Evaluating the Financial Health of Jordan International Investment Company Limited Using Altman's 'Z' Score Model

Dr. Basman Omar Al-Dalayeen
Al-Hussein Bin Talal University
Jordan

Abstract

Various tools are used for assessing the financial health of the companies by shareholders, government, bankers, creditors, financial institutions etc. They focus on the profitability and solvency position of the company. However, the absolute figures in the financial statements do not serve this object. There are many accounting tools like ratio analysis, decision theory etc. used for analysis but again they shows absolute result through which the present position can be judged not the future. Edward I Altman, Professor of Finance at New York University was the first person who developed a new model popularly known as "Z-score Model" to predict the financial health of the business concerns. He considered five ratios and assigned a weight for each ratio and produced a single number which indicates the financial health of the business concerns. In the current paper, an attempt has been made to predict the financial health of Jordan International Investment Company Limited (JIICL) for ten years since 2004-2005 to 2013-2014 with the application of Altman's Z-Score model. It has been revealed that JIICL is in too healthy Zone where it is successful in its financial performance and not to fall bankrupt.

Key words: Financial health, JIICL, Altman's Z-score model, performance

Introduction

Efficient financial management is necessary for success of any business. Effective financial management starts with raising the fund at most economical cost and ends with judicious and deliberate utilization of that fund. But continuous financial analysis of financial position is necessary to take corrective measures if any deviation occurs in the desired direction of the business concern. Z-score model is a business tool which is used to inform the financial health of a business concern. Iron and steel industry is very crucial for development of Indian economy.

Objective of the study

The Objective of the study is to examine the financial performance of Jordan International Investment Company Limited with the application of Altman Z Score model. The present study is based on secondary sources of data. The data has been collected from annual reports of Jordan International Investment Company Limited. The period of the study is from 2005-06 to 2014-15.

Hypothesis of the study

Ho1: Financial health of Jordan International Investment Company Limited is not sound.
Ha1: Financial health of Jordan International Investment Company Limited is sound.

Jordan International Investment Company

Jordan International Investment Company (JIICL) is a leading investment company in the Kingdom of Jordan with a prime focus on the real estate sector. Jordan International Investment Company limited was founded in 2006 and is headquartered in Amman, Jordan. It engages in the financial sector, land buying and selling, and industrial project businesses in Jordan. The company is involved in the purchase of land, as well as the establishment of industrial projects and craft cities, residential projects, and tourist hotels and apartment buildings with floors and apartments or residential buildings, villas, and commercial buildings. It also engages in the provision of commercial brokering; import and export, marketing, and distribution of various goods; and establishment, as well as buying and owning of property.

Review of literature

Altman (1968) used multiple discriminate analyses to find out a bankruptcy prediction model. He selected 33 publicly traded manufacturing bankrupt companies between 1946 and 1965 and matched them to 33 firms on a random basis. The result yielded equations called Z-Score that correctly classified 94% of the bankrupt companies and 97% of the non bankrupt companies a year prior to bankruptcy. This percentage dropped when trying to predict bankruptcy two or more years before it occurred. **Altman and Narayanan (1997)** in their book entitled, *"International Accounting and Finance Handbook"* conducted a study in 22 countries and revealed that multiple discriminate analysis, logistic regression, and probate 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 and 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 Limited is 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.

