



INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE AND MANAGEMENT

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APPLICATION OF Z SCORE ANALYSIS IN EVALUATING THE FINANCIAL HEALTH OF PHARMACEUTICAL COMPANIES- A CASE STUDY

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ABSTRACT

Most of the external users like bankers, financial institutions, investors, government, NGOs etc have been focusing on the success and survival of the business while they were dealing with the same. A continuous effort of analyzing the financial data is inevitable to survive the business. The absolute figures in the financial statements are not serving this purpose. Despite, the ratio analysis considered as a powerful tool for analysis, but combining different ratios into single measure of the probability of sickness will be more powerful than a single ratio. 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 this research paper an attempt is made to predict the financial health of two selected sample pharmacy companies (Aurobindo Datong Bio-Pharmacy Ltd and RANBAXY Laboratories Ltd) for five years 2005-06 to 2009-10 using modified Altman's model. The research findings of the study are that the overall financial health of both (Aurobindo Pharmacy Ltd and Ranbaxy Laboratories Ltd) companies was good.

KEYWORDS

Active pharmaceutical ingredients (APIs), Aurobindo Datong Bio-Pharmacy Ltd (ADBPL), Food & Drugs Administration (FDA) Good Manufacturing practices (GMP).

INTRODUCTION

The importance of financial management practices have excelled in every area of business. The success of any business is largely depends on its effective financial management practices which starts with procurement of funds and ends with effective utilization of funds. Therefore continuous financial analysis of financial position and results is required to take corrective measures to meet the short-term and long-term requirements adequately. Financial statements are the sources for financial information, based on which the financial planning and decision making is done. The profit and loss account provides data about the operating activities where as balance sheet provides the value of acquired assets and liabilities of the business at a particular point of time. The absolute figures reported in the financial statements do not serve the purpose of measuring the financial health of the companies. Hence, the financial analyst has to analyze the financial data in order to ascertain the strengths and weaknesses of the companies.

Despite the financial analyst had many analytical tools, ratio analysis is most powerful toll to ascertain the financial health of the companies. Alone a single ratio does not serve the purpose. Therefore, it is necessary to combine the different ratios into a single measure of the provability of sickness or failure. Multiple discriminant analysis is useful tool in such situations. "The use of MDA helps to consolidate the effect of all ratios".¹ The present study is concerned with the analysis of financial health of two selected sample pharmacy companies.

BRIEFING ABOUT AUROBINDO BIO-PHARMACY LTD AND RANBAXY LABORATORIES LTD

"Aurobindo Pharma Ltd (APL) was incorporated on 26th December, 1986 as a private ltd company. Founders of the company are Mr. P.V.Ramaprasad Reddy, Mr. K.Nityananda Reddy. APL is developing, manufacturing and marketing active pharmaceutical ingredients (APIs also referred as bulk actives), intermediates and generic formulations. APL has been operating with 14 manufacturing plants across the world. The Company commenced its operations during the year 1988-89 with a single unit manufacturing semi synthetic penicillins (SSPs) at Pondicherry and it became a public venture in 1992. Aurobindo Pharmacy had gone public in 1995 by listing its shares in various stock exchanges in the country. The pharmaceutical companies like Chaitanya Organics Pvt. Ltd, Glaxo (India), Sri Chakra Remedies Ltd. Sri Chakra Remedies Ltd, Ranit Pharma and Calc Private Ltd were amalgamated with the Aurobindo Pharmaceuticals Ltd in the fourth wave of mergers and acquisitions. During the year 2003 a JV was happened between Aurobindo Pharmaceuticals Ltd and Shanxi Tongling Pharmaceuticals Company under the name of Aurobindo Tongling (Datong) pharmaceuticals Ltd, China, for manufacture of pharmaceutical products to the local market. During the year 2004-05 the company had acquired a sterile plant of Dee Pharma for the consideration of Rs. 38 million which located at Bhiwadi in Rajasthan. It was received 'Best Management Award' from The State Labour Department of the Government of Andhra Pradesh, in the year 2005. The APL Life Sciences and Senior Organics have merged with it in the year 2007"².

