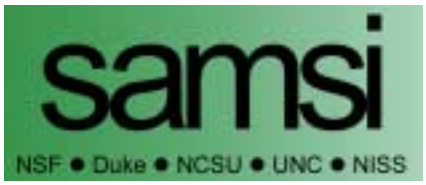

Mid-Term Workday for Financial Modelling
Stochastic Computation Program

February 20, 2003

SCHEDULE

10:00 a.m. "MCMC methods for financial econometrics"
Nick Polson, University of Chicago

11:00 a.m. "Sequential Monte Carlo methods in stochastic volatility models"
Beom Lee, University of North Carolina

11:30 a.m. Discussion

12:00 p.m. Lunch

1:30 p.m. "Short time-scale in stochastic volatility and option pricing"
Sean Han, North Carolina State University

2:00 p.m. "Bayesian estimation of Stochastic volatility models with long-term and short-term volatility components"
German Molina, Duke University

2:30 p.m. Discussion

3:00 p.m. Break

3:15 p.m. "Particle Filtering and Applications"
Rene Carmona, Princeton University

4:15 p.m. Discussion

Refreshments and Lunch will be provided.

Mid-Term Workday for Financial Modelling
Stochastic Computation Program
February 20, 2003

SPEAKER ABSTRACTS

SPEAKER: Nick Polson, University of Chicago

TITLE: "MCMC methods for financial econometrics"

ABSTRACT:
This chapter discusses MCMC based methods for estimating continuous-time asset pricing models. We describe the Bayesian approach to empirical asset pricing, the mechanics of MCMC algorithms and the strong theoretical underpinnings of MCMC algorithms. We provide a tutorial on building MCMC algorithms and show how to estimate equity price models with factors such as stochastic expected returns, stochastic volatility and jumps, multi-factor term-structure models with stochastic volatility, time-varying central tendency or jumps and regime switching models.

SPEAKER: Beom Lee, University of North Carolina

TITLE: "Sequential Monte Carlo methods in stochastic volatility models"

ABSTRACT:
This talk provides an introduction to calibration of stochastic volatility models via MCMC methods. Sequential importance sampling is applied to modify the traditional MCMC for generating latent volatility series. Two simulation dynamics are involved: the asset price (or return) process governed by a real-world probability measure, and the option data related to a risk-neutral probability measure.

SPEAKER: Sean Han, North Carolina State University

TITLE: "Short time-scale in stochastic volatility and option pricing"

ABSTRACT:
The presence of a short time-scale in S&P 500 can be identified by use of the empirical structure function, or variogram, of the high-frequency log absolute returns. We show that a well-separated longer time-scale can be ignored under the pricing measure but not for short time-scale. Option pricing problem under fast-scale volatility is dealt by asymptotic analysis such that the approximated option price takes into account the skew of implied volatility.

SPEAKER: German Molina, Duke University

TITLE: "Bayesian estimation of Stochastic volatility models with long-term and short-term volatility components"

ABSTRACT:
In this talk we propose a multifactor model as an approach to the estimation of different time scales. We describe the multiple move algorithm (Carter & Kohn, 1994, Shephard, 1994) that will allow us to sample the T by K matrix of volatilities at once, where K is the (fixed) number of factors and T the number of univariate observations. The existence of fast and slow time scales imposes additional restrictions that will be added as constraints in our MCMC. We compare the results we obtain when estimating 2-factor simulated data with a 1-factor model versus a 2-factor model, when those factors are associated with different time scales. We will discuss several problems that arise when estimating this model and outline possible future areas of research.

SPEAKER: Rene Carmona, Princeton University

TITLE: "Particle Filtering and Applications"

ABSTRACT:
The purpose of the talk is to present new theoretical results on the asymptotic properties of the optimal filter of a Hidden Markov Model, and to report on numerical experiments with the particle filters. We shall consider engineering applications such as in-car intelligent navigation systems, and financial applications such as volatility tracking and fixed income affine model fitting.

Please direct any questions to Chuanshu Ji (cji@email.unc.edu) or Jean-Pierre Fouque (fouque@math.ncsu.edu).