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CONTENTS

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   INTRODUCTION

   REVIEW OF LITERATURE

   NEED/IMPORTANCE OF THE STUDY

   STATEMENT OF THE PROBLEM

   OBJECTIVES

   HYPOTHESES

   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

   RECOMMENDATIONS/SUGGESTIONS

   CONCLUSIONS

   SCOPE FOR FURTHER RESEARCH

   ACKNOWLEDGMENTS

   REFERENCES

   APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

FINANCIAL HEALTH THROUGH Z SCORE ANALYSIS: A CASE STUDY ON SELECTED PHARMACEUTICAL COMPANIES

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ABSTRACT

Survival of the business in the modem world is possible, only when, apart from other things, it has optimum level of finance which is required to meet its both short term and long term commitment. The objective of the study is to examine the financial health of the selected four companies (namely, Dr. Reddy's laboratories, Ranbaxy laboratories, CIPLA and Aurobindo pharma) during the period 1999-2000 to 2011-2012. Z Score model, developed by Edward I Altman, has been applied to examine the financial health of the selected companies under the study period. The research findings are that overall financial health of all the selected companies was good.

KEYWORDS
Business commitment, Financial health, optimum finance, Z score.

INTRODUCTION

In the changing scenario, every business strives hard for survival in the present day's era of cut throat competition. Survival of the business is possible, only when, apart from other things, it has a sound financial position. The finance is required to meet its long term as well as short term liabilities. To meet long term liability, it requires permanent capital and for short term liability, it requires working capital. Therefore, finance is important for every type of business. However, both excessive as well as inadequate finance position are harmful for the business. Therefore, analysis of financial position on regular basis is very much urgent[2].

Company's performance is judged by its financial statement in the light of operational efficiency of the company. Due to cut throat competition among the business community, everyone is doing something better than the others to capture the market. Therefore, monitoring the financial health of a company by checking its sales volume and the growth of profit is not sufficient for present situation. It is necessary to check the utilization of capital, assets, and return to shareholders as well as predicting financial distress. Several indicators and information sources can help to predict and to prevent from the financial distress. Financial statement analysis is one of the methods by which analysis of financial distress can be predicted.

To analyze the financial position and performance of the company different tools are employed. Among of the different tools, ratio analysis is a widely used tool, which is relevant in assessing the performance of the firm in respect of the liquidity position, managerial efficiency position, operational performance measurement and long term as well as short term solvency position. In addition to the above, it also supports to predict the financial distress of the business. No single ratio can provide a meaningful complete picture of a company's financial health position.

Under the circumstances, an attempt has been made in the present study to have an insight into the examination of financial health of the selected pharmaceutical companies.

COMPANIES PROFILE

Dr. Reddy's Laboratories is one of the popular pharmaceutical companies with base in more than 100 countries. The company is very much customer friendly. Though the company is located in various parts of the world, it has its headquarters in India. The subsidiaries of this company are found at various countries like US, Germany, UK, Russia and Brazil. It takes care of the fact that maximum people get benefited by the products of this pharmaceutical company. It commercialized various treatments so as to provide high tech treatment to the masses. It tries to meet the medical needs to the people.

Ranbaxy is among the predominant pharmaceutical companies in India and was founded in 1961. It is a research based pharma giant and became a public limited company in 1973.Ranbaxy was recently ranked the top 10 international pharmaceutical companies in the world have presence across 49 countries.

CIPLA was founded by Khwaja Abdul Hamied in 1935and was known as The Chemical, Industrial and Pharmaceutical Laboratories, though it is better known by the acronym CIPLA today. It was registered in August, 1935 as a public limited enterprise. Today, the company has its facilities spread across several location s across India. It has an extensive export market and regularly exports more than 150 countries.

