

Analysis Of Liquidity, Profitability, Risk And Financial Distress: A Case Study Of Dr. Reddy's Laboratories Ltd.

* C. Viswanatha Reddy

ABSTRACT

Liquidity is the ability of an organization to meet its financial obligations during the short-term and to maintain long-term debt-paying ability. The long-term survival depends on the satisfactory income earned by it. A sound liquidity leads to better profitability, and in turn reduces the probability of default risk in the future. Further, the risk and return are very important aspects to be considered while making any decisions regarding a company's finances. Predicting enterprise failures constitutes one of the most important activities in supervising enterprise risks and/or variables. The term enterprise failure is a definable phenomenon: which encompasses, for instance, failure to cover external debts, exceeding budget limits, failure to effect payment to suppliers, incurring losses, etc. Therefore, a study of liquidity, profitability, and their association with risk, assessing the financial position (financial distress/bankruptcy) is very much necessary to evaluate the financial strength of a company. Financial distress is a tight cash situation in which a business cannot pay the owed amounts on the due date. When a firm is under financial distress, the situation sharply reduces its market value, and larger customers may cancel their orders. A firm in financial distress may face bankruptcy or liquidation leading to delay in meeting its liabilities. This paper attempts to study the association between liquidity, profitability and risk factor. The Altman's Z-score model has been employed by the researcher to predict the risk of financial distress of Dr.Reddy's Laboratories Limited, from the year 2005-2011. The results indicate that the liquidity and solvency position of the company have been satisfactory. The Z-score analysis revealed that the company was not suffering from financial distress and there are indications of turnaround activities already undertaken by the company.

Keywords: Liquidity, Profitability, Risk Factor, Bankruptcy, Financial Distress, Z-Score, Trade-off, Fiscal Fitness

JEL Classification : G32, G33

INTRODUCTION

❖ **Liquidity :** Liquidity management has been taken as an important tool to analyze the sustainability and liquidity position of any enterprise that may also help any organization to derive maximum profits at minimum cost. A company must maintain its ability to pay off its current obligations and have a sound base of working capital to maintain its position (for a long time) in the competitive market. The management of working capital is an important aspect to be considered for attaining a sound liquidity position.

❖ **Profitability :** Profitability, in this reference, may be the return earned on the total assets of the company. Every firm aims to dig up maximum profits out of the invested capital pool. The success of the company usually depends on its returns earned, keeping the liquidity prospects in view. Usually, it is a difficult task to trade off between liquidity and profitability, as the conservative policy of working capital may ensure sound liquidity, but it endangers the profitability. On the other hand, aggressive policy helps in making profits, but the liquidity is in not promised. Before deciding on an appropriate level of working capital investment, a firm's management has to evaluate the trade-off between expected profitability and the risk that it may be unable to meet its financial obligations.

❖ **Risk Analysis :** Risk is the "effect of uncertainty on objectives". It can be seen as relating to the probability of uncertain future events. Risk analysis is the technique of defining and analyzing the dangers posed to businesses by adverse events. Finance deals with creating a proper framework to maximize profits at a given level of risk. In pursuing this balance, the firm must develop control over the flows of funds while allowing sufficient flexibility to respond to changes in the operating environment. Thus, the firms must attain a level of adequate liquidity at a minimum risk so as to achieve maximum profitability.

❖ **Financial Distress :** The situation where a company cannot meet or has difficulty in paying off its current obligations is called financial distress. The symptoms of financial distress include erosion of net worth, negative operating results, factory layoff, dividend reductions, and plummeting share prices. Financial distress in companies is shaky for top

* Associate Professor, Department of Business Administration, Sree Vidyanikethan Institute of Management, A. Rangampet - 517 102, Tirupati, Andhra Pradesh. E-mail: vsrits@yahoo.com

management positions, leading to the problem of managerial inefficiencies. If prolonged, this situation can force the owning entity into bankruptcy or forced liquidation. It is compounded by the fact that banks and other financial institutions refuse to lend to those in serious distress. The chance of financial distress increases when a firm has high fixed costs, illiquid assets or revenues that are sensitive to economic downturns. An organization has to successfully manage its finances to achieve overall efficiency and a healthy growth in its operations. The present study focuses on the financial health of Dr. Reddy's Laboratories Ltd., which has reported continued operating profits.

