

Local risk-minimization for Barndorff-Nielsen and Shephard models with volatility risk premium

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Abstract

We derive representations of local risk-minimization of call and put options for Barndorff-Nielsen and Shephard models: jump type stochastic volatility models whose squared volatility process is given by a non-Gaussian Ornstein-Uhlenbeck process. The general form of Barndorff-Nielsen and Shephard models includes two parameters: volatility risk premium β and leverage effect ρ . Arai and Suzuki [1] dealt with the same problem under constraint $\beta = -\frac{1}{2}$. In this paper, we relax the restriction on β ; and restrict ρ to 0 instead. We introduce a Malliavin calculus under the minimal martingale measure to solve the problem.

References

- [1] Arai, T., Suzuki, R.: Local risk minimization for Barndorff-Nielsen and Shephard models. *International Journal of Financial Engineering*, Vol.2, 1550015, 2015.

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