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Financial Econometrics II – Cross Section & Panel Data

SFI Léman PhD Program

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Lectures: 14:00 - 17:00 on 4 Dec – Ext # 126; 11, 18 Dec – Ext # 125 ; 14 Jan – Ext # 126

1. Objectives

This part of the course provides students with a toolbox and working knowledge of the main empirical methods for research in corporate finance, financial intermediation, and related subfields of finance. The goal of this class is that students get an overview of the standard methods, including their limitations, and start applying these methods in some datasets commonly used in research in this area.

This course consists of three main components. First, the lectures and econometric readings will help students to understand the econometric intuition behind each method. As this course is intended for end-users of econometric tools, we will generally not derive the theoretical properties, but focus on intuition (and knowing "where to go" for details when needed).

Second, students will see the methods implemented by other researchers in published and working papers. This is accomplished by reading, understanding, and discussing selected prior empirical work.

Third, students will implement some of the methods on real data. The empirical exercises will require that students download, manipulate, and analyze data in Stata, R or other software using the various econometric techniques. The data and applications will be corporate finance and financial intermediation related.

2. Prerequisites and Course Material

Students taking this class should have a basic understanding of econometrics. Practically speaking, students should be comfortable with econometrics at the level of Jeffrey Wooldridge's "Econometric Analysis of Cross Section and Panel Data" or William Greene's "Econometric Analysis."

There is no required textbook for the course. I will teach the course from slides which I will make available to you before each class. However, I will draw from a variety of sources including textbooks, journal articles, working papers, and other professors' lecture notes.[1] For each session, I specify the

[1] Most directly, my slides build on those generously provided to me by Philip Valta (University of Bern), who taught the course in previous years. His slides in turn benefitted from course materials used and provided by other professors, notably Laurent Frésard (University of Maryland, now USI/SFI), Todd Gormley (Wharton), and Michael Roberts (Wharton). I

relevant chapters in the textbooks and relevant articles below. I separately make available a list of papers in finance that use the various techniques that we cover in this course.

3. Textbooks and Readings

The course relies on parts and sections of the following textbooks and readings.

1. Roberts, M., and T. Whited, 2012. Endogeneity in Empirical Corporate Finance, Handbook of the Economics of Finance Vol. 2A. SSRN working paper available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1748604. **[Roberts and Whited]**

2. Verbeek, M., 2021. Panel Methods for Finance: A Guide to Panel Data Econometrics for Financial Applications, De Gruyter. **[Verbeek]**

3. Angrist, J., and J.-S. Pischke, 2009. Mostly Harmless Econometrics, Princeton University Press, New Jersey. **[Angrist and Pischke]**

4. Cunningham, S., 2021. Causal Inference: The Mixtape. Online version at https://mixtape.scunning.com/index.html. **[Cunningham]**

5. Huntington-Klein, N. 2022. The Effect: An Introduction to Research Design and Causality. Online version at https://theeffectbook.net/. **[Huntington-Klein]**

I would recommend reading at least the Roberts and Whited paper. Verbeek is a more thorough and updated version of much of the same material, with more emphasis on "traditional" panel analysis, and also discusses finance applications. The other three references are good "chattier" overviews, not finance oriented, and provide more intuition for the various techniques we see in the course.

For more technical background, the classic reference is:
Wooldridge, J., 2010. Econometric Analysis of Cross Section and Panel Data, MIT Press, Massachusetts.

4. Problem Sets & Exam

There will be two required problem sets for this course. These should be done individually, and students should send their code along with the write-up of the solutions. The first problem set will be due on **December 18 (before the third lecture)** and the second one in **January (exact date tbd).**

Furthermore, there will be a written "midterm" **exam** (**Jan 29, 2026**, 14:00-16:00).

This course will be graded pass/fail only. To earn a "pass" you will need to:
- hand in the two problem sets for this part of the course;
- do sufficiently well in the exam for this part of the course;
- and pass the second part of the course, by Prof. Nikolov

furthermore benefitted from course materials by Paul Goldsmith-Pinkham (Yale SOM), Daniel Paravisini (LSE) and Philipp Schnabl (NYU).

5. Course Schedule and Bibliography

This part of the course is divided into 4 lectures. The bibliography provided here focuses on methodological/background papers you may find useful; I will separately make available a list of finance papers that apply the different methods.

