

An Analysis of Financial Distress of Selected Public Sector Enterprises of India using Springate Score Model

Dr. Yagnesh Mohanlal Dalvadi,

Professor, PG Department of Business Studies, Sardar Patel University,
Vallabh Vidyanagar

Ms. Jyoti Badribhai Pandit

Research Scholar, PG Department of Business Studies, Sardar Patel University,
Vallabh Vidyanagar

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Abstract

Financially healthy company is able to pay its liability within the time, but sometimes due to internal and external factors company incurred losses and unable to pay its debt. Hence company becomes financially distressed, insolvent or bankrupt. In order to take a corrective steps prediction of financial distress is necessary so in this study the researcher attempts to analyze financial distress of selected public sector enterprises of India by using Springate s score. The Secondary data of Eight listed, worst performer, manufacturing public sector enterprises were collected for the period of six years beginning from 2011-12 to 2016-17. The collected data analyzed by using Microsoft excel software. The result showed that four Public Sector Enterprises are Financial Distressed and four public sector enterprises are financially healthy out of Eight Public Sector Enterprises as per Springate score model.

Key Words: Financial Distress, Springate score, Central Public sector enterprises (CPSE), Solvent Company.

Classification JEL : G32, L32, N45.

1. INTRODUCTION

Solvent companies are able to pay its liabilities within the proper time but some companies incurred losses and are unable to pay its liabilities are known as financially distressed companies. Sometimes Internal and external environment factors may Leads the Company into financial distress situation. Financial distress negatively affects on companies reputation as many stakeholders are associated with the company like customers, suppliers, shareholders, government .employees etc. Hence, prediction of financial distress is an

important tool to avoid bankruptcy. Thus, In this study the researcher attempts to analyze financial distress of selected public sector enterprises as increasing in number of loss making CPSEs.

2. Literature Review

2.1 Rajasekar T. ;Sania Ashraf ;Malabika Deo (2014) the main Purpose of this research work is to investigate financial distress of Indian Navratna Companies by using sophisticated bankruptcy prediction models like Springate S score, Fulmer and CA- Score were used for the period 1995 to 2012. The study found that 6 out

of 14 Navratna companies were financially sound all the years, remaining 8 companies were found financially weak for some of the years.

2.2 Peyman Imanzadeh, Mehdi Maran-Jouri, Petro Sepehri (2011) The purpose of this study was to present the theoretical bases of the research and compare the results obtained from applying the Springate and Zmijewski models for firm bankruptcy prediction. The data collected during the period 2004 to 2008 were tested. Binomial non-parametric methods were applied for data analysis. The results suggest that there is a significant difference between the two models in bankruptcy prediction. Moreover, the Springate model is more conservative in bankruptcy prediction than the Zmijewski model.

2.3 The purpose of this research was to determine the bankruptcy possibility of coal mining companies listed on Indonesia stock exchange by using Altman model, Springate S score model, Zmijewski X score model for the period 2011-2014 by using sample of 19 coal mining companies out of 22 listed companies. The research showed that Zmijewski model is the most accurate predictive model as compared to Altman Z score and Springate S score.

3. RESEARCH GAP

After critically analyzing literature review it is clear that very little research has been carried out for prediction of financial distress by using Springate S score especially for Public Sector Enterprises. Thus, the researcher attempts to analyze financial distress using Springate score for the eight listed, loss making and manufacturing CPSEs for the year 2011-12 to 2016-17.

4. OBJECTIVE OF THE STUDY

Purpose of this analytical research is to analyze the Financial Distress of Selected the Public Sector Enterprises using Springate Score Model.

5. FORMULATION OF HYPOTHESIS

H0: There is no significant difference in

Springate S Score of selected Public Sector Enterprises.

H1: There is a significant difference in Springate S Score of selected Public Sector Enterprises.

6. RESEARCH METHODOLOGY

This analytical research is based on secondary data collected from annual reports of the selected public sector enterprises. The researcher has selected Eight Public Sector Enterprises

- Which are listed on the recognized stock exchange i.e. BSE
- Which are loss making CPSEs as per the Lok Sabha's starred question NO.*27 for reply on loss making CPSEs on 19.07.2016 and Public Enterprises Survey 2015-2016: Vol-I also.
- Which are belongs to the manufacturing cognate group out of five Cognate Group of Public Sector Enterprises
- Purposive sampling techniques used for selection of sample

Following are the companies which are selected for the study

1. BEML (Bharat Earth Movers Ltd.)
2. Bharat Heavy Electricals Limited (BHEL)
3. Chennai Petroleum Corporation Limited (CPCL)
4. Hindustan Organic Chemicals Limited (HOCL)
5. Mangalore Refinery and Petrochemicals Limited (MRPL)
6. Steel Authority of India Limited (SAIL)
7. Scooters India Limited (SIL)
8. National Fertilizers Limited (NFL)

