

**FIN 620**  
**EMPIRICAL METHODS IN FINANCE**  
**SPRING 2023**

<b>Instructor:</b>	Professor Todd Gormley E-mail: my lastname @wustl.edu
<b>Class Times and Location:</b>	Tuesday/Thursday, 9:00-11:50am CST in KH 511 Except Thursday, Apr. 20 [ <i>Class will instead be Apr. 21, 1-4pm, KH 301</i> ]
<b>Office Hours:</b>	Thursdays, 1:00-2:00pm CST [ <i>in person (SH 217)</i> ] ( <i>Outside of the classroom, this is the best way to interact with me.</i> )
<b>Course Website:</b>	<a href="https://wustl.instructure.com">https://wustl.instructure.com</a>

**Course Description:** This course will provide students with a toolbox and working knowledge of cross-sectional and panel data empirical methods for use in corporate finance research. This will be accomplished by exposing the students to a variety of methods commonly employed in empirical research. Because of time constraints, not all widely used empirical methods will be covered.

The course is designed to help you learn these methods via a three-pronged approach.

- (1) Lectures and light econometric readings will help you learn the econometric intuition behind each method. This is not a theory course; this is a course for end-users of econometric tools. Accordingly, I will teach you how to use each tool properly, not how to derive its asymptotic properties.
- (2) Course readings will expose you to examples of the methods being used in published and working papers. Seeing how the tools are used by other researchers is often far more useful in helping students understand the tools. I will rely on examples from corporate finance when possible, though I will also reference examples from other fields in economics including: labor, development, and public finance.
- (3) Course assignments will require you to use the methods analyzed in the course; i.e., you will learn by doing. There will be several exercises that will have you manipulate and analyze data using the various econometric techniques, and there will be assignments where you analyze and criticize other researchers' use of these tools. Since this is a finance course, the applications will typically be corporate finance related.

**Reading Materials:** I will teach from slides, which I will make available to you before each class on the course website, Canvas. I will be drawing from a variety of sources including various textbooks, journal articles, working papers, and other professors' lecture notes. As such, there is no required "textbook," but I will make note of the appropriate references for each lecture. The

relevant methodology readings for each lecture are provided at the bottom of this syllabus, and students are expected to read these prior to the lecture. Additionally, most lectures will contain student presentations of three papers related to the previous lecture's topic. A list of papers to be presented by students is given below.

**Prerequisites:** You should have taken a graduate sequence in econometrics. Practically speaking, you should be comfortable with econometrics at the level of William Greene's *Econometric Analysis* and Jeffrey Wooldridge's *Econometric Analysis of Cross-Section and Panel Data*.

**Coursework:** In addition to the final exam, there will be two graded components to the course. These are designed to help you learn the econometric tools used in the literature while also preparing you for a successful career in academic research. The two assignments are as follows:

1. In-class presentations/discussions

For most classes, there will be three papers assigned that students must read and present a discussion of in-class. Students will form groups of their own choosing, and we will assign each group their paper in the week ahead. E.g., if I give a lecture on instrumental variable estimations, then at the end of the lecture, I will assign three papers that make use of IV strategies. Students will present their discussions of these three papers in the second half of the next class. Each group will need to make a 10-minute presentation that discusses the paper, and each presentation will be followed by in-class discussion. The purpose of the assignment is twofold: (1) Presentations are one way people in academia will come to know (and assess) you. So, it's a good idea to get some practice now. And (2), this will help you apply and think critically about the empirical tools discussed in the previous lecture. Because students find it helpful to study for the final exam, I will also post each presentation on Canvas after class. To ensure participation following each presentation, each student must also type up one concern they had about each of the two papers their group did NOT present and hand these in at the start of class. I will randomly select one submission for each assigned paper and have that randomly selected student elaborate upon their comment in class. The comments should be very short [2-3 sentences maximum] and designed to do one of two things: (1) isolate what you thought the biggest problem of the paper was, or (2) identify a concern you think the presenting group might overlook. Every failure to turn in this sheet of comments will result in a 2-point reduction in participation points.

2. Write a research proposal

Basically, you will be asked to sketch out an outline for a possible empirical paper you could write using tools taught in the course. You'll need to come up with an interesting question, place your question in the relevant literature, sketch out an identification strategy for answering that question, and identify the necessary datasets to implement your identification strategy. If you want, you can think of this as a possible start to an eventual dissertation paper.

