

STRATEGIC FINANCIAL PERFORMANCE ANALYSIS USING ALTMAN'S Z SCORE MODEL: A STUDY OF LISTED UNICORN STARTUPS IN INDIA FROM 2019 TO 2023

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Abstract

Over the past several years, financial analysts have been contributing significantly to society in the field of predicting bankruptcy. Corporate managers spend a lot of time understanding and changing policies to avoid bankruptcy, especially after the global meltdown in the year 2008. Post Covid-19 there is a growing interest in the corporate world to understand and assess the implications and fallout in the aftermath of global business disruptions. Serious issues arise when a company goes bankrupt, it hampers the interest of all stakeholders including investors and promoters. It is imperative to check and review the financial performance of a business regularly to take prompt actions before the occurrence of any unforeseen events. Bankruptcy of companies can be predicted based on ratio analysis; proven by studies conducted on several such cases. A case in point is Altman's Z score. To achieve this study Altman's Z score model is applied and concluded that the sample companies are Healthy and stable for the coming two to three years. For this purpose, researchers have taken 10 listed unicorn startup companies in India from the year 2019 to 2023.

Keywords: Financial Performance, Bankruptcy Prediction, Altman's Z score

1. INTRODUCTION

Bankruptcy is not an abnormal phenomenon. The symptom point of bankruptcy is when the company is in financial distress. Financial distress is a state or condition of financial difficulties that begins when a business cannot generate enough cash flow to pay its debts. The chances of financial distress are directly influenced by basic financial variables such as Working capital, Total assets, Retained earnings before interest and tax, the book value of liabilities, the book value of equities, and Sales. Here the point is bankruptcy does not happen in a day. This happened due to the continuous erode of financial performance for multiple reasons i.e. economic factors, wrong management decisions, and natural disasters (**Sudana 2011**).

Financial distress comes before bankruptcy. By examining financial performance, it is possible to anticipate financial hardship and early bankruptcy signs, and accordingly, necessary steps can be taken by the management to avoid unwanted situations. Experts have developed various alarming models to anticipate the situation of financial distress. Altman's Z score model is one of such kind developed by Professor Edward I Altman in 1968, and widely used by managers across the globe. Ratios are one of the best techniques for analyzing the financial performance of companies. Altman concludes that an independent ratio diagnosis about a particular aspect of financial health and a combination of ratios have a greater effect on understanding the same.

Altman Z score is based on ratios such as liquidity, solvency, profitability, profit margin, and financial leverage. To predict the financial distress of selected companies, the researchers have undertaken a critical and historical examination of the literature on financial distress and the application of the Z score model.

2. REVIEW OF LITERATURE

There is an increase in the prediction of bankruptcy after the financial crisis of 2008. Numerous studies have been done to forecast business failure and corporate bankruptcy. Altman's Z score is one investigation of this prediction which is used universally.

Rohini Sajjan (2016) examined the chance of bankruptcy from 2011 to 2015, for a sample of manufacturing and non-manufacturing enterprises registered on the BSE and NSE. According to the survey, none of the companies truly belong in the safe zone, except for a few years. The majority of the analyzed firms are distressed, which amply demonstrates that they may go out of business soon.

Maya Korath & Surekha Nayak (2022) examined the financial plight of a few chosen manufacturing firms that have been approved for bankruptcy under the Insolvency and Bankruptcy Board of India. The authors employed the Altman Z score methodology to evaluate the research goal. The study's five-year time frame is from 2017 to 2021. According to the report, each of the five companies has a low Z score, a sign that they are in a financial crisis.

Herman Somantri & Mochamad Kohar Mudzakar (2023) investigated to forecast insolvency in businesses listed in the Kompas 100. The research for 2019–2021 used a purposive sampling technique together with explanatory and descriptive analysis.

Arpita Sidhu & Rupinder Katoch (2019) applied Altman's Z score model to estimate the possibility of bankruptcy of real estate sector enterprises. The NSE-listed Realty sector companies that make up the Nifty Realty Index and are largely involved in building residential and commercial properties were the subject of the study. The study discovered that the outcomes generated by the two models using various accounting parameters are not identical. But both models show that two financially troubled enterprises in the real sector must act quickly.

Neetu Saini & Sanjeev Bansal (2020) assessed the financial stability of the pharmaceutical companies listed on the Bombay stock markets using Altman's Z score model. The survey was conducted for thirty pharmaceutical businesses over ten years, from 2004–2005 to 2013–2014. There are no appreciable differences between the liquidity, solvency, and profitability of the chosen pharmaceutical enterprises, according to the model, which has a good match.