7. SPRINGATE SCORE MODEL

Springate Score Model is one of the Multiple Discriminant Analysis model developed by Gordon L.V. Springate in 1978 at Simon Fraser University by using 19 financial ratios to predict soundness of business, with 92.5% accuracy rate. The Springate model takes the following form -:

$$Z = 1.03A + 3.07B + 0.66C + 0.4D$$

Where,

A = Working Capital/Total Assets

B = Net Profit before Interest and Taxes (NPBIT)/Total Assets

C = Net Profit before Taxes (NPBT)/ Current Liabilities

D = Sales/Total Assets

If $Z < 0.862$; then the firm is classified as "failed"/distressed

8. DATA ANALYSIS & FINDINGS

8.1 Sample calculation of the Springate Score of BEML

Table No. 1 about here

Table No. 1 Springate S Score of BEML for the Study Period 2011-12 to 2016-17

YEARS	CALCULATION					¹ Interpretation
	I	II	III	IV	I+II+III+IV	
	1.03 (A)	3.07 (B)	0.66 (C)	0.4 (D)	Results	
2016-17	0.465	0.095	0.038	0.2389	0.8373	0.8373<0.862=Financially Distressed
2015-16	0.4798	0.08	0.031982	0.27357	0.8658	0.8658>0.862=Solvent
2014-15	0.4419	0.052	0.002817	0.2419	0.73834	0.73834<0.862=Financially Distressed
2013-14	0.4293	0.077	0.003524	0.2419	0.7518	0.7518<0.862= Financially Distressed
2012-13	0.408	0.0101	0.03878	0.2126	0.5932	0.5932<0.862= Financially Distressed
2011-12	0.4282	0.0964	0.022185	0.21827	0.7649	0.7649<0.862= Financially Distressed

(Source: Computed From Annual Report of BEML)

Chart No.1 Average Springate score of Selected Public Sector Enterprises for the Study Period 2011-12 to 2016-17

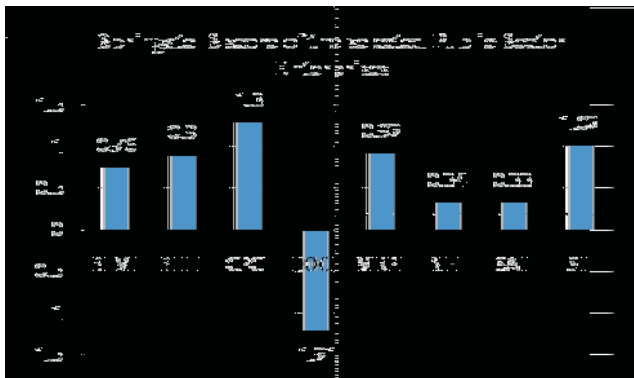


Table No. 2 about here

The above table No.1 and 2 shows calculated Springate score of selected public sector enterprises. It is observed that Springate

score of NFL and SAIL are below 0.862 hence, this both companies found financially distressed because of continuously incurring losses. Besides this BEML and HOCL are also financially distressed companies for six years except the year 2015-16.

BHEL was solvent for the initial three years but then after unable to recover its position and unable to pay its debts as S score found below 0.862 and becomes financially distressed .CPCL becomes the most solvent company except the year 2012-13.MRPL was solvent company except

the year 2014-15 and 2015-16 but company is able to recover its position in the year 2016-17 and became solvent again with high s score.SIL was initially financially distressed company with low S score but then after company improve its position and become solvent.

Table No.3 about here

Table No.3 shows Average Springate score of Selected Public Sector enterprises For the Study Period 2011-12 to 2016-17.from the above table it can observed that four CPSEs respectively BEML, HOCL, NFL, SAIL found as a financially Distressed companies as S score found below 0.862.Besides this four company can be seen in solvent position because of high S score than the cut off 0.862.CPCL is the most solvent company.

Table No. 2
Calculated Springate S Score of the Selected
PSEs for the Study Period 2011-12 to 2016-17

