Updated 1/17/2024

# Economics 2727: Empirical Methods in Financial Economics
## Sever 208
## Spring 2024, Mondays 3:00-5:45

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The goal of this course is to provide a rigorous, PhD-level introduction to the modern empirical toolkit that is used in corporate finance and asset pricing. Thus, the course is designed to complement the PhD Asset Pricing course (Economics 2723), the PhD Corporate Finance course (Economics 2725), and the PhD Behavioral Finance course (Economics 2728). The course shows how to apply these empirical methodologies to answer research questions in financial economics. We will frequently use the literatures on (i) credit supply shocks, (ii) investment cash flow sensitivity, and (iii) corporate market-timing as settings for building a deeper understanding of these tools. However, examples from other empirical finance literatures will also be covered.

There are two sets of required readings. The required readings marked $$ provide an introduction to the empirical methodologies. The required readings marked ** illustrate applications of these empirical methodologies in financial economics. You must read the required readings, but are encouraged to read other papers listed on the syllabus. There are two recommended textbooks for the course:

> Angrist, Joshua and Jorn-Steffen Pischke, 2009, Mostly Harmless Econometrics, Princeton University Press, Princeton, NJ.
>
> Cochrane, John H., 2005, Asset Pricing, Princeton University Press, Princeton, NJ.

**Course Requirements**: The main requirement for the course is a short research paper (roughly 10-20 pages) that asks an interesting question in financial economics and tackles it using the modern empirical toolkit. It is fine if the final paper is a "non-result": the focus is on formulating an interesting question and doing your best to answer it. In class on March 15th, each student will make a 5-minute presentation (3 slides) describing (i) the research question, (ii) the identification strategy, and (iii) the data to be used. In the final class on April 26th, each student will make a 15-minute presentation explaining their research paper. In addition, two referee reports and three data exercises will be due over the course of the semester. These are indicated in bold italics.

| Class | Date | Instructor(s) | Topic | Assignment? |
|---|---|---|---|---|
| 1 | 1/22 | Hanson | Overview, Linear Regression I | |
| 2 | 1/29 | Sunderam | Linear Regression II, Standard Errors | |
| 3 | 2/5 | Sunderam | Instrumental Variables | Data Exercise #1 Due |
| 4 | 2/12 | Hanson | Difference-in-Differences | Referee Report #1 Due |
| | 2/19 | | No class: President's Day | |
| 5 | 2/26 | Hanson | Regression Discontinuity and Bunching | |
| 6 | 3/4 | Sunderam | Fixed Effects | Idea Presentations |
| | 3/11 | | No class: Spring Break | |
| 7 | 3/18 | Sunderam | GMM and Structural Models | |
| 8 | 3/25 | Hanson | IO-like approaches 1: Demand estimation | Data Exercise #2 Due |
| 9 | 4/1 | Egan | IO-like approaches 2 | |
| 10 | 4/8 | Hanson | VARs, Factor Models, and Alpha | Referee Report #2 Due |
| 11 | 4/15 | Sunderam | Forecasting regressions and time-series | Data Exercise #3 Due |
| 12 | 4/22 | Both | Presentations | Paper Presentations |

**Detailed Syllabus- EC 2727**

**Class 1: January 22, 2024**
**Topic: Overview and Linear Regression, Part 1** **Instructor: Hanson**

*Course overview*

*Identifying credit supply effects*

** Baker, Malcolm. "Capital Market-Driven Corporate Finance." *Annual Review of Financial Economics* 1, no. 1 (December 2009), pp. 181–205.

- Focus on pp. 1-5 and 11-21.

*Investment cash flow sensitivity (costly external finance)*

** Stein, Jeremy C. "Agency, Information and Corporate Investment" in Handbook of the Economics of Finance, edited by George Constantinides, Milt Harris and Rene Stulz. Amsterdam: North Holland, 2003.

- Focus on pp. 114-128.

*Corporate market timing*

** Baker, Malcolm, and Jeffrey Wurgler. "Behavioral Corporate Finance: A Current Survey. In: Handbook of the Economics of Finance. Vol. 2, edited by George M. Constantinides, Milton Harris, and Rene M. Stulz. Handbooks in Economics. New York, 2012.

- Focus on pp. 1-22.

*Linear Regression I*

$$ Mostly Harmless Econometrics, Chapter 1, Chapter 2, and Chapter 3.1, pgs. 1-50.

- The experimental ideal.
- Trade-offs between (i) economic relevance/importance vs. econometric identification (ii) external validity versus internal validity.
- Regression fundamentals.
- Measurement error and least squares attenuation.
- Partitioned regression: The Frisch-Waugh theorem.

