Columbia Business School
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B9326: Financial Econometrics: Panel Data (PhD)
Spring 2024

<u>Syllabus</u>

Instructor: Xavier Giroud

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Class time: Tuesdays, 9:00am – 12:15pm

Classroom: Geffen-440

TA: TBA

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1. Course Description

This is the second course in Financial Econometrics. It is required for first-year students in the Finance Ph.D. Program and the Master in Financial Economics Program. It is also open to graduate students and visiting scholars who satisfy pre-requisites. The minimum pre-requisites are:

- One Ph.D. level course in econometrics;
- One of each of the following courses at the graduate level or honor undergraduate level: Microeconomics; Calculus; Statistics; Probability Studies; and Matrix Algebra.

The course aims to cover the most important materials in Panel Data, with emphases on their applications to empirical research, especially empirical corporate finance. The course will deliver a comprehensive list of empirical methods that allow researchers to interpret correlations and to identify causal relationships in data. Such tools are essential for graduate students who aspire to conduct careful, state-of-art empirical research. In addition, the course will provide general guidance on formulating and executing (empirical) research ideas.

2. Course Requirements

Your grade for the course will consist of two components:

- Replication assignment (50%)
- Final exam (50%)

Replication assignment. Participants will replicate the results of an existing paper that uses panel data techniques. You will be asked to download the necessary data, and conduct the econometric analysis to achieve similar results to the ones in the paper. The objective of this assignment is to learn how to use the tools covered in this course—it is one thing to learn about difference-in-differences estimation, yet it is another thing to actually estimate one. More details on this assignment will be posted on the course website.

Final exam. The final exam will be administered in the final class.

3. Course Materials

I will use slides for each session. The slides are self-contained and include all necessary materials for the replication assignment and the final exam. In addition, three academic articles are required readings. They are marked with a # in the reading list.

While there is no required textbook for this course, we will use the following three econometric references (the relevant chapters are indicated in the course outline):

- Angrist, Joshua, and Joern-Steffen Pischke (2009), *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, Princeton, NJ.

- Roberts, Michael R., and Toni M. Whited (2013), Endogeneity in empirical corporate finance, in: Constantinides, George, Milton Harris, and Rene Stulz (eds.), *Handbook of the Economics of Finance*, volume 2, 493–572, Elsevier/North-Holland, Oxford and Amsterdam.

- Wooldridge, Jeffrey M. (2010), *Econometric Analysis of Cross Section and Panel Data*, 2nd Edition, MIT Press, Cambridge, MA.

In addition, the following is a useful reference if you need some refreshing of basic econometrics:

- Greene, William H. (2017), *Econometric Analysis*, 8th Edition, Pearson, New York, NY.

4. Course Outline

Note that # denotes a required reading.

<u>**Class 1:**</u>   **Fixed effects regression (FE)**

Readings:

- Angrist and Pischke, Chapters 1 and 2.
- Roberts and Whited, Chapters 1 and 2.
- Wooldridge, Chapter 10.

<u>**Class 2:**</u>   **Difference-in-differences (DID)**

Readings:

- # Bertrand, Marianne, and Sendhil Mullainathan (2003), Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy* 111: 1043–1075.
- Angrist and Pischke, Chapter 5.
- Roberts and Whited, Chapter 4.
- Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan (2004), How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics* 119: 249–275.
- Gormley, Todd, and David Matsa (2014), Common errors: How to (and not to) control for unobserved heterogeneity. *Review of Financial Studies* 27: 617–661.
- Petersen, Mitchell (2009), Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22: 435–480.

<u>**Class 3:**</u>   **Regression discontinuity design (RDD)**

Readings:

- # Cuñat, Vicente, Mireia Giné, and Maria Guadalupe (2012), The vote is cast: The effect of corporate governance on shareholder value. *Journal of Finance* 67: 1943–1977.
- Lee, David S., and Thomas Lemieux (2010), Regression discontinuity designs in economics. *Journal of Economic Literature* 48: 281–355.
- Angrist and Pischke, Chapter 6.
- Roberts and Whited, Chapter 5.
- Wooldridge, Chapter 21.

<u>**Class 4:**</u>   **Instrumental variables (IV) in panel data**

Readings:

- \# Bennedsen, Morten, Kasper M. Nielsen, Francisco Perez-Gonzalez, and Daniel Wolfenzon (2007), Inside the family firm: The role of families in succession decisions and performance. *Quarterly Journal of Economics* 122: 647–691.
- Angrist and Pischke, Chapter 4.
- Roberts and Whited, Chapter 3.
- Wooldridge, Chapters 11 and 21.

<u>**Class 5:**</u>   **Non-linear panel data models**

Readings:

- Wooldridge, Chapters 15, 16, and 18.

<u>**Class 6:**</u>   **Final Exam**

5. Course schedule

Class #	Date	Topic
1	Tuesday Mar 19, 2024	Fixed effects regression (FE)
2	Tuesday Mar 26, 2024	Difference-in-differences (DID)
3	Tuesday Apr 2, 2024	Regression discontinuity design (RDD)
4	Tuesday Apr 9, 2024	Instrumental variables (IV)
5	Tuesday Apr 16, 2024	Non-linear models *Replication assignment due by 9:00am*
6	Tuesday Apr 23, 2024	Final exam