

Jean Jacod

Modeling asset prices: small scale versus large scale

Joint with Yacine Aït-Sahalia

A typical model for the price of a financial asset, allowing for explicit or numerical computation of option prices, hedging, calibration, etc. . . . , describes the price with an horizon of months or years. In contrast, a very active topic now is concerned with models for tick prices or order books. The structure of the price at the microscopic level is very different from the structure of the usual (often continuous) semimartingales used at a macroscopic level. In particular the microscopic prices evolves on the tick grid, usually going up or down by one tick only. Our aim is to see how it is possible to reconcile the two viewpoints, using a scaling limit of tick-level price models. We will see that this question (going back to the thesis of Bachelier, in a sense) raises a number of non trivial questions if we want a reasonably simple microscopic model, together with a macroscopic model exhibiting stochastic volatility or jumps or a drift.