
An Analysis of Financial Health of Indian Pharmaceutical Industry

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Introduction

The financial health plays a significant role in the successful functioning of a firm. Poor financial health threatens the very survival of the firm and leads to business failures. The recent financial crisis and the ensuing economic downturn have had a significant impact on the corporate sector. Corporate profitability has eroded sharply while debt burden has increased. Corporate failures are a common problem of developing and developed economies. Failure is not an impulsive outcome and it grows constantly in stages. There are unique characteristics of failure in firm's financial levels prior to reaching the levels of total failures. A protective effort could be made effectively if the company is foreseen to be proceeding in the direction of potential bankruptcy and this can help the company and the stakeholders from facing the painful consequences of a complete failure.

In what way can financial data add depth to our understanding of why some firms cease growing, discontinue, fail, or go into bankruptcy? Signs of potential corporate failure are evident months before the actual bankruptcy materializes. But accurate prediction of declining business activity that leads to bankruptcy allows time for managers and creditors to take corrective action.

The turbulent and the competitive scenario in the corporate sector has made it imperative for the stakeholders to assess the financial health of the companies.

With the recent global financial crisis and the failure of many organizations in the

U.S and the European countries it has become all the more necessary that the stakeholders study the financial health of their organization. For companies, being able to meet their financial obligations is an integral part of maintaining operations and growing in the future. If the company is not in a good financial health it may not be able to survive in the future. That's why it's essential for investors to know how to evaluate the short-term as well as long term financial health of the organisation. Here an attempt has been made to examine the financial health in Pharmaceutical Industry.

Review of Literature

A lot of research has gone into studying and analysing the financial health of companies by accountants and researches all over the world. Accounting ratios have been widely used in development of models for the prediction of financial health and financial distress of companies. Researchers have been trying to find a ratio that would serve as the sole predictor of corporate health and bankruptcy for a long time. They have also tried to build up models that would help in predicting the financial health of companies.

In 1966 William Beaver conducted a comprehensive study using a variety of financial ratios. His study was based on univariate analysis of the data under study. He made use of 30 financial ratios of 79 failed and non failed companies and came to the conclusion that the cash flow to debt ratio was the single best predictor (Chuvakhin & Gertmenian, 2003) that gave statistically significant signals well before actual business failure.

In 1968, Edward Altman used multiple discriminant analysis (MDA) to built a bankruptcy prediction model. Altman made use of five ratios to develop a Z Score

which helped in the prediction of the financial health of a company. Altman found that his five ratios outperformed Beaver's (1966) cash flow to total debt ratio. His study was based on 60 firms in general.

In 1978 Gordon L. V. Springate developed the Springate model selecting four out of nineteen ratios that best distinguished between sound business and unhealthy business. These four ratios are working capital/total assets, net profit before interest and taxes/total assets, net profit before taxes/current liabilities and sales /total assets.

Not satisfied by the MDA model, particularly regarding the restrictive statistical requirements imposed by the model, Olhson (1980) used logistic regression to predict company failure. He used the logit model using nine ratios to develop an estimate of the probability of failure for each firm.

Fulmer (1984) developed a model using multi discriminate analysis to evaluate forty financial ratios applied to a sample of sixty companies of which thirty were successful while thirty failed.

Keasy and Meguinness (1990) used logistic analysis and entropy analysis using sixteen financial ratios on thirty seven firms in The UK. Platt and Platt (1990) used logistic analysis on fifty seven failed and non failed companies. Again in 1991, Skogsvik performed Probit function analysis using twenty cost accounting ratios on Swedish firms. He concluded that interest expenses ratio and financial leverage ratios were highly significant.

L.C Gupta (1999) attempted to refine Beaver's method with objective of predicting the business failure. In 2002, Mansur. A.Mulla made a study in textile mills with the help of Z score model for evaluating the financial health with five weighted financial ratios. This was followed by a study by Selvam M, and others (2004) which revealed the Cement industry's financial health with special reference to India Cements Limited. Bagchi

S.K (2004) analysed the practical implications of accounting ratios in risk evaluation and came to the conclusion that accounting ratios are still dominant factors in the matter of credit risk evaluation. Krishna Chaitanya (2005) used Z model to measure the financial distress of IDBI and concluded that IDBI is likely to become insolvent in the years to come.

Using data on South African companies listed on the Johannesburg Stock Exchange, Muller, Steyn-Bruwer and Hamman (2009) tested the effectiveness of four different techniques used to predict financial distress. They found that multiple discriminant analysis and recursive partitioning have the highest prediction accuracy for predicting "failed" companies.

Beneda (2006) investigated returns, bankruptcies and firm distress for new US public companies that issued IPOs from 1995 through 2002. Beneda found that the average first year returns for IPO companies underperformed the market and that Ohlson's model was effective in identifying companies that had a higher probability of bankruptcy and financial distress and earned lower than average returns.