**Optional Empirical Exercises:** Usually, I would ask you to download data and write code to implement some of the tools taught in the course. However, given the late scheduling and condensed nature of the course this year, these exercises will be optional this year. I have posted them (and their solutions) to Canvas. The five exercises are designed to teach you how to use various tools. It's one thing to learn about a difference-in-difference-in-difference estimation and another thing to estimate one. While these are optional, I strongly encourage you to complete them after the course is over to make sure you can implement the course tools.

**Presentation Groups:** The class will be organized into three presentation groups, which will each give a presentation during lectures that include student presentations of related research papers. You are free to choose your own members. I just recommend that you split yourselves into three roughly equal-sized groups. We will choose our groups in the very first lecture, but students are free to change groups later if needed.

**Limitations:** Time limitations impose certain restrictions on what we can accomplish in this course. For example, we will not cover all the methods you might need or should know. We also will not cover each method in excruciating detail. Arguably, you could build an entire course (research agenda) around each method.

**Canvas:** Important course materials, such as lecture notes, required assignments, and other useful information will be available on the course web page at Canvas. You will also use Canvas to turn in your research proposals and individual participation comments.

**Questions:** Please, just ask. I don't anticipate that everything I say in class or my lecture notes will be crystal clear. So, if something is confusing, just ask me. I can't guarantee to always have an immediate answer, especially for questions of a more technical nature, but I promise to always find one and get back to you in the next lecture.

**Participation:** You will be graded on participation. Basically, I expect each student to give in-class presentations during the semester and to turn in weekly comments on each paper their group was not assigned to present. (You will be working in groups to write the presentation, but ultimately, only one of you gets up to give the presentation each week.) You should consider yourself likely to get "full participation credit" if you split the presentations equally among group members and turn in your comments on each paper. Failure to do presentations or to turn in comments on the assigned readings will result in a lower grade.

**Final Exam:** There is a final exam that is not optional and will be given in the last scheduled class. The exam is closed book and closed notes. Calculators and laptops are allowed for the exam, but no communication with other students is allowed during the exam. The exam is intended to be time sensitive.

The exam time is *non-negotiable*. If you have a conflict, you must inform me by the end of the first week of the course (i.e., please check now to ensure the exam times do not conflict with a religious holiday, etc.). If you think you will miss the exam (1) contact me as soon as possible

and (2) bring reliable proof of absence (hospital receipt, copy of obituary, etc.). Without clear and hard evidence, you will get no credit and will not be allowed to retake the exam.

**Grading:** You should not be too worried about your grade; instead, you should focus on learning the tools taught in this course. Using these tools to write a solid job market paper and dissertation is far more important than your actual grade. When you're on the job market, no one will care what grade you got in your PhD courses. Instead, you should view your grade in this course as a signal of where I think you stand in terms of your understanding and ability to apply the tools of this course.

Your grade for the course will be determined by participation, research proposal, and an exam. There will be a total of 125 points available, and the points are allocated as follows:

In-Class Discussions/Participation	25 points
Rough Draft of Research Proposal	15 points
Research Proposal	35 points
Final Exam	50 points

Grades are *non-negotiable*, and the quality of your work is a matter left to the course instructor's judgment. If you have a question about feedback or an assigned grade, please ask.

**Code of Ethics:** What follows is the boiler plate statement I give in my MBA and undergraduate students; I don't expect they need to be said for PhD students... "I take the matters of academic integrity seriously and expect that you do, too. Submitted assignments for grading should be your own work only. Failure to observe this rule, will at a minimum, result in receiving zero points on that assignment, and may result in an automatic failing grade for the course and referral to the Office of Student Conduct. Refer to the Code of Academic Integrity if you have any questions."

**Office Hours and E-mail:** If you have any questions or need assistance, please visit me during my office hours. If you are unable to make my office hours, just e-mail me so that we can arrange a mutually convenient time to meet in my office. You may also send me questions via e-mail.

