Finance Theory I  
Fall Semester, 2018.  
Course Outline

Instructors  
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Class Times  
The class will meet once a week on Tuesday from 2:30 to 5:30pm in Tisch UC-05. As per the Stern calendar, the first class is on Sep 4 and the last in on Dec 11, with no classes on Sep 11 or Oct 9. Exams will either be given in class or at a time mutually agreed to by the instructor and the students enrolled in the course.

Course Objectives  
Finance Theory I is the first of 5 second-year finance Ph.D courses offered by the Stern School. Its focus is modern valuation theory in a discrete-time setting. The course is also designed to prepare students for the other 4 finance Ph.D. courses.

Lectures  
There are 13 classes. The first class will be an organizational/overview class. Professor Lynch will teach the next 6 classes and Professor Savov will teach the last 6 classes. Professor Lynch’s last class will be on Tuesday October 30.

Assessment  
There will be a midterm and a final exam, as well as problem sets and homeworks. The midterm will be worth 50%, the final will be worth 35%, and the homeworks for Professor Savov’s half of the course will be worth 15%. The midterm will cover the material taught by Professor Lynch in the 2\textsuperscript{nd} to 7\textsuperscript{th} classes, while the final will cover the material taught by Professor Savov in the last 6 classes. The midterm will be closed book except for the typed lecture notes discussed below, and one 8½" x 11" sheet which can be written on both sides. A student who fails to submit 2 or more of the problems sets on time for Professor Lynch’s half of the course will automatically get a score of 0% out of 50% for his half of the course. Problem sets solutions must be hand-written and late solutions will not be accepted.
Professor Lynch’s Half of the Course
Professor Lynch has a set of typed lecture notes covering most of the topics to be covered in the course. The relevant chapters for each of his lectures will be emailed to students in advance. Finance Theory I Final and Midterm exams for the years 2000, 2001, 2002, 2004 and 2005 and solutions for the 2000, 20001 and 2002 Midterms will also be emailed. You can look over (and take notes about) rough solutions to the other exams by stopping by Professor Lynch’s office.

Professor Savov’s Half of the Course
Professor Savov will distribute the slides that are being projected in class, one week ahead of time. For most classes, there will be two or three recent papers that the students are required to read before the class.

Textbooks
Required

Recommended
These are books worth buying independent of your enrollment in the course if you are planning to do serious finance research.

Preliminary Reading
If your mathematical background is weak, the following readings will probably be useful.
1. Chiang, A., Fundamental Methods of Mathematical Economics, McGraw Hill (This is a basic book and easy to read, but full of techniques that you need to know about.)
2. Ingersoll, Mathematical Introduction (A laundry list of useful information).
3. Sargent, T., Dynamic Macroeconomic Theory, Harvard University Press, Chapter 1 (This is a reasonably non-technical introduction to dynamic programming.).
Outline

Prices in a Single-period Setting

Topics:
1. Law of One Price and asset returns
2. No arbitrage and asset returns.
4. Complete versus incomplete markets.
5. Mean-variance frontiers for returns.
7. Relations between discount factors, mean-variance frontiers, and Betas.

Reading:
1. CLM, Chapter 1.
3. CLM, Section 8.1.

Prices in a Multi-period Setting

Topics:
1. Present value formula with a constant discount factor.
2. Present value formula with a stochastic discount factor.
5. An approximate decomposition for returns.
6. Completing markets through dynamic trading.

Reading:
1. CLM, Section 7.1.
Equilibrium Pricing Models and Portfolio Separation

Topics:
1. Time-separable preferences.
2. Portfolio allocation decisions.
   a. Single period and multi-period.
   b. Campbell-Viceira approximation.
3. Equilibrium Pricing: Representative agent
   a. C-CAPM.
   b. CAPM.
   c. I-CAPM
   d. Endowment economies.
4. APT. (time permitting)
5. Heterogeneity and Equilibrium: Homogenous beliefs. (time permitting)

Reading:
1. I, Chapter 1.
2. Co, Chapter 9.
4. CLM, Sections 5.1, 6.1 and 8.2.
5. I, Chapters 4 and 11.
8. I, Chapters 3, 7-10.
12. I, Chapter 5-6.

Midterm Exam
Stylized Facts about the Riskless Rate and Equity Prices and Returns

Topics:
1. Representative Agent Anomalies:
   a. Equity Premium Puzzle.
   b. Riskfree Rate Puzzle.
   c. Equity Volatility Puzzle.
2. Equity Return Predictability.

Reading:
1. Ca, Chapter 3.3 and 5.
3. CLM, Chapter 8.2.
Stylized Facts about the Bond Prices, Bond Returns, and Currency Returns

Topics:
1. Bonds
   a. Yields, Forward rates, Bond Returns: definitions and stylized facts
   b. The Expectations Hypothesis and its empirical failure.
   c. Failure of the CCAPM to explain bond puzzles.
2. Currency returns
   a. Definitions and SDF approach
   b. Uncovered Interest Rate Parity, Real Exchange Rate Volatility, Correlation, and Backus-Smith Puzzles
   c. Failure of the CCAPM to explain currency puzzles

Reading:
3. CLM, Chapter 10.
6. Brandt, Michael, John Cochrane, and Pedro Santa-Clara, 2006, International risk-sharing is better than you think, or exchange rates are too smooth, *Journal of Monetary Economics*
New Models to Address Stylized Facts about Asset Prices: Habit models

Reading:
1. Ca, Chapter 6.7.
2. Co, Chapter 21.2.
3. CLM, Chapter 8.3-8.4

New Models to Address Stylized Facts about Asset Prices: Epstein-Zin and Long-Run Risk Models

Reading:
1. Ca, Chapter 6.4-6.5.
New Models to Address Stylized Facts about Asset Prices: Idiosyncratic Risk Models

Reading:
1. Ca, Chapter 11.1.

Term Structure Models and Stylized Facts

Topics:
1. Concepts
2. Model of the Expectations Hypothesis
3. Vasicek Model
4. Cox-Ingersoll-Ross Model
6. Empirics of the Term Structure
   a. Bond Excess Return Predictability.

Reading:
1. Ca, Chapter 8.3-8.5
2. Co, Chapter 19
3. CLM, Chapter 11.1.
Frictions

Topics:
1. Intermediary-Based Asset Pricing
2. Margin-Based Asset Pricing

Reading:
1. Ca, Chapter 12.3
5. He Zhiguo and Arvind Krishnamurty, A Model of Capital and Crises, Forthcoming Review of Economic Studies

Final Exam Take home