Research Methodology

Objective:

To examine the financial health of sample units through Altman Model.

Hypothesis:

All the sample units of the pharmaceutical industry are equally sound with respect to financial health.

Period of Study:

Sample for six financial years i.e. 2004-05, 2005-2006, 2006-2007, 2007-2008, 2008-2009, 2009-2010 have been used for the purpose of present research work. A study of six years seems to be appropriate for establishing a trend.

Statistical Techniques used:

The statistical techniques used to conduct this study

are Ratio Analysis, Multi Discriminate Analysis, Mean, Standard Deviation and Coefficient of Variation.

Data Collection

The study has been done on companies in the pharmaceutical Industry. This study is based on secondary data, which have been obtained from published sources i.e. Annual report for the period of six years (2004-05 to 2009-10).

Sample Design

A sample of eight companies engaged in pharmaceutical

sector was selected for the purpose of the present study. The sample was chosen based on lottery system out of fifty companies.

Analysis and Discussion

The financial health of sample units has been judged through Altman score. The details regarding Altman model have been given at the end of the article in form of end notes. The ratios used in calculating Z - Score in Altman model have been discussed in the following paragraph.

Table 1: Ratios used in Altman Model

Company/Ratios	X1 Working Capital/ Total Assets	X2 Retained Earnings/ TA	X3 EBIT/TA	X4 Market Value of Equity/Book Value of Total Debt	X5 Sales/TA
Aurobindo Pharma	0.46	0.13	0.09	0.95	0.62
Cipla	0.38	0.18	0.17	7.16	0.78
Dr. Reddys	0.36	0.21	0.11	4.88	0.54
Glaxosmithkline Pharma	0.14	0.36	0.38	11.25	0.85
Merck	0.36	0.32	0.25	7.22	0.86
Piramal Health Care	0.24	0.21	0.18	4.91	0.93
Torrent	0.21	0.12	0.14	1.86	0.82
Wyeth	0.55	0.46	0.25	7.74	0.82
Mean	0.34	0.25	0.20	5.75	0.78
St.Deviation	0.14	0.12	0.09	3.34	0.13

Table 1 depicts the average ratios of 6 years which are used in calculating Altman model.

An analysis of the working capital shows that the industry average of the working capital to total assets is .34. Galxo, Piramal and Torrent are below the industry average whereas all the other companies are well above the industry average. It clearly indicates that an average pharmaceutical industry having 34% of total assets engaged in industry in form of liquidity. The lowest ratio

is reported by Glaxo Smithkline i.e, 0.14 while Wyeth is having the highest ratio of .55. It may be concluded that the Glaxo Smithkline utilized their assets effectively as compared to other sample units of present study.

The retained earnings to total assets ratio indicates the proportion of retained earnings to the total assets. On

an average the industry is retaining an amount of 25 % of its total assets. Companies like Cipla, Dr. Reddys, Piramal, and Torrent are retaining less than the industry average. The retained earnings to total assets is maximum (0.46) in Wyeth while it is the lowest in Torrent. (i.e. 0.12)

The industry ratio of earnings before interest and tax (EBIT) to total assets is 20%. The EBIT to total assets of Glaxo Smithkline is high (i.e. 0.36) compared to both the industry as well as other companies.

The market value of equity compared to book value of total debt of the industry is 5.75 times which indicates a comfortable position of the industry as a whole. Glaxo Smithkline is in the most comfortable position followed by Wyeth, Merck and Cipla. Aurobindo has a cause of concern regarding this ratio as it is below 1.

The average sales compared to total assets of the industry is 0.78. This low ratio indicates that the industry

is having an idle capacity and there is a scope of further improvement. Aurobindo and Dr.Reddys are below the industry average. All other companies are at or above the industry average indicating comfortable position. The highest ratio (0.93) has been reported by Piramal Healthcare.

As far as variability of ratios of sample units are concerned Market Value to Book Value reported the highest inconsistency as evident from the highest C.V. (58.08).The lowest C.V. (.11) is reported by Sales / Total Assets. It indicates that there is uniformity in this ratio as compared to others during the period of study.

