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EVALUATING THE FINANCIAL HEALTH IN ONE ÍNDIAN OIL CORPORATION USING 'Z'-SCORE MODEL

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ABSTRACT

The present research has been undertaken to study the financial performance of Indian Oil Corporation Limited since 2010-11 to 2014-15. Data have been collected through annual reports of Indian Oil Corporation and Altman Z Score Model of corporate bankruptcy has been applied to examine the financial performance of the company. The Z value after the application of Altman Z Score model is 2.7624 which documents that the financial position of the company is sound.

KEYWORDS: *Altman Z Score, Indian Oil Corporation, assets, liabilities, equity.*

INTRODUCTION

Indian Oil Corporation Limited is an Indian state-owned oil and gas corporation with its headquarters in New Delhi, India. It is the largest public corporation in India in terms of revenue. IndianOil Corporation Limitedand its subsidiaries account for a 49% share in the petroleum products market in India. It owns and operates 10 of India's 22 refineries. The company is mainly controlled by the government of India which owns approximately 58.57% shares in the company. It is one of the seven Maharatna status companies of India.As of 31 March 2013, the company had 34,084 employees, out of which 2643 were women (7.8%). Its workforce includes 14,981 officers. The attrition rate in IndianOil is around 1.5%. The company incurred INR 78 billion on employee benefits during the financial year 2012-13.

Altman 'Z' Score Model for Measuring the Bankruptcy

Edward I. Altman developed a model for measuring the corporate bankruptcy in the year 1968 which is popularly known as Altman's Z score model. This modelis based on a sample composed of 66 manufacturing companies. It was used in predicting business insolvency. It isalso known as Z score model.This model uses five financial ratios that combine in a specificway to produce a single number called the Z-score which is a general measure of corporatefinancial health. Basedon Multiple Discriminate Analysis (MDA), the model predicts a company's financial healthbased on a discriminate function to the firm. Table 1 shows the guidelines provided by Edward Altman. If the value of Z comes to below 1.8, then it known as Bankruptcy Zone orit can be said that the performance of the company is not sound. Moreover, if the value of Z falls between 1.8 and 2.99, it documents healthy zone for the company. The value of Z more than 2.99 highlights that the company is financially very sound.

$$Z = 1.2\,X_1 + 1.4\,X_2 + 3.3\,X_3 + 0.6\,X_4 + 1.0\,X_5$$

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 Value of Equity / Book value of Total Liabilities or Reciprocal of Debt-Equity Ratio
X_5 = Sales / Total Assets.

Table 1: Shows the Altman's Guidelines

Situation	Z Value	Zone	Remarks
I	Below 1.8	Red Zone	Bankruptcy Zone Certain to fall
II	Between 1.8 and 2.99	Yellow Zone	Healthy Zone Uncertain to predict
III	3.0 and above	Green Zone	Too Healthy Zone Not to fall

LITERATURE REVIEW

Altman & Narayanan (1997) in their book entitled, "International Accounting and Finance Handbook" conducted a study in 22 countries and revealed that multiple discriminant analysis, logistic regression, and probit models built on the basis of accounting ratios are effective tools for predicting default companies. Aiyabei (2002) in his paper titled, "Financial Distress: Theory, Measurement and Consequence" examined the financial performance of small business firms in Kenya by applying Z score model. He concluded that investors should check Z-score of the companies on a regular basis to keep an eye on their investments. The author stressed that a deteriorating Z-score is a signal of trouble. Mansur &Mulla (2002) made a study in Textile mill with the help of Z score model for evaluating the financial health with five weighted financial ratios and revealed that cement Industry's financial health especially India Cements Limitedis sound. Chaitanya (2005) used Z model to measure the financial distress of Industrial Development Bank of India (IDBI) and found that IDBI is likely to become insolvent in the coming years. Kumari (2013) in the research paper entitled, "Evaluation of Financial Health of MMTC of India: A Z Score Model" examined the financial soundness of public and private sector banks in India by applying the Altman Z score model. It has been found that the financial conditions of the Indian Banks are sound except Canara bank (among the public sector banks) and Kotak Mahindra bank among the private banks. While the capital adequacy ratio of both banks was sound enough as compared to other banks. Lahiri (2013) in the research paper entitled, "Measuring the Financial Health of Indian Oil Corporation Limited using 'Z'Score Model" analyzedthe financial health of the companyby way of applying Altman's Z-Score. The Z-score of Indian Oil Corporation stands at1.8528which is between the range of 1.8 and 2.99 as depicted from the Altman's guidelinesof bankruptcy. The company falls in the red zone because of very low Z score and hence must incorporate necessary changes to improve its overall performance.

