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MEASURING THE FINANCIAL HEALTH OF HINDUSTAN PETROLEUM CORPORATION LIMITED USING 'Z' SCORE MODEL

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Abstract:-Measuring the financial health of a firm has become vital and coming up need in the context of emerging hectic competition at almost every sector of the business. The financial health of a firm is assessed through various financial parameters and they are closely associated with each other. As for as ratios are concerned, there are many number of ratios are available to analyze and predict the financial soundness of a firm, since single ratio does not convey much of the sense. Altman combined a number of accounting ratios to form an index of profitability, which is regarded as an effective indication of corporate performance in predicting financial health of a firm. In this view, this paper has made an attempt to analyze and predict the financial health of Hindustan Petroleum Corporation Limited by way of applying Altman's Z – score.

Keywords: Financial Health , Hindustan Petroleum Corporation Limited , 'Z' Score Model.

INTRODUCTION

There is a dire need for prediction of business failures since the results of business failure leads to heavy losses both financially and non-financially. The study conducted is to investigative the significance level of profit / bankruptcy of Hindustan Petroleum Corporation Limited using Z-score analysis over a period of 10years. The study is based upon the secondary sources of data available from the annual reports. There are number of variables contributed for the financial performance of a concern. The financial statements consist of different variables, which established either direct or indirect relationship with each other. A financial analyst can predict the financial performance in terms of liquidity, profitability and viability. It helps to predict the financial distress of the business. In order to measure the performance, ratios, the indicators, are normally used to identify the financial health of the firm.

The Major Parameters of the Methodology Include

1.Data collection (Annual Reports of HPCL tending from 2003-04 to 2012-13).
2.Analyzing and interpreting the information available in the financial performance and drawing meaningful conclusions from them.
3.Finally, drawing conclusions using Altman's Z-score analysis.

'Z' Score Model for Measuring the Bankruptcy

About 40 years age, Edward I. Altman, a financial economist at New York University's Graduate School of Business, developed a model for predicting the likelihood that a company would go bankrupt. This model uses five financial ratios that combine in a specific way to produce a single number, called the Z-score is a general measure of corporate financial health. The most famous failure prediction model is Altman's Z-score model. Based on Multiple Discriminate Analysis (MDA), the model predicts a company's financial health based on a discriminate function to the firm.

$Z = 1.2\,X_1 + 1.4\,X_2 + 3.3\,X_3 + 0.6\,X_4 + 1.0\,X_5$ …….. (1)

Where;

Z = Discriminate function score of a firm

X_1 = Working Capital / Total Assets.

X_2 = Retained Earnings / Total Assets

X_3 = Earnings before Interest and Taxes / Total Assets

X_4 = Market Values of Equity / Book Value of Total liabilities or reciprocal of Debt Equity Ratio.

X_5 = Sales / Total Assets.

The Z-score model (developed in 1968) was based on a sample composed of 66 manufacturing companies with 33 companies in each of two matched pair groups. Altman subsequently developed a revised Z-score model (with revised co-efficient and Z-score cut – offs) which dropped variables X_4 and X_5 (above) and replaced them with a new variable X_4 = net worth (Book value) / total liabilities. The X5 variables were allegedly dropped to minimize potential industry effects related to assets turnover.

GUIDELINES

Altman Guidelines for Health Zone

With the help of Altman guidelines, the overall financial health of Hindustan Petroleum Corporation is measured during the study period, calculation of all the necessary components that are needed for the equation to be solved.

SITUATION	Z-SCORE	ZONES	REMARKS
I	Below 1.8	Red Zone	Its business failure is certain and will occur in the next 1-2 years.
II	Between 1.8 and 2.99	Yellow zone	Financial health is good. Failure is uncertain to predict.
III	3.0 and above	Green Zone	Its financial viability is extremely high and good. There is no risk to fall.

'Z' Score Ingredients

The Z-score is calculated by multiplying the following accounting ratios, which is efficient in predicting bankruptcy.

Ratio of Working Capital to Total Assets (X1)

The ratio of working capital to total assets expresses the liquidity position of the company. It measures the relationship between the working capital of the firm and total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered. A firm with consistent operating losses will often have shrinking current assets in relation to total assets.

