

PREDICTION OF BUSINESS BANKRUPTCY FOR SELECTED INDIAN AIRLINE COMPANIES USING ALTMAN'S MODEL

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ABSTRACT

One of the important tool and technique used to measure the financial performance of the company is ratio analysis. It helps to measure the operational and financial efficiency of the business undertaking. Ratios are the foundation for the application of Altman z-score model. This model can be used to predict the bankruptcy of the firm up to 2-3 years in advance. This paper attempts to predict the bankruptcy of selective airlines such as king fisher airlines, jet Airways and spic jet airways. In addition the researcher focused to measure the financial and operational performance of the airlines.

KEYWORDS: Business Failure, Bankruptcy, Altman's Z-Score Model, Financial Ratios

INTRODUCTION

In the competitive business environment the success of the business undertaking depends upon so many factors. The financial soundness of the business can be analyzed with the help of various ratios and bankruptcy can be predicted with the help of various models. Corporate bankruptcy has always been analyzed due to its severe consequences. The impact of insolvency could be enormous to the firm and its stakeholders, such as equity owners, creditors, managers and employees. Bankruptcy, can also affect the global economy (e.g . increasing the employment rate or harming the investors' confidence in financial markets). A failure occurs for several reasons including managerial incompetence (in managing cash, debt and risk), industry specific reasons such as deregulation or overcapacity, high interest rates in specific periods, and severe international competition (Altman, 2006). The number of failures also increases in recession periods when the GDP is lower than the trend (Hol, 2007).

REVIEW OF LITERATURE

The purpose of this journal paper is to review the related literature pertaining to business failure, often called bankruptcy prediction. Fitzpatrick (1932) identified five stages leading to business failure. They are (1) incubation (2) financial embarrassment, (3) financial insolvency, (4) total insolvency, and (5) confirmed insolvency. Incubation is when the company's financials are just developing. Financial embarrassment is when management becomes aware of the firm's distressed condition.

Altman's (1968) MDA analysis was the most dominant method in predicting bankruptcy for many years.

Aharony, Jones, and swary (1980) describe business failure as an indication of resources misallocation that is undesirable from a social point of view.

Zmijewski (1984) explore the Probit Analysis in his interpretations. He argues that most literatures prior to his study are based on non-random samples. He shows that this type of sampling leads to two biases: The first bias is

oversampling the distressed firms and the second bias results from sample selection (i.e. the data for failed companies are often unavailable).

Karels and Prakash (1987) mentioned that a diverse set of definitions has emerged to explain business failure. The set includes negative net-worth, non- payments of creditors, bond defaults, inability to pay debts, over drawn bank accounts, omission of preferred dividends, receivership, etc. Financial insolvency occurs when the firm is unable to acquire the necessary funds to meet its obligations. Total insolvency occurs when the liabilities exceed the physical assets. Finally, confirmed insolvency occurs when legal steps are taken to protect the firm's creditors or liquidation occurs. (Poston, Harmon, & Gramlich, 1994).

Dichev (1998) shows that financial distress risk cannot be captured by size and book to market ratio. He shows that higher distress risk leads to a lower return.

Shumway (2001) shows that many accounting-based variables that have been employed in previous studies are not significant in predicting failures. He also finds that some market data, such as firm's market size, firm's previous returns, and the idiosyncratic standard deviation of these returns are better predictors of bankruptcy.

Saunders and Allen (2002) mention, market based models are based on some unusual assumptions. These assumptions are: (i) the non-normality of stock returns, (ii) similarity for all debts (i.e. the firm holds only a single zero coupon bond.), and (iii) the static nature of the debt (once it is structured, it is unchanged).

Griffin and Lemmon (2003) find that the negative relationship between returns and failure risk is higher in firms with lower book to market ratio

Sun and Feng Hui (2006) believe that bankruptcy not only brings much individual loss to interest parts such as stockholders, creditors, managers, employees, etc., but also too much bankruptcy will greatly shock the whole country's economic development.

