Syllabus
Doctoral Seminar in Empirical Option Pricing

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1   Course Description

The objective of this course is to cover the recent advances in models capturing joint dynamics of assets and the associated derivatives. These models allow a researcher to quantify sources of risk affecting an asset and how each of these risks is priced. This information is useful for practical use of derivatives (how much do you earn when you sell out-of-the-money puts and why?) and for development of realistic general equilibrium models. We will cover both empirical methods and findings in this area.

2   Topics

1. Motivation: Option Puzzles

2. Stochastic Processes

3. Simulation

4. Change of probabilities

5. Discrete-time models

6. Building blocks and their properties

7. Estimation methods

8. Studying the S&P 500 dynamics

9. Solving the S&P 500 option puzzles

10. "Model-free" implied variance of S&P 500

11. Time-varying central tendency of variance

12. Options on individual stocks vs the index

13. Learning about preferences and endowments from options

3 Readings and Reference Materials

The following textbooks/articles contain major reviews of the material:

- Bates (1996)

- Bates (2003)

- Garcia, Ghysels, and Renault (2009)

- Singleton (2006) (Ch. 15, 16)

- Annals issue of the Journal of Econometrics, Frontiers of Financial Econometrics and Financial Engineering, Vol. 116, no. 1-2 (2003)

I will expect familiarity with theoretical option pricing at the level of: Black and Scholes (JPE, 1973), or any other more modern rendition; Heston (RFS, 1993); Bates (RFS, 1996) and Duffie, Pan, and Singleton (ECMA, 2000).

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