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Prediction of Financial Distress in Indian Firms Using Altman Z-Score Model

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Abstract: Recently, it is notable that business environment is everchanging. Due to dynamic business environment, companies have to face many problems without coping up with the changed environment, companies are not able to survive in the market. If the company is slow in responding to changes in the environment any social economic and technological changes may affects its performance. India is a developing country. Central and state governments take many industrial reform initiatives for the industrial growth. But due to enhance uncertainty scenario, many companies have been suffering from distress and bankruptcy has become very major problem in India because it's become challenging for the companies to survive in the market in ever growing business environment. Companies can escape from the situation of the bankruptcy by the constantly update themselves.

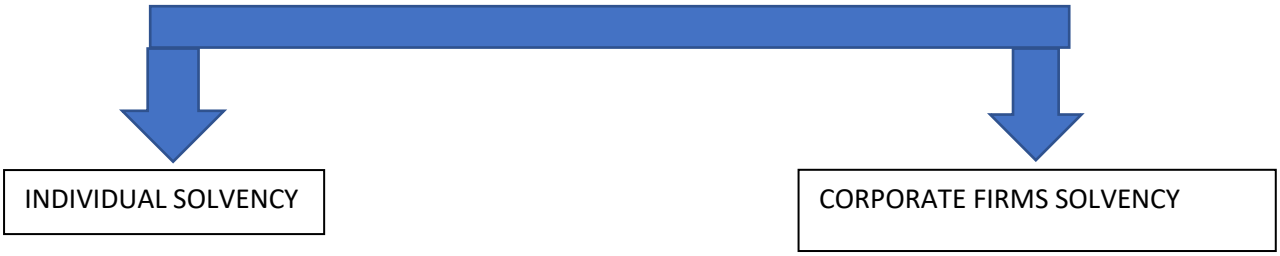
Keywords: financial, distress.

INTRODUCTION

Bankruptcy

Bankruptcy is the legal proceeding towards an organisation who is unable to fulfil its obligations. It is a legal term where company cease to do operation under the specific legal framework. It is an economic decision rather than legal (Dietrich 1984). Bankruptcy is a worldwide problem and not a good signal for the economy (Kaufman,1996). Risk of bankruptcy takes place in all the stages of life cycle of the company (Rybak, 2006). A report on financial status in Indian corporate prepared by (Peter Linder, Dec 2014) in IMF has concluded that Indian firms are facing severe problems in repayment of loans and reason behind is that high level of debt and decline in the profitability. Factors are employee resistance to change in technology, communication gap and fraudulent transactions (Dambolena and Khnowy, 1980). A survey by world bank (Doing business in 2005 – Indian Regional Profile) reported that India takes 10 years to liquidate while other countries takes 1 to 6 years.

Insolvency And Bankruptcy Regime In India



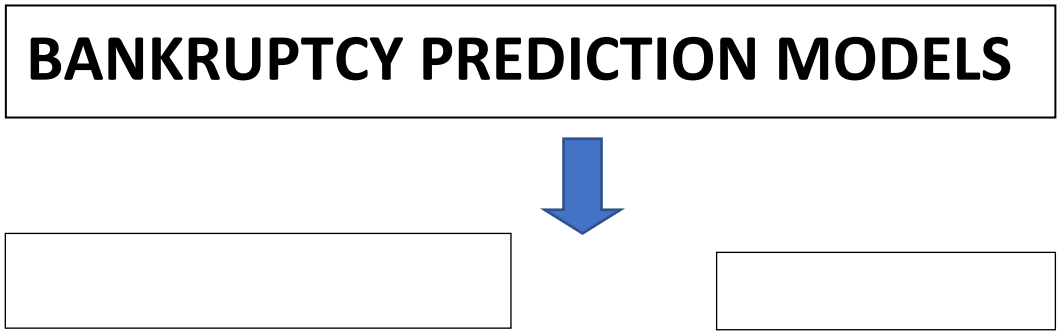
Bankcruptcy Prediction Models

From 1930, several models were developed by the researchers for the prediction of bankruptcy. These are:

Model	Writer	Year
Univariate	Fitzpatrick	1932
Multiple discriminant Analysis	Altman	1986
	Edmister	1972
	Deakin	1972
	Blum	1974
	Moyer	1977
	Halderman , Naarayanan, Altman,	1977
	Bartezak	1985

	Lawerence and Bear	1986
	Poston, Harmon	1994

Other Bankruptcy prediction models are logit and probit analysis, Neural networks recursive portioning and Ohlson model etc.