STATEMENT OF THE PROBLEM

Liquidity is the ability of an organization to meet its financial obligations during the short-term and to maintain long-term debt-paying ability. The long-term survival depends on satisfactory income earned by it. A sound liquidity leads to better profitability, and in turn reduces the probability of default risk in the future. Further, risk and return are very important aspects to be considered while making any decisions regarding a company's finances. Predicting enterprise failures constitutes one of the most important activities in supervising enterprise risks and/or variables. The term enterprise failure is a definable phenomenon: for instance, failure to cover external debts, exceeding budget limits, failure to affect payment to suppliers, incurring losses, etc. Therefore, a study of liquidity, profitability, and their association with risk, assessing the financial position (financial distress/bankruptcy) is very much necessary to evaluate the financial strength of the company. This present paper entitled "Analysis of Liquidity, Profitability, Risk and Financial Distress: A Case Study of Dr. Reddy's Laboratories Ltd." is a modest attempt in this direction, which focuses on various aspects, viz., liquidity, profitability, the association between liquidity, profitability and risk, and the financial distress using Altman's Z-Score Test.

OBJECTIVES OF THE STUDY

- 1) To analyze the short-term financial position through liquidity analysis.
- 2) To examine the profitability of the company over the study period.
- 3) To test the correlation between liquidity and risk.
- 4) To know the association between profitability and risk.
- 5) To analyze the long-term financial performance of the company using solvency ratios.
- 6) To measure the financial health of the company using Altman's Z-Score Test.

RESEARCH METHODOLOGY

❖ **Research Design:** In view of the objectives of the study listed above, exploratory research design was adopted for the present study. Exploratory research is one, which largely interprets the already available information, and it lays particular emphasis on analysis and interpretation of the existing and available information, and it makes use of secondary data.

❖ **Sources of Data:** The study is based on secondary data and on discussions with the concerned personnel. The secondary data consists of the annual reports of Dr. Reddy's Laboratories Ltd., Hyderabad ranging for the last 7 years. Various other reports like the company's magazines, various published books and websites were also used for the purpose of the study.

❖ **Tools of Analysis:** The data collected for the study was analyzed logically and meaningfully to arrive at meaningful conclusions. The following are the tools that were applied for data analysis in the present study.

❖ **Financial Tools:** Current Ratio, Quick Ratio, Gross Profit Ratio, Operating Profit Ratio, Net Profit Ratio, Return On Equity, Earnings Per Share, Return On Total Assets, Risk Factor, Ratio of EBIT to Total Assets, Ratio of Net Sales to Total Assets, Market Value of Equity to Total Liabilities, Working Capital to Total Assets, Retained Earnings to Total Assets.

❖ **Statistical Tools:** Correlation analysis, t-test, Altman's Z-Score formula were used for the present study.

❖ **Scope and Period of The Study:** The scope of the study is defined below in terms of concepts adopted and the period under focus:

Firstly, the binary concepts of Return on equity, Book value per share, intrinsic value of the share were used for measuring profitability and the market price of the share and also to deduce the various objectives of the study. Secondly, the study is based on the annual reports of the company for a period of 7 years from 2004-05 to 2010-11. The reason for restricting the study to this small period was due to time constraints.

❖ **Limitations of The Study:** The information used is primarily from historical annual reports available to the public and the same doesn't indicate the current situation of the firm. Detailed analysis could not be carried for the research work because of the limited time span. Since financial matters are sensitive in nature, the same could not be acquired easily.

ANALYSIS AND DISCUSSION

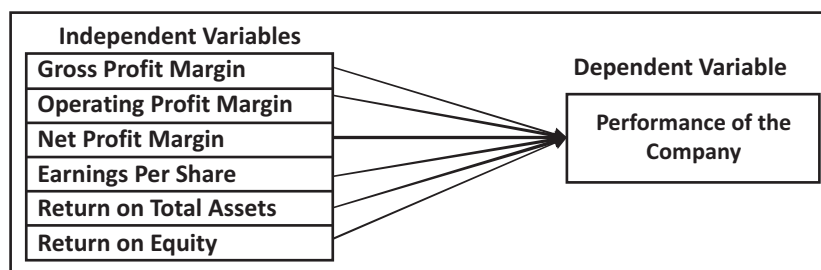
❖ **Section – I: Liquidity Position Of Dr. Reddy's Laboratories Ltd. :** The Table 1 exhibits the three basic ratios of the test of liquidity, viz. Current Ratio, Quick Ratio, and Absolute Ratio. The ratios are ranked in the order of their influence on liquidity. The higher the ratio; the greater is the liquidity. Further, the ultimate rank has been calculated from the total of the ranks of ratios. The ultimate ranking has been done on the principle that the lower the aggregate of the individual ranks, the more profitable is the liquidity position and vice versa. Current ratio is a relationship between the current assets and current liabilities and thus, is used as a measure of general liquidity.