Sandesh C (2016) studied the NIFTY 50 firms' Altman Z scores, eliminating the banks and financial institutions. Using the company's current financial records, the author attempts to forecast the likelihood that companies would default owing to financial difficulties. Electric generating, distribution, metals, and gas industries have low Z scores, while technology, FMCG, and health care have high Z scores.

Flourien Nurul Ch & Lies Zulfiati (2018) analyzed the 1984-developed Altman Z-score method's ability to forecast the state of health of state-owned companies listed on the Indonesian stock exchanges. Additionally, learn about and put to the test how the value of associated companies is impacted by the health level. Financial statements of state-owned businesses registered on BEI between 2014 and 2016 were the primary source of secondary data used by the author. Using linear regression analysis, this study's analysis was conducted. The findings of this study demonstrate that the three classification zones created by the Altman Z score approach, which was used in this study, were successful.

Apoorva D. V, Sneha Prasad Curpod & Namratha M. (2019) evaluated the effectiveness of the Z score model, bankruptcy of Indian enterprises must be predicted three years in advance. The Z score model was found to be 85% accurate and useful for the three years before the event of bankruptcy based on research done by applying it to seven companies listed on the Bombay Stock Exchange.

Toshan Gugnani (2020) analyzed the results of the Altman Z score model for numerous failed businesses. This study evaluated the efficacy and precision of Altman's bankruptcy model on Indian companies included in the NIFTY Metal Index. Analyze the data for the two or three years before the official bankruptcy filing. The study's findings show that the Z score represents the likelihood of bankruptcy rather than a forecast of bankruptcy.

Anuj CS, Adithya Narayan R. & Nandan S. (2018) Analyzed the viability and accuracy of the tool Z score for the Indian Steel sector by employing numerous ratios to learn about each facet of the enterprises in this sector. To test its accuracy, the method was initially applied to Indian enterprises that had previously collapsed or been taken over, and then to some of the most prominent corporations in big, medium, and market capitalization areas to determine the health of the industry. The author concludes that past research in this sector is no longer relevant because the industry has changed dramatically with several takeovers and shutdowns. As a result, determining the industry's health in the future is critical.

Vikash Saini (2018), analyzed the financial situation and likelihood of bankruptcy of RCFL shortly assessed with the aid of the Z score. It can be concluded from the examination of the study's ten-year period from 2007–2008 to 2016–17 that RCFL's capacity for making profits and making short-term investments is subpar. The corporation may soon file for bankruptcy, according to the Z score number, which indicates that it is distressed. As a result, it demands a heroic effort from all parties concerned, including management, employees, and other stakeholders.

Aniruddha Joshi, Madhura Ranade, and Neha Patvardhan (2018) examined the company's detailed financial analysis using Altman's Z score and retrospective event analysis using Altman's Z score technique to measure the risk (solvency) associated with steel manufacturers. Along with the inquiry, the method's dependability is demonstrated. According to the survey, both internal and external factors are contributing to the steel industry's issues. The financial health of the steel sector has deteriorated over time.

Anuja Mandvekar (2020) foresees the bankruptcy of the chosen Indian companies two years before the event. To evaluate the model's efficacy and accuracy, four businesses have been chosen. According to the model, bankruptcy could be anticipated two years before it occurred in India. In conclusion, other Indian enterprises might use the Altman Z score to gauge their financial health and predict insolvency.

3. RESEARCH GAP

Significant and extensive literature on financial distress and the Z score model is available. After reviewing existing literature, it was found that most of the reported studies primarily focused on performance evaluation of sector-specific, established corporates or failed companies. That is why the present study has been made to evaluate the financial performance of listed Unicorn startups to study their financial distress as they are very vulnerable to their performance.

4. SIGNIFICANCE OF STUDY

Start-ups act as foundation stone for every economy. Start-ups are known for their innovation and use of technology in solving social, economic, and environmental problems. Indian start-ups have been playing a vital role in strengthening the economy and solving the problem of employment. India is now home to more than 100 unicorns due to the availability of a strong support ecosystem. Unicorn is a privately held start-up company having a market capitalization of more than one billion US dollars. Start-ups operate under a very complex model with risks and uncertainty. Due to this, start-ups continue to face closures and management challenges. The stability of the startups is the major concern for the investors. Based on stability, stakeholders change their decisions regarding either their new involvement or continuing existing involvement in a particular firm. Financial analysis is becoming crucial in this environment to safeguard the interests of several stakeholders. This research aims to assess start-ups' financial stability, as start-ups are more vulnerable to their financial performance.

