

PPAA 8022-F2022

Econometrics for Policy Research II

Syllabus

Course Logistics

- Class: Wednesday, 6:10 – 8:00 pm, [Philips Hall](#), Room 415
- Lab: Wednesday, 8:10 – 10:00 pm, GELM B01

If we need to hold class or lab online, a Zoom link will be distributed by email.

Course Description and Objectives

The essence of research is posing a question about how the world works, generating a hypothesis, and using data to test that hypothesis. This course focuses on how we test hypotheses about cause and effect by applying econometric methods to data.

The course will cover the following methods:

- Instrumental variables
- Propensity score matching
- Differences-in-differences
- Fixed effects
- Instrumental variables
- Comparative interrupted time series
- Regression discontinuity
- Randomized trials

These methods were developed by statisticians, economists, and other social scientists for addressing “selection bias” in estimating causal effects.

From taking this course, you will know how to critique and conduct studies that use these methods. You will learn when to use different methods, how to justify or reject their use, and how to implement them using real data to estimate causal effects.

Prerequisite: PPPA 6013: Econometrics for Policy Research

The prerequisite for this class is PPPA 6013. Since this class builds on material from PPPA 6013, it requires a good understanding of the material taught in that course. This class also requires either familiarity with statistical programming or the ability and willingness to learn this skill while taking the course. Please contact me if you are unsure whether this course is appropriate for you.

Class Attendance and Participation

Class attendance is expected. If you have question about the material covered in class, please speak up and ask a question. Since the class is fast-paced and the material is cumulative, the best time to clarify any confusion you may have about the lecture is during the lecture. Class participation is part of your final grade (see *Grading* below).

If you need to miss class due to a personal or family emergency or illness:

- Please email me and explain the reason
- Catch up on the reading for the class that you missed
- Listen to the recording

Class sessions will be recorded and made available on Blackboard under GWU Lecture Capture. Recordings are for course purposes only and shall not be copied nor shared in part or in full outside of the class. This protects the safety and privacy of the classroom environment.

Office Hours

If you have a substantive question about the material that you didn't think to ask in class, or you'd like to discuss your final project, please invite me to a 15-minute meeting in Google. I will be available during the hours listed below:

- Tuesdays 7 PM to 8:45 PM (last appt ends at 9 PM).
- Thursdays 7 PM to 8:45 PM (last appt ends at 9 PM).

I will share my GW calendar with you so that you can see when I am available. Office hours will be held in Google Meet. Please join the meeting online a few minutes early. I'll admit you to the meeting at your scheduled time. If there is no appointment immediately after yours during my office hours listed above, we can talk for longer than 15 minutes.

If you are unavailable for the scheduled office hours due to work or personal responsibilities, let me know and I will make accommodations.

The teaching assistant (TA) for this class, Genevieve Denoeux, will hold in-person office hours before class:

- Wednesday, 5 PM to 6 PM.

They will also offer virtual office hours by appointment.

Email

Email me at robolsen@gwu.edu if you have a question about a lecture or the final project. I will aim to respond within 24 hours. If your question reflects ambiguity in the instructions for homework assignments or the final project, I will email the entire class to provide additional clarification.

Email Genevieve at genevieve@gwu.edu to request a virtual appointment for help with homework assignments or statistical software in conducting your final project.

Readings for Class

The required textbook is *Mastering Metrics: The Path from Cause and Effect*, by Angrist and Pischke. You can purchase it on Amazon or elsewhere. For a typical class, the required reading involves a chapter of the text describing the method and a journal article or report that uses the method to estimate causal effects. Readings for each lecture, including links to access the articles, are shown below under *Weekly Schedule* and *Full Citations to the Readings*.

Other than the textbook, the readings for this class are available for free to GW students through GW's online library resources. You need to be logged in to GW's VPN to access most readings. Please email me if you have difficulties accessing any of them.

The reading assignment for a particular class (see *Weekly Schedule*) should be completed after the class in time to help you in completing the week's homework.

Homework Assignments

Most weeks, a new homework assignment will be given in class and posted on Blackboard shortly after class. These assignments give you an opportunity to check your understanding of the material and obtain feedback. To complete the homework, you will first need to review the previous lecture and read the assigned readings.

Completed homework assignments should be turned in by uploading them on Blackboard.

Final Project

The final project involves replicating the results from a published study that uses one or more of the econometric methods taught in this class. In addition to replicating the analysis, students should provide a more extensive critique of the method's application in the paper. This could involve:

- Providing a more extensive argument for why the assumptions behind the method are valid in this application; and/or
- Providing a critique for why you think the assumptions behind the method are probably not valid in this application.