Aurobindo Pharma , an India based private pharmaceutical company having presence around the world. It was set up in the year 1986 and started its operation in 1988-89 in Pondicherry, India. Now, the company is headquartered at Hyderabad, India. It is one of the most respected generic pharmaceuticals and active pharmaceutical ingredients manufacturing company of the world. The company operates in over 100 countries across the world. Aurobindo pharma products cover segments like- Antibiotics, Anti-Retro Virals, CVS, and CNS, gastroenterological, Anti-Allergic.

LITERATURE REVIEW

Mulla[4] (2002) in his article entitled "Use of Z-score Analysis for Evaluation of Financial Health of Textile Mills - A Case Study."made a study in Textile mill with the help of Z-score model for evaluating the financial health with five weighted financial ratios .

Selvam M[6]., Vanitha, S., & Babu. (2004 July),in their article entitled " A Study on Financial Health of Cement Industry - Z-score Analysis" which revealed about Cement industry's financial heath with special reference to India Cements Limited.

Bagchi, S[5]. (2004, July)in his article entitled " Accounting Ratios for Risk Evaluation" analyzed about practical implication of accounting ratios in risk evaluation and concluded that accounting ratios are still dominant factors in the matter of credit risk evaluation.

Chaitanya, V. K[7]. (2005, August) in his article entitled "Measuring Financial Distress of IDBI using Altman Z-score Model" used Z-score model to measure the financial fitness of IDBI and concluded that IDBI is likely to become insolvent in the years to come.

Chowdhury, A., & Barua, S[1]. (2009) in their article entitled "Rationalities of Z-category Shares in Dhaka Stock Exchange: Are They in Financial Distress Risk?", investigate the financial attributes of Z- category companies' shares using Z-score analysis and found that ninety percent of those companies are suffering with financial problem.

RESEARCH GAP

All the above reviews show the significance of measurement of financial distress in several companies other than pharmaceutical companies. Rather a few studies have been made on pharmaceutical companies in India. The present study made an attempt to measure the financial distress along with liquidity, solvency and leverage position of select pharmaceutical companies in India. The Indian pharmaceutical companies are also competing with some of the best companies in the global market. The industry is capital intensive and intellectual in nature and in the front rank of India's science based industries. Indian pharmaceutical industry is currently the third largest in the world in terms of volume and 14th in terms of value. So the present study is concentrated on financial health of selected pharmaceutical companies in India.

NEED FOR MONITORING FINANCIAL HEALTH

The pressure to monitor financial health of a company arises today for the following reasons:-

1. Determining the sustainability and growth of the company in the competitive world.
2. Identifying the sign of financial distress and thereby avoid the bankruptcy.
3. The integrated financial market bringing investors from countries.
4. Entry of the new players in the market.
5. Reluctance to invest due to political uncertainty and coalition politics.

OBJECTIVES OF THE STUDY

The main objective of the study is to examine the financial health position of the selected pharmaceutical companies through Z-Score analysis. To attain the main objective, the following objectives are sought to be achieved:

i) To examine the liquidity position of the selected companies.
ii) To examine the operating performance of the selected companies.
iii) To examine the long term solvency of the selected companies.
iv) To examine the sales generating capacity of the selected companies.

DATA BASE AND METHODOLOGY

DATA BASE

To carry out the present study, four companies namely. Ranbaxy Laboratories Ltd., Dr. Reddy's Laboratories, CIPLA and Aurobindo pharmaceutical company have been selected purposively based on secondary data.

DATA SOURCE

The data required for the study has been collected from the published annual reports of the selected companies.

STUDY PERIOD

The study period has been selected from 1999-2000 to 2011-2012.

METHODOLOGY

The data collected from the published annual reports of the selected companies for the thirteen years period have been suitable arranged, classified and tabulated as per requirement for the study. No single ratio can provide a meaningful complete picture of a company's financial health position. Under the circumstances ALTAMAN'S Z score has been applied to get a score, to determine the financial health of the selected pharmaceutical companies under the study period.