5. STATEMENT OF PROBLEM

Indian startups are going through phases of both success and failure stories. Currently, there are more than 75000 startups in India in its 75th year of Independence. In contrast, many start-ups are struggling to sustain and shutting their operations for multiple reasons. According to a study by the IBM Institute, "90% of Indian startups fail within the first five years of being founded for a variety of reasons, including a lack of finance, an inability to scale, a bad business plan, a high rate of cash burn, an inability to secure more funding, etc". It left investors unable to recover their investments. Since Startups have a high failure rate, investing in them is considered highly risky. Investors are particularly interested in learning about start-ups' financial stability and soundness before making investment selections. Investors today spend more time analyzing the financial statements of startups to guard against that situation.

6. RESEARCH OBJECTIVES

To determine the Altman's Z score value of Unicorn Startups to predict the likelihood of bankruptcy

To assess the financial condition of the selected Unicorn Startups

To compare the operational and financial efficiency of selected Unicorn Startups

7. HYPOTHESIS OF THE STUDY

Listed Unicorn startups in India are in financial distress and likely to face bankruptcy

Listed Unicorn startups in India are not in financial distress nor are they likely to face bankruptcy

8. RESEARCH METHODOLOGY

8.1 Research design

Descriptive research study

8.2 Data collection

The data are secondary and collected from www.moneycontrol.com. In addition to this various magazines and journals are also referred to support this study.

8.3 Data sample

Presently there are more than 100 unicorns in India, out of only a dozen unicorns are listed on Indian stock exchanges. The present study is made for 10 unicorns listed after 2021 and the list is given below.

Table 1

S. No.	Name of Company	Brand Name	Sector	Listing date
1	Easy Trip Planners Ltd	Easymytrip	Tour & Travel	March 19, 2021
2	Nazara Technologies Ltd.	Nazara	Digital Entertainment	March 30, 2021
3	Zomato Ltd.	Zomato	E-retail/E-commerce	July 23, 2021
4	CarTrade Tech Ltd	Cartrade	E-retail/E-commerce	August 20, 2021
5	FSN E-Commerce Ventures Ltd	Nykaa	E-retail/E-commerce	November 10, 2021
6	PB Fintech Ltd.	Policybazar	Fintech	November 15, 2021
7	One97 Communications Ltd	Paytm	Fintech	November 18, 2021
8	Delhivery Ltd.	Delhivery	Logistics	May 24, 2022
9	C.E. Infosystems Ltd.	Mapmyindia	Digital Map	Dec 21, 2021
10	Rategain Travel Technologies Ltd.	RateGain	Tour & Travel	Dec 17, 2021

8.4 Data period

Five-year data period from March ending 2019 to 2023.

8.5 Data source

The relevant data of each of the companies were collected from their annual reports published on www.moneycontrol.com. Six variables make up the data: working capital, retained profits, the book value of equity, the book value of liabilities, total assets, and earnings before interest and taxes (EBIT).

Table 2

Variables	Data Source of	Published in
Working Capital	Balance Sheet of respective companies	www.moneycontrol.com
Retained Earnings	Balance Sheet of respective companies	www.moneycontrol.com
Book value of Equity	Balance Sheet of respective companies	www.moneycontrol.com
Book value of Liabilities	Balance Sheet of respective companies	www.moneycontrol.com
Total Assets	Balance Sheet of respective companies	www.moneycontrol.com
EBIT	Profit and Loss of respective companies	www.moneycontrol.com

8.6 Tools & techniques

Financial techniques: Altman Z score model

Statistical techniques: Mean, Minimum, Maximum, Range, Standard deviation, Coefficient variation, Skewness and kurtosis

9. ALTMAN'S Z SCORE MODEL: A CONCEPTUAL ANALYSIS

The Z score model is a predicting tool developed by Edward I Altman to forecast the likelihood that a company would fail and go bankrupt within two years after the assessment. Altman's Z score is simply the output of different ratios or variables in determining the likelihood of financial distress or bankruptcy. Altman found certain financial ratios have "Predictive power" in predicting the possible bankruptcy of companies. He identified five financial ratios i.e. Ratios of Liquidity, Profitability, Productivity, Efficiency, and Leverage to find a value and that value is known as Altman's Z score. In the process of formulating the Z score value, he used different weighted factors with the Ratios. The Z score = $(W1R1) + (W2R2) + (W3R3) + \dots + (WNRN)$ Where W1, W2 and WN are weighted parameters and R1, R2, and RN are financial ratios to the prediction model.

