Empirical Asset Pricing

USI - Spring 2016

Syllabus

Contact Information

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Meetings

Tuesday and Thursday from February 23 to March 17.
Time: 1PM – 4PM
Location: Room 251 (except for March 15, room PC04, and March 17, room 254)

Course Description

This course is intended for Ph.D. students in Finance. It provides an introduction to empirical asset pricing, while focusing on selected topics. We will start from the theory behind the tests of CAPM. Then, we will examine the main failures of this model (size effect, value premium, momentum, low volatility, profitability). Next, we will consider the recent developments in cross sectional asset pricing (conditional models, multi-factor models, consumption based models). In the second part of the course, we will focus on explanation for the persistence of anomalies. In particular, we will discuss the literature on the limits of arbitrage and slow moving capital. We will also discuss some recent research on institutional investors (hedge funds, mutual funds, and ETFs) and their relation to the limits of arbitrage literature.
The econometric tools that will encounter include: Linear Regression, Maximum Likelihood, Generalized Method of Moments. Since the focus of the class is on applications, the treatment of the econometric tools will be informal.
The grading is based on a final exam.

Readings

The readings for the course consist of a combination of published articles, working papers, and textbook chapters. The textbooks are:

- John H. Cochrane, *Asset Pricing*, Princeton University Press, Princeton 2001. In the reading list I will refer to this book as Cochrane.
- John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, Princeton, 1997. I will refer to this book as CLM
- Huang, C.F., and R.H. Litzenberger (1988), *Foundations for Financial Economics*, Prentice-Hall

Course Outline

1. Introduction
    a. Overview of the issues in empirical asset pricing through the glasses of market efficiency

2. The Cross-Section of Expected Returns
    a. Testing CAPM and other issues
    b. Methodology: Estimating and Evaluating Asset Pricing Models
    c. Early tests of CAPM
    d. Recent tests of CAPM: size, B/M, momentum
    e. Multi-factor models
    f. The consumption CAPM
    g. Conditional Models, and Conditioning Information
    h. Critiques of asset pricing tests

3. The limits of arbitrage
    a. Theory
    b. Empirical evidence

Reading List

This reading list is provisional and will be updated.

The textbooks are:

- John H. Cochrane, *Asset Pricing* (revised edition), Princeton University Press, Princeton 2006. In the reading list I will refer to this book as **Cochrane**
- John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, Princeton, 1997. I will refer to this book as **CLM**
- Huang, C.F., and R.H. Litzenberger (1988), *Foundations for Financial Economics*, Prentice-Hall. I will refer to this book as **HL**

All the readings in this list are required.
When I denote a reading by *, I will assume knowledge of the intuition and main results (which you can often, but not always, draw from the Introduction and Conclusion, if it is an article). The other readings are the most important ones. You will need to have a very good grasp of the entire content.

Introduction: Efficient Market Hypothesis

CLM, chapter 1

Fama, Eugene, 1991, Efficient capital markets: II, *Journal of Finance* 46, 1575-1617

Fama, Eugene, 2010, My life in finance, working paper, University of Chicago.

* Francesco Franzoni and José M. Marín, 2006, Pension Plan Funding and Stock Market Efficiency, Journal of Finance, April, pp. 921-956

Testing Asset Pricing Models: Overview

Cochrane, chapters 7, 12, 14, 15, 16

HL, chapter 10

* CLM chapters 6 and 7

Cross-sectional anomalies: the debate

Fama, Eugene and Kenneth French, 1992, The cross-section of expected stock returns, *Journal of Finance* 47, 427-465

Berk, Jonathan, 1995, A critique of size-related anomalies, Review of Financial Studies 8, 275-286

Fama, Eugene and Kenneth French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56

* Lakonishok, Josef, Andrei Shleifer, and Robert Vishny, 1994, Contrarian investment, extrapolation, and risk, *Journal of Finance* 49, 1541-1578.

Daniel, Kent and Sheridan Titman, 1997, Evidence on the characteristics of cross-sectional variation in stock returns, *Journal of Finance* 52, 1-33

Cochrane, section 20.2

* Fama, Eugene and Kenneth French, 1995, Size and book-to-market factors in earnings and returns, *Journa of Finance* 50, 131-155

CLM section 6.6

* Heaton, John and Deborah Lucas, 2000, Portfolio Choice and Asset Prices: The Importance of Entrepreneurial Risk, *Journal of Finance 55(3)*, 1163-1198

* Fama, Eugene and Kenneth French, 1996, Multifactor explanations of asset pricing anomalies, *Journal of Finance* 51, 55-84

* DeBondt, Werner and Richard Thaler, 1985, Does the stock market overreact?, *Journal of Finance* 40, 793-808.

