Equity to Total Assets Ratio in Solvency Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_7: Total Assets Turnover Ratio in Activity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_8: Collection Period in Activity Ratio before COVID-19 is better than during the COVID-19 pandemic.

H_9: The financial health of Garuda Indonesia before COVID-19 is better than during the COVID-19 pandemic.

This hypothesis is measured statistically using a two-dependent samples test, with equal sample sizes for the two groups.

3. 6 Altman Z –score

A Z-Score of more than 2.9 signifies a strong financial performance for the business. A score in the range of 1.23 to 2.9 signifies that the organization's financial performance is at a crucial level. Furthermore, a score of less than 1.23 indicates a possible bankruptcy for the business (Altman & Hotchkiss, 1993).

To get the Z-Score outcome, certain financial ratios must be computed. Stakeholders will have some understanding of the company's financial situation from the outcome. This information from the financial statement will be crucial for stakeholders to make future strategic decisions for the company.

$$\text{Z-Score} = 6.56\ (X1) + 3.26\ (X2) + 6.72\ (X3) + 1.05\ (X4)$$

CHAPTER 4 : RESULT AND DISCUSSION

4. 1 Financial Ratio Analysis

In this chapter, the results of the financial ratio analysis for Garuda Indonesia are presented, based on calculations using eight ratio analysis. These calculations are derived from quarterly data spanning from 2016 to 2023, totaling 28 data points, with Q1 2020 serving as the cut-off point. The results of the financial ratio analysis are detailed in **Table 4.1** and **Table 4.2.**

Table 4. 1 Profitability and Activity Ratio Analysis of Garuda Indonesia

PROFITABILITY RATIO						ACTIVITY RATIO					
Return on Equity			Return on Asset			Total Asset Turnover			Collection Period		
Before COVID - 19						Before COVID - 19					
	Q3	0.021		Q3	0.005		Q3	0.506		Q3	16.359
2016	Q4	0.052	2016	Q4	0.014	2016	Q4	0.459	2016	Q4	17.237
	Q1	-0.108		Q1	-0.025		Q1	0.436		Q1	22.178
	Q2	-0.257		Q2	-0.049		Q2	0.375		Q2	25.004
	Q3	0.077		Q3	0.017		Q3	0.708		Q3	18.960
2017	Q4	0.009	2017	Q4	0.002	2017	Q4	0.579	2017	Q4	19.361
	Q1	-0.074		Q1	-0.016		Q1	0.559		Q1	27.712
	Q2	-0.061		Q2	-0.012		Q2	0.595		Q2	26.559
	Q3	0.005		Q3	0.001		Q3	0.669		Q3	24.760
2018	Q4	-0.163	2018	Q4	-0.028	2018	Q4	1.015	2018	Q4	23.220
	Q1	0.025		Q1	0.005		Q1	0.590		Q1	39.241
	Q2	0.005		Q2	0.001		Q2	0.782		Q2	43.512
	Q3	0.109		Q3	0.022		Q3	0.872		Q3	29.104
2019	Q4	-0.161	2019	Q4	-0.026	2019	Q4	0.862	2019	Q4	21.786
2020 Q1 (Cut off Point) : -0.2466			2020 Q1 (Cut off Point) : -0.0135			2020 Q1 (Cut off Point) : 0.1405			2020 Q1 (Cut off Point) : 18.3036		
	Q2	-0.247		Q2	-0.058		Q2	0.025		Q2	102.182
	Q3	0.749		Q3	-0.037		Q3	0.043		Q3	67.719
2020	Q4	0.809	2020	Q4	-0.128	2020	Q4	0.054	2020	Q4	28.232
	Q1	0.713		Q1	-0.036		Q1	0.059		Q1	25.745
	Q2	0.166		Q2	-0.051		Q2	0.068		Q2	26.082
	Q3	0.181		Q3	-0.081		Q3	0.059		Q3	42.688
2021	Q4	0.212	2021	Q4	-0.349	2021	Q4	0.280	2021	Q4	21.442
	Q1	0.410		Q1	-0.032		Q1	0.376		Q1	26.709
	Q2	0.035		Q2	0.680		Q2	0.143		Q2	15.223
	Q3	-1.694		Q3	-0.010		Q3	0.172		Q3	14.380
2022	Q4	0.026	2022	Q4	0.006	2022	Q4	0.131	2022	Q4	15.579
	Q1	-0.026		Q1	-0.018		Q1	0.136		Q1	20.092
	Q2	0.067		Q2	0.005		Q2	0.172		Q2	18.565
2023	Q3	-0.021	2023	Q3	0.001	2023	Q3	0.182	2023	Q3	8.372

Source : Author Analysis, 2024

Table 4. 2 Solvency and Liquidity Ratio Analysis of Garuda Indonesia

SOLVENCY RATIO						LIQUIDTY RATIO					
Debt to Equity Ratio			Total Equity to Total Asset Ratio			Current Ratio			Cash Ratio		
Before COVID - 19						Before COVID - 19					
	Q3	2.812		Q3	0.262		Q3	0.777		Q3	0.331
2016	Q4	2.701	2016	Q4	0.270	2016	Q4	0.745	2016	Q4	0.370
	Q1	3.255		Q1	0.235		Q1	0.651		Q1	0.305
	Q2	4.256		Q2	0.190		Q2	0.557		Q2	0.201
	Q3	3.637		Q3	0.216		Q3	0.539		Q3	0.194
2017	Q4	3.014	2017	Q4	0.249	2017	Q4	0.513	2017	Q4	0.160
	Q1	3.544		Q1	0.220		Q1	0.495		Q1	0.139
	Q2	3.901		Q2	0.204		Q2	0.454		Q2	0.131
	Q3	4.084		Q3	0.197		Q3	0.472		Q3	0.269
2018	Q4	5.495	2018	Q4	0.154	2018	Q4	0.353	2018	Q4	0.083
	Q1	4.472		Q1	0.183		Q1	0.508		Q1	0.137
	Q2	4.415		Q2	0.185		Q2	0.428		Q2	0.108
	Q3	3.848		Q3	0.206		Q3	0.447		Q3	0.120
2019	Q4	5.183	2019	Q4	0.162	2019	Q4	0.348	2019	Q4	0.092
2020 Q1 (Cut off Point) : 17.2612			2020 Q1 (Cut off Point) : 0.0548			2020 Q1 (Cut off Point) : 0.2101			2020 Q1 (Cut off Point) : 0.0444		
	Q2	-12.947		Q2	-0.008		Q2	0.163		Q2	0.038
	Q3	-22.743		Q3	-0.046		Q3	0.152		Q3	0.036
2020	Q4	-6.553	2020	Q4	-0.180	2020	Q4	0.125	2020	Q4	0.047
	Q1	-5.556		Q1	-0.220		Q1	0.107		Q1	0.037
	Q2	-4.551		Q2	-0.282		Q2	0.080		Q2	0.016
	Q3	-3.613		Q3	-0.383		Q3	0.069		Q3	0.008
2021	Q4	-2.177	2021	Q4	-0.850	2021	Q4	0.053	2021	Q4	0.009
	Q1	-2.113		Q1	-0.899		Q1	0.065		Q1	0.014
	Q2	-3.493		Q2	-0.401		Q2	0.180		Q2	0.060
	Q3	-3.440		Q3	-0.410		Q3	0.207		Q3	0.075
2022	Q4	-5.062	2022	Q4	-0.246	2022	Q4	0.477	2022	Q4	0.310
	Q1	-4.765		Q1	-0.266		Q1	0.453		Q1	0.245
	Q2	-4.902		Q2	-0.256		Q2	0.501		Q2	0.258
2023	Q3	-4.822	2023	Q3	-0.262	2023	Q3	0.534	2023	Q3	0.227

Source : Author Analysis, 2024

4. 1. 2 Profitability Ratio

One of the important factors in determining an organization's financial standing is its profitability ratio. Profitability Ratios are widely recognized as the metric the organization utilizes to assess its capacity to produce profits from its revenue following the subtraction of all associated expenses (Winarko & Jaya, 2018).

4. 1. 2. 1 Return on Asset (ROA)

Profitability ratios are essential for assessing a company's financial performance, especially Return on Equity (ROE) and Return on Assets (ROA). The return on assets (ROA) metric evaluates a company's capacity to make money from all of its assets, offering valuable information on asset efficiency and managerial effectiveness. On the other hand, return on equity (ROE) evaluates the profitability of shareholders' equity and indicates how well the business looks after shareholder capital (Ummah, *et al*., 2023).

