

The 3rd Asian Quantitative Finance Seminar (AQFS)

Host: The PolyU-SDU Joint Research Center on Financial Mathematics and the CAS AMSS-POLYU Joint Laboratory of Applied Mathematics, The Hong Kong Polytechnic University. The invited talk is sponsored by Centre for Quantitative Finance, National University of Singapore.

- Date & Time: 9:00am-11:30am, Saturday, Oct. 17, 2020 (HK Time Zone, GMT +8)
 - ZOOM Meeting ID: **929 1057 7698** Passcode: **1017**
 - Free registration via
https://polyu.zoom.us/meeting/register/tJYkdumtqTwsE9xu35Qd-W95I_4KDzNN0CTC
-

Programme

8:40am --- 9:00am Registration

Invited talk:

Title: *Reinforcement Learning via Stochastic Control*

Authors: *Xun Yu Zhou* (Columbia University)

Session Chair: *Zuo Quan Xu*, The Hong Kong Polytechnic University

9:00am --- 9:50am Presentation by *Xun Yu Zhou*

9:50am --- 10:00am Q&A

Paper 1:

Title: *How does the Introduction of Hidden Orders Affect Limit Order Markets?*

Authors: *Yuanyuan Chen* (Nanjing University), *Steven Kou* (Boston University)

Session Chair: *Xiang Yu*, The Hong Kong Polytechnic University

10:00am --- 10:20am Presentation by *Yuanyuan Chen*

10:20am --- 10:30am Discussion by *Ningyuan Chen*, University of Toronto

10:30am --- 10:35am Q&A

Paper 2:

Title: *Large Shareholder Premium*

Authors: *Weihuan Huang* (Fudan University and Shandong University), *Chenghu Ma* (Fudan University), *Yuhong Xu* (Soochow University)

Session Chair: *Xun Li*, The Hong Kong Polytechnic University

10:35am --- 10:55am Presentation by *Yuhong Xu*

10:55am --- 11:05am Discussion by *Lihong Zhang*, Tsinghua University

11:05am --- 11:10am Q&A

Scientific Committee

Jiro Akahori (Ritsumeikan U); Nan Chen (CUHK); Zengjing Chen (Shandong U); Min Dai (NUS); Masaaki Fukasawa (Osaka U); Xin Guo (UC Berkeley); Ying Hu (Univ Rennes); Hanqing Jin (Oxford); Wanmo Kang (KAIST); Steven Kou (Boston U); Yue-Kuen Kwok (HKUST); Duan Li (CityU of Hong Kong); Zhongfei Li (SYSU); Zongxia Liang (Tsinghua U); Jin Ma (USC); Huyen Pham (Paris 7); Shanjian Tang (Fudan U); Jie Xiong (SUSTech); Jingping Yang (Peking U); Jiongmin Yong (UCF); and Xunyu Zhou (Columbia U).

Abstract

Reinforcement Learning via Stochastic Control

Xun Yu Zhou

Columbia University, xz2574@columbia.edu

While most existing reinforcement learning (RL) research is in the framework of Markov Decision Processes (MDPs), it is important and indeed necessary, both theoretically and practically, to consider RL in continuous time with continuous feature and action spaces, for which stochastic control theory offers a natural underpinning. The related research is still in its infancy, and this talk reports some of the latest developments and suggests several directions for investigation.

How does the Introduction of Hidden Orders Affect Limit Order Markets?

Yuanyuan Chen

Nanjing University, yychen@nju.edu.cn

Steven Kou

Boston University, kou@bu.edu

Hidden orders are widely used in major exchanges. We study how these orders affect markets by introducing hidden orders to the limit order market model in Foucault et al. (2005). In particular, we build an infinite-time horizon equilibrium model with multiple price levels and unknown hidden order queues. By extending the algorithm in Pakes and McGuire (2001), we investigate the equilibrium outcomes. We find that the introduction of hidden orders (including the hidden limit orders and the midpoint peg orders) would increase the welfare of patient traders, may slightly harm the impatient traders, and benefit market liquidity.

Large Shareholder Premium

Weihuan Huang

Fudan University and Shandong University, hwh@fudan.edu.cn

Chenghu Ma

Fudan University, machenghu@fudan.edu.cn

Yuhong Xu

Soochow University, yuhong.xu@hotmail.com

We develop a theoretical model to study investors' trading behavior in the presence of large shareholders' influence on a firm's equity performance. We show that, for a good stock, large shareholders may invest a higher proportion of their wealth in the firm than small investors, and smart small investors may invest more heavily than those naive small investors. Insight is also cast into the impacts of board structure on the firm's equity when the firm is with several large influential shareholders: (i) the large shareholders collude in trading, and each tends to invest more aggressively in the companion of other large shareholders, and (ii) firms with sole ownership can outperform those with dispersed ownerships, would the impact coefficient of the former case exceed or coincide with the aggregated impact coefficients of the latter.