Z-SCORE FORMULA

The Altman Z-Score actually consists of five performance ratios that are combined into a single score. These five ratios are weighted using the following formula:

Z-Score = 1.2X1 + 1.4X2 + 3.3X3+ 0.6X4 + 1.0X5

Where:

X1 = working capital ÷ total assets

X2= retained earnings ÷ total assets

X3 = earnings before interest & taxes ÷ total assets

X4 = market value of equity ÷ total liabilities

X5 = sales ÷ total assets

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. Altaman subsequently developed a revised Z-Score model (with revised coefficient and Z-score cut-offs) which dropped variables X4 and X5 (above) and replaced them with a new variable X4= net worth (book value)/ total liabilities. The X5 variables were allegedly dropped to minimize potential industry effects related to assets turnover. When analyzing the Z-Score of a company, the lower the value, the higher the odds that the company is headed toward bankruptcy. Altman came up with the following rules for interpreting a firm's Z-Score:

Situation	Z-score	Zones	Remarks
I	Below 1.8	Not Healthy	Its failure is certain and extremely likely and would occur probably within a period of two years.
II	Between 1.8 and 2.99	Healthy	Financial viability is considered healthy. The failure in this situation is uncertain to predict.
III	3.0 and above	Too healthy	Its financial health is viable and there is no risk of a fall

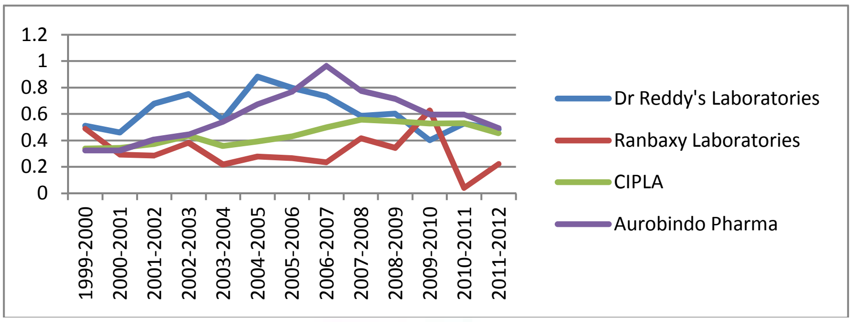
RESULT AND DISCUSSION

TABLE 1: WORKING CAPITAL TO TOTAL ASSETS (X1)

Name	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Mean	r
Dr. Reddy's Laboratories	.510	.461	.677	.750	.559	.882	.798	.733	.586	.603	.401	.528	.484	.613	.916
Ranbaxy Laboratories Ltd.	.489	.294	.285	.382	.217	.278	.267	.235	.417	.343	.628	.041	.222	.315	.714
CIPLA	.338	.344	.373	.437	.359	.393	.431	.500	.558	.545	.528	.531	.456	.446	.987
Aurobindo Pharma	.325	.325	.407	.445	.539	.673	.769	.963	.776	.715	.595	.596	.494	.586	.974

(Source- computed)

FIGURE-1: WORKING CAPITAL TO TOTAL ASSET



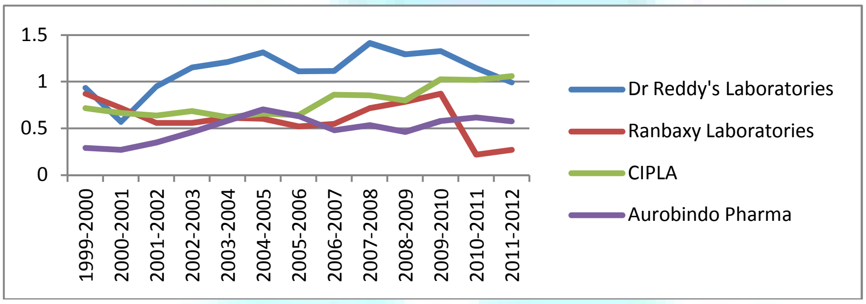
The Table-1 shows the ratio of working capital to total assets. It is observed from the table that the ratio lies between 0.401 and 0.882 in 2010 and 2005 respectively with a mean ratio of 0.613 of Dr. Reddy's Laboratories. In case of Ranbaxy Laboratories Ltd, the ratio lies between 0.217 in 2004 and 0.628 in 2010 with mean ratio 0.315 under the study period. The said ratio for CIPLA lies between 0.338 in 2000 and 0.558 in 2008 with mean ratio 0.446. The minimum and maximum of the aforesaid ratio of Aurobondo Pharmaceutical s are 0.325 in 2000 and 0.963 in 2007 with average 0.586. The figure -1 shows the trend line of working capital to total assets of the selected companies under the study period.