Name of the selected CPSEs	Year	Springate score	prediction
BHEL	2016-17	0.7332	0.7332<0.862= Financially Distressed
	2015-16	0.2637	0.2637<0.862= Financially Distressed
	2014-15	0.78057	0.78057<0.862= Financially Distressed
	2013-14	0.9736	0.9736>0.862=Solvent
	2012-13	1.295	1.295>0.862=Solvent
	2011-12	1.3406	1.3406>0.862=Solvent
	CPCL	2016-17	1.7478
2015-16		1.17572	1.1757>0.862=Solvent
2014-15		1.24021	1.24021>0.862=Solvent
2013-14		1.6488	1.6488>0.862=Solvent
2012-13		0.66788	0.66788<0.862= Financially Distressed
2011-12		1.34068	1.34068>0.862=Solvent
HOCL	2016-17	-4.924	-4.924<0.862= Financially Distressed
	2015-16	3.9724	3.9724>0.862=Solvent
	2014-15	-2.9742	-2.9742<0.862= Financially Distressed
	2013-14	-2.0496	-2.0496<0.862= Financially Distressed
	2012-13	-1.0476	-1.0476<0.862= Financially Distressed
	2011-12	-0.2282	-0.2282<0.862= Financially Distressed
	MRPL	2016-17	1.628
2015-16		0.68212	0.68212<0.862= Financially Distressed
2014-15		0.2788	0.2788<0.862= Financially Distressed
2013-14		1.04287	1.0429>0.862=Solvent
2012-13		0.8669	0.867>0.862=Solvent
2011-12		1.02468	1.0247>0.862=Solvent

NFL	2016-17	0.4468	0.4468<0.862= Financially Distressed
	2015-16	0.254	0.254<0.862= Financially Distressed
	2014-15	0.57217	0.572<0.862= Financially Distressed
	2013-14	0.06475	0.065<0.862= Financially Distressed
	2012-13	0.02915	0.029<0.862= Financially Distressed
	2011-12	0.6641	0.664<0.862= Financially Distressed
SAIL	2016-17	0.014	0.014<0.862= Financially Distressed
	2015-16	-0.2297	-0.2297 <0.862= Financially Distressed
	2014-15	0.3379	0.3379 <0.862= Financially Distressed
	2013-14	0.4568	0.4568 <0.862= Financially Distressed
	2012-13	0.5712	0.5712 <0.862= Financially Distressed
	2011-12	0.8574	0.8574 <0.862= Financially Distressed
SIL	2016-17	1.1715	1.1715>0.862=Solvent
	2015-16	1.0946	1.0946>0.862=Solvent
	2014-15	1.258	1.258>0.862=Solvent
	2013-14	1.5726	1.5726>0.862=Solvent
	2012-13	0.777	0.777<0.862= Financially Distressed
	2011-12	0.225	0.225<0.862= Financially Distressed

(Source: Computed from Annual Report of Selected Public Sector Enterprises)

Chart No.1 indicates 1 Average Springate score of Selected Public Sector Enterprises for the Study Period 2011-12 to 2016-17. From the above chart it can be seen clearly that S score of HOCL is negative. Hence, it is the most financially distressed CPSEs and S score of CPCL and SIL is high so these two companies are the most solvent companies.

Table No.3 Average Springate score of Selected Public Sector enterprises For the Study Period 2011-12 to 2016-17

Name of The selected CPSEs	Average Springate Score	Prediction
BEML	0.76	Financially distressed
BHEL	0.90	Solvent
CPCL	1.30	Solvent
HOCL	-1.21	Financially distressed
MRPL	0.92	Solvent
NFL	0.34	Financially distressed
SAIL	0.33	Financially distressed
SIL	1.02	Solvent

(Source: computed from the annual report of all public sector enterprises)

9. HYPOTHESIS TESTING

Table No.4 about here

Table-4

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	25.62	7.00	3.66	2.91	0.01	2.25
Within Groups	50.24	40.00	1.26			
Total	75.87	47.00				

INFERENCE

Above table no 2 shows the analysis of variance of Springate S –Score model. F value is 2.91 and p-value is 0.01. As p-value is less than 0.05 therefore we cannot accept the null hypothesis. It means there is a significant difference in Springate S score of selected public

sector enterprises during the study period

10. SUGGESTIONS

BEML, HOCL, NFL and SAIL are financially distressed CPSEs as per Springate S score. Hence, it is mediatory to take precautionary steps to increase sales, maintaining working capital ,increase profit so that companies can recover its position and become solvent again.

11. CONCLUSION

Solvent companies are able to pay its liabilities within the proper time but financially distressed company cannot pay its debts within the time so that it may leads to defer in its position hence, it is necessary to predict financial distress so that precautionary steps should be taken to avoid bankruptcy. In this research paper researcher analyze financial distress of eight listed, loss making, manufacturing CPSEs for the study period 2011-12 to 2016-17 by using Springate S score model. Results of the study revealed that four CPSEs namely BEML.HOCL, NFL, SAIL were financially distressed CPSEs and BHEL, CPCL, MRPL and SIL were financially healthy CPSEs. Financially distressed companies have to try to make an attempt to increasing sales, profit, decrease liabilities, and maintain working capital.

Table No.4 ANOVA: Single Factor Analysis for Hypothesis Testing of Springate Score Model

H0: There is no significant difference in Springate score of selected public sector enterprises.

H1: There is a significant difference in Springate score of selected public sector enterprises public sector enterprises

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