

Evaluating the Financial Health of Central Public Sector Enterprises in India through Z Score Model



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The contribution of the Central Public Sector Enterprises (CPSEs) in Indian economy is significant. The CPSEs are proclaimed towards gaining control over the commanding heights of the nation and promoting critical development in terms of the social gains, strategic value and resources. This paper is an attempt to analyze the financial performance and efficiency of selected CPSEs and also evaluate the financial health by using the Altman's Z Score; as the CPSEs are considered as a powerful instrument of bringing about the socio-economic transformation in our country. The study shows that ONGC, BEL and RCF are in gray zone where the solvency level is medium. SAIL and NTPC are in distress zone.

Key words: Financial health, bankruptcy, Z score.

1. Introduction

Business, whether new or existing, may vary from one another in terms of the industry they operate in, the environment they function in, the product/services they render, or the operations that they undertake. The success of any business is largely depends on its effective financial management practices. The financial requirement of a business must be sufficient to meet its long term and short term commitments. To meet long term commitment, it needs permanent capital and for short term commitment it needs working capital. Thus, finance is an important facet of every business.

Soon after the independence late prime minister Pandit Jawahar Lal Nehru adopted the socialistic pattern of development of the Indian economy, as it was more based on equality and justice to all. In this drive the Government owned Public Sector Undertakings (PSUs) were established in whole of the country to speed up the Indian economy and industrialization. (Harvinder Singh 2000) The PSUs are further categories as Central Public Sector Enterprises (CPSEs) and Public Sector Banks (PSBs). Central Public Sector Enterprises (CPSEs) are those companies in which the direct holding of the Central Government or other CPSEs is 51 percent or more (Gupta K.L., 1994). Since inception, the CPSEs have been the mainstay of the Indian economy and were set up with the mandate to serve the broad macro-economic objectives of higher economic growth, achieve self-sufficiency in production of goods/services, facilitate long term equilibrium in balance of payments and ensure the stability in prices and create benchmarks for prices of essential items (Deloitte, 2010).

Historically, CPSEs assume significant importance to the India's economy both in the pre and post-independence period. During the first five year plan (1951-56), there were only five CPSEs operating in primarily to select core sectors including with an investment of Rs. 29 crores. Consequent to the initiatives taken by Government during the five year plans, the role of CPSEs in terms of contribution to the Indian economy has increased manifold. Thus, the number of PSUs as on 31st March 2013 are 277 (excluding 7 Insurance companies) with a total capital employed Rs. 15,32,007 crores, at present there are 229 CPSEs are operating with a total capital employed Rs. 15,10,373 crore (DPE survey 2012-13). The GDP recorded a growth rate of 11.65% at market prices during 2012-13. The total investment in all CPSEs stood at Rs. 8,50,599 crore as on 31st March 2013, recording a growth of 16.63%. The total turnover of all CPSEs during the FY 2012-2013 stood at Rs. 19,45,777 crore. There are 14.04 lakh employees are working in CPSEs. (Public Enterprise Survey: Vol. I)

As the CPSEs have reformed their business and benchmarked their performance with the best practices and are able to perform better than the rest of the enterprises. CPSEs are transforming the business in terms of organization, financially, profitably and a heading towards sustainability. (Deloitte, 2011) However, many CPSEs are still facing several issues such as poor performance, continuous losses, risk aversion, ineffective governance, high operating cost and low rate of return on capital, over capitalization, etc forcing the enterprises to move towards financial distress. The economic consequence of corporate failure is enormous, especially for the stakeholders of Public sector enterprises. As the objectives of establishment of CPSEs are rapid economic growth and industrialization, earn return on investment, generate resources for development, promote redistribution of income and wealth creation, create employment opportunities, promote balanced regional developments and earn foreign exchange vital for economy. (Trivedi P., 1986) The rising problems of poor financial performance, inefficient management and financial insolvency always bring huge socio economic losses to the society and to the Indian economy as in CPSEs are moving towards financial insolvency. Both excessive as well as inadequate finance position are dangerous from the business point of view. One of the most significant threats for many businesses today, despite their size and the nature of their operations, is insolvency. Insolvency is the situation where the company is not meeting its long term fixed expenses and commitments. Solvency is defined as the ability of a company to meet its long term fixed

