

IEX Project – Quoting Behavior and Information Leakage

I. Outline and Proposal

It is well known that orderbook imbalance drives many trading strategies, particularly strategies that are high-frequency in nature^[1]. It is clear why market participants, especially those who require large fills quickly, can be worried about how their activity negatively impacts the order book and thus their strategy. The question of whether to join the NBBO on an exchange or post the current NBB on the book of another exchange gives way to interesting analysis. If one were to have a merged view of all venue's books, then intuitively it would not matter where you post your bids, the only information leaked is the increase in demand at the NBB. However, I would like to further investigate how a venue's specific microstructure and design (speed bumps, order matching system, fees) can impact quoting behaviour on that venue's order book. In addition, I would also investigate how concepts such as opening and closing imbalance trading activities, as well as the depth of a venue's specific book can provide further insight to the proposed question.

II. Methodology and Ideas for Approach

- i. Python – IEX Cloud Framework – Using the IEX Cloud API, and specifically the Investors Exchange Data fields such as Last, DEEP, and Stats Summaries, I want to set up a working environment in Python to recreate the order book. Specifically, I would need to recreate the book at timestamps before and after NBB bids in order to examine potential impacts. To approach this, I will make use of existing Python libraries and the IEX Cloud API docs^[2]
- ii. Metrics for Order Book Impact - To start analyzing the impact of NBB orders on a book, I will try to recreate current literature using my Python framework in attempt to find robust relationships between posting NBB bids and the price impact thereafter. For example, a study by Cont et al. suggests a linear relationship between order flow imbalance and price changes and an inverse relationship with the market depth. To test this, I would draw comparisons on new BBO creation impacts on securities with a deep order book, and that of securities with less depth.

III. Personal Profile

There are a few reasons why I believe I am a good candidate for this project. Firstly, I have industry experience related to market microstructure. As a Market Data Analyst for IRESS I assisted in the data integration and data maintenance process with exchanges across Canada. It was in this role that I was introduced to concepts such as Level 2 data, the NBBO, and how different venues handle incoming orders. Secondly, I am comfortable applying technical and quantitative methods in a data-driven environment. As a Quantitative Analyst for Metric Asset Management, I used Python to stream live price data from the Bloomberg API and integrated this into a GUI that displayed real-time trading signals. Lastly, I am passionate and curious about various topics incorporated in this project as I hope to pursue a career that involves knowledge of market microstructure and execution strategies. I enjoy learning about this particular aspect of financial markets as I believe it is intellectually stimulating, incredibly important to the industry, and there is great opportunity to advance the field through technology and quantitative research.

IV. References

1. Álvaro Cartea, Ryan Donnelly & Sebastian Jaimungal (2018) Enhancing trading strategies with order book signals, Applied Mathematical Finance, 25:1, 1-35, DOI: [10.1080/1350486X.2018.1434009](https://doi.org/10.1080/1350486X.2018.1434009)
2. <https://iextrading.com/developer/docs/#unofficial-libraries-and-integrations>
3. Rama Cont, Arseniy Kukanov, Sasha Stoikov, The Price Impact of Order Book Events, Journal of Financial Econometrics, Volume 12, Issue 1, Winter 2014, Pages 47–88,