Z SCORE ANALYSIS OF COOPERATIVE DAIRY UNITS OF MAHARASHTRA

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ABSTRACT

The wilful and planned efforts of people and government, reflected through successful implementation of programmes like Operation Flood, National Dairy development programme transformed India from its deficit state in milk production to the world's largest milk producing country. Cooperative sector played a major role of bringing the small scattered milk producers in the value chain of dairy industry in India. Under the Cooperative form of organisation these small and marginal milk producers became the farmer members of the milk unions. These milk unions provide services like veterinary services, fodder, and feed and consultancy services to the farmer members either free of cost or at reasonable price. However to sustain in the competitive world, these cooperative milk processing and producing unions should be economically viable.

The present study is intended to evaluate the financial health of 10 cooperative dairy units in Maharashtra using Z score analysis. The Z Score analysis reveals that all of the 10 dairy units have the Z score more than 3 for all 5 years. As per Altman's Z score analysis all the 10 units are financially healthy.

Keywords: Financial Performance, Z score, Dairy Cooperative

INTRODUCTION

India is predominantly an agro economy till a few decades ago. Agriculture and allied sectors (dairy, fishery etc.) are still considered as source of livelihood and not as a business. Agriculture along with dairy farming plays a significant role in socio- economic structure of India. Milk is one of the most important sources of animal protein in the diet of predominantly vegetarian population of India. However the development and modernisation of this primary sector of the economy is still awaited. This study evaluates the economic health of dairy units and will provide basis for my research study of dairy sector. Financial Measures are the most widely used and understood measures of performance evaluation. The financial performance of the selected

dairy units has been evaluated using the Z score analysis. Z score is the measure which analyses the financial viability of a unit. Secondary data of 10 dairy cooperatives for 5 years was collected and analysed. As it was promised to maintain the secrecy of the data, in place of name specific codes are used for the dairy units. Purposive sampling technique was used while selecting the dairy units.

The Objective of the Study: The study is intended to analyse the financial health of the cooperative dairy units.

RESEARCH METHODOLOGY

Type of Data: The study is based on secondary data collected from annual financial reports of the dairy units.

Sample Size: 10 Cooperative Dairy units

Period of the data used for the study: 5 years data (2011-12 to 2015-16) was used.

Method of analysis: The data is analysed using Altman's "Z" Score analysis.

The Altman's Z score is the value calculated using a formula which consider those financial components which play vital role in the performance evaluation of a business unit.

Edwin I Altman has developed the Z score technique considering the liquidity, profitability, turnover, capital structure of the organisation. The formula developed by Altman to compute the value of Z score is as under

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

Where

$X_1 = (WC/TA*100)$: Ratio of Working Capital to Total Asset, measures the proportion of liquid assets in the total capitalisation.

$X_2 = (EBIT/S*100)$: Ratio of EBIT to sales measures the operational efficiency (covering manufacturing, administration and sales activities)

$X_3 = (EBIT/TA*100)$: Ratio of Earnings before interest and tax to Total Assets measures the earning power.

X_4 = (MVE/BVD)* 100: The ratio of Market value of equity to book value of debt measures the long term solvency. In the present study instead of market value of equity (not available), book value of equity is considered.

X_5 = (S/TA): The ratio of sales to total assets measures the sales generating capacity of the assets.

Interpretation of the Z score as per Altman:

$Z < 1.8$ indicates the unit is in bankruptcy zone

$1.8 < Z < 3$ indicates the unit is financially healthy and failure in this case is uncertain to predict.

$Z > 3$ indicates the unit is financially very healthy.

LITERATURE REVIEW

In his research article "A Study on Financial health of dairy industry in Andhra Pradesh based on Z score analysis" Mr. T Himabindu has described the concept of profitability, measurement of profitability in relation to total investment, sales and shareholders' funds in Dairy Industry in Andhra Pradesh. The study was based on the data collected for 5 dairy units for a period of 11 years. The study revealed reasons for poor financial health of Ravi Leela Dairy Products Limited.