expenses and to accomplish long term expansion and growth. (Arun R and Kasilingam R., 2011). The better a company's solvency the better it is financially. When a company is insolvent, it means that it can no longer operate and is undergoing bankruptcy. Bankruptcy is a business failure that can be defined as "the condition in which a business cannot meet its debt obligations." (Arun R and Kasilingam R., 2011). Bankruptcy/ financial distress is a legal procedure that is taken up when an individual or a firm is unable to pay off its business debts. When firm fails to pay off debts, they are liable to be sued by their creditors. As a result of bankruptcy, companies in general and public shareholding, in particular, will suffer financial distress. Not only owners are affected, but also other financial statements users, such as investors, creditors and the economy in general will also be affected. Thus, an early warning signal of probable failure will enable management, investors and employees to take preventive actions and shorten the length of time whereby losses are incurred. Thus, an accurate prediction of bankruptcy has become an important issue in finance. So the purpose of the study is to analyze the financial performance of selected CPSEs and assess the financial health of selected CPSEs listed on PSU index of Bombay Stock Exchange.

2. Profile of Selected CPSEs

1. Oil & Natural Gas Corporation Ltd (ONGC)

Oil & Natural Gas Corporation Ltd (ONGC) is India's largest Oil and Gas Company, accounting for 76 percent of the country's oil and gas production. The Government of India is the majority shareholder, with a 74% equity stake. ONGC has a presence in the refining segment through its subsidiary MRPL (Mangalore Refinery and Petrochemicals). The company has acquired equity interest in gas pipelines and LNG import terminals as well. It is also expanding its overseas footprint in exploration via a series of acquisition through its wholly owned subsidiary ONGC Videsh Ltd (OVL).

2. Steel Authority of India Ltd. (SAIL)

Steel Authority of India Ltd (SAIL) was incorporated in 1973. The company manufactures and sells a broad range of steel products. These steel products are used in various industries. It has several ongoing joint venture projects and memorandum of understanding with other companies.

SAIL is one of the leading players in manufacturing of steel. The company has five integrated steel plants and three alloy steel plants. The primary products include hot rolled coils, plates and rails and secondary products are pig iron, coal chemicals, ingots, etc. During FY10, the steel plants produced 319,027 tonnes of pig iron; 13,198,558 tonnes of crude steel, and 12,127,650 tonnes of saleable steel. During same period, alloy steels plants produced 3,587 tonnes of pig iron; 307,712 tonnes of crude steel, and 04,198 tonnes of saleable steel. In FY10, the company also produced 14.5 million (mn) tonnes of hot metal and sold 4.45 million tonnes of long steel products. The company has nationwide distribution network with a presence in every district in India with around 2,500 dealers in place.

3. Bharat Electronics Limited

Bharat Electronics Limited (BEL) was set up by the Government of India under the Ministry of Defence in 1954 to meet the specialized electronic need of the Indian defense services. The company started with the manufacture of a few communication equipments in 1956. The Government of India currently holds 75.86 percent shares in BEL. The company is dominant supplier of radar, communication and electronic warfare equipments to the armed forces. BEL also has products for non defence applications and it also provides services such as contract manufacturing and quality assurance. It has nine manufacturing units and two research labs located across India. The company became the first defence CPSEs to acquire Mini Ratna (category 1) in February 2002 and has now been elevated to a 'Navratna' based on its consistent performance.

4. National Thermal Power Corporation Ltd. (NTPC)

National Thermal Power Corporation (NTPC) was incorporated on November 7, 1975 to accelerate power development in India. NTPC is India's largest power generator, with capacity and generation shares of 19% and 29%, respectively, as on FY09. The company has projects totaling about 42,454 MW (including joint ventures) in various stages of execution with 17 coal based and 7 Gas based stations located across the country. The Government of India (Gol) holds an around 75 per cent stake in the company. NTPC became a 'Maharatna' company in May, 2010, one of the only four companies to be awarded this status.