Table 1 : Consolidated Liquidity Position of Dr. Reddy's Labs Ltd.								
Year	Current Ratio		Quick Ratio		Absolute Quick Ratio		Total	Ultimate
	Ratio (Times)	Rank	Ratio (Times)	Rank	Ratio (Times)	Rank		Rank (R _i)
2004-05	4.15	2	3.46	2	2.02	1	5	2
2005-06	3.86	3	3.13	3	1.07	3	9	3
2006-07	5.03	1	4.37	1	1.98	2	4	1
2007-08	3.85	4	3.02	4	0.70	4	12	4
2008-09	3.25	5	2.63	5	0.32	5	15	5
2009-10	2.15	7	1.62	7	0.22	6	20	7
2010-11	2.67	6	2.05	6	0.04	7	19	6
Source: Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.								

It can be noted from the Table 1 that the current ratio declined from 4.15 times in 2004-05 to 2.67 times in 2010-11. The average current ratio during the study period was 3.57, which is greater than the rule of thumb 2:1. The least value of the current ratio was 2.15 in the year 2009-10. Quick ratio is an indicator of the liquidity in the sense of the relationship between the quick assets and current liabilities. Again, a higher ratio is an indicator of higher liquidity. Quick ratio ranged between a maximum of 4.37 in 2006-07 and a minimum of 1.62 in 2009-10. The average quick ratio during the study period was 2.90, which is greater than the rule of thumb 1:1. Absolute ratio shows the relation of absolute liquid assets viz. cash in hand and bank and market securities with current liabilities. This ratio helps in examining the absolute liquid position. The ratio was the highest in the year 2004-05 at 2.02, and was the lowest in the year 2010-11 at 0.04. The average absolute quick ratio during the study period was 0.91, which is greater than the rule of thumb 0.5:1. However, this ratio is lower than the rule of thumb in 2008-09 to 2010-11. In these years, the company struggled with a shortfall of cash balances to meet their short term obligations. Further, the ultimate ranks denote that during the initial years, i.e., from 2004-05 to 2006-07, the company enjoyed the highest liquidity, and the poorest liquidity was recorded in 2009-10.

❖ **Section – II: Profitability Analysis Of Dr. Reddy's Labs Ltd. :** To assess the profitability of the company, basically, the investment analysts looks at metrics like the Gross Profit Margin, Operating Profit Margin, Net Profit Margin, Earnings Per Share, Return On Total Assets, Return On Equity, etc. The theoretical Model of Profitability Analysis is given as follows :

❖ **Gross Profit Margin:** It is defined as follows:



$$\text{Gross Profit Margin} = \frac{\text{Sales} - \text{Cost of Sales}}{\text{Sales}} \text{ or } \frac{\text{Gross Profit}}{\text{Sales}}$$

It measures the relative profitability of a firm's sales after the cost of sales has been deducted. The higher the gross profit margin, the better, i.e., the lower is the relative cost of the merchandise sold. This factor is shown in the Table 2.

Table 2 : Gross Profit Margin Ratio (₹ In Millions)				
Year (1)	Sales Revenue (2)	Cost of Revenue (3)	Gross Profit 4 = (2-3)	Gross Profit As Percentage Of Sales 5 = (4÷2)*100
2004-05	19,519	9,386	10,134	51.9
2005-06	24,267	12,417	11,850	48.8
2006-07	65,095	34,220	30,876	47.0
2007-08	50,006	24,598	25,408	50.8
2008-09	69,441	32,941	36,500	52.6
2009-10	70,277	32,937	36,340	51.7
2010-11	74,693	34,430	40,263	53.9
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.				

❖ **Operating Profit Margin:** It is defined as follows:

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Sales}}$$

Table 3 : Operating Profit Margin Ratio (₹ In Millions)					
Year (1)	Gross Profit (2)	Operating expenses (3)	Operating Profit/(Loss) (4) = (2 - 3)	Sales (5)	Operating Profit As Percentage Of Sales 5 = (4÷5)*100
2004-05	10,134	9,747	387	19,519	2.0
2005-06	11,850	10,167	1,683	24,267	7.0
2006-07	30,876	19,394	11,481	65,095	18.0
2007-08	25,408	23,067	2,341	50,006	5.0
2008-09	36,500	39,334	(2,834)	69,441	(4.0)
2009-10	36,340	34,332	2,008	70,277	3.0
2010-11	40,263	27,634	12,629	74,693	17.0
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.					

This ratio measures the percentage of each sales amount remaining after all costs and expenses other than interest, taxes, and dividend on preference shares are deducted. It represents the clear profits earned on each sales amount. A higher operating profit margin is preferred. The data relating to this factor is presented in the Table 3.