## SCHEDULE OF CLASSES

<b>Class # (Date)</b>	<b>Lecture Topic</b> <i>[first half of class on days with student presentations]</i>	<b>Student Presentation Topic</b> <i>[for second half of class]</i>	<b>Assignments due</b>
1 (3/28)	Linear Regression <i>[Part 1]</i>		
2 (3/30)	Linear Regression <i>[Part 2]</i>	Classics #1 (Non-Finance)	
3 (4/4)	Causality	Classics #2 (Finance)	
4 (4/6)	Panel Data	Causality	
5 (4/11)	Instrumental Variables	Panel Data	
6 (4/13)	Natural Experiments <i>[Part 1]</i>	Instrumental Variables	
7 (4/18)	Natural Experiments <i>[Part 2]</i>	Natural Experiments #1	<b><i>Rough draft of research proposal due <u>at noon</u></i></b>
* (4/20)	<i>No class at usual time; class will instead be the next day, 1-4pm</i>		
8 (4/21)	Regression Discontinuity <i>Class is from 1-4pm, KH 301</i>	Natural Experiments #2	
9 (4/25)	Common Limitations & Errors	Regression Discontinuity	
10 (4/27)	Matching & Selection Models	Common Limitations & Errors	
11 (5/2)	Standard Errors & Clustering Limited Dependent Variables	Matching	
12 (5/4)	Review/Exam Prep <i>[No new material will be covered, possibly do proposal presentations]</i>	Miscellaneous	<b><i>Possible research proposal presentations [in-class]</i></b>
** (5/9)	<b><u>In-Class Final Exam</u></b> <i>2 hours, 9-11am</i>		
*** (5/10)			<b><i>Final draft of research proposal due <u>at noon</u></i></b>

## IN-CLASS STUDENT PRESENTATION PAPERS

Below is the list of readings to be presented in class by students. All students are expected to read these papers, and groups will need to select one paper to present. Groups cannot choose the same paper to present. I have broken down the papers into “Topics”. The “Topic” corresponds to the schedule of classes above and which lecture the papers will be presented. We will assign the groups to present each paper in the lecture prior to the scheduled presentations.

### Classics #1 (Non-Finance)

1. Angrist, Joshua D., 1990 “Lifetime earnings and the Vietnam era draft lottery: Evidence from Social Security administrative records,” *American Economic Review* 80(3), 313-336.
2. Angrist, Joshua D. and Victor Lavy, 1999, “Using Maimonides’ rule to estimate the effect of class size on scholastic achievement,” *Quarterly Journal of Economics*, 533-575.
3. Acemoglu, Daron, Simon Johnson, and James A. Robinson, 2001, “The colonial origins of comparative development: An empirical investigation,” *American Economic Review* 91(5), 1369-1401.

### Classics #2 (Finance)

4. Fazzari, Steven M., R. Glenn Hubbard and Bruce C. Petersen, 1988, “Financing Constraints and Corporate Investment,” *Brookings Papers on Economic Activity*, 141–195.
5. Morck, Randal, Andrei Shleifer, and Robert Vishny, 1990, “The Stock Market and Investment: Is the Market a Sideshow?” *Brookings Papers on Economic Activity*, 157–215.
6. Opler, Timothy, Larry Pinkowitz, Rene Stulz, and Rohan Williamson, 1999, “The determinants and implications of corporate cash holdings,” *Journal of Financial Economics* 52, 3-46.

### Causality

7. Rajan, Raghuram G., and Luigi Zingales, 1998, “Financial dependence and growth,” *American Economic Review*, 88(3), 559-586.
8. Matsa, David A., 2010 “Capital structure as a strategic variable: Evidence from collective bargaining,” *Journal of Finance*, 65(3), 1197-1232.
9. Agarwal, Ashwini, and David A. Matsa, 2013, “Labor unemployment risk and corporate financing decision,” *Journal of Financial Economics*, 108(2), pp. 449-470.

### Panel Data

10. Khwaja, Asim Ijaz, and Atif Mian, 2008, “Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market,” *American Economic Review*, 98(4), 1413-1442.
11. Paravisini, Daniel, Veronica Rappoport, Philipp Schnabl, and Daniel Wolfenzon, 2014, “Dissecting the effect of credit supply on trade: Evidence from matched credit-export data,” *Review of Economic Studies*, 1-26.

12. Becker, Bo, Zoran Ivkovic, and Scott Weisbenner, 2011, "Local dividend clienteles," *Journal of Finance*, 66(2), 655-683.

