

Modelling High-Frequency Crude Oil Dynamics Using Affine and Non-Affine Jump-Diffusion Models

Authors : Katja Ignatieva, Patrick Wong

Abstract : We investigated the dynamics of high frequency energy prices, including crude oil and electricity prices. The returns of underlying quantities are modelled using various parametric models such as stochastic framework with jumps and stochastic volatility (SVCJ) as well as non-parametric alternatives, which are purely data driven and do not require specification of the drift or the diffusion coefficient function. Using different statistical criteria, we investigate the performance of considered parametric and nonparametric models in their ability to forecast price series and volatilities. Our models incorporate possible seasonalities in the underlying dynamics and utilise advanced estimation techniques for the dynamics of energy prices.

Keywords : stochastic volatility, affine jump-diffusion models, high frequency data, model specification, markov chain monte carlo

Conference Title : ICMCF 2023 : International Conference on Mathematical and Computational Finance

Conference Location : Singapore, Singapore

Conference Dates : March 27-28, 2023