

Financial Distress in Transportation and Logistic Companies in Indonesia : Comparative Study of the Covid-19 Pandemic Crisis

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ABSTRACT

Objective: This study aims to analyze the differences in the level of financial distress among transportation and logistics companies in Indonesia between the period during the pandemic Covid-19 (2020-2021) and after the pandemic Covid-19 (2022-2023). **Method:** The research sample consisted of 30 companies that met the criteria using purposive sampling techniques. The method used a quantitative approach with descriptive statistical analysis, normality testing, and a mean difference test. **Results:** The result shows that there is a significant difference between the two periods, with a significant value of $0,034 < 0,05$. The average level of financial distress increased after the pandemic, accompanied by a decrease in standard deviation, indicating improvements and greater stability in the financial condition of companies post-pandemic. **Novelty:** These findings support signaling theory, in which changes in a company's financial condition reflect positive or negative signals to the market and stakeholders.

INTRODUCTION

In 2019, the world was confronted with the emergence of a global pandemic, namely Covid-19. Its rapid spread had a major impact on the stability of various business sectors in Indonesia. The economic sector experienced the most significant impact of the Covid-19 pandemic. The government implemented social activity restrictions aimed at reducing the spread of the Covid-19 virus. However, these restrictions resulted in a reduction of business activities, which in turn led to a decline in Indonesia's economic performance [1]. The economic downturn was evident in the second quarter of 2020, where Indonesia's economic growth dropped to -5.23 percent. This was a sharp decline from the 2.97 percent growth recorded in the second quarter of 2019, and significantly lower than the 5.02 percent growth achieved in 2019 [2].

The transportation and logistics sector has long been regarded as a stable and highly profitable industry. With increasing population and the growing need for efficient distribution of goods, the demand for transportation and logistics services continues to rise. From delivering essential goods to providing passenger transportation services, this sector plays a crucial role in both global and domestic economies. However, Indonesia's current economic instability has heightened the risk for companies in this sector, potentially leading to financial difficulties or even bankruptcy [3]. A company's financial condition often reflects the overall economic health of a country, making the transportation and logistics sector a key pillar in supporting economic activities and effective distribution systems [4]. In many countries, including Indonesia, transportation

and logistics companies continue to grow and attract investors seeking to increase the value of their investments. This sector contributes significantly to economic growth, especially in the transportation of goods and services that support the manufacturing and trade sectors. Nevertheless, it also faces major challenges, especially due to the crisis triggered by the Covid-19 pandemic, which disrupted supply chains, hindered deliveries, and caused a significant drop in passenger volumes, particularly in the air and sea transport segments [5].

The transportation and logistics industry was one of the sectors most affected by the Covid-19 pandemic. Social restrictions and travel limitations led to a drastic decline in passenger transport demand, while logistical challenges increased due to disruptions in global supply chains. According to data from Statistics Indonesia (BPS), the country faced significant economic challenges in 2020, with an economic growth rate of -2.07%. Many companies, especially those in the transportation and logistics sector, struggled to maintain financial and operational stability. The Indonesian Transportation Companies Association (APTI) reported that during the first quarter of 2020, the sector experienced a significant decline, characterized by reduced freight volume and a sharp drop in passenger numbers. This decline was particularly severe in the air and sea transportation sectors, while goods logistics also faced distribution obstacles due to the closure of several international trade routes [6].

The Covid-19 pandemic, which affected Indonesia from 2020 to 2021, significantly impacted various economic sectors, including transportation and logistics. Large-scale social restrictions (PSBB) and reduced public mobility resulted in a sharp decrease in operational activities, which affected the financial condition of companies in this sector. Many companies experienced liquidity pressures and declining profitability, placing them at risk of financial distress. Entering the 2022–2023 period, Indonesia began transitioning into the new normal era, marked by relaxed restrictions and increased economic activity. According to the Head of the Covid-19 Task Force of the Indonesian Medical Association (IDI), Dr. Erlina Burhan, conditions in early 2023 had approached pre-pandemic levels. This recovery was supported by strong economic growth, with the World Bank reporting a 5.2% growth rate in 2022, driven by the reopening of the economy after Covid-19 [7].

The Covid-19 pandemic not only affected public health but also significantly influenced economic growth. Changes in economic conditions impacted company activities and performance. Companies unable to manage resources and performance effectively faced competitive disadvantages, which could lead to losses and ultimately financial distress [5]. This condition can also affect investor confidence and the company's ability to maintain operational and financial stability in the future. Furthermore, financial distress may affect a company's capacity to meet financial obligations such as debt payments and operational expenses [8].

Financial distress became one of the major challenges for transportation and logistics companies during the pandemic. This situation arises when a company is unable to meet its financial obligations, potentially leading to bankruptcy [9]. Other studies

indicate that financial distress can be measured using certain financial ratios, such as the debt-to-equity ratio and liquidity ratios. Failure to meet these obligations increases bankruptcy or liquidity risk. During the pandemic, many transportation and logistics companies were forced to reduce shipment volumes, temporarily halt operations, and downsize their workforce—all contributing to more severe financial distress [10]. Other research also shows significant differences in financial distress levels and financial performance of transportation and logistics companies in Indonesia during and after the Covid-19 pandemic. Researchers found declining values during the pandemic, indicating increased bankruptcy risk and worsening financial performance. Many companies—especially those involved in freight and logistics services—experienced financial difficulties due to declining revenues, high operational costs, and market uncertainty driven by restrictions and economic fluctuations [11].

