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Non-Gaussian Ornstein–Uhlenbeck-based models and some of their uses in financial economics

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Abstract

Non-Gaussian processes of Ornstein–Uhlenbeck (OU) type offer the possibility of capturing important distributional deviations from Gaussianity and for flexible modelling of dependence structures. This paper develops this potential, drawing on and extending powerful results from probability theory for applications in statistical analysis. Their power is illustrated by a sustained application of OU processes within the context of finance and econometrics. We construct continuous time stochastic volatility models for financial assets where the volatility processes are superpositions of positive OU processes, and we study these models in relation to financial data and theory.