**Class 2: January 29, 2024**
**Topic: Linear Regression II and Standard Errors** **Instructor: Sunderam**

*Linear Regression II*

$$ Mostly Harmless Econometrics, Chapter 3.2, pgs. 51-68.

- Regression and causality.
- Omitted variable bias.

*Getting the standard errors right*

$$ Mostly Harmless Econometrics, Chapter 8, pgs. 293-325.

- Clustering

- Fama-Macbeth
- Bootstrap basics
- Generated regressors.

**$$** Petersen, Mitchell A., 2009, Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches, *Review of Financial Studies* 22, 435-480.

$$ Thompson, Samuel B., 2011, "Simple Formulas for Standard Errors that Cluster by Both Firm and Time," *Journal of Financial Economics* 99:1, pp. 1-10.

**Class 3: February 5, 2024**
**Topic: Instrumental Variables** **Instructor: Sunderam**

***Data Exercise #1 due: Standard Errors.***

*Instrumental variables*

$$ Mostly Harmless Econometrics, Chapter 4.

- IV and Causality, pp. 113-138.
- Asymptotic 2SLS Inference, pp. 138-147.
- The Bias of 2SLS, pp. 205-216.

Angrist, Joshua , Guido Imbens, Donald B. Rubin, 1996, "Identification of Causal Effects Using Instrumental Variables," *Journal of the American Statistical Association* 91(434), pp.444-445

** Bernstein, Shai, 2012, "Does Going Public Affect Innovation?," Stanford working paper.

** Gabaix, Xavier, and Ralph S. J. Koijen. 2020. "Granular Instrumental Variables," NBER working paper.

** Mian, Atif, and Amir Sufi. 2011. "House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis." American Economic Review, 101(5): 2132-56.

Greenstone, Michael, Alexandre Mass, Hoai-Luu Nguyen, 2015, "Do Credit Market Shocks Affect the Real Economy? Quasi-Experimental Evidence from the Great Recession and 'Normal' Economic Times," MIT working paper.

*IV-like approaches*

** Giroud, Xavier, 2012, "Proximity and Investment: Evidence from Plant-Level Data," forthcoming *Quarterly Journal of Economics*

*Identifying credit supply effects*

** Ashcraft, Adam, 2005, "Are Banks Really Special? New Evidence from the FDIC-Induced Failure of Healthy Banks," *American Economic Review* 95(5), pp. 1712-1730.

Frydman, Carola, Eric Hilt, Lily Y. Zhou, 2012, "Economic Effects of Runs on Early 'Shadow Banks': Trust Companies and the Impact of the Panic of 1907"

Peek, Joe and Eric Rosengren, 1997, "The International Transmission of Financial Shocks: The Case of Japan," *American Economic Review* 87(4), pp. 495-505.

Peek, Joe and Eric Rosengren, 2000, "Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States," *American Economic Review* 90(1), pp. 30-45.

*Investment cash flow sensitivity*

Lamont, Owen, 1997, Cash Flow and Investment: Evidence from Internal Capital Markets, *Journal of Finance*, 52, pp. 83-109.

**Class 4: February 12, 2024**
**Topic: Difference-in-Differences** **Instructor: Hanson**

***Referee report #1 due:***
***Vants, Nishant (2023). "Safety Nets, Credit, and Investment: Evidence from a Guaranteed Income Program."***
***https://nishvats.github.io/Documents/Vats_JMP_Booth.pdf***

*Difference-in-differences approaches*

$$ Mostly Harmless Econometrics, Chapter 5, 227-247.

$$ Roth, Jonathan Pedro H. C. Sant'Annay, Alyssa Bilinskiz, and John Poe (2022). What's Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature, working paper.

Meyer, Bruce D., 1995, Natural and Quasi-experiments in Economics, *Journal of Business and Economic Statistics* 13, 151-161.

** Almeida, Heitor, Murillo Campello, Bruno Laranjeira and Scott Weisbenner (2012) "Corporate Debt Maturity and the Real Effects of the 2007 Credit Crisis", *Critical Finance Review*: Vol. 1:No 1, pp 3-58.

Bertrand, Marianne, and Sendhil Mullainathan, 2003, Enjoying the Quiet Life? Corporate Governance and Managerial Preferences," *Journal 8f Political Economy* 111, 1043-1075.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan, 2004, How Much Should We Trust Differences-in-Differences Estimates?, *Quarterly Journal of Economics* 119, 249-275.

*Synthetic control*

$$ Abadie, Alberto, 2021, Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects, *Journal of Economic Literature* 59(2), 391–425.