ALTMAN 'S Z SCORE MODEL

1968	EDWARD ALTMAN
Professor – Stern School of Business	To predict bankruptcy

1.Profitability
2.Liquidity
3.Leverage
4.Solvency
5.Activity

X1	Working Capital /Total Assets
X2	Retained Earnings/ Total Assets
X3	Earnings Before Interest and Taxes/ Total Assets
X4	Market Value of Equity/ Total Liabilities
X5	Sales/ Total Assets

$Z= 1.2\ X_1+1.4\ X_2+3.3\ X_3+0.6\ X_4+0.999\ X_5$

HIGHER SCORE	Less chances of bankruptcy
LOWER SCORE	More chances of Bankruptcy

LITERATURE REVIEW

Altman (1968) suggested that traditional ratio analysis is not a sufficient tool for the bankruptcy in companies. There is a need to develop a model which helps the business organisation. In this model Altman developed different financial ratios. They were determined to create a discriminant function which sought out the problem of bankruptcy in corporate sector. According to him, if ratios are analysed in multivariate framework, it will give more satisfactory results. 79 failed firms in US selected for the study during the period from 1954 to 1964. In 1980 Ohlson used the logistic model for the prediction of bankruptcy in corporates. He analysed different companies in US (1970-76). Hanson (2003) examines Altman's model to determine the level of predictive accuracy between solvent and bankrupt firms. Hillegeist (2004) identified a new technique for bankruptcy prediction. In 2005 Spengers in his thesis identified CART and model for the bankruptcy prediction. Jennings (2005) in his thesis applied Altman model for prediction of financial distress in health maintenance organisations. Arnold (2006) identified Z score as a means of providing a summary statistic for the composition of ratios. Merkevicius (2006) reintroduced the horse race between Altman Z score and Merton model. Lisník (2007) valued various companies by using different tools for predicting financial distress. Zhang (2009) studied bankruptcy by taking the cases of Japanese listed companies. Hayes applied Altman model in 2010. Aasenin (2011) studied in his thesis, focused on probability of financial distress measured by Altman model. Pradhan (2011) used neutral network for predicting the financial distress. Rama (2012) empirically evaluated the Altman model by applying it on South African listed companies. The study found that Altman model is a good predictor of the bankruptcy. Anjum (2012) found out the significance of Altman model. In 2013 Cerri applied Altman