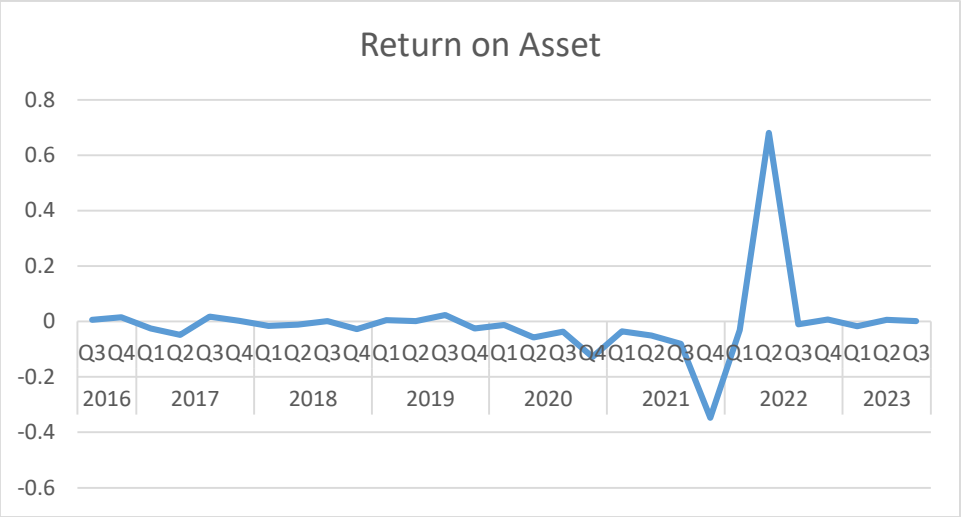

Figure 4. 1 Analysis of Return on Asset

Source: Author Analysis, 2024

Based on **Figure 4.1** illustrates the Return on Assets (ROA) for Garuda Indonesia from Q3 2016 to Q3 2023, it highlights variations in the profitability of the company about its assets. ROA fluctuated at this time, showing both positive and negative returns. A significant increase in ROA was observed in Q2 2022, this improvement occurred despite the revenue in 2022 being $2.1 billion, a significant increase from the $1.492 billion in 2020 and $1.336 billion in 2021. This revenue growth likely contributed to higher profitability and, consequently, an increase in ROA.s (GIA, 2023).

However, there is a sharp decline in 2021, the reduction in operational capacity and passenger traffic led to a decline in asset utilization (Lestari & Fitranita, 2024). Minus ROA indicates that the company is unable to produce meaningful test results from its assets. This might result from less-than-ideal active labor, such as undervaluing purchases or increasing operational costs (Tindige, *et al*., 2020).

Based on Table 4.3 Garuda Indonesia's ROA (Return on Assets), which averaged -0.6% before the pandemic and decreased to -0.8% during the pandemic, shows a significant change in the company's efficiency in managing its assets. Before the pandemic, the negative ROA of -0.6% indicated that the company was experiencing operational losses that could not cover the use of its assets. Hence,

every rupiah invested in assets resulted in a loss. However, during the pandemic, despite the global challenges, ROA still negative at -0.8%, indicating that the company managed to decreased the effectiveness of its asset usage to generate profits, in the difficult economic conditions (Febriana & Lestari, 2023).

The airline's ROA ratio increased significantly in 2022. Net income of US$3.76 billion or equivalent to IDR57.3 trillion in Q1-2022 was the result of a significant increase in revenue (CNN, 2023). According to Falinda & Miniarty (2023), the standard value of ROA that is considered good is above 1.5%. Therefore, the ROA results in Q4 2016, Q3 and Q4 2017, Q3 2019 and Q2 and Q4 2022 are above the standard ROA value set. The company has implemented effective operational strategies, such as restructuring, cost reduction, and improving business process efficiency (Falinda & Muniarty, 2023).

Table 4. 3 Result of Return on Asset

Return on Asset					
Before COVID - 19			During COVID-19		
2016	Q3	0.005	2020	Q1	-0.014
	Q4	0.014		Q2	-0.058
2017	Q1	-0.025		Q3	-0.037
	Q2	-0.049		Q4	-0.128
	Q3	0.017	2021	Q1	-0.036
	Q4	0.002		Q2	-0.051
2018	Q1	-0.016		Q3	-0.081
	Q2	-0.012		Q4	-0.349
	Q3	0.001	2022	Q1	-0.032
	Q4	-0.028		Q2	0.680
2019	Q1	0.005		Q3	-0.010
	Q2	0.001		Q4	0.006
	Q3	0.022	2023	Q1	-0.018
	Q4	-0.026		Q2	0.005
				Q3	0.001
Average		-0.006	Average		-0.008

Source : Author Analysis, 2024

4. 1. 2. 2 Return on Equity (ROE)

Return on Equity (ROE) is a financial metric that evaluates a company's effectiveness in generating earnings from the equity investments of its shareholders.

ROE reflects how efficiently a company utilizes its equity to produce profits, making it a crucial measure for assessing a company's financial health and the effectiveness of its management (Dahlan & Manda, 2023).

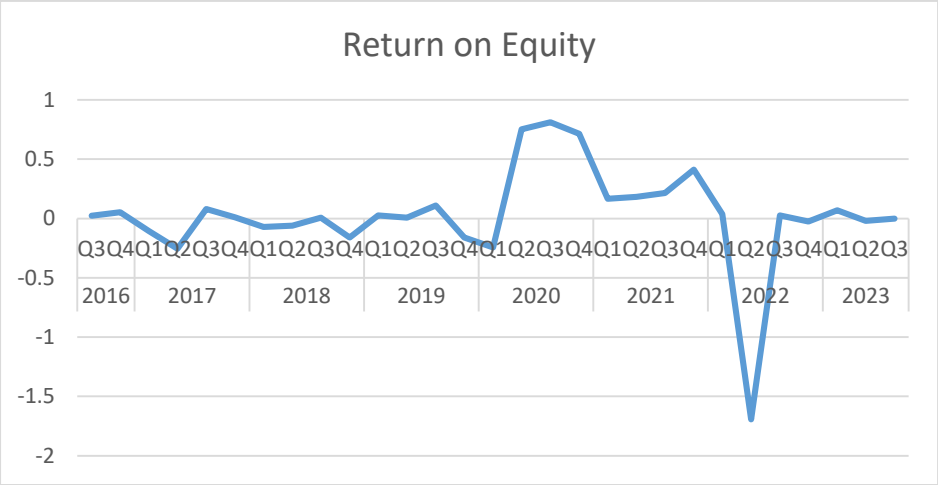

Figure 4. 2 Analysis of Return on Equity

Source : Author Analysis, 2024

Based on **Figure 4.2, t**he graph highlights a fluctuating ROE for Garuda Indonesia, swinging between positive and negative figures. Although there were phases of improvement, the general trend points to a challenging financial performance. The ROE started negatively and got worse through Q2 2017 before making a small recovery in Q3 2018. It experienced significant declines in Q1, Q2 and Q3 2022, culminating in persistent fluctuations in Q4 2022 and Q1 2023.

ROE declined in 2020, 2021 and 2022 because many airlines, including Garuda Indonesia, were forced to take on additional debt to survive the crisis, which increased interest expenses and reduced profitability (Triandi & Christine, 2022). Even though in Q3 2023 the ROE appeared to stabilize close to zero, the overall trend shows inconsistent financial performance. Compared to the record operating income of US$ 350.15 million in the first quarter of 2022, Garuda Indonesia as a group was able to record an operational revenue increase of up to 72% in the first quarter of 2023, reaching USD 602.99 million (GIAA, Corporate Presentation Q1 2O23, 2023).

According to **Table 4.4,** the average Return on Equity (ROE) for Garuda Indonesia before the COVID-19 pandemic was -3.7%, or -0.037 Based on KEP-100 / MBU / 2002, a ROE of -4% receives a score of 0 for non-infrastructure companies. This score represents the lowest possible value, indicating that the company struggled to generate sufficient profits to cover its operational costs and debts. Consequently, these results reflect an unstable financial condition for the company (Hutabarat & Astutik, 2022).