**NO CLASS ON FEBRUARY 19, 2024 —PRESIDENT'S DAY**

**Class 5: February 26, 2024**
**Topic: Regression Discontinuity and Bunching** **Instructor: Hanson**

*Regression Discontinuity*

$$ Mostly Harmless Econometrics, Chapter 6, pgs. 252-268.

$$ Imbens, Guido, Thomas Lemieux, 2008 Regression Discontinuity Designs: A guide to practice, *Journal of Econometrics* 142, 615-635.

** DiNardo, John and David Lee, 2004, "Economic Impacts of New Unionization on Private Sector Employers: 1984-2001," *Quarterly Journal of Economics*, 119(4), 1383-1441.

** Lee, David, Thomas Lemieux, 2010 "Regression Discontinuity Designs In Economics," *Journal of Economic Literature* 48, 281-355.

*Identifying credit supply effects*

** Keys, Benjamin, Tanmoy Mukherjee, Amit Seru, and Vikrant Vig, 2010, "Did Securitization Lead to Lax Screening? Evidence from Subprime Loans," *Quarterly Journal of Economics*, 125, 307-362.

** Bubb, Ryan, Alex Kaufman, 2009, Securitization and Moral Hazard: Evidence from a Lender Cutoff Rule, Working paper.

Keys, Benjamin, Amit Seru, and Vikrant Vig, "Lender Screening and Role of Securitization: Evidence from Prime and Subprime Mortgage Markets," *Review of Financial Studies*, August 2012, 25(8).

Bubb, Ryan, Alex Kaufman, 2011, "Further Investigations into the Origin of Credit Score Cutoff Rules," working paper.

*Investment cash-flow sensitivity*

** Rauh, Joshua D., 2006, Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans, *Journal of Finance*, 61, 33-71.

*Bunching estimators*

Kleven, Henrik Jacobsen, 2016, Bunching, *Annual Review of Economics*, 8:435-464

**Class 6: March 4, 2024**
**Topic: Fixed effects** **Instructor: Sunderam**

***Idea presentations during class.***

*Fixed-effects*

**$$** Mostly Harmless Econometrics, Chapter 5, pp. 221-227.

**$$** Gormley, Todd and David Matsa, Common Errors: How to (and Not to) Control for Unobserved Heterogeneity, *Review of Financial Studies*, 2014, 27(2), 617-61.

*Identifying credit supply effects*

** Khwaja, Asim & Atif Mian, 2008. "Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market," *American Economic Review* 98(4), pages 1413-1442.

** Mian, Atif and Amir Sufi, 2009, "The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis," *Quarterly Journal of Economics*, November 2009, 124(4), 1449-1496.

Manuel Adelino, Antoinette Schoar, and Felipe Severino, 2014, "Credit Supply and House Prices: Evidence from Mortgage Market Segmentation," Working Paper.

Becker, Bo, and Victoria Ivashina, 2014, "Cyclicality of Credit Supply: Firm Level Evidence," *Journal of Monetary Economics*, 62, 76–93.

*Other applications:*

** Bertrand, Marianne & Antoinette Schoar, 2003. "Managing With Style: The Effect Of Managers On Firm Policies," *The Quarterly Journal of Economics* 118(4), pgs. 1169-1208.

**NO CLASS ON March 11, 2024 —SPRING BREAK**

**Class 7: March 18, 2024**
**Topic: GMM and Structural Models** **Instructor: Sunderam**

*Generalized Method of Moments and Simulated Method of Moments*

$$ Cochrane, Asset Pricing, 2005, Chapters 10 and 11, pp. 189-227.

$$ Gentzkow, Matthew and Jesse M. Shapiro, 2014, "Measuring the Sensitivity of Parameter Estimates to Sample Statistics", University of Chicago working paper.

Structural Corporate Finance

Hennessy, Christopher A., Amnon Levy, Toni M. Whited, "Testing Q theory with financing frictions," *Journal of Financial Economics* 83 (2007) 691–717.

** Taylor, Luke, "Why are CEOs Rarely Fired? Evidence from Structural Estimation," *Journal of Finance*, 2010, 65(6): 2051-2087.

**Class 8: March 25, 2024**
**Topic: IO-like Approaches #1: Demand Estimation** **Instructor: Hanson**

***Data Exercise #2 due: Regression discontinuity.***

$$ Berry, Steven and Philip Haile, 2021, Foundations of Demand Estimation, NBER Working paper 29305

Berry, Stephen, 1994, "Estimating Discrete Choice Models of Product Differentiation," RAND Journal of Economics, 23, 242–262.

