



DEPARTMENT OF APPLIED MATHEMATICS

應 用 數 學 系

**The Hong Kong Polytechnic University  
Department of Applied Mathematics**

**Colloquium**

**A Stackelberg Order Execution Game**

by

**Professor Donglei Du**

**University of New Brunswick**

**Abstract**

We consider a sequential order execution differential game over a finite time horizon in the Stackelberg duopoly framework, complementing the simultaneous Nash game investigated by Carlin et al. (2007). There are one risk-neutral leader and one risk-neutral follower who maximize their expected trading payoffs respectively by trading the same risky asset whose price dynamic follows the well-known stochastic linear-price market impact model of Bertsimas and Lo (1998 and Almgren and Chriss (2001). We derive a closed-form solution for the unique open-loop Stackelberg equilibrium. We then develop new and complementary managerial insights by looking at the equilibrium behavior in terms of trading rates, positions, price dynamics, first mover's advantage, and trading horizon effect. We also emphasize key differences between our sequential game and the aforementioned simultaneous Nash game along the way.

**Date : 29 May, 2018 (Tuesday)**

**Time : 11:00a.m. – 12:00noon**

**Venue : TU801, The Hong Kong Polytechnic University**

**\*\*\* ALL ARE WELCOME \*\*\***