THE UNIVERSITY   **OF HONG KONG**

Department of Mathematics

Numerical Mathematics and Applied Analysis Group Seminar (NMAA)

On Neural Network Conditional Autoregressive Value at Risk

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on Wednesday, December 7, 2005 at 2:00p.m. in Room 517, Meng Wah Complex

Abstract

Recently, Value at Risk (VaR) has emerged as a popular and important tool for financial risk management. It is defined as the monetary value that a portfolio will lose over a fixed time horizon (one or ten days) with a given confidence level (95% or 99%). Engle and Manganelli (2001) proposed the Conditional Autoregressive Value at Risk (CAViaR) model by specifying the conditional VaR as an autoregressive process given the current and past information. Jin, Li and Yu (2003) provided different specifications to the CAViaR model by Engle and Manganelli (2001) using two popular non-linear parametric time series, namely the threshold model first proposed by Tong (1977, 1978) and the mixture GARCH model by Wong and Li (2001). In this paper, we develop a considerably more flexible model, namely the Neural Network CAViaR (NNCAViaR) model, for the CAViaR model by using various Neural Network (NN) models. We further explore the non-linear of the CAViaR model without imposing any stringent parametric assumptions on the non-linear relationship. We will consider the applications of Artificial Neural Network (ANN) for the CAViaR model. The estimation schemes and the model selection procedures will be discussed. We also perform backtesting to our NNCAViaR model for evaluating its forecasting performance empirically using S&P 500 Index series.

All are welcome