

Market Design and Regulation in the Presence of High-Frequency Trading

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Organized by Global Research Unit (Department of Economics, City University of Hong Kong), Center for Analytical Finance (University of California, Santa Cruz)

Presentation Abstracts

Peter L. Bossaerts

Keynote address: Experimenting with human-robot interaction in financial markets

Abstract:

In recent years, finance academics have attempted to determine the benefits and drawbacks of robot trading by investigating historical data from field markets where robots were introduced. Because of absence of control of major forces influencing the introduction, only little can be learned from this approach. The talk discusses recent attempts to apply the scientific method to studying financial markets in general and algorithmic trading in particular. Central to this endeavour is creation of a laboratory, called Flex-E-Markets. This is an online marketplace where humans and robots can trade multiple securities in a controlled setting. A brief history of experiments with financial markets will be provided, before focusing on human-robot interaction. The talk will end with a presentation of a new method of teaching algorithmic trading, centred on hands-on experience with robots in a laboratory setting, like a traditional robotics class in engineering.

Allison Bishop

Keynote address: The Evolution of the Crumbling Quote Signal

Abstract:

In this paper, we illuminate the origins of the crumbling quote signal employed by IEX, provide detailed analyses of its performance, and discuss its continuing evolution.

Elvira Sojli (with Ioanid Rosu and Wing Wah Tham)

Title: Quotes, Trades and the Cost of Capital

Abstract:

We study the quoting activity of market makers in relation with trading, liquidity, and expected returns. Empirically, we find larger quote-to-trade (QT) ratios in small, illiquid or neglected firms, yet large QT ratios are associated with low expected returns. The last result is driven by quotes, not by trades. We propose a model of quoting activity consistent with these facts. In equilibrium, market makers monitor the market faster (and thus increase the QT ratio) in neglected, difficult-to-understand stocks. They also monitor faster when their clients are less risk averse, which reduces mispricing and lowers expected returns.

Susan Thomas (with Nidhi Aggarwal and Venkatesh Panchapagesan)

Title: When do regulatory hurdles work?

Abstract:

The paper analyses two instances when an orders-to-trades ratio fee was used as a hurdle to algorithmic trading in the Indian equity market. In the first instance, the fee was charged to manage the increased load on limited exchange bandwidth, while in the second, the fee was used to alleviate public interest concerns. We use a difference-in-difference estimation strategy to identify the causal impact of the fee. We find that the first fee reduced orders-to-trades on average, liquidity improved and liquidity risk decreased as a consequence. The second fee had little or no change in the orders-to-trades ratio or market quality. We conclude that interventions with clearly defined objectives are more likely to realise desired outcomes.

Vladyslav Sushko (with Ingomar Krohn)

Title: Liquidity in FX spot and forward markets and the rise in liquidity droughts

Abstract:

This paper assesses liquidity conditions in foreign exchange (FX) spot and derivatives markets using intra-day data against the background of FX dealers' response to recent regulatory changes. Given that FX swap markets are by some measures even deeper than the spot market, an assessment of FX liquidity requires taking such instruments into account. We find that spot and swap market liquidity is intimately linked. Furthermore, the co-movement between FX funding and market liquidity, as gleaned from the pricing of both types of instruments, has increased over time. This development relates to dealer balance sheet capacity. While top dealers continue to dominate liquidity provision in spot, they tend to pull back from market making in FX swaps around regulatory reporting periods. This shifts market-making activity in FX derivatives towards smaller, more expensive and less informed, dealers, and also results in adverse spillovers to liquidity conditions in spot markets.

Darya Yuferova (with Mario Bellia, Lorian Pelizzon, Marti G. Subrahmanyam and Jun Uno)

Title: Coming Early to the Party

Abstract:

We examine the strategic behavior of High Frequency Traders (HFTs) during the pre-opening phase and the opening auction of the NYSE-Euronext Paris exchange. HFTs actively participate, and profitably extract information from the order flow. They also post “flash crash” orders, to gain time priority. They make profits on their last-second orders; however, so do others, suggesting that there is no speed advantage. HFTs lead price discovery, and neither harm nor improve liquidity. They “come early to the party”, and enjoy it (make profits); however, they also help others enjoy the party (improve market quality) and do not have privileges (their speed advantage is not crucial).

