CHAPTER - V

S U M M A R Y AND C O N C L U S I O N

Prediction of different degrees of corporate financial health, in an objective manner, is very important as well as necessary as this can be used as a vital device for total monitoring system with a view to saving an unit from being sick. Corporate sickness and its mounting ill-effects warrant prompt detection, and that too at an early stage, of the signals of mal-functioning of an unit. "The early detection of rapidly deteriorating conditions may enable managers of a firm to take action early enough to reverse the trend"[1]. As an instrument of forewarning, the 'Ratio Analysis Technique' associated with sophisticated statistical or mathematical tools is helpful in predicting corporate financial health. The context necessitates an inquiry as to whether financial ratios can reflect different degrees of corporate financial health; and if they do, an assessment of the predictive ability of the financial ratios in identifying different degrees of firm's financial health becomes inevitable.

To assess predictive ability (i.e. effectiveness) of financial ratios, researchers have been attempting to:

(i) identify the particular financial ratios (an individual ratio or a set of ratios) which reflect the particular financial/economic event better, and (ii) improve or enhance the quality of the prediction models through statistical sensitivity and statistical validity tests of both the ratios and the models. As a whole, they have been attempting to improve the overall quality of the 'Ratio Analysis Technique' itself.

Generally, researchers have attempted to identify and predict various aspects of the financial health of their respective sample units 'in an objective manner' and amongst them three major study groups could be identified:

(i) the group that studied and compared the financial characteristics of the units which failed or closed or were bankrupt with those of the non-failing or the running or the non-bankrupt ones;

(ii) the group that studied some particular financial aspects of the corporate units which were irregular in those financial matters i.e. non-compliance of loan agreement, bad credit risks, etc. and,

(iii) the group that studied the 'units at risk' and the 'potential bankrupt units' and their chances of revival.

Thus, our study centered around the examination of :

(i) whether financial ratios are able to discriminate between the different degrees of corporate financial health,

(ii) whether financial ratios can serve as indicators/predictors of different degrees/statuses of corporate financial health,

(iii) which 'set' of financial ratios indicate/predict the corporate financial health, in a better way,

and in relation to the above, hypotheses developed were:

(i) the magnitudes of financial ratios of the sample tea units having dissimilar financial health differ from one financial status to the other,

(ii) the financial ratios are the predictors of the degrees of corporate financial health of the tea units, and

(iii) the classification accuracy of the financial ratios (in 'sets') differ from one another.

The financial health of "corporate enterprises represent a continuum on the scale calibrated according to some measure of health or survival strength"[2]. The 'good' and the 'sick' categories of financial health were not of the nature of"abrupt or qualitative classes like 'male' or 'female' "[3]. Our study was limited primarily to the two-fold classification (i.e. the 'good' and the 'sick') although the results derived were tested against a three-fold classification (i.e., the 'good', the 'semi-good/semi-sick', and the 'sick').

The definitions and measurements of the relationships of the financial characteristics (variables) differ widely owing to the implicit emphasis placed by different users of financial information on different aspects of a particular firm's functioning[4]. A number of permutations and combinations of these definitions and measurements resulted in quite a large number of financial ratios. A variety of financial ratios were used by previous researchers in their prediction studies, and a variety of financial ratios (either a ratio or a 'set of ratios') were recommended by them as the best ones for the particular financial/economic events under their study. Our study tested fifty two (52) financial ratios to assess its effectiveness in identifying the degrees of financial health of tea units.

Testing the First Hypothesis

The test of the first hypothesis was determined by the observation of the results of the statistical significance tests (Mean Test and F-Test) of the financial ratios. A financial ratio was considered significant one only when the particular ratio was found significant at .01 level in both the 'Mean' and 'F' - Tests.

Out of the sample financial ratios, the present study found that only thirtysix (36) ratios were significant (and considered those as 'monitoring' ratios); that is, the magnitudes of these 36 ratios varied according to the variations in the corporate financial health of the sample tea units. Thus, the first hypothesis of our study held good for these 36 financial ratios.