TABLE 2: RETAINED EARNINGS TO SALES RATIO (X2)

Name	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Mean	r
Dr. Reddy's Laboratories	0.933	0.567	0.95	1.153	1.209	1.314	1.110	1.133	1.413	1.293	1.326	1.144	0.992	1.118	0.971
Ranbaxy Laboratories ltd	0.869	0.718	0.558	0.559	0.612	0.602	0.519	0.548	0.716	0.784	0.871	0.220	0.271	0.603	0.312
CIPLA	0.717	0.665	0.636	0.685	0.621	0.658	0.642	0.862	0.854	0.799	1.024	1.019	1.059	0.787	0.985
Aurobindo Pharma	0.289	0.271	0.348	0.458	0.583	0.703	0.631	0.481	0.534	0.463	0.580	0.615	0.575	0.502	0.982

(Source- computed)

FIGURE-2: RETAINED EARNINGS TO SALES RATIO



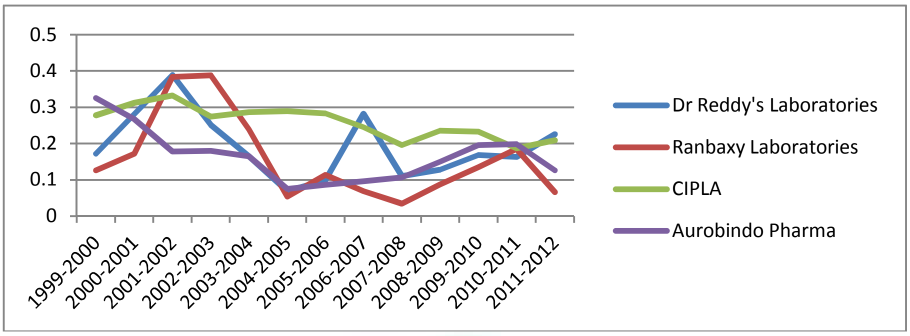
The above table shows the relationship between the retained earnings to sales of the selected pharmaceutical companies under the study period. For Dr. Reddy's Laboratories, the ratio is minimum (0.567) in 2001 and maximum (1.413) in 2008 with average of 1.118 during the study period. In case of Ranbaxy Laboratories ltd minimum retained earnings to sales ratio is 0.220 in 2011 and maximum of the said ratio is 0.871 in 2010 with a mean ratio 0.603 under the study period. For CIPLA the lowest retained earnings to sales ratio is 0.621in 2004 and the highest is 1.059 in 2012 with average value 0.787 during the study period where as Aurobindo pharmaceutical has scored 0.271 in 2001 being the minimum and 0.703 in 2005 being the maximum under the study period. The figure -2 depicted the trend of retained earnings to sales ratio of the selected companies under the study period.

