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Research Papers

Using a hybrid evolution approach to forecast financial failures for Taiwan-listed companies

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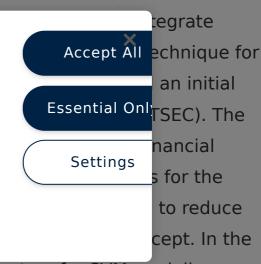🖨 Reprints & Permissions   Read this article

Abstract

Bankruptcy has been an important topic in finance and accounting research for a long time. Recent major bankruptcies have included seemingly robust companies such as Enron, Kmart, Global Crossing, WorldCom, and Lehman Brothers. These cases have become of serious public concern due to the huge influence these companies have on the real ... ...tegrate particle ... ...echnique for the purp... ...an initial sample... ...TSEC). The finan... ...nancial ratios a... ...s for the input ve... ...to reduce the data... ...cept. In the swarming phase, PSO was applied to obtain suitable parameters for SVM modeling
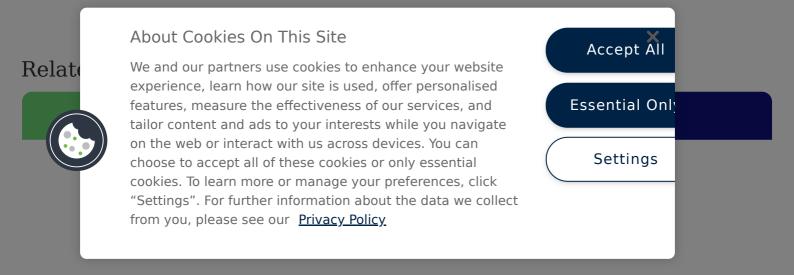
without reducing the classification accuracy rate. In the modeling phase, the SVM model was used to build a training set that was used to calculate the model's accuracy and fitness value. Finally, these optimized parameters were used in the hybrid PSO–SVM model to evaluate the model's predictive accuracy. This paper provides four critical contributions. (1) Using the PCA technique, the statistical results indicate that the financial prediction performance is mainly affected by financial ratios rather than non-financial and macroeconomic ratios. (2) Even with the input of nearly 70% fewer indicators, our approach is still able to provide highly accurate forecasts of financial bankruptcy. (3) The empirical results show that the PSO–SVM model provides better classification accuracy (i.e. normal vs. bankrupt) than the grid search (Grid–SVM) approach. (4) For six well-known UCI datasets, the PSO–SVM model also provides better prediction accuracy than the Grid–SVM, GA–SVM, SVM, SOM, and SVR–SOM approaches. Therefore, this paper proposes that the PSO–SVM approach is better suited for predicting potential financial distress.

Keywords: Financial engineering   Evolutionary finance   Network design   Corporate finance

JEL Classification:: C4   C5   C45   C53   G3

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