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UCLA **Fall 2016**
MGMT 239C **Prof. Mikhail Chernov**

Empirical Asset Pricing

Teaching Schedule

Tuesdays, 8:30 – 11:20 am @ D310
Classes on 9/27 and 10/4 are CANCELLED
Make-up classes are on Thursdays 9/22 and 9/29, the same room and time

Final exam

Tuesday, 12/6, 8:30 – 11:30 am @ C303

Office Hours

by appointment

Course Description

Empirical asset pricing is focused on measuring and understanding risk premiums in the financial markets. Thinking about risk premiums necessarily involves modelling the pricing kernel. This course will study evidence pertaining to the pricing kernel and applied theoretical developments that are motivated by the evidence. Primarily, we will focus on modelling of equities and bonds with some time dedicated to options and currencies.

Readings and Reference Materials

To motivate the class, I am posting an article titled "Understanding Asset Prices", which was compiled by the Nobel Prize committee to explain the importance of the 2013 prize. This is, basically, the topic of this class.

- John Y. Campbell, Andrew W. Lo and A. Craig MacKinlay, The Econometrics of Financial Markets, Princeton University Press, Princeton, 1997.
- John H. Cochrane, Asset Pricing, Princeton University Press, Princeton, 2004.

- William Greene, Econometric Analysis (5th ed.), MacMillan, New York, 2003.
- James Hamilton, Time Series Analysis, Princeton University Press, Princeton, 1994.
- Kenneth Singleton, Empirical Dynamic Asset Pricing, Princeton University Press, Princeton, 2006

A detailed list of papers used in the course is provided at the end of this document.

Course Requirements

The grade will be determined solely on the basis of the final exam and assignments. You should be ready to present homework in each class. I will be selecting students for presentations randomly. Your presentation, your participation when someone else presents and your submitted assignments will count towards the assignment grade, which will be 50% of your final grade. The final exam accounts for the other half. It is important that you follow up on the presented material by reading the referenced papers. I will omit a lot of details in class, but nonetheless will hold you responsible for knowing them both in real time, that is, in subsequent classes, and on the final exam.

Course Outline

Part 0: Tools

- State-space models and the associated probabilities
- Estimation
- Likelihood
- Bayesian methods

References

Backus, David, Mikhail Chernov, and Ian Martin, 2011, Disasters implied by equity index options, *Journal of Finance* 66, 1967–2010.

Bertholon, Henri, Alain Monfort, and Fulvio Pegoraro, 2008, Econometric asset pricing modelling, *Journal of Financial Econometrics* 6, 407–458.

Hamilton, James, 1994, State space models, in R.F. Engle, and D.L. McFadden, ed.: *Handbook of Econometrics, Volume IV* (Elsvier).

Jacquier, Eric, Nicholas G. Polson, and Peter Rossi, 1994, Bayesian analysis of stochastic volatility models, *Journal of Business and Economic Statistics* 12, 69–87.

Johannes, Michael, and Nicholas G. Polson, 2009, MCMC methods in financial econometrics, in Yacine Aït-Sahalia, and Lars Hansen, ed.: *Handbook of Financial Econometrics, 1-72* (Elsevier: Oxford).

Part 1: Asset Pricing puzzles

- Resolving AP puzzles with recursive preferences
- Solving Bellman equations
- Assessing models with recursive preferences
- Resolving AP puzzles with habits

References

Backus, David, Mikhail Chernov, and Ian Martin, 2011, Disasters implied by equity index options, *Journal of Finance* 66, 1967–2010.

Backus, David, Mikhail Chernov, and Stanley Zin, 2014, Sources of entropy in representative agent models, *Journal of Finance* 69, 51–99.

Bansal, Ravi, and Amir Yaron, 2004, Risks for the long run: A potential resolution of asset pricing puzzles, *Journal of Finance* 59, 1481–1509.

Barro, Robert, 2006, Rare disasters and asset markets in the twentieth century, *Quarterly Journal of Economics* 121, 823?867.

Bertholon, Henri, Alain Monfort, and Fulvio Pegoraro, 2008, Econometric asset pricing modelling, *Journal of Financial Econometrics* 6, 407–458.

Campbell, John, 1999, Asset prices, consumption, and the business cycle, in J.B. Taylor, and M. Woodford, ed.: *Handbook of Macroeconomics, Volume I* (Elsvier).

——— , and John Cochrane, 1999, By force of habit: a consumption-based explanation of aggregate stock market behavior, *Journal of Political Economy* 107, 205–251.

Chernov, Mikhail, and Philippe Mueller, 2012, The term structure of inflation expectations, *Journal of Financial Economics* 106, 367–394.

Cochrane, John, 2007, The dog that did not bark: A defense of return predictability, *Review of Financial Studies* 21, 1533–1575.

Epstein, Larry G., and Stanley E. Zin, 1989, Substitution, risk aversion, and the temporal behavior of consumption and asset returns: a theoretical framework, *Econometrica* 57, 937–969.

Hansen, Lars, and Ravi Jagannathan, 1991, Implications of security market data for models of dynamic economies, *Journal of Political Economy* 99, 225–262.

Kreps, David M., and Evan L. Porteus, 1978, Temporal resolution of uncertainty and dynamic choice theory, *Econometrica* 46, 185–200.

Lewellen, Jonathan, 2004, Predicting returns with financial ratios, *Journal of Financial Economics* 74, 209–235.

