

Asymmetric Stochastic Conditional Duration Model – A Mixture of Normals Approach

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Abstract

This paper extends the stochastic conditional duration model by imposing mixtures of bivariate normal distributions on the innovations of the observation and latent equations of the duration process. This extension allows the model not only to capture the asymmetric behavior of the expected duration but also to easily accommodate a richer dependence structure between the two innovations. In addition, it proposes a novel estimation methodology based on the empirical characteristic function. A set of Monte Carlo experiments as well as empirical applications based on the IBM and Boeing transaction data are provided to assess and illustrate the performance of the proposed model and the estimation method. One main empirical finding in this paper is that there is a significantly positive "leverage effect" under both the contemporaneous and lagged inter-temporal dependence structures for the IBM and Boeing duration data.

Keywords: Stochastic Conditional Duration model; Leverage Effect; Discrete Mixtures of Normal; Empirical Characteristic Function

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