Table 4. 4 Result of Return on Equity

Return on Equity					
Before COVID - 19			During COVID-19		
	Q3	0.021		Q1	-0.247
2016	Q4	0.052	2020	Q2	0.749
	Q1	-0.108		Q3	0.809
	Q2	-0.257		Q4	0.713
	Q3	0.077		Q1	0.166
2017	Q4	0.009	2021	Q2	0.181
	Q1	-0.074		Q3	0.212
	Q2	-0.061		Q4	0.410
	Q3	0.005		Q1	0.035
2018	Q4	-0.163	2022	Q2	-1.694
	Q1	0.025		Q3	0.026
	Q2	0.005		Q4	-0.026
	Q3	0.109		Q1	0.067
2019	Q4	-0.161	2023	Q2	-0.021
				Q3	-0.003
Average		-0.037	Average		0.116

Source : Author Analysis, 2024

During the COVID-19 pandemic, the average Return on Equity (ROE) for the company was 12%. However, this ROE figure does not necessarily indicate an improvement in the company's financial condition. In 2020, the high ROE was primarily the result of both negative equity and negative net income, which, when divided, produce a positive ratio. This scenario is concerning, as a high ROE combined with negative equity often signals that the company is at risk of bankruptcy or experiencing a financial crisis. The underlying issue is typically a significant increase in debt that outpaces asset growth, resulting in profits that are

insufficient to cover liabilities and generate a positive net income (Holili, Paramita, & Taufiq, 2021).

4. 1. 3 Activity Ratio

The activity ratio is a financial indicator that assesses how effectively a business uses its resources to produce revenue. It shows that a business uses its resources to generate income (Dahlan & Manda, 2023).

4. 1. 3. 1 Total Asset Turnover

Total Asset Turnover (TATO) is a financial ratio used to measure a company's ability to generate sales from its total assets. This ratio indicates how effectively the company uses its assets to produce revenue (Triandi & Christine, 2022).

Figure 4. 3 Analysis of Total Asset Turnover

Source : Author Analysis, 2024

Based on **Figure 4.3**, the total asset turnover of Garuda Indonesia has experienced fluctuations, with periods of increase and decrease that are not stable. From 2016 to 2019, the ratio exhibited fluctuations but remained relatively high, peaking around 2019, indicating strong asset utilization during this period. Notably, Q2 2019, Q3 2019, and Q3 2018 stand out as peak periods. The company successfully expanded its domestic market share, resulting in more flights and passengers, and thus greater asset utilization. This growth is especially significant in 2019, with a 3.22% increase in domestic market share compared to 2018 (GIAA, 2019). Garuda Indonesia is enhancing operational efficiency by optimizing flight

schedules, reducing turnaround times, and enhancing ground handling processes, resulting in higher asset utilization and resource utilization (GIAA, 2019).

However, starting in late 2019, the ratio experienced a sharp decline, dropping significantly by early 2020. This is particularly evident in Q1 2021, Q1 2020, and Q4 2020. The pandemic caused a significant rise in flight cancellations and delays, further reducing the number of flights operated and consequently lowering asset utilization (GIAA, 2021).

Table 4. 5 Result of Total Asset Turnover

Total Asset Turnover					
Before COVID - 19			During COVID-19		
2016	Q3	0.506	2020	Q1	0.141
	Q4	0.459		Q2	0.025
2017	Q1	0.436		Q3	0.043
	Q2	0.375		Q4	0.054
	Q3	0.708	2021	Q1	0.059
	Q4	0.579		Q2	0.068
2018	Q1	0.559		Q3	0.059
	Q2	0.595		Q4	0.280
	Q3	0.669	2022	Q1	0.376
	Q4	1.015		Q2	0.143
2019	Q1	0.590		Q3	0.172
	Q2	0.782		Q4	0.131
	Q3	0.872	2023	Q1	0.136
	Q4	0.862		Q2	0.172
				Q3	0.182
Average		0.643	Average		0.136

Source : Author Analysis, 2024

The drastic decline in Garuda Indonesia's Total Asset Turnover (TAT) based on **Table 4.5** from an average of 0.64 before the pandemic to 0.14 during the pandemic reflects the significant impact of the COVID-19 pandemic on the efficiency of the company's asset utilization. Before the pandemic, the TAT of 0.643 showed that every rupiah invested in assets could generate revenue of 0.64 rupiah. However, during the pandemic, the TAT dropped sharply to 0.136, indicating that the company's ability to generate revenue from its assets decreased drastically.

Based on KEP-100 / MBU / 2002, the value of Total Asset Turnover with an average of 0.643 gets a score of 3 for non-infrastructure companies such as Garuda Indonesia. The value above the maximum score of 1.6 indicates that the company has achieved good efficiency in using assets to generate revenue. A score of 3 indicates that the company has a relatively low efficiency in generating revenue from its assets. This value is below the maximum score of 4.5, but above the minimum score of 1.6, indicating that the company can still generate revenue from assets, although not as efficient as before the pandemic (Baskara & Rahyuda, 2016).

4. 1. 3. 2 Collection Period

A financial indicator called the collection period, or average collection period, determines how long a company typically takes to collect its accounts receivable (Herawati & Paradona, 2022). A brief collection period signifies that the company can quickly gather its receivables, normally indicating efficient operations and effective credit management (Spanò, 2019).

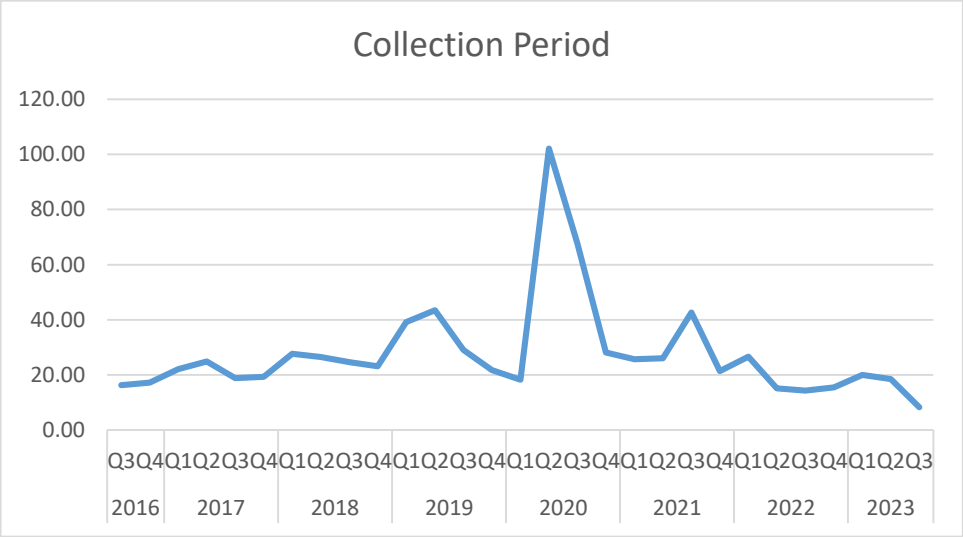

Figure 4. 4 Analysis of Collection Period

Source : Author Analysis, 2024

Figure 4. 4 depicts the collection period of a company or organization over a period spanning from Q3 2016 to Q3 2023. A significant peak occurred in the second quarter of 2020, marking the highest collection period. Following this peak, the collection period generally decreased until the end of 2022. In 2023, there was a slight increase, although it remained below the peak levels seen in 2020.

Table 4. 6 Result of Collection Period

Collection Period					
Before COVID - 19			During COVID-19		
2016	Q3	16.359	2020	Q1	18.304
	Q4	17.237		Q2	102.182
2017	Q1	22.178		Q3	67.719
	Q2	25.004		Q4	28.232
	Q3	18.960	2021	Q1	25.745
	Q4	19.361		Q2	26.082
2018	Q1	27.712		Q3	42.688
	Q2	26.559		Q4	21.442
	Q3	24.760	2022	Q1	26.709
	Q4	23.220		Q2	15.223
2019	Q1	39.241		Q3	14.380
	Q2	43.512		Q4	15.579
	Q3	29.104	2023	Q1	20.092
	Q4	21.786		Q2	18.565
				Q3	8.372
Average		25.36	Average		30.93

Source : Author Analysis, 2024

The increase in Garuda Indonesia's Collection Period shown in **Table 4.6** from 25.36 days before the pandemic to 30.93 days during the pandemic reflects a decrease in efficiency in collecting receivables. Before the pandemic, the company took around 25 days to collect its receivables. However, during the pandemic, the collection time increased by almost 6 days. The pandemic caused operational disruptions, including the grounding of aircraft, which would have impacted the airline's ability to generate revenue and, consequently, collect payments from customers (GIAA, Annual Report, 2022). A higher Collection Period indicates a longer time to collect receivables, which is generally considered a negative indicator of a company's financial health.

