Seminar in Finance I
Mini 3, 2013

Course Description
The main goal of the course is a fundamental understanding of the theory of valuation in frictionless financial markets. The first result will be that the absence of riskless arbitrage implies the existence of Arrow-Debreu state prices. These state prices can be expressed as a positive random variable called a ‘pricing kernel’ which, when applied to any cash flow, yields the price of the cash flow. Most valuation theories (e.g., CAPM, APT, Black-Scholes) can be characterized as a specific model of a pricing kernel. A useful organizing framework for the course, then, is models of pricing kernels. We’ll begin with the simplest one-period model and finish a dynamic general equilibrium model.

Text
We’ll use my notes and Dynamic Asset Pricing Theory by Darrell Duffie (Princeton University Press, 2nd or 3rd ed.). Students are expected to have read Duffie, Chapter 1, and the relevant mathematical appendix material before the class commences.

Evaluation
Completing problem sets will be the primary means by which students will learn the material. Problem sets will be distributed at least once per week, sometimes twice per week, and are due one week after being distributed. Successful completion of all problem sets, graded on a pass-fail basis, is necessary to complete the course. Making use of existing solution sets and/or students who have previously completed the problem sets is strictly forbidden. Grades will be based on a take-home final exam, to be distributed on the Friday following our last meeting and turned in the following Monday morning.

Other
Appendices A and B of Duffie’s book are representative of the level of mathematical knowledge students will be assumed to possess. An introductory course in Phd-level microeconomics will also be assumed. Later in the course, knowledge of dynamic programming fundamentals will be required (see, for instance, the well-known macroeconomics texts by Sargent and/or Lucas and Stokey).
## Approximate Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>First Lecture</th>
<th>Second Lecture</th>
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| 1    | Pricing kernel overview  
State price fundamentals | Canonical portfolio problem  
Duffie, 1.A-B, 1.F | Duffie, 1.D |
| 2    | Preferences and risk aversion  
Portfolio separation | Portfolio theory  
H&L, chp 1 | H&L, chp 3 |
| 3    | Equilibrium  
Representative agent construction | | |
| 4    | Fundamentals of dynamic economies  
Dynamic portfolio choice  
Riesz representation | Duffie, 2.A-C  
Duffie, 2.D | Duffie, 2.E-F  
Duffie, 2.G |
| 5    | Dynamic equilibrium  
Equivalent martingale measures  
Dynamic representative agent | | |
| 6    | Markov uncertainty  
The Mehra-Prescott model  
Dynamic programming and asset pricing | | |
| 7    | Geometry, revisited  
Residual  
Hansen-Jagannathan bounds | | |

*Hansen-Jagannathan (1991)*  
*Mehra-Prescott (1985)*  
*final exam distributed*