Table 1: Working Capital to Total Assets Ratio of HPCL (` in Crore)

Years	Current Assets	Current Liabilities	W.C = C.A – C.L	Total Assets `	$X_{1=}$ W.C/T.A
2003-04	9430.17	7655.15	1775.02	10897.69	0.163
2004-05	9502.30	6988.67	2513.63	12000.95	0.209
2005-06	11009.98	7954.89	3055.09	16784.01	0.182
2006-07	11,464.70	10119.49	1345.21	21537.08	0.062
2007-08	19,297.37	12433.69	6863.68	28945.97	0.237
2008-09	15992.69	11755.81	4236.88	35089.17	0.121
2009-10	20,641.94	16555.11	4086.83	34668.31	0.118
2010-11	26,590.97	19606.60	6984.37	40762.62	0.171
2011-12	36,765.26	42702.56	-5937.30	71109.55	-0.083
2012-13	38,230.64	43262.65	-5032.01	76244.73	-0.066
				Mean	**0.111**

Source: Annual Reports of Hindustan Petroleum Corporation limited

The working capital to total assets ratio of HPCL is calculated and exhibited in Table 1. It is noticed from the table that the ratio was fluctuated throughout the period of study and it lies in between -0.083 in 2011-12 and 0.237 in 2007-08. The mean value of the ratio is 0.111, which is one of the ingredients of z-score for evaluation of the financial health of the HPCL. This figure will be put in equation (1) as above in place of X_1. The ratio of working capital to total assets is negative during 2011-12 and 2012-13. It reflects the poor liquidity position of the HPCL.

Ratio of Retained Earnings to Total Assets (X2)

Retained earnings are the amount re invested earnings or losses of a firm. The ratio of retained earnings to total assets measures the leverage of a firm. The company with high of this ratio has financed their assets through retention of profits and has not utilized as much debt.

Table 2: Ratio of Retained Earnings to Total Assets Ratio of HPCL (` in Crore)

Years	Retained Earnings (` in Crores)	Total Assets (` in Crores)	X_2 = R.E / T.A
2003-04	1061.48	10897.69	0.097
2004-05	697.18	12000.95	0.058
2005-06	289.55	16784.01	0.017
2006-07	862.62	21537.08	0.040
2007-08	1016.03	28945.97	0.035
2008-09	366.99	35089.17	0.010

2009-10	827.53	34668.31	0.024
2010-11	988.02	40762.62	0.024
2011-12	576.90	71109.55	0.008
2012-13	567.96	76244.73	0.007
		Mean	0.032

Source: Annual Reports of HPCL

Table 2 shows the ratio of retained earnings to total assets of the HPCL. It is clear from the table that the ratios are fluctuating throughout the study period. It was 0.097 as high in the year 2003-04 and 0.007 as low in the year. The mean ratio of retained earnings to total assets was 0.032 during the study period, which is the second parameter of z- score. The decreasing trend in this ratio for the lost two years shows the financial weakness of the HPCL. It needs more effort to strengthen the financial health for the company.

Ratio of Earnings before Interest and Taxes /Total Assets (X_3)

It measures the operating performance of the company and it also indicates the earning power of the company. In addition, this is a measure of the productivity of the firm's assets, independent of any tax on advantage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with credit risk.

Table 3: Ratio of Earnings before Interest and Taxes to Total Assets (X_3)

Years	EBIT (` in Crores)	Total Assets (Rs. (` in Crores)	X_3 = EBIT / T.A
2003-04	2904.22	10897.69	0.266
2004-05	1640.60	12000.95	0.137
2005-06	285.10	16784.01	0.017
2006-07	1961.11	21537.08	0.091
2007-08	1130.32	28945.97	0.039
2008-09	712.22	35089.17	0.020
2009-10	2121.19	34668.31	0.061
2010-11	2361.38	40762.62	0.058
2011-12	1219.73	71109.55	0.017
2012-13	1361.17	76244.73	0.018
		Mean	0.072

Source: Annual Reports of HPCL

Table 3 exhibits the ratio of EBIT to total assets of the HPCL. It is observed form table that the ratios are fluctuating throughout the study period in between the low of 0.017 2005-06 and 2011-12, and high of 0.137 in 2004-05. The average ratio of EBIT to total assets was 0.072 during the study period, which is the third parameter of z- score. The lowest of this ratio for the lost two years shows the low profitability of the HPCL. It is necessary that the HPCL take adequate steps to increasing he earning capacity of the company.

Ratio of Market Value of Equity to Book Value of Total Liabilities (X_4)

Ratio of equity to total liabilities is the measure of the long term solvency of a company. It is reciprocal of the familiar debt-equity ratio. Equity is measured by the combined book value of all shares and liabilities include both, current and long-term liabilities. This measure shows how much assets of an enterprise can decline in value before the liabilities exceed the assets and the concern becomes insolvent.

