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## **Economics 829– Empirical Methods**

### **Professor: Dexin Zhou**

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Time: Tuesday 10:00-12:00  
Place: VC 10-215  
Office hour: by appointment

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### **Overview**

This course is an introduction to empirical asset pricing. We will cover evidence on the time-series and cross-sectional behavior of asset prices and the methodologies used to uncover that evidence statistically. Topics will include: review of empirical methods and databases, CAPM and APT tests, Panel data estimation, return decomposition, and event study/long horizon analysis. We will also cover a number of recent topics.

### **Prerequisites**

The prerequisites for this course are graduate level asset pricing theory (Econ830), microeconomics, matrix algebra, calculus, and econometrics.

### **Course Material**

Class notes and assigned papers.

#### Optional:

Campbell, J., A. Lo, and A. McKinlay, 1997. *The Econometrics of Financial Markets*. Princeton University Press.

Cochrane, J. H., 2005. *Asset Pricing*. Princeton University Press.

### **Course Work and Grading**

Requirements for credit include a series of presentations of papers in the literature and a research paper. The number of presentations will depend on the class size. The presentations and the class participation will count for 35%, the homework assignments will account for 40%, and the term paper will account for 25%. Because class participation is important, attendance is mandatory and you may miss only one class without consequence to your grade.

You can choose one of the following options for the research paper:

1. Write an original paper with empirical asset pricing content.
2. A major extension of an important published research paper.

Three homework projects. 10% comes from your submitted code. You also need to read the code from a classmate and give your criticism. This will account for 5%:

0. Simulate and demonstrate central limit theorem.
1. Replicate momentum (portfolio and Fama-MacBeth approaches).
2. Test standard errors using simulated panel data.
3. You can choose between
  - a. Event study: replicate the PEAD.
  - b. Time-series predictability: Stambaugh-bias correction

## **Tentative Course Outline**

1. Review / Time-series CAPM test:
  - a. CAPM
  - b. Central limit theorem
  - c. Properties of the OLS estimator/standard errors
  - d. Testing CAPM
  - e. Black, Jensen and Scholes, The Capital Asset Pricing Model: Some Empirical Tests, Working Paper (1972)
2. Testing CAPM / Multifactor Models
  - a. Gibbons, Ross and Shanken, A Test of the Efficiency of a Given Portfolio, *Econometrica* (1989)
  - b. Fama and MacBeth, Risk, Return and Equilibrium: Empirical Tests, *Journal of Political Economy* (1973)
  - c. Roll, A critique of the asset pricing theory's tests Part I: On past and potential testability of the theory, *Journal of Financial Economics* (1977)
  - d. Stambaugh, On the exclusion of assets from tests of the two-parameter model: A sensitivity analysis, *Journal of Financial Economics* (1982)
  - e. Fama and French, Multifactor explanations of asset pricing anomalies, *Journal of Finance* (1996)
  - f. Hou, Xue and Zhang, Digesting anomalies: An investment approach, *Review of Financial Studies* (2015)
  - g. Fama and French, A five-factor asset pricing model, *Journal of Financial Economics* (2015)
3. Conditional CAPM / Characteristic models:
  - a. Lewellen and Nagel, The conditional CAPM does not explain asset-pricing anomalies, *Journal of Financial Economics* (2006)
  - b. Daniel and Titman, Evidence on the characteristics of cross-sectional variation in stock returns, *Journal of Finance* (1997)
  - c. Daniel, Grinblatt, Titman and Wermers, Measuring mutual fund performance with characteristic-based benchmarks, *Journal of Finance* (1997)
  - d. Bessembinder, Cooper, and Zhang, Characteristics-based Expected Returns and Corporate Events, *Review of Financial Studies* (2019).
4. Panel Data standard errors / simulation
  - a. Petersen, Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies* (2009)

- b. Horowitz, Hand Book of Econometrics, Chapter 52, (2001)
- 5. Time-series predictability
  - a. Fama and French, Dividend yields and expected stock returns, Journal of Financial Economics (1988)
  - b. Stambaugh, Bias in Regressions with Lagged Stochastic Regressors, CRSP Working Paper (1986)
  - c. Nelson and Kim, Predictable Stock Returns: The Role of Small Sample Bias, Journal of Finance (1993)
  - d. Kothari and Shanken, Book-to-market, dividend yield, and expected market returns: A time-series analysis, Journal of Financial Economics (1997)
  - e. Goyal and Welch, A comprehensive look at the empirical performance of equity premium prediction, Review of Financial Studies (2008)
  - f. Campbell and Thompson, Predicting excess stock returns out of sample: Can anything beat the historical average?, Review of Financial Studies (2008)
  - g. Cochrane: The dog that did not bark, A defense of return predictability, Review of Financial Studies (2008)
  - h. Lettau and Van Nieuwerburgh, Reconciling the Return Predictability Evidence, Review of Financial Studies (2008)
- 6. Return Decomposition
  - a. Shiller, Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?, American Economic Review (1981)
  - b. Campbell and Ammer, What Moves the Stock and Bond Markets? A Variance Decomposition for Long - Term Asset Returns, Journal of Finance (1993)
  - c. Chen and Zhao, Return decomposition, Review of Financial Studies (2009)
  - d. Pastor, Sinha and Swaminathan, Estimating the intertemporal risk–return tradeoff using the implied cost of capital, Journal of Finance (2008)
  - e. Chen, Da and Zhao, What drives stock price movements?, Review of Financial Studies (2013)
- 7. Event study, Long horizon returns
  - a. Lyon, Barber and Tsai, Improved methods for tests of long - run abnormal stock returns, Journal of Finance (1999)
  - b. Bessemmer and Zhang, Firm characteristics and long-run stock returns after corporate events, Journal of Financial Economics (2013).
  - c. Besseminder, Do Stocks outperform treasury bills?, Journal of Financial Economics (2018).
- 8. Mutual funds/hedge funds (Presentation Only)
  - a. Carhart, On Persistence in Mutual Fund Performance, Journal of Finance (1997)