In the research article "Financial Performance Analysis and Bankruptcy prediction in Hungarian dairy sector" the author Rozsa Andrea has analysed the performance of 7 dairy units of Hungary for a period of 5 years using Z score analysis Springate Model.

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DATA ANALYSIS

I) X_1 component of Z Score: $X_1 = (WC/TA*100)$

| X_1: (WC/TA*100)						
Cooperative Union	Mar-16	Mar-15	Mar-14	Mar-13	Mar-12	Average
BSKC1	18.33	20.43	19.10	23.97	17.75	19.90
BSKC2	10.55	10.27	9.11	33.10	22.17	13.21
BSKC3	49.79	47.28	56.05	53.74	55.20	52.05
BSKC4	51.49	65.59	62.51	60.50	64.02	60.14
BSKC5	55.59	67.81	56.07	62.96	55.99	61.83
BSKC6	55.24	36.72	38.00	44.09	35.57	44.24
BSKC7	45.91	42.24	33.40	39.45	50.68	42.77
BSKC8	41.90	38.15	31.92	31.47	32.13	35.44
BSKC9	61.69	59.69	59.59	58.90	65.30	60.94
BSKC10	12.12	17.32	22.79	23.47	20.17	18.74
Consolidated	34.247	37.191	32.594	43.01	41.32	36.942
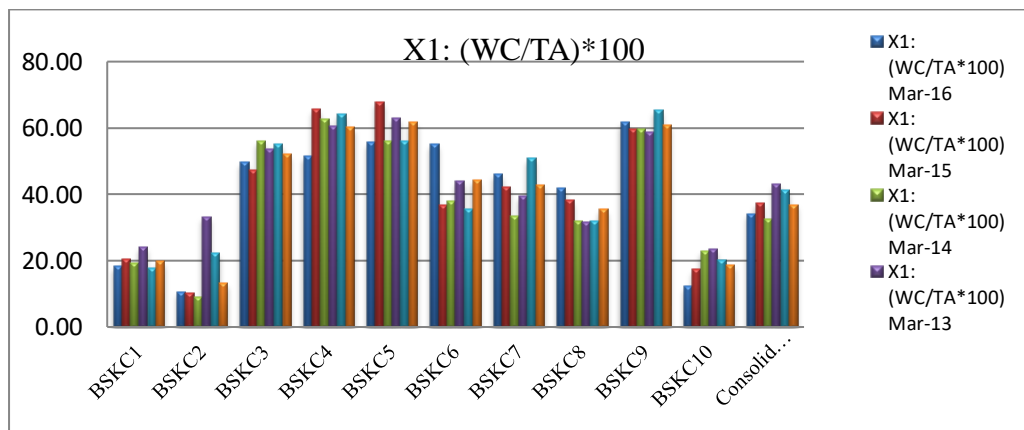
Interpretation:

i)   Five out of 10 cooperative units have higher value of X1 than the consolidated value of X1 for all 5 years.

ii) Three units have lower value of X1 than the consolidated value for all 5 years.

iii) High fluctuations have been observed in the proportion of working capital with total assets over a period of 5 years in case of unit no. BSKC2 and BSKC6

iv) In comparison with other units the ratio was found to be consistent in case of BSKC1 and BSKC9.