Table 4: Ratio of Market Value of Equity to Book Value of Total Liabilities (X_4)

Years	Equity Value (` in Crores)	Total Liabilities (` in Crores)	X_4 = Equity Value / T. L
2003-04	338.90	10897.69	0.031
2004-05	338.93	12000.95	0.028
2005-06	338.94	16784.01	0.020
2006-07	338.95	21537.08	0.016
2007-08	339.01	28945.97	0.012
2008-09	339.01	35089.17	0.010
2009-10	339.01	34668.31	0.010
2010-11	339.01	40762.62	0.008
2011-12	339.01	71109.55	0.005
2012-13	339.01	76.244.73	0.004
		Mean	0.014

Source: Annual Reports of HPCL

The ratio of equity to total liabilities of HPCL is calculated and exhibited in Table 4. It shows declining trend over the period of the study period. It was 0.031 in 2003-04, which has decreased to 0.004 in 2012-13. The mean value of the ratio is 0.014, which is one of the ingredients of z-score for evaluation of the financial health of the HPCL. It reflects the poor solvency position of the HPCL.

Ratio of Sales to Total Assets (X_5)

Ratio of sales to total assets is a standard turnover measure and shows the performance of the company. In addition to this, it will reveal the sales generating capacity of the company's assets and measure of management's capacity to deal with competitive conditions.

Table 5: Ratio of Sales to Total Assets (X_5)

Years	Net Sales (` n Crores)	Total Assets (` n Crores)	X_5 = Net Sales / T .A
2003-04	50339.10	10897.69	4.619
2004-05	59264.55	12000.95	4.938
2005-06	68161.77	16784.01	4.061
2006-07	83571.14	21537.08	3.880
2007-08	96442.92	28945.97	3.332
2008-09	109377.60	35089.17	3.117
2009-10	101347.51	34668.31	2.923
2010-11	123772.42	40762.62	3.036
2011-12	178139.23	71109.55	2.505
2012-13	206529.34	76244.73	2.709
		Mean	3.512

Source: Annual Reports of HPCL

Table 5 shows the ratio of net sales to total assets of the HPCL. It is understand from the table that the ratios are fluctuating throughout the study period. It is lies in between the low of 2.505 in 2011-12 and high of 4.938 in 2004-05. The mean value of the ratio is 3.512, which is one of the ingredients of z-score for evaluation of the financial health of the HPCL. The decreasing trend in this ratio for the lost two years shows the poor operating performance of the HPCL It is suggested that the HPCL should constantly increased its sales for improve its operating performance.

Z score of HPCL

Table 6 Z score of HPCL

Year	X_1	X_2	X_3	X_4	X_5	Z score
2003-04	0.195	0.136	0.879	0.019	4.619	5.849
2004-05	0.251	0.081	0.451	0.017	4.938	5.739
2005-06	0.218	0.024	0.056	0.012	4.061	4.372

2006-07	0.075	0.056	0.300	0.009	3.880	4.321
2007-08	0.285	0.049	0.129	0.007	3.332	3.801
2008-09	0.145	0.015	0.067	0.006	3.117	3.349
2009-10	0.141	0.033	0.202	0.006	2.923	3.306
2010-11	0.206	0.034	0.191	0.005	3.036	3.472
2011-12	-0.100	0.011	0.057	0.003	2.505	2.476
2012-13	-0.079	0.010	0.059	0.003	2.709	2.702
Average	0.134	0.045	0.239	0.009	3.512	3.939

The Z-score value of the HPCL was calculated as per the Altman's guidelines and exhibited in Table 6. The Z- score of HPCL was 5.849 in 2003-04, which is decreased to 3.306 in 2009-10. Subsequently, it is turned to increase as 3.476 in 2010-11, later on it was deceased to 2.476 in 2011-12. In the final year it was increased to 2.702. It is noticed that except lost two years the Z-score shows more than 3, it reflects that the financial health is viable and there is no risk of a fail. However it is turned to decline in the lost two years, it is fall under yellow region and the financial viability is considered healthy but the failure in this situation is uncertain to predict.

CONCLUSION

Though the average z score value of the HPCL 3.939, the z-score shows decreasing trend over the period of analysis. The negative ratio of working capital to total assets reflects the poor liquidity position of the HPCL. All other components X_2, X_3, X_4, and X_5 also show decreasing trend, which revels decreasing trend in solvency, profitability, and operating performance. It is suggested that the HPCL should take adequate measure to strengthen the financial health for the HPCL for maintain the safer zone.

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