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Stock Price Processes with Infinite Source Poisson Agents

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(Submitted on 30 Jun 2011)

We construct a general stochastic process and prove weak convergence results. It is scaled in space and through the parameters of its distribution. We show that our simplified scaling is equivalent to time scaling used frequently. The process is constructed as an integral with respect to a Poisson random measure which governs several parameters of trading agents in the context of stock prices. When the trading occurs more frequently and in smaller quantities, the limit is a fractional Brownian motion. In contrast, a stable Levy motion is obtained if the rate of trading decreases while its effect rate increases.

Subjects: **Probability (math.PR)**; Pricing of Securities (q-fin.PR)

Cite as: [arXiv:1106.6300v1](#) [math.PR]

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