HARVARD UNIVERSITY: DEPARTMENT OF ECONOMICS

Economics 2723: Asset Pricing
Syllabus 08/10/14

Fall 2014 | Prof. John Y. Campbell
Tu Th 2.30-4.00pm, Sever 110 | Littauer 213, 617-496-6448
Office hours Tu Th 1.00-2.00pm
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This course is an introduction to asset pricing. It begins with a review of the theory of choice under uncertainty, then develops classical asset pricing theory in discrete time. It also discusses empirical puzzles and recent theories that have been developed to try to solve them.

Ec2723 is a natural introduction to other graduate courses in finance, including the fall course Ec2725, Corporate Finance and Banking, taught by David Scharfstein and Jeremy Stein; and the spring courses Ec2726, Theoretical and Empirical Perspectives on Entrepreneurship: Economics and Finance, taught by William Kerr and Josh Lerner; Ec2727, Empirical Methods in Corporate Finance, taught by Paul Gompers, Sam Hanson, Victoria Ivashina, and Adi Sunderam; and Ec2728, Behavioral Finance, taught by Andrei Shleifer.

Requirements for credit in Ec2723 include three assignments and a final exam. Two of the assignments will contain computational exercises. At least one assignment will include a “referee report” to be written on an unpublished asset pricing paper.

Ec2723 is intended for PhD students in economics, and I will assume knowledge of first-year PhD microeconomics, macroeconomics, and econometrics. Undergraduates interested in this field should take my undergraduate course Ec1723, Capital Markets.

The book will be taught using an unpublished manuscript, *Financial Decisions and Markets: A Course in Asset Pricing.* I will hand out a free hardcopy of the manuscript to all students registered in the course. Two published books will also be used: John H. Cochrane, *Asset Pricing*, Princeton University Press, revised ed., 2005, and John Y. Campbell and Luis M. Viceira, *Strategic Asset Allocation: Portfolio Choice for Long-Term Investors*, Oxford University Press, 2002. Both these books are available at the Harvard Coop.

Two other books may also be useful: John Y. Campbell, Andrew Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, 1997, and Christian Gollier, *The Economics of Risk and Time*, MIT Press, 2001. No required readings are assigned from these books, but some chapters of Gollier are recommended as background reading.

Other readings are available on the course website.
* denotes required reading and [ ] denotes classic reading, the original source but not necessarily the easiest reference today.

The teaching fellow for the course is Argyris Tsiaras, atsiaras@fas.harvard.edu.

What is finance?

Cochrane, Chapters 1-2.

*Cochrane, John H., 2011, "Presidential Address: Discount Rates", *Journal of Finance* 66:1047-1108.

Campbell, John Y., 2014, "Empirical Asset Pricing: Eugene Fama, Lars Peter Hansen, and Robert Shiller", forthcoming *Scandinavian Journal of Economics*.

1. Choice under uncertainty

Campbell, Chapter 1 and/or Gollier, Chapters 1-3.

[Arrow, Kenneth J., 1971, "The Theory of Risk Aversion", in *Essays in the Theory of Risk Bearing*, Markham.]

Backus, David K., Bryan R. Routledge, and Stanley E. Zin, 2004, "Exotic Preferences for Macroeconomists", *NBER Macroeconomics Annual* 19, 319-390.

Barberis, Nicholas, Ming Huang, and Richard H. Thaler, 2006, "Individual Preferences, Monetary Gambles, and Stock Market Participation: A Case for Narrow Framing", *American Economic Review* 96, 1069-1090.

*Chetty, Raj and Adam Szeidl, 2007, "Consumption Commitments and Risk Preferences", *Quarterly Journal of Economics* 122:831-877.

[Kahneman, Daniel and Amos Tversky, 1979, "Prospect Theory: An Analysis of Decision Under Risk", *Econometrica* 47:263-291.]

[Kimball, Miles, 1990, "Precautionary Saving in the Small and in the Large", *Econometrica* 58, 53-73.]

