

TELKOM UNIVERSITY

Abstract

School of Computing

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Master of Engineering

**Prediction of Stock Price in Investor Portfolios with Stock Price Time
Series Analysis using ANN**

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Indonesia Stock Exchange (IDX) is a place to trade the stock market in Indonesia. In general, this is represented by the value of Jakarta Composite Index (JCI). JCI itself is the combined value of all stocks listed on the Stock Exchange. It does not matter whether the stock traded on that day is in a state of rising, down, flat (no change in value), not being traded and even suspension (prohibited from conducting transactions for a certain period of time).

The problem in the stock prediction is how to predict the stock price in investor portfolios in time series analysis using Artificial Neural Network (ANN).

The stock data source used is the closing stock price of BNI, BCA and Mandiri stocks for 5 years from 2011-2015 from the Indonesia Stock Exchange (via yahoo finance site). This data is processed using ANN method especially Backpropagation method. Each of these stock data are be trained and tested, to observe how much the accuracy by using this method. The stock price that has been predicted by ANN are merged into a portfolio, this portfolio will shows the increasing or decreasing. At the end of process, the change rate of loss predicted stock price into beneficial predicted stock price are calculated.

In the experiment 3 scenario are used, that are prediction by daily, weekly and monthly data. The experiment result shows that the accuracy of stock prediction by using daily data is better than weekly and monthly data.

The daily data accuracy of BNI, BCA and Mandiri are 97.7474%, 98.2266%, and 97.8942%. Weekly accuracy data a bit smallest than daily accuracy. The weekly data accuracy of BNI, BCA and Mandiri are 95.4247%, 97.0631%, and 96.5706%. Monthly accuracy data a bit smallest than weekly accuracy. The monthly data accuracy of BNI, BCA and Mandiri are 91.6259%, 95.9425%, and 94.1434%.

Portfolio benefits are calculated from the difference between the latest investment value and the initial investment value divided by the initial investment value. The value of prediction accuracy with daily data is better than weekly and monthly data, because the data trained on daily data is more than weekly and monthly data.

If the investor focuses all of his funds only to buy one stock, then he will have a portfolio profit of 3 times more than before. If the profit of BNI stocks is 19.19%, then in terms of the investor portfolio will have a profit of $19.19\% \times 3 = 57.57\%$.

Compare with the profit level of the 3 banks which if we add up, the value will be as follows: $19.19+17.68+15.73 = 52.6\%$. So there are additional benefits from a portfolio of $57.57\% - 52.6\% = 4.97\%$.

Keywords : Stock, Backpropagation, Prediction, Portfolio