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FIN501: Asset Pricing
Fall 2015
MW, 8:30AM-9:50AM
BCF 103

FIN 501: Asset Pricing I
Pricing Models and Derivatives

Course Description:

The aim of this course is to introduce students to the modern theory of asset pricing, portfolio theory and derivatives pricing. Topics covered include (i) no-arbitrage, Arrow-Debreu prices, and equivalent martingale measures, (ii) security structure and market completeness, (iii) mean-variance analysis, Beta pricing, CAPM, and (iv) derivatives pricing. The course is designed for Master in Finance students, but is also open to undergraduate and Ph.D. students.

Lecture Notes:

We will distribute some preliminary lecture notes that summarizes the main takeaways from the course. The notes together with the presentation slides are the main background reading material.

Textbooks:

There is no ideal textbook for this Masters' course. A less technical introduction to the course can be found in

- Danthine and Donaldson [*D*], (2005), *"Intermediate Financial Theory"*, Elsevier.

A more advanced treatment of the material can be found in

- Kerry Back (2010), *"Asset Pricing and Portfolio Choice Theory"*, Oxford University Press
- Stephen F. LeRoy and Jan Werner [L], (2001), *"Principles of Financial Economics"*, Cambridge University Press (optional).

The elements of the course that focus on derivative pricing are based on

- Robert L. McDonald [McD], (2009), *"Derivatives Markets"*, Addison Wesley.
  or
- John C. Hull [H], (2011), "Options, Futures and Other Derivatives" Prentice Hall.

Supplementary reading:

- George Pennacchi (2007), *"Principles of Financial Economics"*, Addison Wesley.
- Yvan Lengwiler, [Y] (2004), "*Microfoundations of Financial Economics: An Introduction to General Equilibrium Asset Pricing",* Princeton University Press
- Jakša Cvitanić and Fernando Zapatero [CZ], (2004), *"Introduction to the Economics and Mathematics of Financial Markets"*, MIT Press (optional).

Structure of the Course*:*

The relevant chapters of the books are indicated in brackets, e.g. [*L*3] refers to chapter 3 of LeRoy and Werner book.

1. Introduction
    - Market Efficiency: Role of Financial Markets and Empirical Regularities
2. One-Period Models
    - Setup [*L*3, *Y*2,3]
    - Security structure and market,
    - Options, Forwards, Futures, Swaps [*H*1-6,*McD*1-8, *CZ*1-2]
3. Pricing in the One-Period Model
    - LOOP, No Arbitrage
    - Basics of Forward and Option Pricing
    - The four Pricing Formulas:
    - Arrow-Debreu (State) Prices/Stochastic Discount Factor/Martingale Pricing
4. Risk Measures and Preferences
    - Stochastic Dominance, Expected Utility, Portfolio Choice [*Y*4, *L*8,9,11,12, *LY*4]
    - Optimality, Representative Agent Analysis
    - Mean Variance Analysis, Beta-Pricing, CAPM [*L*17-19], [*D*4, 5.2-5.5, 6, *CZ*5.1,13.1-13.2]
5. General Equilibrium, Efficiency and Aggregation
    - Pareto Efficiency
    - The Welfare Theorems
6. Sharpe Ratio Bounds, Equity Premium Puzzle [*L*14.4]
    - Hansen-Jagannathan Bound Theorem
7. Mean-Variance Analysis and CAPM
    - Traditional derivation
    - Modern derivation: projections and pricing kernel
    - Testing CAPM
    - Black-Litterman
8. Multi-Period Models
    - Setup [*Y*6, *L*21-28]
    - Dynamic Market Completeness
    - Ponzi Schemes
    - “Rational Bubbles”
9. Fixed Income, Futures, Swaps
    - Bonds, Bond Duration, Term Structure of interest rates
    - The Expectations Hypothesis
    - Futures, Repos, Swaps
10. Option Pricing
    - Black-Scholes Option Pricing Formula [*H*7-10,*McD*9-13]
    - Basics of Dynamic Optimization
    - Equilibrium Models: ICAPM, Hedging Demand
11. Multiple Factor Pricing Models (APT, FF) [*L*20, *CZ*14]
    - Conditional versus unconditional beta
12. Friction Finance
    - Market Efficiency – Asymmetric Information
    - Liquidity Asset Pricing, Funding Liquidity Risk, Violation of LOOP

Course material:
Additional course material (if necessary) will be made available on the course website http://scholar.princeton.edu/markus/classes/fin501 after classes. All students who are registered for this class will also have access to Princeton's blackboard webpage.