Campbell et al. (2008) propose a reduced form econometric model using both accounting and market data to predict corporate bankruptcies and failures. They argue that their model is more accurate than other alternatives. A more accurate reduced form model of them confirms the negative association between distress risk and equity returns too

OBJECTIVES OF THE STUDY

- To determine the operational and financial efficiency of selective airlines
- To develop Altman's Z-score Model for king fisher airlines, jet Airways and spic jet airways
- To make a comparison between different models of Bankruptcy Models to predict the bankruptcy of selective private Airlines
- To suggest strategies to safeguard or protect the company from the sign of bankruptcy

RESEARCH METHODOLOGY

Research Design

The research is based on both empirical and analytical study

Method of Data Collection

The study is fully based on secondary data which is basically collected from company websites, research papers and various articles related to bankruptcy

Secondary Source

Since the study is mainly focused on analysis of financial performance and examining the insolvency of selective Airlines during a five year period from 2008-2012. The researcher had given immense importance to collect secondary data from company websites, audited financial statements, reports published by the stock exchange and databases. The following 3 selective airlines such as king fisher airlines, jet Airways, spic jet airways were considered to predict the symptom of bankruptcy

Tools and Techniques

The various tools and techniques used to analyze the financial performance of the company. Ratio analysis is one of the important financial tool to determine the operational & financial efficiency of company or business undertaking. The various bankruptcy models are used to predict the bankruptcy of the airlines .With the help of the Z- Score model, Altman could predict financial efficiency /Bankruptcy up to 2-3 years in advance

Altman's Original Model

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 \text{ where}$$

$$X_1 = \text{Working capital/total assets}$$

$$X_2 = \text{Retained earnings/total assets}$$

$$X_3 = \text{EBIT/total assets}$$

$$X_4 = \text{N.W. (book value)/total liabilities}$$

$$X_5 = \text{Sales/total assets}$$

Interpretation

Z-score < 1.81 indicates bankruptcy of firm. While scores > 2.67 represent financial soundness.

The grey area or zone of ignorance exists when firms have z-scores between 1.81 and 2.67

The Revised Z-Score Formula Used to Predict the Bankruptcy is as Follows

$$Z = 0.717(X_1) + 0.847(X_2) + 3.107(X_3) + 0.420(X_4) + 0.998(X_5)$$

Interpretation

Scores < 1.23 indicate bankrupt firms and

Scores of > 2.90 indicates non bankrupt firms.

Firms with scores between 1.23 and 2.90 are considered to be exist in the grey area or zone of ignorance

Revised Four Model

$$Z = 6.56(X_1) + 3.26(X_2) + 6.72(X_3) + 1.05(X_4)$$

where cut off scores reflect

Interpretation

Bankrupt firms < 1.10

Non bankrupt firms>2.60

Grey area= 1.10-2.60

DATA ANALYSIS AND INTERPRETATION

Operational and Financial Efficiency

Table 1: Kingfisher Airlines - Ratio Analysis

Particulars	2012	2011	2010	2009	2008
Operating Profit Margin (%)	-39.29	15.14	6.32	-10.49	-22.32
Net Profit Margin (%)	-39.97	-15.99	-32.04	-27.43	-12.5
Return On Capital Employed (%)	-73.61	21.72	4.35	-3.68	-27.63
Return on Assets Including Revaluations	-97.56	-72.99	-156.01	-84.05	12.68
Current Ratio	0.81	1.22	0.78	0.64	0.97
Quick Ratio	0.55	0.62	0.58	0.52	0.88
Inventory Turnover Ratio	26.83	4185.44	4659.3	5738.39	0
Debtors Turnover Ratio	17.49	16.34	18.35	41.01	46.67
Fixed Assets Turnover Ratio	2.52	2.83	2.53	2.85	0
Total Assets Turnover Ratio	1.9	1.54	1.27	1.51	1.29
Earnings Per Share	-40.3	-20.64	-61.95	-60.5	-13.85
Book Value	-97.56	-70.46	-150.54	-83.88	13.9

(Source: www.moneycontrol.com)

The above table highlights the operational and financial performance of the Kingfisher Airlines

On the analysis of the operating profit margin it was found the company's operating performance is adversely affected for all the years except in the years 2010 and 2011. Further it is identified that net profit margin shows negative fallout for the years i.e., from the year 2008-2012. The performance of return on capital employed and return on assets also shows unsatisfactory performance.