OBJECTIVE OF THE STUDY

The purpose of this study is to judge the financial performance of Indian Oil Corporation for a period of five yearssince 2011 to 2015 by using Edward Altman Z-score model of corporate bankruptcy.

'Z'-SCORE Components

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

X_1 (Working Capital/Total Assets)

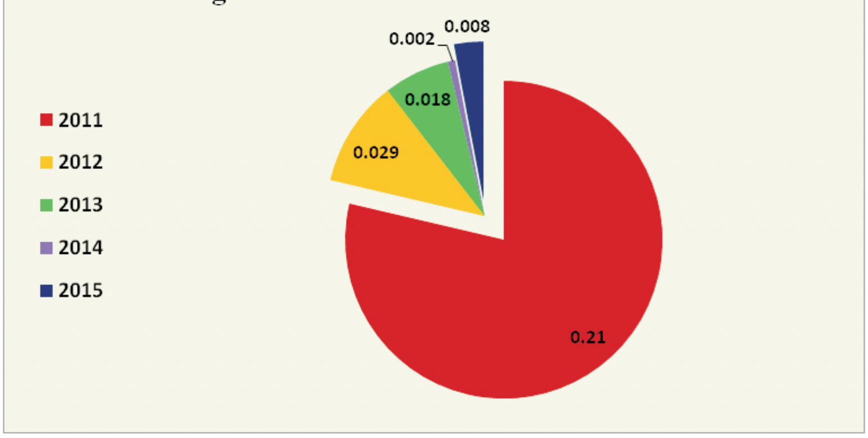
It expresses the liquidity position of thecompany towards the total capitalization. Working capital is defined as the differencebetween current assets and current liabilities. Table 2 shows the calculation of X_1. The total mean value of X_1 comes to be 0.0534.

Table 2: Shows the Calculation of X_1

Year	Current Assets	Current Liabilities	Working Capital	Total Assets	X_1=WC/TA
2011	83321.18	59313.40	24007.78	114402.78	0.21
2012	125977.44	132518.95	6541.51	219827.22	0.029
2013	128298.57	124133.67	4164.9	223995.27	0.018
2014	134577.77	135320.24	742.47	252413.78	0.002
2015	95931.02	96801.35	870.33	219849.47	0.008
Total Mean Value					**0.0534**

Source: Annual Reports of Indian Oil Corporation 2014-15, 2013-14, 2012-13, 2011-12, and 2010-11.

Fig.1: Shows the values of X1



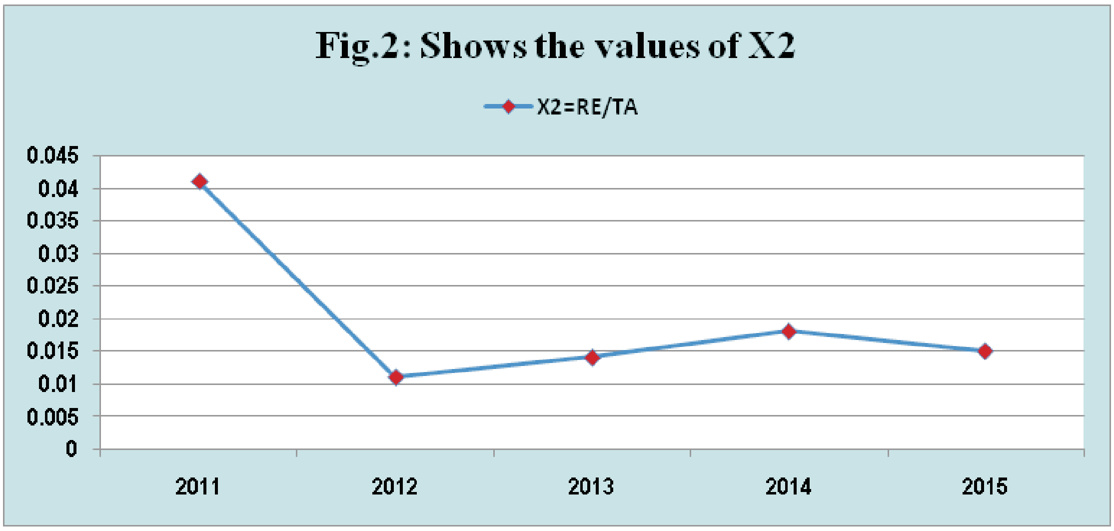
X_2 (Retained Earnings / Total Sales)

Retained earnings refer to the percentage of net earnings not paid out as dividends but retained by the company to be reinvested in its core business, or to pay debt. It is recorded under shareholders' equity on the balance sheet. X_2reflects the extent of the company's leverage. The mean of X_2 is 0.0198 as shown by the table 3.