The Z-Score of samples and units has been calculated after using the above discussed ratios. The cut off Z-Score is 1.8 i.e. sample companies having to score more than 1.8 may be considered financially healthy company other units not. The Z-Score of sample units is as follows:

Table 2: Altman Model - Z Score

Company/Year	2009-10	2008-09	2007-08	2006-07	2005-06	2005-04	Mean	CV
Aurobindo Pharma	3.08	1.82	2.16	2.43	1.85	1.91	2.21	21.98
Cipla	7.63	5.14	5.74	9.21	5.03	5.43	6.36	26.51
Dr. Reddys	6.00	3.36	4.25	6.18	2.99	4.52	4.55	28.98
GlaxoSmithKline Pharma	13.77	9.96	9.49	8.84	7.77	7.34	9.53	24.17
Merck	8.14	4.80	6.82	7.19	7.18	7.33	6.91	16.26
Piramal Health Care	5.53	3.46	5.15	4.43	6.27	5.47	5.05	19.41
Torrent	3.47	2.31	2.47	3.10	3.11	2.11	2.76	19.46
Wyeth	10.57	6.46	7.02	7.60	6.86	6.99	7.59	19.87
Mean	7.27	4.67	5.39	6.12	5.13	5.14	5.62	
CV	49.48	56.26	45.44	41.81	43.50	42.43		

The average Z-Score of pharmaceutical industries is 5.62 during the period of study. It clearly indicates that Pharmaceutical Industry has a healthy financial position

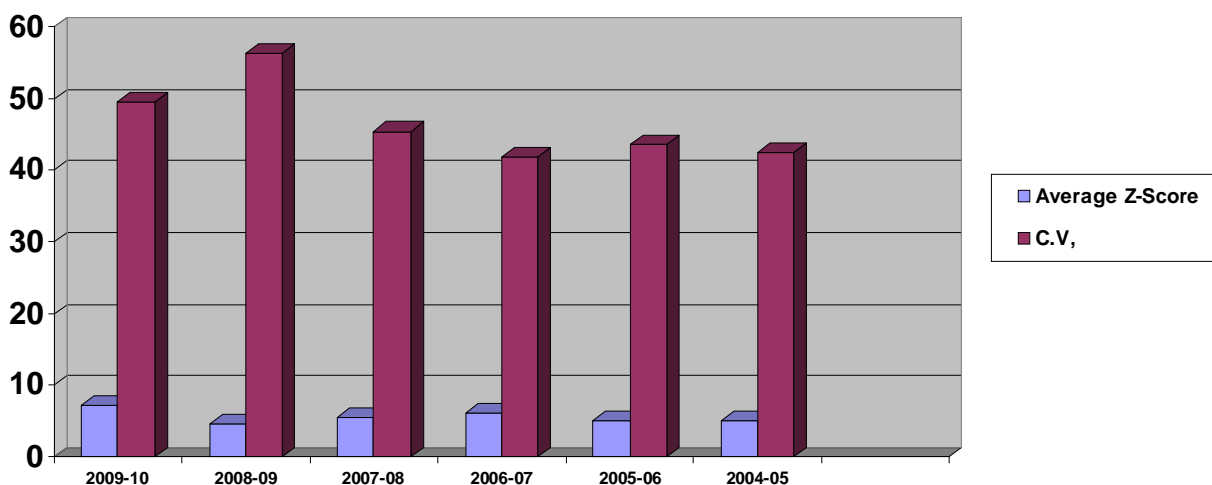
because Z-Score is much above the cut off score i.e. 1.8. Glaxo Smithkline reported the highest average ratio (9.53) followed by Wyeth with 7.59. Merck at the third

place has a Z-Score of 6.91, with Cipla just slightly behind with a score of 6.36. Piramal is next with 5.05 followed by Dr. Reddys with 4.55. Torrent and Aurobindo have relatively lower Z-Scores with 2.76 and 2.21 respectively.

Z-score is 2.21 which is neither too good nor too bad. But in 2009-10 it has come into the satisfactory zone. Torrent Pharma is another company which has a score slightly below the satisfactory zone. All other companies are well above the satisfactory zone with a strong financial health.

The figures of Aurobindo Pharma show that the mean

Figure 1: Average Z-Score and C.V. (Year wise)

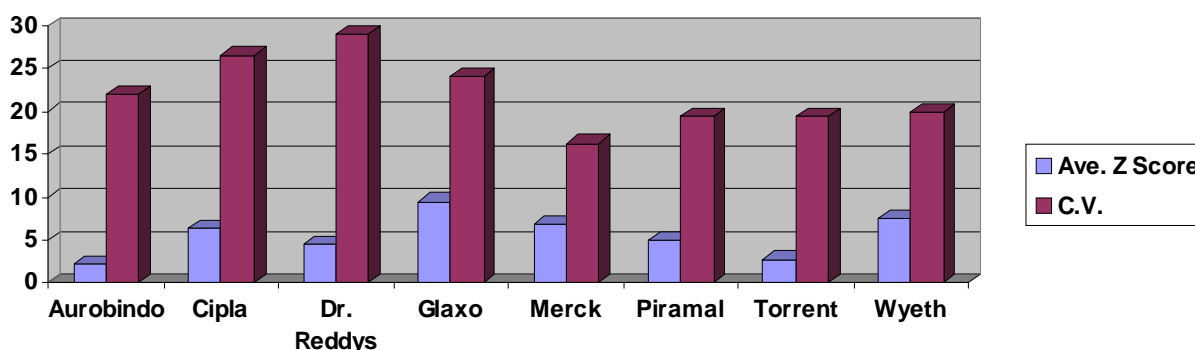


An overall industry analysis for the six years reveals that the mean Z-Score of the Pharma industry is well above the satisfactory level indicating a very healthy position for the industry. The mean Z-Score for the industry as a whole is also well above the cut off mark. The above graph indicates that the year 2009-10 has been very good for the industry as regards the financial

health as the Z Score is the highest i.e. 7.27.

