

Financial Mathematics/Engineering Seminar Series

The Microstructure of Stochastic Volatility Models with Self-Exciting Jump Dynamics

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Abstract

We provide a general probabilistic framework within which we establish scaling limits for a class of continuous-time stochastic volatility models with self-exciting jump dynamics. In the scaling limit, the joint dynamics of asset returns and volatility is driven by independent Gaussian white noises and two independent Poisson random measures that capture the arrival of exogenous shocks and the arrival of self-excited shocks, respectively. Various well-studied stochastic volatility models with and without self-exciting price/volatility co-jumps are obtained as special cases under different scaling regimes. We analyze the impact of external shocks on the market dynamics, especially their impact on jump cascades and show in a mathematically rigorous manner that many small external shocks may trigger endogenous jump cascades in asset returns and stock price volatility. The talk is based on joint work with Wei Xu.

About the speaker

Ulrich Horst is a full professor at Department of Mathematics in Humboldt University of Berlin. He is also affiliated to School of Business and Economics. From 2007-2011, he was the scientific director of the quantitative product laboratory sponsored by Deutsche Bank. From 2012-2018, he was the department head. He holds visiting professorship of several institutes including National University of Singapore, University Paris Dauphine etc. Currently he is the editor in chief of Mathematics and Financial Economics. Ulrich Horst is an expert in game theory, market microstructure and limit order books.

Date

23 June 2021 (Wed)
(HK Time)

Time

4:00pm – 5:00pm (HK
Time)

Zoom

<https://cityu.zoom.us/j/91686290566?pwd=UE1rOEM5RU4remdCVWhKQm g5ZFFqQT09>

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