

Basics of Asset Pricing
Summer 2012 workshop series
Sharif University of Technology, GSME

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1 Course objective

Like any other discipline, Asset pricing theory, and more broadly, the theory of finance relies on their own language. In order to follow the state of the art research in the field efficiently, readers need to have technical tools and theoretical understanding of basics in this field. This workshop will hopefully help participants in getting familiar with introductory concepts and techniques in theory of asset pricing.

2 Text

Pennacchi, *Theory of Asset Pricing*, Prentice Hall.

3 Prerequisites

- Basic algebra and general knowledge of multivariate functions optimization.
- Familiarity with utility, expected utility, and risk-aversion concepts.
- Participants are encouraged to read chapter 8 of the aforementioned text prior the workshop begins to get a good handle on Diffusion processes and Ito's lemma which are essential for techniques to be covered.

4 Topics

1. Expected utility and risk-aversion.
2. Discrete time consumption-portfolio choice:
 - Optimality principle and Bellman equation.

- Recursive solution of the model.
 - Log utility and its implications.
3. Multi period market equilibrium:
- Pricing kernel.
 - The Lucas model of asset pricing.
 - The equity premium puzzle.
4. Dynamic Hedging - options pricing (continues time approach):
- Introduction to options.
 - The Black-Scholes model and PDE implementation.
 - The Vasicek model.
 - The Merton model.
5. Pricing kernels and Martingales:
- Simple diffusions.
 - Diffusions with disasters.
6. Continues time consumption-portfolio choice:
- Dynamic programing.
 - Constant investment opportunities vs changing investment opportunities.
 - The Martingale approach.
7. Intertemporal Consumption Asset Pricing Model.
8. Alternative preferences.