4. 1. 4 Solvency Ratio

A solvency ratio is a performance metric used to assess a company's financial health. Specifically, it helps determine if the company can fulfill its long-term financial obligations. The solvency ratio is valuable to lenders, investors, suppliers, and others interested in doing business with a company. It compares the

company's profitability to its obligations to assess financial stability. A higher solvency ratio indicates financial strength, while a lower ratio may signal potential future financial challenges (CFI, 2020).

4. 1. 4. 1 Debt to Equity Ratio

The debt-to-equity (D/E) ratio is a key financial metric that assesses a company's capital structure by comparing its total liabilities to shareholder equity. This ratio offers insights into the company's financial leverage and risk, aiding stakeholders in evaluating its capacity to meet long-term debt obligations and overall financial health (Spanò, 2019).

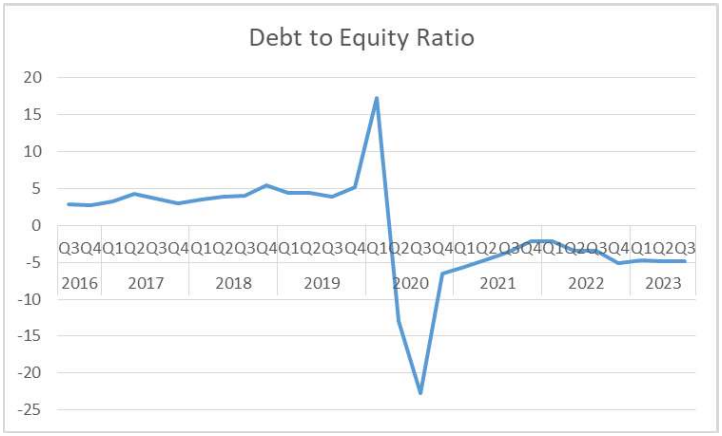

Figure 4. 5 Analysis of Debt to Equity Ratio

Source : Author Analysis, 2024

Figure 4. 5 depicts the Debt-to-Equity (D/E) ratio of the company from Q3 2016 to Q3 2023, showing a relatively stable period with minor fluctuations from Q3 2016 to Q1 2020, indicating consistent financial leverage. However, a significant spike in Q2 2020 suggests a substantial increase in debt relative to equity, potentially due to increased borrowing or decreased equity. These factors can be assigned to several factors, including lower revenue, operational difficulties, financial strain, strategy changes, and possible regulatory support. Together, these elements played a significant role in the significant rise in debt to equity throughout this time (Kurniawati & Listyowati, 2021).

Recent quarters (2022-2023) show the ratio stabilizing at a lower level. To fully understand the company's financial health, further analysis of the interest

coverage ratio, cash flow, and industry comparisons would be beneficial. The company's focus on financial sustainability is evident in its strategic plans, such as the "Beyond the Limit" initiative, which aims to improve operational efficiency and reduce costs (GIAA, 2022).

Based on **Table 4.7**, Garuda Indonesia's Debt to Equity Ratio (DER) of 3.9013 before the pandemic shows that the company has a debt that is much greater than its equity, but this value is relatively low and does not describe a very bad condition. However, the Debt to Equity Ratio (DER) value during the pandemic has an average of -6.20. This indicates a very poor financial condition as the company's equity is negative (Azzahra, 2021).

According to the British Business Bank, a good DER is generally in the range of 1-1.5. However, the type of company also affects the ideal value of a DER. This is because some industries use more debt funding than others. For example, in capital-intensive industries such as finance and manufacturing, the DER of companies in these industries is often recorded at more than 2. This figure may indicate that the company is using debt to drive business growth (Nadya, 2023).

Table 4. 7 Result of Debt to Equity Ratio

Debt to Equity Ratio					
Before COVID - 19			During COVID-19		
2016	Q3	2.812	2020	Q1	17.261
	Q4	2.701		Q2	-12.947
2017	Q1	3.255		Q3	-22.743
	Q2	4.256		Q4	-6.553
	Q3	3.637	2021	Q1	-5.556
	Q4	3.014		Q2	-4.551
2018	Q1	3.544		Q3	-3.613
	Q2	3.901		Q4	-2.177
	Q3	4.084	2022	Q1	-2.113
	Q4	5.495		Q2	-3.493
2019	Q1	4.472		Q3	-3.440
	Q2	4.415		Q4	-5.062
	Q3	3.848	2023	Q1	-4.765
	Q4	5.183		Q2	-4.902
				Q3	-4.822
Average		3.90	Average		-6.20

Source : Author Analysis, 2024

4. 1. 4. 2 Total Equity to Total Asset Ratio

Total Equity to Total Asset Ratio is a financial indicator used to assess a company's financial leverage and risk. It offers information on the percentage of a company's assets financed by shareholder equity, revealing the degree of stability and risk associated with the financial system (Spanò, 2019).

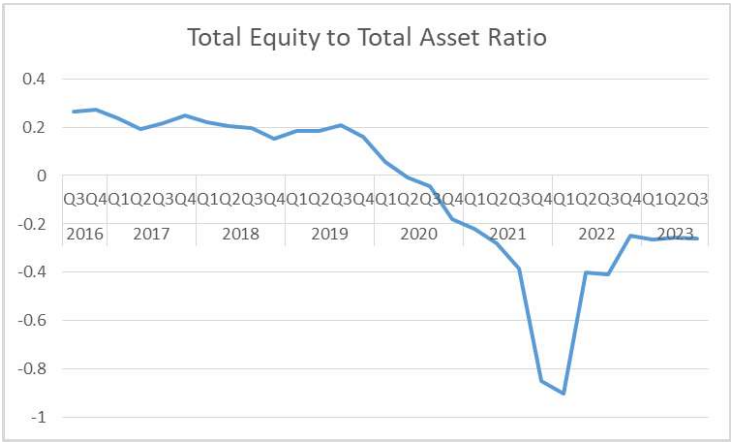

Figure 4. 6 Analysis of Total Equity to Total Asset Ratio

Source : Author Analysis, 2024

Figure 4. 6 illustrates the Total Equity to Total Asset Ratio of a company from Q3 2016 to Q3 2023. Beginning in Q3 2016, the ratio remained fairly stable around 0.3, but it steadily declined, hitting a low of approximately -0.2 in Q3 2020. This indicates a growing dependence on debt to finance assets during this time. Negative economic circumstances, such as those brought on by the COVID-19 outbreak, would have put Garuda Indonesia under extra pressure to take on debt as a result of lower income and higher operating expenses. This is especially important for airlines that had large declines in passenger volume during this time (Mutmainah, Aprilia, & Citradewi, 2023). If the company is acquiring more assets without a corresponding increase in equity, the ratio will decline.

Garuda Indonesia's financial restructuring operations increased the company's total equity to total asset ratio in Q4 2022. In particular, the company received IDR 725 billion in fleet restoration finance from PT PPA and an additional IDR 7.5 trillion in State Equity Participation (SEP). The company's total equity

increased significantly as a result of these financing injections, and the equity-to-asset ratio rose above values that occurred in earlier times (GIAA, 2023).

Based on **Table 4.8** before the pandemic, Garuda Indonesia's Total Equity to Total Asset Ratio was 20.95% which still reflects a stable financial structure despite being more dependent on debt. However, during the pandemic, this ratio changed drastically to -34%. The Total Equity to Total Asset Ratio value before the pandemic (21%) according to KEP-100/MBU/2002 Garuda Indonesia received a score of 6 for non-infrastructure companies and during the pandemic (-34%) received a score of 0. A score of 6 indicates that the company has a stable and healthy financial structure. This ratio shows that every 100% of the company's total assets is supported by 21% of total equity. Meanwhile, a score of 0 indicates that the company does not have enough capital to pay its debts and finance its operations, making the company highly vulnerable to financial failure (Primandari, Rabiulkhri, & Ulandari, 2024).

Table 4. 8 Result of Total Equity to Total Asset Ratio

Total Equity to Total Asset Ratio					
Before COVID - 19			During COVID-19		
	Q3	0.262		Q1	0.055
2016	Q4	0.270	2020	Q2	-0.008
	Q1	0.235		Q3	-0.046
	Q2	0.190		Q4	-0.180
	Q3	0.216		Q1	-0.220
2017	Q4	0.249	2021	Q2	-0.282
	Q1	0.220		Q3	-0.383
	Q2	0.204		Q4	-0.850
	Q3	0.197		Q1	-0.899
2018	Q4	0.154	2022	Q2	-0.401
	Q1	0.183		Q3	-0.410
	Q2	0.185		Q4	-0.246
	Q3	0.206		Q1	-0.266
2019	Q4	0.162	2023	Q2	-0.256
				Q3	-0.262
Average		0.209	Average		-0.336

Source : Author Analysis, 2024

4. 1. 5 Liquidity Ratio

A liquidity ratio is a financial metric that measures a company's capacity to meet its short-term financial obligations. It evaluates whether a company possesses enough liquid assets to cover its short-term liabilities, such as accounts payable and other debts due within a year (Coulon, 2020).