II) X_2 component of Z Score: $X_2 = (EBIT/S*100)$

| Cooperative Union	Mar-16	Mar-15	Mar-14	Mar-13	Mar-12	Avg.
X2: (EBIT/S*100)						
BSKC1	0.81	0.72	0.51	0.71	0.58	0.67
BSKC2	1.32	1.16	0.55	1.19	1.34	1.11
BSKC3	0.34	0.35	0.50	0.52	0.40	0.41
BSKC4	0.53	0.62	0.61	0.51	0.46	0.55
BSKC5	1.13	0.92	0.57	0.62	0.60	0.69
BSKC6	0.89	1.08	0.79	0.83	0.81	0.89
BSKC7	1.07	1.02	0.76	1.19	0.02	0.81
BSKC8	0.82	0.77	1.48	0.62	1.02	0.95
BSKC9	0.11	0.31	0.30	0.17	0.18	0.22
BSKC10	0.84	1.13	1.35	0.72	0.97	0.99
Consolidated MH 10	0.80	0.77	0.66	0.70	0.63	0.72
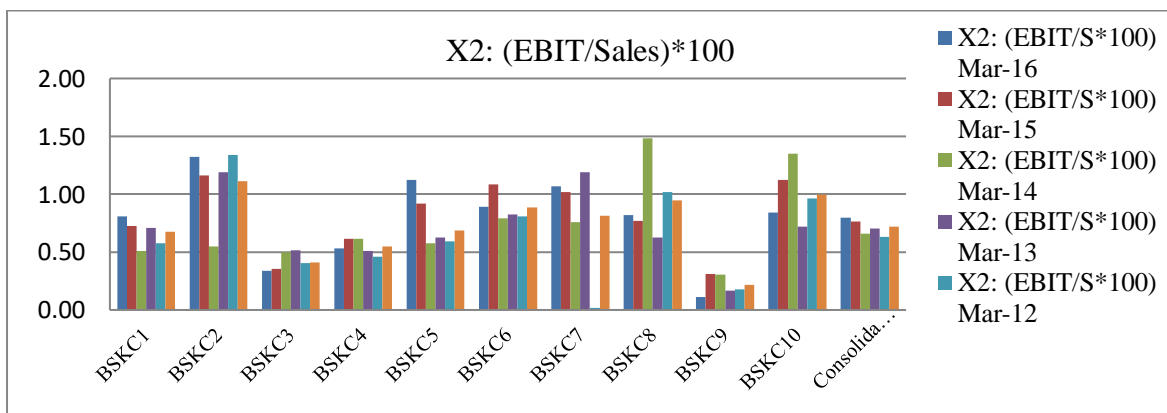
Interpretation:

i) Two (BSKC6 and BSKC10) out of 10 cooperative units have higher value of X2 than the consolidated value of X2 for all 5 years.

ii) Three units (BSKC3, BSKC4 and BSKC9) have lower value of X2 than the consolidated value for all 5 years.

iii) High fluctuations have been observed in the Profitability ratio over the period of 5 years in case of unit no. BSKC2, BSKC7 and BSKC8.

iv) In comparison with other units the ratio was found to be consistent in case of BSKC3, BSKC4 and BSKC9.

III) X_3 component of Z Score: $X_3 = (EBIT/ TA*100)$

| X3: (EBIT/ TA*100)						
Cooperative Union	Mar-16	Mar-15	Mar-14	Mar-13	Mar-12	Avg.
BSKC1	1.73	1.70	1.28	1.63	1.56	1.59
BSKC2	1.82	1.50	0.63	3.42	3.71	1.73
BSKC3	2.22	2.44	2.93	3.08	2.46	2.60
BSKC4	1.89	2.48	2.44	2.36	2.00	2.22
BSKC5	5.80	3.48	3.30	4.04	3.70	3.59
BSKC6	3.54	6.34	4.87	4.72	4.95	4.69
BSKC7	4.37	4.09	4.49	5.93	0.08	3.74
BSKC8	2.39	2.50	4.99	2.42	3.92	3.23
BSKC9	0.66	2.23	1.74	1.21	1.03	1.39
BSKC10	3.24	3.77	5.20	2.78	4.59	3.87
Consolidated MH 10	2.46	2.36	2.08	2.78	2.61	2.43
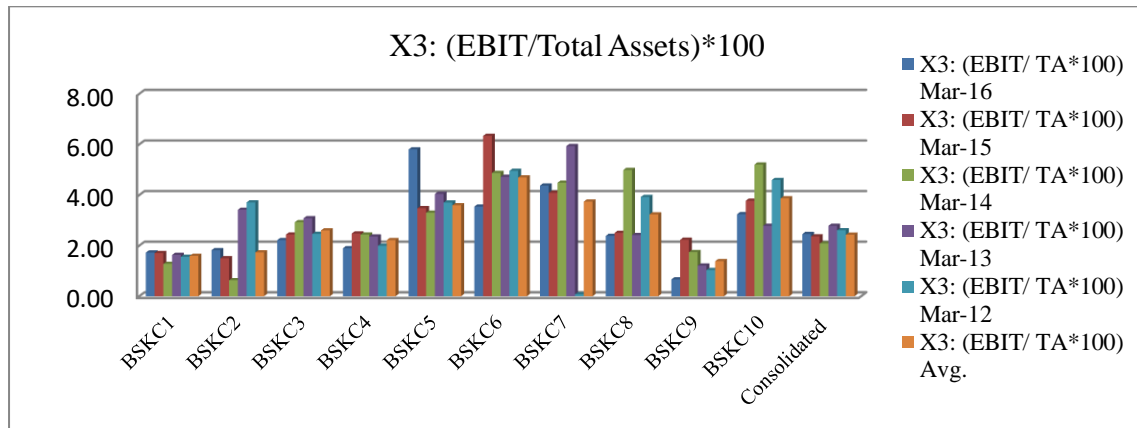
Interpretation:

