Contacts

Dr. Osea Giuntella

Office: Room 4908

Office Hours: M/W 2.30pm-4pm

Email: osea.giuntella@pitt.edu

Personal Website: www.oseagiuntella.com

Course Description

This course will cover empirical methods typically used in applied micro-economic research and it is designed to help you learn how to apply the econometric techniques learned in the econometrics sequence. We will focus on techniques used in applied microeconomics to identify causal estimates. The course will cover data issues and distributional estimators in some detail along with matching and propensity scores, local regressions, instrumental variables, regression discontinuity designs, and inference issues. Many example will come from development, health, labor, public economics, and political economy, but I hope the material will be useful to any applied researcher. The course will focus also on the implementation of econometric techniques learning the basic tools of programming and coding using statistical softwares. The goal of this class is to provide students with the tools needed to become critical readers of empirical work and teach them techniques that they can apply to their own original research.

Requirements and Grading

I expect you to read the papers in the reading list before class and to be prepared to discuss them. Please bring a copy (paper or electronic) of the papers we are discussing with you to class. 20% of your grade will be based on the problem sets. 20% of your grade will be based on a verbal presentation of a paper. You should briefly summarize the paper (touching on data, methods, and findings) and then point out any major issues with the approach or conclusions. Finally, 60% of your grade will be based on the replication and extension of an empirical project. The paper replication must be turned in on time.

Problem Sets (20%)

There will be 4 problem sets. The problem sets will be data exercises that will allow you to practice the econometric techniques covered in class and familiarize with STATA and ArcGis. If you don't have it yet, you should obtain a copy of **STATA** and **ArcGIS** through mypitt.edu:

- STATA: http://technology.pitt.edu/software/stata-for-students

- ArcGIS: http://technology.pitt.edu/software/arcgis-for-students

Each problem set will count for 5% of your grade. Time management is an important part of this exercise, so there will be no extensions.

Presentation (20%)

Presenting work at conferences, meetings, seminars is a key part of our profession. Each student will be asked to critically discuss one of the papers in the reading list. You should briefly summarize the content of the paper and then point out any major limitation with the contribution, identification, interpretation, or generalizability of the results. You need to select a topic (and you can express a preference for a paper) no later than September 14. Presentation will follow the schedule of each topic (see below).

Empirical Project (60%)

You are expected to replicate and extend a research paper on a topic you choose. I recommend you choose a published paper which uses publicly available data. Most top journals in Economics make data freely available on their websites. The paper should apply one of the methods covered in the course. You can extend the paper by changing the outcome of interest, the sample (years, country etc.), or improving on the identification strategy. I will also provide a list of potential papers that you may replicate and extend. You will need to have the topic approved by me no later than Monday September 19. You will need to turn in an outline or sketch of the project no later than Monday November 21. This will count for 10% of your grade. The final draft is due no later than December 13 and should be no longer than 20 pages (including text and tables). The final draft will count for 40% of your grade. The presentation of your work will count 10% of your grade and will occur during the last week of class (20 minute talk). Time management is an important part of this exercise, so there will be no extensions.

Outline

Topic 1: The Experimental Ideal

- Causality vs correlation

- Selection, Randomized Trials, Treatment Effects,

Topic 2: Regression Analysis

- Regression Fundamentals

- Conditional Independence Assumption, Omitted Variable Bias

- Matching and Propensity Score Methods

- Limited Dependent Variables

Topic 3: Instrumental Variables

- IV and omitted variables bias

- The Wald estimator and grouped data

- Two-sample IV and related methods

- The bias of 2SLS

- IV with heterogeneous potential outcomes

- Local average treatment effects

Topic 4: Fixed Effects and Difference-in-Differences

- Individual fixed effects

- Difference-in-Differences

- Synthetic control method

Topic 5: Regression Discontinuity Design

- Sharp RD

- Fuzzy RD

Topic 6: Quantile Regression

Topic 7: Standard Errors Issues

- The bias of robust standard errors

- Clustering and serial correlation

- Clustering and the Moulton factor

Topic 8: Additional Topics (if we have time)

- Duration Models

- Bounds

- Research Transparency

General Readings and Textbooks

There is no required textbook for this course. Below a list of textbooks than can be used as a useful reference for the course.