Where,

R1: Ratio of Liquidity (Working capital/Total Assets)

This ratio shows how much net working capital is about all assets. It gauges how liquid the net assets are to the total assets. Better, if the ratio is higher

R2: Ratio of Profitability (Retained earnings/Total Assets)

This ratio demonstrates how much of the company's total assets are kept in reserves. It gauges

a company's capacity to produce retained profitability out of all of its revenues. It suggests that instead of paying dividends, the company is keeping its profits on hand. Improve this ratio. Reduce your reliance on debt and borrowing.

R3: Ratio of Productivity (Earnings before interest and Taxes/Total Assets)

This describes the company's capacity to produce earnings from its assets before paying taxes and interest. It gauges a company's productivity of its overall assets. Better is a higher ratio.

R4: Ratio of Leverage (Book value of Equity/Book Value of Total Liabilities)

This shows how well a business may use its equity to pay its debts. It gauges how much equity a company has about all of its liabilities. Any sharp decline in this percentage indicates an unsound financial condition.

R5: Ratio of Efficiency (Sales/Total Assets)

This describes the company's sales volume when utilizing its resources. It evaluates the capacity of an organization to generate money from its assets. Better if the ratio is higher.

The theoretical framework of Altman's Z score

Altman created three distinct Z score models, for public manufacturing firms, private manufacturing companies, and all types of non-manufacturing companies. Altman divided the businesses into three groups according to their likelihood of bankruptcy: high, low, and intermediate. When analyzing the Z score value, a company with a lower Z score value has a higher risk of filing for bankruptcy, while a company with a higher Z score value has a lower risk.

The first "Z" score model was created in 1968 for publicly traded manufacturing enterprises, that is "Z" score = $1.2R_1 + 1.4R_2 + 3.3R_3 + 0.6R_4 + 1.0R_5$. Following are the explanations for Altman's initial "Z" score value.

A "Z" score of less than 1.8 is a warning indicator of a red zone that a company is in financial trouble and perhaps on the verge of bankruptcy.

A "Z" score between 1.8 and 3.0 is an indicator of a yellow zone and it should be warned to prevent bankruptcy.

A "Z" score of 3.0 or higher is an indicator of a green zone that a company is healthy and unlikely to file for bankruptcy.

For private manufacturing firms, Altman created a new Z score model in 1983, which is Altman's "Z" score = $0.717R_1 + 0.847R_2 + 3.107R_3 + 0.420R_4 + 0.998R_5$. Following are the explanations for Altman's "Z" score value.

A "Z" score of less than 1.23 is a warning indicator of the red zone that a company is in financial trouble and perhaps on the verge of bankruptcy.

A "Z" score number between 1.23 and 2.9 is an indicator of the yellow zone and it should be warned to avoid insolvency.

A “Z” score of 2.9 or higher is an indicator of a green zone that a company is healthy and unlikely to file for bankruptcy.

Altman altered a different model Z score for private, non-manufacturing businesses in 1995.

The Altman Z score = $6.56R_1 + 3.26R_2 + 6.72R_3 + 1.05R_4$. Following are the explanations for Altman's "Z" score value.

A “Z” score of less than 1.10 is a warning indicator of a red zone that a company is in financial trouble and perhaps on the verge of bankruptcy.

A “Z” score value between 1.10 and 2.6 is an indicator of the yellow zone and it should be warned to avoid bankruptcy.

A “Z” score of 2.6 or higher is an indicator of a green zone that a company is healthy and unlikely to file for bankruptcy.

Table 3: Theoretical Framework of Z Score for non-manufacturing firms

Variables(R)	Ratios of	Calculation	Weighing factor (W)	Output (WX)
R1	Liquidity	Working Capital/Total Assets	6.56	6.56R1
R2	Profitability	Retained Earnings/Total Assets	3.26	3.26R2
R3	Productivity	EBIT/Total Assets	6.72	6.72R3
R4	Leverage	Book Value of Equity/Bools Value of Liabilities	1.05	1.05R4

10. RESULT AND DISCUSSION

The five-year data from 2019 to 2023 were taken and the relevant ratios are calculated to get their Z score. The Z score values of each of the companies are given below in Table No. 4

