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# Bankruptcy risk prediction models based on artificial neural networks

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## Abstract

The purpose of this research is to study the ability of artificial neural networks to forecast the companies' risk of financial distress. We predicted the bankruptcy risk using the associated financial ratios (overall liquidity ratio and the overall solvency ratio) and two artificial neural network models based on the backpropagation algorithm. The proposed models were implemented and tested using the PyBrain software and have been applied to 55 companies listed on the Bucharest Stock Exchange during 2010-2014. After a total of 19,944 iterations for the learning stage, the two algorithms converged and the errors obtained during the tests reached the fixed target. The empirical results showed that the artificial neural network models are efficient and reliable in detecting the risk of bankruptcy. The artificial neural networks are very useful in economic analysis when the complexity of data makes it difficult to implement functions that properly describe the link between economic variables. The use of the neural networks method for predicting the risk of bankruptcy is less common in Romania. This study intends to fill this gap in the literature and we believe it could be of interest not only for the companies listed on the stock exchange, but also for investors, shareholders and banks.

**Keywords:** Artificial Neural Networks; backpropagation; bankruptcy risk; overall liquidity ratio; overall solvency ratio

**JEL Classification:** M41, C53, G33

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