HYBRID FUZZY NEURAL NETWORK TO PREDICT PRICE DIRECTION IN THE GERMAN DAX-30 INDEX

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Abstract

Intraday trading rules require accurate information about the future short term market evolution. For that reason, next-day market trend prediction has attracted the attention of both academics and practitioners. This interest has increased in recent years, as different methodologies have been applied to this end. Usually, machine learning techniques are used such as artificial neural networks, support vector machines and decision trees. The input variables of most of the studies are traditional technical indicators which are used by professional traders to implement investment strategies. We analyse if these indicators have predictive power on the German DAX-30 stock index by applying a hybrid fuzzy neural network to predict the one-day ahead direction of index. We implement different models depending on whether all the indicators and oscillators are used as inputs, or if a linear combination of them obtained through a factor analysis is used instead. In order to guarantee for the robustness of the results, we train and apply the HyFIS models on randomly selected subsamples 10,000 times. The results show that the reduction of the dimension through the factorial analysis generates more profitable and less risky strategies.

Keywords: Trend forecasting, stock exchange index, technical indicators, artificial neural networks, fuzzy rule-based systems, HyFIS

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