

A STUDY ON FINANCIAL HEALTH OF DAIRY INDUSTRY IN ANDHRA PRADESH BASED ON Z SCORE ANALYSIS

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ABSTRACT

The study deals with the concept of profitability, measurement of profitability in relation to total investment, sales and shareholders' funds in Dairy Industry in Andhra Pradesh during 2001 to 2011. It also deals with the evaluation of earning power, analysis of operating efficiency, analysis of financial efficiency and measurement of financial health of Dairy Industry in Andhra Pradesh using Z score analysis.

Key words: financial efficiency, financial health, Liquidity, profitability and solvency.

INTRODUCTION

The Indian dairy industry is one of the leading sectors of Indian economy as it accounts for a significant fraction of total output of India. The dairy sector in India has shown significant development in the past decade. Now, India has become one of the largest producers of milk and value-added milk products in the world. India has largest market for dairy products with a great potential with more than a billion people, vast territory and abundant resources.

The Indian dairy industry achieved a healthy growth in its operations. To face the stiff competition radical steps are to be taken to reduce cost of production in dairy industry in India. The application of financial management techniques would help the dairy companies in increasing their productivity and profitability. An attempt has been made in the present study to have an insight into the examination of financial health of the dairy industry in Andhra Pradesh.

Research Goals

To study the financial health of dairy industry in Andhra Pradesh using Z Score Analysis (Multiple Discriminant Analysis)

Methodology

The study has been undertaken for the period of eleven years from 2000-01 to 2010-11. In order to study the financial health of dairy industry in Andhra Pradesh I have chosen five dairy enterprises, namely National Dairy Development Board, Heritage Foods India Limited, Amrit Corporation Limited, Gskch Limited and Ravileela Dairy Products Limited.

Tools applied

To measure the financial health of dairy enterprises, Z Score Analysis is adopted.

Z Score Analysis

In order to analyze financial health of dairy industry in Andhra Pradesh in terms of liquidity, solvency, profitability and financial efficiency, various accounting ratios like ratio of working capital to total assets, net operating profit to net sales, ratio of earnings before interest and taxes to total assets, ratio of market value of equity to book value of debt and the ratio of sales to total assets have been used. In this context an attempt has been made to analyse the financial health of dairy industry in Andhra Pradesh to understand how management of finance plays a crucial role in the growth.

ALTMAN Z Score: "Z" score analysis has been established by Edward I. Altman to evaluate the general trend in the financial health of an enterprise over a period. Many of the individual accounting ratios are used frequently to predict the financial performance of an enterprise may only provide warnings when it is too late to take a corrective action. Further single ratio does not convey much of the sense. There is no internationally accepted standard for financial ratios against which the results can be compared. Therefore, Edwin I Altman combined a number of accounting ratios (liquidity, leverage, activity and profitability) to form an index of the probability, which was effective indicator of corporate performance in predicting bankruptcy. The data collected were first analyzed with the help of five accounting ratios. These different ratios were combined into a single measure-Z Score Analysis with the help of Multiple Discriminant Analysis (MDA). "Z" is the overall index and the variables X_1 to X_4 are computed as absolute percentage values while X_5 is computed in number of times.

The formula used to evaluate the "Z" score analysis as established by Altman is as follows:

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

Variables (Ratios) used in "Z" Score Analysis

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

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

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

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

X₄: The ratio of market value of equity to book value of debt ($MVE/ BVD *100$). It is reciprocal of the familiar debt-equity ratio. Equity is measured by the combined market value of all shares, while debt includes both current and long term liabilities. This measure shows how much assets of an enterprise can decline in value before the liabilities exceed the assets and the concern becomes insolvent.

X₅: The ratio of sales to total assets (S/TA). The capital turnover ratio is a standard financial measure for illustrating the sales generating capacity of the assets.

Accuracy and Effectiveness

Some studies measuring the effectiveness of the Z-score have shown the model to be accurate with >70% reliability. What is usually meant by accuracy is the percentage of firms that are classified correctly, within the estimation sample, when the Z-score values for firms are translated into yes/no predictions for whether each turns out to be bankrupt. Because the parameters of the model are estimated based on the same sample, and because the sample itself is not randomly selected, it is not reasonable to project that the formula will achieve similar accuracy when applied for making predictions about other firms.