i) Three units (BSKC5, BSKC6 and BSKC10) out of 10 cooperative units have higher value of X3 than the consolidated value of X3 for all 5 years.

ii) Two units (BSKC1 and BSKC9) have lower values of X3 than the consolidated value for all 5 years.

iii) High fluctuations have been observed in the X3 ratio of BSKC2, BSKC7 over the period of 5 years in case of unit no.

iv) In comparison with other units the ratio was found to be consistent in case of BSKC3, BSKC4.

IV) X_4 component of Z Score: $X_4 = (BVE/ BVD *100)$

X4: (BVE/ BVD *100)						
Cooperative Union	Mar-16	Mar-15	Mar-14	Mar-13	Mar-12	Average
BSKC1	984.02	1183.24	1247.04	1203.05	1048.58	1117.13
BSKC2	3321.18	1431.75	1045.96	437.85	383.16	1130.45
BSKC3	291.11	271.15	242.43	205.00	218.32	245.81
BSKC4	418.69	702.21	791.91	476.34	338.21	503.56
BSKC5	98.88	82.28	171.90	199.04	137.72	114.19
BSKC6	115.47	379.92	359.01	286.51	280.39	223.25
BSKC7	58.01	57.60	73.64	97.13	67.37	68.36
BSKC8	-4.32	-5.23	-5.99	-12.15	-22.70	-9.52
BSKC9	478.78	1213.32	877.95	682.67	353.17	621.85

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BSKC10	175.66	145.47	61.43	62.85	83.29	101.29
Consolidated	366.21	358.2	373.19	242.74	215.11	317.79
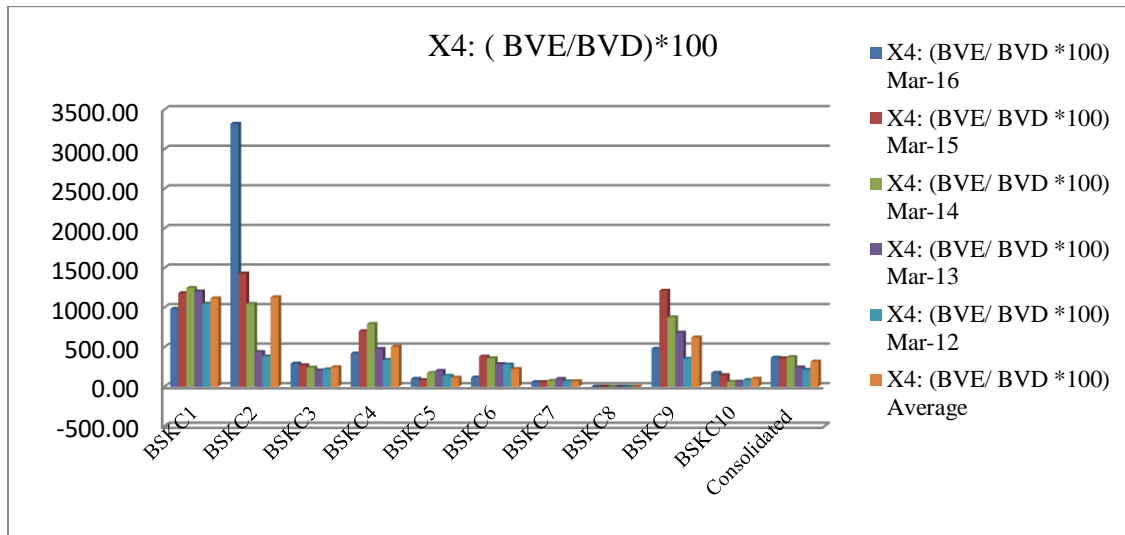
Interpretation:

