

Outline and course policies

Course description

This course surveys recent developments in investments, bridging the gap from 35000 to the current research and practice. One central theme: asset pricing has undergone a sea change in the last 10-20 years or so, with the realization that expected returns do vary across time, and across assets in ways that the static CAPM does not recognize. We will cover the modern discount factor approach to asset pricing theory, covering stocks, bonds, and options together. We will cover empirical methods, including how to evaluate asset pricing models and how to evaluate forecasting techniques. We will cover a range of topics, including 1) how stock and bond returns can be predicted over time 2) understanding the volatility of stock and bond returns 3) multi-factor models for understanding the cross-sectional pattern of average returns, 4) optimal portfolios that reflect multifactor models, return predictability and hedging motives, 5) advanced trading strategies used by trading desks and hedge funds 6) performance evaluation and benchmarks for funds 7) liquidity effects and "bubbles" in stock and bonds 8) The financial crisis 9) Dynamic Portfolio theory. This course involves a lot of work, including reading, working pen and pencil problems, and extensive computer problems.

First class assignment.

There is a first class assignment, and first-class readings. Find them on the class website.

Prerequisites

Before taking this class, you must have taken investments 35000 or a more advanced investments course (35151, 35901, 35904), or a similar course at another institution, that covers the finance background described below. You must have taken a course that covers regression and the statistics background described below, 41000, 41100 or a more advanced course (41100 or 41202). Note that the regression classes at Booth do cover time series but many regression classes at other institutions do not. The mandatory first problem set includes a section that assesses your comfort with the prerequisite material.

Finance background: You must have a working understanding of the CAPM, efficient markets, the expectations hypothesis and duration, and have seen option payoff diagrams and the Black Scholes formula, at the level that these topics are typically taught in 35000 or similar courses at other universities.

Statistics background: You must understand random variables and distributions, statistics (i.e. what standard errors, confidence intervals and hypothesis tests are), you must be able to run a regression and interpret the output. You must have seen a simple time series model such as the AR(1), $x_t = \rho x_{t-1} + \varepsilon_t$ and MA(1) $x_t = \varepsilon_t + \theta \varepsilon_{t-1}$; you must be familiar with concepts like conditional expectation $E_t(x_{t+j})$ and conditional variance $\sigma_t(x_{t+j})$.

Economics: Economics is itself a prerequisite for 35000, so I will assume you have seen a utility function and budget constraint and can do simple utility maximization problems ($\max u(\text{apples}, \text{oranges})$. s.t. $p_a \times \text{apples} + p_o \times \text{oranges} = \text{income}$).

Math: You need basic calculus (taking simple derivatives and integrals and looking at more complex ones) and basic matrix algebra.

Computers: There will be extensive computer problems in this course. You need to be able to do them. See below for program suggestions.

Workload. This class will take a lot of work; I expect 10-15 hours per week outside of class for the average student. Students who can't devote this much time to the class will not enjoy it.

Course materials

Book: There is one textbook, *Asset Pricing* by me (John H. Cochrane), Princeton University Press. If you buy it, get the Revised Edition which is typo-free. If you have a first edition copy, get the typo list from my website. You don't have to buy it since the class readings from *Asset Pricing* will be in the packet and on the website. But then you're missing all that great stuff from the rest of the book.

Readings: There will be readings. These will be available in pdf form from the class website.

Programming: There will be a lot of computational problems. I strongly recommend Matlab. The TA and I use Matlab, we can give advice for doing the problems in Matlab, and answers to the problems will be provided in Matlab code. Matlab is a very nice matrix-based programming language. Get the student edition with the statistics toolbox from campus computing or from the mathworks website. You need to get the statistics toolbox. Matlab is on the several PCs in the computer labs. To get going, fire up matlab, click "help" and then "begin here". Work through "if you are using matlab for the first time." The first problem set also has a lot of matlab help.

Matlab is not required. If you are already good at another programming language, it will be possible to do all the programming in another language. R, S+, c++ or GAUSS will work. However, we can't provide programming help in these languages. *It's next to impossible to get through this class in excel.* You need some serious programming language that can handle matrices. If you don't already have a favorite, learn Matlab.