Ramaratnam and Jayaraman (2010) made an attempt to analyze and predict the financial health of the select companies of Indian steel industry by way of applying Altman's Z – Score. The study revealed that all the selected companies are financially sound during the study period. **Sheela and Kartikeyan (2012)** attempted to study financial health of Pharmaceutical industry with the help of Altman's Z-score model with special reference to Cipla, Dr Reddy and Ranbaxy. Researcher found that the Cipla and Dr Reddy were in too healthy position while Ranbaxy was in healthy situation. **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"* analyzed the financial health of the company by way of applying Altman's Z-Score. The Z-score of Indian Oil Corporation stands at 1.8528 which is between the range of 1.8 and 2.99 as depicted from the Altman's guidelines of 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. **Chandra and Selvaraj (2013)** conducted a study on analyses of financial health of selected steel companies in India using Altman's Z-score model and concluded that the financial health of selected steel companies was not in safe zone and there was no significant difference between the size of the companies and Z-score value. **Kavitha and Palanivelu (2013)** selected 7 NSE listed companies to analyze and compare the financial performances of NSE listed steel Company. Altman's Z-Score revealed healthy situation only for few years for some companies, otherwise, for all the companies it was found to be in the unpredictable and unhealthy zone. Short term solvency positions of the NSE listing companies were found to be satisfactory.

Theoretical Framework

'Z' score model for measuring the bankruptcy

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. 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 cutoffs) which dropped variables X_4 and X_5 (below) and replaced them with a new variable X4 = net worth (Book value) / total liabilities. The X_5 variables were allegedly dropped to minimize potential industry effects related to assets turnover.

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

Where:
Z = Discriminate function score of a firm

'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)
- X_2 (Retained Earnings / Total Sales)
- X_3 (Earnings before Interest and Taxes / Total Assets)
- X_4 (Market Value of Equity / Book Value of Total liabilities)
- X_5 (Sales / Total Assets)

X_1 (Working Capital/Total Assets)

This ratio expresses the liquidity position of the company towards the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered.

X_2 (Retained Earnings / Total Sales)

It indicates the amount reinvested, the earnings or losses, which reflects the extent of the company's leverage. In other words, the extent assets, which have paid by company profits

X_3 (Earnings before Interest and Taxes / Total Assets)

It is the measure of the company's operating performance 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.

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

It 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 market value of all shares. While debt includes 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.

X_5 (Sales / Total Assets)

This is a standard turnover measure. Unfortunately, it varies greatly from one industry to another. 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.

- **Situation I.** *(Red Zone) When Z-Score falls below 1.8*

There is a high probability that the business will face financial distress in near future and the business may need strict measures to survive in the market.

- **Situation II.** *(Yellow Zone) When Z-Score falls between 1.8 and 2.99*

The firm falls in the gray area that means there is less probability that the firm will face financial distress in the near future.

- **Situation III.** *(Green Zone) When Z-Score falls 3.0 and above*

The business is financially sound and there is least probability that the firm will face financial distress

Table 1: Calculation of X1 Ratio Net Working Capital and Total assets

Year	X_1 (Working Capital/Total Assets)
2006	0.42
2007	0.50
2008	0.61
2009	0.61
2010	0.61
2011	0.55
2012	0.42
2013	0.21
2014	0.17
2015	0.13
Mean	0.42

