

THE STIGLER-LUCKOCK MODEL FOR A LIMIT ORDER BOOK

Abstract

One of the types of modern-day markets are so-called order-driven markets whose core component is a database of all incoming buy and sell orders (order book). The main goal of this thesis is to extend the Stigler-Luckock model for order books to give a better insight into the price forming process and behaviour of the market participants themselves. The model introduced in this thesis focuses on a comparison of behaviour and various strategies of market makers who are sophisticated market participants profiting from extensive trading. The market is described using Markov chains, and the strategies are compared using Monte Carlo simulations and game theory. The results showed that market makers' orders should have small spread and large volumes. The final model compares two strategies in which market makers monitor their portfolio. In case of having more cash than asset (or vice versa), they shift prices of their orders to equalise the portfolio. The model recommends checking the market quite often, but acting conservatively, which means not changing prices that frequently and not jumping to conclusions just from a small imbalance in the portfolio.