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An Enquiry into the Financial Distress of Maharatna CPSEs in India: An empirical analysis

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Abstract:

Public sector enterprises (PSEs) have been the back bone of Indian economy since independence. Since independence PSEs involved in manufacturing of essential products, raw materials and offering numerous other services for the people of the society at reasonable cost. The main objective of this study is to investigate the status of Maharatna CPSEs in terms of their health, more specifically enquiring the financial distress / health. For measurement of sound health, sophisticated bankruptcy prediction model like Springate (1978) and CA- Score (1978) were used.

Keywords: Financial Distress, Maharatna, Reasonable, Bankruptcy.

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Introduction

Studying financial health in terms of financial distress or bankruptcy prediction is an important topic of accounting and finance, which widely studied since liberalization of the economy. The initial journey of bankruptcy prediction was done by Beaver in the year 1966, using univariate analysis, followed by Altman Z score in the year 1968 who extended multivariate discrimination methodology using the financial ratios of United States business failures. Prediction of financial health or distress in a way is important, as it provides a signal to the stakeholders and the investors of the company, as regard to the worthiness of the company in terms of investment or stake in the company. After global financial crisis it becomes an essential work to study bankruptcy prediction of public limited companies or private sectors which can help to understand company's financial wellbeing. The prediction of financial health now becomes important for serving the interest of regulator, stakeholders, creditors and other interested parties who uses the financial statement of the company for taking important decisions. According to the some of the report it can be said that prediction of financial heath or bankruptcy of a company has its own quality because it can perfectly point out the financial status of the company. Prediction of distress or insolvency of an organization helps the various interested parties in taking appropriate decision at proper time regarding their investment or overall control.

The Indian industries got exposed to large scale domestic and international competition with the advent of economic liberalization in the 1992. While few firms were able to take up the challenges, a large number of firms were adversely affected by the competition and were financial distress. The detection of companies operating in financial difficulties hence, is a matter which has been particularly subject to in depth analysis. Through at one extreme, many learned academicians question the validity of financial distress prediction models, using univariate analysis methodology for classifying bankrupt and non-bankrupt firms are ample. In 1968, the journal of finance published a paper which was authored by Edward I. Altman which introduced to the world the "Altman Z-score", a technique designed to predict corporate bankruptcy. The Z-score model examines liquidity, profitability, reinvestment earnings and leverage which are integrated into a single composite score. Another model was developed on bankruptcy prediction on 1978 by Gordon L.V. Springate along with procedures developed by Altman. Later several important models were developed by Fulmer (1984) and CA-Score (1987) for predicting the organizations bankruptcy.

Maharatna CPSEs in India

With adoption of mixed economy in India public sector assumed the strategic importance in nation building. Since then, public sector enterprises have been treated as the back bone of Indian economy and were involved in various industrial activities like manufacturing and

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producing various products, raw materials and offering numerous other services for the benefit of the citizens of India. Most of the industrial activities of PSUs have been related to core sectors like Mining, Oil and Natural Gas, Electrical Power Generation and Distribution, Telecommunication, Iron and Steel, Heavy Water Resources as well as industries in other verticals like Fertilizer and Petro-Chemicals. Many of these units have been in operation since last 6 to 7 decades and have provided employment opportunities to millions of people in gross estimation. The government is also able to earn revenue as a result of profitable functioning of these companies. Importance of such organizations is almost indescribable and to honor such contributions, the Government of India has conferred special status to some of these industrial organizations, so that they can charter their path towards growth and prosperity. They have been categorized into three i.e. Maharatna, Navaratna and Miniratna CPSEs.

Maharatna companies in India

The Government of India first introduced Maharatna Scheme in February 2010 with the objective to make India self-reliant in several core sectors. The main objective behind introducing this scheme was to provide autonomy to the identified large sized Navaratna companies so that this company could expand their business activities in domestic as well as in foreign markets. At present 11 companies are functioning as Maharatna companies. These are as follows.

1. Bharat Heavy Electricals Limited (BHEL).
2. Bharat Petroleum Corporation Limited (BPCL).
3. Coal India Limited 4. GAIL India Limited (CIL).
4. Hindustan Petroleum Corporation Limited (HPCL).
5. Indian Oil Corporation Limited (IOCL)
6. NTPC Limited NTPC).
7. Oil & Natural Gas Corporation Limited (ONGC).
8. Power Finance Corporation (PFC).
9. Power Grid Corporation of India Limited (POWERGRID)
10. Steel Authority of India Limited (SAIL).