4. 1. 5. 1 Cash Ratio

The cash ratio is a liquidity ratio that measures a company's ability to pay off its short-term liabilities with its most liquid assets—cash and cash equivalents. This ratio is considered one of the most stringent tests of liquidity, as it only considers cash and cash equivalents, excluding other current assets like accounts receivable and inventory (Coulon, 2020).

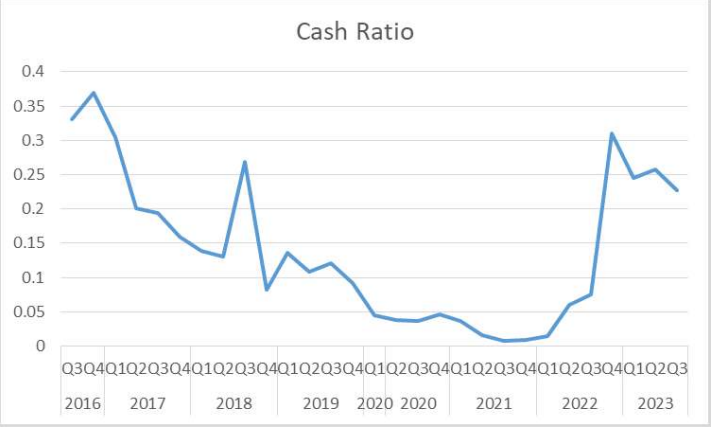

Figure 4.7 Analysis of Cash Ratio

Source : Author Analysis, 2024

Figure 4.7 illustrates the Cash Ratio of a company from Q3 2016 to Q3 2023, highlighting its ability to meet short-term obligations using cash and cash equivalents. The Cash Ratio began to decrease in Q1 2017 and continued to steadily drop until Q4 2019, suggesting that the company was using its cash reserves for operations or investments, which was worsening its liquidity position. Garuda Indonesia has to face increasing operating costs, especially with changes in fuel prices and maintenance bills (Curran, 2020). In 2019, the price of aviation fuel increased by Rp 9,500 per liter compared to the previous year (Admininaca, 2020). The company's cash reserves were strained as a result of these rising expenses because they required more money to cover ongoing operations.

Post-Q3 2020, the Cash Ratio fluctuated, showing both improvements and declines, stabilizing at a moderate level by Q3 2023. This trend suggests the company's efforts to balance liquidity and operational needs. Garuda Indonesia has increased revenue from cargo to compensate for the decline in revenue from passengers due to the COVID-19 pandemic (GIAA, 2023). Increased revenue from cargo may help improve the Cash Ratio.

Table 4. 9 Result of Cash Ratio

Cash Ratio					
Before COVID - 19			During COVID-19		
	Q3	0.331		Q1	0.044
2016	Q4	0.370	2020	Q2	0.038
	Q1	0.305		Q3	0.036
	Q2	0.201		Q4	0.047
	Q3	0.194		Q1	0.037
2017	Q4	0.160	2021	Q2	0.016
	Q1	0.139		Q3	0.008
	Q2	0.131		Q4	0.009
	Q3	0.269		Q1	0.014
2018	Q4	0.083	2022	Q2	0.060
	Q1	0.137		Q3	0.075
	Q2	0.108		Q4	0.310
	Q3	0.120		Q1	0.245
2019	Q4	0.092	2023	Q2	0.258
				Q3	0.227
Average		0.189	Average		0.099

Source : Author Analysis, 2024

Based on Table 4.9 Cash Ratio at Garuda Indonesia had an average value of 18.9% before COVID-19 and during COVID-19 is 9.9%. According to KEP-100/MBU/2002, the cash ratio value before the pandemic had a score of 4 for non-infra and a score of 2 for the ratio during the pandemic. This ratio indicates that every 100% of the company's total debt is supported by 18.9% of cash and cash equivalents. A score of 4 indicates that the company can deal with liquidity risk well and has enough cash to pay debts. A score of 2 indicates that the company has a decreased ability to deal with liquidity risk and has less cash to pay debts (Hutabarat & Astutik, 2022).

4. 1. 5. 2 Current Ratio

The current ratio is a financial metric used to evaluate a company's capacity to meet its short-term obligations with its current assets. This ratio offers a perspective on the company's liquidity and its capability to fulfill short-term financial responsibilities (Krishnankutty & Chakraborty, 2011).

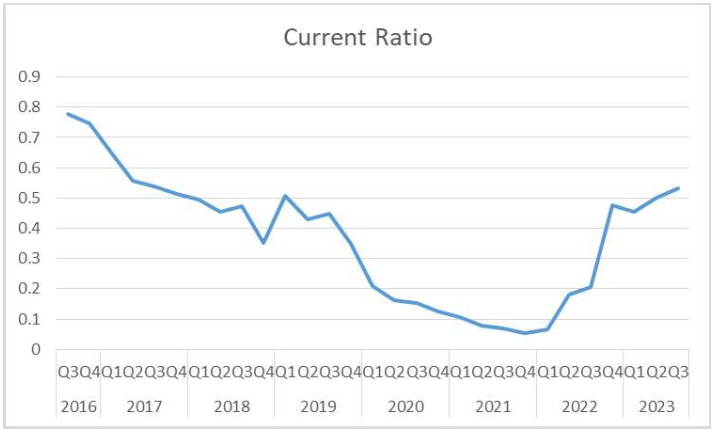

Figure 4. 8 Analysis of Current Ratio

Source : Author Analysis, 2024

Figure 4.8 illustrates the Current Ratio of a company from Q3 2016 to Q3 2023, which measures the company's ability to meet its short-term obligations using its current assets. Initially, from Q3 2016, the Current Ratio was relatively high but steadily declined until reaching a low point around Q4 2019. The decrease in Garuda Indonesia's current ratio was caused by the increase in current liabilities by 59.29% in 2018 and by 6.42% in 2019 (Triandi & Christine, 2022).

By Q1 2023, the ratio stabilized moderately, indicating the company's successful efforts to manage current assets and liabilities to balance liquidity and operational needs. Garuda Indonesia is experiencing an increase in its current ratio due to a rise in current assets and the reduced impact of the pandemic on the aviation sector.

Table 4.10 shows that the Current Ratio before the COVID-19 pandemic was 52.06% and during the pandemic it dropped to 22.60%, indicating a significant decline in the company's liquidity condition. If this score is linked to the Decree of the Minister of SOEs Number Kep-100/MBU/2002, this drastic change puts Garuda Indonesia in a higher risk category. According to Kep-100/MBU/2002, Current

Ratio is one of the important indicators in liquidity assessment, where a ratio lower than 100% may be considered unhealthy, depending on the industry and the specific conditions of the company.

Table 4. 10 Result of Current Ratio

Current Ratio					
Before COVID - 19			During COVID-19		
2016	Q3	0.777	2020	Q1	0.210
	Q4	0.745		Q2	0.163
	Q1	0.651		Q3	0.152
	Q2	0.557		Q4	0.125
2017	Q3	0.539	2021	Q1	0.107
	Q4	0.513		Q2	0.080
	Q1	0.495		Q3	0.069
	Q2	0.454		Q4	0.053
2018	Q3	0.472	2022	Q1	0.065
	Q4	0.353		Q2	0.180
	Q1	0.508		Q3	0.207
	Q2	0.428		Q4	0.477
2019	Q3	0.447	2023	Q1	0.453
	Q4	0.348		Q2	0.501
				Q3	0.534
Average		0.521	Average		0.226

Source : Author Analysis, 2024

4. 2 Altman Z-Score Analysis

The Altman Z-score, created by Professor Edward Altman in 1968, is a financial indicator used to forecast a company's risk of insolvency. The Altman Z-score is commonly employed to assess corporate credit risk and forecast financial distress (Altman & Hotchkiss, 1993).

