



# A Study On Financial Distress Using Altman's Z Score Model For Selected Public Listed Manufacturing Engineering Msmes Of India

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## ABSTRACT

In the pursuit of understanding financial distress within the context of Micro, Small, and Medium Enterprises (MSMEs) in India, this research paper utilizes Altman's Z-Score Model to analyze the financial health of selected public listed manufacturing engineering MSMEs for the financial year 2023-24. Financial distress, explains a company's inability to meet its financial obligations, it has been widely studied and researched topic across the world, as highlighted in the literature. This study aims to contribute to this body of knowledge by applying a robust analytical approach, using secondary data from 31 MSMEs, to evaluate the extent of financial distress and its implications. By analyzing financial ratios through the Z-Score model, this research provides insights into the financial stability of these enterprises and potentially identifying risks of bankruptcy. The study explains that most of the micro and small enterprises are under financial distress zone, few medium enterprises are in grey zone and out of total 31 industries only 3 medium enterprises were in safe zone.

**KEYWORD:** Financial Performance, Altman's Z Score, MSME, Micro, Small and Medium Enterprises, India

## INTRODUCTION

After financial performance the most researched thing is financial distress among the companies. Financial distress is the condition which explains the potential financial risk or uncertainty arising in the company. This condition may sometimes lead to liquidation of the company also (Hayes, 2021). Financial distress is a critical concern for Micro, Small, and Medium Enterprises (MSMEs) in India, as these businesses often operate with limited financial resources and face significant challenges in managing funds. In Indian, MSMEs play a vital role in economic growth and generating employment. Although, unforeseen economic conditions and inadequate financial management can lead to distress, potentially resulting in insolvency or bankruptcy, which can have wide-reaching implications for the broader economy. The present paper aims to study the financial distress using Altma's Z Score on the public listed manufacturing engineering micro, small and medium enterprises of India.

## LITERATURE REVIEW

Financial distress is a significant challenge to detect in any firm and across different industries. Financial distress is a condition in which a company faces financial difficulties, leading to the inability to meet its financial obligations. It sometimes leads to bankruptcy or liquidation of the company. According to (Almaw & Molla, 2022), financial distress remains a persistent issue even for large firms, as unforeseen circumstances can lead to failures, causing economic and social problems. Molla's study on the Commercial Bank of Ethiopia (CBE) revealed that liquidity issues were a primary cause of financial distress, highlighting the need for robust financial management practices to maintain long-term financial soundness. (Say, 2024) in his study explains financial distress by highlighting that it typically begins with increasing liquidity pressures, which may lead to inability to pay financial obligations. Servet's study focused on companies in Turkey's chemical, pharmaceutical and related sectors, finding that many firms were either in the "risky" or "gray" zones, indicating varying degrees of financial instability.

(Usmansyah & Com, 2023) conducted a study on textile companies listed on the Indonesia Stock Exchange and (Dukalang et al., 2024) employing multiple financial distress models, including Zmijewski, Fulmer, Grover, Springate and Altman's Z-Score models. Their findings indicated that these models are effective in predicting financial distress by analyzing the companies' financial performance over a five-year period (2017-2021). Similarly, (Widiastuty, 2024) examined the impact of the COVID-19 pandemic on financial distress in Indonesia's primary consumer goods sector. The study used the Wilcoxon Signed Rank test to compare financial distress conditions before and during the pandemic. (Widiastuty, 2024) found that the Springate and Zmijewski models were the most accurate in predicting financial distress, with an accuracy rate of 88.69%. (Dukalang et al., 2024) conducted a comparative analysis of six financial distress prediction models, including the CA-Score, Ohlson, and Altman models. Their research concluded that the CA-Score model was the most reliable, with an accuracy rate of 97.14%. This study underscores the importance of selecting the appropriate model for accurately predicting financial distress in various sectors.

Among the various financial distress models, Altman's Z-Score model, developed by Professor Edward I. Altman in 1968, has emerged as one of the most widely used and reliable tools for predicting financial distress and the risk of bankruptcy. (Moshiuddullah et al., 2024) applied Altman's Z-Score model to assess the financial health of Bangladesh's top five pharmaceutical companies. In the Islamic banking sector, (Nurulhuda Ibrahim et al., 2024) used the Altman Z-Score model to evaluate the financial health of Islamic banks in top sukuk-issuing countries. The study found that banks in the UAE, Indonesia, and Saudi Arabia were in financial distress, while Malaysian banks exhibited greater financial stability. (Tran et al., 2023) applied Altman's Z-Score model to the Vietnamese market, particularly in the construction and real estate sectors. The study confirmed the model's validity in Vietnam and identified key financial ratios that are indicative of financial distress, especially during global crises like the COVID-19 pandemic.

## RESEARCH METHODOLOGY

**Objective:** To study financial distress using Altman's Z Score Model for selected companies in India.

**Hypothesis:**

H0 There is no significant difference between the Altman's Z Score of the selected MSMEs.

H1 There is significant difference between the Altman's Z Score of the selected MSMEs.