i) The negative equity to debt ratio in case of BSKC8 indicates that the unit has negative net worth throughout the period under study which is not a good sign

ii) BSKC1 and BSKC2 show an unduly high net worth in compare to the long term borrowings as the units have high accumulated reserves as part of net worth.

iii) All the dairy units except BSKC8 have higher net worth than the borrowed funds.

V) X_5 component of Z Score: X_5 = Sales / Total Assets

X5: (S/TA)						
Cooperative Union	Mar-16	Mar-15	Mar-14	Mar-13	Mar-12	Average
BSKC1	2.13	2.35	2.52	2.31	2.70	2.37
BSKC2	1.38	1.29	1.15	2.87	2.77	1.56
BSKC3	6.60	6.88	5.86	5.95	6.09	6.32
BSKC4	3.55	4.02	3.98	4.61	4.33	4.04
BSKC5	5.16	3.79	5.75	6.47	6.22	5.24

|						
BSKC6	3.98	5.85	6.17	5.72	6.14	5.29
BSKC7	4.09	4.02	5.93	4.99	4.43	4.61
BSKC8	2.90	3.24	3.37	3.87	3.85	3.41
BSKC9	5.94	7.17	5.74	7.25	5.82	6.38
BSKC10	3.85	3.35	3.85	3.87	4.76	3.89
Consolidated MH 10	3.08	3.09	3.15	3.96	4.11	3.38
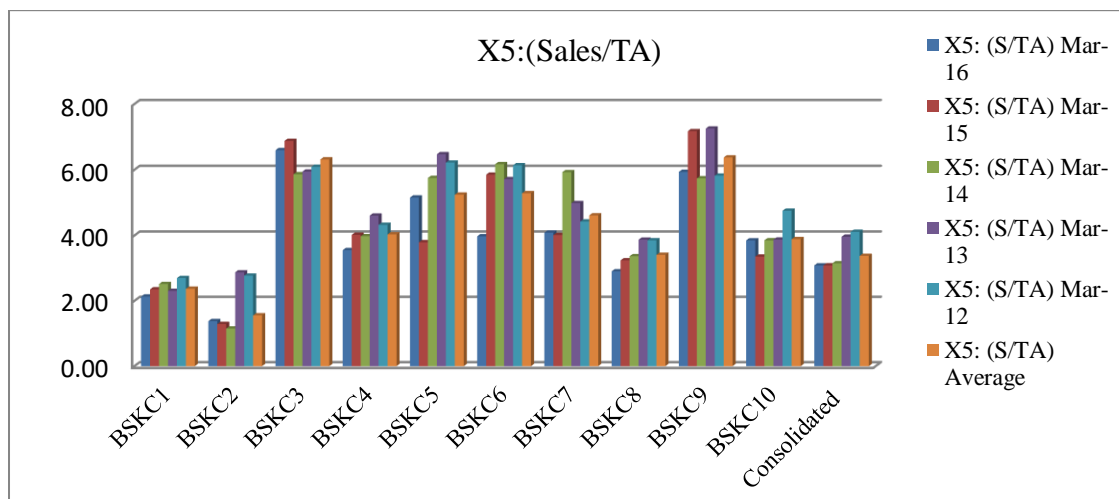
Interpretation:

  i)   Six dairy units have higher value of X5 than the consolidated value of X5 for all 5 years.

  ii)   BSKC1 and BSKC2 have lower value of X5 than the consolidated value for all 5 years.

  iii)   High fluctuations have been observed in the ratio over the period of 5 years in case of unit no. BSKC5

  iv)   In comparison with other units the ratio was found to be highly consistent in case of BSKC1, BSKC3, BSKC4.