- Angrist, Joshua D., and Jrn-Steffen Pischke. Mostly harmless econometrics: An empiricist's companion. Princeton University Press, 2008. **(MHE)**

- Angrist, Joshua D., and Jrn-Steffen Pischke. Mastering 'metrics: the path from cause to effect. Princeton University Press, 2014. **(MM)**

- Angrist, Joshua D., and Alan B. Krueger. "Empirical strategies in labor economics." Handbook of labor economics 3 (1999): 1277-1366.

- Cameron, Colin and Pravin Trivedi. 2005. Microeconometrics: Methods and Applications. Cambridge University Press.

- Cameron, Colin and Pravin Trivedi. 2009. Microeconometrics Using Stata. College Station, TX: Stata Press. **(CT)**

- Imbens, Guido W., and Jeffrey M. Wooldridge. "Recent developments in the econometrics of program evaluation." Journal of economic literature 47.1 (2009): 5-86.

- Wooldridge, Jeffrey M. Econometric Analysis of Cross Section and Panel Data. MIT Press, 2010, 2002 (Second Edition). **(W)**

Other Useful Resources

- Melissa Dell's class notes: GIS Analysis for Applied Economists (Very comprehensive, good reference for definitions of ArcGIS tools, packages, etc., no exercises to replicate)

- Masayuki Kudamatsu's class notes: ArcGIS 10 for Applied Microeconometric Research (Set of 7 lectures with replication exercises and corresponding data for replication, great learning resource)

- Ogura, L. M. 2010. Template-Based Introductory Guide to LaTeX for Economics, Grand Valley State University.

- Quick Stata Guide, Liz Foster: `http://www.princeton.edu/wwac/academic-review/stata/` A guide to ArcGis: `https://sites.google.com/site/mkudamatsu/gis`

- IPUMS data

- NBER DATA

Readings (Subject to Changes)

We will read and discuss several articles. The readings listed below are available through institutional access.

Topic 1: The Experimental Ideal

- MHE Chapter 2; MM Chapter 1; W, Chapter 21.

- Angrist, Joshua, and Victor Lavy. "The effects of high stakes high school achievement awards: Evidence from a randomized trial." The American Economic Review 99.4 (2009): 1384-1414.

- Aron-Dine, Aviva, Liran Einav, and Amy Finkelstein. "The RAND health insurance experiment, three decades later." The Journal of Economic Perspectives 27.1 (2013): 197-222.

- Crepon, B., E. Duflo, M. Gurgand, R. Rathelot, and P. Zamora, 2013. Do Labor Market Policies have Displacement Effects? Evidence from a Clustered Randomized Experiment, Quarterly Journal of Economics, 128.2: 531-580.

- Finkelstein, Amy, et al. "The Oregon Health Insurance Experiment: Evidence from the First Year." The Quarterly journal of economics 127.3 (2012): 1057-1106.

- Krueger, Alan B. "Experimental Estimates of Education Production Functions." The Quarterly Journal of Economics 114.2 (1999): 497-532.

- Miguel, Edward, and Michael Kremer. "Worms: identifying impacts on education and health in the presence of treatment externalities." Econometrica 72.1 (2004): 159-217.

- Taubman, Sarah L., et al. "Medicaid increases emergency-department use: evidence from Oregon's Health Insurance Experiment." Science 343.6168 (2014): 263-268.

Further readings

- Angrist, Joshua, Daniel Lang, and Philip Oreopoulos. "Incentives and services for college achievement: Evidence from a randomized trial." American Economic Journal: Applied Economics 1.1 (2009): 136-163.