Testing the Second Hypothesis

For testing the second hypothesis, the financial characteristics (grounded on those 36 significant financial ratios) of the 'good' units were compared with that of the 'sick' units (i.e. between the two extreme degrees of financial health) in terms of all the 'monitoring' financial ratios and in terms of suitable small 'sets' of such financial ratios.

The financial ratios (36) tested through small 'sets' were selected on the basis of relative individual discriminating power of the ratios. Actually seventeen (17) ratios were selected to study in eight (8) such 'sets'. The number of ratios considered for each of the small 'sets' (save the 8th set) to form discriminant function (termed as 'reduced' functions) were four because of the reasons:

(i) The financial ratios of only four 'groups' (out of the five 'groups' under this study) were found significant (Vide Table III.5) in discriminating between the degrees of corporate financial health and the small 'set of ratios' containing only one representative ratio from each of the four 'groups' made the 'set' (the Ratio-representative Set or the '2nd set' of ratios) to contain only four ratios;

(ii) For application in a practical situation, researchers suggested that "the greater number of variables in the 'best' linear discriminant model can cause difficulties. .... The reduced model seems quite appropriate for classification purposes ('prediction') in practical situation, the full original model can be used in an analytical context"[5].

For this, a discriminant function (termed as 'original' function) was computed taking all the 36 'monitoring' ratios, and for selection of ratios for these small 'sets' (8) the relative share of contributions of the individual ratios in the overall discriminating power of the 'original' function were observed considering : (i) the whole set of 'monitoring' ratios (36) and, (ii) the ratio 'sets' representing the ratio 'groups' like profitability, financial stability, liquidity, and asset-utilisation.

The relationship between the degrees of financial health and the classifying ability i.e. the effectiveness of :

(i) the whole set of 'monitoring' ratios (represented by a small 'set'),

(ii) the set of ratios containing only one representative ratio from each ratio 'groups' (save the 'turn-over' group)[6],

(iii) the profitability ratios,

(iv) the financial-stability ratios,

(v) the liquidity ratios, and

(vi) the asset-utilisation ratios,

were examined and analysed. For each of the set of ratios, linear discriminant function was derived and based on such

functions 'Z-scores' of the sample units were computed. And, the classification accuracy (i.e. the predictive ability) of each of the derived functions based on the 'initial' and 'optimum' cut-off points of the 'Z-scores' were assessed (Table - V.1).

The assessment revealed that the 'reduced' discriminant functions of the 'sets' of ratios were able to predict/classify the different degrees of financial health of the corporate tea units. Besides, F-statistic of all the discriminant functions (computed to test discriminating ability of the functions) were significant at .01 level [vide Appendix I and Appendix-I(i) to I(viii)] .

Thus, the second hypothesis of the study held good.

Testing the Third Hypothesis

For testing the third hypothesis of this study, the predictive (classification) accuracy of the 'sets' of ratios were assessed and based on the classification accuracy of both the 'initial' and 'secondary' sample tea units, the best 'set' of ratios was selected. The discriminant function of the 'set of ratios' with highest classification accuracy was chosen as the best one.

Table - V.1

CLASSIFICATION ACCURACY (%) OF 'SETS' OF RATIOS (INITIAL SAMPLE)

'Sets' of Ratios	Two-degree Situation			Three - degree Situation							
				On the basis of 'Initial' cut-off points				On the basis of 'Optimum' cut-off points			
	Good	Sick	Overall	Good	Semi-good/ semi-sick	Sick	Overall	Good	Semi-good/ semi-sick	Sick	Overall
1st	100	100	100	100	37.97	100	68.18	94.59	70.89	92.11	81.82
2nd	100	100	100	100	36.71	100	67.53	89.19	56.96	97.37	74.68
3rd	100	100	100	100	22.78	100	60.39	91.89	60.76	71.05	70.78
4th	100	100	100	100	24.05	100	61.04	56.76	84.81	57.89	71.43
5th	97.30	100	98.67	97.30	1.27	100	48.71	89.19	41.77	92.11	65.58
6th	100	100	100	100	2.53	100	50.00	89.19	70.89	68.42	74.68
7th	100	100	100	100	5.06	100	51.30	97.3	74.69	57.90	75.97
8th	80.56	89.48	85.14	80.56	2.53	89.48	42.48	55.56	44.31	57.89	50.33