Jegadeesh, Narasimhan and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48, 65-91

* Jegadeesh, N., Titman, S., 2001, Profitability of momentum strategies: an evaluation of alternative explanations. *Journal of Finance* 56, 699-720

* Korajczyk, Ronnie Sadka, 2004, Are Momentum Profits Robust to Trading Costs?, *Journal of Finance* 59, 1039-1082

* Chan, Louis, Narasimhan Jegadeesh, and Josef Lakonishok, 1996, Momentum strategies, *Journal of Finance* 51, 1681-1713

* Bernard, Victor and Jacob Thomas, 1990, Evidence that stock prices do not fully reflect the implications of current earnings for future earnings, *Journal of Accounting and Economics* 13, 305-340

* Hong, Harrison and Jeremy Stein, 1999, A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets, *Journal of Finance* 54, 2143-2184

* Hong, Harrison, Terrence Lim, and Jeremy Stein, 2000, Bad news travels slowly: Size, analyst coverage, and the profitability of momentum strategies, *Journal of Finance* 55, 265-295

* Moskowitz, Tobias and Mark Grinblatt, 1999, Do Industries Explain Momentum?, *Journal of Finance* 54, 1249-1290

* Davis, James, Eugene Fama, and Kenneth French, 2000, Characteristics, covariances, and average returns: 1929 – 1997, *Journal of Finance* 55, 389-406

Ang, Andrew, Bob Hodrick, Yuhang Xing, and Xiaoyan Zhang, 2009, "High Idiosyncratic Volatility and Low Returns: International and Further U.S. Evidence" Journal of Financial Economics, 91, 1, 1-23

Frazzini, Andrea and Lasse Heje Pedersen, 2014, "Betting Against Beta,". Journal of Financial Economics

Stambaugh RF, Yu J, Yuan Y., 2015, Arbitrage asymmetry and the idiosyncratic volatility puzzle. *Journal of Finance* 70(5), 1903-48.

Hou, Kewei, and Roger Loh, 2016, Have we solved the idiosyncratic volatility puzzle?, *Journal of Financial Economics*, forthcoming.

Fama, Eugene F., and Kenneth R. French, 2015, "A five-factor asset pricing model." *Journal of Financial Economics* 116.1, 1-22.

Fama, Eugene F., and Kenneth R. French, 2016, "Dissecting anomalies with a five-factor model." *Review of Financial Studies* 29.1, 69-103.

McLean, R. David, and Jeffrey Pontiff, 2016, Does academic research destroy stock return predictability? *Journal of Finance* 71.1: 5-32.

Conditional asset pricing: tests and critiques

Jagannathan, Ravi and Zhenyu Wang, 1996, The conditional CAPM and the cross-section of stock returns. *Journal of Finance* 51, 3-53

Lettau, Martin and Sydney Ludvigson, 2001, Resurrecting the (C)CAPM: A cross-sectional test when risk premia are time varying, *Journal of Political Economy* 109, 1238 – 1287

Cochrane, chapters 8, 9, and 13

Lewellen, J., and S. Nagel, 2006, The Conditional CAPM Does Not Explain Asset Pricing Anomalies, *Journal of Financial Economics*, November

* Lustig, H. and S.G. Van Nieuwerburgh, 2005, Housing Collateral, Consumption Insurance, and Risk Premia: An Empirical Perspective, *Journal of Finance* 60, 1167-1219

* Santos, T., and P., Veronesi, 2006, Labor income and predictable stock returns, *Review of Financial Studies*, 19, 1-44

* Nagel, S., & Singleton, K. J., 2011, Estimation and evaluation of conditional asset pricing models. *The Journal of Finance*, *66*(3), 873-909.

ICAPM, Recent Trends, and Skeptical Appraisal

Campbell, J., and T., Vuolteenaho, 2004, Bad Beta, Good Beta, *American Economic Review,* 94, 1249-1275

* Chen, Long and X. Zhao, 2009, Return Decomposition, *Review of Financial Studies*

Lewellen, J., S. Nagel, and J. Shanken, 2010, A skeptical appraisal of asset pricing tests, *Journal of Financial Economics*

Nagel Stefan, 2012, Empirical Cross-Sectional Asset Pricing, NBER working paper n. 18554

Liquidity and liquidity risk in asset pricing

Amihud, Yakov, Haim Mendelson, and Lasse H. Pedersen, 2005, Liquidity and asset prices, *Foundations and Trends in Finance* 1(4), 269–364.

Pastor, Lubos, and Robert F. Stambaugh, 2003, Liquidity risk and expected stock returns, *Journal of Political Economy* 111, 642–685.

Acharya, Viral V., and Lasse H. Pedersen, 2005, Asset pricing with liquidity risk, *Journal of Financial Economics* 77, 375–410.