Source: Calculated from Company's Financial Reports

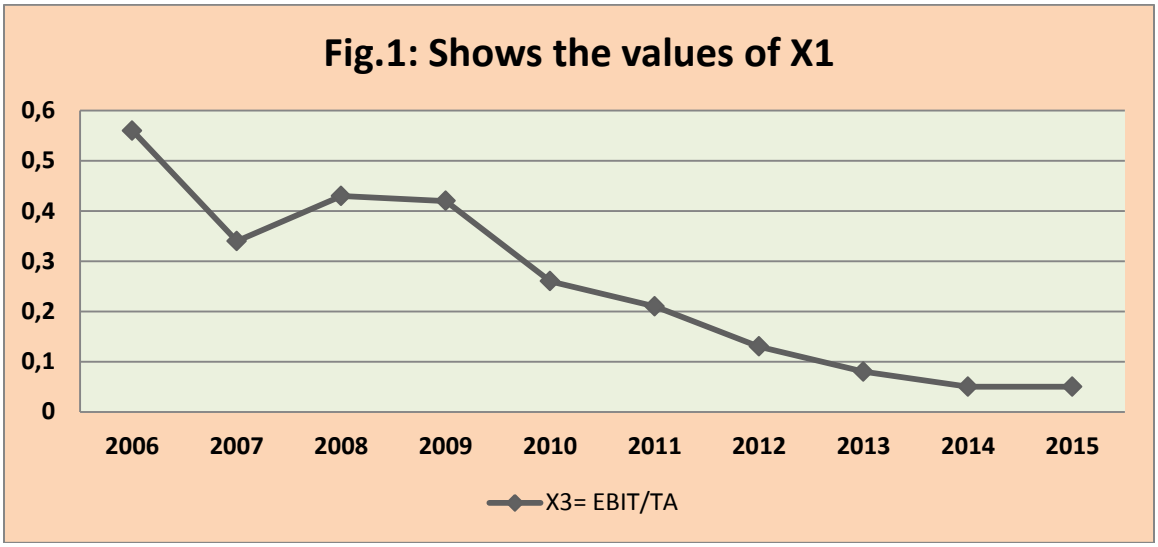
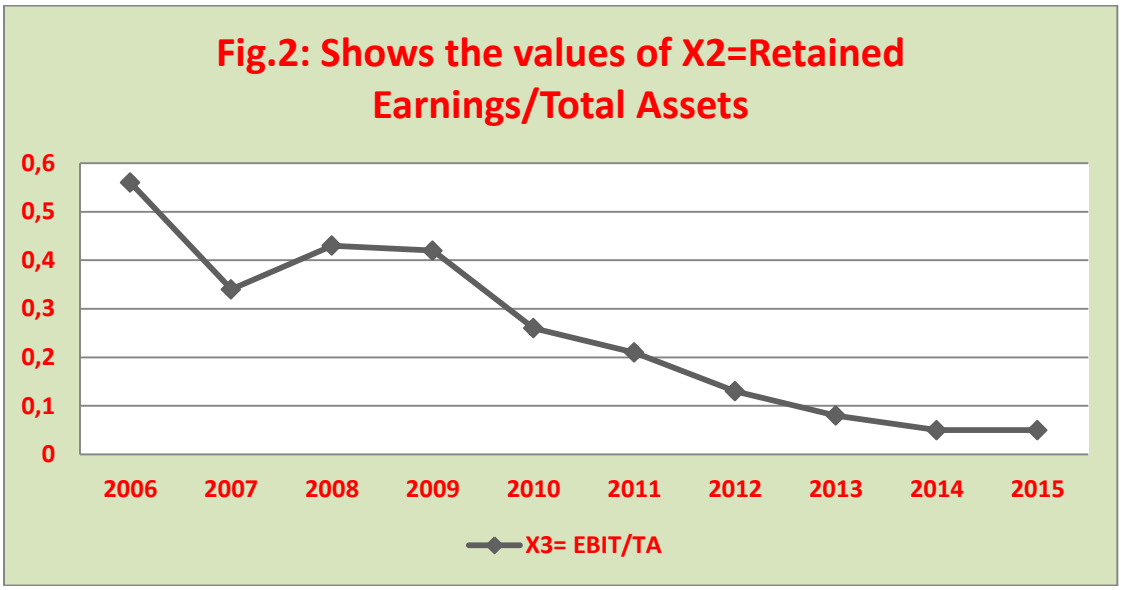


Table 1 shows the calculation of X_1. It expresses the liquidity position of the company towards the total capitalization. Working capital is defined as the difference between current assets and current liabilities. The above ratio indicates the level of liquid asset to the total capitalization of the company. Table 1 shows that the ratio is in increasing trend until the year 2008-09 showing that the company has greater ability to meet the current obligations. But the ratio decreased considerably in last three years of the study. The total mean value of X_1 comes to be 0.42.