The transportation and logistics sector became one of the industries most affected by the Covid-19 pandemic. High operational costs and decreasing demand forced many companies in this sector to struggle for survival. Data from the Indonesian Logistics Association (ALI) shows that many transportation and logistics companies experienced declining revenues during the pandemic [12]. Companies unable to adapt to changing consumer behavior and evolving business models—such as shifting to technology-based delivery and digital logistics management—faced higher risks of financial distress. This condition not only affects company sustainability but also has the potential to hinder national economic recovery. In recent years, transportation and logistics companies in Indonesia have faced major challenges, both economic and non-economic. The Covid-19 pandemic became one of the most significant crises, disrupting not only public health but also creating substantial economic impacts. The pandemic caused a slowdown in the global economy, reducing demand, disrupting supply chains, and lowering operational capacity across industries [13]. Research also indicates that companies with weak capital structures are more vulnerable to financial distress. Meanwhile, other studies reveal that liquidity variables, measured by the current ratio, do not have a significant negative impact but instead show a significantly positive influence on financial distress in transportation and logistics companies [14].

This research is grounded in signaling theory, which connects information about a company's financial health with communication to stakeholders. Improving financial distress conditions encourage companies to send positive signals to stakeholders, whereas worsening financial distress makes these signals important in supporting decision-making processes [15]. Other studies reveal that when companies face financial distress and uncertain future prospects, managers tend to apply conservative accounting policies to send signals to external parties [16]. This study is a replication of previous research titled *Financial Distress in Indonesian Banking: A Comparative Study of the 2008 Global Crisis and the Covid-19 Pandemic*. The earlier study focused on the banking sector and analyzed the impact of the 2008 global crisis and the Covid-19 pandemic on financial distress [17]. This replication includes several key differences. First, it shifts the focus from the banking sector to the transportation and logistics sector, allowing examination

of whether the Covid-19 crisis shows similar or different patterns in a more operationally oriented industry. Second, it focuses solely on the Covid-19 pandemic without discussing the 2008 global crisis. Third, unlike the previous study, which used the Grover Score, this research uses the Altman Z-Score as the independent variable to identify potential financial distress caused by the Covid-19 pandemic, as the Altman model is considered more accurate than other methods [18]. The transportation and logistics sector was chosen because it remained essential during the pandemic to ensure smooth distribution of goods and services, making it highly relevant for analysis. By comparing financial distress conditions during and after the pandemic, this study aims to determine whether significant differences exist between the two periods. The findings are expected to provide guidance for stakeholders, including company management, regulators, and the government, in making strategic decisions to maintain the stability of the transportation and logistics sector and the overall Indonesian economy [19].

Hypothesis Development

Financial Distress in Transportation and Logistics Companies During and After the Covid-19 Crisis

Before the Covid-19 pandemic, many companies in the transportation and logistics sector faced challenges in maintaining cash flow stability and sustaining profitability. Data from Statistics Indonesia (BPS) shows that in 2019, the transportation and logistics sector demonstrated stable growth and contributed significantly to the national Gross Domestic Product (GDP). Although the sector experienced positive growth in that year, financial pressures began to emerge as several companies faced a decline in demand for transportation services due to cost-efficiency measures from service users, along with rising operational expenses such as fuel and fleet maintenance [20].

Previous studies reveal that companies with weak capital structures tend to be more vulnerable to financial distress. The analysis indicates that transportation and logistics companies that rely heavily on short-term debt to meet operational needs face a higher risk of financial difficulty, especially during market fluctuations [21]. These findings are consistent with other research examining the relationship between capital structure and financial distress in Indonesia, which shows that transportation and logistics companies are highly sensitive to changes in economic conditions. Firms with high leverage are more likely to experience financial distress, which can lead to declining profitability and threaten long-term operational stability [22].

Contingency theory states that the severity of financial pressure experienced by a company can influence its earnings management strategy. Such strategies may be executed through two approaches: accrual-based earnings management and real earnings management. During the Covid-19 pandemic, accrual-based earnings management was considered more suitable, as it is generally less costly and easier to implement than real earnings management [23].

Other studies also indicate that the liquidity variable, measured by the current ratio, does not have a significant negative influence but instead shows a significant positive relationship with financial distress in manufacturing companies. Meanwhile, leverage

has also been found to have a significant positive effect on financial distress in manufacturing firms [24].

Signaling Theory, in the context of financial distress during the pandemic, explains how companies communicate information to external parties—such as investors and creditors—regarding their financial condition. The theory emphasizes efforts made by companies to send signals that reflect stability or resilience amid financial pressure. Based on the discussion above, the following hypothesis is proposed [15]:

H1: There is a significant difference in financial distress among transportation and logistics companies during the pandemic and after the Covid-19 crisis.

Conceptual Framework

The following figure presents the conceptual framework of the study titled: *Financial Distress in Transportation and Logistics Companies in Indonesia: A Comparative Study of the Covid-19 Crisis Period*.