Table 3: Shows the Calculation of X_2

Year	Retained Earnings	Total Assets	X_2=RE/TA
2011	4779	114402.78	0.041
2012	2547	219827.22	0.011
2013	3244	223995.27	0.014
2014	4548	252413.78	0.018
2015	3345	219849.47	0.015
Total Mean Value			**0.0198**

Source: Annual Reports of Indian Oil Corporation 2014-15, 2013-14, 2012-13, 2011-12, and 2010-11

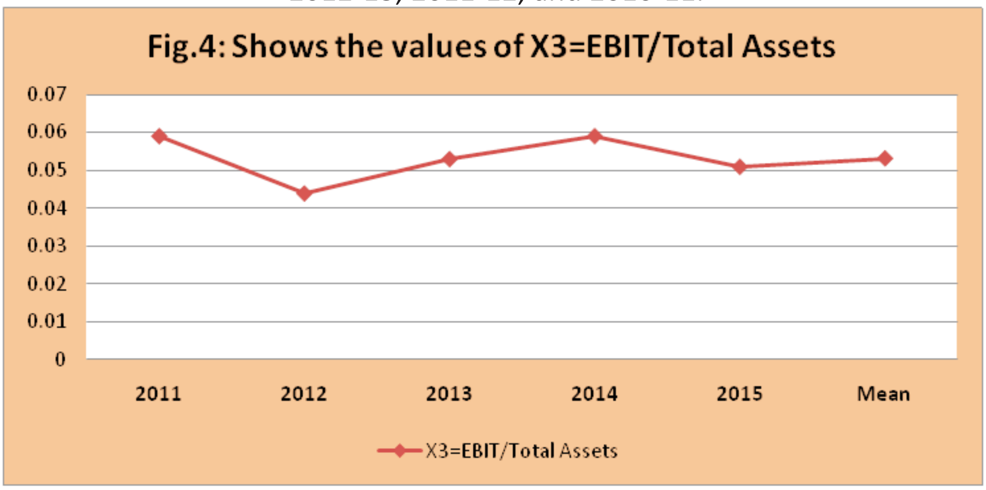


X_3 (Earnings before Interest and Taxes / Total Assets)

It is a measure of a firm's profit that includes all expenses except interest and income taxexpenses. It is the difference between operating revenues and operating expenses.It is the measure of the company's operating performance and indicates the earning capacity of the company. Table 4 shows the calculation of X_3. The total mean value of X_3 comes to be 0.0532.

Table 4: Shows the Calculation of X_3			
Year	**EBIT**	**Total Assets**	**X_3=EBIT/TA**
2011	9095.86	114402.78	0.059
2012	9889.97	219827.22	0.044
2013	12056.45	223995.27	0.053
2014	15009.93	252413.78	0.059
2015	11430.56	219849.47	0.051
Total			**0.0532**

Source: Annual Reports of Indian Oil Corporation 2014-15, 2013-14, 2012-13, 2011-12, and 2010-11.

