On the predictability of risk box approach by genetic programming method for bankruptcy prediction

ABSTRACT

Problem statement: Theoretical based data representation is an important tool for model selection and interpretations in bankruptcy analysis since the numerical representation are much less transparent. Some methodological problems concerning financial ratios such as non-proportionality, non-asymetricity, non-scalicity are solved in this study and we presented a complementary technique for empirical analysis of financial ratios and bankruptcy risk. Approach: This study presented new geometric technique for empirical analysis of bankruptcy risk using financial ratios. Within this framework, we proposed the use of a new ratio representation which named Risk Box measure (RB). We demonstrated the application of this geometric approach for variable representation, data visualization and financial ratios at different stages of corporate bankruptcy prediction models based on financial balance sheet ratios. These stages were the selection of variables (predictors), accuracy of each estimation model and the representation of each model for transformed and common ratios. Results: We provided evidence of extent to which changes in values of this index were associated with changes in each axis values and how this may alter our economic interpretation of changes in the patterns and direction of risk components. Results of Genetic Programming (GP) models were compared as different classification models and results showed the classifiers outperform by modified ratios. Conclusion/Recommendations: In this study, a new dimension to risk measurement and data representation with the advent of the Share Risk method (SR) was proposed. Genetic programming method is substantially superior to the traditional methods such as MDA or Logistic method. It was strongly suggested the use of SR methodology for ratio analysis, which provided a conceptual and complimentary methodological solution to many problems associated with the use of ratios. Respectively, GP will provide heuristic non linear regression as a tool in providing forecasting regression for studies associated with financial data. Genetic programming as one of the modern classification method out performs by the use of modified ratios. Our new method would be a general methodological guideline associated with financial data analysis.

Keyword: Ratio analysis; Risk box; Bankruptcy prediction; Genetic programming