Monfort, Alain, and Fulvio Pegoraro, 2012, Asset pricing with second-order esscher transforms, *The Journal of Banking and Finance* 36, 1678–1687.

Weil, Philippe, 1989, The equity premium puzzle and the risk-free rate puzzle, *Journal of Monetary Economics* 24, 4201–4219.

Part 2: Term Structure of Interest Rates

- Structural models of real yields
- Long-Run Properties of the Structural Models
- Structural Models of Nominal Yields
- Affine Term Structure Models

References

Alvarez, Fernando, and Urban Jermann, 2005, Using asset prices to measure the persistence of the marginal utility of wealth, *Econometrica* 73, 1977–2016.

Ang, Andrew, and Monika Piazzesi, 2003, A no-arbitrage vector autoregression of term structure dynamics with macroeconomic and latent variables, *Journal of Monetary Economics* 50, 745–787.

Bansal, Ravi, and Bruce N. Lehmann, 1997, Growth-optimal portfolio restrictions on asset pricing models, *Macroeconomic Dynamics* 1, 333–354.

Bansal, Ravi, and Ivan Shaliastovich, 2013, A long-run risks explanation of predictability puzzles in bond and currency markets, *Review of Financial Studies* 26, 1–33.

Campbell, John, Carolin Pflueger, and Luis Viceira, 2014, Monetary policy drivers of bond and equity risks, working paper.

Campbell, John, and Robert Shiller, 1991, Yield spreads and interest rate movements: A bird's eye view, *Review of Economic Studies* 58, 495–514.

Chernov, Mikhail, and Philippe Mueller, 2012, The term structure of inflation expectations, *Journal of Financial Economics* 106, 367–394.

Cochrane, John, and Monika Piazzesi, 2005, Bond risk premia, *American Economic Review* 95, 138–160.

Dai, Qiang, and Kenneth Singleton, 2002, Expectation puzzles, time-varying risk premia, and dynamic models of the term structure, *Journal of Financial Economics* 63, 415–441.

Duffee, Gregory R., 2011, Information in (and not in) the term structure, *Review of Financial Studies* 24, 2895–2934.

Gallmeyer, Michael, Burton Hollifield, Francisco Palomino, and Stanley Zin, 2007, Arbitrage free bond pricing with dynamic macroeconomic models, *The Federal Reserve Bank of St. Louis Review* pp. 305–326.

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Le, Anh, Kenneth Singleton, and Qiang Dai, 2010, Discrete-time affine term structure models with generalized market prices of risk, *Review of Financial Studies* 23, 2184–2227.

Litterman, R., and J. Scheinkman, 1991, Common factors affecting bond returns, *Journal of Fixed Income* 6, 54–61.

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Song, Dongho, 2014, Bond market exposures to macroeconomic and monetary policy risks, working paper.

Wachter, Jessica, 2006, A consumption-based model of the term structure of interest rates, *Journal of Financial Economics* 79, 365–399.

Part 3: Option puzzles

- Properties of index returns
- Studying the S&P 500 dynamics
- Solving the S&P 500 option puzzles
- Options and structural models

References

Aït-Sahalia, Yacine, and Andrew Lo, 2000, Nonparametric risk management and implied risk aversion, *Journal of Econometrics* 94, 9–51.

Amengual, Dante, 2009, The term structure of variance risk premia, Working paper, Princeton University.

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Chabi-Yo, Fousseini, Rene Garcia, and Eric Renault, 2008, State dependence can explain the risk aversion puzzle, *Review of Financial Studies* 21, 973–1011.

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Ross, Stephen, 2015, The recovery theorem, *Journal of Finance* 70, 615–648.

Song, Zhaogang, and Dacheng Xiu, 2015, A tale of two option markets: Pricing kernels and volatility risk, working paper.

Part 4: Cross-sectional asset pricing

- Puzzles
- Linear factor models
- Equilibrium models

References

Bansal, Ravi, Dana Kiku, Ivan Shaliastovich, and Amir Yaron, 2014, Volatility, the macroeconomy, and asset prices, *Journal of Finance* pp. xx–xx.

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Zviadadze, Irina, 2013, Term-structure of consumption risk premia in the cross-section of currency returns, Working paper, Stockholm School of Economics.

Part 5: Exchange rate puzzles

- Basic evidence
- Basic theory
- FX crash risk
- Currency options

References

Asness, Cliff .S., Tobias Moskowitz, and Lasse H. Pedersen, 2010, Value and Momentum Everywhere, *AQR, Chicago, and NYU, working paper*.

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Zviadadze, Irina, 2013, Term-structure of consumption risk premia in the cross-section of currency returns, Working paper, Stockholm School of Economics.

Part 6: Credit risk

- Credit puzzles
- Affine models
- Real option models
- Structural models

References

Bhamra, Harjoat, Lars-Alexander Kuehn, and Ilya Strebulaev, 2010, The levered equity risk premium and credit spreads: A unified framework, *Review of Financial Studies* 23, 645–703.

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Part 7: Learning

- Evidence
- Long-run risk
- Overlapping generations

References

Collin-Dufresne, Pierre, Michael Johannes, and Lars Lochstoer, 2015a, Asset pricing when 'This time is different', working paper.

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Johannes, Michael, Lars Lochstoer, and Yiqun Mou, 2015, Learning about consumption dynamics, *Journal of Finance* pp. xx–xx.