

COMPARATIVE STUDY OF PHARMACEUTICAL COMPANIES: (ALTMAN'S Z- SCORE TEST)

Dr. Manisha M. Barad*

ABSTRACT

It is major concern for all companies to predict financial health. If it will results into financially weak position then it will become harmful to stakeholders who all are connected with companies' every moves. By using Z-score model given by Altman, we can find out the financial health of the particular company or whole industry. This model gives the satisfactory results about study of financial distress. Here, the study covers a period of 5 years from 2014-15 to 2018-19 for investigation about financial health of top 2 Pharmaceutical company of India on the basis of market capitalization. The Altman Z-score test technique has been applied to analyze the data.

Keywords: Financial Health, Liquidity, Profitability, Leverage, Solvency & Activity- Altman's Z-Score Test.

Introduction

Review of Literature

M.S. Prathibha Raj & Dr G Dinakar (2017): In the research paper titled "ANALYSIS OF SELECTED AUTOMOBILES COMPANIES IN INDIA BY USING ALTMAN Z SCORE" the researcher has made a technical analysis as well as fundamental analysis on the financial health of nine BSE & NSE listed automobile companies for the year 2014 to 2015. He utilized Altman's Z score for better future investment in automobile sector in India which is play well because India is huge market.

Research Objective

To examine financial health by using ALTMAN'S Z-score test.

Sample Design

This study is based on secondary data collected from annual reports of the SUN PHARMA and DR. REDDY'S company and from the website www.moneycontrol.com for the period of five years from 2014-15 to 2018-19.

Altman's Z-Score Test

To test financial health, Z-score test was first published in 1968 by Edward Altman. In his studies, he had taken initially 66 corporations with 33 companies in each group in the period from 1946 to 1965. Firstly Altman used 22 different financial ratios but to eliminate size effects, he had considered only 5 ratios from them which are divided into 5 categories: liquidity, profitability, leverage, solvency and activity.

To evaluate financial health, formula used by ALTMAN is as follows:

$$Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.999X5$$

Here, X1, X2, X3, and X4 are computed as absolute percentage and X5 is in number of times.

- X1=** Ratio of WORKING CAPITAL to TOTAL ASSETS to measure liquid assets to total assets.
X2= Ratio of NET OPERATING PROFIT to SALES to measure efficiency of management.
X3= Ratio of Earning Before Interest and Tax (EBIT) to TOTAL ASSETS to measure productivity of assets employed in company.

* Assistant Professor, Department of Commerce and Management, K.S.K.V Kachchh University, Bhuj (Kachchh), Gujarat, India.

X4= Ratio of Market Value of Equity to Book Value of Debts which is reciprocal of the familiar Debt-Equity Ratio.

X5 = Ratio of Sales to Total Assets to measure the sales generating capacity of the asset

In this study Altman model has been used in solvency test of sample units. Is the Altman model varies components of financial statements are required so researchers has been also drawn required components from financial statements of sample units?

The Name of components are given below:

- Working capital
- Total assets
- Net sales
- Interest
- Total liability
- Market value of equity
- Earnings before interest and tax
- Retained earnings

X1= Working Capital / Total Assets (WC/TA)

The working capital/total assets ratio, frequently found in studies of corporate problems, is a measure of the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered. Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets. Of the three liquidity ratios evaluated, this one proved to be the most valuable. Two other liquidity ratios tested were the current ratio and the quick ratio. There were found to be less helpful and subject to perverse trends for some failing firms.

X2, Retained Earnings/Total Assets (RE/TA)

Retained earnings are the account which reports the total amount of reinvested earnings and/or losses of a firm over its entire life. The account is also referred to as earned surplus. It should be noted that the retained earnings account is subject to "manipulation" via corporate quasi-reorganizations and stock dividend declarations. While these occurrences are not evident in this study, it is conceivable that a bias would be created by a substantial reorganization or stock dividend and appropriate readjustments should be made to the accounts. This measure of cumulative profitability over time is what I referred to earlier as a "new" ratio. The age of a firm is implicitly considered in this ratio. For example, a relatively young firm will probably show a low RE/TA ratio because it has not had time to build up its cumulative profits. Therefore, it may be argued that the young firm is somewhat discriminated against in this analysis, and its chance of being classified as bankrupt is relatively higher than that of another older firm, ceteris paribus. But, this is precisely the situation in the real world. The incidence of failure is much higher in a firm's earlier year. In 1993, approximately 50% of all firms that failed did so in the first five years of their existence (Dun & Bradstreet, 1994). In addition, the RE/TA ratio measures the leverage of a firm. Those firms with high RE, relative to TA, have financed their assets through retention of profits and have not utilized as much debt.