model. This study aimed to apply the Altman model on European listed companies. Rado (2013) extended the well-Known Altman Z score model by calibrating it to the United Kingdom. Rao (2013) analysed various bankruptcy models by applying them on Indian companies and suggested suitable model for Indian environment. Sulphey (2013) applied Altman model on BSE listed small cap companies and found that Altman model can be used in the Indian environment. Ghosh (2013) tested the Altman model by taking the cases of Dunlop India Ltd. Gurau (2013) used Altman model on Japanese companies and found that this model is suitable predictor of bankruptcy in Japan. Altman (2013) revised the Z score and ZETA model for predicting the bankruptcy in corporate sector. Jouzbarkand (2013) compared Ohlson model and Shirata model by applying them on Tehran stock exchange. He studied these models using logistic regression. Pradhan (2014) took different combination of short-term debts and long-term debt. Chouhan (2014) applied the Altman model on BSE listed companies and suggested that Altman model is a best predictor of bankruptcy in Indian environment than any other model. Coelho (2014) used Altman Z score and Altman EMS models and applied them on JSE alternative exchange and took the time period from 2008 to 2012. Thai (2014) applied Altman model on Bursa Malaysia companies and judged its predicting ability. K.Okay (2015) investigates business failures in non - financial Turkish companies and compares the accuracies of different bankruptcy models such as MDA, Logit, decision tree etc . Awais (2015) studied that whether Z Score and Current ratio has the ability of predicting bankruptcy or not. Kumar (2015) developed a methodology for predicting risk in advance. Makini (2015) applied Altman model on companies listed in Nairobi securities exchange for predicting bankruptcy. Foteini (2016) investigated the role of the Z score in granting bank credit to Greek small and medium sized enterprises. Mohammed (2016) identified. This model predicts the likelihood of bankruptcy of corporates. MDA is useful tool in this field. Kiaupaite (2016) applied Altman model on listed companies of Lithuanian and explained its importance in predicting financial distress. Onakoya (2017) analysed that economy cannot be grow without proper functioning of power generation and distribution companies and to measure financial distress Z score is used. In his study Li.X (2017) compared six telecommunications groups to test the validation of bankruptcy models. M.P.Raj (2017) analysed selected automobile companies concluded that it is a financial tool through which company's financial performance can be judged. Eight automobile companies have been analysed by him for his study. Sharma (2019) studied the first ten companies (RBI).Soni(2019) analysed the financial distress in selected public sector .Above stated literature review clearly highlights the gap in research.

Sample Size

The sample of this study includes 20bankrupt companies which were admitted to National Company Law Tribunal, Chandigarh bench and Delhi bench for insolvency proceedings and 20 non bankrupt companies as their counterpart by using convenience sampling techniques.

No. of companies referred to NCLT benches for insolvency proceedings.

New Delhi bench	**1751**
Ahmedabad bench	516
Allahabad bench	184
Amaravati bench	27
Bangalore bench	367
Chandigarh bench	**303**
Chennai bench	1350
Cuttack bench	35
Guwahati bench	60
Hyderabad bench	523
Indore bench	8
Jaipur bench	88
Kochi bench	36
Kolkata bench	724
Mumbai bench	1515

List of Bankrupt Firms (Companies which were referred to NCLT, Chandigarh bench and Delhi bench for insolvency proceedings)

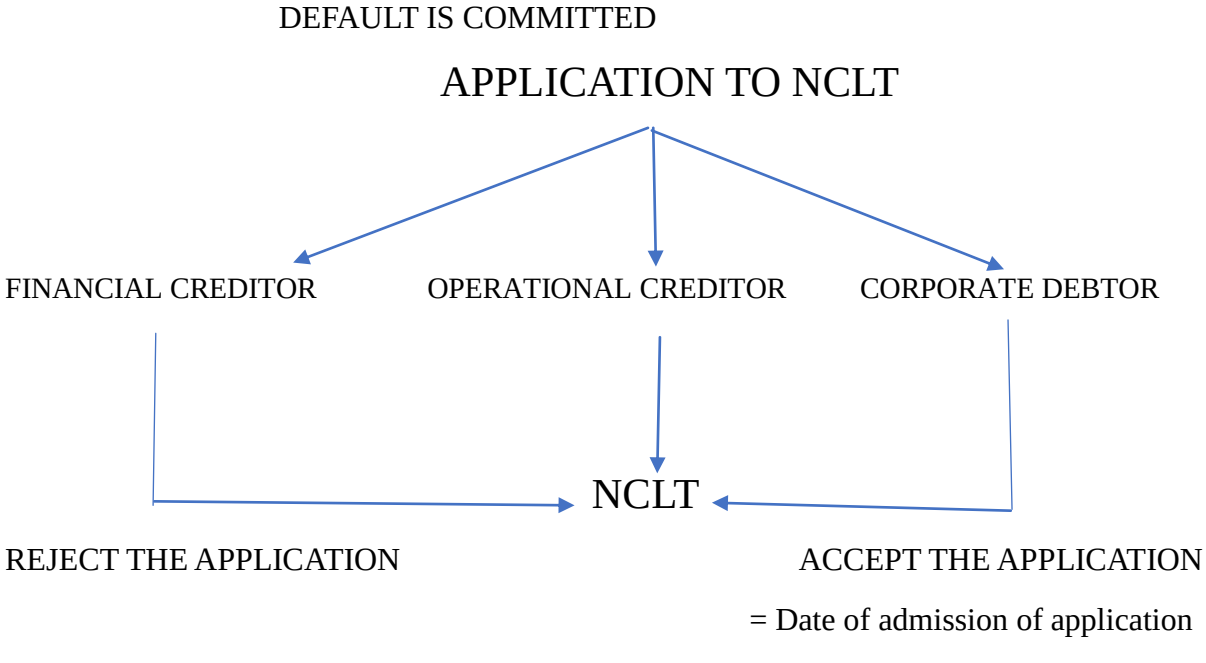
1.Punjab Basmati Rice Ltd
2.Satnam Agri Products Ltd.
3.SRS Modern Sales Ltd
4.Sainath Texport Ltd.
5.Vegan Colloids Ltd.
6.Supreme Tex Mart Ltd
7.Anandtex International Pvt Ltd.
8.Sky Blue Papers Pvt Ltd.
9. Gian Chand & Sons Pvt Ltd
10.Kingfisher Industries Pvt Ltd
11. Oswal Spinning &Weaving Mills Ltd
12. OSIL Exports Ltd.
13. Mahabir techno Ltd.
14.Julka Rice and Oil Mills Ltd
15.Shyam Udyog Ltd.
16. Hind Motors India Ltd.
17. Tara Chand Rice Mills Pvt Ltd.
18.Dunn Foods Pvt Ltd.
19. Millennium Wires Pvt Ltd.
20. Emsons Organic Ltd.