❖ **Net Profit Margin:** The net profit is defined as follows:

$$\text{Net Profit Margin} = \frac{\text{Net Earnings After Tax}}{\text{Sales}}$$

Table 4 : Net Profit Margin Ratio (₹ In Millions)							
Year (1)	Operating Profit/(Loss) (2)	Other non-operating (Income)/Expenditure, net (3)	Profit/(Loss) Before Interest & Taxes (4) = (2-3)	Income Tax (Exp)/Benefit (5)	Net Earnings After Tax (6) = (4-5)	Sales (7)	Net Profit as percentage of sales (6÷7)*100
2004-05	387	280	107	94	201	19,519	1.0
2005-06	1,683	(204)	1887	(258)	1,629	24,267	7.0
2006-07	11,481	981	10,500	(1,177)	9,323	65,095	14.0
2007-08	2,341	(523)	2,864	972	3,836	50,006	8.0
2008-09	(2,834)	1,162	(3,996)	(1,172)	(5,168)	69,441	(7.0)
2009-10	2008	(45)	2,053	(985)	1,068	70,277	2.0
2010-11	12,629	186	12,443	(1,043)	11,040	74,693	15.0
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.							

Table 5 : Earnings Per Share (EPS) (₹ In Millions)			
Year (1)	Earnings After Tax (₹ in millions) (2)	No. of Shares Outstanding (3)	Earnings Per Share (₹ per share) (4) = (2)÷(3)
2004-05	201	76,518,949	1.38
2005-06	1,629	76,694,570	10.64
2006-07	9,323	167,912,180	58.82
2007-08	3,836	168,172,746	22.89
2008-09	(5,168)	168,468,777	(30.69)
2009-10	1,068	168,845,385	6.33
2010-11	11,040	169,252,732	65.28
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

Table 6 : Return On Total Assets (ROTA) (₹ In Millions)			
Year (1)	Earnings After Tax (2)	Total Assets (3)	Return on Total Assets (%) (4) = (2÷3)*100
2004-05	201	29,288	0.69
2005-06	1,629	68,768	2.37
2006-07	9,323	86,755	10.75
2007-08	3,836	85,634	4.48
2008-09	(5,168)	83,792	(6.17)
2009-10	1,068	80,330	1.33
2010-11	11,040	95,505	11.56
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

It judges how profitable a company's sales are after all expenses, interest, taxes and dividends on preference shares have been deducted. The higher the firm's net profit margin, the better. This factor is shown in the Table 4.

❖ **Earnings Per Share (EPS):** Earnings Per share are defined as:

$$\text{Earnings Per Share} = \text{Earnings After Tax (EAT)} / \text{Number of Equity Shares Outstanding}$$

EPS represents the net profit earned during the period on each outstanding equity share of the company. The firm's EPS is generally of interest to present or prospective stockholders and managements. The EPS is closely watched by the investing public and is considered an important indicator of corporate success. This factor is shown in the Table 5.

Table 7 : Return on Equity (ROE) (₹ In Millions)			
Year (1)	Earnings After Tax (2)	Total Shareholders' Equity (3)	Return on Equity (%) (4) = (2÷3)*100
2004-05	201	20,953	0.96
2005-06	1,629	22,272	7.31
2006-07	9,323	42,627	21.87
2007-08	3,836	47,350	8.10
2008-09	(5,168)	42,045	(12.29)
2009-10	1,068	42,915	2.49
2010-11	11,040	45,990	24.01
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

❖ **Return on Total Assets (ROTA):** The return on total assets is defined as:

$$\text{ROTA} = \text{Earnings After Tax (EAT)} / \text{Total Assets}$$

The ROTA, often called the Return On Investment (ROI), measures the overall effectiveness of the management in generating profits with its available assets. The higher the firm's return on total assets, the better. This factor is shown in the Table 6.

❖ **Return On Equity (ROE):** The return on shareholders' equity is defined as follows:

$$\text{ROE} = \text{Earnings After Tax (EAT)} / \text{Common Shareholders' Equity}$$

The ROE measures the return earned on the common shareholders' equity in the company. Generally, the higher the ROE, the better off the owners. This factor is presented in the Table 7.

Table 8 : Correlation Analysis Between Profitability Factors			
Correlation Between	Correlation Co-efficient	Significance Level (2-tailed)	N
Sales and Gross Profit	0.994*	0.05	7
Sales and Operating Profit	0.406##	0.10	7
Sales and Earnings after Tax	0.279**	0.05	7
Earnings after Tax and Net Worth	0.344##	0.10	7
Earnings after Tax and Total Assets	0.411##	0.05	7
*The correlation is significant at 0.05 level (2-tailed)			
**The correlation is not significant at 0.10 level, but significant at 0.05 level (2-tailed)			
##The correlation is not significant at 0.10 level (2-tailed)			
Source: Compiled from Tables 2 - 6 and calculations were done using MS Excel.			