Lecture 1: Cross Section and Panel Data (Dec 4)

a. Introduction, Identification, and Causality

- Roberts and Whited, section 2
- Verbeek, chapter 1
- Angrist and Pischke, section 3.2
- Huntington-Klein, chapter 5
- Coles, J., and Li, F., 2023. An empirical assessment of empirical corporate finance. *Journal of Financial and Quantitative Analysis*.
- Currie, J., Kleven, H., and E. Zwiers, 2020. Technology and Big Data Are Changing Economics: Mining Text to Track Methods. *AEA Papers and Proceedings*.
- Goldsmith-Pinkham, P., 2024. Tracking the Credibility Revolution across Fields. Available at https://arxiv.org/pdf/2405.20604. See also https://paulgp.com/econlit-pipeline/dashboard.html
- Kahn, J., and T. Whited, 2018. Identification is not causality, and vice versa. *Review of Corporate Finance Studies*.
    - Or see Toni Whited's slides of the keynote speech at the 2014 SFS Cavalcade (available at http://toni.marginalq.com/Cavalcade2014Keynote.pdf).
- Leamer, E., 2010. Tantalus on the road of asymptopia. *Journal of Economic Perspectives*.
- Lewbel, A., 2019. The Identification Zoo: Meanings of Identification in Econometrics. *Journal of Economic Literature.*
- Nobel Committee, 2021. Answering Causal Questions Using Observational Data. https://www.nobelprize.org/uploads/2021/10/advanced-economicsciencesprize2021.pdf
- Oster, E. 2019. Unobservable Selection and Coefficient Stability: Theory and Evidence. *Journal of Business & Economic Statistics*.

b. Fixed Effects and Standard Errors

- Verbeek, chapters 2 and 3
- Angrist and Pischke, sections 5.1 and 5.3
- Cunningham, chapter 8

- Huntington-Klein, chapters 13 and 16

- Cameron C. and D. Miller. 2015. A Practitioner's Guide to Cluster-Robust Inference. *Journal of Human Resources.*

- deHaan, E., 2021. Using and Interpreting Fixed Effects Models. *SSRN Working paper*.

- Gormley, T., and D. Matsa, 2014. Common errors: How to (and not to) control for unobserved heterogeneity. *Review of Financial Studies*.

- MacKinnon, J., Nielsen, M., Webb, D. 2023. Cluster-robust inference: A guide to empirical practice. *Journal of Econometrics*.

- Petersen, M., 2008. Estimating standard errors in finance panel data sets: comparing approaches. *Review of Financial Studies*.

- Roodman, D., Nielsen, M., MacKinnon, J., and M. Webb, 2019. Fast and wild: Bootstrap inference in Stata using boottest. *The Stata Journal*.

c. Other useful papers on methodology etc.

- Adams, J., Hayunga, D., Mansi, S., Reeb, D., and V. Verardi. 2019. Identifying and treating outliers in Finance. *Financial Management*.

- Cattaneo, M.D., R.K. Crump, M.H. Farrell and Y. Feg. 2021. Binscatter Regressions. Available at https://nppackages.github.io/references/Cattaneo-Crump-Farrell-Feng_2025_Stata.pdf

- Cohn, J., Liu, Z. and M. Wardlaw, 2022. Count (and count-like) data in finance. *Journal of Financial Economics*.

- Mitton, T., 2022. Methodological Variation in Empirical Corporate Finance. *Review of Financial Studies*.

Lecture 2: Instrumental Variables (Dec 11)

- Roberts and Whited, section 3

- Verbeek, sections 3.4 and 7.5

- Angrist and Pischke, chapter 4

- Cunningham, chapter 7

- Huntington-Klein, chapter 19

- Andrews, I., Stock, J., and L. Sun. 2019. Weak Instruments in Instrumental Variables Regressions: Theory and Practice. *Annual Review of Economics*.

    - See also https://www.nber.org/lecture/summer-institute-2018-methods-lectures-weak-instruments-and-what-do-about-them

- Angrist, J., and A. Krueger, 2001. Instrumental variables and the search for identification: From supply and demand to natural experiments. *Journal of Economic Perspectives*.

- Borusyak, K., Hull, P., and X. Jaravel. 2022. Quasi-Experimental Shift-Share Research Designs. *Review of Economic Studies.*

- Borusyak, K., Hull, P., and X. Jaravel. 2025. A Practical Guide to Shift-Share Instruments. *Journal of Economic Perspectives.*

- Breuer, M., Bartik Instruments: An Applied Introduction, 2022. *Journal of Financial Reporting*, available at http://dx.doi.org/10.2139/ssrn.3786229

- Goldsmith-Pinkham, P., Sorkin, I., and H. Swift, 2020. Bartik Instruments: What, When, Why, and How. *American Economic Review.*

- Imbens, G., 2010. Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009). *Journal of Economic Literature*.

- Jiang, W., 2017. Have Instrumental Variables Brought Us Closer to the Truth? *Review of Corporate Finance Studies*.

- Keane, M. and T. Neal, 2023. Instrument strength in IV estimation and inference: A guide to theory and practice. *Journal of Econometrics*.

- Keane, M. and T. Neal, 2024. A Practical Guide to Weak Instruments. *Annual Review of Economics*.