- Brook, Robert H., et al. "Does free care improve adults' health? Results from a randomized controlled trial." New England Journal of Medicine 309.23 (1983): 1426-1434.

- Burtless, Gary. "The case for randomized field trials in economic and policy research." The Journal of Economic Perspectives 9.2 (1995): 63-84.

- Duflo, Esther, Rachel Glennerster, and Michael Kremer. "Using randomization in development economics research: A toolkit." Handbook of development economics 4 (2007): 3895-3962.

- Finkelstein, Amy, and Sarah Taubman. "Randomize evaluations to improve health care delivery." Science 347.6223 (2015): 720-722.

Topic 2: Regression Analysis (Matching, Propensity Score Methods, Sythetic Control)
MHE, chapter 3; MM, chapter 2; W, chapters 1, 4, and 21.

- Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. "Synthetic control methods for comparative case studies: Estimating the effect of Californias tobacco control program." Journal of the American statistical Association (2012).

- Abadie, Alberto, and Javier Gardeazabal. "The economic costs of conflict: A case study of the Basque Country." The American Economic Review 93.1 (2003): 113-132

- Abadie, Alberto, and Guido W. Imbens. "Matching on the estimated propensity score." Econometrica 84.2 (2016): 781-80

- Angrist, Joshua D. "Estimating the Labor Market Impact of Voluntary Military Service Using Social Security Data on Military Applicants." Econometrica 66.2 (1998): 249-288.

- Angrist, Joshua, and Jinyong Hahn. "When to control for covariates? Panel asymptotics for estimates of treatment effects." Review of Economics and statistics 86.1 (2004): 58-72

- Dehejia, Rajeev H., and Sadek Wahba. "Propensity score-matching methods for nonexperimental causal studies." Review of Economics and statistics 84.1 (2002): 151-161.

- Heckman, James J., Hidehiko Ichimura, and Petra E. Todd. "Matching as an econometric evaluation estimator: Evidence from evaluating a job training programme." The Review of Rconomic Dtudies 64.4 (1997): 605-654.

Further readings

- Abadie, Alberto, Matthew M. Chingos, and Martin R. West. Endogenous stratification in randomized experiments. No. w19742. National Bureau of Economic Research, 2013.

- Dehejia, Rajeev. "Practical propensity score matching: a reply to Smith and Todd." Journal of Econometrics 125.1 (2005): 355-364.

- Imbens, Guido W., and Jeffrey M. Wooldridge. "Recent developments in the econometrics of program evaluation." Journal of Economic Literature 47.1 (2009): 5-86.

- Pischke, Steve. "Lecture notes on measurement error." London School of Economics, London (2007).

- Sianesi, Barbara. "Implementing propensity score matching estimators with Stata." UK Stata Users Group, VII Meeting. 2001.

- Smith, Jeffrey A., and Petra E. Todd.(2005). Rejoinder. Journal of Econometrics, 125

- Smith, Jeffrey A., and Petra E. Todd. "Does matching overcome LaLonde's critique of nonexperimental estimators?." Journal of Econometrics 125.1 (2005): 305-353.

- Ravallion, Martin. "The mystery of the vanishing benefits: An introduction to impact evaluation." the world bank economic review 15.1 (2001): 115-140.

Topic 3: Instrumental Variable

MHE, chapter 4; MM, chapter 3; W, chapters 5, 8, 21.4

- Acemoglu, Daron, Simon Johnson, and James A. Robinson. "The Colonial Origins of Comparative Development: An Empirical Investigation." The American Economic Review 91.5 (2001): 1369-1401.

- Altonji, Joseph G., Todd E. Elder, and Christopher R. Taber. "An evaluation of instrumental variable strategies for estimating the effects of catholic schooling." Journal of Human resources 40.4 (2005): 791-821.

