

For favour of posting

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
THE UNIVERSITY OF HONG KONG

Seminar

Professor HUANG Dawei

Bell Labs Research China

will give a talk

entitled

MODELLING AND CLASSIFYING FINANCIAL TIME SERIES AS BUY AND SELL SEQUENCE

Abstract

Traditionally, asset return is the fundamental concept and research focus in financial time series study (Tsay 2005, Lai & Xing, 2008). However, predicting it is extremely difficult. Also, the most important thing in trading practice is to find a reliable policy to balance the return and risk.

In this talk, we introduce BUY and SELL states for a financial time series. Given an upper bound and a lower bound, we define the financial time series is in BUY or SELL state according to that it will reach the upper or lower bound first. This concept is related to Shannon-Kelly curve, which was developed to show the relationship between return expectation and gambling policy. Using this concept, we can code a financial time series as a binary sequence. Within a short time window, this sequence is linearly related to some technical indicators and has Markov chain property.

To obtain information about BUY and SELL states, we consider both traditional statistical methods and emerging machine learning methods. Firstly Fisher's LDA can be explained as a variation of canonical analysis for classification. Then it is related to regression. Based on this approach, LASSO can be applied for classifying the BUY and SELL states. Instead of using an explicit λ in LASSO, we consider the statistic of the so called Permutation Null Distribution [Efron 2010]. The probability of observation conditional on BUY and SELL state is obtained by the output and training data of LASSO. Finally, to make a final decision, we combine the obtained information into a Hidden Markov Model. Using Baum-Welch algorithm and Viterbi algorithm we obtain the BUY and SELL sequence which maximizes the likelihood function. Then a trading policy can be chosen based on the test probability and Shannon-Kelly curve.

In summary, modelling financial time series as BUY and SELL sequence enables us to develop a new approach for both quantitative trading practice and developing time series analysis theory.

on

Friday, March 13, 2015

(Refreshments will be served from 10:45 a.m. outside Room 301 Run Run Shaw Building)

11:00 a.m. – 12:00 noon

at

Room 301, Run Run Shaw Building

Visitors Please Note that the University has limited parking space. If you are driving please call the Department at 3917 2466 for parking arrangement.

All interested are welcome