[Pratt, John W., 1964, "Risk Aversion in the Small and in the Large", *Econometrica* 32:122-136.]

*Rabin, Matthew, 2000, "Risk Aversion and Expected-Utility Theory: A Calibration Theorem", *Econometrica* 68:1281-1292.

[Rothschild, Michael and Joseph E. Stiglitz, 1970, "Increasing Risk I: A Definition", *Journal of Economic Theory* 2:225-243.]

2. Static portfolio choice, the CAPM, and the APT

A. Mean-variance analysis and factor models

Campbell, Chapters 2 and 3 and/or Campbell-Viceira, Chapter 2, Cochrane, Chapters 5 and 9, or Gollier, Chapter 4.

[Black, Fischer, 1972, "Capital Market Equilibrium with Restricted Borrowing", *Journal of Business* 45:444-454.]

Campbell, John, Martin Lettau, Burton Malkiel, and Yexiao Xu, 2001, "Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk", *Journal of Finance* 56:1-43.

DeMiguel, Victor, Lorenzo Garlappi, and Raman Uppal, 2009, "Optimal versus Naïve Diversification: How Inefficient is the 1/*N* Portfolio Strategy? ", *Review of Financial Studies* 22:1915-1953.

[Roll, Richard, 1976, "A Critique of the Asset Pricing Theory's Tests: Part I", *Journal of Financial Economics* 4:129-176.]

[Ross, Stephen A., 1976, "The Arbitrage Theory of Capital Asset Pricing", *Journal of Economic Theory* 13:341-360.]

[Sharpe, William F., 1964, "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk", *Journal of Finance* 19:425-442.]

B. Test methodology

Cochrane, Chapters 10-12.

Brennan, Michael J., Tarun Chordia, and Avanidhar Subrahmanyam, 1998, "Alternative Factor Specifications, Security Characteristics, and the Cross-Section of Expected Stock Returns", *Journal of Financial Economics* 49, 345-373.

[Fama, Eugene F. and James D. MacBeth, 1973, "Risk, Return, and Equilibrium: Empirical Tests", *Journal of Political Economy* 81, 607-636.]

[Gibbons, Michael, Stephen Ross, and Jay Shanken, 1989, "A Test of the Efficiency of a Given Portfolio", *Econometrica* 57:1121-1152.]

Kandel, Shmuel and Robert F. Stambaugh, 1995, "Portfolio Inefficiency and the Cross-Section of Expected Returns", *Journal of Finance* 50:157-184.

*Lewellen, Jonathan, Stefan Nagel, and Jay Shanken, 2010, "A Skeptical Appraisal of Asset Pricing Tests", *Journal of Financial Economics* 96:175-194.

C. Factor models and the cross-section of stock returns

Campbell, Chapter 3, section 3.3 and/or Cochrane, Chapter 20, section 20.2.

*Fama, Eugene F. and Kenneth R. French, 1993, "Common Risk Factors in the Returns on Stocks and Bonds", *Journal of Financial Economics* 33:3-56.

Jegadeesh, Narasimhan and Sheridan Titman, 1993, "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency", *Journal of Finance* 48, 65-92.

*Lewellen, Jonathan and Stefan Nagel, 2006, "The Conditional CAPM Does Not Explain Asset-Pricing Anomalies", *Journal of Financial Economics* 82:289-314.

Nagel, Stefan, 2013, “Empirical Cross-Sectional Asset Pricing”, *Annual Review of Financial Economics* 5, 167-169.

Wermers, Russ, 2000, “Mutual Fund Performance: An Empirical Decomposition into Stock-Picking Talent, Style, Transactions Costs, and Expenses”, *Journal of Finance* 55, 1655-1695.

3. Absence of arbitrage and the stochastic discount factor

A. Theory

Campbell, Chapter 4 and/or Cochrane, Chapters 3-4 and 6-8.

*Alvarez, Fernando and Urban Jermann, 2005, “Using Asset Prices to Measure the Persistence of the Marginal Utility of Wealth”, *Econometrica* 73:1977-2016.