In the "two-degree situation", it was observed that all the 'sets of ratios' save the '8th set of ratios' (i.e. the set representing the asset-utilisation ratio group) perfectly reclassified the sample units (initial sample) and each of the 'sets' was of about equal merits (in terms of rate of classification accuracy) in identifying the 'good' and the 'sick' financial firms. In reclassifying only the 'sick' sample units, the classification error of the derived functions of the 'sets' were 'zero' and that of only the 'good' units ranged between 'zero' and 2.7 percent. However, the '8th set of ratios' correctly classified 89.48 percent of the 'sick' units and 80.56 percent of the 'good' units. In the context of this low rate, it could be emphasised that:

(i) the function representing the asset-utilisation ratios was comparatively a reduced one (i.e. it contained only three financial ratios instead of four);

(ii) the ratios of this 'set' had lower contributing shares in the overall discriminating power than that of the ratios used in the other 'sets';

(iii) the variability of the ratios (save the R-46) of this 'set' was found low in comparison to other ratios; and,

(iv) the constituent ratios of the function failed to reflect the degrees of financial health as could be expected by the definitional parameters.

Again, in the two-degree situation, the discriminant functions of the 'sets of ratios' except the '8th Set'[7] tested on the secondary sample consisting of 36 'good' and 20 'sick' units, revealed that amongst the discriminant functions of the 'sets of ratios', the function of the '1st set of ratios' was the best one in identifying/predicting only the 'sick' sample units; the discriminant function of the '5th set' and '6th set of ratios' were the best 'sets' in identifying/predicting only the 'good' sample units (vide Table III.24(a). The discriminant function of the '1st set of ratios' was the best one amongst the functions of the 'sets' in identifying/predicting all the units in the secondary sample. The accuracy rate of classification of the '1st set' was 96.43 percent which was the highest one in classifying the secondary sample units (vide, Appendix-V(a)(i))_7.

Further attempts had been made to study the possibilities of identification and classification of the corporate financial health by dividing the same into three statuses - the 'good', the 'semi-good/semi-sick' and the 'sick'. For such study, tests were made on the basis of the discriminant functions obtained

in two-degree situation. It was observed that classification/ prediction was possible but the overall classification accuracy was lower (ranged between 68.18 percent to 42.48 percent on the basis of 'initial' cut-off points and ranged between 81.82 percent to 50.33 percent on the basis of the 'optimum' cut-off points) than that under the two-degree situation (Vide Table-V. 1). The poor classification accuracy of the 'sets' in classifying the 'semi-good/semi-sick' sample units that ranged between 37.97 percent and 1.27 percent could be held responsible for this. Such low classification accuracy was due to the fact that:

(i) the financial characteristics (reflected by the financial ratios) of the 'semi-good/semi-sick' units were not taken into consideration at the time of :
   (a) selecting the 'monitoring' ratios,
   (b) selecting the ratios to form small 'sets', and
   (c) computing the discriminant functions,

(ii) the difference between the average values of financial ratios of the 'good' units/'sick' units and the 'semi-good/semi-sick' units were lower than that of the difference between the 'good' units and 'sick' units (Vide, Annexure — VI).

An analysis of the combinations and positions of the definitional parameters (i.e. the positive and negative values of OCF, NW and WC) of the (mis)classified 'semi-good/semi-sick' units could not

focus any meaningful light on the misclassification aspects of the three-degree situation. A close scrutiny of the financial characteristics from the published annual accounts and reports of the misclassified 'semi-good/semi-sick' units, also could not provide any clue to analyse such low rate. Perhaps, a bit further disclosure in financial reporting could have helped in this matter[8].

It would be noted that, in the three-degree situation, on the basis of the 'initial' cut-off points, the '1st set' and the '2nd set' of ratios were of about equal merits (in terms of percentage of classification accuracy) to identify/classify all the sample units in the 'initial' sample. However, on the basis of the 'optimum' cut-off points, the '1st set' of ratios was the best one amongst all the 'sets' as its overall classification accuracy was highest (81.82 percent). This '1st set' of ratios when tested on the 'secondary' sample (consisting of 36 'good', 91 'semi-good/semi-sick' and 20 'sick' units) disclosed an overall classification accuracy of 63.27 percent (vide, Table III. 26).