"Ranbaxy Laboratories Ltd was incorporated in 1961 and which is renowned as India's largest pharmaceutical company and producing a wide range of quality, affordable generic medicines. Its present MD is Arun Sawhney. It is ranked amongst the top ten generic companies worldwide. Ranbaxy has expanding international portfolios of affiliates, JVs and representative offices across the globe with a presence in 23 of the top 25 pharmaceutical markets of the world.

Ranbaxy is one of the largest pharmaceutical companies in India, with significant focus on the generics markets of the US and Europe. It is the only Indian company listed in the top 100 pharmaceutical companies of the world. The company has a well-diversified presence with products in over 100 countries and a ground presence in 34 countries. It manufactures and markets generic pharmaceuticals, branded generics, APIs and intermediates. In 2008, Ranbaxy retained its No. 2 market position with a market share of 5.0 per cent."³

OBJECTIVES OF THE STUDY

1. To evaluate the efficiency of financial performance of two sample pharmacy companies.
2. To examine the overall financial performance of two selected sample pharmacy companies.
3. To forecast the financial health and viability of the two selected sample pharmacy companies.

RESEARCH METHODOLOGY

The present study is concerned with the analysis of financial health of Aurobindo Bio-Pharmacy Ltd and RANBAXY Laboratories Ltd. The entire study is based on secondary data. The data has been collected from websites of the companies. The period of study is 2005-06 to 2009-10. Modified Altman’s model popularly known as K.B Mehta’s Model has been adopted to analyze the financial health of Aurobindo Bio-Pharmacy Ltd and RANBAXY Laboratories Ltd.

LIMITATIONS OF THE STUDY

1. The study is confined to only two pharmaceutical companies
2. The present study covers only a period of five years
3. The collected data for the present study is secondary data.

REVIEW OF LITERATURE

Discriminant analysis may be applied for prediction of sickness, market research, credit rating portfolio selection identification of growth and classification of officers/managers or personals. Discriminant analysis has been widely used to identify and to predict financial health of industrial units. “Multiple discriminant analysis (MDA) is a straight forward statistical technique for calculating how much weight to put on each variable in order to separate the sheeps from the goats”⁴. William H. Beaver (1967) selected five ratios out of thirty financial ratios to study the financial health of 79 successful units and 79 unsuccessful units. The ratios were (i) cash flow to total debt (ii) net income to total assets (iii) total debt to total assets (iv) networking capital to total assets and (v) current assets to current liabilities” as expected, failed firms had more debt and lower return on assets. They had less cash but more receivables as well as low current ratios. They also had fewer inventories”⁵. It was observed that cash flow to total debt had maximum prediction power among different ratios in the study. Prof. Adward I. Altman (1968) selected five ratios of twenty two initially considered. He took 33 successful firms and 33 bankrupt firms and developed a model popularly known as ‘Altman’s Z- Score mode’. The model comprises the five ratios viz;

- (i) Networking capital to total assets (X₁)
- (ii) Retained earnings to total assets (X₂)
- (iii) Earnings before interest and tax to total assets (X₃)
- (iv) Market value of equity to book value of debt (X₄) and
- (v) Sales to total assets (X₅)