5. Rashtriya Chemicals & Fertilizers Limited (RCF)

Rashtriya Chemicals & Fertilizers Limited (RCF) was incorporated in 1978. The company produces fertilizers and industrial chemical products. It also trades in improved di-ammonium phosphate and muriate of potash. RCF is a leading fertilizers producers in India. The company has manufacturing units at Trombay and Thal, both in Maharashtra. Its major fertilizers include "Sujala", "Suphala 15:15:15", "Suphala 20:20", "Ujala", "Microla", and "Biola." The company also manufactures industrial chemical products such as methanol, sodium nitrate, sodium nitrite, ammonium bicarbonate, methylamines, dimethyl formamid(DMF), dimethylacetamide, etc. RCF is the only manufacture of DMF in India. Fertilisers manufactured by the company can be used with different soil types and in various climatic conditions.

3. Review of Literature

During the last few decades, a good number of studies have been made in India and abroad on the financial performance, analysis and financial health of organization or industry; financial management and financial performance of Central Public

Sector Enterprises played a very vital role in the Indian Economy. Thus, keeping in the mind, the various studies made in the past relating to the present study are reviewed.

Talha Mohd. (1986) analysed the existing trends in profit and profitability which are considered as a measure of performance and efficiency of public sector in India. The researcher concluded that the performance of public sector undertakings during the last two decades had been unsatisfactory. Social and economic returns were low and in many cases huge losses have been incurred, output was below the capacity and costs were high. Delay in construction, cost escalation in construction projects have led to over capitalisation. **Sinha S.L.N. (1988)** observed that vast number of public enterprises in India instead of contributing to the growth of the economy, they were accounted for wastages of physical and human assets and they are great burden on the central exchequer. **Kumar Pramod (1991)** published a Book in 1991, "Analysis of Financial statements of Indian industries." The study covered the 17 private, 5 state owned and 1 central public sector companies. He studied analysis of activities, assessment of profitability, return on capital investment, Analysis of financial structure, Analysis of fixed assets and working capital. In this research he revealed various problems of cement industries and suggested remedies for the problems. He also suggested for the improvement of profitability and techniques of cost control. **Vijayakumar (1996)** in 'Assessment of Corporate Liquidity – a discriminate analysis approach' has revealed that the growth rate of sales, leverage, current ratio, operating expenses to sales and vertical integration are the important variables which determine the profitability of companies in the sugar industry. Further, the author has studied the short-term liquidity position in twenty-eight selected sugar factories in co-operative and private sectors. A discriminate analysis has been undertaken to distinguish the good risk companies from poor risk companies based on current and liquidity ratios. Discriminating 'Z' scores have been calculated with the help of discriminate function and according to the 'Z' scores the companies are ranked in the order of liquidity. **Vijayakumar (1998)**, has examined the determinants of corporate size, growth and profitability - the Indian experience. To meet the objectives of the study, Indian public sector industries were selected. The data relating to size, growth and profitability were collected from their annual reports published by the Bureau of Public Enterprises (BPE), Government of India. The study covers the period from 1980-81 to 1995-96. The technique of average, correlation and linear and linear and multiple regression analysis has been used in this study. Inter - industry analysis reveals that the growth is positively and significantly associated with the size in all the industry groups except textiles. **Gilker (1999)** found that public enterprises (in the central as well as state sector) have failed to overcome the expectations of the society but most of them now proved white elephants. He examined the overall financial performance of a central public sector unit operating in the J and K state for last several years in different phases of its operations; identifies the various areas contributing towards the unsatisfactory operational performance of the unit, attempts to predict the financial health and viability of the unit in the year to come by testing the technique of 'Altman's Z-score analysis and finally prevails for the privatization of the unit and such other enterprises in the state sector with an objective to improve their operational efficiency, effectiveness, productivity and profitability. **Ritu C. (2002)** made an attempt to assess the financial performance and financial health of public sector units in India by applying Altman's Z-Score. The researcher found that some PSU were in very healthy zone, some in healthy zone and some in bankruptcy zone and keeping in view the PSU's, which would be designated as bankrupt and in financial distress zone and certain to fail, thus these units need to be privatized. **Amalendu Bhunia (2007)**, in his study on liquidity management analysed the efficiency of the management of short-term liquidity in selected public sector iron and steel enterprises in India. The study revealed that actual values of working capital have been found to be lower than the estimated values of working capital for the companies, such as Steel Authority of India Limited (SAIL) and Indian Iron and Steel Corporation (IISCO). There was a poor liquidity position existed in case of both SAIL and IISCO, inefficient inventory management in case of SAIL and inefficient receivable management in case of both the enterprises. It suggested that increase in additional investment in raw materials, reduction in the burden of current liabilities were necessary in order to improve the inventory management and liquidity position of these steel companies. **Siddharth Mahajan and Mainak Sarkar (2007)** made an attempt to compare the financial performance of three Indian companies, namely, Tata motors, Maruti and Mahindra and Mahindra with two MNCs, Honda and Hyundai. The study indicated that the MNCs are more efficient in utilizing their assets to generate profits. However, the return on equity of the Indian companies was about ten times than that of the MNCs. Regarding the solvency ratios, the debt-equity ratio of the Indian companies were about one-and-half times than that of the MNCs. This was because the Indian Companies used much less equity capital than that of MNCs. According to the news published in the Lokmat Daily New paper, there is a significant increase in the sick companies in Maharashtra state. According to the data supplied by BIFR, after every two sick companies that filed there case to BIFR one is from Maharashtra state. In the year 2009 to 2012 total 116 companies have registered their case with BIFR. Out of the total 24 companies are from Maharashtra state only. In the year 2009, in Maharashtra only 4 companies were sick, where as in 2011 seven companies and in 2012 there are 11 companies are declared as sick companies.