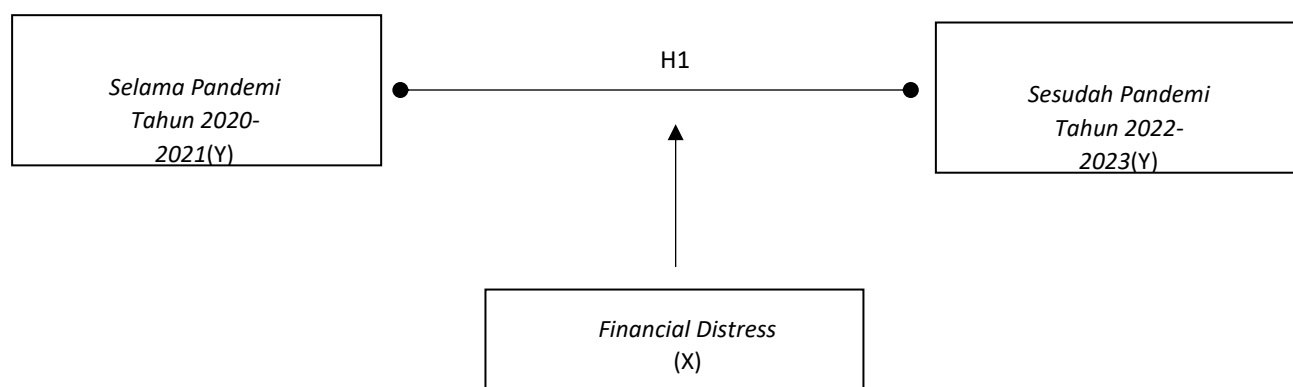


Figure 1. Conceptual Framework.

RESEARCH METHOD

The method used in this study is a descriptive method with a quantitative approach. The quantitative approach is a research method that involves numerical data to test hypotheses, identify patterns, and analyze relationships between variables. The analysis is carried out using statistical methods to test the predetermined hypotheses [23]. This descriptive research refers to a comparative study designed to compare the financial distress conditions of transportation and logistics companies during the Covid-19 pandemic and after the Covid-19 pandemic. The data used in this study are secondary data obtained from the official website of the Indonesia Stock Exchange (IDX) [18].

According to previous research, a population is defined as the entire set of objects or subjects that possess specific characteristics and qualities determined by the researcher to be studied and analyzed in order to draw conclusions. The population in this research consists of all transportation and logistics companies listed on the Indonesia Stock Exchange [25]. The sample represents a portion of the population selected to represent the whole. Samples are used to collect data that will later be analyzed to draw conclusions applicable to the entire population. This study uses a purposive sampling method, which

selects samples based on specific criteria. The sampling criteria used in this research are as follows [26]:

1. Transportation and logistics companies listed on the Indonesia Stock Exchange in 2020–2021 (during Covid-19) and 2022–2023 (after Covid-19).
2. Transportation and logistics companies that consistently publish annual financial reports on the Indonesia Stock Exchange during 2020–2021 and 2022–2023.
3. Transportation and logistics companies that have complete and consecutive financial report data.

Tabel 1. Sampel Criteria.

Criteria	Amount	
	During 2020-2021	After 2022-2023
Transportation and Logistics Companies Listed on the Indonesia Stock Exchange	37	37
Sampel Criteria:		
1. Companies that do not publish financial statements consecutively.	(7)	(7)
Number of sampel	30	30
Sampel years	2x	2x
Total sampel	60	60
Final total sampel		120

Tabel 2. List of Transportation and Logistics Company Samples.

No	Company Code	Company Name
1	AKSI	Mineral Sumberdaya Mandiri Tbk
2	ASSA	Adi Sarana Armada Tbk
3	BIRD	Blue Bird Tbk.
4	BLTA	Berlian Laju Tanker Tbk
5	CMPP	AirAsia Indonesia Tbk.
6	GIAA	Garuda Indonesia (Persero) Tbk
7	IMJS	Indomobil Multi Jasa Tbk.
8	LRNA	Eka Sari Lorena Transport Tbk.
9	MIRA	Mitra International Resources
10	MITI	Mitra Investindo Tbk.
11	NELY	Pelayaran Nelly Dwi Putri Tbk.
12	SAFE	Steady Safe Tbk
13	SDMU	Sidomulyo Selaras Tbk.
14	SMDR	Samudera Indonesia Tbk.
15	TAXI	Express Transindo Utama Tbk.
16	TMAS	Temas Tbk.
17	WEHA	Weha Transportasi Indonesia Tb
18	HELI	Jaya Trishindo Tbk.
19	TRUK	Guna Timur Raya Tbk.

20	TNCA	Trimuda Nuansa Citra Tbk.
21	BPTR	Batavia Prosperindo Trans Tbk.
22	SAPX	Satria Antaran Prima Tbk.
23	JAYA	Armada Berjaya Trans Tbk.
24	KJEN	Krida Jaringan Nusantara Tbk.
25	PURA	Putra Rajawali Kencana Tbk.
26	PPGL	Prima Globalindo Logistik Tbk.
27	TRJA	Transkon Jaya Tbk.
28	HAIS	Hasnur Internasional Shipping
29	LAJU	Jasa Berdikari Logistics Tbk.
30	DEAL	Dewata Freightinternational Tb

Operational Definition / Variable Measurement

Financial Distress

Financial distress is a condition in which a company's financial position becomes unstable or experiences a crisis, representing an early stage before bankruptcy. Financial difficulties occur when a company is unable to meet its financial obligations, which may result in delays in the timely presentation of financial statements and potentially reduce the quality of financial reporting. *Financial distress* has a significant impact on the timeliness of financial statement publication [26].