The ratios were given weight aged and combined to produce a single number which was termed as Z score. Johah Aiyabei (2002)⁶ applied Z score model examine the financial performance of small business firms based in Kenya and discussed the theoretical aspect of a financially distressed firm based on a cyclical concept. Ben Mc Clure (2004)⁷ suggested investors to check Z score of their companies regularly. In the Indian context, L.C.Gupta (1979)⁸ attempted a refinement of Beaver’s method with the objective of building a forewarning system of corporate sickness. A simple non-parametric test for measuring the relative differentiating power of the various financial ratios were used. The test is based on taking a sample of sick and non-sick companies, arraying them by the magnitude of each ratio to be tested, selecting a cut of point which will divide the array into two classes with a minimum possible number of misclassification and then computing the percentage classification error. The cut-off point is determined by visual inspection. The percentage classification error is determined as number of classifications divided by the number in sample. The ratio which results into the lower percentage classification error is the most efficient ratio.”⁹ Mansur A. Mulla (2002)¹⁰ conducted a study to evaluate financial health of textile mills by using Z score model. Selvam, M . and others (2004)¹¹ made a study to predict the financial health and viability of India cements Ltd. They concluded that the cement company under the study was just on the range of financial collapse. Further, they write that financial health of cement companies has been subject to empirical investigation. Krishna Chaitanya (2005)¹² measured the financial distress of IDBI with the help of Altman’s Z score model and predicted that IDBI is not in the health zone and is likely to be insolvent in the near future. M.Khannadhasan (2007)¹³ ascertained the financial health of Wendt India Ltd company by using ‘Z’ score model. He concluded that company’s overall financial health was good. V.Dheenadhyalan (2008)¹⁴ adopted Z score to predict the corporate failure of steel authority of Indian Limited. The Z score of the SAIL showed a rising trend throughout the study period and it was concluded that the financial health of the SAIL was good. Dr.K Venkat Janardhan Rao and M.Durga Prasad (2009)¹⁵ examined the financial performance of Eicher Motors Ltd is better than M M. According to K.R.Sharma¹⁶, different models like R.A.Yadav and S.S.Srivastava model, Prof.C.D.Bhattacharya model and Prof..K.B.Mehta’s model have been used to measure financial health. The present study is based on Prof.K.B Mehta’s model because the model considers Indian conditions.

PROF.K.B. MEHATA’S: A MODIFICATION OF ALTMAN’S MODEL

Prof.K.B. Mehata’s model represented a modification of Altman’s model as per Indian conditions.” For example, as all share were not listed on stock exchange, instead of market value of equity, book value of equity was taken as fourth valuable (X) financial considered were:

- X1= Net working capital to Total assets.
- X2 = Retained earnings to Total assets
- X3 = Earnings before Interest and Tax to Total assets
- X4 = Book Value of Equity of Book Value to Total debts.
- X5 = Net sales to total assets

Discriminant function: $Z = 0.717X_1 + 0.845X_2 + 3.107X_3 + 0.42X_4 + 0.995X_5$ (1)

- Here
- X1 Shows liquidity position to the total capitalization
 - X2 Indicates cumulative profitability overtime and leverage
 - X3 Express operating performance and productivity of assets.
 - X4 Presents the long-term solvency position. It shows how much assets of an enterprise can decline in value before the liabilities exceeds the assets and the concern becomes insolvent.
 - X5 Reveals the sales generating capacity of the assets.

Measurement of financial health: There may be three situations;

1. If Z score is below 1.2 then the unit is considered to be in bankruptcy Zone. Its failure is certain
2. If Z score lies between 1.2 and 2.9 then the unit is considered to be in grey area or healthy zone. In this situation the failure is uncertain to predict.
3. If Z score is above 2.9, then the unit is considered to be in good health Zone.

TABLE 1: Z SCORE INGREDIENTS OF ADBPL AND RANBAXY LTD (RS.CRORES) CNTD

Year	Net working capital		Total assets		Retained earnings		EBIT	
	ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY
2005-06	1144.46	1,011.52	2110.63	3,407.11	70.24	160.52	239.93	185.44
2006-07	1874.51	1,112.75	2905.64	5,528.61	227.2	456.3	392.59	632.27
2007-08	1808.99	1,006.93	2976.25	6,041.42	411.82	375.12	461.54	414.59
2008-09	2085.67	1,938.67	3435.51	7,442.15	464.29	246.84	342.39	256.17
2009-10	2038.49	1,640.98	3859.14	7,482.99	939.16	510.02	976.87	652.64

Source: Religare Technova

TABLE 1: Z SCORE INGREDIENTS OF ADBPL AND RANBAXY LTD (RS.CRORES)

Year	Net sales		Book value of equity		Book value of debt	
	ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY
2005-06	1561.21	3,640.49	905.41	2,377.30	1205.22	1,029.80
2006-07	2104.45	4,165.12	929.3	2,350.01	1976.34	3,178.60
2007-08	2426.12	4,293.02	1220.6	2,538.40	1755.65	3,503.03
2008-09	3037.98	4,652.04	1320.83	3,716.77	2114.68	3,725.37
2009-10	3523.87	4,781.59	1914.36	4,134.60	1944.78	3,348.38

Source: Religare Technova

TABLE 2: STATEMENT SHOWING THE RATIOS USED IN Z SCORE ANALYSIS OF ADBPL AND RANBAXY LTD CNTD...