Public sector enterprises are backed by Government of India. Govt. recapitalizes these PSEs in case of financial emergency to save these organizations. As Maharatna companies are backed by the Central Government so the question of distress analysis has not aroused unless one investigates the financial health of these companies in terms of bankruptcy. This paper

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aims at investigating the financial status of Maharatna companies in terms of financial health / financial distress.

Review of Significant Literatures

Many studies have tried to anticipate company bankruptcy in the past few decades, both domestically and internationally.

Beaver (1966) and Altman (1968) made the first attempts to predict business failures using publicly available data and multivariate statistical tests. Beaver was able to identify 94% of bankrupt companies and 97% of non-bankrupt enterprises in the year before bankruptcy.

Whitaker (1999) extended the discussion by examining the early stages of financial distress and emphasized that declining cash flow, falling profitability, and debt-servicing incapacity are the earliest warning signals. The study highlighted that distress is a gradual deterioration process rather than a sudden event, which is particularly relevant for large public enterprises with prolonged government support.

Elloumi and Gueyié (2001) studied the relationship between corporate governance and financial distress and found that weak governance structures, poor board oversight, and inefficient managerial decisions significantly increase the probability of distress. Their findings are highly relevant in the context of Indian Maharatna CPSEs, where governance quality and state intervention often influence financial outcomes.

A major contribution in the Indian CPSE context was made by **Pardeshi and Thorat (2014)**, who evaluated the financial health of selected CPSEs using the Altman Z-score model. Their study found that companies such as NTPC and SAIL fell into the distress zone, while ONGC and BEL remained in the gray zone, indicating moderate solvency risk. The study established the usefulness of Z-score analysis for public sector enterprises in India.

Rajasekar (2014) conducted an empirical enquiry into the financial distress of Navratna public sector enterprises and concluded that traditional distress models such as Altman's Z-score remain effective for assessing the financial vulnerability of Indian government-owned firms. The study also emphasized that profitability and leverage ratios are the most significant determinants of distress among public enterprises.

A comparative study by **Batth, Nayak, and Pasumarti (2018)** analyzed the financial performance of Maharatna and Navratna PSUs using the Altman Z-score framework. Their findings revealed that several Maharatna firms such as Coal India and NMDC remained financially sound, whereas a few others showed declining Z-scores over time. This study is directly relevant to the present enquiry as it focuses on the Maharatna category itself.

Chitta (2019) specifically examined eight Maharatna companies through the Altman Z-score model during 2014–2018 and found that not all Maharatna companies performed according to

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expectations. The study observed that some enterprises experienced weakening financial structures despite their prestigious status, thereby questioning the assumption that Maharatna firms are inherently financially stable.

Dirman (2020) examined the determinants of financial distress and found profitability, liquidity, leverage, firm size, and free cash flow to be significant explanatory variables. The study concluded that higher leverage and lower liquidity substantially increase distress risk, which is particularly relevant for capital-intensive CPSEs operating in sectors such as steel, power, and petroleum.

Sareen and Sharma (2022) assessed financial distress in the Indian automotive sector and demonstrated the robustness of the Altman Z-score model in predicting stock price reactions to financial weakness. Their study indicates that market perception and accounting-based distress indicators move closely together, suggesting that distress in CPSEs may also affect investor confidence and government disinvestment outcomes.

More recently, **Ahamed (2024)** reaffirmed the predictive usefulness of the Altman Z-score model in the Indian context by reporting a high level of accuracy in identifying financially troubled firms. This supports the continued relevance of ratio-based empirical analysis for evaluating the distress position of Maharatna CPSEs in India.

Research Gap

From the above review, it is evident that although several studies have examined financial distress in PSUs, CPSEs, and Navratna enterprises, exclusive empirical studies focusing only on Maharatna CPSEs over a longer period remain limited. Therefore, the present study titled "An Enquiry into the Financial Distress of Maharatna CPSEs in India: An Empirical Analysis" seeks to fill this gap by providing a focused and updated analysis of India's largest public sector enterprises.

Objective of the study

The current study made an effort to investigate the financial hardship experienced by Indian Maharatna CPSEs between 2005 and 2022. The study has made use of the essential financial ratios that were computed utilizing secondary data. During the study period, the information was gathered from the Centre for Monitoring Indian Economy (CMIE) reports, Capitaline Corporate Database, administrative and other reports of the relevant businesses.

Bankruptcy Prediction Model

Springate Score Model

The Springate score is one of the well-known bankruptcy prediction models, which is developed on the basis of the Altman model. In the process of developing a model of the 19

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financial ratios that were considered the best, Springate selected four coefficients, based on which the model was built.