In this study, the financial distress variable is measured using the *Altman Z-Score* model. The formula for the *Altman Z-Score* is as follows:

$$Z = 1,2 X1 + 1,4 X2 + 3,3 X3 + 0,6 X4 + 1,0 X5$$

Where:

Z = Bankruptcy Index

X1 = Working Capital / Total Assets

X2 = Retained Earnings / Total Assets

X3 = Earnings Before Interest and Taxes / Total Assets

X4 = Book Value of Equity / Total Liabilities

X5 = Sales / Total Assets

Classification of Companies Based on the Altman Z-Score

The classification of company performance according to the Altman Z-Score model is as follows:

a) Distress Zone (Z-Score < 1.22)

A situation in which a company faces a high risk of bankruptcy. In this condition, management must be alert and immediately take corrective actions to address existing problems so that the risk of bankruptcy can be avoided.

b) Grey Zone ($1.22 \leq \text{Z-Score} \leq 2.90$)

A situation in which a company is in an uncertain condition, where it cannot be clearly classified as either healthy or prone to bankruptcy. If management is able to handle the situation properly, the risk of financial distress can be minimized.

Conversely, delayed corrective policies may increase the likelihood of financial distress.

c) Safe Zone (Z-Score > 2.90)

A situation in which the company's finances are stable and the risk of bankruptcy is very low.

Data Analysis Procedure

The data analysis procedures used in this study include [26]:

1. Descriptive Statistics Test Used to describe data based on the mean, standard deviation, variance, maximum, and minimum values.
2. Normality Test Used to determine whether the data come from a normally distributed population. If the significance (p-value) is greater than 0.05, the data are considered normally distributed.
3. Mean Difference Test (t-Test) A statistical method used to compare the mean values of two groups to determine whether a significant difference exists. If Sig. (2-tailed) < 0.05, there is a significant difference between the financial distress data during and after the Covid-19 pandemic. If Sig. (2-tailed) > 0.05, there is no significant difference.

RESULTS AND DISCUSSION

After calculating the financial ratio values using the Altman Z-Score method, and then computing these ratios based on the formula and criteria of the Altman Z-Score, the financial condition results of transportation and logistics sector companies are presented in Table 3.

Table 3. Calculation Results of Z-Score and Financial Condition of Companies.

Emiten	Tahun	X1	X2	X3	X4	X5	Z-Score	Keterangan
AKSI	2020	0,2018	0,0143	0,6300	0,3332	1,7489	2,9280	Safe
	2021	0,2873	0,1229	1,0556	0,5400	1,7379	3,7435	Safe
	2022	0,1970	0,1796	0,9894	0,5657	1,3222	3,2539	Safe
	2023	0,1873	0,0513	0,5987	0,8510	1,3427	3,0310	Safe
ASSA	2020	-0,1878	0,0173	0,5042	0,2314	0,5874	1,1526	Grey
	2021	-0,0241	0,0370	0,5781	0,2483	0,8435	1,6829	Grey
	2022	-0,0408	0,0007	0,4912	0,3090	0,8076	1,5678	Grey
	2023	-0,0105	0,0127	0,3823	0,3470	0,4773	1,2087	Grey
BIRD	2020	0,0996	-0,0315	0,1522	1,5570	0,2822	2,0594	Grey
	2021	0,1458	0,0019	0,2471	2,1292	0,3366	2,8605	Grey
	2022	0,1349	0,0554	0,3642	2,2237	0,3755	3,1536	Safe
	2023	0,0984	0,0855	0,6113	1,7338	0,5834	3,1124	Safe
BLTA	2020	-0,1131	-0,0173	0,2471	0,4398	0,2771	0,8336	Distress
	2021	0,0595	0,1172	0,2201	0,5030	0,2795	1,1793	Distress
	2022	0,0259	0,1652	0,2919	0,6404	0,3076	1,4310	Grey
	2023	0,1550	0,2363	0,4966	0,9763	0,4202	2,2843	Grey
CMPP	2020	-0,9442	-0,6342	-1,6659	-0,1942	0,2649	-3,1737	Distress
	2021	-1,5000	-0,6357	-1,0695	-0,3016	0,1216	-3,3852	Distress
	2022	-1,6055	-0,4304	0,8105	-0,3359	0,7057	-0,8556	Distress