❖ **Hypotheses:** Based on the previous studies and the profitability ratios of the company under study, the following hypotheses were developed for the present study.

❖ **H₀₁:** There is no statistical relationship between gross profit margin and performance of the company during different financial years.

❖ **H₀₂:** There is no statistical relationship between operating profit margin and performance of the company during different financial years.

❖ **H₀₃:** There is no statistical relationship between net profit margin and performance of the company during different financial years.

❖ **H₀₄:** There is no statistical relationship between ROA and performance of the company during different financial

years.

❖ H_{05} : There is no statistical relationship between ROE and performance of the company during different financial years.

The Pearson's Correlation analysis was used to test the hypotheses, and the results of the correlation analysis are presented in the Table 8.

Table 9 : Consolidated Profitability Position of Dr. Reddy's Laboratories Ltd.								
Year	Return on Assets		Return on Capital Employed		Return on Net Worth		Total	Ultimate
	Ratio (%)	Rank	Ratio (%)	Rank	Ratio (%)	Rank		Rank (R_2)
2004-05	0.69	6	0.51	6	0.96	6	18	6
2005-06	2.37	4	4.28	4	7.31	4	12	4
2006-07	10.75	2	17.36	2	21.87	2	6	2
2007-08	4.48	3	4.77	3	8.10	3	9	3
2008-09	(6.17)	7	(7.66)	7	(12.29)	7	21	7
2009-10	1.33	5	4.25	5	2.49	5	15	5
2010-11	11.56	1	24.27	1	24.01	1	3	1
Source: Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.								

❖ A significant relationship was found at 0.05 level between gross profit margin and sales with $r = 0.994$, which is high and positive. Hence, the hypothesis (H_{01}) is rejected. Therefore, there is a statistical relationship between gross profit margin and performance of the company during different financial years under study.

❖ The relationship between earnings after tax and sales was found to be insignificant at 0.10 level, but significant at 0.05 level. Hence, the hypothesis (H_{03}) is rejected. So, there is a statistical relationship between sales and earnings after tax at 0.05 level over the study period.

❖ It was found that there is an insignificant relationship between operating profit and sales (with $r = 0.406$), earnings after tax and net worth (with $r = 0.344$) and earnings after tax and total assets (with $r = 0.411$). Therefore, there is no statistical relationship between operating profit, earnings after tax and the performance of the company.

The Table 9 exhibits the profitability position of the company by using three very basic ratios of profitability. The Return On Assets (ROA) percentage shows how profitable a company's assets are in generating revenue. This ratio showed a mixed trend during the period of the study. During 2008-09, a negative percentage was recorded at - 6.18%. This shows that the company is managing to get good returns out of their assets pool. Return on capital employed is the indicator of the operational efficiency of the company. The resulting ratio represents the efficiency with which capital is being utilized to generate revenue. It is observed from the Table 9 that the ratio was at a negative value in the year 2008-09 at -7.66% and is showing a fluctuating trend. Return on net worth is the relationship between the net profit and the shareholder's funds of the company. It is noticed from the Table 9 that the ratio showed a negative percentage in the year 2008-09 at -12.29% and showed a mixed performance over the entire study period.

❖ **Section – III : Trade-off Between Liquidity, Profitability, And Risk:** Trade off (equivalence) between risk and profitability can be made by calculating the risk factor. The analysis can be done through which it can be said about the policies adopted while managing the working capital of the company. Risk factor can be calculated through the following formula:

$$\text{Risk Factor } (R_k) = \frac{(E_j + L_j) - A_j}{C_j}$$

Where, R_k = Risk factor,

E_j = Equity + Retained Earnings,

L_j = Long term Loans,

A_j = Fixed Assets,

Table 10 : Risk Factor In Ranking Order (₹ In millions)						
Year	Equity + Retained earnings (E _i)	Long-Term Loans (L _i)	Fixed Assets (A _i)	Current Assets (C _i)	Risk Factor $R_k = [(E_i + L_i) - A_i] \div C_i$	
					Factor (R _k)	Rank
2004-05	19,417	2,804	8,414	18,300	0.75	6.5
2005-06	20,688	31,169	35,315	26,617	0.62	4
2006-07	39,972	24,906	38,252	37,492	0.71	5
2007-08	44,969	19,684	41,809	30,377	0.75	6.5
2008-09	35,261	19,976	33,566	38,798	0.56	2.5
2009-10	37,758	14,840	31,144	38,202	0.56	2.5
2010-11	40,318	23,705	39,900	47,517	0.51	1
Source: Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.						