TABLE 3: EBIT TO TOTAL ASSETS (X3)

Name	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Mean	r
Dr. Reddy's Laboratories	0.172	0.281	0.389	0.251	0.165	0.069	0.099	0.282	0.110	0.128	0.168	0.163	0.226	0.192	0.860
Ranbaxy Laboratories ltd	0.126	0.172	0.383	0.388	0.239	0.054	0.114	0.069	0.034	0.087	0.135	0.185	0.066	0.157	0.347
CIPLA	0.278	0.312	0.332	0.274	0.286	0.289	0.283	0.245	0.196	0.235	0.233	0.187	0.209	0.258	0.985
Aurobindo Pharma	0.325	0.267	0.178	0.180	0.165	0.075	0.086	0.096	0.107	0.150	0.196	0.198	0.126	0.165	0.895

(Source- computed)

FIGURE-3: EBIT TO TOTAL ASSET



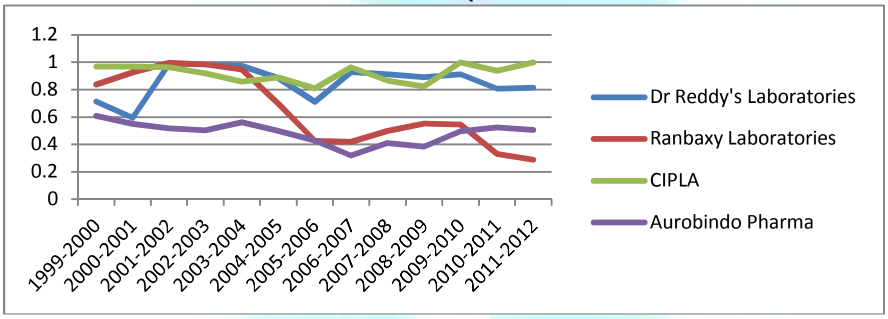
The above table exhibits the ratio of EBIT to total assets. The ratio lies between 0.069 in 2005 and 0.389 in 2002 with a mean value 0.192 of Dr. Reddy's Laboratories under the study period. In case of Ranbaxy Laboratories Ltd the ratio lies between 0.034 in 2008 and 0.388 in 2003 under the study period. The average of the said ratio is 0.157. whereas for CIPLA the ratio is ranging from 0.187 (minimum) in 2011 to 0.332 (maximum) in 2002 with the average 0.258. In case of Aurobindo Pharmaceutical the ratio lies between 0.075 being the minimum in 2005 and 0.325 being the maximum in 2000 with the average value 0.165 under the study period. The figure -3 shows the trend of the mentioned ratios of the selected companies under the study period.

TABLE 4: MARKET VALUE OF EQUITY TO TOTAL LIABILITIES (X4)

Name	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Mean	r
Dr. Reddy's Laboratories	.713	0.595	0.990	0.984	0.972	0883	0.710	0.929	0.912	0.891	0.913	0.806	0.814	0.854	0.990
Ranbaxy Laboratories ltd	0.838	0.927	0.996	0.985	0.948	0.697	0.425	0.420	0.499	0.552	0.546	0.331	0.287	0.650	0.666
CIPLA	0.967	0.967	0.963	0.918	0.857	0.888	0.808	0.963	0.866	0.822	0.999	0.937	0.998	0.919	0.993
Aurobindo Pharma	0.608	0.550	0.518	0.504	0.561	0.498	0.428	0.319	0.410	0.384	0.496	0.525	0.505	0.485	0.968

(Source- computed)