Bansal, Ravi and Bruce N. Lehmann, 1997, “Growth-Optimal Portfolio Restrictions on Asset Pricing Models”, *Macroeconomic Dynamics* 1:333-354.

Cochrane, John H. and Jesus Saa-Requejo, 2000, “Beyond Arbitrage: Good-Deal Asset Price Bounds in Incomplete Markets”, *Journal of Political Economy* 108:79-119.

*Hansen, Lars Peter and Ravi Jagannathan, 1991, “Implications of Security Market Data for Models of Dynamic Economies”, *Journal of Political Economy* 99:225-262.

B. Heterogeneous beliefs, short-sales constraints, and limits to arbitrage

Duffie, Darrell, 2010, “Presidential Address: Asset Price Dynamics with Slow-Moving Capital”, *Journal of Finance* 65:1237-1267.

*Geanakoplos, John, 2009, “The Leverage Cycle”, *NBER Macroeconomics Annual* 1-65.

[Harrison, J. Michael and David M. Kreps, 1978, “Speculative Investor Behavior in a Stock Market with Heterogeneous Expectations”, *Quarterly Journal of Economics* 92:323-336.]

*Lamont, Owen A. and Richard H. Thaler, 2003, “Anomalies: The Law of One Price in Financial Markets”, *Journal of Economic Perspectives* 17(4), 191-202.

Scheinkman, Jose and Wei Xiong, 2003, “Overconfidence and Speculative Bubbles”, *Journal of Political Economy* 111, 1183-1219.

*Shleifer, Andrei and Robert Vishny, 1997, “The Limits of Arbitrage”, *Journal of Finance* 52:35-55.

Simsek, Alp, 2013, “Belief Disagreements and Collateral Constraints”, *Econometrica* 81:1-53.

4. Present value relations and stock return predictability

A. Models of stock prices

Campbell, Chapter 5, sections 5.1-5.3.

Campbell, John Y. and Robert J. Shiller, 1988, "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors", *Review of Financial Studies* 1:195-228.

*Gabaix, Xavier, 2009, "Linearity-Generating Processes: A Modelling Tool Yielding Closed Forms for Asset Prices", unpublished paper, New York University.

B. Predictability of aggregate stock returns

Campbell, Chapter 5, sections 5.3-5.4 and/or Cochrane, Chapter 20, section 20.1.

Campbell, John Y. and Samuel B. Thompson, 2008, "Predicting Excess Stock Returns Out of Sample: Can Anything Beat the Historical Average?", *Review of Financial Studies* 21:1509-1531.

Fama, Eugene F. and Kenneth R. French, 1989, "Business Conditions and Expected Returns on Stocks and Bonds", *Journal of Financial Economics* 25:23-50.

*Lettau, Martin and Sydney Ludvigson, 2001, "Consumption, Aggregate Wealth, and Expected Stock Returns", *Journal of Finance* 56:815-849.

Lewellen, Jonathan, 2004, "Predicting Returns with Financial Ratios", *Journal of Financial Economics* 74, 209-235.

Pastor, Lubos and Robert F. Stambaugh, 2009, "Predictive Systems: Living with Imperfect Predictors", *Journal of Finance* 64:1583-1628.

Stambaugh, Robert F., 1999, "Predictive Regressions", *Journal of Financial Economics* 54:375-421, 1999.

C. Present value logic and the cross-section of stock prices

Campbell, Chapter 5, section 5.5.

Asness, Clifford S., Andrea Frazzini, and Lasse H. Pedersen, 2014, "Quality Minus Junk", unpublished paper, AQR Capital Management.

Cohen, Randolph, Christopher Polk, and Tuomo Vuolteenaho, 2005, "Money Illusion in the Stock Market: The Modigliani-Cohn Hypothesis", *Quarterly Journal of Economics* 120, 639-668.

*Pastor, Lubos and Pietro Veronesi, 2003, "Stock Valuation and Learning About Profitability", *Journal of Finance* 58:1749-1789.

