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# Valuing Volatility and Variance Swaps for a Non-Gaussian Ornstein–Uhlenbeck Stochastic Volatility Model

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## Abstract

Following the increasing awareness of the risk from volatility fluctuations, the market for hedging contracts written on realized volatility has surged. Companies looking for means to secure against unexpected accumulation of market activity can find over-the-counter products written on volatility indices. Since the Black and Scholes model require a constant volatility the need to consider other models is obvious. Swaps written on powers of realized volatility in the stochastic volatility model proposed by Barndorff-Nielsen and Shephard are investigated. A key formula is derived for the realized variance able to represent the swap price dynamics in terms of Laplace transforms, which makes fast numerical inversion methods viable. An example using the fast Fourier transform is shown and compared with the approximation proposed by Brockhaus and Long.

Keywords:

Risk
hedging contracts
realized volatility
stochastic volatility
Levy processes
Laplace transforms

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