Table 4. 11 Altman Z-Score Analysis in Quarterly

Altman Z-Score Before COVID-19	2016			2017				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
	-0.451	-0.233	-0.374	-0.611	-0.603	-0.232	-0.362	
	2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	-0.571	-0.561	-0.457	-0.721	-0.311	-0.375	-0.138	-0.544
Altman Z-Score During COVID-19	2020				2021			
	Q1 (Cut Off)	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	-0.579	-1.060	-0.830	-1.305	-3.847	-3.953	-4.163	-5.762
	2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	-3.773	1.176	-3.701	-3.579	-3.717	-3.569	-3.572	-3.244

Source : Author Analysis, 2024

Based on **Table 4.11**, the Altman Z-Score for 2016 exhibited marginal improvement in Q3 and Q4. Nevertheless, the score remained significantly below the healthy threshold, recording a value of only -0.233, which falls short of the benchmark value of 1.23. In 2016, the Working Capital to Total Assets ratio (X1) was low, suggesting liquidity problems. This indicates that the company may lack sufficient liquid assets to cover its short-term liabilities, which worsens its financial challenges (Jaya, 2022).

The financial condition of companies generally deteriorated year-on-year before the COVID-19 pandemic. There were some periods where companies showed signs of improvement, but overall the trend was negative. The significant decline in 2017 and the end of 2018 and 2019 suggests that the company is in a fairly critical situation. The poor financial condition before the pandemic was because Garuda Indonesia had accumulated considerable debt, resulting in a high interest burden. This high financial leverage limited their ability to invest in necessary improvements and innovations (Singh & Bansal, 2020). Despite having a strong brand, Garuda Indonesia struggled with low passenger yields due to competitive pricing strategies and overcapacity in the market (Bank A. D., 2023).

In Q2 2022, the score starts at 1.17, indicating that the company was in a relatively stable financial condition and increased from the previous year (2021). However, from Q1 to Q4 2020, the score declines significantly from -0.579 to -1.305, suggesting deteriorating financial health due to potential operational inefficiencies, increased costs, or reduced revenues. The scores for all quarters in 2021 are negative, starting from -1.305 in Q1 and further decreasing to -5.762 by Q4, indicating severe financial distress. In Q1 2022, the score remains negative at -

3.773 but shows a slight improvement from Q2 2022. From Q1 to Q4 2023, the scores once again declined into the negative range, from -3.717 in Q1 to -3.244 in Q4, suggesting that the financial health of the company deteriorated again, possibly due to unresolved underlying issues or new challenges.

A negative Z-score before the pandemic indicates that a company's debt is greater than its total assets or equity, indicating high bankruptcy risk. During the pandemic, a decrease in the value of assets or equity may occur due to depreciation in asset value or a decrease in market value (Coudert, Couharde, & Mignon, 2011). If the value of total assets decreases while debt remains fixed, financial ratios may change. However, if debt also decreases or there is a significant decrease in total assets that changes the proportion of debt to assets, the Z-score may become more positive (Nguyen, Mishra, Prakash, & Ghosh, 2007).

4. 3 Distribution Normality Test Analysis

The results of the normal distribution test on Garuda Indonesia's financial performance data for the years 2016-2023 can be seen in **Table 4.12.**

Based on **Table 4.12**, 7 out of 16 financial performance data points for Garuda Indonesia before and during COVID-19 are not normally distributed. Data is considered normally distributed if the p-value is above 0.05. This can occur if the data contains extreme scores, whether extremely high or extremely low, which can cause the data distribution to be not normally distributed (Heryana, 2023).

This indicates that more than half of the financial performance metrics do not follow a normal distribution, which could impact the types of statistical analyses that can be appropriately applied. For normally distributed data, parametric tests may be suitable, while non-parametric tests may be required for non-normally distributed data.

Table 4. 12 Result Analysis of Normality Distribution using Saphiro-Wilk Test

Financial Ratio	Saphiro-Wilk Test		Conclusion
	p-value	Statistics	
	Before COVID-19		
ROE	0.420	0.940	H0 Accepted
ROA	0.488	0.945	H0 Accepted
Total Asset Turnover	0.723	0.96	H0 Accepted
Collection Period	0.051	0.876	H0 Accepted
Debt to Equity Ratio	0.828	0.967	H0 Accepted
Total Equity to Total Asset Ratio	0.900	0.972	H0 Accepted
Current Ratio	0.185	0.915	H0 Accepted
Cash Ratio	0.080	0.890	H0 Accepted
	During COVID-19		
ROE	< 0.001	0.740	H0 Rejected
ROA	< 0.001	0.630	H0 Rejected
Total Asset Turnover	0.054	0.878	H0 Accepted
Collection Period	< 0.001	0.727	H0 Rejected
Debt to Equity Ratio	< 0.001	0.646	H0 Rejected
Total Equity to Total Asset Ratio	0.013	0.833	H0 Rejected
Current Ratio	0.005	0.789	H0 Rejected
Cash Ratio	0.002	0.763	H0 Rejected

Source : Author Analysis using SPSS. 2024

Table 4. 13 Result Analysis of Normality Distribution using Saphiro-Wilk Test in Altman Z-Score

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ALTMAN Z-SCORE BEFORE	0.142	15	.200*	0.970	15	0.861
ALTMAN Z-SCORE DURING	0.297	15	0.001	0.846	15	0.015

Source : Author Analysis on SPSS

Table 4.13 presents the results of the normality test on the sample of Altman Z-Score data from 2016 to 2023, consisting of 30 quarterly data points. The significance value result of the Saphiro-Wilk test for Altman Z-Score before COVID-19 is 0.861 and during COVID-19 is 0.015 the data before COVID-19 is higher than 0.05, but for data during COVID-19 is less than 0.05. Hence, it concludes that the data are not normally distributed and will tested by a non-parametric test.

4. 4 Hypothesis Testing Result

H_1: Return on Equity in Profitability Ratio before COVID-19 is better than during the COVID-19 pandemic

Table 4. 14 Hypothesis Testing Result on ROE

Test Statistics

	ROE DURING-ROE BEFORE
Z	-2.04
Asymp. Sig.	0.041

Source : Author Analysis on SPSS, 2024

The Z-score, also known as the Z-value, expresses the number of standard deviations an element deviates from the mean. The Z-value in hypothesis testing is used to calculate the deviation of the sample statistic (such as the mean difference between two periods) from the population parameter under the null hypothesis (Colleges, 2023). Based on **Table 4.14** the z-value of -2.04 indicates that the test statistic is 2.04 standard deviations below the mean value expected under the null hypothesis.

A p-value of 0.041 for a two-tailed test means there is a 4.1% probability that the observed difference (or one more extreme) could occur under the null hypothesis. A one-tailed test with a p-value of 0.020, indicating a 2% probability of the observed difference occurring under the null hypothesis, would be used. Since this p-value is less than 0.05, it suggests that the difference observed is statistically significant, meaning that you would reject the null hypothesis. Therefore, **the result reject the null hypothesis** or before COVID-19 ROE is better than during COVID-19.

H_2: Return on Assets in Profitability Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 15 Hypothesis Testing Result on ROA

Test Statistics

	ROA DURING-ROA BEFORE
Z	-1.538
Asymp. Sig.	0.124

Source : Author Analysis on SPSS, 2024

The Z-score, also known as the Z-value, expresses the number of standard deviations an element deviates from the mean. The Z-value in hypothesis testing is used to calculate the deviation of the sample statistic (such as the mean difference between two periods) from the population parameter under the null hypothesis (Colleges, 2023). Based on **Table 4.15** the Z-value is -1.53, This value's small size indicates that, compared to the change in ROA, there isn't much of a difference between the ROA (Return on Assets) over the two periods (before and during).

A p-value of 0.124 for a two-tailed test means there is a 12.4% probability that the observed difference (or one more extreme) could occur under the null hypothesis. A one-tailed test with a p-value of 0.062, indicating a 6.2% probability of the observed difference occurring under the null hypothesis, would be used. Therefore, **the result fails to reject the null hypothesis**. There is not enough evidence to conclude that there is a statistically significant difference between the ROA During and the ROA Before COVID-19. Garuda Indonesia's revenue did not change significantly before and during the pandemic. Operating costs, such as fuel costs and overhead costs, may remain stable, resulting in no significant change in net profit per asset (Gayatri & Thamrin, 2020).

H_3: Current Ratio in Liquidity Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 16 Hypothesis Testing Result on Current Ratio

Test Statistics

	CURRENT RATIO DURING- CURRENT RATIO BEFORE
Z	-2.480
Asymp. Sig.	0.013

Source : Author Analysis on SPSS, 2024

Based on **Table 4.16** the Z- Value is -2.480. This Z-value indicates how many standard deviations the observed difference in Current Ratios (between the two periods) is from the mean difference under the null hypothesis. A Z-value of -2.480 suggests that the observed difference is 2.480 standard deviations below the mean difference under the null hypothesis.