C_j = Current Assets

The above formula tells us about how the current assets are being financed through long term funds after fixed assets are financed in full. Based on the above formula, the following inferences can be drawn:

- ❖ If the value of R_k is zero or less, it would mean that the firm is using an aggressive policy and normally, the profitability would be high; and
- ❖ If the value of R_k is 1 or close to 1, it would mean that the firm is using a conservative policy and the profitability would be low.

Under an aggressive policy, the firm opts for a lower level of working capital, thereby investing in current assets at lower proportion to total assets. When a firm adopts this policy, the profitability is high, but at higher risk of liquidity. In case of conservative policy, the firm adopts a conservative approach of having high proportion of working capital. The profitability is relatively low as the return on current assets is normally less. However, ensuring good liquidity as the risk of meeting current obligations is reduced. The data relating to the risk factor, its ranking order, and the type of policy adopted by the company in various periods is depicted in the Table 10.

❖ **Hypotheses:** The hypotheses for testing relationship between liquidity & risk factor and profitability & risk factor is given as follows:

- ❖ H_{01} : There is a negative association between liquidity and risk.
- ❖ H_{02} : Profitability and risk of the firm are negatively correlated.

Table 11 : Rank Correlation Between Liquidity, Profitability, And Risk Factor			
Year	Rank (R ₁)	Rank (R ₂)	Rank (R ₃)
2004-05	2	6	6.5
2005-06	3	4	4
2006-07	1	2	5
2007-08	4	3	6.5
2008-09	5	7	2.5
2009-10	7	5	2.5
2010-11	6	1	1
'r'	-0.727	-0.127	
't' value of 'r'	2.36	0.29	
The table value of 't' at (n-2) degrees of freedom at 0.05 level of significance is 2.571			
Source: Calculations are done using MS Excel.			

Table 12 : Ratio of EBIT And Total Assets (₹ In Millions)			
Year (1)	Earnings/(Loss) Before Interest & Taxes (2)	Total Assets (3)	Return on Total Assets (4) = (2÷3)
2004-05	107	29,288	0.37
2005-06	1887	68,768	0.03
2006-07	10,500	86,755	0.12
2007-08	2,864	85,634	0.03
2008-09	(3,996)	83,792	-0.05
2009-10	2,053	80,330	0.03
2010-11	12,443	95,505	0.13
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

Table 13 : Ratio of Net Sales And Total Assets (₹ In Millions)			
Year (1)	Sales (2)	Total Assets (3)	Sales to Total Assets (4) = (2÷3)
2004-05	19,519	29,288	0.67
2005-06	24,267	68,768	0.35
2006-07	65,095	86,755	0.75
2007-08	50,006	85,634	0.58
2008-09	69,441	83,792	0.83
2009-10	70,277	80,330	0.87
2010-11	74,693	95,505	0.78
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

Table 14 : Ratio of Market Value of Equity And Total Liabilities (₹ In Millions)			
Year (1)	MV of Equity (2)	Total Liabilities (3)	Ratio of MV of Equity to Total Liabilities (4) = (2÷3)
2004-05	63,302	8,335	7.59
2005-06	81,216	46,495	1.75
2006-07	1,22,492	44,128	2.78
2007-08	99,832	38,384	2.60
2008-09	91,728	41,747	2.20
2009-10	1,50,654	37,415	4.03
2010-11	2,64,582	49,015	5.40
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

Table 15 : Ratio of Working Capital And Total Assets (₹ in millions)			
Year (1)	Working Capital (2)	Total Assets (3)	Ratio of WC to Total Assets (4) = (2÷3)
2004-05	10,771	29,288	0.37
2005-06	1,345	68,768	0.02
2006-07	18,832	86,755	0.22
2007-08	14,387	85,634	0.17
2008-09	12,481	83,792	0.15
2009-10	13,041	80,330	0.16
2010-11	6,578	95,505	0.07
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

Table 16 : Ratio of Retained Earnings And Total Assets (₹ in millions)			
Year (1)	Retained Earnings (2)	Total Assets (3)	Ratio of Retained Earnings to Total Assets (4) = (2÷3)
2004-05	366	29,288	0.01
2005-06	1,185	68,768	0.02
2006-07	8,448	86,755	0.10
2007-08	12,001	85,634	0.14
2008-09	1,036	83,792	0.01
2009-10	1,162	80,330	0.01
2010-11	8,073	95,505	0.08
Source: Compiled from the Annual Reports of Dr. Reddy's Laboratories Ltd., Hyderabad.			

The hypotheses drawn were tested by using student's t-test for confirming the association between the risk, liquidity, and profitability.

