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Artifical Neural Networks in Default Forecast

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Abstract

In this article an artificial neural network will be described, which is able to forecast the financial default of a company given enough and good-quality data and well-defined conditions. The method is able to predict the default of a company with the help of financial ratios, which can be calculated from the annual Profit and Loss Statement and Balance Sheet of the company. I tested the method on real companies and real data from 2008. I compared the results with the results of a now-used economical model (discriminance analysis). The comparison shows the reliability of the method and the influence of each parameter to the reliability of the result.

Keywords: neural network, default forecast, finance default, discriminance analysis

1. Introduction

An important scope of artificial neural networks is the forecasting. One of the well-known problem in the financial world is the forecast of defaults. This is an important issue in the current financial situation, especially if we think about the financial crisis. Default models are used to project defaults in the economics. One of the famous models is the so called discriminance analysis. In Hungary the default projections have no long traditions, because the law for bankruptcy and liquidation process[1] was only accepted in 1991. The first default-model was developed by Miklós Virág and Ottó Hajdu in 1996 based on annual report data from 1990 and 1991 using discriminance analysis. From in the survey used 154 company working in processing industry in August 1992, 77 companies were creditworthy and 77 unable to (re)pay. In the model used companies employed at least 300 employees. For the model 17 financial ratios were taken into account. In the next pages I would like to introduce the discriminance analysis, which is the basis of the model. After the work of Miklós Virág and Tamás Kristóf I build up and describe in details the solution of the problem with neural networks based on data from 2008. With the analysis of the results I will show under what kind of circumstances and why the neural networks solve the problem better.

[1] The law Nr. 1991. XLIX. about bankruptcy and liquidation process