A few attempts were made by the researcher to study the financial performance of selected CPSEs in India or abroad. But no comprehensive study was carried out to analyze the financial performance and financial health of CPSEs in India especially with respect to manufacturing sector. Bearing this in mind, the researcher has selected a comprehensive study the financial analysis, performance, health of Manufacturing CPSEs in India listed on BSE PSU Index.

Though this study was mainly based on secondary data in the form of financial statements of selected CPSEs, the present study is unique in the sense that it will assess the financial performance and on the basis of that it will predict the financial health of CPSEs and it also compare the results with the average in the industry.

4. Objectives of the Study

1. To study the financial performance and examine the efficiency of the selected CPSEs.
2. To evaluate the financial health and viability of the selected CPSEs.

5. Research Methodology

As the present study is intended to analyse the financial performance of select CPSEs engaged in manufacturing activities and provides the basic infrastructure. The data which is vital for this kind of analysis were collected from the financial statements of the CPSEs submitted to the Department of Public Enterprise, Government of India. The data is ranging from the Financial Year 2010-11 to Financial Year 2012-13 i.e. for three Years for all considered CPSEs. The sample size derived from the CPSEs listed on the PSU index of the Bombay Stock Exchange. Out of 60 PSUs, 35 are CPSEs and 25 are PSBs. Out of 35 CPSEs 27 are in manufacturing sector and 8 are in service sector, out of the 27 CPSEs five CPSEs were selected by systematic sampling. The sample CPSEs are shown in the table 1.

Table 1 List of Selected CPSEs in India.