Preceptor:
Amin Jafarian
Office: BCF
E-mail: amin.jafarian@gmail.com

- The preceptor's job is to act as a catalytic in that process. Please
    - **Ask** him when something is not clear – if you did not understand something, the odds are that somebody else did not either

Assignments and Precepts:
Time and place of the precepts are to be determined in the first lecture. Please communicate to him your availability through the 'whenisgood.org' link.

The purpose of the homework assignments and precepts is to help you better understand the rather abstract material from the lectures. To that end, careful **preparation** of the precepts as well as the lectures will help you a lot. Moreover, it is only possible to grasp the concepts by **thinking through concrete examples by yourself**. Many students find it helpful to **discuss** the problems with their peers.

To align your incentives with these goals, and to give you a commitment device…

- Collaboration is explicitly allowed and desirable. Help each other prepare for the precepts, make stuff available to each other, and discuss your solutions.
- **Use the Blackboard Discussion Board** to discuss problems before emailing me. I will look into it and give comments if needed.
- Everyone should submit the written homework assignment. You should also be ready to individually present your solutions to the precept class. Your performance (not your presentation skills) and participation in the discussion will enter your overall grade.

Furthermore, he will answer questions of general concern and respond to feedback in the precepts. Do not hesitate to email him your questions in advance, especially if they might require preparation. You can also point them out to him during the office hours.

Unannounced tests during precepts:
There might be occasionally, in-precept, unannounced tests, which count towards the precept share of your grade. They will ***only*** cover the material that was discussed at the previous precept. The tests are meant as a commitment device for you to stay on top of things at all times. To that end, you should come to the office hours if you had problems following in a precept.

Please let the preceptor know well in advance if you cannot attend a precept so we can find a solution.

Office hours (preliminary):
Instructor: Mondays 4:30 to 5:45 p.m.
Preceptor: TBD

The purpose of office hours is to allow you to ask additional questions outside the classroom setting. These could be issues you did not understand in the lecture or in the last precept, or more personal concerns. The preceptor will be very happy to assist you with any of these. For the sake of fairness to your fellow students, the preceptor will, however, make an effort to answer questions that are of general concern in the precepts.

To make the best use of office hours, **come prepared**. A clear question is the best way to elicit a clear answer.

Grading:

The overall grade is calculated based on the following weighting scheme:

Class Participation:	15 %
Problem Sets/Precepts/Unannounced Tests:	15 %
Midterm test:	30 %
Final examination:	40 %

The midterm test will be held in class on Wednesday, November 11, 2015 (possibly on Nov 18th, 2015). The final will be held in January 2016.
Although the exams are closed book, you may bring into the exam one 8 ½ x 11 sheet of paper. You can write on both sides and as small as you wish, but I recommend using this only as a psychological support to have a formula available "just in case." The exams won't be "fill in the blanks" exercises, nor will they rely on intensive formula-based computations. Preparing lots of pre-fabricated solutions from previous exams or assignments will only be distracting during the exam.

You will be allowed to use a silent battery operated calculator during the exams (but not during the "precept tests"). Laptops, while useful for assignments, are not needed (nor allowed) in my exams.

Appeals policy:

Since the preceptor will grade all assignments and exams, all appeals of grades should first be addressed to the preceptor within one week. Verbal appeals of grades will not be accepted. We will be glad to regrade any assignment or exam. However, you must provide a statement in writing as to where and why there is a problem. Importantly, the entire exam or assignment will be regraded. As a result, the regraded score may increase, remain the same, or decrease. Exams or assignments written with pencil cannot be regraded.