Descriptive analysis

Table 4: The results of the “Z ”Score of Unicorn Startups

Company	2019	2020	2021	2022	2023	Mean	Zone	Indicator
EaseMyTrip	4.42	5.16	5.98	5.15	6.97	5.54	Green	Healthy & Stable
Delhivery	4.35	4.83	3.45	3.95	6.30	4.58	Green	Healthy & Stable
Nykaa	-	8.55	9.20	9.00	8.21	8.74	Green	Healthy & Stable
Nazara	6.00	4.51	4.86	6.61	6.36	5.67	Green	Healthy & Stable
Cartrade	-	5.66	6.70	6.66	7.51	6.63	Green	Healthy & Stable
Paytm	2.18	4.18	5.97	5.30	6.34	4.79	Green	Healthy & Stable
Policybazar	6.76	7.86	8.16	8.37	6.12	7.45	Green	Healthy & Stable
Zomato	6.70	-3.48	5.77	6.07	6.34	4.28	Green	Healthy & Stable
Mapmyindia	-	-	7.07	7.92	8.62	7.87	Green	Healthy & Stable
RateGain	5.53	5.77	7.17	7.29	8.16	6.78	Green	Healthy & Stable

From the above result, it was observed that

In the year 2019, only Paytm experienced the caution of the Yellow zone with a Z score of 2.18

In the year 2020, only Zomato experienced the danger of the red zone with a Z score of -3.48

In the Year 2021. All 10 companies enjoyed the comfort of the green zone with a Z score above 2.60

In the Year 2022, All 10 companies enjoyed the comfort of the green zone with a Z score above 2.60

In the Year 2013, All 10 companies enjoyed the comfort of the green zone with a Z score above 2.60

Statistical analysis

The statistical analysis was done for a total sample size of 10 for the period from 2019 to 2023. The following tools are used for statistical analysis

Table 5

Variable	Mean	Minimum	Maximum	Range	Std.Dev.	Cof. Var.	Skewness	Kurtosis
R1	2.89	1.78	4.69	2.91	0.74	11.89	1.22	2.86
R2	2.52	1.03	3.21	2.18	0.58	9.25	-1.67	4.13
R3	-0.04	-1.49	1.61	3.10	1.02	16.35	0.12	0.68
R4	0.86	0.43	1.04	0.61	0.16	2.57	1.65	3.67
Z Score	6.23	4.28	8.74	4.46	1.43	22.91	0.27	1.10

Based on the above statistical analysis,

The R1 (Working capital/Total Assets) mean value is 2.89, with a minimum value of 1.78, a maximum value of 4.69, and a standard deviation of 0.74.

The R2 (Retained Earnings/Total Assets) mean value is 2.52, with a minimum of 1.03, a maximum of 3.21, and a standard deviation of 0.58.

The R3 (EBIT/Total Assets) mean value is -0.04, with a minimum value of -1.49, a maximum value of 1.61, and a standard deviation of 1.02.

The R4 (Book value of Equity/Book value of Liabilities) mean value is 0.86, with a minimum value of 43, a maximum value of 04, and a standard deviation of 16.

The Z score ($6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$) has a mean value of 6.23, a minimum value of 4.28, a maximum value of 8.74, and a standard deviation of 1.43.

11. CONCLUSION

Based on findings of the 5 five-year average Z score of the companies, it shows that all the companies have well above score of 2.60 which indicates they are all financially healthy and stable and not likely to go for bankruptcy shortly. Ranking-wise Nykaa is in the top position

with a Z score value of 8.74 and Zomato is in the lowest position with a Z score value of 4.28 with a mean score of 6.23.

12. LIMITATION

In this study, only four ratios are considered to understand the financial condition of the selected companies whereas other ratios are also important to understand a condition. Secondly, cash flow is not taken into consideration. Thirdly, the computations are based on the past performance of the last five years from 2019 to 2023. Fourth, the accuracy of the Z score computed solely depends upon the accuracy of data published on moneycontrol.com. Lastly Z score model is not one hundred percent sure about becoming bankrupt for up to two years.

13. KEY FINDINGS, SUGGESTIONS, AND RECOMMENDATIONS

The study shows, that all the concerned managers are well in managing their business affairs, the challenge is to sustain it for a longer period. Since all the companies are well placed in their performance, investors can bet their money on these companies. However, it is better to consider fundamental and technical analyses before investing money. Lastly, it is also important to study some of the liquidated companies to understand what went wrong so that managers to learn and be cautioned to avoid the same kind of unwanted situation.

14. MANAGERIAL IMPLICATION

The financial analysis revealed in this study can aid stakeholders in understanding the health and performance of a company. All the analysis done in this study can help the investors in making the decisions on the investment of any company. The Z score will help the concerned stakeholders to predict the likelihood of bankruptcy in the coming years. The peer comparison is made to compare the profitability and solvency efficiencies of the selected companies. The Altman method is used by the managers to initiate preventive measures if see any indications of bankruptcy.

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