Applied Empirical Microeconomics of Inequality
Mary Kaltenberg

What you'll learn:

- How to identify a causal mechanism
- The power of randomization& experimental design
- Application in non-experimental settings:
    - Instrumental Variables
    - Difference-in-difference
    - Regression Discontinuity Design
- Data management and coding for applied economics (in STATA)
- A survey on the causes and consequences of inequality including:
    - Place, education, minimum wage, discrimination, and gender

Exams, problem sets, classroom performance, and grading:
Grading: 4 Problem sets 30%, 1 Exam 30%, 1 Presentation 10%, 1 Final project 30%. Bonus for in-class participation and/or attendance.

Labs: Some classes identified in the syllabus will be "lab" style where you will bring or borrow a laptop from the library to bring to class. Typically, half of this class will be dedicated to coding applications to the methods outlined in class – in some classes you will code "from scratch" (without assistance from a package). The other half will be dedicated to discussing an applied application (published paper). We will use one dataset to code applications throughout the course in the lab style classes.

Problem Sets:
This course will require 4 problem sets that are due in class and will be discussed in recitation. The problem sets normally have two parts: one covering more technical problems out of the textbook and class lectures, and the other covering applications of topics discussed in class. The problem set will include coding and interpreting output. No late problem sets will be accepted. However, life circumstances may come up and I will drop the lowest graded problem set from your average of your problem set portion of your grade.

Final Project:
You can choose 1 out of 4 datasets and write a paper applying one of the methods in the syllabus. You also have the option to find a different data set on your own. You will present your idea to the class where you will receive feedback, and then submit the final paper at the end of the course. You must submit your code that can replicate your results with the paper.

Textbooks

- **[S&W)] Stock, James H. & Mark W. Watson (2007), *Introduction to Econometrics,*** *Third Edition,* Pearson Education, ISBN 978-1-4082-6433-1. (Its *Second Edition,* Addison-Wesley, ISBN 0-321-44253-9, is equally good.)
- **[A&P] Angrist, J. D., & Pischke, J. S. (2014). *Mastering 'Metrics:*** *The path from cause to effect*. Princeton University Press.
- You will also be assigned research papers which we will discuss together in class and identify concepts from the textbooks.

Optional additional references

- Grusky, D. (2018). *The inequality reader: Contemporary and foundational readings in race, class, and gender*. Routledge. (Highly recommended reader on a variety of topics on inequality)
- Ashenfelter, O., & Card, D. (Eds.). (2010). *Handbook of labor economics 4a*. Elsevier. (Reader on applied labor economics including application in field experiments and research design)
- Smith, Gary (2011), *Essential Statistics, Regression, and Econometrics,* Academic Press, ISBN 978-0123822215. (Excellent, non-intimidating introduction to the prerequisite statistics and regression stuff; see also the supplementary chapters on-line)
- Wooldridge, Jeffrey M. (2013), *Introductory Econometrics: A Modern Approach*, 5th *edition*, Cengage Learning, ISBN 978-1-111-53439-4. (Comparable level to Stock & Watson; 4th edition from 2009, ISBN 978-0-324-58548-3, still equally good)
- Greene, William H. (2008), *Econometric Analysis*, *6th edition*, Pearson, ISBN 978-0-13-513245-6. (Very well-known graduate text with extensive coverage, uses a lot of matrix algebra and mathematical statistics)
- Deaton Angus (1997), *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy,* Johns Hopkins, ISBN 0-8018-5254-4. (Applied focus on development, but comprehensive on applied methods)
- Cameron, A. Colin & Pravin K. Trivedi (2005), *Microeconometrics,* Cambridge University Press, ISBN 0-521-84805-9. (Comprehensive, theory and applications)
- Gertler, P. J., Martinez, S., Premand, P., Rawlings, L. B., & Vermeersch, C. M. (2016). *Impact evaluation in practice*. The World Bank. (Applied focus geared towards development economics)

Week	Topics		Assign.
1	Introduction: Causality	Correlation vs. Causality, Intro to Inequality	
		What is Identification?	
2	RCT	Randomization	
Lab		Cont. Randomization Intro to STATA: Import and Cleaning Data	
3	RCT	Designing Experiments	
		Internal & External Validity	
4	OLS (Review)	OLS	PS1
Lab		Applying OLS and Graphing	
5	IV	Searching for IV	
Lab		IV in the Wild & Application	
6	IV Validity	Is IV Valid?	
		Exclusion Restriction	
7	Probit/Logit	MLE	PS2
Lab		Inference and Application	
8		Catch-up	
	Midterm	Midterm	Midterm
9	Matching	Intro to Matching	
Lab		Unconfoudedness, Overlapping Support & Application	
10	Diff in Diff	Intro to Diff in Diff	
Lab		Applying Diff in Diff	
11	Diff in Diff	ATE vs. LATE	
		Debating Policy	
12	Paper Pitches	Paper Pitches	Paper Pitches
		Paper Pitches	
13	RDD	Intro to RDD	PS3
		Sharp & Fuzzy	
Lab	RDD	Applying RDD & Graphing	
		Bandwidth Selection, Bunching	
15	Big Data	Big Data in Economics	PS4
Lab		Efficient Coding: Loops, Logic and Tricks	
16	Algorithmic Bias	Economic Implications of Algorithmic Bias	Final Project