X3, Earnings Before Interest and Taxes/Total Assets (EBIT/TA)

This ratio is a measure of the true productivity of the firm's assets, independent of any tax or leverage factor. 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 corporate failure. Furthermore, insolvency in a bankrupt sense occurs when the total liabilities exceed a fair valuation of the firm's assets with value determined by the earning power of the assets. As we will show, this ratio continually outperforms other profitability measures, including cash flow.

X4, Market Value of Equity/Book Value of Total Liabilities (MVE/TL)

Equity is measured by the combined market value of all shares of stock, preferred and common, while liabilities include both current and long term. The measure shows how much the firm's assets can decline in value (measured by market value of equity plus debt) before the liabilities exceed the assets and the firm becomes insolvent. For example, a company with a market value of its equity of \$1,000 and debt of \$500 could experience a two-thirds drop in asset value before insolvency. However, the same firm with \$250 equity will be insolvent if assets drop only one-third in value. This ratio adds a market

value dimension which most other failure studies did not consider. The reciprocal of X4 is a slightly modified version of one of the variables used effectively by Fisher (1959) in a study of corporate bond yield-spread differentials. It also appears to be a more effective predictor of bankruptcy than a similar, more commonly used ratio; net worth/total debt (book values). At a later point, we will substitute the book value of net worth for the market value in order to derive a discriminant function for privately held firms (Z') and for non-manufacturers (Z''). More recent models, such as the KMV approach, are essentially based on the market value of equity and its volatility. The equity market value serves as a proxy for the firm's asset values.

X5, Sales/Total Assets (S/TA).

The capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It is one measure of management's capacity in dealing with competitive conditions. This final ratio is quite important because it is the least significant ratio on an individual basis. In fact, based on the univariate statistical significance test, it would not have appeared at all. However, because of its unique relationship to other variables in the model, the sales/total assets ratio ranks second in its contribution to the overall discriminating ability of the model. Still, there is a wide variation among industries in asset turnover, and we will specify an alternative model (Z''), without X5 at a later point

Altman's Guideline for Financial Health

Situation	Z-score	Zone	Results
1	Below 1.8	Bankruptcy zone	Financially weak
2	1.8 to 2.99	Grey zone	May or may not fail
3	Above 2.99	Healthy zone	Financially healthy

Researcher Used Above Guideline For To Measure Financial Health Of Two Pharmaceutical Companies and Compare Each Other Financial Health With Data Based

SUN PHARMA industries ltd.

	WC	RE	EBIT	MV of eq	TL	SALES	TA
2014-15	1465.97	3139.19	2782.71	119042.22	6429.12	2724.31	13837
2015-16	-5601.8	2196.08	1007.72	212070.16	14659.28	7730.92	37445.55
2016-17	-3495.08	1314.04	537.27	197341.2	12706.17	7132.03	34189.93
2017-18	-4574.46	1229.14	206.77	164957.52	12856.8	7400.43	33869.27
2018-19	-2983.21	1203.07	668.56	118908.55	14469.2	8774.41	36791.81

Year	WC/TS	RE/TA	EBIT/TA	MV of EQ/TL	SALES/TA
2014-15	0.1059	0.2269	0.2011	18.516	0.1969
2015-16	-0.1496	0.0586	0.0269	14.47	0.2065
2016-17	-0.1022	0.0384	0.0157	15.53	0.2086
2017-18	-0.1351	0.0363	0.0061	12.83	0.2185
2018-19	-0.0811	0.0327	0.0182	8.218	0.2385

Above table of SUN PHARMA industries ltd's data Indicate company financial situation period of 2014-15 to 2018-19 to compared with the data of Dr. Reddy's Laboratories Co Ltd same periodic time 2014 -15 to 2018-19

Dr. Reddy's Laboratories Co Ltd.