- Angrist, Joshua D., and Alan B. Krueger. "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." The Journal of Economic Perspectives 15.4 (2001): 69-85.

- Angrist, Joshua D., and Alan B. Krueger. Does compulsory school attendance affect schooling and earnings?. No. w3572. National Bureau of Economic Research, 1990.

- Bound, John, David A. Jaeger, and Regina M. Baker. "Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak." Journal of the American statistical association 90.430 (1995): 443-450.

  Further Readings

- Deaton, Angus. "Instruments, randomization, and learning about development." Journal of economic literature 48.2 (2010): 424-455.

- Imbens, Guido W., and Joshua D. Angrist. "Identification and estimation of local average treatment effects." Econometrica 62.2 (1994): 467-475.

- Imbens, Guido W. "Better LATE than nothing: Some comments on Deaton (2009) and Heckman and Urzua (2009)." Journal of Economic literature 48.2 (2010): 399-423.

Topic 4: Fixed Effects and Difference-in-Differences

MHE, chapter 5; MM chapter 5; W chapter 10.

- Abadie, Alberto. "Semiparametric difference-in-differences estimators." The Review of Economic Studies 72.1 (2005): 1-19

- Athey, Susan, and Guido W. Imbens. "Identification and inference in nonlinear differenceindifferences models." Econometrica 74.2 (2006): 431-497.

- Bertrand, B., E. Duflo, and S. Mullainathan. "How Much Should We Trust Differences-In-Differences Estimates?." The Quarterly Journal of Economics (2003): 1-32.

- Card, David, and Alan B. Krueger. "Minimum wages and employment: a case study of the fast-food industry in New Jersey and Pennsylvania: reply." The American Economic Review 90.5 (2000): 1397-1420.

- De Chaisemartin, Clment, and Xavier d'Haultfoeuille. "Fuzzy differences-in-differences. mimeo, October 2015.

- Dube, Arindrajit, T. William Lester, and Michael Reich. "Minimum wage effects across state borders: Estimates using contiguous counties." The Review of Economics and Statistics 92.4 (2010): 945-964

- Duflo, Esther. "Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment." The American Economic Review 91.4 (2001): 795.

Topic 5: Regression Discontinuity Design

MHE, chapter 6; MM, chapter 4; W, chapter 21.5

- Almond, Douglas, et al. "Estimating Marginal Returns to Medical Care: Evidence from At-risk Newborns." The Quarterly Journal of Economics 125.2 (2010): 591-634.

- Barreca, Alan I., et al. "Saving babies? Revisiting the effect of very low birth weight classification." The Quarterly Journal of Economics 126.4 (2011): 2117-2123.

- Card, David, et al. "Inference on causal effects in a generalized regression kink design." Econometrica 83.6 (2015): 2453-2483.

- Dell, M., 2010. Dell, Melissa. "The persistent effects of Peru's mining mita." Econometrica 78.6 (2010): 1863-1903.

- Imbens, Guido W., and Thomas Lemieux. "Regression Discontinuity Designs: A Guide to Practice." Journal of Econometrics 142.2 (2008): 615-635.

- Imbens, Guido, and Karthik Kalyanaraman. "Optimal bandwidth choice for the regression discontinuity estimator." The Review of economic studies (2011): rdr043.

- Lee, David S., and Thomas Lemieux. "Regression discontinuity designs in economics." Journal of economic literature 48.2 (2010): 281-355.

- Ludwig, Jens, and Douglas L. Miller. "Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design." The Quarterly Journal of Economics 122.1 (2007): 159-208.

Further Readings

- Angrist, Joshua, and Miikka Rokkanen. Wanna get away? RD identification away from the cutoff. No. w18662. National Bureau of Economic Research, 2012.

- Calonico, Sebastian, Matias D. Cattaneo, and Rocio Titiunik. "Robust Nonparametric Confidence Intervals for RegressionDiscontinuity Designs." Econometrica 82.6 (2014): 2295-232

- Calonico, Sebastian, Matias D. Cattaneo, and Rocio Titiunik. "Optimal data-driven regression discontinuity plots." Journal of the American Statistical Association 110.512 (2015): 1753-1769.