The p-value result is 0.013, this p-value indicates that there is a 1.3% chance of observing a difference as extreme as the one observed (or more extreme) if the null hypothesis is true. If a one-tailed test were used instead, the p-value would typically be halved, resulting in a p-value of 0.0065. This means there would be a 0.65% chance of observing a difference as extreme as the one observed (or more extreme) in the direction specified by the alternative hypothesis if the null hypothesis is true. Since the p-value (0.0065) is less than the significance level (0.05), **the result rejects the null hypothesis.** Based on the result, the current ratio before the pandemic is better than the current ratio during the pandemic.

H_4: Cash Ratio in Liquidity Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 17 Hypothesis Testing Result on Cash Ratio

Test Statistics

	CASH RATIO DURING- CASH RATIO BEFORE
Z	-3.296
Asymp. Sig.	< 0.001

Source : Author Analysis on SPSS, 2024

Based on **Table 4.17** the Z-value is -3.296. This Z-value indicates that the observed difference in Cash Ratios between the two periods is 3.296 standard deviations away from the mean difference expected under the null hypothesis. The p-value represents the probability of obtaining a test statistic as extreme as the one observed, assuming the null hypothesis is true.

The p-value on the result is less than 0.001, The extremely small p-value suggests that, in the case of the null hypothesis, there is less than 0.1% chance of finding such a severe difference, or one even more extreme. A one-tailed test would yield a p-value less than 0.0005, indicating a less than 0.05% chance of observing a severe difference under the null hypothesis. Since the p-value (< 0.0005) is significantly smaller than the significance level (0.05), **the result rejects the null hypothesis.** This means that the observed difference in the Cash Ratios is better before COVID-19 than during COVID-19.

H_5: Debt to Equity Ratio in Solvency Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 18 Hypothesis Testing Result on Debt to Equity Ratio

Test Statistics

	DER DURING - DER BEFORE
Z	-3.296
Asymp. Sig.	< 0.001

Source : Author Analysis on SPSS, 2024

Based on **Table 4.18** the Z-value is -3.296. This Z-value indicates that the observed difference in Debt to Equity Ratio between the two periods is 3.296 standard deviations away from the mean difference expected under the null hypothesis. The p-value represents the probability of obtaining a test statistic as extreme as the one observed, assuming the null hypothesis is true.

The p-value on the result is less than 0.001, The extremely small p-value suggests that, in the case of the null hypothesis, there is less than 0.1% chance of finding such a severe difference, or one even more extreme. A one-tailed test would

yield a p-value less than 0.0005, indicating a less than 0.05% chance of observing a severe difference under the null hypothesis.

Since the p-value (< 0.0005) is significantly smaller than the significance level (0.05), **the result rejects the null hypothesis.** This means that the observed difference in the Debt to Equity Ratio is better before COVID-19 than during COVID-19.

H_6: Total Equity to Total Assets Ratio in Solvency Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 19 Hypothesis Testing Result on Total Equity to Total Asset Ratio

Test Statistics

	TOTAL EQUITY TO TOTAL ASSET DURING - TOTAL EQUITY TO TOTAL ASSET BEFORE
Z	-3.297
Asymp. Sig.	< 0.001

Source : Author Analysis on SPSS, 2024

Based on **Table 4.19** the Z-value is -3.297. This Z-value indicates that the observed difference in Total Equit y to Total Asset Ratio between the two periods is 3.297 standard deviations away from the mean difference expected under the null hypothesis. The p-value represents the probability of obtaining a test statistic as extreme as the one observed, assuming the null hypothesis is true.

The p-value on the result is less than 0.001, The extremely small p-value suggests that, in the case of the null hypothesis, there is less than 0.1% chance of finding such a severe difference, or one even more extreme. A one-tailed test would yield a p-value less than 0.0005, indicating a less than 0.05% chance of observing a severe difference under the null hypothesis. Since the p-value (< 0.0005) is significantly smaller than the significance level (0.05), **the result rejects the null hypothesis.** This means that the observed difference in the Total Equity to Total Asset Ratio is better before COVID-19 than during COVID-19.

H_7: Total Assets Turnover Ratio in Activity Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 20 Hypothesis Testing Result on Total Asset Turnover Ratio

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	TOTAL ASSET TURNOVER BEFORE	0.6436	14	0.18566	0.04962
	TOTAL ASSET TURNOVER DURING	0.1357	14	0.09936	0.02656

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	TOTAL ASSET TURNOVER BEFORE & TOTAL ASSET TURNOVER DURING	14	0.319	0.267

Paired Sample Test										
Paired Differences										
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	df	Sig. (2-tailed)	Sig. (1-Tailed)
Pair 1	TOTAL ASSET TURNOVER BEFORE - TOTAL ASSET TURNOVER DURING	0.50786	0.18052	0.04825	0.40363	0.61209	10.526	13	<0.001	<0.0005

Source : Author Analysis on SPSS, 2024

Based on Table 4.20 the mean difference between ROE Before and ROE During is 0.50786. This indicates that, on average, the ROE During the specified period was 0.50786 points lower than the ROE Before that period. A t-value of 10.526 indicates that the observed difference is only 10.526 standard deviations away from the hypothesized value (often zero). A t-value this large would correspond to a very small p-value (much less than 0.05), meaning that the result is

statistically significant. The one-sided p-value is <0.0005. Since the p-value is greater than 0.05, **the result fails to accept the null hypothesis**. This means there is statistically difference in the hypothesized direction between Total Asset Turnover Before and During COVID-19.

H_8: Collection Period in Activity Ratio before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 21 Hypothesis Testing Result on Collection Period

Test Statistics

	COLLECTION PERIOD DURING - COLLECTION PERIOD BEFORE
Z	-0.282
Asymp. Sig.	0.778

Based on **Table 4.21** a z-value of -0.282 indicates that the sample mean is only 0.282 standard deviations below the hypothesized mean, suggesting minimal deviation from what was expected under the null hypothesis. This small z-value implies that the observed data closely aligns with the null hypothesis, showing no significant difference. The two-tailed p-value of 0.778 further supports this, as it reflects a 77.8% probability of observing a result as extreme as the one obtained, whether it is greater or smaller than the hypothesized mean, assuming the null hypothesis is true.

A one-tailed test would yield a p-value is 0.336. Since the p-value is larger than the significance level (0.05), **the result fails to rejects the null hypothesis.** As a result, the data does not provide sufficient evidence to reject the null hypothesis, leading to the conclusion that there is no statistically significant difference between Collection Period in Before and During COVID-19.

H_9: The financial health of Garuda Indonesia before COVID-19 is better than during the COVID-19 pandemic.

Table 4. 22 Hypothesis Testing Result on Altman Z-Score

Test Statistics

	ALTMAN Z-SCORE DURING – ALTMAN Z-SCORE BEFORE
Z	-3.181
Asymp. Sig.	0.001

Source : Author Analysis on SPSS, 2024

Based on Table 4.21 a z-value of -3.181 indicates that the sample mean is only 3.181 standard deviations below the hypothesized mean, suggesting minimal deviation from what was expected under the null hypothesis. The p-value on the result is less than 0.001, The extremely small p-value suggests that, in the case of the null hypothesis, there is less than 0.1% chance of finding such a severe difference, or one even more extreme. A one-tailed test would yield a p-value less than 0.0005, indicating a less than 0.05% chance of observing a severe difference under the null hypothesis.

Since the p-value (< 0.0005) is significantly smaller than the significance level (0.05), the result rejects the null hypothesis. **This means that the observed difference in the Altman Z-Score is better before COVID-19 than during COVID-19 or reject the null hypothesis.**

CHAPTER 5 : CONCLUSION AND RECOMMENDATIONS

5. 1 Conclusions

In this study, four research questions have been addressed in Chapter 4. The analysis used parametric (Paired T-Test) and non-parametric (Wilcoxon Signed Rank T-Test). The study successfully met its objective by elucidating the research questions and hypotheses through an examination of the variables involved. Here are the conclusions drawn from the study's objectives:

1. To analyze and evaluate the financial performance condition of Garuda Indonesia before and during COVID-19.

Based on the result, Garuda Indonesia has several problems regarding its financial performance during COVID-19. ROA and ROE during the pandemic experienced a significant decline, in 2016-2019 the lowest ROE value was -0.257, but when entering 2020 the lowest ROE had a value of -0.247. This indicates that Garuda Indonesia has significant financial problems due to the COVID-19 pandemic. Meanwhile, Garuda Indonesia's ROA did not have a significant difference before COVID-19 or during COVID-19. This can be seen from the range of ROA before COVID-19 is -0.049 to 0.022, while during the pandemic is -0.349 to 0.680.