Sadka, Ronnie, 2006, Momentum and post-earnings-announcement drift anomalies: The role of liquidity risk, *Journal of Financial Economics* 80, 309–349.

Sadka, Ronnie, 2010, Liquidity risk and the cross-section of hedge-fund returns, Journal of Financial Economics 98, October, 54-71.

Bekaert, Geert, Campbell Harvey, and Christian Lundblad, 2007, Liquidity and expected returns: Lessons from emerging markets, *Review of Financial Studies* 20, 1783–1831.

Franzoni, Francesco, Eric Nowak, and Ludovic Phalippou, 2012, "Private equity performance and liquidity risk", *Journal of Finance* 67(6), 2341-2373

Limits to arbitrage and Fire Sales

Theory

Gromb, D., and D. Vayanos, 2010, Limits of Arbitrage: The State of the Theory, Annual Review of Financial Economics 2, 251–275.

Shleifer, Andrei, and Robert W. Vishny 1997, The Limits of Arbitrage, Journal of Finance 52(1), 35-55.

*Shleifer, Andrei and Robert Vishny, 1992, Liquidation values and debt capacity: a market equilibrium approach, Journal of Finance, 47, 343–366.

Shleifer, Andrei, and Robert W. Vishny, 2011, Fire Sales in Finance and Macroeconomics, Journal of Economic Perspectives 25(1), 29–48.

*Gromb, Denis, and Dimitri Vayanos, 2002, Equilibrium and Welfare in Markets with Financially Constrained Arbitrageurs, Journal of Financial Economics 66, 361-407.

*Vayanos, Dimitri, 2004, Flight to Quality, Flight to Liquidity, and the Pricing of Risk, Working Paper, London School of Economics.

*Brunnermeier, Markus K. and Dilip Abreu, 2002, Synchronization Risk and Delayed Arbitrage, Journal of Financial Economics, 66, 341-360.

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

*Duffie Darrell, 2010, Presidential Address: Asset Price Dynamics with Slow-Moving Capital, Journal of Finance 65(4), 1236-1267.

Vayanos, Dimitri, and Paul Woolley, 2013, An institutional theory of momentum and reversal *Review of Financial Studies* 26 (5), 1087–1145.

<u>Empirical Evidence</u>

*Mitchell, Mark, Todd Pulvino, and Erik Stafford, 2002, Limited arbitrage in equity markets, *The Journal of Finance* 57.2, 551-584.

Mitchell M, L. Pedersen, and T. Pulvino, 2007, Slow moving capital, American Economic Review Papers and Proceedings, 97, pp. 215–220

Brunnermeier, Markus K., and Stefan Nagel, 2004, Hedge Funds and the Technology Bubble, Journal of Finance 59(5), 2013-2040.

Ben-David, I., Francesco Franzoni, and Rabih Moussawi, Hedge fund stock trading in the financial crisis of 2007-2009", Review of Financial Studies, 2012, 25(1), pp. 1-54

Aragon, George O., and Phillip Strahan, 2012, Hedge funds as liquidity providers: Evidence from the Lehman bankruptcy, Journal of Financial Economics 103, 570 – 587.

Coval, Joshua, and Erik Stafford, 2007, Asset Fire Sales (and Purchases) in Equity Markets, Journal of Financial Economics 86.

Lou, Dong, 2012, A Flow-Based Explanation for Return Predictability, Review of Financial Studies, 25, 3457-3489.

*Hameed, Allaudeen, Wenjin Kang, and S. Viswanathan, 2010, Stock Market Declines and Liquidity, Journal of Finance 65(1), 257-293.

*Nagel, Stefan, 2012, Evaporating Liquidity, Review of Financial Studies 25, 2005–2039.

*Khandani, Amir E., and Andrew W. Lo, 2007, What Happened to the Quants in August 2007?, Working Paper, Massachusetts Institute of Technology.

*Khandani, Amir E., and Andrew W. Lo, 2009, Illiquidity Premia in Asset Returns: An Empirical Analysis of Hedge Funds, Mutual Funds, and U.S. Equity Portfolios, Working Paper, Massachusetts Institute of Technology.

*Adrian, Tobias, and Hyun Song Shin, 2010, Liquidity and Leverage, Journal of Financial Intermediation 19(3), 418-443.

* Teo, Melvyn, 2011, The liquidity risk of liquid hedge funds. Journal of Financial Economics, 100(1), 24-44.
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*Ben-David, I., Francesco Franzoni, Augustin Landier, and Rabih Moussawi, 2011, Do hedge funds manipulate stock prices?, Journal of Finance, 2013, 68(6), 2383-2434

*Ben-David, I., Francesco Franzoni, and Rabih Moussawi, 2015, Do ETFs increase volatility? working paper