- Frandsen, Brigham R., Markus Frlich, and Blaise Melly. "Quantile treatment effects in the regression discontinuity design." Journal of Econometrics 168.2 (2012): 382-395.

- Hahn, Jinyong, Petra Todd, and Wilbert Van der Klaauw. "Identification and estimation of treatment effects with a regressiondiscontinuity design." Econometrica 69.1 (2001): 201-209.

Topic 6: Quantile Regressions

MHE, chapter 7; W, chapter 12.

- Angrist, Joshua, Victor Chernozhukov, and Ivn FernndezVal. "Quantile regression under misspecification, with an application to the US wage structure." Econometrica 74.2 (2006): 539-56

- Abadie, Alberto, Joshua Angrist, and Guido Imbens. "Instrumental variables estimates of the effect of subsidized training on the quantiles of trainee earnings." Econometrica 70.1 (2002): 91-117.

- Chernozhukov, Victor, and Christian Hansen. "An IV model of quantile treatment effects." Econometrica 73.1 (2005): 245-261..

- Frandsen, Brigham R., Markus Frolich, and Blaise Melly. "Quantile treatment effects in the regression discontinuity design." Journal of Econometrics 168.2 (2012): 382-395.

- Koenker, Roger, and Kevin Hallock. "Quantile regression: An introduction." Journal of Economic Perspectives 15.4 (2001): 43-56.

Topic 7: Standard Errors Issues

MHE, chapter 8; W, chapter 20.

- Bertrand, B., E. Duflo, and S. Mullainathan. "How Much Should We Trust Differences-In-Differences Estimates?." The Quarterly Journal of Economics (2003): 1-32.

- Cameron, A. Colin, and Douglas L. Miller. "A practitioners guide to cluster-robust inference." Journal of Human Resources 50.2 (2015): 317-372

- Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller. "Bootstrap-based improvements for inference with clustered errors." The Review of Economics and Statistics 90.3 (2008): 414-427.

- Donald, Stephen G., and Kevin Lang. "Inference with difference-in-differences and other panel data." The review of Economics and Statistics 89.2 (2007): 221-233.

- Hansen, Christian B. "Generalized least squares inference in panel and multilevel models with serial correlation and fixed effects." Journal of Econometrics 140.2 (2007): 670-694.

- Imbens, Guido W., and Michal Kolesar. "Robust standard errors in small samples: Some practical advice." Review of Economics and Statistics 0 (2012).

- Moulton, Brent R. "Random group effects and the precision of regression estimates." Journal of Econometrics 32.3 (1986): 385-397.

Further Readings

- Abadie, Alberto, Guido W. Imbens, and Fanyin Zheng. "Inference for Misspecified Models With Fixed Regressors." Journal of the American Statistical Association 109.508 (2014): 1601-1614.

- Chesher, Andrew, and Ian Jewitt. "The bias of a heteroskedasticity consistent covariance matrix estimator." Econometrica: Journal of the Econometric Society (1987): 1217-1222.

- Hansen, Christian B. "Asymptotic properties of a robust variance matrix estimator for panel data when T is large." Journal of Econometrics 141.2 (2007): 597-620.

- Young, Alwyn., Channelling Fisher: Randomization Tests and the Statistical Insignificance of Seemingly Significant Experimental Results, London School of Economics, mimeo, October 2015.

- Young, Alwyn. Improved, nearly exact, statistical inference with robust and clustered covariance matrices using effective degrees of freedom corrections. London School of Economics, Mimeo, 2015.

Additional Topics

Decomposition

- DiNardo, John, Nicole M. Fortin, and Thomas Lemieux. "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach." Econometrica 64.5 (1996): 1001-1044

- Fortin, Nicole, Thomas Lemieux, and Sergio Firpo. "Decomposition methods in economics." Handbook of labor economics 4 (2011): 1-102.