**Sample:** A total of 31 public listed engineering Micro, Small and Medium Enterprises were selected having the highest market capital were selected.

The study is an analytical study which uses Altman's Z Score Model to understand the financial distress for the selected manufacturing micro, small and medium enterprises in India. The data is collected for the financial year 2023-24. ANOVA is used to analyse the collected data for Altman's Z Score between micro, small and medium enterprises.

### Altman Z Score:

Altman's Z-Score Model is one of the financial models used to predict the probability of a company entering bankruptcy. The model calculates a Z-Score based on five financial ratios derived from a company's financial statements viz.

1. Working Capital / Total Assets
2. Retained Earnings / Total Assets
3. Earnings Before Interest and Taxes (EBIT) / Total Assets
4. Market Value of Equity / Total Liabilities
5. Sales / Total Assets

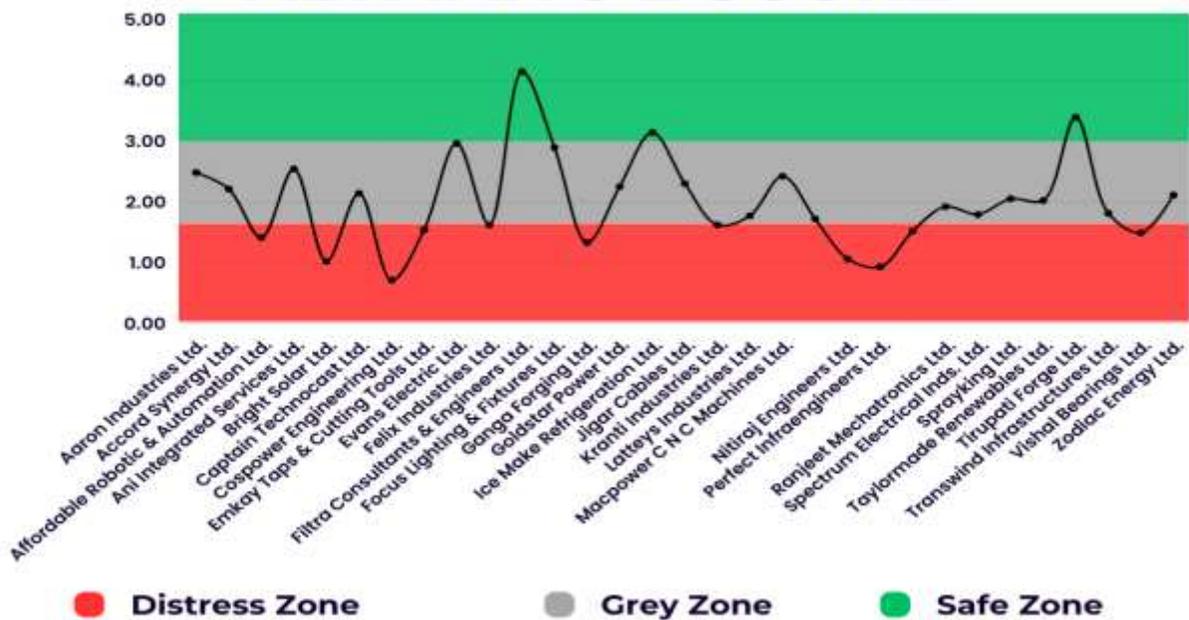
### DATA COLLECTION AND ANALYSIS

For the present study secondary data is collected for public listed manufacturing Engineering micro, small and medium enterprises of India. The period of study covers the financial data for the year 2023-24. For which the published annual reports and annual financial statements were used, some data is also collected from the online database Centre for Monitoring Indian Economy also popular as Prowess IQ.

Company Name	Z SCORE = $1.2*I2 + 1.4*J2 + 3.3*K2 + 0.6*L2 + 1.0*M2$	Financial Distress Category
Aaron Industries Ltd.	2.49	Grey Zone
Accord Synergy Ltd.	2.22	Grey Zone
Affordable Robotic & Automation Ltd.	1.42	Distress Zone
Ani Integrated Services Ltd.	2.55	Grey Zone
Bright Solar Ltd.	1.03	Distress Zone
Captain Technocast Ltd.	2.15	Grey Zone
Cospower Engineering Ltd.	0.72	Distress Zone
Emkay Taps & Cutting Tools Ltd.	1.55	Distress Zone
Evans Electric Ltd.	2.97	Grey Zone
Felix Industries Ltd.	1.63	Distress Zone
Filtra Consultants & Engineers Ltd.	4.15	Safe Zone
Focus Lighting & Fixtures Ltd.	2.90	Grey Zone
Ganga Forging Ltd.	1.34	Distress Zone
Goldstar Power Ltd.	2.26	Grey Zone
Ice Make Refrigeration Ltd.	3.15	Safe Zone
Jigar Cables Ltd.	2.31	Grey Zone
Kranti Industries Ltd.	1.63	Distress Zone
Latteys Industries Ltd.	1.78	Distress Zone