Berry, S., J. Levinsohn, and A. Pakes, 1995, Automobile Prices in Market Equilibrium, *Econometrica*, 60, 889-917.

$$ Koijen, Ralph S. J. and Motohiro Yogo, 2019. "A Demand System Approach to Asset Pricing," *Journal of Political Economy*, Volume 127, Number 4

**Class 9: April 1, 2024**
**Topic: IO-based Approaches #2** **Instructor: Egan**

** Egan, Mark, Ali Hortacsu, and Gregor Matvos. Deposit concentration and Financial Fragility : Evidence from the US Banking Sector. *American Economic Review,* 2017.

** Hortacsu, Ali and Chad Syverson. Product Differentiation, Search Costs, and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds. *Quarterly Journal of Economics*, 2004.

Ali Hortacsu, Jakub Kastl, and Allen Zhang. Bid Shading and Bidder Surplus in the U.S. Treasury Auction System. American Economic Review, 108(1), 2018.

Ali Hortacsu and Jakub Kastl. Valuing Dealers' Informational Advantage: A Study of Canadian Treasury Auctions. Econometrica, 80(6), 2012.

**Class 10: April 8, 2024**
**Topic: VARs, factor models, and alpha** **Instructor: Hanson**

***Referee Report #2 due: Wang, Lulu (2023) "Payment Network Competition ."*** https://luluywang.github.io/PaperRepository/payment_jmp.pdf

*Vector Auto Regressions*

Hamilton, James, 1995, *Time Series Analysis*, Chapter 11.

Jorda, Oscar (2005). Estimation and inference of impulse responses by local projections. America Economic Review 95 (1), 161–182.

Mian, Atif, Amir Sufi, and Emil Verner, 2016, "Household Debt and Business Cycles Worldwide," University of Chicago working paper

*Testing factor models*

$$ Cochrane, John, Asset Pricing, 2005, Chapters 12 and 13, pp. 229-266.

** Lettau, Martin and Sydney Ludvigson, 2001, "Resurrecting the (C)CAPM: A Cross-Sectional Test When Risk Premia Are Time-Varying," *The Journal of Political Economy*, 109(6), pgs. 1238-1287.

** Lewellen, Jonathan and Nagel, Stefan & Shanken, Jay, 2010. "A skeptical appraisal of asset pricing tests," *Journal of Financial Economics* 96(2), pp. 175-194.

Daniel, Kent and Sheridan Titman. "Testing Factor-Model Explanations of Market Anomalies," *Critical Finance Review* Volume 1, Issue 1 (January, 2012).

*Identifying risk-adjusted outperformance or "alpha"*

** 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.

Carhart, Mark M. (1997). "On Persistence in Mutual Fund Performance". Journal of Finance 52 (1): 57–82.

**Daniel, Kent, Mark Grinblatt, Sheridan Titman, & Russ Wermers, 1997, Measuring Mutual Fund Performance with Characteristic-Based Benchmarks, *Journal of Finance* 52, 1035-1058.

**Cohen, Lauren and Andrea Frazzini, 2008, "Economic Links and Predictable Returns, Journal of Finance, 63, 1977-2011.

**Fama, Eugene F., and Kenneth R. French, 2008, Dissecting Anomalies, The Journal of Finance Volume 63, Issue 4, pages 1653–1678, August 2008

**Class 11: April 15, 2024**
**Topic: Forecasting regressions and time-series inference** **Instructor: Sunderam**

***Data Exercise #3 due: Factor models.***

*Forecasting regressions and Stambaugh bias*

$$ Stambaugh, Robert F., 1999, "Predictive regressions," *Journal of Financial Economics*, pp. 375-421.

** Baker, Malcolm, and Jeffrey Wurgler, 2000, "The Equity Share in New Issues and Aggregate Stock Returns," *Journal of Finance*, 55, 2219-2257.

** Butler, Alexander W., Gustavo Grullon, and James P. Weston, 2005, "Can Managers Forecast Aggregate Market Returns?," *Journal of Finance*, 60, 963-986.

** Baker, Malcolm, Ryan Taliaferro, and Jeffrey Wurgler, 2006, "Predicting Returns with Managerial Decision Variables: Is There a Small-Sample Bias?" *Journal of Finance* 61, 1711-1730.

*HAC standard errors to deal with serial correlation*

See the Appendix to: Hanson, Samuel and Robin Greenwood, 2012, "Issuer Quality and Corporate Bond Returns."

See the Appendix to: Greenwood, Robin, Samuel G. Hanson, Jeremy C. Stein, and Adi Sunderam. 2023, "A Quantity-Driven Theory of Term Premia and Exchange Rates." *Quarterly Journal of Economics*

**Class 12: April 22, 2024**
**STUDENT PRESENTATIONS TODAY**