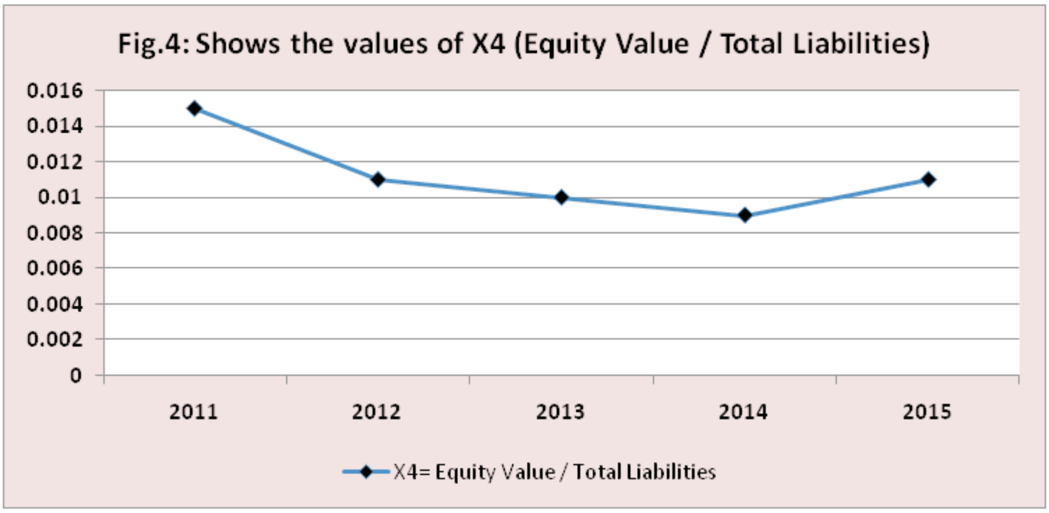


X_4 (Market Value of Equity / Book Value of Total liabilities)

It is the measure of the longtermsolvency of a company. It is reciprocal of the debt-equity ratio. Equity ismeasured by the combined market value of all shares while debt includes long-term liabilities and current liabilities.This measure shows how much assets of an enterprise can declinein value before the liabilities exceed the assets and the concern becomes insolvent.Table 5 shows the calculation of X_4. The mean value of X_4 after calculation becomes 0.0113.

Table 5: Shows the Calculation of X_4			
Year	**Equity Value**	**Total Liabilities**	**X_4=EQ/TL**
2011	2427.95	114402.78	0.015
2012	2427.95	219827.22	0.011
2013	2427.95	223995.27	0.010
2014	2427.95	252413.78	0.009
2015	2427.95	219849.47	0.011
Total			0.0113

Source: Annual Reports of Indian Oil Corporation 2014-15, 2013-14, 2012-13, 2011-12, and 2010-11.



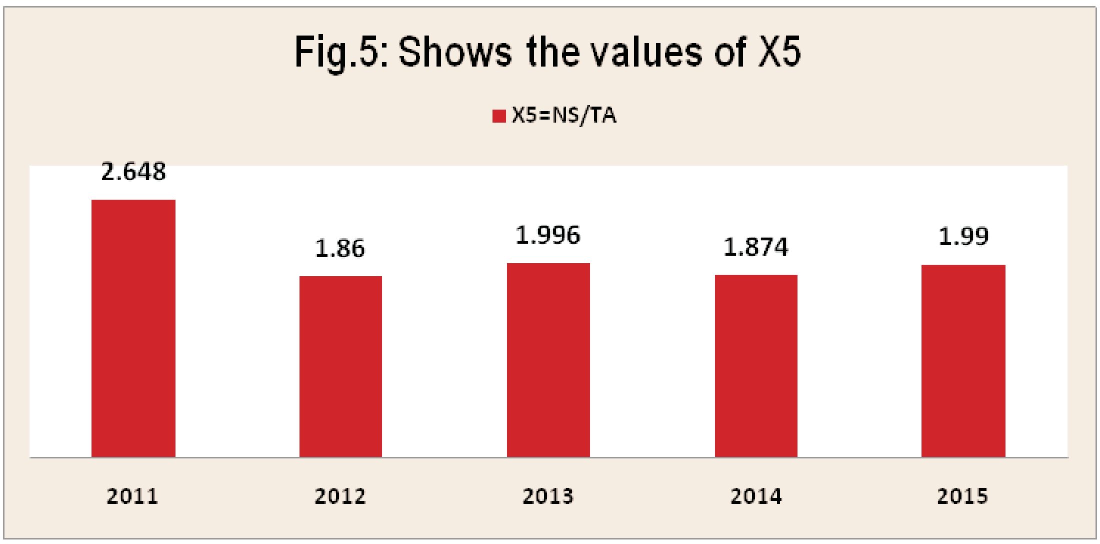
X_5 (Sales / Total Assets)

It documents the sales generatingcapacity of the company's assets and measure of management's capacity to deal withcompetitive conditions. It is calculated by dividing the net sales by total assets of the firm. Table 6 shows the calculation of X_5. The mean value of X_5 is 2.0736.