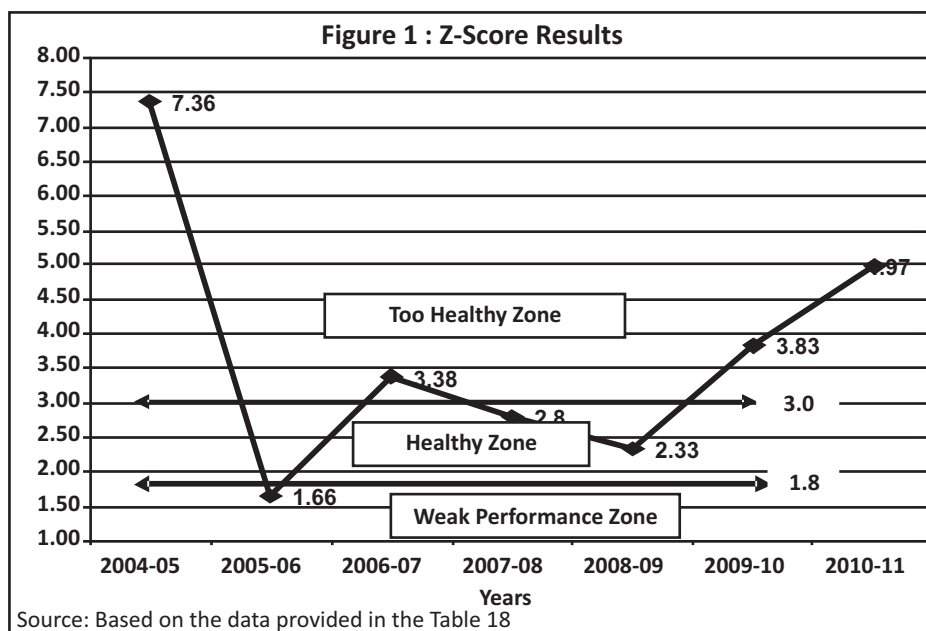
The Table 11 exhibits that there is a high degree of negative association between liquidity and risk, and further, this association was tested. The null hypothesis (H_{01}) states that there is a negative association between liquidity and risk. Calculated Value of 't'=2.36 and Critical value of 't'=2.571. As the calculated value is less than the critical value, thus, the null hypothesis is accepted. Thus, it can be said that there is a negative association between liquidity and risk of this company. The Table 11 also shows that the profitability and risk are negatively associated but again, it has to be tested using the 't' test. The null hypothesis states (H_{02}) that profitability and risk of the firm are negatively correlated. Calculated value of 't'=0.29 and Critical value of 't'=2.571. As the calculated value is less than the table value, the null hypothesis is accepted. Hence, it can be said that the profitability and risk are negatively correlated.

❖ **Section IV: Solvency Position (Measuring The Fiscal Fitness) Of Dr. Reddy's Laboratories Ltd:** Solvency is the ability to meet long-term obligations and accomplish long-term expansion and growth. A number of financial ratios are calculated to detect signs of looming bankruptcy. Each ratio being unique, the true financial health of the company is not reflected. Five ratios have been computed in this respect and are shown in the Tables 12 to 16.

Table 12 evidences that the content of EBIT to Total Assets stood negative during 2008-09, indicating the inability of the company to meet interest payments. It is witnessed from the Table 13 that the sales content to total assets presented stability except in 2005-06, in a range of 0.35 in 2005-06 and 0.87 in 2009-10. It is observed from the Table 14 that the proportion of Market Value of Equity to Total Assets was recorded high and varied from 1.75 to 7.59. The Table 15 evidences that the content of working capital to total assets has been low and varied in between a minimum of 0.02 and a maximum of 0.37. The proportion of retained earnings mobilization to total assets showed a mixed performance over the period of the study. It shows that the interest of the shareholders has been sound due to the financial health of the company. The consolidated solvency position of the company is given in the Table 17.

Table 17 : Consolidated Solvency Position of Dr. Reddy's Laboratories Ltd. (Inputs For Z-Score Analysis)					
Year	WC÷TA (X_1)	RE÷TA (X_2)	EBIT÷TA (X_3)	Equity ÷ TA (X_4)	Sales ÷ TA (X_5)
2004-05	0.37	0.01	0.37	7.59	0.67
2005-06	0.02	0.02	0.03	1.75	0.35
2006-07	0.22	0.10	0.12	2.78	0.75
2007-08	0.17	0.14	0.03	2.60	0.58
2008-09	0.15	0.01	-0.05	2.20	0.83
2009-10	0.16	0.01	0.03	4.03	0.87
2010-11	0.07	0.08	0.13	5.40	0.78
Factor Weightage	1.2	1.4	3.3	0.66	0.999
Source: Compiled from Tables 12 - 16					

Table 18 : Z-Score Value							
Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Z-Score	7.36	1.66	3.38	2.80	2.33	3.83	4.97
Source: Calculated from Table No-17.							