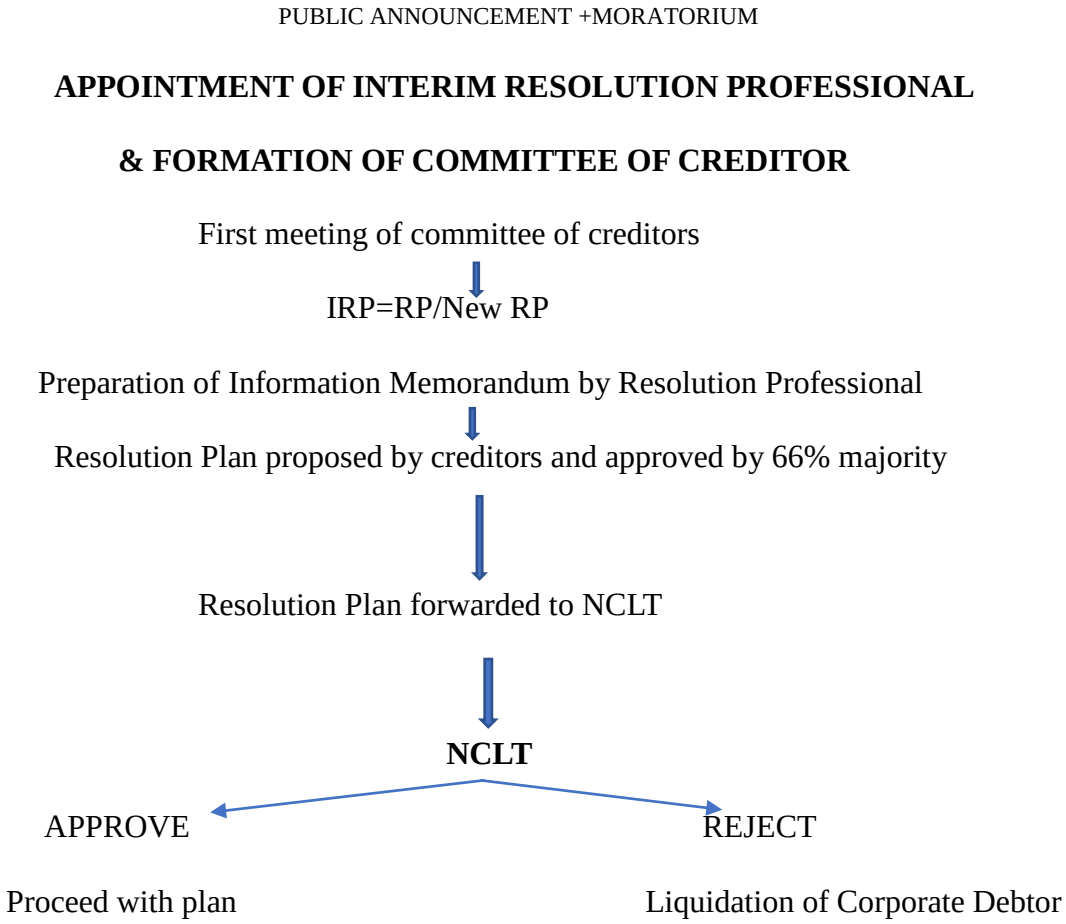
The data collection in the present study is through secondary sources. The data is collected from Annual Reports and Balance Sheets of Corporates & Banks, Registry Branch containing Data base of every Bench of NCLT , Banking Newsletters, various journals, publications, RBI Bulletins and Reports , Annual Reports of Ministry of Finance, Companies Act , 2013 , Codified & Amended version of IBC, 2016 & related Laws, Website of NCLT Benches -Internet Material & Information obtained through RTI etc.

