Inter-comparison of Artificial Neural Network Algorithms for Time Series Forecasting: Predicting Indian Financial Markets

Abstract

The financial market prediction is a specialized case of a time series analysis. Although many different methods have been employed by researchers for time series/financial data studies which include statistical techniques like ANOVA (analysis of variances), ARIMA (integrated moving averages), smoothing methods, correlation analysis etc., use of Artificial Neural Network (ANN) methods for financial prediction have become quite popular in the recent times. Though ANN methods like the conventionally used backpropagation method or the recurrent methods have been employed in the past, a complete and detailed investigation of more robust and popular ANN methods incorporated into ANN like the Resilient backprop, Marquardt Lavenberg, Conjugate gradient methods, One Step Secant, Quasi Newton methods, Bayesian learning etc., is missing from the literature. In the present study, a detailed study was undertaken to investigate the potential of these robust methods in the ANN domain for the Indian financial market prediction, more specifically the prediction of the share price of two popular scripts that are traded in the Indian secondary market. In this study, the 1 month ahead opening share price of two scripts namely ICICI bank and L&T have been forecasted. The results of our study
indicate that while as for L&T data, Marquardt Lavenberg algorithm is able to give ~85% accurate prediction, it gives ~92% accurate prediction for ICICI bank data. This study therefore attempts to conduct a detailed investigation of many popular methods under the ANN domain to converge on the best possible results instead of just considering one or two methods and comparing them to the backpropagation method—a method being followed conventionally.

References

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Index Terms

Computer Science

Algorithms

Keywords

Artificial Neural Networks, backpropagation, financial data analysis.