The Total Asset Turnover Ratio at Garuda Indonesia has decreased due to COVID-19. This can be seen in 2016-2019 the ratio range is 0.375 - 1.015. Meanwhile, during COVID-19 the Total Asset Turnover Ratio decreased with an average ratio only ranging from 0.025 - 0.280. Similarly, the Collection Period during the COVID-19 pandemic has a high value which ranges from 8.37-102.18.

A significant difference is evident in the Debt to Equity ratio. Before the COVID-19 pandemic, there were no negative ratios, but during the pandemic, the Debt to Equity Ratio ranged from -22.74 to -2.18. Even in 2023, this ratio remained negative, indicating that Garuda Indonesia is facing several challenges in improving its financial situation. During the pandemic, the Total Equity to Total Asset Ratio also decreased compared to before COVID-19. This can be seen from the range of Total Equity to Total Asset Ratio values during the pandemic is -0.90 to 0.05.

During the pandemic in Indonesia, both the Current Ratio and Cash Ratio saw notable declines. Before the pandemic, the Current Ratio ranged between 0.35 and 0.78, but during the pandemic, this ratio dropped significantly, fluctuating between 0.06 and 0.48, with the lowest point observed in Q1 2022. The Cash Ratio similarly experienced a sharp decrease during the pandemic, with values ranging from 0.01 to 0.22. Encouragingly, the Cash Ratio started to increase in Q1 2023.

2. To identify and analyze any significant differences in Garuda Indonesia's financial performance measures before and during the COVID-19 pandemic.

Based on the results presented in Chapter 4, out of the 8 hypotheses tested related to financial ratios, 2 of them did not demonstrate that the ratios before COVID-19 were better than during the pandemic. These ratios are ROA (Return on Assets) and Collection Period. The results showed that these ratios have a p-value greater than 0.05, indicating a failure to reject the null hypothesis, or in other words, the null hypothesis should be accepted. Statistically, the ROA, and Collection Period ratios before and during the pandemic are either the same or worse.

The analysis of key financial performance ratios, including the ROE, Total Asset Turnover Ratio, Cash Ratio, Current Ratio, Total Equity to Total Asset Ratio, and Debt to Equity Ratio, reveals significant findings. With p-values less than 0.05 for these ratios, the null hypothesis is rejected in favor of the alternative hypothesis. This statistical result indicates that these financial metrics were significantly better before the COVID-19 pandemic than during the period. This suggests that the company's efficiency, liquidity, and overall financial stability were stronger before the pandemic, highlighting the adverse impact of COVID-19 on its financial performance.

3. To assess Garuda Indonesia's financial health before and during the COVID-19 pandemic.

Altman Z-Score analysis from 2016 to 2023 that the overall financial health of Garuda Indonesia has been declining throughout, with a big hit occurring during and before the COVID-19 Pandemic. The company did not manage to build for itself a competitive advantage and remained in high levels of debt which reflected

negatively on its health score. In Q4 2016, for example, the Z-Score is only at a level of -0.451 lower than a strains-quite-low value or 1.23 showing healthiness problems in Garuda Indonesia.

The position further eroded so that by Q4 2021, the Z-Score was a grim -5.762 and remained negative in Q1 2022, but there is an improvement in Garuda Indonesia financially in Q2 2022 with a score 1.176. Overall score of Altman Z-Score is negative scores before and during the pandemic which signals significant financial distress and a high risk of bankruptcy. It demonstrates the acute financial difficulties facing Garuda Indonesia, straining both internal incompetence and external competitiveness.

4. To identify and analyze any significant differences in Garuda Indonesia's financial healthiness measures before and during the COVID-19 pandemic.

With a p-value less than 0.001 from the Wilcoxon test, the likelihood of observing such a severe difference by chance is less than 0.1%, and a one-tailed test further narrows this to a p-value of less than 0.0005, indicating a less than 0.05% chance. Since these p-values are significantly below the significance level of 0.05, the null hypothesis is rejected. This result suggests that the Altman Z-Score was significantly better before COVID-19 than during the pandemic, as evidenced by the Wilcoxon test's results.

5. 2 Research Limitation

The study faces several limitations that should be considered when interpreting its findings. First, reliance on publicly available financial data from Garuda Indonesia could present data accuracy and completeness issues, potentially impacting the analysis. The study's focus on a limited set of financial ratios may not provide a comprehensive view of the company's financial health, as other important metrics like EBIT, Net Profit Margin, or Operating Cash Flow were not included. Additionally, the analysis did not account for external factors such as government policies, industry challenges, or broader economic conditions that may have influenced the company's financial performance during the pandemic.

The short time frame of pandemic data also poses a limitation, as the ongoing impact of COVID-19 on the aviation industry may not be fully captured. The use of the Altman Z-Score, while established, may not perfectly account for the unique challenges faced by the airline industry during this period, potentially limiting the accuracy of the financial distress assessment. Moreover, the findings are specific to Garuda Indonesia and may not be generalizable to other airlines or companies in different industries.

Statistical limitations also play a role in the study's conclusions. The results from the paired T-Test and Wilcoxon Signed Rank T-Test, while appropriate for the data, are subject to the potential for Type I or Type II errors. Additionally, the wide confidence intervals and high standard deviation observed in the Altman Z-Score analysis suggest substantial variability, which may weaken the robustness of the findings. These limitations highlight the need for caution in concluding Garuda Indonesia's financial performance during the COVID-19 pandemic.

5. 3 Recommendation

The financial performance measurement, analysis, and evaluation financial healthiness of Garuda Indonesia discovered that liquidity, solvency, and activity ratio before the COVID-19 pandemic were statistically significantly better than during the COVID-19 pandemic. However, the Altman Z-Score score statistically has no difference before and during COVID-19. To strengthen its financial standing following the pandemic, Garuda Indonesia ought to concentrate on raising its liquidity and solvency ratios. This can be accomplished by cutting back on pointless spending, refinancing debt as needed, and optimizing cash flow management. Enhancing operational effectiveness is also necessary to raise activity ratios, which will help the business remain sustainable over the long run.

Considering the very high DER ratio before the pandemic and the negative equity condition during the pandemic, Garuda Indonesia needs to restructure its debt to ease the liability burden. This could involve renegotiating with creditors to extend payment terms, lower interest rates, or even convert some debt into equity to improve the company's capital structure. A significant decline in Cash Ratio and Current Ratio indicates that the company is facing serious liquidity problems. To

address this, the company may seek short-term funding sources, sell non-productive assets, or pursue capital raising through issuing new shares or seeking strategic investors who can inject fresh funds.

Companies should revisit their ticket pricing policies and sales strategies to ensure that they are competitive yet still able to provide adequate profit margins. This could involve using data analytics to dynamically adjust ticket prices based on market demand. As a state-owned enterprise, Garuda Indonesia may be able to get support from the government to help stabilize its finances, either through special policies, capital injections, or loan facilities with more favorable terms. In addition, entering into strategic partnerships with other airlines or companies could open up opportunities to increase revenue and operational efficiency.

Garuda Indonesia can increase revenue by offering premium services and partnering with third-party companies for travel-related services, such as hotel bookings and car rentals. Garuda Indonesia has to analyze the current route network to identify underperforming routes, explore new routes in high-demand regions, and explore seasonal and charter flights for profitable additions. Garuda Indonesia can boost customer retention and revenue by enhancing its frequent flyer program through exclusive benefits, brand partnerships, and targeted promotions.

Expanding the range of financial measures to include EBIT, Net Profit Margin, and Operating Cash Flow will be crucial for future studies on Garuda Indonesia's financial performance and other studies of a similar nature in the aviation sector. A better context for the financial data will result from including external issues like laws, industry-specific difficulties, and general economic situations. Comparing Garuda Indonesia's performance to other airlines and tailoring financial distress assessment instruments like the Altman Z-Score to the particular difficulties faced by the aviation sector can yield insightful benchmarks. The results will be strengthened by addressing statistical restrictions with a combination of tests and strong models; also, improving data accuracy with new sources will increase the reliability of the findings.

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