Bounds

- Lee, David S. "Training, wages, and sample selection: Estimating sharp bounds on treatment effects." The Review of Economic Studies 76.3 (2009): 1071-1102.

- Kreider, Brent, et al. "Identifying the effects of SNAP (food stamps) on child health outcomes when participation is endogenous and misreported." Journal of the American Statistical Association 107.499 (2012): 958-975.

- Oster, Emily. Unobservable selection and coefficient stability: Theory and validation. No. w19054. National Bureau of Economic Research, 2013.

Research Transparency

- Brodeur, Abel, et al. "Star wars: The empirics strike back." American Economic Journal: Applied Economics 8.1 (2016): 1-32.

- Casey, Katherine, Rachel Glennerster, and Edward Miguel. "Reshaping Institutions: Evidence on Aid Impacts Using a Preanalysis Plan" The Quarterly Journal of Economics 1755 (2012): 1812.

- Miguel, Edward, et al. "Promoting transparency in social science research." Science 343.6166 (2014): 30-31.

Tentative Schedule

Lecture	Day	Date	Month	Topic	Key Dates & Deadlines
1	Monday	29	Aug	Introduction	Problem Set 1 posted
2	Wednesday	31	Aug	The Experimental Ideal	
NO CLASS	Monday	5	Sep	NO CLASS (LABOR DAY)	
3	Wednesday	7	Sep	Randomized Control Trials	
NO CLASS	Monday	12	Sep	NO CLASS (moved to next week)	
4	Wednesday	14	Sep	Randomized Control Trials	Topic of Empirical Project and PS1 due
5	Friday	14	Sep	Regression Fundamentals	
6	Monday	19	Sep	Regression Fundamentals	Problem Set 2 posted
7	Wednesday	21	Sep	Matching and Propensity Score	
8	Monday	26	Sep	Matching and Propensity Score	
9	Wednesday	28	Sep	Instrumental Variables	
10	Monday	3	Oct	Instrumental Variables	PS2 due
11	Wednesday	5	Oct	Instrumental Variables	
12	Monday	10	Oct	Instrumental Variables	Problem Set 3 posted
13	Wednesday	12	Oct	Fixed Effects and Diff-in-Diff	
NO CLASS	Monday	17	Oct	NO CLASS (FALL BREAK)	
14	Tuesday (make up)	18	Oct	Fixed Effects and Diff-in-Diff	
15	Wednesday	19	Oct	Fixed Effects and Diff-in-Diff	
16	Monday	24	Oct	Regression Discontinuity	PS3 due
17	Wednesday	26	Oct	Regression Discontinuity	
18	Monday	31	Oct	Regression Discontinuity	Problem Set 4 posted
19	Wednesday	2	Nov	Event Studies	
20	Monday	7	Nov	Quantile Regressions	
21	Wednesday	9	Nov	Quantile Regressions	
22	Monday	14	Nov	Decomposition	PS4 due
23	Wednesday	16	Nov	Decomposition	
24	Monday	21	Nov	Inference	Sketch of Empirical Project due
NO CLASS	Wednesday	23	Nov	NO CLASS (THANKSGIVING)	
25	Monday	28	Nov	Inference	
26	Wednesday	30	Nov	Inference	
27	Monday	4	Dec	Bounds, Duration Models	
28	Wednesday	6	Dec	Research Transparency	
29	Monday	11	Dec	Student Presentations	
30	Wednesday	13	Dec	Student Presentations	Final Draft of Project Due

Academic Integrity

Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, from the February 1974 Senate Committee on Tenure and Academic Freedom reported to the Senate Council, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz or exam will be imposed.

Disability Resource

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-624-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course. For more information, visit www.studentaffairs.pitt.edu/drsabout.