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Syllabus for Dyanamic Asset Pricing

Fall 2015
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Prerequisites: The first-year doctoral sequence in economics.
Course Focus: This course is meant to serve as an introduction to asset pricing. I will introduce the theoretical constructs and then explore the restrictions that the theory imposes on the data. We will consider both frequentist and Bayesian empirical specifications.
Overarching theme: The absence of arbitrage.
Outline structure:

1. Much of the course follows the outline of John Campbell's Asset Pricing at the Millenium, *Journal of Finance* 2000, 1515–1567.

2. I will also rely heavily on John Cochrane's text, *Asset Pricing*, revised edition.

Requirements:

1. Every paper that is listed on this syllabus is required reading–before the scheduled class.

2. I want to run the class largely as a seminar. This means active class participation is critical.

3. I have divided the course into 5 blocks. Each student has to replicate the empirical analysis of one of the papers in each of 2 blocks. Students will present both replications to the class during the scheduled final exam time. You should get started on this immediately! This must be done at the individual-student level.

Course Schedule

Block I The Absence of Arbitrage and the Data: Introduction and tools

- Week 1. Pricing Rule Representation Theorem / Fundamental Theorem of Asset Pricing
  - Arbitrage, State Prices, and Portfolio Theory, by Phil Dybvig and Steve Ross (2003).

- Week 2. Some probability theory and the behavior of stock returns
  - Simple Binomial Processes as Diffusion Approximations in Financial Models, by Dan Nelson and Krishna Ramaswamy, *Review of Financial Studies*, 393–430, 1990.
  - A subordinated stochastic process model with finite variance for speculative prices, by Peter Clark, *Econometrica*, 135–155, 1973.
  - Heteroskedasticity in stock return data: Volume versus GARCH effects, by Chris Lamoureux and Bill Lastrapes, *Journal of Finance*, 221–229, 1990.
  - On estimating the expected return on the market: An exploratory investigation, by Robert Merton, *Journal of Financial Economics*, 323–361, 1980.
- Week 3. SDF Moments
  - Implications of security market data for models of dynamic economies, by Lars Hansen and Ravi Jagannathan, *Journal of Political Economy*, 225-262, 1991.
  - Measurement of market integration and arbitrage, by Zhiwu Chen and Peter Knez, *Review of Financial Studies*, 287–325, 1995.
  - Chapter 5 in Cochrane's book.
  - Econometric Evaluation of asset pricing models, by Lars Hansen, John Heaton, and Erzo Luttmer, *Review of Financial Studies*, 237–274, 1995.
  - Diagnosing asset pricing models using the distribution of asset returns, by Karl Snow, *Journal of Finance*, 955–983, 1991.
- Week 4. Additional Restrictions on the data: Equity premium puzzle
  - The equity premium: A puzzle, by Rajnish Mehra and Edward Prescott, *Journal of Monetary Economics*, 145–161, 1985.
  - Rare disasters and asset markets in the twentieth century, by Robert Barro, *Quarterly Journal of Economics*, 823–867, 2006.
  - Variable rare disasters: An exactly solved framework for ten puzzles in macro-finance, by Xavier Gabaix, *Quarterly Journal of Economics*, 645–700, 2012.
- Week 5. Predictability of aggregate market returns
  - Temporary components of stock returns: What do the data tell us? by Chris Lamoureux and Guofu Zhou, *Review of Financial Studies*, 1033–1059, 1996.
  - A comprehensive look at the empirical performance of equity premium prediction, by Amit Goyal and Ivo Welch, *Review of Financial Studies*, 1455–1508, 2008.
  - The dog that did not bark: A defense of return predictability, by John Cochrane, *Review of Financial Studies*, 1533–1575, 2008.