	Financial ratios	2005-06		2006-07		2007-08	
		ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY
X1	NWC to total assets	0.542	0.297	0.645	0.201	0.608	0.167
X2	Retained earnings to total assets	0.033	0.047	0.078	0.083	0.138	0.062
X3	EBIT to total assets	0.114	0.054	0.135	0.114	0.155	0.069
X4	BVE to BVD	0.751	2.309	0.47	0.739	0.695	0.725
X5	Net sales to total assets	0.74	1.069	0.724	0.753	0.815	0.711

Source: Religare Technova

TABLE 2: STATEMENT SHOWING THE RATIOS USED IN Z SCORE ANALYSIS OF ADBPL AND RANBAXY LTD

	Financial ratios	2008-09		2009-10		Mean	
		ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY
X1	NWC to total assets	0.607	0.26	0.528	0.219	0.586	0.229
X2	Retained earnings to total assets	0.135	0.033	0.243	0.068	0.125	0.059
X3	EBIT to total assets	0.1	0.034	0.253	0.087	0.151	0.072
X4	BVE to BVD	0.625	0.998	0.984	1.235	0.705	1.201
X5	Net sales to total assets	0.884	0.625	0.913	0.639	0.815	0.759

Source: Religare Technova

TABLE 3: STATEMENT SHOWING THE Z SCORES OF ADBPL AND RANBAXY LTD CNTD...

Year	0.717X1		0.842X2		3.107X3	
	ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY
2005-06	0.389	0.213	0.028	0.04	0.354	0.168
2006-07	0.462	0.144	0.066	0.07	0.419	0.354
2007-08	0.436	0.12	0.116	0.052	0.782	0.214
2008-09	0.435	0.186	0.114	0.029	0.311	0.106
2009-10	0.379	0.157	0.205	0.057	0.786	0.27

Source: Religare Technova

TABLE3: STATEMENT SHOWING THE Z SCORES OF ADBPL AND RANBAXY LTD

Year	0.42X4		0.995X5		Z	
	ADBPL	RANBAXY	ADBPL	RANBAXY	ADBPL	RANBAXY
2005-06	0.315	0.97	0.736	1.064	1.822	2.555
2006-07	0.197	0.31	0.72	0.749	1.864	1.627
2007-08	0.292	0.305	0.811	0.707	2.437	1.398
2008-09	0.263	0.419	0.88	0.622	2.003	1.362
2009-10	0.413	0.519	0.908	0.636	2.691	1.639

Source: Religare Technova

FINDINGS

WORKING CAPITAL TO TOTAL ASSETS

Working capital is the excess of total current assets. The ratio of working capital to total assets shows liquidity position of relative to total capitalization. "Consistent operating losses will cause current assets to shrink relative to total assets. A negative ratio, resulting from negative working capital, is a serious problem".¹⁷ The ratios of working capital to total assets of both the companies are furnished in the Table 2 about here.

It may be observed from the table 2 that the working capital to total assets ratio of Aurobindo Bio-Pharmacy Ltd had been around 0.528 to 0.645 but where as it is 0.167 to 0.297 for RANBAXY Laboratories Ltd. It indicates that the Aurobindo Bio-Pharmacy had very high level of investment (aggressive) in current assets and which shows that too much of its current funds are blocked in the form of current assets instead of investing them in the potential investments. And the RANBAXY had very low level (conservative) of investments in current assets which shows the poor working capital management of the company. This analysis will help both the companies in maintaining the appropriate working capital i.e. neither low nor high level of investments in current assets without disturbing the basic liquidity position of the companies.

