Lévy-driven Stochastic Volatility and COGARCH Models

Abstract

In recent years various attempts have been made to capture the so-called *stylized features* (e.g. tail heaviness, volatility clustering and dependence without correlation) of financial time series using continuous-time models. The interest in continuous-time models stems from their use in modelling irregularly spaced data, their use in financial applications such as option-pricing and the current wide-spread availability of high-frequency data.

The applications of Lévy-driven continuous-time ARMA (CARMA) processes in this context are discussed, with particular reference to their use in extending the stochastic volatility model of Barndorff-Nielsen and Shephard (J.R.S.S.(B), 2001) and constructing continuous-time GARCH(p, q) processes which generalize the COGARCH(1,1) process of Klüppelberg, Lindner and Maller (J.Appl.Prob., 2004).