Year	WC	RE	EBIT	MV of eq	TL	SALES	TA
2014-15	4793.6	1621.6	2532.7	218187.89	5179.1	9646.80	14508.10
2015-16	5724.7	1338.2	2123.7	297241.5	5822	9927.50	16456.00
2016-17	5296.2	1014	1643.8	258902.5	5952.2	10150.60	17557.60
2017-18	4335.8	907.40	1601.7	217729.8	4846.6	9628.10	16447.20
2018-19	4318.6	995.11	759.80	173843.5	5292.5	9302.60	17100.30

Year	WC/TA	RE/TA	EBIT/TA	MV of EQ /TL	SALES/TA
2014-15	0.3304	0.1118	0.1746	42.13	0.6649
2015-16	0.3479	0.0813	0.1291	51.05	0.6033
2016-17	0.3016	0.0578	0.0936	43.497	0.5781
2017-18	0.2636	0.0552	0.0974	44.92	0.5854
2018-19	0.2525	0.0582	0.0444	32.85	0.5440

Z- Score Table

Year	Sun Pharma	Dr. Reddy's
2014-15	12.42	27.07
2015-16	8.88	32.19
2016-17	9.51	27.43
2017-18	7.82	28.25
2018-19	5.18	20.79
Mean	8.746	27.146

Here both the companies are financially healthy according to Altman's z-score model in all the 5 years. We can see that Dr. Reddy's company's z-score is higher than Sun Pharma Company. According to calculations of z-score, sun pharma is going continuously downward but in the current market it is the highest market capitalized pharmaceutical company of India. Here we can analyze that sales of sun Pharma Company having increases in 5 years while sales of DR. REDDY'S is decreasing in 5 years. In the year 2018-19, assets of sun Pharma Company is more than Dr. Reddy's company but in case of working capital it is less than Dr. Reddy's company. It may be concluded that Sun Pharma utilized its assets more effectively. Here z-score is the only tool of analysis which becomes limitation and data used in research are secondary data which also have its own limitations

Conclusion

Here it is clearly indicates healthy financial position of both the companies having z-score more than 2.99 and there is no scope of bankruptcy. DR. REDDY'S z-score is on an average 3 times more than SUN PHARMA. Sometimes having low or negative working capital policy leads to the default and bankruptcy. SUN PHARMA is using same policy which will create risk or financial trouble in longer period of time.

References

- ✿ Analysis of selected automobiles companies in india.
- ✿ BIMS International Journal of Social Science Research, 8(1), 37–5
- ✿ Homedes N, Ugalde A, Fornes JR. The World Bank, pharmaceutical policies, and health reforms in Latin America. *Int. J. Health Serv.* 2005;4:691–717.
- ✿ Jeffery R. Pharmaceuticals distribution systems in India. University of Edinburgh, Edinburgh: Centre for International Public Health Policy; 2007. pp. 5–15.
- ✿ M.S, P. R., & Dinakar, G. (2017)
- ✿ Mehta A, Farooqui HH, Selvaraj S. A critical analysis of concentration and competition in the Indian pharmaceutical market. *PLoS One.* 2016; 11:e0148951.
- ✿ Paterson A, Karimi A. Understanding markets in Afghanistan: A study of the market for pharmaceuticals. The Institute, Kabul: Afghanistan Research and Evaluation Unit; 2005. pp. 15–30.
- ✿ Quick J. Essential drugs and medicines policy: Supporting countries to close the access gap. Americas. 2003. Available from: URL: <http://www.who.int/countries/eth/areas/medicines/en/>
- ✿ Rahimi M, Ahmadi P, Khodadad HS. Commercial effects of Iran's membership in the WTO in drug industry (in Persian) *Hakim Health Sys. Res. J.* 2011;2:73–7.
- ✿ Retrieved from <http://www.informaticsjournals.com/index.php/bims/article/view/16252>.
- ✿ Sorte Junior WF. The production and research and development structure of the Brazilian pharmaceutical industry: The role of public procurement and public drug production. *Glob. Public Health.* 2012;7:1062–79.

