SERDAR NESLIHANOĞLU

Eskisehir Osmangazi University, Turkey

FATMA ÖZGÜ SERTTAŞ

Ankara Yıldırım Beyazıt University, Turkey

SIMULATIONS OF STATE SPACE MODEL WITH ALPHA-STABLE ERRORS IN FINANCIAL TIME SERIES

Abstract:

In this study, we focus on state space models with the family of alpha-stable distributions via Kalman filter in financial time series data. Alpha-stable distributions are a broad class of distributions including the Gaussian distribution as a special case. In addition, alpha-stable distributions are commonly used to capture extreme events in financial time series data. For the linear system, Kalman filter is a successful technique for estimating latent states of dynamical system from observed time series data in many applications including financial and economics data. To obtain a robust estimation framework in any financial time series application, we newly simulate different specifications of state space model such as random walk, random coefficient and mean reverting based on alpha-stable errors via Kalman filtering in R Software. The simulation results show a solution to the robust filtering for state-space model with alpha-stable errors in financial time series.

Keywords:

State-Space Model, Alpha-stable distribution, Filtering,Financial Time Series

JEL Classification: C10, C15, C13