

AKSOE 10: Award Ceremony: Young Scientist Award for Socio- and Econophysics

Time: Tuesday 16:00–18:00

Location: EW 201

Invited Talk AKSOE 10.1 Tue 16:00 EW 201
Fat-tails and the physics of finance — •LISA BORLAND — Evinine and Associates, Inc., 456 Montgomery Street #800, San Francisco, CA 94104, USA

The dynamics of financial markets and the price formation process is an example of a high dimensional complex system at work. There is a need to understand and model the fluctuations that drive these processes, for purposes such as correctly pricing complicated traded instruments such as options, or for hedging financial risk. At the same time one would like a model that is somewhat intuitive and analytically tractable.

The most popular model, made famous by Black, Scholes and Merton in their Nobel-prize winning work, is essentially a simple Brownian motion, resulting in Gaussian statistics for the price changes. However, real financial time series exhibit a slew of anomalous statistics - or styl-

ized facts - such as persistent fat tails, long-range memory and time reversal asymmetry. We discuss some feasible models, in particular a non-Gaussian model that generalizes the standard one in a way that reproduces many of the stylized facts while still allowing for closed-form solutions which allow efficient pricing of options and other important derivatives such as credit default swaps.

In addition we show that not only the distributions of stock returns and stock indices are fat-tailed, but so are also the distributions of hedge fund strategy returns. This indicates the need - in general - for more efficient control of extreme risks.

— **Presentation of the Young Scientist Award for Socio- and Econophysics 2008** —

— **Awardees Talk** —