Policies

Attendance: Class attendance is important. If you can't make it, you are responsible for getting notes from a friend. You can't count on knowing everything that happens from the notes etc. posted on the class website. You may attend the other section, if space is available.

Quiz: I typically start each class with a short quiz, covering reading or problem set material. The quiz is closed book - closed note. Don't make me nag you. No, you can't make these up if you don't show up to class that day or if you show up late.

Final Exam: The final exam will occur as given by the Booth program guide. The exam will be given *only* at that time, so plan now to make it. *I do not allow makeup or early exams. Period.* You may take the exam with the other section *provided* you have a good reason and clear it with me in advance. (I need to make sure there is room.)

Problem Sets: There will be weekly problem sets, and we will discuss them in class.

You are welcome to work in groups on the problem sets. You are free to work in groups of up to 5 people. If you work in a group, turn in one problem set. However, I will reduce the problem set grade according to the number of people in it. 1 person = 10 points, 2 people = 9 points 3-4 people = 8 points, 4-5 people = 7 points. I expect each person to contribute to all of the solving of a problem set; and I expect you each to be able to do the problems on your own if needed. "Group" does not mean one person does the work, one gets the coffee, one gets the donuts! The exam will require you to be able to do problems on your own. You must be able to do the programming on your own if needed.

You may talk to people outside your group or in a larger group, but each group must do its own work. (No, xeroxing up one big problem set doesn't count.)

I encourage you to work with a "study group" even if you do your own problem sets. Get together with a group to discuss the basic ideas of each question, and solutions to programming problems. The do the work on your own. I think this is the most time-efficient and productive way to do the homework in this course.

The problem sets are similar to those of previous years. I consider using old solutions from people who took the course before a serious honor code violation. There are enough differences in the questions that it will take longer to make sure you're answering this year's questions than it will to just do it all

from scratch, and let's not talk about what will happen if I catch you turning in last year's answers.

I teach two sections of the class. I prefer that you hand in problem sets in class. However, you may hand in problem sets as late as the end of the second section, to my mailfolder in the HPC faculty lounge (2nd floor NW corner) or the TA's PhD mailfolder. Since I post solutions, I never accept late problem sets, ever. If you haven't been able to complete it, hand in what you have. If you can't make it to class, you may email the problem set to the TA. Please type your problem sets. Equations by hand are ok if you must. Please format regression output – don't hand in reams of printout and expect us to find what's important. You do not have to hand in code or data unless specifically asked to do so.

Review session. There will be a weekly review session. No extra material will be presented at review sessions, and attendance is not required. This is simply a time and place to get together and have questions answered about class materials or problem sets.

Name Cards Please bring them to every class. Unless you really don't want me and the other students to learn your name, and you don't want any class participation credit.

Honor code statement Students must adhere to the standards of conduct in the Honor Code and Standards of Scholarship.

Grading. Your grade will be based on the maximum of 70% final + 30% problem sets+quizzes and 100% final. I will count class participation in deciding cases on the grade borderlines. Thus, problem sets can help you but they can't hurt you. I do not deviate substantially from the Booth mandated 3.25 GPA.

Final exam regrade policy. Put your exam in my mailbox or mail it to me with a written explanation of the problem. I will happily correct arithmetic errors in adding up your grade. I will only change a grade if your answer is almost completely right but I graded it almost completely wrong. I won't change assignments of partial credit. The reason is that I do all the exams together so that each wrong answer gets the same partial credit. I reserve the right to regrade the entire exam.

Laptops. You may use laptops to take notes or read pdf versions of the class papers. *You may not surf the web, check email, do other class homework, check your portfolio, or do anything else in class. This is very distracting to your fellow students. I will ban laptops from class if anyone violates this policy. No iphones or text messaging in class please.*

Communication

There is a class webpage; http://faculty.chicagobooth.edu/john.cochrane/teaching/35150_advanced_investments/, or find the link under my *portal* webpage. (A decision above my pay grade was made that we have “public” webpages without course information and a “portal” webpages that do have it.) All materials will be posted there as soon as they are available. I use the class email lists to notify you of new materials on the webpage, typos or other glitches, to answer questions of general interest, and to make announcements. Check your email! If you are a Booth student not registered for the course, you still can get on the class email list via the portal. Non Booth students should email me to get on the class list.

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