Thus, it could be observed that the classification accuracy of the 'sets' under the study differ from one another and the '1st set of ratios' was the best set having the highest classification accuracy in classifying/predicting the different degrees of financial health of the tea units. Hence, the third hypothesis of the study held good.

Thus, it could be emphasised that the variations in the degrees of corporate financial health of tea units could be identified/predicted through 'z-scores' and the magnitudes/ characteristics of the financial variables (in terms of the ratios studied) were the determinants of the said 'z-scores'. In other words, the financial ratios were useful and effective in identifying/classifying the different degrees of financial health of the tea units.

The '1st set of ratios' consisting of R-12 (OCF/Total Debts), R-18 [(Retained Profit + Depreciation Charge)/Total Debt], R-19 [(Retained Profit + Depreciation Charge)/(Tangible Assets + Accumulated Depreciation)], and R-24 (Net Worth/Total Debt) was the best indicator of the corporate financial health of tea units.

Amongst the ratios tested, the profitability ratios were the best indicators of the corporate financial health. The '1st set of ratios' which was the best indicator of corporate financial health, consisting of four ratios of which three were from profitability 'group'; again, in assessing the relative contribution of the individual financial ratios in the overall discriminating power of the function of this '1st set' of ratios, it was the profitability ratio R-18 which was found to contribute more than the other ratios in the 'set' [vide Appendix III.(i)]. In analysing the importance and position of the financial ratios in contributing towards the overall discriminating power of the

discriminant functions of all the 'sets' under study, the ratio R-19 which was also a profitability ratio, was identified as the important indicator having the highest number of appearances in the 'sets' (Vide Table - III.27).

Since thirties, researchers have been attempting to search the best ratio predictors[8]. They have also been attempting to enhance the quality of the Ratio Analysis Technique by applying quantitative techniques. This study attempted to widen the usefulness of the financial ratios of the published annual accounts. To obtain better results, possibilities remained for further probing into:

(i) by using the alternative definitional parameters to identify the different degrees/statuses of corporate financial health;

(ii) by using the alternative independent variables in the discriminant analysis (e.g. using the tartiary financial ratios, non-financial ratios, non-ratios etc);

(iii) by increasing the sample size by the expansion in the numbers of the sample units; and

(iv) by using cross-sectional data to provide evidence to the extent of generalisations of the results provided.

An alternative classification technique other than the Multiple Discriminant Analysis may provide a more powerful device in assessing the predictability of the financial ratios in monitoring corporate financial health in Tea units.

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NOTES & REFERENCES

1. Baldwin, Jane Nora : Bankruptcy Prediction Using Quarterly Financial Statement Data, A Bell & Howell Information Co., Michigan, 1987, p. 118.

2. Gupta, L.C. : Financial Ratios for Monitoring Corporate Sickness, Oxford University Press, New Delhi, 1984, p. 111.

3. Ibid, p. 111.

4. Ibid, p. 114.

5. Ooghe, H and Verbaere, E : "Predicting Business Failure on the Basis of Accounting Data : The Belgian Experience", The International Journal of Accounting Education and Research, Vol. 20, No. 2, Spring 1985, p. 33 and 37.

6. The financial ratios in this group was found insignificant in discriminating between the degrees of corporate financial health of the tea units (Vide, Table - III. 5, Chapter - III, Page 112).

7. The '8th set of ratios' was not tested on secondary sample because of its lower rate of accuracy in classifying the units in the 'initial' sample.

8. Similar views were also expressed by the researchers like, L.C.Gupta; Gupta, L.C. : Controlling Corporate Sickness : Lessons from Experiences for Managers and Bankers; Oxford University Press, 1988, pp. 17 & 18.

9. Lev, B. : Financial Statement Analysis : A New Approach, Prentice-Hall Inc., 1974.

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