ROGEMAR MAMON, University of Western Ontario
Weak HMM and its application to asset price modelling

A higher-order hidden Markov model (HMM) is considered in modelling the price dynamics of a risky asset. The log returns of asset prices are governed by a higher-order or the so-called weak Markov chain in a finite-state space. The optimal estimates of the second-order Markov chain and model parameters are derived. This is done via a transformation that converts the second-order HMM into the usual HMM. The model is implemented to a dataset of financial time series and its forecasting performance investigated. An extension of the parameter estimation framework is developed to handle multivariate time series data. The use of higher-order HMM captures both the regime-switching behaviour and long-range dependence in the financial data. (This is a joint work with X. Xi, Dept of Applied Mathematics, University of Western Ontario.)