On the analysis of the turnover ratios it can be inferred that company's performance is not exciting one but for the year 2008 inventory turnover ratio and fixed assets turnover ratio shows zero. In 2008, more losses were due to economic downturn. Earning per share and book value of the company also shows negative performance.

Table 2: Jet Airways - Ratio Analysis

Particulars	2012	2011	2010	2009	2008
Operating Profit Margin (%)	12.16	19.58	20.18	5.17	8.55
Net Profit Margin (%)	-7.93	0.07	-4.41	-3.44	-2.83
Return On Capital Employed (%)	12.28	12.33	8.81	-1.07	0.65
Return on Assets Including Revaluations	136.78	301.66	306.02	365.67	527.21
Current Ratio	0.39	0.64	0.34	0.37	0.61
Quick Ratio	0.5	0.77	0.86	1.09	0.77
Inventory Turnover Ratio	3051.04	2778.81	4349.4	7370.16	2143.82
Debtors Turnover Ratio	13.64	14.39	13.53	11.31	9.19
Fixed Assets Turnover Ratio	0.81	0.72	0.59	0.62	0.54
Total Assets Turnover Ratio	1.5	0.91	0.72	0.66	0.65
Earnings Per Share	-143.18	1.12	-54.17	-46.6	-29.31
Book Value	-62.48	96.91	95.79	149.96	214.49

(Source: www.moneycontrol.com)

From the above table it can be inferred that net profit margin performance is poor. The ratio of return on capital employed shows negative performance during the year 2009. On the analysis of solvency ratios such as current ratio and quick ratio it was noticed that it was shortfall to meet industry standards. The performance of turnover ratio is also not that

much attractive. The earnings per share ratio are not giving promising return except in the year 2011. The book value of the company is gradually decreasing from the year 2008 – 2012 and even during the year 2012 it was adversely affected.

Table 3: Spice Jet - Ratio Analysis

Particulars	2012	2011	2010	2009	2008
Operating Profit Per Share (Rs)	-13.55	12.47	17.77	-2.16	0.13
Net Profit Margin (%)	-15.07	3.43	3.02	-19.43	-9.6
Return On Capital Employed (%)	-78.15	138.56	477	5.21	13.28
Return on Assets Including Revaluations	-3.34	7.79	-14.4	-18.07	1.16
Current Ratio	0.67	0.54	0.64	0.68	0.76
Quick Ratio	0.86	0.56	0.65	0.71	0.99
Inventory Turnover Ratio	124.58	--	--	--	6815.74
Debtors Turnover Ratio	209.8	159.34	139.13	242.27	364.02
Fixed Assets Turnover Ratio	4.35	--	--	--	17.36
Total Assets Turnover Ratio	5.68	7.1	22.69	--	2.32
Earnings Per Share	-13.72	2.5	2.77	-14.13	-5.5
Book Value	-3.34	7.79	-14.4	-18.07	1.16

(Source: www.moneycontrol.com)

The above table exhibits the operating and financial performance of the company. The ratio on operating profit and net profit margin shows not satisfactory result. The return on capital employed shows upward and downward trend and ultimately for the year 2012 it shows negative result which was very much unsatisfactory. It has been identified that the solvency ratio is also not in-line with the industry standards. Further it is noticed that earnings per share and book value of the company is not satisfactory one.

