

ECON 25000: Introduction to Finance

Spring 2018

Instructor:	Paymon Khorrami (paymon@uchicago.edu)
Class hours:	MW 2:30 – 4:00pm (Saieh 146)
Office hours:	Tuesday 5:30 – 6:30pm (Booth Winter Garden)
Teaching Assistant:	Hongcen Wei (hcwei@uchicago.edu)
TA Session:	Thursday 7:30 – 8:30pm (Rosenwald 015)
TA Office hours:	Monday 5:00 – 6:00pm (outside Saieh 146)

Overview

Description. Welcome to the class! This course provides an introduction to the basic topics in investments. The main goal is to provide frameworks used to price various securities: so-called “asset pricing.” The primary frameworks used are “no arbitrage,” which says that there is no free lunch, or you can’t get something for nothing; and “equilibrium,” which dictates a relationship between risk and return based on supply and demand. We will look at risk-free bonds, forwards, stocks, options, and corporate bonds. In addition to the theory, we will perform some empirical tests of the pricing models to see how well they work in practice. Ultimately, finance is not about creating abstract theory, it’s about creating models that work well in practice! After taking this class, you should have a solid foundation in financial economics, and you should be well-prepared to take more advanced classes. For example, a natural extension of this class, if you are interested in derivatives pricing, is Fernando Alvarez’s ECON 251 class. I hope the class is also useful to those considering jobs in the investment / portfolio management / banking area.

Prerequisites. You should have taken ECON 200-203 and STAT 234/244 before enrolling. It would be great if you have also taken a class on linear regression, e.g., ECON 209/210 or STAT 245. If not, I would like you to be concurrently enrolled for such a class (officially, I believe ECON 210 is a prerequisite, but concurrent enrollment is OK). This is mainly because we will be doing some data analysis in the empirical homework. There will be some programming, so you should get familiar with a basic data processing program (e.g., Matlab, Python, R, even Excel if you’re a wizard with it). I will provide some support for Matlab, but the choice is up to you. You should also be familiar with probability (expected values, variance, covariance, probability distributions), calculus (partial differentiation), optimization (Lagrange method, infinite-horizon problems), and linear algebra (matrixes).

Policies

Grading. There will be a midterm and a final exam. The midterm will be Wednesday, April 25, during class. The final exam will be administered on Wednesday, June 6, from 8:00 – 10:00am. *Other than graduating seniors, you cannot reschedule or miss the final exam. If there are issues with this, contact me now!* For graduating seniors, the final exam will likely be May 31 (first day of reading period) at a time TBD. Grades will be determined by:

$$\text{grade} = 35\% \times \text{problem sets} + 25\% \times \text{midterm exam} + 40\% \times \text{final exam}$$

The grades will be “curved”, in that I will normalize your scores to be a Z-score within each category.

Homework Assignments. There will be about 6 homework assignments. *No late assignments will be accepted.* If you can’t hand in the assignment on the due date, you must email an electronic copy or scanned copy to me or the TA. Group discussion and collaboration on homework is encouraged, but assignments ultimately need to be handed in individually. Write who you discussed with at the top of your assignment solution. If you have questions about the homework, feel free to email the TA.

References. I will often post my own lecture notes on Canvas. There will be no required textbook for the class. However, I realize that it may be useful to know about commonly used textbooks. I will name the following, just so you are aware of them:

- Bodie, Kane, and Marcus, *Investments*: standard MBA-level textbook
- Berk and DeMarzo, *Corporate Finance*: another standard MBA-level textbook
- Cochrane, *Asset Pricing*: more advanced (used in the first PhD class), but a very nice unifying framework “price = discounted payoff”
- Hull, *Introduction to Futures and Options*: derivatives pricing, like what we will do with options
- Wooldridge, *Introductory Econometrics: A Modern Approach*: accessible introduction to using statistics in economics, which centers around linear regression

Schedule

Week 0. Math review.

Fundamentals

Weeks 1-2. Basic compounding and discounting. Understanding “Price = Discounted payoffs.” Pricing risk-free bonds (e.g., U.S. Treasuries) and other “fixed-income” securities (e.g., forwards and swaps). The yield curve and forward curve. Pricing by the method of no arbitrage.

Week 3. Risky assets (e.g., equities). “Price = Discounted payoffs” again. We need models to assess the risk-return relationship (e.g., investors’ demand for risky assets). The Mean-Variance Frontier (MVF) in both math and pictures.

Week 4-5. Equilibrium. The Capital Asset Pricing Model (CAPM). This is the most important model is asset pricing. How do we test it? Lots of discussion.

Modern Asset-Pricing Topics

Week 6. Other equilibrium models, e.g. Fama-French 3-factor (FF3F) model, consumption capital asset pricing model (CCAPM), limited stock market participation, intermediary asset pricing.

Week 7. Efficient markets. A detour into trading, information, and bubbles in financial markets.

Auxiliary Topics

Week 8. Options as an example of pricing by replication. Payoff diagrams and the binomial tree. Arbitrage pricing again, and “limits to arbitrage.”

Week 9-10. Corporate finance. Understanding risky debt as an option on the firm’s assets. NPV and investment. Debt overhang and risk-shifting. Securitization and banking.

Week 11. Final exam!

Miscellaneous

Difficulty level. I prefer to make the assignments and exam slightly harder and more thought-provoking than the typical course. The benefit of this is that I hope you would learn more this way. Potential costs of this approach include (a) rendering the assignments too time-consuming; and (b) students getting bad scores. I hope to resolve (a) by being fair about the length of the homeworks and exams, by allowing some homeworks to be submitted in groups, and by economizing on the amount of outside reading I assign. I hope to resolve (b) by grading everything on a curve, so that your absolute score won't matter. That said, as the course progresses, I am open to feedback about the level of difficulty so that we can adapt as we go.

Math. Unfortunately or fortunately, there are a non-trivial amount of mathematical derivations in this class. I personally would like to emphasize intuition, but I need to include some of these derivations. There are two main reasons for including these. First, some results in the theory of financial economics are *counter-intuitive*. With math, we can understand which conventional wisdoms hold and which lead us astray. Second, a goal of this course is to provide students with certain tools that may be useful in future classes and careers.

Guidance. To anyone who wants it, I am willing to meet outside of class to give academic and career guidance. This includes future course selection, research assistantships, summer internships, pursuit of graduate school, careers in finance, and skillsets that might be useful. When I was doing undergrad, this type of guidance seemed to be in limited supply, so please don't be shy.