### **Instrumental Variables**

13. Gormley, Todd A., 2010, "The impact of foreign bank entry in emerging markets: evidence from India," *Journal of Financial Intermediation*, 19(1), 26-51.
14. Bennedsen, M., K Nielsen, F. Perez-Gonzalez, and D. Wolfenzon, 2007, Inside the family firm: The role of families in succession decisions and performance, *Quarterly Journal of Economics*, 122, 647-691.
15. Giroud, Xavier, Holger M. Mueller, Alex Stomper, and Arne Westerkamp, 2012, "Snow and leverage," *Review of Financial Studies*, 25, 680-710.

### **Natural Experiments #1**

16. Jayaratne, Jith, and Philip Strahan, 1996, "The finance-growth nexus evidence from bank branch deregulation," *Quarterly Journal of Economics*, 111(3), 639-670.
17. Bertrand, Marianne, and Sendhil Mullainathan, 2003 "Enjoying the quiet life? Corporate governance and managerial preferences," *Journal of Political Economy*, 111(5), 1043-75.
18. Hayes, Rachel M., Michael Lemmon, and Mingming Qiu, 2012, "Stock options and managerial incentives for risk taking: evidence from FAS 123R," *Journal of Financial Economics*, 105, 174-190.

### **Natural Experiments #2**

19. Gormley, Todd A., and David Matsa, 2011, "Growing Out of Trouble? Corporate Responses to Liability Risk," *Review of Financial Studies*, 24(8), 2781-2821.
20. Becker, Bo, and Per Stromberg, 2012, "Fiduciary Duties and Equity-Debtholder Conflicts." *Review of Financial Studies* 25(6), 1931-1969.
21. Agrawal, Ashwini, 2013, "The impact of investor protection law on corporate policy and performance: evidence from the blue sky laws," *Journal of Financial Economics*, 107, 417-35.

### **Regression Discontinuity**

22. Malenko, Nadya, and Yao Shen, 2016, "The role of proxy advisory firms: Evidence from a regression-discontinuity design," *Review of Financial Studies*, 29(12) 3394–3427.
23. Keys, Benjamin, Ranmoy Mukherjee, Amit Seru, and Vikrant Vig, 2010, Did securitization lead to lax screening? Evidence from subprime loans, *Quarterly Journal of Economics* 125, 307-362.
24. Almeida, Heitor, Vyacheslav Fos, and Mathias Kronlund, 2016 "The Real Effects of Share Repurchases," *Journal of Financial Economics*, 119 (1), 168-185.

## Common Limitations & Errors

25. Gormley, Todd A., and David A. Matsa, 2016, “Playing it Safe? Managerial Preferences, Risk, and Agency Conflicts,” *Journal of Financial Economics*, 122(3), 431-455.
26. Gormley, Todd A., Vishal Gupta, David A. Matsa, Sandra Mortal, and Lukai Yang, 2023 “The Big Three and Board Gender Diversity: The Effectiveness of Shareholder Voice,” *Journal of Financial Economics*, Forthcoming.  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3724653](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3724653)
27. Bennedsen, Morten, Francisco Perez-Gonzalez, and Daniel Wolfenzon, 2012, “Evaluating the Impact of the Boss: Evidence from CEO Hospitalization Events”, working paper, [http://www.iza.org/conference\\_files/Leadership\\_2012/perez-gonzalez\\_f7878.pdf](http://www.iza.org/conference_files/Leadership_2012/perez-gonzalez_f7878.pdf) [The paper has since been published, but please use this version]

## Matching

28. Morse, Adair, 2011, “Payday lenders: heroes or villains?” *Journal of Financial Economics*, 102, 28-44.
29. Colak, Gonul and Toni Whited, 2007, Spin-offs, divestitures, and conglomerate investment, *Review of Financial Studies* 20, 557-595.
30. Almeida, Heitor, Igor Cunha, Miguel A. Ferreira, and Felipe Restrepo, 2017, “The Real Effects of Credit Ratings: The Sovereign Ceiling Channel,” *Journal of Finance*, 72, 249-290.

## Miscellaneous

31. Jenter, Dirk, Thomas Schmid, and Daniel Urban, 2023, “Does board size matter?” Working paper. <https://ssrn.com/abstract=4371743>
32. Iliev, Peter, 2010, “The effect of SOX Section 404: Costs, earnings quality, and stock prices,” *Journal of Finance* 65(3), 1163-1196.
33. Appel, Ian R., Todd A. Gormley, and Donald B. Keim, “Passive Investors, Not Passive Owners,” 2016, *Journal of Financial Economics*, 121(1), 111-141.