❖ **Altman's Z-Score Test For Solvency Analysis:** Edward Altman built a model that distills the five key performance ratios into a single score which gives a pretty good snapshot of corporate financial health, which has been applied in the present study with the calculated solvency ratios. The Z-score formula is a measurement of the financial health of the company and is a powerful diagnostic tool that forecasts the probability of a company entering bankruptcy within a two-year period. The model discriminates the performance in three categories in terms of Z-score output in relation to the financial performance.

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.66X_4 + 0.999X_5$$

Where;

X_1 = Working Capital to Total Assets;

X_2 = Retained Earnings to Total Assets;

X_3 = EBIT to Total Assets;

X_4 = Market Value of Equity to Total Assets;

and X_5 = Sales to Total Assets

❖ **Category Z-score Value Inference/Implications :**

❖ $Z < 1.8$ indicates bad performance and the firm is considered to be in the bankruptcy zone.

❖ $Z > 1.8$ and $Z < 3$ indicates gray area, uncertain to predict (healthy performance).

❖ $Z > 3$ indicates very good/healthy financial performance.

It is observed from the analysis presented above that the company's Z score had been above the value of 1.8 except in the year 2005-06 ($Z=1.66$), which is an indication of sound financial performance. The Z scores were, on an average, in a healthy zone in 2007-08 and 2008-09. However, the Z score increased from 2.33 in 2008-09 to 4.97 in 2010-11, which indicates that the company undertook turnaround activities to increase its financial performance.

FINDINGS

- 1) The ranking of liquidity ratios denotes that during the initial years, i.e., from 2004-05 to 2006-07, the company enjoyed the highest liquidity and the poorest liquidity was recorded in 2009-10.
- 2) The Return On Assets (ROA) showed a mixed trend during the period of the study. During 2008-09, a negative percentage was recorded at - 6.18%. This shows that the company is managing to get good returns out of their assets pool.
- 3) Return on capital employed was at a negative value in year 2008-09 at -7.66% and showed a fluctuating trend.
- 4) Return on net worth noticed a negative percentage in year 2008-09 at -12.29% and showed a mixed performance over the study period.
- 5) It is observed that there is a high degree of negative association between liquidity and risk. Further, the profitability and risk are also negatively correlated.
- 6) There is evidence that the content of EBIT to Total Assets stood negative during 2008-09, indicating the inability of the company to meet interest payments.
- 7) The sales content to total assets presented stability except in 2005-06, in a range of 0.35 in 2005-06 and 0.87 in 2009-10.
- 8) The proportion of Market Value of Equity to Total Assets recorded a high value and varied from 1.75 to 7.59.
- 9) The content of working capital to total assets had been low and varied in between a minimum of 0.02 and a maximum of 0.37.
- 10) The proportion of retained earnings mobilization to total assets showed a mixed performance over the period of the study. It shows that the interest of the shareholders has been sound due to the financial health of the company.
- 11) The company's Z score has been above 1.8, except in the year 2005-06 ($Z=1.66$), which is an indication of sound financial performance. However, the Z score increased from 2.33 in 2008-09 to 4.97 in 2010-11, which indicates that the company undertook turnaround activities to further increase its financial performance.

SUGGESTIONS

In the light of above findings, the researcher has offered the following suggestions:

- 1) It was found that the liquidity performance of the company is unstable. However, the company should take necessary steps for maintaining consistent liquidity position by way of implementing sound collection policies, adequate amount of cash in hand, and investments in short-term marketable securities.
- 2) There was a high degree of negative association between liquidity and risk. Therefore, the company should take appropriate steps to improve its liquidity position, so that the risk can be minimized.
- 3) The company's Z score has been satisfactory and was above 1.8 except in the year 2005-06 ($Z=1.66$), which is an indication of sound financial performance. However, the Z score increased, which indicates that the company initiated turnaround activities to further increase its financial performance. So, the company should take care for maintaining the same level of score in the future.
- 4) Dr. Reddy's Laboratories Ltd., a well established company, is satisfactorily churning out profits and has been maintaining its liquidity position, but at an increased risk factor. The liquidity position of the company was fluctuating, but it was acceptable.
- 5) The company is changing its policies for better results at regular intervals, however, the growth levels are also accompanied with higher levels of risk. The profitability is increasing at a good pace, showing the efficiency of the company. Thus, it can be concluded that (during the study period) the company was earning good profits with reasonable liquidity, however, the profits were earned at a higher risk level.

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