Table 2: Calculation of X2: (Retained Earning and total assets)

Year ended 31st December	X_2=Retained Earnings/Total Assets
2006	0.30
2007	0.38
2008	0.50
2009	0.60
2010	0.56
2011	0.50
2012	0.49
2013	0.40
2014	0.38
2015	0.36
Mean	0.45

Source: Calculated from Company's Financial Reports



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_2 reflects the extent of the company's leverage. The ratio indicates the ability of the firm to earn profit and thereby securing retained earnings. Normally a firm has higher retained earnings, the firm will not starve for liquidity crunch and also the firm can reinvest in the appropriate venture at cheaper cost. The company JIICL maintains on an average of 45% of retained earnings to total assets indicating the company is in good position in terms of liquidity aspect as well as the exploitation of near opportunity for investment if any. The mean of X_2 is 0.45 as shown by the table 2.

Table 3: Calculation of X3: Earnings Before Interest & Taxes (EBIT)/ Total Assets (TA)

Year ended 31st December	X_3= EBIT/TA
2006	0.56
2007	0.34
2008	0.43
2009	0.42
2010	0.26
2011	0.21
2012	0.13
2013	0.08
2014	0.05
2015	0.05
Mean	0.25

Source: Calculated from Company's Financial Reports

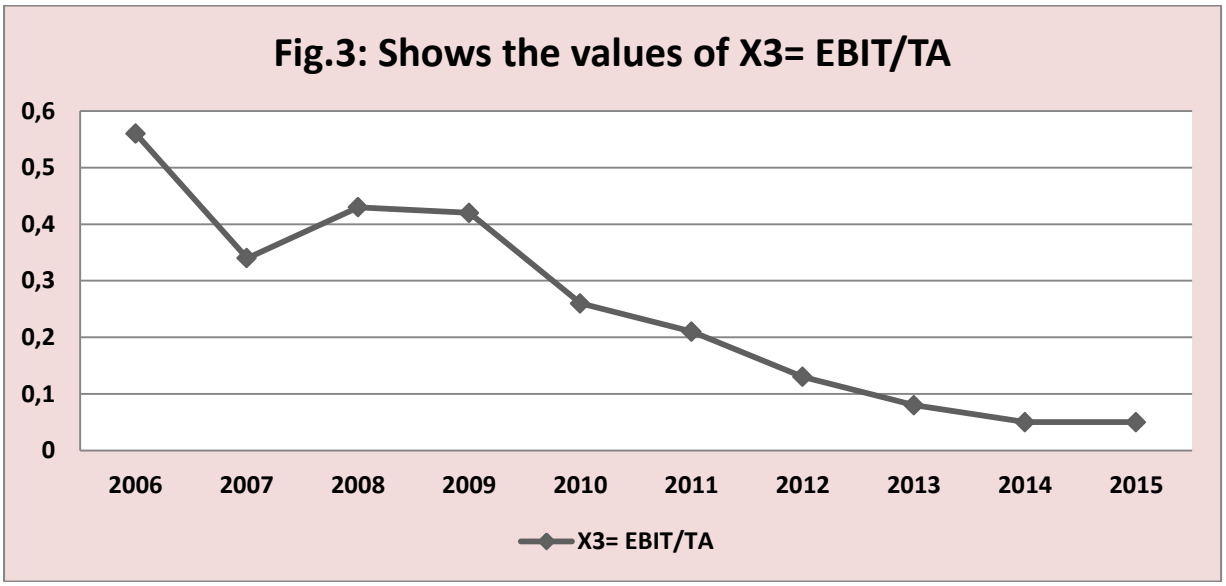


Table 4 shows the calculation of X_3. It is a measure of a firm's profit that includes all expenses except interest and income tax expenses. It is the difference between operating revenues and operating expenses. It is the measure of the company's operating performance and indicates the earning capacity of the company. Return on total assets indicates the ability of the firm to ensure earning capacity against its total assets. A firm's ability to earn is measured by the operating profit with which the firm enjoys over the period. Average profitability of JIICL has been 25% during the study period. Return on total assets was very good in 2004-05 i.e. 56%, it was good in years 2006-07 and 2007-08 but from 2008-09 to 2013-14 there has been a continuous drop in profitability of company. The total mean value of X_3 comes to be 0.25.