VI)   Z Score: $Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$

| Z Score $Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$						
Cooperative Union	Mar-16	Mar-15	Mar-14	Mar-13	Mar-12	Average
BSKC1	8.32	9.76	10.27	9.87	9.26	9.37
BSKC2	21.51	10.07	7.56	6.02	5.47	8.57
BSKC3	9.01	9.15	8.09	7.92	8.14	8.50
BSKC4	6.75	9.11	9.57	8.27	7.19	7.85
BSKC5	6.62	5.23	7.57	8.56	7.84	6.79
BSKC6	5.46	8.79	8.95	8.13	8.42	7.32
BSKC7	5.14	5.01	6.92	6.25	5.44	5.67
BSKC8	3.47	3.76	3.90	4.26	4.24	3.89
BSKC9	9.57	15.24	11.78	12.09	8.76	10.88
BSKC10	5.17	4.57	4.68	4.63	5.66	4.86
Consolidated	5.78	5.77	5.86	6.03	5.99	5.81
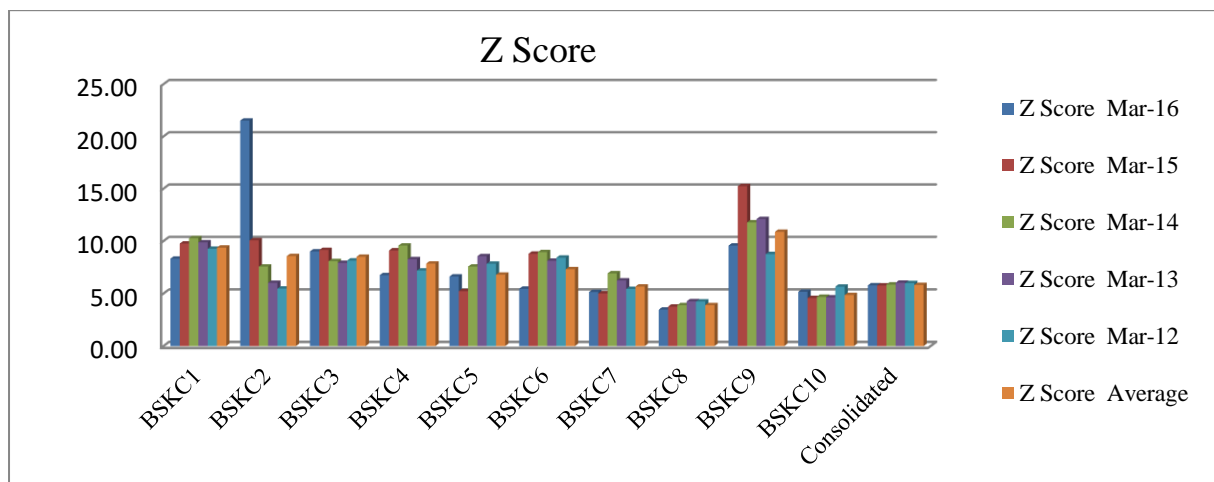
Interpretation

i) No unit out of 10 dairy units is in danger zone as Z score for all 10 units for all 5 years are > 1.8

ii) All dairy units have a Z score more than 3 which as per Altman's Z score analysis is a healthy situation.