Objective -1:

To study the liquidation and resolution process of bankrupt firms of NCLT, Chandigarh bench and Delhi bench.

INSOLVENCY RESOLUTION PROCESS





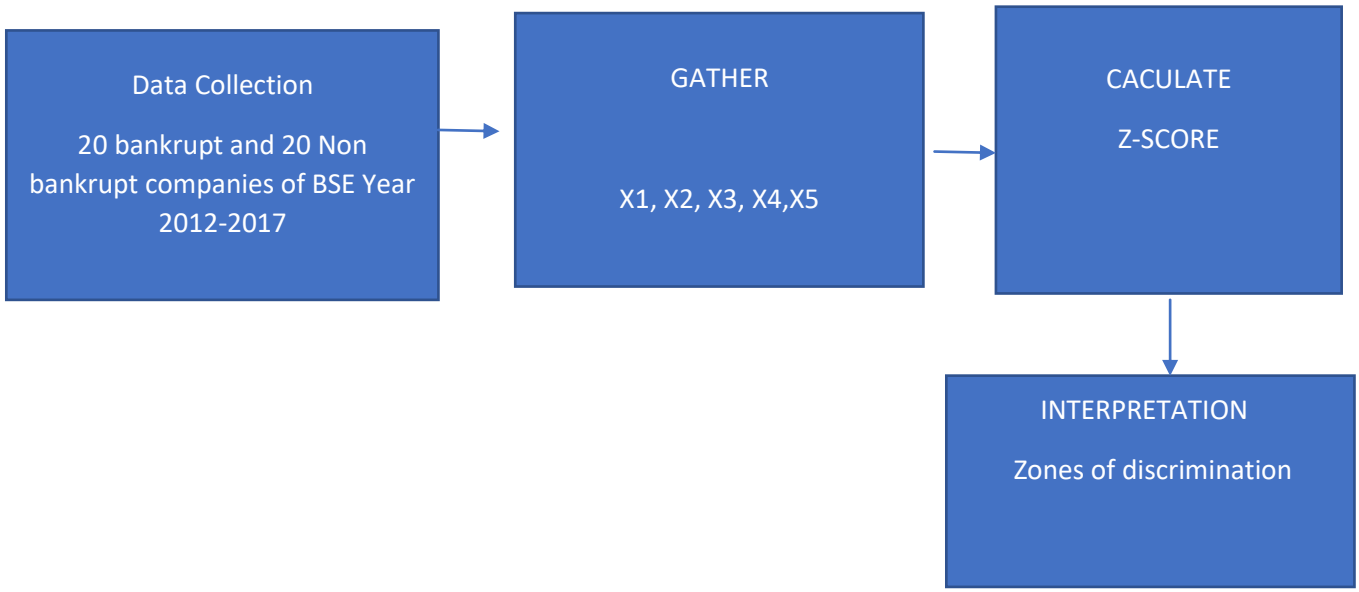
It is descriptive study-based objective. I, researcher, will make the data bags by collecting relevant fields of information (shown in Table A)