FIGURE-4: MARKET VALUE OF EQUITY TO TOTAL LIABILITIES



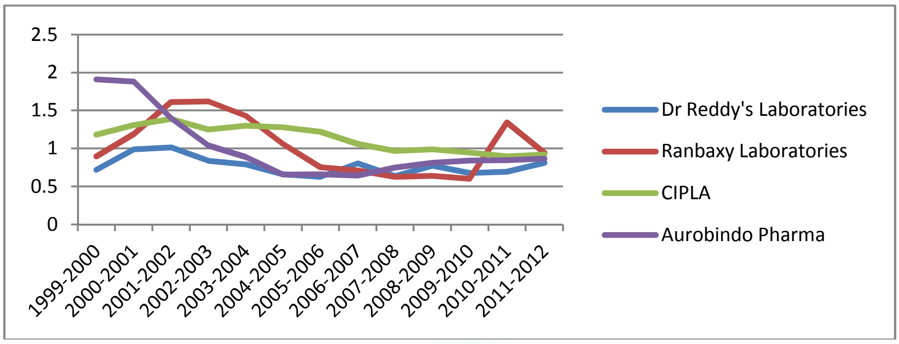
It is observed from the Table-4, that the ratios are found to be positive in all the years. It implies that the long term financial policies of the selected companies are found to be sound. The ratios lie between 0.319 in 2012 of Aurobindo pharma and 0.999 in 2010 of CIPLA during the study period. The mean ratios are 0.854, 0.650, 0.919 and 0.485 of Dr. Reddy's Laboratories, Ranbaxy laboratories, CIPLA and Aurobindo Pharma respectively under the study period. The Figure – 4, also depicted the trend lines of market value of equity to total liabilities of the selected companies under the study period.

TABLE 5: SALES TO TOTAL ASSETS (X5)

Name	199-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Mean	r
Dr. Reddy's Laboratories	0.718	0.990	1.015	0.835	0.789	0.659	0.628	0.804	0.634	0.772	0.678	0.695	0.810	0.771	0.982
Ranbaxy Laboratories ltd	0.894	1.19	1.61	1.62	1.43	1.06	0.753	0.710	0.625	0.639	0.601	1.34	0.943	1.032	0.717
CIPLA	1.18	1.31	1.39	1.25	1.30	1.28	1.22	1.06	0.969	0.989	0.947	0.897	0.923	1.132	0.995
Aurobindo Pharma	1.91	1.88	1.40	1.04	0.889	0.656	0.660	0.645	0.750	0.813	0.842	0.845	0.868	1.015	0.970

(Source- computed)

FIGURE-5: SALES TO TOTAL ASSET



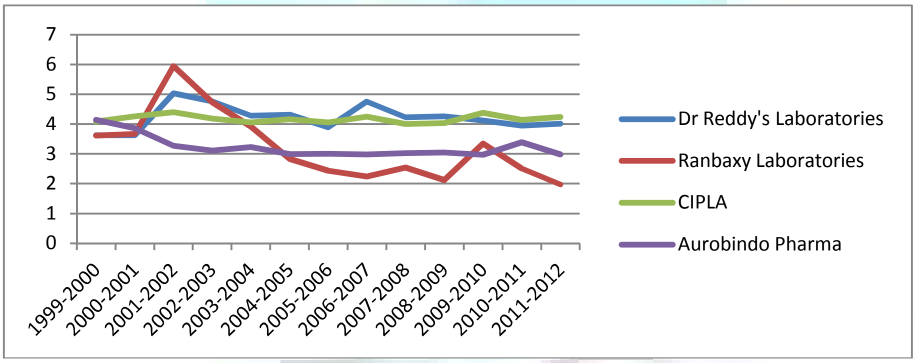
The table shows the overall performance of the companies. Sales to total assets ratio measure the power of the asset in generating the sales. Greater the ratio better the performance and the vise a- vise. It is observed from the study that the average ratio ranges from 0.771 to 1.132. The ratio of Dr.Reddy's Laboratories lies between 0.634 and 1.015. The ratio for Ranbaxy Laboratories lies between 0.601 and 1.62 while it was 0.897 and 1.39 for CIPLA, 0.645 and 1.91 for Aurobindo pharma during the study period. It is observed that the CIPLA got the first position in terms of sales to total assets followed by Aurobindo pharma, Ranbaxy Laboratories and Dr. Reddy's Laboratories respectively under the study period.