Ester Félez-Viñas (with Björn Hagströmer)

Title: Call Auction Volatility Extensions

Abstract:

Volatility extensions in closing auctions are designed to improve the efficiency of the closing price. We find that the introduction of a volatility extension indeed leads to a reduction in extraordinary closing price volatility. We hypothesize and find evidence that the effect is driven by improvements in market integrity and trust in the auction mechanism. In particular, we show that market manipulation strategies are deterred. Our findings provide guidance to policy-makers, who are due to introduce similar mechanisms at NYSE and NASDAQ in 2017. In the EU, call auction volatility curbs will become mandatory under MiFID II in 2018.

Bart Zhou Yueshen (with Shiyang Huang)

Title: Speed Acquisition

Abstract:

Speed has become a signature of modern financial markets. This paper studies investors' endogenous speed acquisition, alongside their information acquisition. In equilibrium, speed heterogeneity endogenously arises across investors, temporally fragmenting the process of price discovery. A deterioration in long-run price efficiency ensues. Intra- and intertemporal competition among investors drive speed and information to be either substitutes or complements. The model cautions the dysfunction of information aggregation in financial markets: An advancement in the information technology might worsen price efficiency, because it can endogenously complement investors' speed acquisition, further fragmenting the price discovery process and hurting price discovery.

G. Nathan Dong (with Wan-Jiun Paul Chiou and Alejandro Serrano)

Title: Transparency in the Equity Market: Evidence from a Natural Experiment

Abstract:

Transparency has been promoted by the SEC as a measure that can reduce transaction costs and increase liquidity. However, theoretically, there are scenarios under which transparency might harm trading and some degree of opaqueness may be desirable for certain types of investors. The existing empirical evidence is still inconclusive as the benefits of transparency are not entirely positive across different markets. This paper contributes to the transparency literature by using the implementation of the National Market System (NMS) as an exogenous shock to the post-trade transparency (price information after a trade) in the equity market and measuring its effect on transaction costs. Our sample covers the period when new technology was first introduced on NASDAQ and the implementation of second tier firms in the NMS. The main finding of our study—that the improvement of information quality after a trade as a result of the stock being included in the NMS reduces the quoted spreads and

return volatility—will help guide the creation of comprehensive policies that can effectively maintain a fair and orderly stock market.

Jonathan Brogaard (with Matthew Baron, Björn Hagströmer and Andrei Kirilenko)

Title: Risk and Return in High-Frequency Trading

Abstract:

We study performance and competition among high-frequency traders (HFTs). We construct measures of latency and find that differences in relative latency account for large differences in HFTs' trading performance. HFTs that improve their latency rank due to colocation upgrades see improved trading performance. The stronger performance associated with speed comes through both the short-lived information channel and the risk management channel, and speed is useful for a variety of strategies including market making and cross-market arbitrage. We explore implications resulting from competition on relative latency and find support for various theoretical predictions.

Thomas Ruf (with Haoming Chen, Sean Foley and Michael A. Goldstein)

Title: The Value of a Millisecond: Harnessing Information in Fast, Fragmented Markets

Abstract:

We examine the introduction of an asymmetric, randomized speed bump that exempts certain limit orders, allowing low-latency liquidity providers to avoid order-flow driven adverse selection by reacting to activity on other venues. The speed bump segments order flow and increases profits for fast liquidity providers on that venue at the expense of other liquidity providers and aggregate market quality. The negative effects are concentrated in stocks more exposed to immediate adverse selection ex-ante. Our findings have implications for the speed bump debate and speed differentials more generally, as well as the regulation of market linkages across fragmented trading venues.

Eric Aldrich (with Daniel Friedman)

Title: Order Protection through Delayed Messaging

Abstract:

Several financial exchanges have recently introduced messaging delays (e.g., a 350 microsecond delay at IEX and NYSE American) intended to protect ordinary investors from high-frequency traders who exploit stale orders. We propose an equilibrium model of this exchange design as a modification of the standard continuous double auction market format. The model predicts that a messaging delay will generally improve price efficiency and lower transactions cost but will increase queuing costs. Some of the predictions are testable in the field or in a laboratory environment.