## METHODOLOGY READINGS FOR EACH TOPIC

For each lecture, I've listed some readings that will be helpful with understanding the methodology being discussed. My lectures will be largely based off these readings, and students are expected to read these papers prior to the lecture. The lectures primarily draw from the four below sources, and I've provided abbreviations that will be used to refer to each.

1. Wooldridge, Jeffrey M., 2010, *Econometric Analysis of Cross-Section and Panel Data*, MIT Press, Massachusetts, Second Edition [**Wooldridge**]
2. Greene, William H., 2011, *Econometric Analysis*, Prentice Hall, N.J., Seventh Edition. [**Greene**]
3. Angrist, Joshua D., and Jorn-Steffen Pischke, 2009, *Mostly Harmless Econometrics*, Princeton University Press, New Jersey. [**Angrist-Pischke**]
4. Roberts, Michael R., and Toni M. Whited, 2011, "Endogeneity in Empirical Corporate Finance," University of Rochester, working paper, <http://ssrn.com/abstract=1748604> [**Roberts-Whited**]

### Linear Regression

1. Angrist-Pischke, Sections 3.1-3.2, 3.4.1
2. Wooldridge, Sections 4.1-4.2
3. Greene, Chapter 3 & Sections 4.1-4.4, 5.7-5.9, 6.1-6.2
4. Cohn, J., Z. Liu, and M. Wardlaw. Count (and count-like) data in finance. *Journal of Financial Economics* 146: 529–552.

### Causality

1. Roberts-Whited, Section 2
2. Angrist-Pischke, Section 3.2
3. Greene, Sections 5.8-5.9
4. Wooldridge, Sections 4.3, 4.4

### Panel Data

1. Angrist-Pischke, Sections 5.1, 5.3
2. Greene, Chapter 11
3. Wooldridge, Chapter 10
4. McKinnish, T. 2008. *Panel Data Models and Transitory Fluctuations in the Explanatory Variable In Modeling and Evaluating Treatment Effects in Econometrics*, eds. Daniel L. Millimet, Jeffrey A. Smith, and Edward J. Vytlačil, 335–58. Amsterdam: Elsevier.

### Instrumental Variables

1. Roberts-Whited, Section 3
2. Angrist-Pischke, Sections 4.1, 4.4, 4.6
3. Greene, Sections 8.2-8.5

4. Wooldridge, Chapter 5

### **Natural Experiments**

1. Roberts-Whited, Sections 2.2 and 4
2. Angrist-Pischke, Section 5.2
3. Bertrand, M., E. Duflo, and S. Mullainathan. 2004. How Much Should We Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics* 119:249–75.
4. Baker, A.C., D.F. Larcker, and C.C.Y. Wang. 2022. How much should we trust staggered difference-in-differences estimates? *Journal of Financial Economics* 144:370–395.

### **Regression Discontinuity**

1. Roberts-Whited, Section 5
2. Angrist-Pischke, Chapter 6

### **Common Limitations & Errors**

1. Ali, A., S. Klasa, and E. Yeung, 2009, “The limitations of industry concentration measures constructed with Compustat Data: Implications for finance research,” *Review of Financial Studies*, 22(10), 3839-71
2. Gormley, Todd A., and David A. Matsa, 2014, “Common Errors: How to (and Not to) Control for Unobserved Heterogeneity,” *Review of Financial Studies*, 27(2), 617-661.

### **Matching**

1. Roberts-Whited, Section 6
2. Angrist-Pischke, Sections 3.3.1-3.3.3
3. Wooldridge, Section 21.3.5

### **Standard Errors, Limited Dependent Variables**

1. Angrist-Pischke, Chapter 8 and Sections 3.4.2, 4.6.3
2. Petersen, M. A. 2009. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *Review of Financial Studies* 22:435–80.
3. Bertrand, M., E. Duflo, and S. Mullainathan. 2004. How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics*, 119(1): 249-275.
4. Greene, Section 17.3
5. Spamann, Holger. 2022. On inference when using state corporate laws for identification. ECGI – Finance Working Paper No. 644/2019.