Forecasting Crude Oil Price Using Neural Networks

Komsan Suriya*

Faculty of Economics, Chiang Mai University, Chiang Mai 50200, Thailand

**Corresponding author. E-mail: skomsan@econ.cmu.ac.th*

ABSTRACT

This research constructed the Artificial Neural Networks (Multilayer Feed Forward) to forecast the crude oil price (Brent). The input information was the daily price range between December 27, 2002 to March 18, 2005. Total number of inputs were 561 days. Arranging the input information into groups with 10 consecutive informations in each group, 551 groups were prepared. The model consisted of 10 neurons in the input layer and 1 neuron in the output layer. Quadratic interpolation was utilized to search for the most appropriate number of neurons in the hidden layer. The research question was how many neurons in the hidden layer that would yield the most-accurate forecasting result. The comparisons of models were justified by the 1 day ex ante forecasting results. The Mean Absolute Percentage Error (MAPE) was a measurement of the accuracy. Thirty-four rounds of the forecasting contest were conducted. The least MAPE derived from the best model was 1.98 percent with 200 neurons in the hidden layer.

Key words: Price forecasting, Crude oil, Neural networks

INTRODUCTION

Thailand has risked her energy sector heavily on oil import. The right time to purchase crude oil price will save millions of dollars for Thailand and oil-importing countries. A right notice of an increase of oil price would helpfully suggest the related agents to buy earlier, and vice versa. Thus, the accuracy of the forecasting is so beneficial to agencies who deal with the import of crude oil.

Neural Networks is an efficient tool in training a computer to learn from massive data (Haykin, 1994). It was inspired by the cleverness of the brain cells in the prediction of situations that human faced (Gurney, 1999). It penetrated to economic interest in the time-series analysis (Patterson, 1996; Smith and Gupta, 2000). The technique might promise the satisfied accuracy of the forecasting. Therefore, this study tried to figure out the efficiency of the technique in the forecasting of the crude oil price.

This research aimed to construct an appropriate neural networks model for the forecasting of crude oil price and to test the accuracy of the forecasting. The scope of the study was limited by these following matters. First, only the so-called model "Multilayer Feed Forward" was utilized. Second, only the daily Brent crude oil price was collected. Third, daily forecasting for 34 days was conducted. The last, Mean Absolute Percentage Error (MAPE) was used to measure the accuracy of the forecasting.