- Lee, D., McCrary, J., Moreira, M., Porter, J., 2022. Valid t-Ratio Inference for IV. *American Economic Review.*

- Lee, D., McCrary, J., Moreira, M., Porter, J. and L. Yap, 2023. What to do when you can't use '1.96' Confidence Intervals for IV. NBER Working Paper 31893.

Lecture 3: Differences-in-Differences (Dec 18)

- Roberts and Whited, section 4

- Verbeek, section 7.6

- Angrist and Pischke, section 5.2

- Cunningham, chapter 9

- Huntington-Klein, chapters 18 and 21

- https://www.nber.org/conferences/si-2023-methods-lectures-linear-panel-event-studies

- Baker, A., D. Larcker, and C. Wang. 2022. How Much Should We Trust Staggered Difference-In-Differences Estimates? *Journal of Financial Economics*.

- Baker, A., B. Callaway, S. Cunningham, A. Goodman-Bacon, and P. Sant'Anna. 2025. Difference-in-Differences Designs: A Practitioner's Guide. *Journal of Economic Literature* (forthcoming). https://psantanna.com/files/DiD_JEL.pdf

- Berg, T., M. Reisinger and D. Streitz, 2021. Spillover effects in empirical corporate finance. *Journal of Financial Economics*.

- Bertrand, M., Duflo, E., and S. Mullainathan, 2004. How much should we trust difference-in-differences estimates? *Quarterly Journal of Economics.*

- Borusyak, K., Jaravel, X. and J. Spiess. 2024. Revisiting Event-Study Designs: Robust and Efficient Estimation. *Review of Economic Studies.*

- Callaway, B., Goodman-Bacon, A., and P. Sant'Anna, 2024. Difference-in-differences with a Continuous Treatment. NBER Working Paper 32117.

- de Chaisemartin, C., and X. d'Haultfoeuille, 2023. Credible Answers to Hard Questions: Differences-in-Differences for Natural Experiments. Available at SSRN: https://ssrn.com/abstract=4487202.

- de Chaisemartin, C., and X. D'Haultfoeuille. 2023. Two-way fixed effects and differences-in-differences with heterogeneous treatment effects: A survey. *Econometrics Journal*.

- Freyaldenhoven, S., Hansen, C., Pérez Pérez, J., and J. Shapiro, 2021. Visualization, identification, and estimation in the linear panel event-study design. *Advances in Economics and Econometrics: Twelfth World Congress.*

- Gardner, J., Thakral, N., To, L. and L. Yap. 2024. Two-Stage Differences in Differences. Available at https://jrgcmu.github.io/2sdd_gtty.pdf

- Hagemann, A., 2019. Placebo inference on treatment effects when the number of clusters is small. *Journal of Econometrics.*

- Harmon, N., 2024. Difference-in-Differences and Efficient Estimation of Treatment Effects. Available at https://web.econ.ku.dk/nharmon/docs/harmon2022difference.pdf

- Huang, J., and P. Östberg, 2023. Difference-in-differences with Economic Factors and the Case of Housing Returns. Available at SSRN: https://ssrn.com/abstract=4495214.

- Miller, D., 2023. An introductory guide to event study models. *Journal of Economic Perspectives*.

- Rambachan, A., and J. Roth, 2023. A More Credible Approach to Parallel Trends. *Review of Economic Studies.*

- Roth, J., Sant'Anna, P., Bilinski, A., and J. Poe. 2023. What's trending in difference-in-differences? A synthesis of the recent econometrics literature. *Journal of Econometrics.*

- Roth, J. 2024. Interpreting Event-Studies from Recent Difference-in-Differences Methods. Available at https://www.jonathandroth.com/assets/files/HetEventStudies.pdf

- Sun, L. and J. Shapiro. 2022. A linear panel model with heterogeneous coefficients and variation in exposure. *Journal of Economic Perspectives.*

Lecture 4: Regression Discontinuity Design and Other Methods (Jan 14)

- Roberts and Whited, section 5 and 6

- Verbeek, section 7.6

- Angrist and Pischke, chapter 6

- Cunningham, chapters 6 and 10

- Huntington-Klein, chapter 20

- Cattaneo M. and R. Titiunik, 2022. Regression Discontinuity Designs. Available at https://arxiv.org/pdf/2108.09400.pdf
    - and https://www.nber.org/conferences/si-2021-methods-lecture-causal-inference-using-synthetic-controls-and-regression-discontinuity
    - and other references available at https://rdpackages.github.io/

- Gelman, A. and G. Imbens, 2019. Why High-Order Polynomials Should Not Be Used in Regression Discontinuity Designs. *Journal of Business & Economic Statistics.*

- Kleven, H., 2016. Bunching. *Annual Review of Economics.*