Table 4: Calculation of X4: Market Value of Equity and Total Liabilities

Year ended 31st December	X_4=EQ/TL
2006	3.41
2007	5.93
2008	8.34
2009	16.53
2010	4.48
2011	5.82
2012	1.80
2013	1.06
2014	0.60
2015	0.60
Mean	4.86

Source: Calculated from Company's Financial Reports

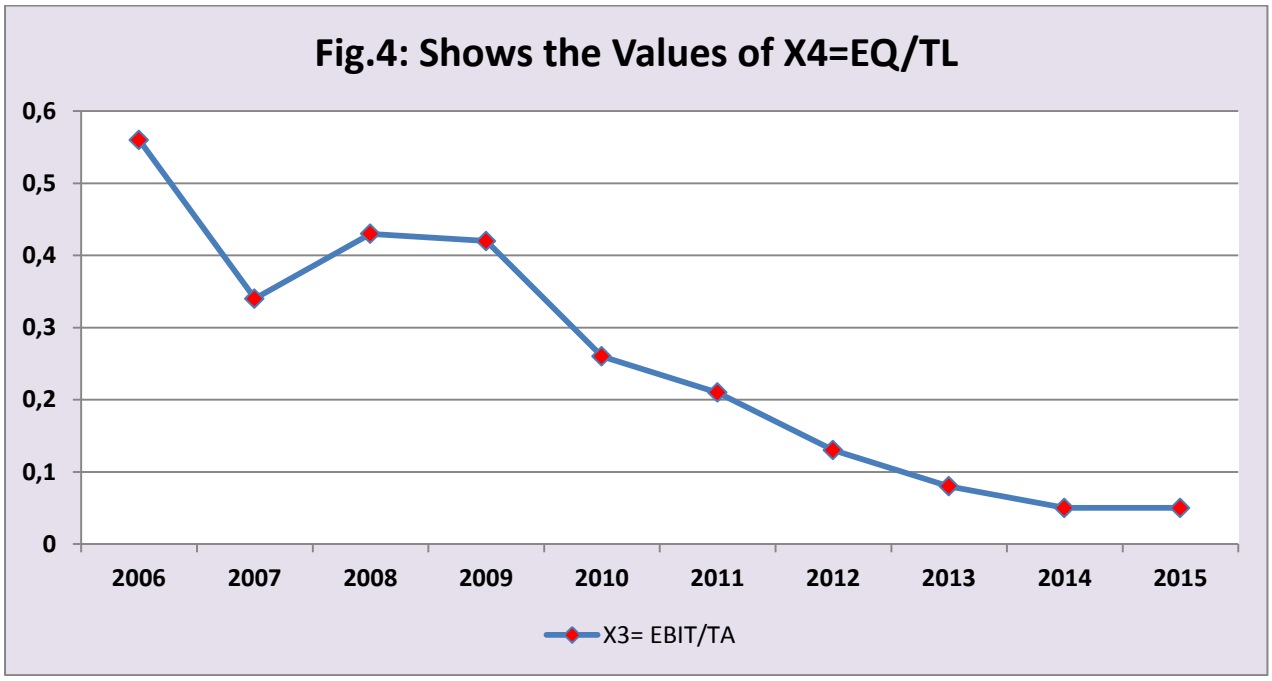
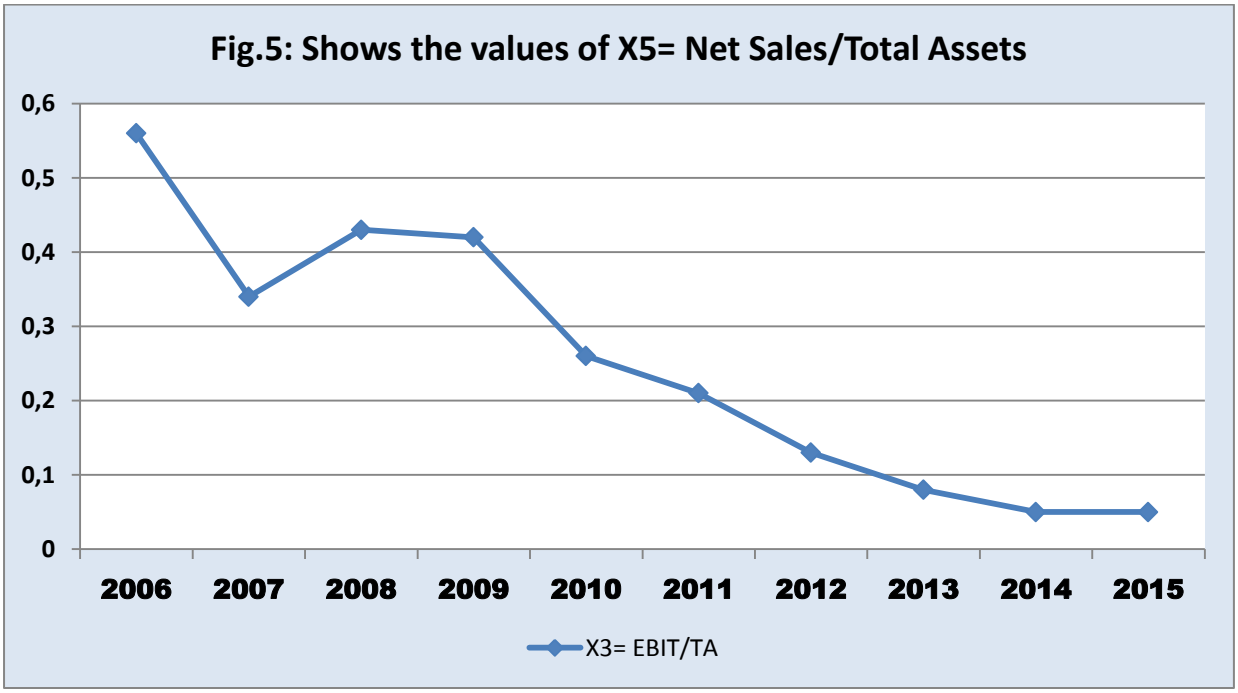


