Statistical Sciences
UNIVERSITY OF TORONTO

SEMINAR

February 4, 2016 at 3:30pm

Refreshments will be provided at 3:15pm

Sidney Smith Hall, Room 2106

Speaker: Tim Leung, Columbia University

Host: Jamie Stafford

Optimal Multiple Stopping Problems Under Mean-Reverting Dynamics

In this talk, we study the optimal timing of trades under mean-reverting price dynamics subject to fixed transaction costs. An optimal double stopping approach is formulated to determine the optimal times to enter and subsequently exit the market when prices are driven by an Ornstein-Uhlenbeck (OU), exponential OU, or CIR process. In addition, we analyze a related optimal switching problem with an infinite sequence of trades, and identify the conditions under which the double stopping and switching problems admit the same optimal entry and/or exit timing strategies. Among our results, we find that the investor generally enters when the price is low. However, under the exponential OU model, it is optimal to wait if the current price is sufficiently close to zero, leading to a disconnected continuation region for entry. We further apply an optimal multiple stopping approach to futures trading over a finite horizon, and provide numerical illustration of the optimal strategies. A number of related financial applications will also be discussed.

Bio: Tim Leung is an Assistant Professor at Columbia University's Industrial Engineering and Operations Research (IEOR) Department. He is also an affiliated faculty member of the Center for Financial Engineering, and Data Sciences Institute at Columbia. He received a PhD in Operations Research & Financial Engineering (ORFE) from Princeton University. Dr Leung's research areas are Financial Engineering and Optimal Stochastic Control, with a focus on the valuation of financial derivatives, and associated risk management and trading strategies. His research has been funded by the National Science Foundation (NSF) and the financial industry. He has published in various Financial Mathematics and

Applied Probability journals, including Mathematical Finance, Finance and Stochastics, Stochastic Processes & Applications, and SIAM Journals, along with two books on Optimal Mean Reversion Trading and Leveraged Exchange-Traded Funds. He is also an officer of the SIAM SIAG on Financial Mathematics and Engineering, and the INFORMS Finance Section.