*Polk, Christopher, Samuel Thompson, and Tuomo Vuolteenaho, 2006, "Cross-Sectional Forecasts of the Equity Premium", *Journal of Financial Economics* 81, 101-141.

5. Consumption-based asset pricing

A. Representative agent models, the equity premium puzzle, and the equity volatility puzzle

(i) General

Campbell, Chapter 6 and/or Cochrane, Chapter 21.

Backus, David, Mikhail Chernov, and Stanley E. Zin, 2014, "Sources of Entropy in Representative Agent Models", *Journal of Finance* 69, 51-99.

[Epstein, Larry G. and Stanley E. Zin, 1991, "Substitution, Risk Aversion, and the Temporal Behavior of Consumption and Asset Returns: An Empirical Analysis", *Journal of Political Economy* 99:263-286.]

Ludvigson, Sydney, 2013, "Advances in Consumption-Based Asset Pricing: Empirical Tests", in George Constantinides, Milton Harris, and Rene Stulz eds., *Handbook of the Economics of Finance*, Volume 2B, North-Holland, 799-906.

[Mehra, Rajnish and Edward Prescott, 1985, "The Equity Premium: A Puzzle", *Journal of Monetary Economics* 15:145-161.]

(ii) Long-run risks and changing volatility

*Bansal, Ravi and Amir Yaron, 2004, "Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles", *Journal of Finance* 59: 1481-1509.

Beeler, Jason and John Y. Campbell, 2012, "The Long-Run Risks Model and Aggregate Asset Prices: An Empirical Assessment", *Critical Finance Review* 1:141-182.

Epstein, Larry, Emmanuel Farhi, and Tomasz Strzalecki, 2013, "How Much Would You Pay to Resolve Long-Run Risk?", unpublished paper, Boston University and Harvard University.

Hansen, Lars Peter, John C. Heaton, and Nan Li, 2008, "Consumption Strikes Back? Measuring Long-Run Risk", *Journal of Political Economy* 116:260-302.

Lettau, Martin, Sydney C. Ludvigson, and Jessica A. Wachter, 2008, "The Declining Equity Premium: What Role Does Macroeconomic Risk Play?", *Review of Financial Studies* 21:1653-1687.

(iii) Ambiguity aversion

*Epstein, Larry and Martin Schneider, 2010, "Ambiguity and Asset Markets", *Annual Review of Financial Economics* 2:315-346.

Hansen, Lars Peter and Thomas J. Sargent, 2008, "Risk Sensitivity, Model Uncertainty, and Asset Pricing", Ch. 14 in *Robustness*, Princeton University Press.

(iv) Habit formation

*Campbell, John Y. and John H. Cochrane, 1999, "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior", *Journal of Political Economy* 107:205-251, April 1999.

Constantinides, George, 1990, "Habit Formation: A Resolution of the Equity Premium Puzzle", *Journal of Political Economy* 98:519-543.

(v) Rare disasters

Barro, Robert and Jose F. Ursua, 2012, "Rare Macroeconomic Disasters", *Annual Review of Economics* 4:83-109.

*Martin, Ian, 2013, "Consumption-Based Asset Pricing with Higher Cumulants", *Review of Economic Studies* 80:745-773.

Wachter, Jessica, 2013, "Can Time-Varying Risk of Rare Disasters Explain Aggregate Stock Market Volatility?", *Journal of Finance* 68:987-1035.

B. Heterogeneous agents

Campbell, Chapter 10, section 10.1.

*Constantinides, George M. and Darrell Duffie, 1996, "Asset Pricing with Heterogeneous Consumers", *Journal of Political Economy* 104:219-240.

Garleanu, Nicolae and Stavros Panageas, 2014, "Young, Old, Conservative and Bold: The Implications of Finite Lives and Heterogeneity for Asset Pricing", forthcoming *Journal of Political Economy*.