	2023	-1,6179	-0,2474	-0,5741	-0,3382	1,0832	-1,6944	Distress
GIAA	2020	-0,4188	-0,3223	-0,7946	-0,0918	0,1384	-1,4891	Distress
	2021	-1,1301	-1,1143	-2,8113	-0,3153	0,1637	-5,2074	Distress
	2022	-0,1693	0,8301	2,0731	-0,1185	0,1856	2,8009	Grey
	2023	-0,0914	0,0525	0,1150	-0,0958	0,4360	0,4163	Distress
IMJS	2020	-0,0686	0,0009	0,0645	0,1079	0,0489	0,1537	Distress
	2021	-0,0876	-0,0046	0,1873	0,1094	0,1634	0,3680	Distress
	2022	-0,1665	0,0048	0,2439	0,1179	0,1792	0,3792	Distress
	2023	-0,0378	0,0029	0,1821	0,1186	0,1334	0,3992	Distress
LRNA	2020	-0,0216	-0,2227	-0,1154	2,5002	0,2405	2,3810	Grey
	2021	0,0006	-0,1561	-0,0217	2,4358	0,2933	2,5519	Grey
	2022	-0,0321	-0,1328	0,1012	1,8969	0,4143	2,2476	Grey
	2023	0,0110	-0,0030	0,2351	3,5250	0,2591	4,0271	Safe
MIRA	2020	0,0305	-0,0805	-0,0052	1,2708	0,2743	1,4900	Grey
	2021	0,0194	-0,0613	-0,0639	1,2411	0,2839	1,4193	Grey
	2022	-0,1793	-0,0216	0,0005	1,0892	0,3150	1,2038	Grey
	2023	-0,0658	-0,0134	0,0009	1,1910	0,0742	1,1870	Distress
MITI	2020	-0,6235	0,2048	1,3524	-0,1473	0,6659	1,4523	Grey
	2021	0,1636	0,0821	0,4255	4,6064	0,2944	5,5721	Safe
	2022	0,3384	0,0452	0,2891	2,9172	0,2566	3,8465	Safe
	2023	0,4245	0,1355	0,7412	4,4249	0,6203	6,3465	Safe
NELY	2020	0,2632	0,1083	0,4398	4,3183	0,4061	5,5355	Safe
	2021	0,1602	0,1302	0,4154	4,8498	0,3606	5,9161	Safe
	2022	0,2017	0,0837	0,2552	5,0303	0,1756	5,7464	Safe
	2023	0,1460	0,0894	0,2467	4,4260	0,1437	5,0517	Safe
SAFE	2020	-0,6201	-0,0764	0,3809	-0,1057	0,4469	0,0255	Distress
	2021	-1,1927	0,0037	0,5804	-0,1116	0,5394	-0,1808	Distress
	2022	-0,7882	0,0530	0,7996	-0,1055	0,9350	0,8940	Distress
	2023	-1,0849	0,0392	0,2403	-0,0833	0,2895	-0,5992	Distress
SDMU	2020	-0,6665	-0,3421	-0,1132	0,0274	0,5024	-0,5920	Distress
	2021	-0,7897	-0,0806	0,3632	-0,0066	0,4883	-0,0254	Distress
	2022	-0,0313	0,0262	0,5443	0,0144	0,5671	1,1206	Distress
	2023	-0,4277	0,3002	0,7621	0,1953	0,6170	1,4469	Grey
SMDR	2020	0,1191	-0,0057	0,3817	0,4359	0,8562	1,7872	Grey
	2021	0,5778	0,2350	0,7550	0,5110	0,8108	2,8897	Grey
	2022	0,3462	0,3188	0,8885	0,7660	0,7386	3,0581	Safe
	2023	0,3269	0,1226	0,4033	0,7218	0,6141	2,1887	Grey
TAXI	2020	-2,0851	-0,3062	-1,0022	-0,4088	0,0885	-3,7139	Distress
	2021	0,9267	2,9005	-0,5512	3,0484	0,0798	6,4041	Safe
	2022	0,9650	-0,2855	-0,2569	3,1597	0,0403	3,6227	Safe
	2023	0,9772	-0,0240	-0,0352	2,9780	0,0170	3,9131	Safe
TMAS	2020	-0,1541	0,0191	0,3616	0,2767	0,6957	1,1990	Distress
	2021	0,0419	0,2410	0,5954	0,3687	0,8318	2,0787	Grey
	2022	0,2097	0,4495	1,3226	0,6130	1,1076	3,7024	Safe
	2023	0,2280	0,1067	0,2759	1,0432	0,2742	1,9280	Grey
WEHA	2020	-0,1057	-0,2130	-0,0218	0,6881	0,3192	0,6668	Distress
	2021	-0,0927	-0,0606	0,4642	0,5712	0,4200	1,3021	Grey
	2022	0,0660	0,0957	0,8839	1,2440	0,6290	2,9187	Safe
	2023	-0,0151	0,0206	0,2016	1,1068	0,1563	1,4702	Grey
HELI	2020	0,0488	0,0276	0,3187	0,3893	0,4284	1,2128	Grey

