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The profitability of daily stock market indices trades based on neural network predictions: case study for the S&P 500, the DAX, the TOPIX and the FTSE in the period 1965–1999

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Abstract

A variety of new and powerful time series tools are available to test for predictive components in data which previously have been regarded as weak form efficient. The key issue is whether these new tools support profitable trading. A method is introduced based on univariate neural networks using untransformed data inputs to provide short-term predictions of the stock market indices returns. The profitability of trading signals generated from the out-of-sample short-term predictions for daily returns of S&P 500, DAX, TOPIX and FTSE stock market indices is evaluated over the period 1965–1999. The results provide strong evidence of high and consistent predictability contrasting the

previous finding of weak form efficiency for index series and is notable because two of the series (S&P 500 and DAX) are confirmed as random using conventional tests. The out-of-sample prediction performance of neural networks is evaluated using RMSE, NMSE, MAE and sign and direction change statistics against a benchmark linear autoregressive model. Significant information advantage is confirmed by the Pesaran–Timmermann test. Finally, it is shown that buy and sell signals derived from neural network predictions are significantly different from unconditional one-day mean return and are likely to provide significant net profits for plausible decision rules and transaction cost assumptions.

Notes

§The results and interpretations in this article are the author's alone and do not necessarily reflect the position of Accenture.

Additional information

Notes on contributors

Douglas Wood
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