[Grossman, Sanford J. and Robert J. Shiller, 1982, "Consumption Correlatedness and Risk Measurement in Economies with Non-Traded Assets and Heterogeneous Information", *Journal of Financial Economics* 10:195-210.]

C. Consumption risk and the cross-section of stock returns

Cochrane, John, Francis Longstaff, and Pedro Santa-Clara, 2008, "Two Trees", *Review of Financial Studies* 21:347-385.

Garleanu, Nicolae, Leonid Kogan, and Stavros Panageas, 2012, "Displacement Risk and Asset Returns", *Journal of Financial Economics* 105:491-510.

Parker, Jonathan and Christian Julliard, 2005, "Consumption Risk and Cross-Sectional Returns", *Journal of Political Economy* 113:185-222.

*Yogo, Motohiro, 2006, "A Consumption-Based Explanation of Expected Stock Returns", *Journal of Finance* 61:539-580.

6. Production-based asset pricing

A. Q theory

Campbell, Chapter 7.

*Belo, Frederico, 2010, "Production-based Measures of Risk for Asset Pricing", *Journal of Monetary Economics* 57:146-163.

Cochrane, John H., 1996, "A Cross-Sectional Test of an Investment-Based Asset Pricing Model", *Journal of Political Economy* 104:572-621.

*Liu, Laura Xiaolei, Toni M. Whited, and Lu Zhang, 2009, "Investment-Based Expected Stock Returns", *Journal of Political Economy* 117:1105-1139.

*Zhang, Lu, 2005, "The Value Premium", *Journal of Finance* 60:67-103.

B. General equilibrium with production

Bloom, Nicholas, 2009, "The Impact of Uncertainty Shocks", *Econometrica* 77:623-685.

Dew-Becker, Ian, 2012, "A Model of Time-Varying Risk Premia with Habits and Production", unpublished paper, Federal Reserve Bank of San Francisco.

*Gomes, Francisco and Alexander Michaelides, 2008, "Asset Pricing with Limited Risk Sharing and Heterogeneous Agents", *Review of Financial Studies* 21:415-448.

*Jermann, Urban J., 1998, "Asset Pricing in Production Economies", *Journal of Monetary Economics* 41:257-275.

*Kaltenbrunner, Georg and Lars A. Lochstoer, 2010, "Long-Run Risk Through Consumption Smoothing", *Review of Financial Studies* 23:3190-3224.

Kogan, Leonid and Dimitris Papanikolaou, 2012, "Economic Activity of Firms and Asset Prices", *Annual Review of Financial Economics* 4: 361-384.

Papanikolaou, Dimitris, 2011, "Investment Shocks and Asset Prices", *Journal of Political Economy* 119:639-685.

Storesletten, Kjetil, Christopher I. Telmer, and Amir Yaron, 2007, "Asset Pricing with Idiosyncratic Risk and Overlapping Generations", *Review of Economic Dynamics* 10:519-548.

Swanson, Eric T., 2012, "Risk Aversion and the Labor Margin in Dynamic Equilibrium Models", *American Economic Review* 102:1663-1691.

Tallarini, Thomas, 2000, "Risk-Sensitive Real Business Cycles", *Journal of Monetary Economics* 45:507-532.

7. Bonds

A. Fixed-income securities and the expectations hypothesis of the term structure

*Campbell, Chapter 8, sections 8.1 and 8.2, and/or Cochrane, Chapter 19 and Chapter 20, pp. 426-435.

Bekaert, Geert, Robert J. Hodrick, and David A. Marshall, 2001, "Peso Problem Explanations for Term Structure Anomalies", *Journal of Monetary Economics* 48:241-270.

Campbell, John Y. and Robert J. Shiller, 1991, "Yield Spreads and Interest Rate Movements: A Bird's Eye View", *Review of Economic Studies* 58:495-514.

*Cochrane, John H. and Monika Piazzesi, 2005, "Bond Risk Premia", *American Economic Review* 95:138-160.

Duffee, Gregory R., 2011, "Information in (and not in) the Term Structure", *Review of Financial Studies* 24:2895-2934.