	2021	0,0110	0,0160	0,2410	0,5283	0,2103	1,0066	Distress
	2022	-0,3158	-0,5314	-0,1152	0,1916	0,1964	-0,5745	Distress
	2023	-0,5989	-0,0045	0,0795	0,2237	0,3376	0,0374	Distress
TRUK	2020	-0,0786	-0,1502	0,1010	1,6819	0,4973	2,0514	Grey
	2021	-0,0624	-0,0899	0,2223	1,9490	0,5161	2,5351	Grey
	2022	-0,0307	-0,0843	0,2828	1,9895	0,5479	2,7052	Grey
	2023	0,0254	-0,0742	0,3882	2,1481	0,6632	3,1507	Safe
	2020	0,3465	-0,0928	1,0969	2,9454	1,4315	5,7275	Safe
TNCA	2021	0,3356	0,0312	1,2575	2,1845	1,4561	5,2649	Safe
	2022	0,3427	0,0191	1,1561	2,4356	1,3546	5,3081	Safe
	2023	0,3339	0,0115	0,9705	2,7405	1,2794	5,3358	Safe
BPTR	2020	-0,2636	0,0963	0,3623	0,4319	0,3025	0,9293	Distress
	2021	-0,1597	0,0195	0,3299	0,2567	0,2596	0,7060	Distress
	2022	-0,1413	0,0204	0,3391	0,1640	0,2685	0,6507	Distress
SAPX	2023	-0,0809	0,1034	0,3303	0,2925	0,2888	0,9341	Distress
	2020	0,6199	0,2085	2,5855	1,1429	2,1462	6,7030	Safe
	2021	0,6113	0,2498	2,6258	1,2159	2,3504	7,0532	Safe
	2022	0,5250	0,0047	2,2841	1,2625	2,3694	6,4456	Safe
	2023	0,4095	0,0050	1,5423	0,7222	1,9194	4,5984	Safe
JAYA	2020	0,1230	0,0516	0,7836	2,5909	0,7965	4,3455	Safe
	2021	0,4709	0,0653	0,6044	5,6372	0,5939	7,3717	Safe
	2022	0,3683	0,0462	0,5692	4,9837	0,6023	6,5697	Safe
	2023	0,1560	0,0859	0,5456	1,6178	0,5086	2,9139	Safe
KJEN	2020	0,0896	-0,0322	0,3152	4,1828	0,1799	4,7353	Safe
	2021	0,0838	-0,0373	0,2166	5,4138	0,1222	5,7990	Safe
	2022	0,0832	-0,0019	0,2450	6,4338	0,1239	6,8840	Safe
	2023	0,0829	0,0005	0,2333	8,8261	0,1171	9,2598	Safe
PURA	2020	0,1497	0,0209	0,1406	5,8278	0,2116	6,3506	Safe
	2021	0,1317	0,0239	0,1571	6,5848	0,2456	7,1431	Safe
	2022	0,0779	0,0160	0,1114	3,9905	0,2210	4,4168	Safe
	2023	0,0832	0,0101	0,1378	3,6611	0,3330	4,2252	Safe
PPGL	2020	0,2450	0,0736	0,8962	1,1741	1,0617	3,4506	Safe
	2021	0,4461	0,1745	1,1961	1,9396	1,5879	5,3442	Safe
	2022	0,4358	0,1617	1,2197	2,4934	1,6446	5,9551	Safe
	2023	0,2696	0,1227	0,9404	1,6469	0,9260	3,9055	Safe
TRJA	2020	-0,1757	0,0886	0,9660	0,5143	0,6646	2,0578	Grey
	2021	-0,0383	0,0996	0,8641	0,5919	0,6229	2,1402	Grey
	2022	-0,0095	0,0585	0,7303	0,4014	0,5530	1,7337	Grey
	2023	-0,2295	0,0190	0,6616	0,2901	0,5481	1,2893	Grey
HAIS	2020	0,1212	0,0689	0,5610	1,1549	0,8202	2,7261	Grey
	2021	0,3332	0,0912	0,5229	2,4736	0,7968	4,2178	Safe
	2022	0,3160	0,2488	1,0056	2,8267	1,1952	5,5923	Safe
	2023	0,2260	0,2411	0,9339	1,6094	1,0300	4,0404	Safe
LAJU	2020	-0,0920	0,0754	0,6590	0,2806	0,8317	1,7547	Grey
	2021	-0,1087	0,1113	0,8599	0,4228	1,1239	2,4092	Grey
	2022	0,0040	0,1423	1,0123	0,5223	1,2302	2,9112	Safe
	2023	0,3004	0,0987	0,7128	1,4772	0,9196	3,5086	Safe
DEAL	2020	-0,1786	-0,2512	-0,1232	0,2201	0,2925	-0,0404	Distress
	2021	-0,4248	-0,2335	-0,0613	-0,1022	0,5051	-0,3167	Distress
	2022	-0,3074	-0,1145	0,3562	-0,1374	0,5678	0,3647	Distress

2023	-0,3888	-0,0887	0,0420	-0,1647	0,2211	-0,3791	Distress
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Based on the Altman Z-Score calculations for 30 transportation and logistics companies in Indonesia during the 2020–2023 period, it is known that the financial distress conditions in this sector show considerable variation among companies. The analysis results indicate that most companies experienced recovery after the pandemic, particularly starting in 2022 and 2023, which marked the beginning of the new normal era.

Companies that consistently remained in the distress zone for four consecutive years include PT AirAsia Indonesia Tbk, PT Batavia Prosperindo Trans Tbk, PT Steady Safe Tbk, and PT Indomobil Multi Jasa Tbk. In addition, companies such as PT Sidomulyo Selaras Tbk also showed distress conditions for three consecutive years and only moved into the grey zone in 2023.

