

A second-order jump diffusion model with application to stock market returns Version 3

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Abstract

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Protocol

A NEW MODEL FOR STOCK MARKET RETURNS

Step 1.

create a new second-order jump diffusion, in which the drift is clearly linear, the diffusion is a convex function and poisson jump.

ESTIMATION OF MODEL

Step 2.

construct maximum likelihood estimation of the model in order to obtain the coefficient estimators using sequential quadratic programming with the “fmincon” routine embedded in the optimization toolbox of Matlab.

A FORMAL STATISTICAL TEST FOR THE PRESENCE OF JUMPS

Step 3.

employ the likelihood ratio test statistic for testing the presence of jumps in the stock and stock index returns.

MONTE CARLO SIMULATION STUDY

Step 4.

conduct a monte carlo simulation experiment for the new second order diffusion model aimed at evaluating the performance of our estimation approach. Here, we generate 100 replications (paths) of dataset according to our design with each replication consisting of (n=2520) observations.

 [DATASET](#)

 [simulated data {X}](#) 

EMPIRICAL ANALYSIS ON REAL-WORLD DATA

Step 5.

empirical analysis of stock market data from America, Asia and Europe. As an example, the Microsoft stock log-price and returns are provided. Other stocks have similar statistical characterization; obtain the parameter estimates of the proposed models for the stocks and stock indexes.

 [DATASET](#)

 [stocks](#) 