Fama, Eugene F. and Robert R. Bliss, 1987, "The Information in Long-Maturity Forward Rates", *American Economic Review* 77, 680-692.

Gurkaynak, Refet S. and Jonathan H. Wright, 2012, "Macroeconomics and the Term Structure", *Journal of Economic Literature* 50:331-367.

Piazzesi, Monika, 2005, "Bond Yields and the Federal Reserve", *Journal of Political Economy* 113:311-344.

B. Models of bond risk premia

Campbell, Chapter 8, sections 8.3 and 8.4.

*Campbell, John Y., Carolin Pflueger, and Luis M. Viceira, 2014, "Monetary Drivers of Bond and Equity Risks", NBER Working Paper No. 20070.

*Greenwood, Robin and Dimitri Vayanos, 2014, "Bond Supply and Excess Bond Returns", *Review of Financial Studies* 27:663–713.

Krishnamurthy, Arvind and Annette Vissing-Jorgensen, 2012, "The Aggregate Demand for Treasury Debt", *Journal of Political Economy* 120:233-267.

Lustig, Hanno and Adrien Verdelhan, 2007, "The Cross-Section of Foreign Currency Risk Premia and US Consumption Growth Risk", *American Economic Review* 97:89-117.

Wachter, Jessica A., 2006, "A Consumption-Based Model of the Term Structure of Interest Rates", *Journal of Financial Economics* 79, 365-399.

8. Intertemporal asset pricing

A. Portfolio choice for long-term investors

*Campbell, Chapter 9 and/or Campbell-Viceira, Chapters 3-4 and 6-7.

Brandt, Michael, 1999, "Estimating Portfolio and Consumption Choice: A Conditional Euler Equations Approach", *Journal of Finance* 54:1609-1645.

[Cox, John C. and Chi-fu Huang, 1989, "Optimal Consumption and Portfolio Policies When Asset Prices Follow a Diffusion Process", *Journal of Economic Theory* 49:33-83.]

DeTemple, Jerome, Rene Garcia, and Marcel Rindisbacher, 2003, "A Monte Carlo Method for Optimal Portfolios", *Journal of Finance* 58:401-446.

*Pastor, Lubos and Robert F. Stambaugh, 2012, "Are Stocks Really Less Volatile in the Long Run?", *Journal of Finance* 67:431-478.

[Samuelson, Paul A., 1969, "Lifetime Portfolio Selection by Dynamic Stochastic Programming", *Review of Economics and Statistics* 51:239-246.]

B. Intertemporal risk and the cross-section of stock returns

*Campbell, John Y., Stefano Giglio, Christopher Polk, and Robert Turley, 2014, "An Intertemporal CAPM with Stochastic Volatility", revision of NBER Working Paper No. 18411.

Campbell, John Y. and Tuomo Vuolteenaho, 2004, "Bad Beta, Good Beta", *American Economic Review* 94:1249-1275.

Lettau, Martin and Jessica Wachter, 2007, "Why is Long-horizon Equity Less Risky? A Duration-based Explanation of the Value Premium", *Journal of Finance* 62:55-92.

9. Market incompleteness and risksharing

Campbell, Chapter 10.

*Alvarez, Fernando and Urban Jermann, 2000, "Efficiency, Equilibrium, and Asset Pricing with Risk of Default", *Econometrica* 68:775-797.

Athanasoulis, Stefano and Robert Shiller, 2000, "The Significance of the Market Portfolio", *Review of Financial Studies* 13:301-329.

Ball, Laurence and N. Gregory Mankiw, 2007, "Intergenerational Risk Sharing in the Spirit of Arrow, Debreu, and Rawls, with Applications to Social Security Design", *Journal of Political Economy* 115:523-547.

Chien, YiLi and Hanno Lustig, 2010, "The Market Price of Aggregate Risk and the Wealth Distribution", *Review of Financial Studies*, 23: 1596-1650.

