Risk Premium Inference from (Noisy) Option Price Panels: Monte Carlo Evidence

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Brief Description of Research Idea

Compare the finite sample performance of implied state vs. particle filtering when conducting joint $\mathbb{P}$-$\mathbb{Q}$ estimation on noisy option price panels focusing on the implications this has for recovered (equity) risk premium components and their error distributions/confidence bands.

Tentative Outline of Building Blocks

1. Implement an efficient simulation scheme for a Heston (Heston, 1993) state space simulation and associated option price panels.

2. Implement IS estimation à la Boswijk et al. (2015).

3. Implement particle filtering à la Hurn et al. (2015).

4. No noise/best case.

5. Noisy option panel case with an assorted menu of assumptions regarding option price error distributions.

Rationale

A. Noisy option data is something I had to deal with both for the first two papers, outside academia and having spent some more time looking at post 2018 academic work it seems that this is an emerging topic with a few papers that touch on this in a different context: Andersen et al. (2021), Duarte et al. (2019).

B. Topic itself ties in well with the other two papers in my thesis.

C. I have sufficient background to work on this independently.

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