Sr.No.	Name of CPSE	Category
1	Oil And Natural Gas Corporation Ltd (ONGC)	Oil & Gas
2	Steel Authority Of India Ltd. (SAIL)	Metal, Metal Products and Mining
3	NTPC Ltd. (NTPC)	Power
4	Bharat Electronics Ltd. (BEL)	Capital Goods
5	Rashtriya Chemicals & Fertilizers Ltd. (RCF)	Agriculture

The data will be analyzed by using financial tools like ratio analysis and Altman's Z score formula. Edward Altman (1968) developed a model 'Altman Z Score' which was the most renowned model in predicting company bankruptcy using financial ratios. Altman set critical values between companies based on survivability indicator. Altman showed that companies with a Z Score of less than 1.81 (distress zone) are highly risky and likely to go bankrupt; companies with a Z Score more than 2.99 (safe zone) are healthy and stable company where bankruptcy is unlikely to occur. Companies that have a Z Score between 1.81 to 2.99 are in the gray zone with uncertain result and bankruptcy is not easily predicted one way or the other. (Altman E.I., 1968)

The original Altman Z Score (1968) is as follow:

$$Z = 0.012(X1) + 0.014 (X2) + 0.033 (X3) + 0.006(X4) + 0.999(X5)$$

Where,

- X1 = working capital/total assets
- X2 = retained earnings/total assets
- X3 = earning before interest and taxes/total assets
- X4 = market value of equity/book value of total debt
- X5 = sales/total assets

X1 Working Capital/Total Assets

This ratio is a measure of the net liquid assets of the firm relative to the total assets of the company. A company which experiences repeated operating losses generally suffers a reduction in the working capital relative to total assets.

X2 Retained Earnings/Total Assets

This component of Z score provides information on the extent to which a company has been able to reinvest its earnings in the business. In addition it measures the leverage of a company. Those companies with high retained earnings relative to total assets have financed their assets through retention of profits and have not utilized as much debt. An older company has time to accumulate earnings and the measurement creates a positive bias towards older companies.

X3 Earnings Before Interest and Taxes/Total Assets

This ratio measures the true productivity of the firm's assets, independent of any tax or leverage factors. Since a company's existence is based on the earning power of its assets. This information allows measuring the effectiveness of company in utilization of its assets. This ratio focuses on the corporate failure.

X4 Market Value of Equity/Book Value of Total Debt (liabilities)

This ratio gives an indication of how much a company's assets can decline in value before debts may exceeds assets and the company become insolvent.

X5 Sales/Total Assets

This ratio measures the ability of the company's assets to generate sales. It measures the management's capacity in dealing with competitive conditions.

6. Limitations of the Study

1. The study is confined to only manufacturing sector and only five CPSEs were selected.
2. The study is based on secondary data and that is collected from the published documents submitted by the CPSEs.
3. The present study covers only three years data.

7. Findings of the study

1. From the table 2 it is observed from the Net Working Capital to Total Assets (X1) this ratio shows the liquidity position of the company. The table shows that ONGC is ranging from 0.0418 to 0.0129, 0.1249 to -0.014 for SAIL, 0.1417 to 0.0813 for NTPC, 0.3318 to 0.4135 for BEL and 0.1958 to 0.2448 for RCF. During the period all the selected CPSEs has shown a decline trend except RCF. It indicates that during 2011-12 to 2013-14 these companies have invested more in current assets, which shows that too much if its funds are blocked in short term investments. It also shows the poor working capital management in all the selected CPSEs.
2. The Retained Earnings to Total Assets (X2) indicates that higher the ratio greater the financial stability of the company at the time of low profitability. From the table 2 it is observed that 0.0008 to 0.0717 of the total assets of ONGC, 0.612 to 0 of SAIL, 0.041 to 0.004 for NTPC, 0.1696 to 0.021 for BEL are financed by its retained earnings. However, in case of RCF the financing of its total from its retained earning is zero during the study period. This shows that these CPSEs have been utilizing more debt rather than retained earnings. The decreasing trend of retained earnings for RCF, NTPC, BEL during the study period indicates that the unstable growth. And this situation continues it may affect the profitability and performance.
3. In Table 2 the Earning before Interest and Tax to Total Assets (X3) shows the earning power of its assets. The operating efficiency of all the CPSEs is very low. SAIL and RCF is very poor in operation of assets.
4. Market Value of Equity/Book Value of Total Debt (liabilities) (X4) is observed from the table 4 that all the selected CPSEs the equity portion is increased in the year 2013-2014. This shows that the financial health of all CPSEs is becoming good when compare to other and provide margin to its creditors in bankruptcy. It is also observed that the CPSEs are rely on the debt financing.
5. From the table 2 it is observed that the Sales to Total Assets (X5) ratio for ONGC it is ranging from 0.6319 to 0.537, 0.5944 to 0.5009 for SAIL, 0.3882 to 0.4011 for NTPC, 0.3851 to 0.4352 for BEL and for RCF it range from 1.1369 to 1.168 during the study period. In the selected CPSEs the performance of RCF is good as compare to the other CPSEs. RCF is using its assets effectively to generate sales or revenue.
6. The table 3 shows that the Z score of the selected CPSEs. The financial health of all the CPSEs is in increasing except SAIL. In the year 2013-2014 the Z score of BEL, ONGC and RCF is 2.20, 2.09 and 2.02 respectively. These companies are in gray zone, where the solvency level is medium and the prediction of bankruptcy is uncertain. SAIL and NTPC are in distress zone where the financial performance is poor and may fall bankrupt in future if sufficient measures are not taken. It is also observed from the study that there is no CPSEs is coming under the safe zone where the financial health is highest and there is no possibility of bankruptcy in future.

