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Mining financial distress trend data using penalty guided support vector machines based on hybrid of particle swarm optimization and artificial bee colony algorithm.

Neurocomputing 82, 196-206 (2012).

Summary: The 2008 financial tsunami had a serious impact on the economic development of many countries, including Taiwan. Thus, the ability to predict financial failure and their trends is crucial and attracts public and professional attention when the world enters a period of economic depression. We examined the predictive ability of the proposed support vector machines (SVM) method that uses the characteristics of a penalty function to generate predictions more efficiently. To include the properties of particle swarm optimization (PSO), an evolutionary artificial bee colony (EABC) algorithm was presented; each bee was given a velocity and flying direction to optimize the proposed penalty guided support vector machines (PGSVM). EABC-PGSVM was used to construct a reliable prediction model for public industrial firms in Taiwan. To demonstrate the advantages of EABC and the penalty function, EABC-PGSVM was compared with back-propagation neural network (BPNN), classic SVM optimized by the ABC algorithm (BSVM), and the PGSVM optimized by the ABC algorithm (BPGSVM). Two matched datasets of sample firms that were financially sound or financially distressed during 1999-2006 and 2000-2007 were selected from among the public industrial firms of Taiwan. The final model was validated using within-sample and out-of- the-sample tests. The results demonstrate that the proposed method is promising and can help corporations to prevent failure.

Keywords: corporate governance; earnings management; financial failure; evolutionary artificial bee colony algorithm; penalty guided support vector machines
doi:10.1016/j.neucom.2011.11.020