Table 4 shows the calculation of X_4. It is the measure of the long term solvency of a company. It is reciprocal of the debt-equity ratio. Equity is measured by the combined market value of all shares while debt includes long-term liabilities and current liabilities. This measure shows how much assets of an enterprise can decline in value before the liabilities exceed the assets and the concern becomes insolvent. Equity to debt ratio indicates the proportion of owner's fund to the long term debt. The ideal ratio is 1:1. The company has an obligation to pay interest to the creditors if debt is more and therefore the shareholders risk may be increased. As far as JIICL is concerned, it has more equity capital rather than debt. Since the investment is in higher side, the company has to rely on debt so that the burden of debt will be more. In the initial stage, the JIICL have ample percentage of equity than debt, Ratio was highest in the year 2007-08, but in due course the ratio is eroded by way of adding more debt to its capital structure to meet their required investment. The mean value of X_4 after calculation becomes 4.86.

Table 5: Calculation of X5: Net Sales and Total Assets

Year ended 31st December	X_5= NS/TA
2006	1.59
2007	1.51
2008	1.48
2009	1.43
2010	1.17
2011	0.79
2012	0.73
2013	0.60
2014	0.52
2015	0.50
Mean	1.03

Source: Calculated from Company's Financial Reports



It documents the sales generating capacity of the company's assets and measure of management's capacity to deal with competitive conditions. It is calculated by dividing the net sales by total assets of the firm. Total assets turnover ratio reveals the efficiency of the firm in utilizing its assets to convert into sales. The demand for the steel increases over the period of time but the ratio shows a decreasing trend during the study period depicting that JIICL has not been able to convert its increase in assets into sales. The percentage of conversion stands at 103% for JIICL. Table 5 shows the calculation of X_5. The mean value of X_5 is 1.03.