Formula: Springate score = 1.03A + 3.07B + .66C + .4D

Definitions:
A = Working capital / Total assets
B = EBIT / Total assets
C = Profit before tax / Current liabilities
D = Revenue / Total assets

What does the Springate Model denote

If the value of this ratio is greater than 0.862, the analyzed company is in a stable state. If the value is less than 0.862, it means the company might be under financial stress.

Results & Discussion

From the Springate values of Indian Maharatna CPSEs presented in the table – I, it was observed that the companies like BPCL, CIL, GAIL and HPCL acquired score more than 0.862 over the time. Hence it could be safely interpreted that companies were financially doing better as compared to other Maharatna CPSEs as far as Springate model reveals concerned. BHEL was found financially sound during 2005 to 2015 while it was found financially weak during 2016 to 2022. The company like IOCL was fond financially weak only in 2020 and 2021, rest of the years it operated with all financial soundness. NTPC was financially weak in more number of years during the study period but showed better financial health 2007-2008. ONGC was financially sound in all years except in the year 2018, 2020 and 2021. PFC was doing well initially but later during 2010-2017 it was unable to achieve minimum score, again during 2018-2022 it crossed the minimum value as per Springate model and treated as financially sound. PGCIL was able to prove themselves as financially sound only in 4 years out of 18 years during the study period. SAIL remain financially sound in 9 years out of 18 years of study. On whole results of Springate model indicate that the companies like BHEL, NTPC, PFC, PGCIL and SAIL should take serious note of their financial position. These companies unless take serious steps to improve their financial health may become pain on the neck of the government exchequer.

The value of CA- Score model of Maharatna CPSEs as presented in table –II. It can be observed that the companies like BPCL, CIL, GAIL, IOCL and ONGC were found to be satisfactory financial position during the period 2005-2022. BHEL showed a weak financial position during last three years. i.e. 2020-2022. HPCL was found financially weak during 2008-2014 while for rest of the period it achieves the score and found to be financially sound. NTPC unable to achieve minimum CA -score during 2017-2022 and proved to be financially unsound during that period but for remaining period (2005-2016) it was found to be

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financially sound enough to remain in existence for long period of time. SAIL fond to be financially sound during 2005-2015 while it was found to be financially unsound during 2016-2022. Other companies such as PFC and PGCIL were found to be financially weak during throughout the study period. The model indicates the above companies should concentrate on their financial position as these companies have failed in showing financial strength to be able enough to avoid distress as per the CA- Score model.

Concluding remarks

Financial health of a company is a matter of concern for each and every stakeholder of the organization as financial health indicates the growth prospect of the concern and indirectly it also shows the investment worthiness of the company. If the company is financially sound it leads to better prospect. In this context the present study carried out investigation into the financial health or distress of Indian Maharatna CPSEs applying sophisticated models like Springate (1978) and CA-Score (1987) which meticulously probe into the financial soundness otherwise of the company. These models have only been in very few Indian studies earlier related to public sector enterprises to analyze the financial strength or distress of the companies, which is the uniqueness of this study.

From the result of the study, it is revealed that the companies like BPCL, CIL, GAIL, IOCL and ONGC were found financially sound during the study period as all two models which has been applied here. Thus, there is no apprehension about their financial health. However, the companies like BHEL, NTPC, PFC, PGCIL and SAIL were identified financially weak during the study period in two models. The worst performance was observed in case of NTPC, PGCIL and PFC. The management should take necessary steps to improve financial status of these companies. These companies may find themselves in distress in absence of distress funding from the government in case of need. At the same time, it may be very stressful for them to raise fund from open market, as they may not be regarded as investment worthy in future. Especially the companies like NTPC, PGCIL and PFC must be more concerned as regards to financial position, because these companies are very nearer to financial distress. Proper action should be taken to improve their financial position for the year to come. Otherwise, their financial distress will create burden on national exchequer which already is stressed with high current account deficit and external obligations. These companies may be suffering because of the administration pricing policy of the government. But still it should be noted that pricing policy should not be detrimental to the survival of a concern be it be the public sector enterprise.

