

## Prediction of Corporate Failure: Formulation of an Early Warning Model

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Industries are an integral part of a nation's economy. In a dynamic set up industrial units that are non-competitive, uneconomical and inefficient become sick and die out when new and more efficient units come up to take their place. Corporate failure is one of the major socio-economic problems that not only India but also many developing as well as developed nations are facing. Corporate failure/sickness is a universal phenomenon pervasive across all economies is the result of multiple factors within and out side an industrial unit. Factors like

- Continuous default by units in repaying dues of the creditors for supplies.
- Continuous default by the units in repaying the installments of loans, which has fallen due for the repayment.
- Occurrence of cash losses.

Corporate failure is a major economic and social problem, which has an adverse impact on entrepreneurship, production and supply of goods, prices, employment and so on. Corporate failure directly concerns the shareholders, employers, bankers, customers and others who have direct or indirect stake in the company. Industrial sickness is as much of a national problem as for a company and industry experiencing this menace

A random survey of the reasons for corporate failure as spelt out by a few companies has revealed that reduction in import duties, stiff competition from MNCs with wider market access and better quality products, competition from unorganized sector which can offer cheaper products due to lower taxes and other charges, inadequate power supply, high cost of finance etc., Payment of heavy excise duties by Indian companies while imports were available at cheaper rates due to drastic cut in custom duties were mentioned as the major reasons. Because of cheaper products from China, South Korea and Taiwan, the indigenous manufacturers have found it very tough marketing their products.

It is observed that out of 3759 references of sickness in large-scale companies received by Board for Industrial and Financial Reconstruction (BIFR), up to December 31 2001, the Textile industry outnumbered the Metallurgical industry with 637 cases against 568. The third position was held by Paper and pulp industry. There has been considerable increase in the number of cases of sickness in the large-scale companies in post economic liberalisation era. During the calendar year 2001, an average of 25-30 cases of

sick companies were reported to BIFR every month.

This study is basically directed towards making an effort to formulate a model, which if applied to the large-scale chemical industrial unit, will provide some clue to determine the likely onslaught of failure to the company. The major objectives of this research are 1. Formulating an Early Warning Model (EWM) to detect failure in advance in large-scale chemical Industry. 2. To provide some yardstick between the failed and non-failed companies. 3. To suggest corrective measures so as to avoid corporate failure or postpone so that the large amount of loss can be avoided. 4. To provide a wholesome scope for those who are interested in further study and research in this field. 5. To suggest the units, which can be revived profitably, and the other, which cannot be, so that the undue wastage of time and money can be saved.

The major limitations that the researcher has come across are 1. The research is focused on failed companies in chemical Industry that too only in the Large Sector. 2. The major data have been taken from secondary sources in form of financial statements given in the Annual Reports of the companies; the research may be affected by the limitations of secondary data. 3. The size of the sample is small so may not be enough to represent all the failed companies in the Chemical Industry. 4. The statistical tools used for the research have also their own limitations. 5. The validation test carried out in this study is restricted to a few sample sick and non-sick companies and some non-sample sick and non-sick companies in the chemical industry. 6. The industrial environment is very fast changing, with the passage of time, therefore, there is a fear that the recommendations forwarded by the researcher based on the present study may become impractical.

In the present research, 13 companies in the large-scale chemical industry were selected from a large pool of sick companies and an equal number of Non-sick companies too were selected based on various well-defined parameters, a few to mention are

1. The selected sick company reported sickness between the financial year 1993-94 and 1999-2000.
2. The sick company had required data for at least five years before the failure or sickness.
3. The non-sick company had data for five years
4. In the year of sickness of matching sick company, the non-sick company's gross capital employed did not vary by more than 20%. This way the pair of 13 sick and non-sick companies were established for the study.

The data source primarily has been from the secondary sources where the annual reports of the company played major role. The Libraries of the Company Law Board, Federation of Indian Chamber of Commerce and Industry (FICCI), Confederation of Indian Industry (CII), Board for Industrial and Financial Reconstruction (BIFR), Department of company affair and Ministry of Industry, Govt. of India in New Delhi have also been quite helpful for collection of data. Using the structured questionnaire the primary data collected.

The first phase was about the collection of maximum possible data on sick and non-sick companies for the sample selection based on the set parameters and conditions.

The second phase dealt with formation of 13 pairs of sick and non-sick companies

based on well-defined criteria to minimise biasness.

The third phase was about the selection of important financial ratios. The researcher selected a set of 40 financial ratios from all the four classes of financial ratios i.e. Profitability, Activity, Liquidity and Solvency ratios. In this phase only the calculation of 40 prominent ratios of all 26 companies in the sample for 5 years prior to the year of sickness was performed.

The fourth phase dealt with initial screening out of those ratios that were not significant in discriminating between a sick and non-sick company. In the end of this phase the researcher found 17 financial variables as important in distinguishing between a failed and non-failed company.

Fifth phase dealt with dichotomous classification test and found that Net Profit to Net Working Capital is the best in discriminating a sick and non-sick company. The other five significant ratios being Cash Flow to Total Liabilities, Total Liabilities to Total Assets, Net Working Capital to Total Assets, Current Assets to Current Liabilities and Net Worth to Net Sales.

Phase six was about the application of Multivariate Analysis, which included Test of significance based on analysis of variance, i.e. F-test, Test of significance based on normal distribution, i.e. T-test, Multiple Discriminant Analysis and Scaled Vector to determine the relative contribution of each of the financial variables to the total discriminating power of the function and the interaction between them.

The seventh and final phase was about the formulation of the Early Warning Model and deciding the benchmark for discriminating a sick company from non-sick. The programme on Multiple Discriminant Analysis produced following coefficients for these financial variables.

**Cash flow to Total Liabilities (P4) → 1.26**

Net Profit to Total Liabilities (P9) → 0.92

**Net Sales to Net worth (A7) → 0.06**

Net working capital to total Assets (L4) → - 0.57

**Current Assets to Current Liabilities (L7) → 0.39**

Total Liabilities to Total Assets (S4) → 0.11

Thus the model was formulated as

$$Z = 1.26P_4 + 0.92P_9 + 0.06A_7 - 0.57L_4 + 0.39L_7 + 0.11S_4$$

The Benchmark score (point) that would discriminate a failed company from a non-failed was taken as 0.4981 based on the Z values of all sample failed and non-failed companies corresponding to the year of sickness of the failed companies.

Finally came the data testing applying the Early Warning Model. The success rate clearly indicates that up to three years prior to the year of failure, the model could predict

failure with more than 80% accuracy. The overall success rate of the model stood at 89.24 for the first year, 88.43 for two years, 81.25 for three years, 75.00 for four years and 64.55 for five years respectively, prior to the year of failure.

The researcher has suggested the plans for the turnaround of sick companies. First, the short-term initiatives targeted at containing the situation from further deterioration to long term full-fledged financial, product and market restructuring.