Computational Investing

From Quantitative Analysis Software Courses

Contents

Lesson 1: So you want to be a hedge fund manager?

- Introduce investing from a hedge fund manager's point of view

Reading: "What Hedge Funds really do", Chapter 2: So you want to be a hedge fund manager?

Lesson 2: Market mechanics

- How exchanges operate
- How orders arrive, are executed
- Buy, sell, market/limit
- Crashes

Reading: "What Hedge Funds really do", Chapter 4: Market - making mechanics

Lesson 3: What is a company worth?

- Why does it matter?
- Prop: Magic money-making machine
- Mismatch between what a company is worth and how they are valued in the market
- Take into account dollars in the future

Reading: "What Hedge Funds really do", Chapter 5: Introduction to company valuation

Lesson 4: The Capital Assets Pricing Model (CAPM)

- One of the fundamental discoveries/advances in finance
- To estimate how much a stock will go up or down, multiply market movement with beta for the stock

Reading: "What Hedge Funds really do", Chapter 7: Framework for investing: The Capital Assets Pricing Model (CAPM)

Lesson 5: How hedge funds use the CAPM

- Use CAPM to figure out ratio in which you want to buy/sell stocks, go long/short
- Time scale: Change allocations weekly - monthly
- Potentially applicable to high-frequency trading

Lesson 6: Technical Analysis

- Ways to generate some sort of forecast about a stock, looking at recent volume and prices
- Contrast this with using fundamental data about a company
- Indicators (like Bollinger Bands)

Lesson 7: Dealing with data

- How data can be bad
- Actual & adjusted
- Survivor bias

Reading: "What Hedge Funds really do", Chapter 12: Overcoming data quirks to design trading strategies

Lesson 8: Efficient Markets Hypothesis (short)

- Hypothesis: What we want to accomplish in this course is impossible!
- Market responds to any piece of information, so we can never predict a stock movement and use that to our advantage

Reading: "What Hedge Funds really do", Chapter 8: The Efficient Market Hypothesis(EMH) - its three versions

Lesson 9: The Fundamental Law of active portfolio management

- Idea 1: Little intelligence about a lot of stocks
- Idea 2: Deep intelligence about a few stocks

Reading: "What Hedge Funds really do", Chapter 9:The fundamental law of active portfolio management

Lesson 10: Portfolio optimization and the efficient frontier

- Deeper knowledge and philosophy behind portfolio optimization

Reading: "What Hedge Funds really do", Chapter 10: Modern portfolio theory: The efficient frontier and portfolio optimization

Projects

02-P1 Build a market simulator

http://wiki.quantsoftware.org/index.php?title=CompInvesti_Homework_3

Create simulator server

02-P2 Use an indicator to find where good buy & sell points are (with Technical Analysis lesson) Invent your own technical indicator

02-P3 Write a strategy that generates orders Back tester: Test strategy using market simulator Possible peer feedback opportunity (peers back test your strategy)

http://wiki.quantsoftware.org/index.php?title=CompInvesti_Homework_4

Exam

Corresponds to a midterm in the context of the overall course Some Python questions

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