Analytics of Finance

Course Description

With increased data availability and complexity comes the need for finance professionals who are not only able to work with data, but can separate insights from noise. This course introduces a core set of modern analytical tools that specifically target finance applications. Students gain exposure to statistical inference; financial time series modeling; event study analysis; and machine learning techniques for forecasting and working with big data. As applications, we will use real-world data to build models for financial and macro forecasting, quantitative trading, and dynamic risk management. We will also look behind the curtain of some fintech innovations, such as Kensho’s “financial answer machine” and big-data lending platforms.

Note: 15.457 (Advanced Analytics of Finance) is a more advanced version of 15.450, covering additional topics on financial forecasting, textual analysis, and optimization. Students with solid background in statistics and proficient in programming are encouraged to take that course instead. 15.457 meets on TTh 2:30-4 PM.

Pre-requisites

15.401 Finance Theory I (or 15.415) is a pre-requisite for this course. Homework assignments will involve intensive data analysis and computer implementation of quantitative methods. In addition, this course assumes undergraduate-level background in calculus and probability.

Course Materials

Lecture notes and additional course materials (problem sets and solutions, recitation schedule, announcements, etc.) will be posted on Canvas. I will also post additional reading materials on Canvas, including research papers and newspaper articles, which can provide useful background information or add depth to the materials covered in class. ISL and T are available online.

Recommended Materials:


Course Requirements

- Lectures: TTh 1:00 – 2:30 PM, E62-262

- Homework Assignments: There are 5 problem sets. The problem sets should be done in groups of 3-4 students.

- Exam: There is one written exam; closed book; two 8.5” × 11” sheets of notes (two-sided) are allowed. The exam will be during the final’s week.

- Final Project: This team project will be a “mini-case.” The project will require the use of concepts developed in the course. Selected groups will be invited to present in class.

- Grading: Grade = 15% × Class participation + 20% × HW + 50% × Exam + 15% × Final project

Office Hours and Recitations

- Office Hours: Mondays 1-2:30 PM, or by appointment

- The TAs for this course are Bryan Seegmiller (bseeg@mit.edu) and Yupeng Wang (yupengw@mit.edu). Bryan and Yupeng will hold weekly office hours and recitations.

Contact Information

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Professional Standards

See the MIT Sloan Professional Standards posted on Canvas.