Macpower C N C Machines Ltd.	2.43	Grey Zone
Marine Electricals (India) Ltd.	1.73	Distress Zone
Nitiraj Engineers Ltd.	1.07	Distress Zone
Perfect Infraengineers Ltd.	0.94	Distress Zone
Power & Instrumentation (Gj.) Ltd.	1.53	Distress Zone
Ranjeet Mechatronics Ltd.	1.93	Grey Zone
Spectrum Electrical Inds. Ltd.	1.80	Distress Zone
Sprayking Ltd.	2.06	Grey Zone
Taylormade Renewables Ltd.	2.03	Grey Zone
Tirupati Forge Ltd.	3.40	Safe Zone
Transwind Infrastructures Ltd.	1.82	Grey Zone
Vishal Bearings Ltd.	1.50	Distress Zone
Zodiac Energy Ltd.	2.12	Grey Zone

## ALTMAN'S Z SCORE



TYPE	DISTRESS ZONE		GREY ZONE		SAFE ZONE		TOTAL	
<b>MICRO</b>	4	80%	1	20%	--	--	<b>5</b>	<b>100%</b>
<b>SMALL</b>	3	27%	8	73%	--	--	<b>11</b>	<b>100%</b>
<b>MEDIUM</b>	7	47%	5	33%	3	20%	<b>15</b>	<b>100%</b>

The data collection shows that about 4 out of 5 micro enterprises are in distress zone having high risk of financial instability. For small enterprises 73% are in grey zone and 27% are in distress zone which shows that among small enterprises there are very few financially instable enterprises compared to small enterprises. The medium

enterprises outperformed compared to both micro and small enterprises. The medium enterprises have 3 enterprises in safe zone and 5 enterprises in grey zone making it a total of 53%. Also, 47% of medium enterprises were in financially distress zone which also indicates that these companies are facing challenges financially. Overall, most of the engineering micro, small and medium enterprises in India are facing challenges financially based on the results of Altman's Z Score during the period of study.

## DATA ANALYSIS

For the present paper, the researcher has used analysis of variance – ANOVA to analyse the data and testing the hypothesis for Altman's Z Score between micro, small and medium enterprises.

H0 There is no significant difference between the Altman's Z Score of the selected MSMEs.

H1 There is significant difference between the Altman's Z Score of the selected MSMEs.

	Frequency	Percent
MICRO	5	16.1
SMALL	11	35.5
MEDIUM	15	48.4
Total	31	100.0

Among the selected samples 5 micro enterprises, 11 small enterprises and 15 medium enterprises from public listed engineering MSMEs were utilized for data analysis.

### ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.657	2	1.328	2.571	.094
Within Groups	14.464	28	.517		
Total	17.120	30			

### Descriptive Statistics Altman's Z-Score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
MICRO	5	1.5019	.47963	.21450	.9064	2.0974	.72	2.03
SMALL	11	1.8843	.63245	.19069	1.4594	2.3091	.94	2.97
MEDIUM	15	2.2922	.82565	.21318	1.8350	2.7495	1.34	4.15
Total	31	2.0200	.75543	.13568	1.7429	2.2971	.72	4.15

According to the one-way ANOVA test on the collected data of micro, small and medium enterprises for Altman's Z Score shows p-value of 0.094 which is higher from 0.05 level of significance and hence we accept the null hypothesis interpreting that there is no significant difference between the mean score of Altman's Z Score among the selected micro, small and medium enterprises for the given period during the study.

## MAJOR FINDINGS

Based on the Z-Scores of the public listed manufacturing MSMEs in India, showed that Affordable Robotic & Automation Ltd. (1.42), Bright Solar Ltd.(1.03) and Cospower Engineering Ltd.(0.72) shows high risk of bankruptcy or severe financial instability in the entire group of companies. The companies like Marine Electricals

(India) Ltd. (1.73) and Vishal Bearings Ltd. (1.50) are on the borderline of financial distress, suggesting potential financial challenges that needs to be controlled.

The companies like Aaron Industries Ltd.(2.49), Accord Synergy Ltd.(2.22) and Ani Integrated Services Ltd. (2.55) are facing moderate financial risk. Out of total companies, three companies i.e. Filtra Consultants & Engineers Ltd.(4.15), Ice Make Refrigeration Ltd. (3.15) and Tirupati Forge Ltd.(3.40) have Z-Scores above 2.99 and are in the safe zone. These companies have a strong financial health with very low financial distress.

## CONCLUSION

After financial performance the second most important analysis becomes to understand the financial distress of any company. Using Altman's Z Score model in the present paper the researcher has studied the financial distress for 31 public listed manufacturing engineering MSMEs in India which highlighted that out of 31 companies analyzed, **14 companies** are in the financial distress zone having high chances of risk, **14 companies** are in the grey zone and only **3 companies** are in the safe zone having good financial performance. A significant number of micro and small engineering companies are either at risk or in financial distress, highlighting potential risk among the manufacturing MSMEs sector in India. The study is limited to the financial year 2023-24 and only 31 companies were study. In future more companies and different sectors can be studied. The present paper shows that there is a need for close monitoring and strong strategic risk management for such companies in the distress and grey zones to avoid potential financial failures in future.

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