Several companies were in the grey zone, reflecting uncertainty in their financial condition. Examples include PT Adi Sarana Armada Tbk, PT Berlian Laju Tanker Tbk, and PT Mitra International Resources Tbk, which were unable to consistently maintain Z-Score values within the safe zone. This indicates that although these companies are not at high risk of bankruptcy, they still require structural improvements in efficiency and profitability.

Conversely, companies such as PT Mineral Sumberdaya Mandiri Tbk, PT Blue Bird Tbk, PT Satria Antarana Prima Tbk, PT Armada Berjaya Trans Tbk, and PT Trimuda Nuansa Citra Tbk consistently remained in the safe zone with Z-Score > 2.9. Some companies previously in the grey or distress zones also showed significant recovery, such as PT Garuda Indonesia Tbk, which increased sharply in 2022, although it declined again in 2023.

Descriptive Statistics

Table 4. Descriptive Statistics Results.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Selama covid 2020-2021	60	-52074.00	73717.00	22533.0500	27740.16627
Sesudah covid 2022-2023	60	-16944.00	92598.00	27931.9500	22236.55065
Valid N (listwise)	60				

Source: SPSS Output version 23

Table 4 describes the descriptive statistics for each variable used in the study. The descriptive statistics explain the minimum, maximum, range, and standard deviation of each research variable. Based on the descriptive statistical test results in the table, the Y variable (during COVID-19, 2020–2021) has a minimum value of -52074.00 and a maximum value of 73717.00, resulting in a mean value of 22533.0500 with a standard deviation of 27740.16627. The Y variable (after COVID-19, 2022–2023) has a minimum value of -16944.00 and a maximum value of 92598.00, resulting in a mean value of 27931.9500 with a standard deviation of 22236.55065.

Normality Test

Table 5. Normality Test Results.

			During covid 2020-2021	After covid 2022-2023
N			60	60
Normal Parameters ^{a,b}	Mean		22533.0500	27931.9500
	Std.		27740.16627	22236.55065
	Deviation			
Most	Extreme	Absolute	.104	.076
Differences		Positive	.104	.076
		Negative	-.078	-.038
Test Statistic			.104	.076
Asymp. Sig. (2-tailed)			.170 ^c	.200 ^{c,d}

Source: SPSS Output version 23

The normality test was conducted to determine whether the data are normally distributed or not. Based on the table above, it is known that the significance value of *financial distress* during COVID-19 in 2020–2021 is 0.170, which means > 0.05 , and the significance value of *financial distress* after COVID-19 in 2022–2023 is 0.200, which also means > 0.05 . From these significance values, it can be concluded that the financial distress variables during COVID-19 in 2020–2021 and after COVID-19 in 2022–2023 are normally distributed.

Mean Difference Test

The hypothesis test conducted in this study is the mean difference test. This hypothesis test is performed to answer the research hypothesis. The researcher used the Mean Difference Test to determine the differences that emerged during COVID-19 and after COVID-19. The test results, processed using SPSS version 23, are as follows:

Table 6. Mean Difference Test Results.

		Paired Differences	t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference			
		Upper			
Pair 1	selama - sesudah	-436.23196	-2.177	59	.034

Source: SPSS Output version 23

Based on the results of the paired t-test, the significance value obtained is $0.034 < 0.05$, which indicates that there is a significant difference between the conditions during and after the Covid-19 pandemic. Thus, it can be concluded that the pandemic had a real impact on the variable being studied.

Discussion

Based on the descriptive statistical results presented in Table 4, it can be seen that the average *financial distress* value of the companies during the COVID-19 pandemic in

2020–2021 was 22,533.05 with a standard deviation of 27,740.17. This value indicates considerable fluctuations in the financial condition of transportation and logistics companies during the pandemic period, as reflected by the minimum value of -52,074 and a maximum of 73,717. Meanwhile, in the post-pandemic period (2022–2023), the average *financial distress* value increased to 27,931.95 with a lower standard deviation of 22,236.55. This increase suggests an improvement in the financial condition of companies after passing the pandemic crisis, although some companies still experienced financial pressure (minimum value -16,944) [27]. The improvement is likely due to the recovery of economic activity, increased demand for transportation and logistics services, and operational efficiency measures implemented after the pandemic. The decline in standard deviation also indicates that differences in financial conditions among companies became smaller, reflecting greater industry stability after being affected during the pandemic [28].

Furthermore, the normality test results in Table 5 show that the data for both periods—during and after the pandemic—are normally distributed, with significance values of 0.170 and 0.200 (> 0.05). Thus, the data meet one of the basic assumptions required to conduct the mean difference test [29].

Based on the mean difference test results in Table 6, the value obtained is $t = -2.177$ with degrees of freedom ($df = 59$) and a significance level (Sig. 2-tailed) of 0.034. Since this value is smaller than 0.05, it can be concluded that there is a statistically significant difference between the conditions during and after the COVID-19 pandemic. The mean difference between the two samples is -436.23, indicating that the average value in the post-pandemic period is higher than during the pandemic. The negative sign reflects that the average values during the pandemic were lower. This indicates an improvement in the measured variable.

These findings align with the fact that mobility restrictions during the pandemic significantly reduced transportation activity, while post-pandemic normalization policies allowed these activities to recover. Thus, the results support the alternative hypothesis (H1) stating that there is a significant change in the variable observed as a result of changing pandemic conditions, and reject the null hypothesis (H0), which states that no difference exists.