RETAINED EARNINGS TO TOTAL ASSETS

The ratio of retained earnings to total assets indicates that how much portion of total assets has been financed by retained earnings. Higher the ratio greater the financial stability of the company at times of low profitability periods. And also it depicts that the company utilizing its own earnings as cheaper source of finance rather than debt finance. The percentages of retained earnings of both the companies are furnished in the table 2 about here.

From the table 2 it is observed that on an average 12.5% and 5.9% of total assets of Aurobindo Bio-Pharmacy and RANBAXY are financed by its retained earnings during the study period. This study shows that these companies have been utilizing more debt rather than retained earnings. The decreasing trend of retained earnings during the study period indicates that the unsustainable growth of the Aurobindo Bio-Pharmacy Ltd and RANBAXY Laboratories Ltd. And this situation may compel both the companies in the bankruptcy at low profitable times.

BOOK VALUE OF EQUITY TO BOOK VALUE OF TOTAL DEBTS

This ratio is used to ascertain the soundness of the long-term financial policies. The company having 1:1 equity-debt mix is considered as quite good. Excessive debt tends to cause insolvency. Fixed interest paid on debt where as variable dividend is paid on equity. If debt is more than the equity it will reduce the profit of the company, despite increases the profitability of the share holders. It will be a curse in times of bad performing. The relevant information of the two selected sample pharmacy companies in the pharmacy industry is furnished in the table 2 about here.

From the table 2 it is observed that the on an average equity portion of Aurobindo Pharmacy was 70.5% in comparison to debt portion in the capital structure during the study period. On the contrary the average equity portion of RANBAXY Laboratories Ltd was 120.1% in comparison to debt portion in the capital structure during the study period. The highest equity portion of total capital of RANBAXY is 2.309 in 2005-06 and the lowest portion of equity is 0.725 in 2007-08. On the basis of the analysis pertaining to this ratio, it may be conclude that the financial health of the RANBAXY is quite good when compare to Aurobindo Bio-Pharmacy and it provides a margin of safety to its creditors in times of bankruptcy. Therefore it is advised the Aurobindo Datong Bio-Pharmacy has to take an appropriate step to improve the equity portion as per its benchmark.

SALES TO TOTAL ASSETS

Sales revenue plays a pivotal role in overall performance of the companies because all the operations are more or less depend on the sales revenue. Sales to total assets ratio measure the power of the asset in generating the sales. Higher ratio indicates the better performance and while poor ratio indicates the poor financial management of the companies in the optimum utilization of its assets in generating the sales revenue. The ratio varies from one company to another. The relevant information of the two selected sample pharmacy companies is furnished in the table 2 about here.

From the table 2 it is observed that the average ratios of sales to total assets of two selected sample pharmacy companies are 0.815 and 0.759 respectively during the study period. The ratio of Aurobindo Pharmacy ranges from 0.724 to 0.913 while it was 0.625 to 1.069 for RANBAXY Laboratories Ltd during the study period. While comparing the performance of both the companies, the performance of RANBAXY Laboratories Ltd is just better than the Aurobindo Pharmacy. Based on the information from table 2 it was crystal clear that both the companies still had an opportunity to improve its sales capacity but had been totally failure to utilize their assets optimally in generating the sales revenue. It will have an adverse effect on its performance. It is suggested that both the companies have to take appropriate steps in the optimum utilization of its assets in generating more and more sales revenue.

CONCLUSION

The Z score of Aurobindo Bio-Pharmacy Ltd and RANBAXY laboratories Ltd based on the modified Altman's model is between 1.2 and 2.9 during the study period (i.e 2005-06 to 2009-10). It is observed from the table 3 that both the companies are in grey area or healthy zone. In this situation the failure of both Aurobindo Bio-Pharmacy Ltd and RANBAXY laboratories Ltd is uncertain to predict. Finally it can be concluded that the overall financial health of both the companies is good. This study will be useful for all the stakeholders of pharmaceutical industry.

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