As far as the variability of ratios for the 6 years is concerned the performance in the year 2008-09 is most inconsistent as can be seen with the highest C.V. i.e. 56.26 while the year 2006-07 has shown uniformity with lowest C.V. of 41.81.

Figure 2: Average Z-Score and C.V. (Company wise)



As far as the variability of ratios for the 8 companies is concerned, Dr. Reddys reported highest inconsistency as evident from the highest C.V (28.98). The lowest C.V (16.26) is reported by Merck. It indicates less inconsistency in the Z-Score score in 6 years, as compared to other units in Pharmaceutical industry.

Testing the hypothesis

In order to know whether the difference among the calculated Z-Score of different sample units is significant or only due to chance, the chi square test is administered. The average ratio of Z-Score and calculated value of chi square are presented in following table:

Table 3: Average Z score

Sample Units	Aurobindo Pharma	Cipla	Dr. Reddys	GlaxoSmithKline Pharma	Merck	Piramal Health Care	Torrent	Wyeth
Average Z score	2.21	6.63	4.55	9.53	6.91	5.05	2.76	7.59

Note: Calculated **chi square value: 7.58**

Table Value of chi square at 5% level of significance at 7 d.f.=14.067

Our null hypothesis is accepted because the calculated value of chi square is less than the table value at 5% level of significance. The calculated value is 7.58 which indicates that all the sample units are equally sound in terms of financial health. The visible difference is due to sampling fluctuations and not due to any major reasons.

Conclusion

The year 2009-10 may be considered a successful year for the Pharmaceutical industry because it reported the highest average ratio of Z-Score i.e. 7.27. The Altman Z-Score of the companies under study in the pharmaceutical sector reveal that the financial health of these companies is good. Cipla, Dr reddys, Glaxo, Merck, Piramal Healthcare and Wyeth are financially very healthy and have no cause of concern as regards financial health . The Z-Scores of these companies are well above 3 indicating very safe zone. Aurobindo and Torrent fall in the grey zone having Z-Scores between 1.8 and 2.99 but still there is no cause for alarm as they too are in the comfort zone. So it can be concluded that the companies of the pharma sector are financially

quite healthy and there is no scope of bankruptcy or any cause of concern as regards the financial health in this sector in the coming years. The investors in this sector have their investments safe. The management also has no reason to worry as regards the financial health of these companies is concerned.

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Altman used five ratios to calculate the Z-Score. These different ratios were combined into a single measure Z-Score Analysis with the help of MDA. The formula used to evaluate the Z-Score analysis as established by Altman is as follows:

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$

"Z" is the overall index and the variables X1 to X4 are computed as absolute percentage values while X5 is computed in number of times.

Ratios Used in Z-Score Analysis

The following accounting ratios are used as variables to combine them into a single measure (index), which is efficient in predicting bankruptcy.

X₁ -The ratio of working capital to total assets (WC/TA*100). It is the measure of the net liquid assets of a concern to the total capitalization.

X₂ -The ratio of net operating profit to net sales (NOP/S*100). It indicates the efficiency of the management in manufacturing, sales, administration and other activities.

X₃ -The ratio of earnings before interest and taxes to total assets (EBIT/ TA*100). It is a measure of productivity of assets employed in an enterprise. The ultimate existence of an enterprise is based on the earning power (profitability).

X₄ -The ratio of market value of equity to book value of debt (MVE/ BVD *100). 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. **X₅** -The ratio of sales to total assets (S/TA). The capital turnover ratio is a standard financial measure for illustrating the sales generating capacity of the assets.

End Notes

Z-Score Analysis

Measurement of Financial Health

Altman established the following guidelines to be used

to classify firms as either financially sound or bankrupt.

Altman guidelines for healthy zone.

Altman Guidelines for Gealthy Zone

Situation	Z-Score	Zones	
I	Below 1.8	Bankruptcy Zone	Failure is certain
II	1.8 to 3	Healthy Zone	May or may not fail
III	Above 3	Too healthy	Will not fail

1. Below Z-Score of 1.8, the unit is considered to be in bankruptcy zone. Its failure is certain and could occur probably within a period of two years.
2. If a unit has a Z-Score between 1.8, and 3, its financial viability is considered to be healthy. The
3. Above Z-Score of 3, the unit is in too healthy zone. Its financial health is very viable and the company will not fail.