Table 6: Shows the Calculation of X_5

Year	Net Sales	Total Assets	X_5=NS/TA
2011	302954.37	114402.78	2.648
2012	408924.03	219827.22	1.860
2013	447096.41	223995.27	1.996
2014	473210.09	252413.78	1.874
2015	437526.13	219849.47	1.990
Total			**2.0736**

Source: Annual Reports of Indian Oil Corporation 2014-15, 2013-14, 2012-13, 2011-12, and 2010-11.



Calculation of Z score

$$Z = 1.2\ X_1 + 1.4\ X_2 + 3.3\ X_3 + 0.6\ X_4 + 1.0\ X_5$$

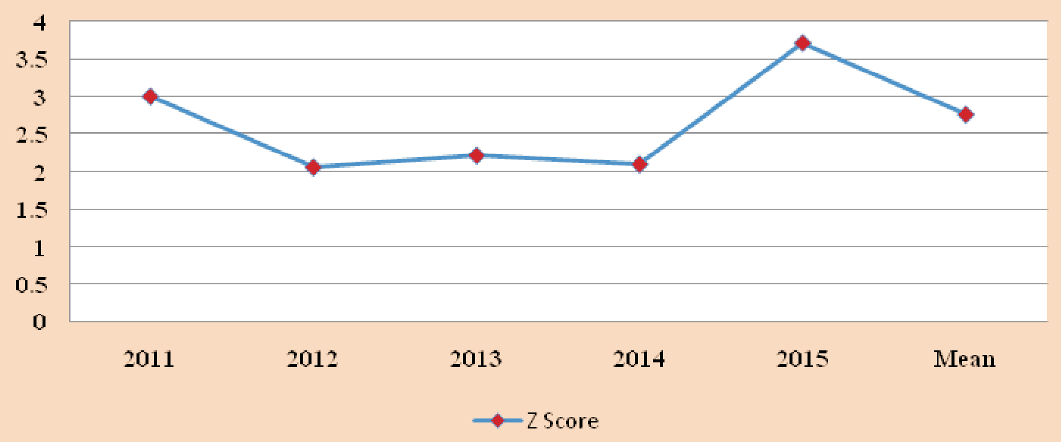
Table 6 shows the calculation of Z score. The Z score of the company in the year 2011 was 3.0018 and it has decreased to 2.062 in the year 2012. In the next two years, the company tried to improve its Z score but cannot reach to 3 as it was in the year 2011. However, the year 2015 highlights maximum Z score i.e. 3.7102 in past five years. So far, mean of Z score is concerned; it is 2.7624 which fall in second category of yellow zone. It can be said that the company is in healthy zone. It is a welcome feature that the company has successfully entered the yellow zone. So it can be concluded that there is no scope of bankruptcy or any cause of concern in the coming years as regards the financial health of IOC.

Table 6: Shows the Calculation of Z Score

Year	X1	X2	X_3	X4	X5	Z Score
2011	0.21	0.041	0.059	0.015	2.648	3.0018
2012	0.029	0.011	0.044	0.011	1.860	2.062
2013	0.018	0.014	0.053	0.010	1.996	2.2181
2014	0.002	0.018	0.059	0.009	1.874	2.1017
2015	0.008	0.015	0.051	0.011	1.990	3.7102
Mean	0.0534	0.0198	0.0532	0.0113	2.0736	2.7624

Note: The Z score is calculated by putting all values of X_1, X_2, X_3, X_4, and X_5 in the aboveequation.

Fig.6: Shows the value of Z Score



CONCLUSION

Indian Oil Corporation Limited is an Indian state-owned oil and gas corporation with its headquarters in New Delhi, India. It is the largest public corporation in India in terms of revenue. The present study has been undertaken to study the financial performance of Indian Oil Corporation Limited since 2010-11 to 2014-15. Data have been collected through annual reports of Indian Oil Corporation and Altman Z Score Model of corporate bankruptcy has been applied to examine the financial performance of the company.The Z score of the company in the year 2011 was 3.0018 and it has decreased to 2.062 in the year 2012. Moreover, the Z score becomes 3.7102 in the year 2015 which is maximum during the study period. The mean value of Z score is 2.7624 which show that IOC falls in yellow zone or healthy zone. In this backdrop, it can be concluded that there is no scope of bankruptcy or any cause of concern in the coming years as regards the financial health of IOC. The investors in this sector have their safe investments. The management has no reason to worry as regards the financial health of these companies is concerned.

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