

A Bayesian Analysis of Return Dynamics with Stochastic Volatility and Levy Jumps

by

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ABSTRACT

We develop Bayesian Markov chain Monte Carlo methods for inferences of continuous-time models with stochastic volatility and infinite-activity Levy jumps using discretely sampled data. Simulation studies show that (i) our methods provide accurate joint identification of diffusion, stochastic volatility, and Levy jumps, and (ii) affine jump-diffusion models fail to adequately approximate the behavior of infinite-activity jumps. In particular, the affine jump-diffusion models fail to capture the infinitely many small Levy jumps which are too big for Brownian motion to model and too small for compound Poisson process to capture. Empirical studies show that infinite-activity Levy jumps are essential for modeling the S&P 500 index returns.