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TABLE-I
SPRINGATE MODEL RESULT OF PREDICTING BANKRUPTCY OF INDIAN MAHARATNA CPSEs (2005-2022)

	BHEL	BPCL	CIL	GAIL	HPCL	IOCL	NTPC	ONGC	PFC	PGCIL	SAIL
2005	2.20	2.07	1.10	1.82	1.65	2.07	0.72	2.09	1.67	0.42	2.96
2006	2.64	2.53	1.29	1.82	1.25	1.94	0.76	1.91	1.54	0.37	2.33
2007	2.99	2.28	1.67	1.82	1.41	2.21	0.88	1.85	1.45	0.31	2.85
2008	2.93	2.04	1.58	1.95	1.28	2.08	0.90	1.92	1.52	1.17	2.85
2009	2.81	1.95	1.84	1.91	1.31	1.80	0.82	1.64	1.55	0.99	2.05
2010	2.80	2.23	1.85	1.70	1.00	1.92	0.82	1.50	1.64	0.85	1.64
2011	2.07	2.71	1.68	1.62	1.04	1.78	0.80	1.63	0.47	1.08	1.19
2012	1.99	3.03	2.48	1.39	1.10	1.70	0.75	1.75	0.53	1.15	0.97
2013	1.86	3.32	2.56	1.39	1.17	1.77	0.77	1.71	0.73	0.48	0.70
2014	1.36	3.17	4.66	1.48	1.40	1.75	0.64	1.57	0.63	0.43	0.62
2015	1.06	2.45	6.29	1.09	1.58	1.61	0.51	1.33	0.58	0.37	0.54
2016	0.74	2.15	8.37	0.94	1.40	1.48	0.41	1.17	0.60	0.40	0.06
2017	0.64	1.43	10.12	1.26	1.38	0.98	0.36	1.45	0.47	0.45	0.22
2018	0.69	1.50	5.10	1.34	2.59	1.15	0.33	0.82	1.98	0.47	0.11
2019	0.64	1.56	11.55	1.75	2.52	1.04	0.25	1.21	1.15	0.42	0.42
2020	0.32	0.94	13.12	1.28	1.56	0.58	0.42	0.85	1.15	0.53	0.43
2021	0.08	1.29	11.26	1.00	1.77	0.83	0.35	0.55	1.18	0.64	0.57
2022	0.32	1.30	17.46	1.70	4.64	0.96	0.41	1.27	1.18	0.62	1.15

Note: *Score is <0.862, then the firm is called "failed"*

TABLE-II
CA - SCORE MODEL RESULT OF PREDICTING BANKRUPTCY OF INDIAN MAHARATNA CPSEs (2005-2022)

	BHEL	BPCL	CIL	GAIL	HPCL	IOCL	NTPC	ONGC	PFC	PGCIL	SAIL
2005	3.18	0.75	1.55	2.73	0.92	1.94	1.23	2.94	-1.10	-0.81	3.17
2006	3.76	1.71	2.11	2.84	0.07	1.50	1.16	2.65	-1.31	-0.82	3.02
2007	4.53	1.16	2.58	2.88	0.07	2.01	1.14	2.59	-1.36	-1.02	3.62
2008	4.50	0.89	2.65	3.16	-0.36	1.65	1.23	2.75	-1.41	-0.26	3.88
2009	4.42	0.65	2.85	3.28	-0.38	1.28	0.92	2.44	-1.45	-0.59	2.56
2010	4.38	1.23	2.94	3.13	-0.59	1.57	0.84	2.37	-1.51	-0.74	1.57
2011	1.69	1.48	1.20	2.91	-0.65	1.21	0.66	2.24	-1.59	-0.58	0.90
2012	1.94	1.76	2.95	2.28	-0.69	0.53	0.57	2.32	-1.56	-0.63	0.98
2013	1.87	2.43	3.15	1.77	-0.66	0.57	0.59	2.21	-1.58	-1.24	0.52
2014	1.09	3.16	4.88	1.81	-0.51	0.61	0.38	2.06	-1.54	-1.22	0.40
2015	1.11	2.27	4.28	1.43	-0.15	1.01	-0.08	1.97	-1.55	-1.28	0.22
2016	0.63	1.88	5.11	1.56	-0.16	1.46	-0.06	2.19	-1.53	-1.26	-0.36
2017	-0.08	0.30	4.37	1.41	-0.09	0.19	-0.40	1.42	-1.65	-1.12	-1.22
2018	-0.06	0.42	2.82	1.53	2.54	0.39	-0.52	1.01	-1.73	-1.11	-1.06
2019	-0.12	0.29	3.38	1.72	2.28	0.01	-0.72	1.29	-1.74	-1.25	-0.72
2020	-0.35	0.46	3.18	1.21	0.69	0.64	-0.63	0.90	-1.75	-1.09	-0.80
2021	-0.80	0.34	2.35	0.96	1.34	-0.25	-0.73	0.59	-1.71	-0.96	-0.34
2022	-0.37	0.21	3.11	1.50	8.44	-0.09	-0.58	1.18	-1.61	-0.79	0.46

Note: *Score is <-0.3, then the firm is called "failed"*

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