Regardless, students should articulate the assumptions under which the methods are valid, describe the argument made for the plausibility of these assumptions in the paper, and either enhance that argument or describe why it is implausible or insufficient. Extra credit will be given for either testing those assumptions in the data or obtaining and presenting external information that either supports or casts doubt on the assumptions behind the methods.

For the Final Project, you are expected to:

- **Submit a project plan (due 10/28).** The project plan should include the full APA citation to the published paper that you plan to replicate, the web address for the site from which you will download the data, and an analysis plan. This analysis plan will specify the causal effect that you plan to replicate, the sample restrictions for inclusion in your analysis, the econometric method used in the original paper and which you plan to replicate, and the regression model that you plan to estimate.
- **Make a 15-minute, “conference-length” presentation in class based on your project (11/30 or 12/7).** By this point, all students should have conducted their analysis in accordance with their plan and provided a critique in favor of or against the method’s application. The presentation will provide an overview of what you plan to include in your written project.
- **Submit your written project (due 12/12).** I will provide a template for what your written project should include by the beginning of November.

Analysis plans and projects should be turned in by uploading them on Blackboard.

Software

For your final project, you will need to use a statistical software package. We recommend Stata because it is well designed for the types of econometric analyses taught in this class, and because the TA can provide support for this project. You can access Stata in the GW library or on the GW Cloud. Alternatively, you can buy a student version. Lastly, you can get an account on GW’s high performance computing cluster. The TA will discuss these options during lab.

To learn some Stata on your own, see the resources at [the UCLA website](#), especially “Fundamentals of Using Stata (part I),” “Fundamentals of Using Stata (part II),” “Basic Data Management in Stata,” and “Intermediate Data Management in Stata.”

You are welcome to use other statistical packages instead of Stata if you know them well enough to implement them without support. However, the teaching assistant will only provide support for Stata programming.

Grading

1. Homework assignments (25%)
2. Analysis plan (25%)
3. Final project (25%)
4. Class presentation (10%)
5. Class participation (15%)

Weekly Schedule

Date	Week	Topic	Readings	Homework Assignment
8/31	1	Causal impacts and questions	Textbook, Introduction Angrist & Krueger (1999). Sec. 2.1	HW1
9/7	2	Regression and selection bias	Textbook, pp. 1-11 and 68-79 Khandker et al. (2009), pp. 25-27	HW2
9/14	3	Matching	Stuart (2010) Furgeson et al. (2015), Chapter 4	HW3
9/21	4	Differences-in-differences	Textbook, Chapter 5 Card & Krueger (1994) Optional: Dee & Fu (2004)	HW4
9/28	5	Fixed effects	Angrist & Krueger (1999). Sec. 2.2.2 Bifulco & Ladd (2006)	HW5
10/5	6	STATA (led by TA)	Learnings modules from UCLA: <ul style="list-style-type: none"> • Fundamentals of Using Stata, I • Fundamentals of Using Stata, II • Basis Data Management in Stata 	HW6
10/12	7	Analysis plans	Olken (2015)	HW7
10/19	8	Comparative interrupted time series	Hallberg et al. (2018) Dee & Jacob (2011)	HW8
10/26	9	Instrumental variables	Textbook, Chapter 3 Clark et al. (2015)	HW9
11/2	10	Regression discontinuity	Textbook, Chapter 4 Jacob & Lefgren (2004)	HW10
11/9	11	Randomized trials	Khandker et al. (2009), Ch. 3 Luca et al. (2021)	HW11
11/16	12	Checking underlying assumptions	Review of textbook, Stuart (2010), and Angrist & Krueger (1999)	None
11/23	13	No class - Thanksgiving	None	None
11/30	14	Paper presentations	None	None
12/7	15	Paper presentations	None	None

Full Citations for Readings

Angrist, J. D., & Krueger, A. B. (1999). Empirical strategies in labor economics. In *Handbook of Labor Economics* (Vol. 3, pp. 1277-1366). [\[link\]](#)

Angrist, J. D., & Pischke, J. S. (2014). *Mastering 'metrics: The path from cause to effect*. Princeton University Press. [\[link to purchase textbook on Amazon\]](#)

Bifulco, R., & Ladd, H. F. (2006). The impacts of charter schools on student achievement: Evidence from North Carolina. *Education Finance and Policy*, 1(1), 50-90. [\[link\]](#)

Dee, T. S., & Fu, H. (2004). Do charter schools skim students or drain resources? *Economics of Education Review*, 23(3), 259-271. [\[link\]](#)

Dee, T. S., & Jacob, B. (2011). The impact of No Child Left Behind on student achievement. *Journal of Policy Analysis and Management*, 30(3), 418-446. [\[link\]](#)

Card, D., & Krueger, A. (1994). Minimum wages and employment: A case study of the New Jersey and Pennsylvania fast food industries. *American Economic Review*, 84(4), 772-793. [\[link\]](#)

