Outline for the Course in Experimental and Neuro-Finance
Elena Asparouhova and Peter Bossaerts

Week 1

**Wednesday, July 25, Elena Asparouhova**

- CAPM in the laboratory. A simple experiment. Intro to flexible-markets (web-based software for designing market experiments).
- One-period markets: the experimental evidence.

Readings:

**Friday, July 25/6, Peter Bossaerts**

- Basic principles of neurophysiology
- Imaging techniques - single-unit neural recording, fMRI, EEG (scalp and intracranial) and MEG.
- Basics of Pharmacology.

Readings:

Week 2

*Monday, July 30, Peter Bossaerts*

- Neural encoding of expected reward and risk
- Reward and risk prediction errors

Readings:
1. Adaptive Coding of Reward Value by Dopamine Neurons, Tobler, P. N, Fiorillo, C. D., and W. Schultz
4. Pupil dilation signals surprise: Evidence for noradrenaline’s role in decision making, Preuschoff, K. et al.

*Wednesday, August 1, Elena Asparouhova*

- Infinite horizon economy—the Lucas model and the experimental evidence.

Reading:
3. The Role of Securities in the Optimal Allocation of Risk-bearing, K. J. Arrow.
4. Existence of Equilibrium of Plans, Prices, and Price Expectations in a Sequence of Markets, Radner, R.
5. Implementing Arrow-Debreu Equilibria by Continuous
Trading of Few Long Lived Securities, Duffie, D. and Chi-Fu Huang.

**Friday August 3 Elena Asparouhova**
- Markets for contracts. Insurance and delegation.

Readings:

**Week 3**

**Monday, August 6, Peter Bossaerts**
- Bayesian learning and the human brain.
- Different Types of Uncertainty.

Readings:
1. Learning the value of information in an uncertain world, Behrens, T. et al.
2. The Role of the Ventromedial Prefrontal Cortex in Abstract State-Based Inference during Decision Making in Humans, Hampton, A. N., Bossaerts, P., and O'Doherty J. P.

**Wednesday, August 8, Elena Asparouhova**

- Credit market bubbles. Individual and Social Rationality.

Readings:


**Friday, August 10, Peter Bossaerts**

- Neurobiological foundations of strategic uncertainty and the link with theory of mind

Readings:

1. Imaging the Intentional Stance in a Competitive Game, Gallagher, H. L. et al.
2. Neural Mechanisms of Belief Inference during Cooperative Games, Yoshida, W. et al.
4. The Rupture and Repair of Cooperation in Borderline Personality Disorder, King-Casas, B. et al.
Week 4
Monday August 13 – Last class, both Peter Bossaerts and Elena Asparouhova
• Finishing up all that was left behind from previous lectures