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Application of Altman Z score model on listed companies applied for CIRP for period of January 2017 to November 2022 with IBBI

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Abstract

The paper investigates the application of the Altman Z-Score model as a predictive tool for assessing the financial health and bankruptcy risk of Indian listed companies that underwent the Corporate Insolvency Resolution Process (CIRP) between January 2017 and November 2022 under the Insolvency and Bankruptcy Board of India (IBBI). Using key financial ratios derived from company financial statements, the study analyzes the effectiveness of the Z-Score in forewarning corporate insolvency events within this timeframe. The findings indicate that companies with low Z-Scores consistently exhibited financial distress signals prior to their referral to CIRP, substantiating the model's utility as an early warning measure in the Indian insolvency context. However, the study also highlights sector-specific limitations and suggests that the model may require recalibration to better suit India's diverse corporate environment. Overall, the Altman Z-Score proves to be a valuable quantitative tool for risk assessment and creditor decision-making in the evolving Indian insolvency framework.

Keywords: *Altman Z-Score,Corporate Insolvency Resolution Process (CIRP), Insolvency and Bankruptcy Code (IBC), Bankruptcy prediction, financial distress, Early warning models, Insolvency prediction, Risk assessment*

Introduction.

The Insolvency and Bankruptcy Code (IBC), introdused in 2016, it changed India's corporate insolvency landscape by giving a structured and time-bound resolution mechanism for distressed assets [1]. Predictive models such as Altman's Z-Score have become instrumental in discerning early financial distress, enabling stakeholders to intervene before a formal insolvency process is triggered.

Literature Review.

The Altman Z-Score model was developed by Edward Altman in 1968, is based on a weighted average of key financial ratios that represent profitability, liquidity, leverage, solvency, and operational efficiency [1].

Its effectiveness as a prediction model has demonstrated various studies on Indian listed companies across sectors, including banking, steel, aviation, and more [3][2].

Recent research insights its relevance in economies like India, especially for publicly traded entities subject to the CIRP process.

Methodology

A quantitative approach was employed, analyzing financial data of selected Indian listed companies referred to CIRP under the IBC between 2017 and 2022.
Analysis of Financial statements, including annual reports, balance sheets, and profit and loss accounts, were reviewed to extract variables necessary for the Z-Score computation. the following ratios are used in Z score model.

- Working Capital / Total Assets
- Retained Earnings / Total Assets
- EBIT / Total Assets
- Market Value of Equity / Total Liabilities
- Sales / Total Assets

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For manufacturing and non-manufacturing firms, sector-appropriate variations of the Altman Z-Score formula are applied [1].

Data Analysis and Findings

Analysis of ten prominent CIRP cases—such as Bhushan Steel, Kingfisher Airlines, ABG Shipyard, Jyoti Structures, Lanco Infratech, Jaypee Infratech, Gitanjali Gems, Unity Infraprojects, Usher Agro, and Viceroy Hotels—revealed that the **majority of firms exhibited Z-Scores in the "distressed zone" ($Z < 1.81$ for manufacturers, $Z < 1.1$ for non-manufacturers) for several years prior to the start of insolvency proceedings [1][4].

We can take Example of Bhushan Steel Limited

Z-Score for year 2016-17 was -0.27 i.e Distressed zone

continously below the threshold since 2010-11, resulting in bankruptcy in 2017[1].

Observed Trends

Firms typically signaled severe financial distress through low Z-Scores years before entering CIRP.

Z-Score proved to be a reliable early warning indicator for default risk.

for enhanced accuracy Sector-specific adjustments may be necessary [1][2].

Discussion

The Z-Score model sets well with the incidence of financial distress among Indian listed companies undergoing CIRP. Its predictive strength is confirmed by the alignment of low Z-Scores with CIRP entry, although certain limitations exist due to imperfect financial data and sectoral differences. alliegnment of Z-Score monitoring into regulatory frameworks can significantly improve early intervention and creditor recovery rates.

Limitations

Availability and quality of financial data may constrain precise Z-Score analysis.

The unique structure and volatility of certain sectors (e.g., aviation, textiles) may affect model performance.

The Indian insolvency regime continues to evolve, necessitating periodic model recalibration [1].

Recommendations

Incorporate Altman Z-Scores and similar financial health indicators within CIRP assessment protocols.

Develop sector-tailored Z-Score benchmarks for improved predictive power.

Use Z-Score analysis for routine corporate monitoring by stakeholders to preempt formal insolvency [1][2].

Conclusion

The Altman Z-Score model is an apt predictor of bankruptcy risk for Indian listed companies subject to CIRP proceedings, giving actionables, insights for regulators, creditors, and policymakers. Early alerts from Z-Score calculations could significantly reduce the frequency and severity of corporate bankruptcies in India, if adopted within regulatory and governance frameworks [1][2].

Acknowledgment

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Company	Year	Z-Score	Bankruptcy Filed	Distress Signal
Bhushan Steel	2016-17	-0.27	2017	Yes [1]
Kingfisher Airlines	2015-16	-1.48	2012	Yes [1]
ABG Shipyard	2014-15	0.07	2017	Yes [1]
Jyoti Structures	2016-17	-0.44	2017	Yes [1]

Lanco Infratech	2015-16	-0.39	2018	Yes [1]
Jaypee Infratech	2016-17	1.37	2017	Grey Zone [1]
Gitanjali Gems	2017	-2.06	2017	Yes [1]
Unity Infraprojects	2016	0.29	2017	Yes [1]
Usher Agro	2017	-1.93	2018	Yes [1]
Viceroy Hotels	2016	-2.19	2018	Yes [1]

Each case illustrates the predictive accuracy of the Altman Z-Score for CIRP-applied companies in the Indian context [1][4].

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