Practically, these results illustrate that the post-pandemic period offered real recovery opportunities for transportation companies. These findings can serve as a basis for evaluating policies and strategies for business recovery in this sector, especially in responding to crises like the pandemic in the future [9]. The results are also consistent with previous studies conducted by other researchers [30], [31], and [32], which likewise found significant differences, thereby supporting the acceptance of H1.

This study is also supported by signaling theory, which states that companies send either positive or negative signals to the market through their financial reports. During the pandemic, the increase in *financial distress* reflected a negative signal about a company's ability to maintain business continuity [33]. Conversely, improvements in financial conditions after the pandemic represent positive signals to investors, creditors,

and other stakeholders, indicating better prospects and the ability to survive and recover. Thus, changes in *financial distress* not only reflect internal conditions but also function as external communication tools in facing market uncertainty [34].

Overall, the results strengthen the conclusion that the COVID-19 pandemic had a significant impact on the financial condition of transportation and logistics companies, but also highlight the potential for recovery and adaptation undertaken in the post-pandemic period. Factors such as economic recovery policies, increased logistics volume, and digital adaptation likely contributed to this recovery [28].

Research Findings

This study presents several findings. At the peak of the pandemic in 2020 and 2021, most companies were in the distress zone, reflecting financial pressure caused by mobility restrictions and supply chain disruptions. Companies that consistently remained in the distress zone during the pandemic include PT AirAsia Indonesia Tbk (CMPP), PT Garuda Indonesia (Persero) Tbk (GIAA), PT Steady Safe Tbk (SAFE), PT Sidomulyo Selaras Tbk (SDMU), and PT Dewata Freightinternational Tbk (DEAL). However, there was significant improvement in 2022 and 2023, as several companies managed to shift from the distress zone to the grey zone or even the safe zone. For example, PT Garuda Indonesia (GIAA) rose sharply from a negative Z-Score of -5.2074 in 2021 to 2.8009 in 2022, nearing the safe zone. PT Sidomulyo Selaras (SDMU) also improved from -0.0254 in 2021 to 1.1206 in 2022 and further to 1.4469 in 2023, indicating a shift from distress to grey zone.

On the other hand, some companies showed financial resilience during the pandemic and consistently remained in the safe zone, such as PT Satria Antaran Prima Tbk (SAPX), PT Trimuda Nuansa Citra Tbk (TNCA), and PT Putra Rajawali Kencana Tbk (PURA), each maintaining scores above 2.9 from 2020 to 2023. Meanwhile, several others, such as PT Blue Bird Tbk (BIRD) and PT Jasa Berdikari Logistics Tbk (LAJU), demonstrated stable improvement and moved from the grey zone to the safe zone after the pandemic.

These findings indicate that financial recovery in the transportation and logistics sector has been uneven. Some companies were able to adapt and improve their financial structure, while others remained in financial distress even after the pandemic had subsided. Therefore, it is important for companies to continue implementing innovation and operational efficiency to maintain financial health in facing similar crises in the future.

A comparison of Z-Scores between the pandemic years (2020–2021) and the new normal period (2022–2023) shows improvement in many companies. For instance, PT Jaya Trishindo Tbk (HELI) and PT Express Transindo Utama Tbk (TAXI) managed to move from the distress zone to the safe zone within two years, reflecting successful restructuring and operational efficiency. Overall, the number of companies classified in the safe zone in 2022 and 2023 increased compared to the previous two years.

CONCLUSION

Fundamental Finding : Based on the results of data analysis and discussion that have been carried out, it can be concluded that there are significant differences in the level of financial distress in transportation and logistics companies between the period during the Covid-19 pandemic in 2020-2021 and after the pandemic in 2022-2023. The Paired T-Test results show a significance value of 0.034 which is smaller than the significance level of 0.05, so the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. This finding indicates that the Covid-19 pandemic had a real impact on the financial condition of companies. The average financial distress value increased after the pandemic, indicating an improvement in the financial condition of companies after the crisis. In addition, the decrease in standard deviation between the two periods also reflects better stability in the transportation and logistics sector after the pandemic. This improvement is likely driven by the recovery of economic activity, increased logistics volume, and efficiency and digitalization measures implemented by companies in responding to post-pandemic challenges. **Implication :** The results of this study are in line with signaling theory, where the financial condition of a company can be an external communication tool to show the company's prospects and performance to investors and other stakeholders. During the pandemic, declining financial conditions became a negative signal, while after the pandemic the improvement became a positive signal of the company's ability to survive and recover. **Limitation :** The limitation of this study is secondary data; the data used comes from public financial statements which may have limitations in terms of completeness or accuracy, especially for companies that are not fully transparent. **Future Research :** Based on the research that has been carried out and the conclusion, the researcher provides suggestions regarding the use of different financial distress calculation models or the use of different financial ratios from this study, in order to identify from another perspective the influence of a crisis on financial distress. The researcher also suggests using a longer longitudinal approach and including additional variables such as specific financial ratios or external macroeconomic factors to obtain a more comprehensive understanding of the dynamics of financial distress in this sector.

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