



THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Robust High Frequency Trader

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ABSTRACT

In this thesis, we incorporate ambiguity aversion to a high frequency trader's decision making in the standard contexts of optimal execution and optimal limit order book placement problems formulated by Jaimungal et al (2013, 2014, 2015). We attempt to answer the following questions: 1) how does ambiguity aversion distort a trader's execution rate and his management between market impact and future price movement?; 2) how does the presence of another trader influence the liquidator's trading rate and would ambiguity aversion weigh equal to both traders?; 3) how would a market maker post his bid/ask spreads if he fears that the mid-price drift, the market order arrival rate and the fill probabilities are misspecified?; and finally 4) how would model uncertainty arising from the mid-price volatility process shed new light to the existing market making literature? To answer these questions, we use minimax decision theory to find decision rules that are robust to model misspecification under both Hansen-Sargent framework and G-expectation.

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