From about 1985 onwards, the Z-scores gained wide acceptance by auditors, management accountants, courts, and database systems used for loan evaluation. The Altman Z-Score model is not recommended for use with financial firms; because these firms often have off-balance sheet liabilities that aren't captured by the financial statement data used in the Altman Z-Score models.

Altman Guidelines for Healthy Zone

Altman established the following guidelines to be used to classify firms as either financially sound or bankrupt.

1. Below "Z" score of 1.8, the unit is considered to be in bankruptcy zone. Its failure is certain and extremely likely and would occur probably within a period of two years.

2. If a unit has a "Z" score between 1.8, and 3, its financial viability is considered to be healthy. The failure in this situation is uncertain to predict.

3. Above "Z" score of 3, the unit is in too healthy zone. Its financial health is very viable and not to fall.

TABLE 1
 ALTMAN Z-SCORE ANALYSIS
 (In times)

VARIABLES	AMRIT CORP LIMITED	GSKCH LIMITED	HERITAGE FOODS INDIA LIMITED	NDDB	RAVILEELA DAIRY PRODUCTS LIMITED
X1	25.86	29.58	21.59	33.84	0.65
X2	2.36	14.48	4.79	40.29	-33.66
X3	14.98	23.94	14.71	3.40	1.76
X4	19.32	59.98	89.56	2170.81	154.75
X5	3.99	1.31	2.44	0.11	0.43
Z-Score	4.94	3.02	3.79	14.21	0.95
FINANCIAL HEALTH	GOOD	GOOD	GOOD	GOOD	BANKRUPTACY ZONE

Source: Various annual reports of selected dairy enterprises during 2001-2011

Financial Health of Dairy Industry in Andhra Pradesh

The Altman "Z" score analysis was applied to evaluate the general trend in the financial health of dairy industries in Andhra Pradesh by using ratio analysis. The financial health of Amrit Corp Limited, GSKCH Limited, Heritage Foods India Limited and NDDB vary viable and these companies fall under too healthy zone. The financial health of Ravi Leela Dairy Products Limited is in danger and the unit is considered to be in bankruptcy zone. Its failure is certain and extremely likely and would occur probably within a period of two years.

Reasons for the Poor Financial Health

The following are important reasons for poor financial health of Ravi Leela Dairy Products Limited.

- Under trading owing to the excess working capital.
- The negative operating profit/small portion of profit during the study period was a serious concern. It was partly because of the fact that earnings were eaten by excess working capital during the study period.
- Failed to achieve the sales targets/adequate sales. This was due to under utilization of available capacity, which contributed for the deterioration of financial health.
- Excess debt was a serious concern as it carries with interest burden. This also affected financial health.

References

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Appendix:

Table No.1a
 X₁: The ratio of working capital to total assets

COMPANY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
DAIRY INDUSTRY - CONSOLIDATED	45.89	39.72	36.15	23.27	24.86	31.68	30.65	37.08	36.03	30.01	26.14	32.86
AMRIT CORP LIMITED	20.31	18.85	19.57	23.03	26.18	28.55	29.58	35.34	29.94	25.48	27.63	25.86
GSKCH LIMITED	16.94	17.58	27.69	35.88	33.27	11.88	13.68	50.39	46.73	35.37	35.97	29.58
HERITAGE FOODS INDIA LIMITED	14.20	13.85	19.42	33.68	21.62	34.15	30.27	20.30	17.55	17.33	15.14	21.59
NDDB	53.95	44.46	38.48	20.72	23.45	36.10	35.36	34.89	33.79	28.97	22.10	33.84
RAVILEELA DAIRY PRODUCTS LIMITED	39.96	18.88	13.20	-3.69	-14.37	-21.38	-8.64	-7.65	-5.33	-2.24	-1.57	0.65

