Colin B. Swaney

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Education

UNIVERSITY OF IOWA
Ph.D. Finance   2012-2017

UNIVERSITY OF IOWA
M.Sc. Mathematics   2009-2011

KANSAS STATE UNIVERSITY
B.Sc. Mathematics and Economics   2005-2009

Research Interests

Market microstructure and high-frequency trading; econometrics and machine learning; empirical and theoretical asset pricing.

Job Market Paper (in progress)

Order Book Events on a Poisson Network

Abstract

In this paper, I explore the dynamics of a fully electronic limit order book. Using recent advances from the field of machine learning, I demonstrate how to estimate a continuous-time, event-driven model of market dynamics in a fully Bayesian fashion. I estimate the model on a dataset of event messages from the Nasdaq exchange and use these estimates to calibrate an order book simulator. The order book simulator serves dual purposes. First, I use it to evaluate the model's ability to reproduce phenomena that the model was not specifically designed to replicate, such as the distribution of spreads and returns. Second, the simulator acts as a plausible method for evaluating the fitness of algorithmic trading strategies, taking into account the actions of the trading algorithm.

Working Papers

Price Formation and the Shape of Limit Order Books

Abstract

In this paper, I construct a unique dataset of reconstructed Nasdaq limit order books that tracks order book activity at ultra high-frequency. With a view towards exploring the information content of limit orders, as opposed to market orders, I propose a factor model of the book shape. Fitting this model on over 20,000 stock-days, I find that the limit order book comprises three common factors, which I characterize as level, slope, and curvature. Combining these factors alongside price increments in a vector autoregression, I

demonstrate that the factors not only explain limit order book shape but also predict returns over one-minute time intervals. Finally, in agreement with the claim that high-frequency traders serve a role in increasing market efficiency, I show a negative correlation between predictability and high-frequency trade activity.

Evaluating Fund Manager Skill: A Mixture Model Approach

Abstract

Evaluating the performance of actively managed equity mutual funds is among the most important topics in the field of finance. In this paper, I present a new assessment of the stock-picking ability of actively-managed funds that accounts for the occurrence of false positives, an issue that complicates traditional assessments. I find that while the data is consistent with a small group of alpha-generating funds, the composition of this population experiences significant annual turnover and is, therefore, difficult to identify ahead of time. Between 1975 and 2015, the returns to a fund selection strategy based on the classification method fail to generate alpha.

Publications

Swaney, Colin *et al.* 2015. Efficient Skin Segmentation via Neural Networks: HP-ELM and BD-SOM. *Procedia Computer Science* 53: 400-409. (Presented at *INNS Big Data* 2015)

Teaching

UNIVERSITY OF IOWA
Teaching Assistant   2012-2017

▸   Financial Management, Investments, Corporate Finance.

Skills

GENERAL PROGRAMMING
Python, C, CUDA, UNIX/Linux, High-Performance Computing (HPC)

SCIENTIFIC AND DATA PROGRAMMING
MATLAB, R, SAS, PostgreSQL

OTHER PROGRAMMING
LaTeX, HTML, CSS, Git