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Chasing volatility

A persistent multiplicative error model with jumps

Massimiliano Caporin * Eduardo Rossi † Paolo Santucci de Magistris ‡

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Abstract

Persistence and unpredictable large increments characterize the volatility of financial returns. We propose the Multiplicative Error Model with volatility jumps (MEM-J) to describe and predict the probability and the size of these extreme events. Under the MEM-J, the conditional density of the realized measure is a countably infinite mixture of Gamma and *Kappa* distributions, with closed form conditional moments. We derive stationarity conditions and the asymptotic theory for the maximum likelihood estimation. Estimates of the volatility jump component confirm that the probability of jumps dramatically increases during the financial crises. The MEM-J improves over other models with fat tails.

Keywords: Multiplicative Error Model, Volatility Jumps, Bipower variation, Volatility-at-Risk

J.E.L. codes: C22, C58, G10

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