(Cambridge University Press, 2015)

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‘Lobster Seminar’
Book’s Structure

• Part I, II and III
• Appendix A
• Bibliography
• Glossary
• Subject Index
• 12 Chapters
• Part I: Chapters 1-4
• Part II: Chapter 5
• Part III: Chapters 6-12
Parts’ Titles

- Part I: Microstructure and Empirical Facts
- Part II: Mathematical Tools
- Part III: Algorithmic and High-Frequency Trading
Part I Description

Starts with a description of the basic elements of electronic markets and the main ways in which people participate in the market: as active traders or as market makers.
Part II Description

• Part II develops mathematical tools for the analysis of trading algorithms.
• Contains a chapter on stochastic optimal control and stopping problems.
Part III Description

• Delves into the modeling of algorithmic trading strategies.
Part I: Chapters 1-4

1. Electronic Markets and the Limit Order Book
   1.1 Electronic markets and how they function
   1.2 Classifying Market Participants
   1.3 Trading in Electronic Markets
      1.3.1 Orders and the Exchange
      1.3.2 Alternate Exchange Structures
      1.3.3 Colocation
      1.3.4 Extended Order Types
      1.3.5 Exchange Fees
   1.4 The Limit Order Book
   1.5 Bibliography and Selected Readings
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   2.1.1 Grossman–Miller Market Making Model
   2.1.2 Trading Costs
   2.1.3 Measuring Liquidity
   2.1.4 Market Making using Limit Orders

2.2 Trading on an Informational Advantage

2.3 Market Making with an Informational Disadvantage
   2.3.1 Price Dynamics
   2.3.2 Price Sensitive Liquidity Traders

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• 3.1.1. The Data
• 3.1.2. Daily Asset Prices and Returns
Part I: Chapters 1-4

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3.1.4 Daily Price Predictability

3.2 Asset Prices and Returns Intraday

3.3 Interarrival Times

3.4 Latency and Tick Size

3.5 Non-Markovian Nature of Price Changes

3.6 Market Fragmentation

3.7 Empirics of Pairs Trading

3.8 Bibliography and Selected Readings
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4.2 Intraday Activity
   4.2.1 Intraday Volume Patterns
   4.2.2 Intrasecond Volume Patterns
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4.3 Trading and Market Quality
   4.3.1 Spreads
   4.3.2 Volatility
   4.3.3 Market Depth and Trade Size
   4.3.4 Price Impact
   4.3.5 Walking the LOB and Permanent Price Impact

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4.5 Hidden Orders

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5.2 Examples of Control Problems in Finance
   5.2.1 The Merton Problem
   5.2.2 The Optimal Liquidation Problem
   5.2.3 Optimal Limit Order Placement

5.3 Control for Diffusion Processes
   5.3.1 The Dynamic Programming Principle
   5.3.2 Dynamic Programming Equation / Hamilton–Jacobi–Bellman Equation
   5.3.3 Verification

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5.5.2 Dynamic Programming Equation
Combined Stopping and Control
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6.4 Optimal Acquisition with Terminal Penalty and Temporary Impact
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6.6 Execution with Exponential Utility Maximiser
6.7 Non-Linear Temporary Price Impact
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Optimal Execution with Continuous Trading II

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    7.3.1 Probabilistic Interpretation
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Bibliography
Glossary
Subject index
Datasets and Matlab code

- http://www.algorithmic-trading.org
Data (several sources)

- Yahoo!Finance
- Center for Research in Security Prices (CRSP)
- ITCH ()