Davila, Eduardo, 2011, "Dissecting Fire Sales Externalities", unpublished paper, Harvard University.

[Geanakoplos, John and Heracles Polemarchakis, 1985, "Existence, Regularity, and Constrained Suboptimality of Competitive Allocations When the Asset Market Is Incomplete", Cowles Foundation for Research in Economics Discussion Paper 764.]

Guvenen, Fatih, 2011, "Macroeconomics with Heterogeneity: A Practical Guide", *Federal Reserve Bankof Richmond Economic Quarterly* 97:255-326.

[Hart, Oliver D., 1975, "On the Optimality of Equilibrium when the Market Structure is Incomplete", *Journal of Economic Theory* 11:418-443.]

*Kocherlakota, Narayana and Luigi Pistaferri, 2009, "Asset Pricing Implications of Pareto Optimality with Private Information", *Journal of Political Economy* 117:555-590.

Krusell, Per and Anthony A. Smith, 1998, "Income and Wealth Heterogeneity in the Macroeconomy", *Journal of Political Economy* 106:867-896.

[Stiglitz, Joseph, 1982, "The Inefficiency of the Stock Market Equilibrium", *Review of Economic Studies*, 49: 241-61.]

10. Household finance

Campbell, Chapter 11.

*Agarwal, Sumit, John Driscoll, Xavier Gabaix, and David Laibson, 2009, "The Age of Reason: Financial Decisions over the Life Cycle and Implications for Regulation", *Brookings Papers on Economic Activity* 2:51-117.

Barberis, Nicholas, Robin Greenwood, Lawrence Jin, and Andrei Shleifer, 2013, "X-CAPM: An Extrapolative Capital Asset Pricing Model", unpublished paper, Yale and Harvard University.

*Campbell, John Y., 2006, "Household Finance", *Journal of Finance* 61:1553-1604.

Campbell, John, Laurent Calvet, and Paolo Sodini, 2007, "Down or Out: Assessing the Welfare Costs of Household Investment Mistakes", *Journal of Political Economy* 115:707-747.

Campbell, John Y., Howell Jackson, Brigitte Madrian, and Peter Tufano, 2011, "Consumer Financial Protection", *Journal of Economic Perspectives* 25(1):91-114.

Chien, Yili, Harold Cole, and Hanno Lustig, 2011, "A Multiplier Approach to Understanding the Macro Implications of Household Finance", *Review of Economic Studies* 78:199-234.

Chien, YiLi, Harold Cole, and Hanno Lustig, 2012, "Is the Volatility of the Market Price of Risk Due to Intermittent Portfolio Rebalancing?", *American Economic Review*, 102: 2859-96.

*French, Kenneth R., 2008, "The Cost of Active Investing", *Journal of Finance* 63:1537-1573.

Gabaix, Xavier and David Laibson, 2006, “Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets”, *Quarterly Journal of Economics* 121:505-540.

Guiso, Luigi and Paolo Sodini, 2013, “Household Finance: An Emerging Field”, in George Constantinides, Milton Harris, and Rene Stulz eds., *Handbook of the Economics of Finance*, Volume 2B, North-Holland, 1397-1531..

Lustig, Hanno and Stijn Van Nieuwerburgh, 2005, “Housing Collateral, Consumption Insurance and Risk Premia: an Empirical Perspective”, *Journal of Finance*, 60: 1167-1219.

Odean, Terrance, 1998, “Are Investors Reluctant to Realize Their Losses?”, *Journal of Finance* 53:1775-1798.

Vissing-Jorgensen, Annette, 2002, “Limited Asset Market Participation and the Elasticity of Intertemporal Substitution”, *Journal of Political Economy* 110:825-853.

11. Asymmetric information, rational expectations, and market microstructure

A. Asymmetric information

Campbell, Chapter 12, sections 12.1-12.2.

*Allen, Franklin, Stephen Morris, and Hyun Song Shin, 2006, “Beauty Contests, Bubbles, and Iterated Expectations in Financial Markets”, *Review of Financial Studies* 19, 719-752.