Source: Various annual reports of selected dairy enterprises during 2001-2011

Table No.1b
 X₂: The ratio of net operating profit to net sales

COMPANY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
DAIRY INDUSTRY - CONSOLIDATED	13.78	21.12	19.21	16.14	12.78	11.57	13.96	8.88	8.65	10.27	11.10	13.41
AMRIT CORP LIMITED	1.46	0.68	2.27	1.88	1.71	3.44	7.38	0.74	1.10	1.83	3.43	2.36
GSKCH LIMITED	22.04	16.49	9.69	11.07	14.72	12.76	14.18	12.68	13.98	14.61	17.09	14.48
HERITAGE FOODS INDIA LIMITED	8.35	10.41	11.67	11.22	6.06	6.56	1.20	-4.59	-2.14	2.72	1.29	4.79
NDDB	12.13	38.04	74.81	65.87	44.19	30.45	41.72	50.33	29.21	27.09	29.29	40.29
RAVILEELA DAIRY PRODUCTS LIMITED	7.21	-15.79	-22.70	-10.07	-16.27	-181.10	0.00	0.00	-19.15	-2.58	-1.59	-33.66

Source: Various annual reports of selected dairy enterprises during 2001-2011

Table No.1c

X₃: The ratio of earnings before interest and taxes to total assets

COMPANY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
DAIRY INDUSTRY - CONSOLIDATED	9.75	9.56	8.08	6.96	6.27	6.81	7.55	8.25	7.90	9.66	9.20	8.18
AMRIT CORP LIMITED	7.96	7.57	38.74	8.37	9.61	20.49	26.40	5.09	8.92	11.22	20.38	14.98
GSKCH LIMITED	28.87	21.00	15.61	17.09	25.33	25.84	27.90	27.12	25.27	25.81	23.47	23.94
HERITAGE FOODS INDIA LIMITED	23.21	32.64	31.42	26.18	16.21	16.98	2.54	3.83	-4.16	7.65	5.35	14.71
NDDB	5.40	7.57	5.57	4.49	2.28	1.96	1.92	2.95	1.87	1.70	1.66	3.40
RAVILEELA DAIRY PRODUCTS LIMITED	7.23	-11.15	-11.21	-4.70	-13.29	0.00	0.00	0.00	-2.01	-0.90	-0.69	1.76

Source: Various annual reports of selected dairy enterprises during 2001-2011

Table No.1d

X₄: The ratio of market value of equity to book value of debt

COMPANY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
DAIRY INDUSTRY - CONSOLIDATED	132.86	196.84	206.69	351.16	653.57	515.32	807.77	696.51	756.87	866.15	938.41	556.56
AMRIT CORP LIMITED	9.92	11.05	17.46	19.09	18.13	19.71	42.11	20.43	17.65	19.06	17.89	19.32
GSKCH LIMITED	59.98	...	...	...	...	...	...	...	...	...	...	59.98
HERITAGE FOODS INDIA LIMITED	116.70	476.18	175.28	43.40	82.29	53.33	9.52	9.58	6.42	6.25	6.20	89.56
NDDB	148.17	210.39	216.92	415.28	928.72	665.00	1366.90	1836.11	2815.54	5299.74	9976.16	2170.81
RAVILEELA DAIRY PRODUCTS LIMITED	271.83	47.91	39.79	41.15	60.88	52.36	0.00	0.00	258.82	185.77	185.77	154.75

Source: Various annual reports of selected dairy enterprises during 2001-2011

Table No.1e
 X₅: The ratio of sales to total assets

COMPANY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
DAIRY INDUSTRY - CONSOLIDATED	0.67	0.43	0.35	0.39	0.44	0.46	0.40	0.62	0.71	0.74	0.74	0.54
AMRIT CORP LIMITED	2.33	2.82	3.45	3.53	3.54	3.40	0.63	5.59	7.21	5.72	5.62	3.99
GSKCH LIMITED	1.23	1.14	1.19	1.22	1.47	1.48	1.43	1.44	1.36	1.31	1.20	1.31
HERITAGE FOODS INDIA LIMITED	2.69	3.06	2.59	2.22	2.55	2.43	1.63	1.72	2.40	2.51	3.04	2.44
NDDDB	0.44	0.20	0.07	0.07	0.05	0.06	0.05	0.06	0.06	0.06	0.06	0.11
RAVILEELA DAIRY PRODUCTS LIMITED	0.56	0.84	0.63	0.70	0.85	0.00	0.00	0.00	0.11	0.40	0.54	0.43

Source: Various annual reports of selected dairy enterprises during 2001-2011