and methodologies

Bayesian MCMC estimation

PER:

Model Risk Measures:

TMR:

The joint dynamics of the daily spot and option prices upon discretization:

The description of all parameters can be found in the paper. \( PE_{\Delta t}(\Theta; Y, V) = \alpha_{\Delta t} + \mu PE_{\Delta t}(\Theta; Y, V) + \sigma \epsilon_{\Delta t} \Delta t. \)

Further: We consider five models with different jump specifications:

\( N^X \sim N^Y \) denotes the Poisson process with rate \( \lambda^X \), \( N^Y \) is normally distributed with mean \( \mu_Y \) and volatility \( \sigma_Y \);

\( X^Y(t) = X^Y(0) + \int_{0}^{t} \delta d\bar{N} \)

\( \eta, t \in \mathbb{R} \)

\( \alpha, \sigma \)

Further Results

Explaining Pricing Error with Model Risk

Is that necessary to measure PER and MSR separately?

Let \( \alpha(\Theta) \) represent the absolute pricing error of option \( \Theta \).

\( \alpha(\Theta) = \beta_0 + \beta_1 \text{PER}(\Theta) + \beta_2 \text{MSR}(\Theta) + \epsilon. \)

Test whether \( \alpha = 0 \).

References

See Table 1 for details.

SVLS has the smallest MSR, while SVVG has the lowest PER and TMR.

All jump models have significantly smaller TMR compared with SV.

A short position bears a greater model risk.

Further: Investigate the model risk of high-dimensional models.

Model Risk from 1996 to 2017. The size of the grey line is the MSR.