*Berk, Jonathan and Richard Green, 2004, “Mutual Fund Flows and Performance in Rational Markets”, *Journal of Political Economy* 112, 1269-1295.

[Grossman, Sanford and Joseph Stiglitz, 1980, “On the Impossibility of Informationally Efficient Markets”, *American Economic Review* 70:393-408.]

Kacperczyk, Marcin, Jaromir Nosal, and Luminita Stevens, 2014, “Investor Sophistication and Capital Income Inequality”, NBER Working Paper No. 20246.

Stambaugh, Robert, 2014, “Investment Noise and Trends”, *Journal of Finance* 69:1415-1453.

B. Determinants of trading costs

Campbell, Chapter 12, section 12.3.

Duffie, Darrell, Nicolae Garleanu, and Lasse Pedersen, 2005, “Over-The-Counter Markets”, *Econometrica* 73, 1815-1847.

Easley, David, Nicholas M. Kiefer, Maureen O’Hara, and Joseph B. Paperman, 1996, “Liquidity, Information, and Infrequently Traded Stocks”, *Journal of Finance* 51:1405-1436.

[Glosten, Lawrence and Paul Milgrom, 1985, "Bid, Ask, and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders", *Journal of Financial Economics* 14:71-100.]

[Kyle, Albert S., 1985, "Continuous Auctions and Insider Trading", *Econometrica* 53:1315-1335.]

C. Liquidity and asset prices

Campbell, Chapter 12, section 12.4.

Acharya, Viral V. and Lasse Heje Pedersen, 2005, "Asset Pricing with Liquidity Risk", *Journal of Financial Economics* 77:375-410.

Amihud, Yakov, Haim Mendelson, and Lasse Heje Pedersen, 2005, "Liquidity and Asset Prices", *Foundations and Trends in Finance* 1:269-364.

Brunnermeier, Markus K. and Martin Oehmke, 2013, "Bubbles, Financial Crises, and Systemic Risk", in George Constantinides, Milton Harris, and Rene Stulz eds., *Handbook of the Economics of Finance,* Volume 2B, North-Holland, 1221-1287.

*Brunnermeier, Markus K. and Lasse Heje Pedersen, 2009, "Market Liquidity and Funding Liquidity", *Review of Financial Studies* 22:2201-2238.

*Gârleanu, Nicolae and Lasse Heje Pedersen, 2011, "Margin-Based Asset Pricing and Deviations from the Law of One Price", *Review of Financial Studies* 24:1980-2022.

Pastor, Lubos and Robert F. Stambaugh, 2003, "Liquidity Risk and Expected Stock Returns", *Journal of Political Economy* 111:642-685.

*Vayanos, Dimitri and Jiang Wang, 2013, "Market Liquidity – Theory and Empirical Evidence", in George Constantinides, Milton Harris, and Rene Stulz eds., *Handbook of the Economics of Finance,* Volume 2B, North-Holland, 1289-1361.

Alternative textbooks and lecture series

Back, Kerry, 2010, *Asset Pricing and Portfolio Choice Theory*, Oxford University Press.

Björk, Tomas, 2009, *Arbitrage Theory in Continuous Time*, third ed., Oxford University Press.

Duffie, Darrell, 1992, *Dynamic Asset Pricing Theory*, Princeton University Press.

Hansen, Lars Peter and Thomas J. Sargent, 2008, *Robustness*, Princeton University Press.

Hull, John C., 2005, *Options, Futures, and Other Derivatives*, sixth ed., Prentice-Hall.

Ingersoll, Jonathan E., Jr., 1987, *Theory of Financial Decision Making*, Rowman and Littlefield.

Merton, Robert C., 1990, *Continuous-Time Finance*, Blackwell.

Munk, Claus, 2013, *Financial Asset Pricing Theory*, Oxford University Press.

Neftci, Salih, 1996, *An Introduction to the Mathematics of Financial Derivatives*, Academic Press.

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