

Jean Jacod: “Models for Option Prices: No-arbitrage and Completeness (with P. Protter)

Abstract:

In order to solve the incompleteness problem of most stock prices models with stochastic volatility and/or jumps, we propose to model at once the stock price, together with a large enough family of option prices based on this stock. This is motivated by the fact that options are effectively traded, and thus can in some sense be considered on the same level as stocks themselves. This leads to models akin to the term structure model of Heath, Jarrow and Morton. However, the necessary compatibility between the stock price and the price of options near their expiry date induces a lot of constraints on the model. The aim of the talk is to present such models in a wide generality, to explain which kind of constraints are encountered, and to show how it is possible to characterize arbitrage-free model and sometimes to achieve completeness.