MANIPULATING ALGORITHMIC MARKETS*

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(Job Market Paper)

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Abstract

This paper develops a new methodology for causal price impact in high-frequency financial markets to study a widespread form of market manipulation and its consequences. I identify directly from data when a trader takes both sides of the same transaction but instead of letting orders cross uses a compliance tool to prevent legal exposure. This functionality is offered by every major exchange and in US futures markets its default use option allows the tool to be exploited strategically. This form of self-trading can effectively signal demand at artificial prices and result in disproportionate liquidity removal from markets. I introduce a source of variation that generates systematic differences in information exposure to traders. This leverages an institutional feature of electronic limit order books where as-good-as random delays between when a trade happens and the market learns about it can be used to assign treatment. By comparing trades occurring almost at the same time facing an identical information set, except for the news about a reference trade, I implement an empirical approach that estimates dynamic responses robust to microstructure noise and confounders. My findings show that self-trading successfully moves prices in the direction that benefits the trader, both by making liquidity providers revise quotes and enticing others to trade. I then use these estimates to quantify the role of self-trading in flash events: brief moments of substantial price increases or declines. Using a causal attribution framework, I separate information shocks — price adjustments based on news — from manipulative price impact to be able to assess the role of each factor individually and in combination. I find that almost 10% of flash events in US futures markets are driven by attracting others to trade in the direction consistent with profitable self-trading.

*I thank Dan Bernhardt, Matthieu Gomez, John Griffin, Harrison Hong, Scott H. Irwin, Andrei Kirilenko, Tatiana Mocanu, Conner Naughton, Alexei Orlov, Noémie Pinardon-Touati, Michel Robe, José Scheinkman, Simon Schmickler, and participants at the Commodity & Energy Markets Association Annual Meeting and the Financial Economics Colloquium at Columbia University for helpful comments and suggestions. I also thank the CME Global Command Center for discussions on CME's Globex infrastructure and for providing data. No trading strategy or conduct is linked to identifiable market participants in this study. The Office of Futures and Options Research (OFOR) at UIUC generously provided funding.
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