Table A

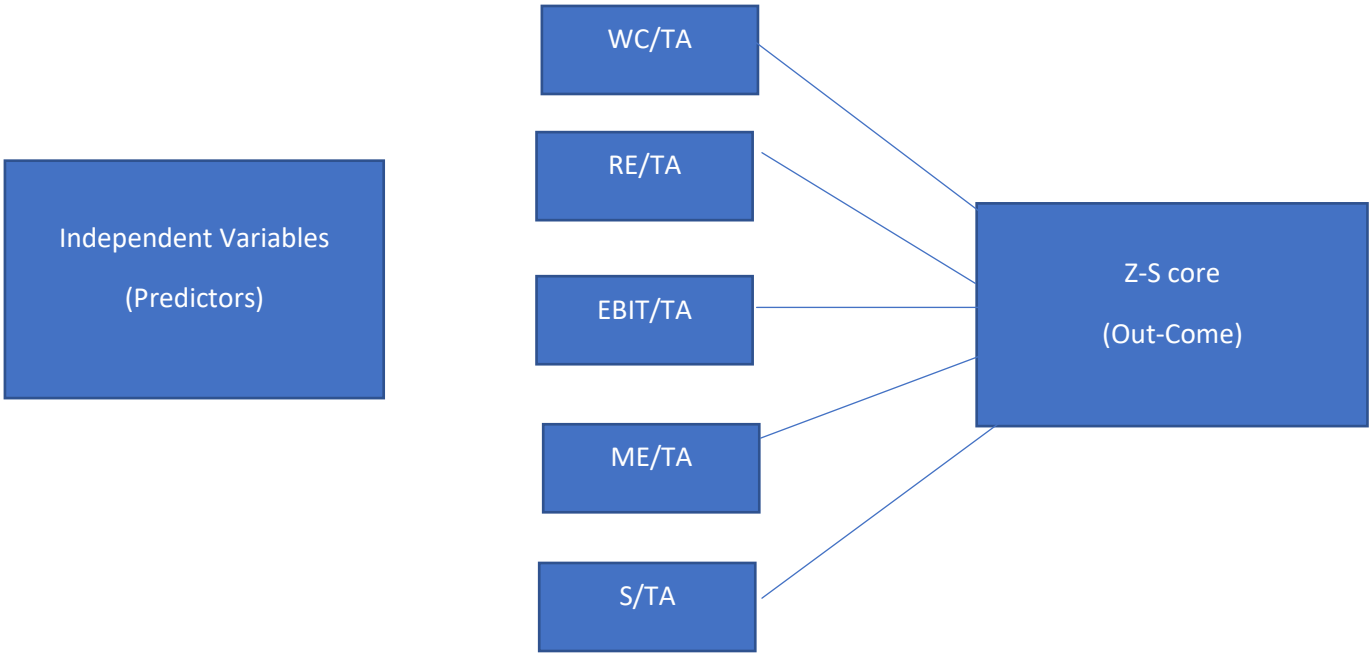
Sr. No	Variable / Factor
1	Bench Name & Location
2	Case No.
3	Type of Financial Creditor – Banks or NBFC etc.
4	Amount of debt
5	Worth of Security
6	First date of case listing at NCLT
7	Name of IP
8	Resolution Plan filed or not? if yes, approved or not?
9	Date of final disposal of case
10	Appeal filed or not? if yes, by Whom
11	Appeal Admitted or rejected?
12	Order of Liquidation passed or not?
13	Any other if needs

Objective 2: To establish a cut off score for Altman Z model applicable for Indian corporates

Research Process



VARIABLE TO BE TESTED IN THIS RESEARCH



CONCLUSION

India is developing country and there is a need to develop cut off score of Altman Z-Score in Indian condition which helps Indian companies to predict bankruptcy earlier in advance

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