TABLE – 6: ALTMAN'S Z SCORE

Year	DR.Reddy's Laboratories	Ranbaxy Laboratories	CIPLA	Aurobindo Pharma
1999-2000	3.631	3.616	4.087	4.142
2000-2001	3.621	3.670	4.263	3.860
2001-2002	5.035	5.940	4.401	3.273
2002-2003	4.767	4.732	4.188	3.112
2003-2004	4.280	3.919	4.058	3.233
2004-2005	4.314	2.832	4.159	2.990
2005-2006	3.892	2.431	4.054	3.006
2006-2007	4.757	2.238	4.253	2.982
2007-2008	4.225	2.539	4.000	3.027
2008-2009	4.263	2.127	4.030	3.044
2009-2010	4.117	3.347	4.382	2.975
2010-2011	3.952	2.506	4.140	3.389
2011-2012	4.014	1.978	4.241	2.984

(Source- computed)

FIGURE-6: ALTMAN'S Z SCORE



The table shows that Z score of Dr. Reddy's Laboratories and CIPLA are more or less stable and the score is greater than 3 in all the years under the study period. It is observed that the financial health of the said two companies is too healthy during the study period. Z score of Aurobindo Pharma is more than 3 in all the study period except in 2005, 2007, 2010 and 2012. However the score is much greater than 1.80. It is observed from the study that the company is financially healthy during the study period. The Z score of Ranbaxy Laboratories is declining from 3.616 to 1.978. it implies that the company is financially healthy at present but a declining trend is observed which is not good for the company's health. It is observed that the financial health of the company is moving from safety zone to dangerous zone. The Figure – 6 shows the Z- Score trend of the selected pharmaceutical companies under the study period.

FINDINGS AND CONCLUSIONS

1. The financial health of CIPLA is the best among all other selected companies as its Z score are more consistent and greater than 3 followed by Dr. Reddy's Laboratories, Aurobindo pharma and Ranbaxy laboratories respectively in all the years under the study period.
2. The working capital to total assets of all the selected companies is found to be positive under the study period. The ratio is much healthy in case of Dr. Reddy's Laboratories followed by Aurobindo Pharmaceutical, CIPLA, and Ranbaxy Laboratories Ltd. Respectively during the study period.
3. The highest working capital to total assets ratio found to 0.963 in 2007 of Aurobindo Pharmaceutical and the lowest ratio 0.217 in 2004 of Ranbaxy Laboratories Ltd of all the selected pharmaceutical companies under the study period. It is observed from the study that liquidity position of Ranbaxy Laboratories Ltd is not satisfactory.
4. Retained earnings to sales ratio of all the selected companies are found to be positive under the study period. The ratio is maximum (1.413) in 2008 of Dr. Reddy's Laboratories and the minimum (0.271) in 2001 of Aurobindo Pharmaceutical.
5. It is observed from the study that Dr. Reddy's Laboratories occupy the better position in comparison to the other selected companies in respect of operational efficiency as the retained earnings to sales ratio is 1.118 (being the maximum) followed by CIPLA (0.787), Ranbaxy Laboratories Ltd (0.603), and Aurobindo Pharmaceutical among all the selected companioes.
6. EBIT to total assets ratio are observed to be positive in all the year s of the selected pharmaceutical companies under the study period. It reveals that earning capacity of the selected companies is satisfactory.

7. It is observed that CIPLA has the highest earning capacity on an average being average ratio 0.258 (maximum) followed by Dr. Reddy's Laboratories, Aurobindo Pharmaceutical and Ranbaxy Laboratories Ltd. Respectively under the study period.
8. It is observed that the ratio of EBIT to Total Assets was the highest (0.389) of Dr. Reddy's Laboratories in 2001 and the lowest 0.75 in 2005 for Aurobindo.

LIMITATION OF THE STUDY

1) The study is mainly based on secondary data.
2) The study is limited to four companies only.
3) The study is based on consolidated financial statement, which may lead to some errors and assumptions.
4) Examining the financial health, only few ratios, have been considered in Z score model which is one of the major limitation of the study
5) The study has been conducted over a limited period of 13 years only.
6) The company has been selected purposively which is it's another limitation.

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