Block II. Factors in the cross-section of stock returns

- Week 6.
  - Chapter 9 of Cochrane's book. Factor Structure of the stochastic discount factor
- Week 7. Factors and utility optimization
  - Parametric portfolio policies: Exploiting characteristics in the cross-section of equity returns, by Michael Brandt, Pedro Santa-Clara, and Ross Valkanov, *Review of Financial Studies*, 3411–3447, 2009.
- Week 8.
  - Firm characteristics and empirical factor models: A data-mining experiment, by Leonid Kogan and Mary Tian, 2013 Working Paper, MIT.
  - Interpreting factor models, by Serhiy Kozak, Stefan Nagel, and Shrihari Santosh, 2014 Working Paper, Michigan.
  - A skeptical appraisal of asset pricing tests, by Jonathan Lewellen, Stefan Nagel, and Jay Shanken, *Journal of Financial Economics*, 175–194, 2010.

Block III. Solving the Present Value Relation

- Week 9
  - A variance decomposition for stock returns, by John Campbell, *Economic Journal*, 157–179, 1991.
  - Intertemporal asset pricing without consumption data, by John Campbell, *American Economic Review*, 487–512, 1993.
- Week 10
  - What drives firm-level stock returns? by Tuomo Vuolteenaho, *Journal of Finance*, 233-264, 2002.
  - Growth or Glamor? Fundamentals and systematic risk in stock returns, by John Campbell, Chris Polk, and Tuomo Vuolteenaho, *Review of Financial Studies*, 305–344, 2010.
  - What drives stock price movements? by Long Chen, Zhi Da, and Xinlei Zhao, *Review of Financial Studies*, 841–876, 2013.

Block IV. Term Structure Models

- Week 11
  - A theory of the term structure of interest rates, by John Cox, Jon Ingersoll, and Steve Ross, *Econometrica*, 385–407, 1985.
  - Empirical analysis of the yield curve: The information in the data viewed through the window of Cox, Ingersoll, and Ross, by Chris Lamoureux and Doug Witte, *Journal of Finance*, 1479–1520, 2002.

- Week 12
  - Specification analysis of affine term structure models, by Qiang Dai and Ken Singleton, *Journal of Finance*, 1943–1978, 2000.
  - Do bonds span the fixed income markets? Theory and evidence for unspanned stochastic volatility, by Pierre Collin-Dufresne and Robert Goldstein, *Journal of Finance*, 1685–1730, 2002.
  - Can interest rate volatility be extracted from the cross-section of bond yields? by Pierre Collin-Dufresne, Robert Goldstein, and Chris Jones, *Journal of Financial Economics*, 47–66, 2009.

Block V. Options

- Week 13
  - Forecasting stock-return variance: Toward an understanding of stochastic implied volatilities, by Chris Lamoureux and Bill Lastrapes, *Review of Financial Studies*, 293–326, 1993.
  - Pricing with a smile, by Bruno Dupire, *Risk* 1994; (in *Risk*'s book: *Volatility*, 126–129).
  - Implied binomial trees, by Mark Rubinstein, *Journal of Finance*, 771–818, 1994.
  - Recovering probability distributions from option prices, by Jens Jackwerth and Mark Rubinstein, *Journal of Finance*, 1611–1631, 1996.
- Week 14
  - The price of a smile: Hedging and spanning in option markets, by Andrea Buraschi and Jens Jackwerth, *Review of Financial Studies*, 495–527, 2001.
  - Expected Option returns, by Josh Coval and Tyler Shumway, *Journal of Finance*, 983–1009, 2001.
  - Can tests based on option hedging errors correctly identify volatility risk premia? by Nicole Branger and Christian Schlag, *Journal of Financial and Quantitative Analysis*, 1055-1090, 2008.
- Week 15
  - Delta-hedged gains and the negative volatility risk premium, by Gurdip Bakshi and Nikunj Kapadia, *Review of Financial Studies*, 527-566, 2003.
  - Stock return characteristics, skew laws, and the differential pricing of individual equity options, by Gurdip Bakshi, Nikunj Kapadia, and Dilip Madan, *Review of Financial Studies*, 101–143, 2003.
  - Understanding index option returns, by Mark Broadie, Mikhail Chernov, and Michael Johannes, *Review of Financial Studies*, 4493–4529, 2009.

- Week 16
  - Disasters implied from equity index options, by Dave Backus, Mike Chernov, and Ian Martin, *Journal of Finance*, 1969–2012, 2011.
  - What is the expected return on the market? by Ian Martin, 2015 Working Paper, LSE.