Consolidated Z score analysis of 10 cooperative dairy units of Maharashtra

Z Score of consolidated values of 10 cooperative dairy units of Maharashtra						
	2015-16	2014-15	2013-14	2012-13	2011-12	Averages
X1: (WC/TA*100)	34.25	37.19	32.59	43.01	41.32	36.94
X2: (EBIT/S*100)	0.80	0.77	0.66	0.70	0.63	0.72
X3: (EBIT/ TA*100)	2.46	2.36	2.08	2.78	2.61	2.43
X4: (BVE/ BVD *100)	366.21	358.20	373.19	242.74	215.11	317.79
X5: (S/TA)	3.08	3.09	3.15	3.96	4.11	3.38
Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.999X5						
Z Score	5.78	5.77	5.86	6.03	5.99	5.81

Consolidated Z score for 10 dairy units of Maharashtra
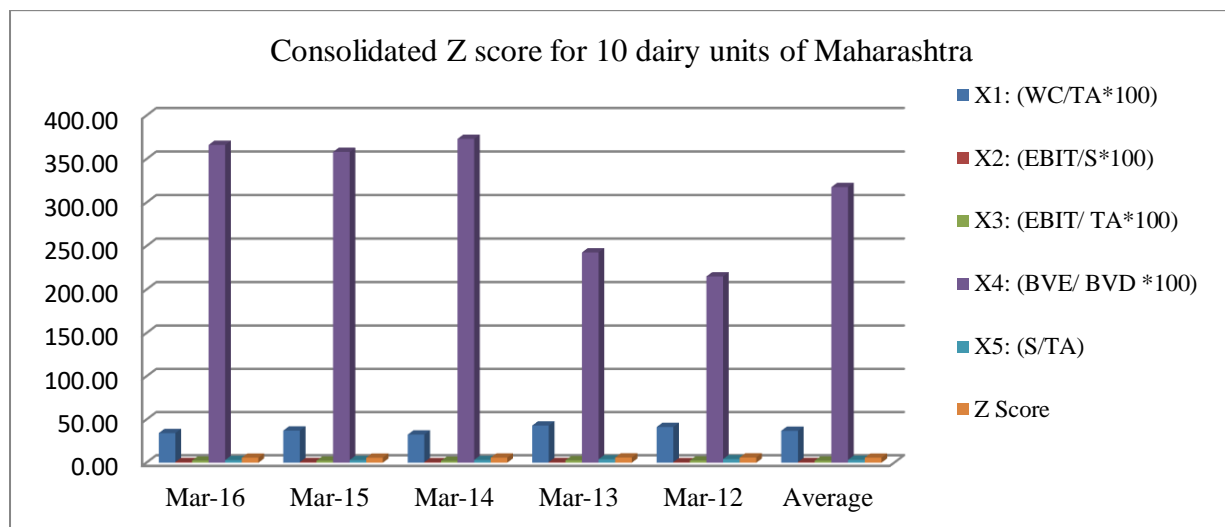
Interpretation

High fluctuations have been observed in the X4 over the period of 5 years.

Though not negative, the profit margin is very poor for all the years under study.

Findings and Observations:

1. The proportion of working capital with total assets deviates heavily between the units. The minimum value of X1 is close to 10% while the maximum value is more than 60%.
2. High fluctuations have been observed over the period of 5 years in majority of the cases.
3. Proper management of working capital is warranted.

4. All units for all 5 years earn profit though the percentages is very low ranging between 0.1 to 1.5
5. The profitability of cooperative is very low as compared to the profitability of some of the private dairy units.
6. The impact of turnover on ROI is more than the impact of profitability on ROI.
7. The Cooperative dairy units under the study rely heavily on the owner's fund than the borrowings. Only one out of ten have negative net worth.
8. Majority of the dairy units have higher turnover ratio than the consolidated turnover ratio.
9. The Z Score analysis reveals that all of the 10 dairy units have the Z score more than 3 for all 5 years. Which as per Altman's Z Score analysis, can be interpreted as financially very healthy situation.

REFERENCES

T.HimaBindu; DR. S.E.V. Subrahmanyam, A Study on Financial health of dairy industry in Andhra Pradesh based on Z score analysis, International Journal of Marketing, Financial Services & Management Research Vol.1 Issue 12, December 2012, ISSN 2277 3622

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