Table 4: Kingfisher Airlines

Bankruptcy Models	2012	2011	2010	2009	2008
Altman's original model	1.80 Bankruptcy	1.51 Bankruptcy	1.24 Bankruptcy	1.47 Bankruptcy	1.28 Bankruptcy
Revised Z-score	-2.55 Bankruptcy	1.40 Grey area	0.44 Bankruptcy	0.22 Bankruptcy	0.82 Bankruptcy
Revised Four Model	-10.25 Bankruptcy	0.38 Bankruptcy	-1.75 Bankruptcy	-3.37 Bankruptcy	1.25 Non bankruptcy

(Source: Values calculated based on Annual report)

Kingfisher airlines is in the verge of bankruptcy, when Altman Z score original model is applied it is identified that the firm is not able to meet the minimum credit score. From 2008 till 2012 the firm's credit score is in the range of 1.24 to 1.80. This states that the firm is bankrupt according to the model. Moreover, Revised Z score formula also states the same and none of the year has grey area. The revised four models also have the same inference with 2012 being the worst with negative 10.25 score.

Table 5: Jet Airways

Bankruptcy Models	2012	2011	2010	2009	2008
Altman's original model	1.26 Bankruptcy	0.8 Bankruptcy	0.63 Bankruptcy	0.6 Bankruptcy	0.53 Bankruptcy
Revised Z-score	1.52 Grey area	1.4 Grey area	1.13 Bankruptcy	0.84 Bankruptcy	0.87 Bankruptcy
Revised Four Model	-1 Bankruptcy	1.53 Grey Area	1.2 Grey Area	0.88 Bankruptcy	0.86 Bankruptcy

(Source: Values calculated based on Annual report)

Jet Airways airline is in the margin of bankruptcy, when Altman Z score original model is applied it is found that the firm is not able to fulfill the required Z score for financial soundness. From 2008 till 2012 the firm's credit score is in the range of 0.53 to 1.26. This states that the firm is bankrupt according to the model.

As per revised Z-score analysis it was found that the firm is in the grey area during the period of 2011-2012. Further the revised four model also states that for the year 2010-2011 the jet airways fall in the stage of grey area.

Table 6: Spice Jet Airways

Bankruptcy Models	2012	2011	2010	2009	2008
Altman's original model	5.27 Non Bankruptcy	7.47 Non Bankruptcy	24 Non Bankruptcy	27.9 Non Bankruptcy	2.27 Grey area
Revised Z-score	1.99 Non Bankruptcy	10.5 Non bankruptcy	27.63 Non bankruptcy	10.65 Non Bankruptcy	2 Bankruptcy
Revised Four Model	-9.92 Bankruptcy	3.77 Non bankruptcy	-13.9 bankruptcy	-72.01 bankruptcy	-1.09 Bankruptcy

(Source: Values calculated based on Annual report)

The analysis of Altman's original model shows that spice jet airways is in the status of financial soundness from 2009- 2012 but for the year 2008, the company falls in the grey area. Revised Z-score model also states that the firm is in state of financial soundness for the period 2009-2012. But revised four model states that the firm is in the condition of bankruptcy which is a contradiction to the previous two models.

FINDINGS AND SUGGESTIONS

- By applying all the three models it is noticed that Kingfisher airlines is in the verge of bankruptcy. A jet airway is managing to maintain the momentum and Spice Jet is using all the resources to move forward.
- In order to succeed in their business each of them has to identify and move forward on the value chain perspective. Firms should aim and identify the way to cut their operating costs in the given environment. They can also look for providing budget seats or budget fares during on season and off season. This provides fixed revenue for the firms and can cover fixed costs.
- The airline carriers should aim to attract passengers through low fare and time savings. Firms can avoid increase revenue by offering certain value added services like travel insurance, tourist guidance, hotel reservations, cabs for rent etc.
- Each airline companies can look forward to promote tourisms through family package or group packages for corporate people.
- High frequency between two destinations must be placed in order to increase the customer base and have more loyalty. Decrease the expenses of cabin crew, can recruit new and young minds which will decrease the cost per employee and can provide more services with limited members in the crew.
- Maintain dynamic pricing based on each destinations.

CONCLUSIONS

Bankruptcy generally affects all the stakeholders' employees, stockholders, managers, investors, and regulators. It was found that Companies can be protected against bankruptcy with efficient management of funds and business strategies. The firms are likely to be affected by an economic expansion or in a recession. This study adds values to everyone who are interested to know about bankruptcy modeling and prediction application.

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