Calculation of Z score

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

Table 6 shows the calculation of Z score of JIICL for the decade since 2006 to 2015. From the year wise observation of Z-Score, JIICL was in excellent position from 2004-05 to 2010-11 while its position was good in the year 2011-12 but JIICL was in grey zone in the last year of the study. Overall performance of JIICL was very good during the study period as Average Z-Score from 2004-05 to 2013-14 stands at 6.3714. 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 JIICL.

Table 6: Shows the Calculation of Z-Score

Year ended 31st December	X1	X2	X3	X4	X5	Z Score
2006	0.42	0.30	0.56	3.41	1.59	6.408
2007	0.50	0.38	0.34	5.93	1.51	7.322
2008	0.61	0.50	0.43	8.34	1.48	9.335
2009	0.61	0.60	0.42	16.53	1.43	14.339
2010	0.61	0.56	0.26	4.48	1.17	6.232
2011	0.55	0.50	0.21	5.82	0.79	6.335
2012	0.42	0.49	0.13	1.80	0.73	7.965
2013	0.21	0.40	0.08	1.06	0.60	2.312
2014	0.17	0.38	0.05	0.60	0.52	1.80
2015	0.13	0.36	0.05	0.60	0.50	1.685
Mean	0.42	0.45	0.25	4.86	1.03	6.3714

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

Conclusion

Jordan International Investment Company limited engages in the financial sector, land buying and selling, and industrial project businesses in Jordan. The company is involved in the purchase of land, as well as the establishment of industrial projects and craft cities, residential projects, and tourist hotels and apartment buildings with floors and apartments or residential buildings, villas, and commercial buildings. The present study has been undertaken to study the financial performance of JIICL since 2006 to 2015. Data have been collected through annual reports of JIICL and Altman Z Score Model of corporate bankruptcy has been applied to examine the financial performance of the company. According to the calculation shown above the Z-score of Steel Authority of India Limited stands at *6.3714* which is in the third categories i.e. 3.0 and above as depicted from the Altman's guidelines of bankruptcy. From this we can conclude that the overall profitability during the study period 2005 to 2015 appears to be significant. Therefore, null hypothesis stands rejected meaning thereby financial health of Jordan International Investment Company Limited is sound and there is no sign of failure of the business in near future. Besides, failure of the company in long-run is completely uncertain to predict.

Suggestions

Following suggestions have been provided to improve the financial health of the JIICL.

1. The company should improve its Liquidity position so that company may not face any financial distress in the future.
2. The company should improve its earning capacity by improving operational efficiency.
3. The company should improve its equity-debt ratio either by improving equity value or by decreasing some debt
4. Efforts should be made to increase sale with increase in the total assets.

References

Aiyabei, J. (2002). Financial Distress: Theory, Measurement & Consequence. *The Eastern Africa Journal of Humanities & Sciences, 1*(1).

Altman, E., (1968). Financial Ratios, Discriminant Analysis & the Prediction of Corporate Bankruptcy, *Journal of Finance,* 23(4), 589-609.

Altman, E., J. Hartzell, & M. Peck, (1995). Emerging Markets Corporate Bonds: A Scoring System, Salomon Brothers Inc, New York.

Altman, E., R. Haldeman, & P. Narayanan, (1977). ZETA Analysis: A New Model to Identify Bankruptcy Risk of Corporations, *Journal of Banking & Finance*.

Altman, E. I., Narayanan, & Paul. (1997). *International Accounting & Finance H&book*. New York: John Wiley & Sons.

Chabra, H. & Selvaraj, A., (2013). A study on financial health of selected Indian steel companies" *Journal of business management studies,* 9(1) jan-june 2013, 36-42.

