



Global jump filters and quasi-likelihood analysis for volatility

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Abstract

We propose a new estimation scheme for estimation of the volatility parameters of a semimartingale with jumps based on a jump detection filter. Our filter uses all of the data to analyze the relative size of increments and to discriminate jumps more precisely. We construct quasi-maximum likelihood estimators and quasi-Bayesian estimators and show limit theorems for them including L^p -estimates of the error and asymptotic mixed normality based on the framework of the quasi-likelihood analysis. The global jump filters do not need a restrictive condition for the distribution of the small jumps. By numerical simulation, we show that our “global” method obtains better estimates of the volatility parameter than the previous “local” methods.

Keywords Volatility · Jump · Global filter · High-frequency data · Quasi-likelihood analysis · Stochastic differential equation · Order statistic · Asymptotic mixed normality · Polynomial-type large deviation · Moment

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