PREDICTIVE MODELS OF BUSINESS FAILURE FOR CORPORATE ENTERPRISES: A STUDY IN INDIAN CONTEXT

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Predictive Models of Business Failure for Corporate Enterprises: A Study in Indian Context

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CERTIFICATE

The thesis titled, "Predictive Models of Business Failure for Corporate Enterprises: A Study in Indian Context", being submitted by Mr. Seyed Mohammadali Nabizadeh to Indian Institute of Technology, Delhi for the award of the degree of Doctor of Philosophy (Ph.D) is a record bonafide research work carried out by him. He has worked under our guidance and supervision, and has fulfilled all the requirements for the submission of this thesis, which has attained the standard required for a Ph. D degree of this institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

This thesis presents a study of various factors that are responsible for failure of corporates in India. In doing so, it brings out few models built around these factors that have predictive abilities of failure of Indian corporate enterprises. This study is necessitated by the fact that, though literature cites many predictive models, performance and reliability of these models are dependent on the business environment of the country under study. A well performing predictive model in a country may not lead to accurate prediction in another country. Since there is no prior study reported covering Indian corporate settings, it raises an opportunity to identify factors of failure, and work out suitable models based on these that have capability to predict business failure of Indian corporates. These are helpful in generating advance warning signals and initiate suitable remedial actions.

The research has been designed to follow three main objectives: to identify financial ratios whose ability to predict business failure is sharp; to develop predictive models (based on the identified financial ratios) useful in forewarning business failure; and to test the validity of predictive models.

For data collection, financial statements of all listed companies at the National Stock Exchange (NSE) of India for the financial years of 2008-9, 2009-10 and 2010-11, were considered. From the record, 91 companies were found as failed firms. Using a match pair sampling, the analysis has been carried out by a sample of total 182 NSE companies that includes 91 failed and 91 non-failed firms.

Three different methods were used: one-way ANOVA, Wilks' Lambda method and Likelihood Ratio method.

The analysis was conducted in two phases over two sets of data i.e. one relates to ten years (2001-2 to 20010-11) time span and another for five years (2006-7 to 2010-11) period. It resulted five sets of predictive variables for business failure prediction; two (2) of which are related to ten years period and other three (3) are to five years period.

It is interesting to note that few ratios are common to all sets of predictive factor. These included Sales/Total Assets, Acid-test Ratio, Cash to Current Liabilities, Raw Material Turnover and Finished Goods Turnover. These form a strong basis to further develop suitable models of failure prediction. To do so, three methods were chosen for further analysis, namely; Multiple Discriminant analysis (MDA) and Logistic regression (Logit) and neural network (NN). Reason for deploying these methods is that these have been observed to be the most efficient predictive models, hence remain dominant choice by the researchers of bankruptcy.

To this end, use of five sets of ratios over three methods led us to develop 15 unique models of business failure prediction, a significant contribution of this research.

These models were further validated over a new sample of 30 failed and 30 non-failed companies, for a period of ten years time span (2003-4 to 2012-13). The validation results are found satisfactory as they indicate all five models are able to predict business failure with an accuracy of almost 75% (highest being 78.3% of accuracy). Accuracy is further higher with data of five years time span. To augment this research, analysis with Neural network is also carried out for predicting business failures. Models developed by neural networks method are more accurate than other presented models.

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