- b. Kosowski, Timmerman, Wermers, White, Can Mutual Fund “Stars” Really Pick Stocks? New Evidence from a Bootstrap Analysis, *Journal of Finance* (2006).
  - c. Berk and Van Binsbergen, Assessing asset pricing models using revealed preference, *Journal of Financial Economics* (2016)
  - d. Jegadeesh and Mangipudi, What Do Fund Flows Reveal About Asset Pricing Models and Investor Sophistication?, Working Paper
  - e. Agarwal and Narayan, Risks and portfolio decisions involving hedge funds, *Review of Financial Studies* (2004)
9. Portfolio Allocation (Presentation Only)
- a. DeMiguel, Garlappi, and Uppal: Optimal versus Naive Diversification: How Inefficient is the 1/N Portfolio Strategy? *Review of Financial Studies* (2015)
  - b. Calvet, Campbell, and Sodini: Fight or Flight? Portfolio Rebalancing By Individual Investors, *Quarterly Journal of Economics* (2009)
  - c. Calvet, Campbell, and Sodini: Down or Out: Assessing the Welfare Costs of Household Investment Mistakes, *Journal of Political Economy* (2007)
  - d. Giglio, Maggiori, Stroebe, and Utkus, Five facts about beliefs and portfolios (working paper)
10. Learning and Bayesian Inference
- a. Lewellen and Shanken, Learning, asset-pricing tests, and market efficiency, *Journal of Finance* (2002).
  - b. Kandel and Stambaugh, On the predictability of stock returns: an asset-allocation perspective, *Journal of Finance* (1996).
  - c. Barberis, Investing for the long run when returns are predictable, *Journal of Finance* (2002).
  - d. Pastor and Stambaugh, Mutual fund performance and seemingly unrelated assets, *Journal of Financial Economics* (2002).
11. New Topics (Presentation, Possible Guest Lecture by Johannes Stroebe)
- a. Brandt, Kojen, Van Binsbergen: On the Timing and Pricing of Dividends, *American Economic Review* (2012)
  - b. Jorda, Knoll, Kushinov, Schularick, Taylor: The Rate of Return on Everything, 1870–2015, *Quarterly Journal of Economics* (2019).
  - c. Martin: What is the Expected Return on the Market?, *Quarterly Journal of Economics* (2017)
  - d. Giglio, Maggiori, Stroebe, Very long-run discount rates, *Quarterly Journal of Economics* (2015).
  - e. Giglio, Maggiori, and Stroebe, No-bubble conditions: model-free tests in housing markets, *Econometrica* (2016).
  - f. Giglio, Maggiori, Stroebe, Rao, Weber, Climate change and long-run discount rates: evidence from real-estate (working paper).
12. Anomalies, Cross-sectional Patterns, and the Econometric Issues (Presentation only)

- a. Mclean and Pontiff, Does Academic Research Destroy Return Predictability?, *Journal of Finance* (2016).
  - b. Harvey, Liu, Zhu, ... and Cross-section of Expected Returns, *Review of Financial Studies* (2016).
  - c. Kozak, Nagel, Santosh, Shrinking the cross-section, *Journal of Financial Economics* (forthcoming)
  - d. Cochrane and Piazzesi, Bond risk premia, *American Economic Review* (2005)
  - e. Gu, Kelly, and Xiu, Empirical Asset Pricing via Machine Learning, *Review of Financial Studies* (forthcoming)
13. Textual analyses and Machine Learning (Presentation only)
- a. Loughran and McDonald, Textual Analysis in Accounting and Finance: A Survey, *Journal of Accounting Research* (2016)
  - b. Mullainathan and Speiss, Machine Learning: An Applied Econometric Approach, *Journal of Economic Perspective* (2017)
  - c. Ke, Kelly, and Xiu, Predicting Returns with Text Data, Working paper
  - d. Athey and Imbens, Machine learning methods economists should know about (working paper)
  - e. Bybee, Kelly, Manela, and Xiu, The Structure of Economic News, Working paper.