Clark, M. A., Gleason, P. M., Tuttle, C. C., & Silverberg, M. K. (2015). Do charter schools improve student achievement? *Educational Evaluation and Policy Analysis*, 37(4), 419-436. [\[link\]](#)

Furgeson, J., Gill, B., Haimson, J., Killewald, A., McCullough, M., Nichols-Barrer, I., ... & Lake, R. (2012). Charter-school management organizations: Diverse strategies and diverse student impacts. Mathematica Policy Research, Inc. [\[link\]](#)

Hallberg, K., Williams, R., Swanlund, A., & Eno, J. (2018). Short comparative interrupted time series using aggregate school-level data in education research. *Educational Researcher*, 47(5), 295-306. [\[link\]](#)

Jacob, B. A., & Lefgren, L. (2004). Remedial education and student achievement: A regression-discontinuity analysis. *Review of economics and statistics*, 86(1), 226-244 [\[link\]](#).

Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2009). *Handbook on impact evaluation: quantitative methods and practices*. World Bank Publications. [\[link\]](#)

Luca, D. L., Stevens, J., Rotz, D., Goesling, B., & Lutz, R. (2021). Evaluating teen options for preventing pregnancy: Impacts and mechanisms. *Journal of Health Economics*, 77, 102459. [\[link\]](#)

Olken, B. A. (2015). Promises and perils of pre-analysis plans. *Journal of Economic Perspectives*, 29(3), 61-80. [\[link\]](#)

Stuart, E. A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science: A Review Journal of the Institute of Mathematical Statistics*, 25(1), 1 [\[link\]](#)

POLICIES AND PROCEDURES FOR THIS COURSE

University policy on observance of religious holidays

In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, see: provost.gwu.edu/policies-procedures-and-guidelines

Academic Integrity Code

Academic Integrity is an integral part of the educational process, and GW takes these matters very seriously. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and in other ways outlined in the Code of Academic Integrity. Students accused of academic integrity violations should contact the Office of Academic Integrity to learn more about their rights and options in the process. Outcomes can range from failure of assignment to expulsion from the University, including a transcript notation. The Office of Academic Integrity maintains a permanent record of the violation. More information is available from the Office of Academic Integrity at studentconduct.gwu.edu/academic-integrity. The University's "Guide of Academic Integrity in Online Learning Environments" is available at studentconduct.gwu.edu/guide-academic-integrity-online-learning-environments. Contact information: rights@gwu.edu or 202-994-6757.

Support for students outside the classroom

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, or access other academic support resources at academiccommons.gwu.edu. For assistance contact academiccommons@gwu.edu.

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact [Disability Support Services](http://disabilitysupport.gwu.edu) to establish eligibility and to coordinate reasonable accommodations. disabilitysupport.gwu.edu

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome

challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services

Safety and Security

Monitor [GW Alerts](#) and [Campus Advisories](#) to [Stay Informed](#) before and during an emergency event or situation. In an emergency: call GWPD 202-994-6111 or 911. For situation-specific actions: review the Emergency Response Handbook at safety.gwu.edu/emergency-response-handbook.

Classroom Expectations

Higher education works best when it becomes a vigorous and lively marketplace of ideas in which all points of view are heard. Free expression in the classroom is an integral part of this process and works best when all of us approach the enterprise with empathy and respect for others.

GW Statement on Diversity and Inclusion

Diversity is crucial to an educational institution's pursuit of excellence in learning, research and service. In pursuit of those goals, a population of students, faculty, and staff with differing perspectives, backgrounds, talents, and needs can lead to a richer mix of ideas, energizing and enlightening debates, deeper commitments, and a host of educational, civic and work outcomes. Leveraging diversity is rarely achieved by accident. As individuals and as an institution we must intentionally act to create the diverse and inclusive community that enables everyone to flourish. All members and units of the GWU community must advance the institution's commitment to diversity and inclusion as a strategic priority.

Incompletes

A student must consult with the instructor to obtain a grade of "I" (incomplete) no later than the last day of classes in a semester. At that time, the student and instructor will both sign the CCAS contract for incompletes and submit a copy to the School Director. Please consult the TSPPPA Student Handbook (found on the Trachtenberg School website) or visit <https://columbian.gwu.edu/sites/columbian.gwu.edu/files/downloads/Incomplete%20Contract.pdf> for the complete CCAS policy on incompletes.

Submission of Written Work Products after Due Date: Policy on Late Work

All work must be turned in by the assigned due date in order to receive full credit for that assignment, unless an exception is expressly made by the instructor.

Changing Grades After Completion of Course

No changes can be made in grades after the conclusion of the semester, other than in cases of clerical error.

The Syllabus

This syllabus is a guide to the course for the student. Sound educational practice requires flexibility and the instructor may therefore revise content and requirements during the semester.