Khataibeh,Ahmad H A. (2013). A Critical Study on the Financial Performance of Arab East for Real Estate Investments Company. *Jordan Journal of Economic Sciences*, ISSN 2415-6671(Online) & ISSN 2415-6663 (Print), Vol. 29, No.11, 51-55.

Krishna chaitanya. (2005). Measuring Financial Distress of IDBI Using Altman Z-Score Model. *The ICFAI Journal of Bank Management, Vol.* 4(3), 7-17.

Kumari, N. 2013. Evaluation of Financial Health of MMTC of India: A Z score Model. *European Journal of Accounting Auditing & Finance Research*. 1(1), 36-43.

Lahiri, M. 2013.Measuring the Financial Health of Indian Oil Corporation Limited using 'Z'Score Model. FLEET CARD. 32.

Mansur, A. & Mulla. (2002). Use of Z score Analysis for Evaluation of Financial Health of Textile Mills-A Case Study. *Abhigya, 19*(4), 37-41. Available at: https://en.wikipedia.org/ wiki/ Indian_Oil_Corporation

Majdey Abdel Ghaffar & Mahmoud Salemeh. (2011). Performance Appraisal of Al-Bilad Securities and Investment. *Dirasat: Human and Social Sciences, Vol.* 45, No.9, 66-78.

Mizan, A.N.K & Hossain, M.M. (2014) "Financial Soundness of Cement Industry of Bangladesh: An Empirical Investigation Using Z-score" *American Journal of trade & policy,* 1(1), June 2014, 16-22

Ramaratnam, M.S & Jayaraman, R. (2010) "A study on measuring the financial soundness of select firms with special reference to Indian steel industry – An empirical view with Z score", *Asian Journal Of Management Research,* 724-735.

Palanivelu, P. & Kavita, K.S. (2013) "An Analysis On Financial Health Of NSE Listed Steel Industries", *International Journal Of Scientific Research,* 2(9), 46-48.

Sheela, S.C. & Karthikeyan, k. (2012) "Evaluating financial health of pharmaceutical industry in india through z-score model*", International journal of social sciences & interdisciplinary research,* 1(5), may 2012, 25-31.

Sulp & Nisa. S. (2013) "The Analytical Implication of Altman's Z Score Analysis Of Bse Listed Small Cap Companies", *Global Journal Of Management & Commerce Perspective*, 2(4), July-Aug, 2013, 145-155.

The Hashimite Kingdom of Jordan, Department of Statistics, Statistical Year Book, No.41, 2012.

Sahawneh,Nizar M F. (2009). Evaluation of Financial Performance of Jordan Mortgage Refinance with the help of Z score Model. *Jordan Journal of Business Administration, Vol.*19, 254-259.

Appendix

Table: Shows Working Capital, Retained Earnings, EBIT, Total Assets and Liabilities, Equity Value, Net Sales of JIICL during the study period

Year	Working Capital	Retained Earning	EBIT	Total Assets	Equity Value	Total Liabilities	Net Sales
2006	7579	5291.39	9970	17920.75	26000.868	7614.1	28523
2007	9276	6919.53	6174	18383.49	34344.276	5782.08	27860
2008	13879	11408.23	9755	22906.33	46673.52	5593.18	33923
2009	16879	16561.27	11720	27677.41	76309.14	4613.84	39508
2010	22398	20797.31	9658	36855.04	39837.708	8896.04	43204
2011	28081	25508.87	10534	51242.87	104313.252	17926.17	40551
2012	24372	28687.73	7544	58726.03	70216.8	39013.52	42719
2013	16206	30810.08	6091	76337.02	38847.63465	36525.7	45654
2014	14604	31658.93	4218	84218.46	25753.85455	43193.82	43961
2015	11679	32997.55	4192	91961.89	29491.9842	49295.54	46189

Source: Calculated from Company's Financial Reports since 2006-2015