Table 2 Analysis of Financial Performance and efficiency of Selected CPSEs

CPSEs	ONGC			SAIL			NTPC			BEL			RCF		
Year Factor	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014
X1	0.0418	0.0294	0.0129	0.1249	0.0605	-0.014	0.1417	0.1014	0.0813	0.3318	0.3767	0.4135	0.1958	0.2049	0.2448
X2	0.0008	0	0.0717	0.0612	0	0	0.0041	0.0042	0.004	0.1696	0.1898	0.21	0	0	0
X3	0.1867	0.145	0.1213	0.0673	0.04	0.047	0.0984	0.0929	0.0778	0.0734	0.0773	0.0805	0.0748	0.0635	0.0636
X4	0.0007	0	1.7849	0	0	0.5815	0	0	1.0551	0	0	1.1807	0	0	0.5805
X5	0.6319	0.6408	0.537	0.5944	0.5211	0.5009	0.3882	0.3882	0.4011	0.3851	0.4142	0.4352	1.1369	1.1766	1.168

Table 3 Calculation of Z score of the Selected CPSEs

ONGC			SAIL			NTPC			BEL			RCF		
2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014	2011-2012	2012-2013	2013-2014
1.32	1.15	2.09	1.05	0.73	0.99	0.92	0.82	1.39	1.26	1.39	2.20	1.62	1.63	2.02

8. Conclusion

The study reveals that the financial ratios are the important tools for measuring the financial performance and efficiency of the companies. The selected CPSEs have invested more funds in the current assets which results in blockage of funds and creates the pressure on the earnings and the utilization of assets. RCF and SAIL is very poor in generating the returns on the total assets. However, RCF is good in case of sales to total assets as compare the other CPSEs.

The Altman's Z-Score helps in predicting the financial solvency of the companies. It is possible to the CPSEs to reduce the rate of bankruptcy through use of Z-Score by identifying and control the variables that induce the financial failure. This study finds out the financial health of BEL, ONGC and RCF are in gray zone. The financial health of these CPSEs is considered to be medium and the bankruptcy is not easily predicted. The failure of these CPSEs in the situation is uncertain. In case of NTPC and SAIL are highly risky and fall under the Distress zone where the failure is certain in the future if proper measurements are not taken to improve the performance and efficiency. The study further shows that out of the selected CPSEs no CPSEs fall under the safe zone, where the solvency is highest and there is no uncertainty of bankruptcy in the near future. The financial health is sound and the financial performance and efficiency in management of the resources and business is good.

It is recommended that financial ratios should be regularly calculated to and used as a performance measurement tool of the CPSEs in India. The effective use of this information on the financial health should be used as a warning signal to sensitize the development of the CPSEs. The CPSEs are assigned very important role in the development of Indian economy. The failure of any CPSEs may affect the socio economic balance of the country.

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