Readings

Week 1: Introduction: Causality & Identification

- Varian, H. R. (2016). "Causal inference in economics and marketing". *Proceedings of the National Academy of Sciences*, 113(27), 7310-7315.
- Grusky, D. B., & Szelenyi, S. (2011). "The stories about inequality that we love to tell". The Inequality Reader: Contemporary and foundational readings in race, class, and gender, 2-16.
- Imbens, G.W., and D.B. Rubin (2015), Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction. Cambridge University Press. Chapter 1.
- Chetty, R., & Hendren, N. (2016). "The impacts of neighborhoods on intergenerational mobility II: County-level estimates" (No. w23002). *National Bureau of Economic Research*.

Week 2: Randomized Control Trials (RCT)

- A&P Chp 1
- Chetty, R., Hendren, N. and Katz, L. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment". *American Economic Review* 106(4): 855-902, 2016
- Khandker, Koolwal, Samad (2010). Randomization. In: Handbook on Impact Evaluation (pp. 33-52). Washington, DC: The World Bank.,
- Bleakley, H., & Ferrie, J. (2016). "Shocking behavior: Random wealth in antebellum Georgia and human capital across generations". *The Quarterly Journal of Economics*, 131(3), 1455-1495.

Week 3: Randomized Control Trials (RCT)

- S&W Chp. 13.3
- Bertrand, M., & Mullainathan, S. (2004). "Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination". *American Economic Review*, 94(4), 991-1013.
- S&W Chp. 13.5

Week 4: Ordinary Least Squares (OLS)

- S&W Chp 6
- A&P Chp 2

Week 5: Instrumental Variables (IV)

- A&P Chp 3, Handout "Star Wars IV"
- Autor, D. H., Dorn, D., & Hanson, G. H. (2016). "The China shock: Learning from labor-market adjustment to large changes in trade". *Annual Review of Economics*, 8, 205-240.

Week 6: Instrumental Variables & Validity (IV Validity)

- S&W Chp 12
- Angrist, J.D., G.W. Imbens and D.B. Rubin (1996), "Identification of Causal Effects Using Instrumental Variables," *Journal of the American Statistical Association*, vol. 91, 444-472.
- Angrist, J. D. (1990). "Lifetime earnings and the Vietnam era draft lottery: evidence from social security administrative records". *The American Economic Review*, 313-336

Week 7: Binary Dependent Variables (Probit/Logit)

- S&W Chp 11
- Correll, S. J., Benard, S., & Paik, I. (2007). "Getting a job: Is there a motherhood penalty?". *American Journal of Sociology*, 112(5), 1297-1338.

Week 8: Midterm & Catchup

Week 9: Matching

- Gertler, et al (2016). Matching (Chapter 8). In: Impact Evaluation in Practice (pp. 143-158). Washington, DC: The World Bank., Rosenbaum, P.R. (2009), Design of Observational Studies. Springer-Verlag. Chapter 1, sections 1-6.
- Rosenbaum, P.R., and D. B. Rubin (1983), "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika*, vol. 70, 41-55.
- Caliendo, M., & Kopeinig, S. (2008). "Some practical guidance for the implementation of propensity score matching". *Journal of Economic Surveys*, 22(1), 31-72.
- Ashenfelter, O. "Estimating the Effect of Training Programs on Earnings." *The Review of Economics and Statistics* 60, no. 1 (1978): 47–57.

Week 10: Difference-in-Difference (Diff-in-Diff)

- A&P Chp 5
- Krueger, A., & Ashenfelter, O. (1992). "Estimates of the economic return to schooling from a new sample of twins" (No. w4143). *National Bureau of Economic Research*.

Week 11: Difference-in-Difference (Diff-in-Diff)

- Oreopoulos, P. "Estimating Average and Local Average Treatment Effects of Education when Compulsory Schooling Laws Really Matter." *The American Economic Review* 96, no. 1 (2006): 152–75.
- Chaisemartin, Clement de. "All you Need is LATE". University of Warwick, Mimeo, 2012.
- Imbens, G. "Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009)"
- Card, D., & Krueger, A. B. (1993). "Minimum wages and employment: A case study of the fast food industry in New Jersey and Pennsylvania" (No. w4509). *National Bureau of Economic Research*.
- Neumark, D., & Wascher, W. (1994). "Employment effects of minimum and subminimum wages: Reply to Card, Katz, and Krueger". *ILR Review*, 47(3), 497-512.

Week 12: Paper Pitches

Week 13: Regression Discontinuity Design (RDD)

- A&P Chp 4
- van der Klaauw, W. 2002. "Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression-Discontinuity Approach". *International Economic Review* 43 (4): 1249-1287.
- D. S., & Lemieux, T. (2010). "Regression discontinuity designs in economics". *Journal of economic literature*, 48(2), 281-355.
- Abdulkadiroglu, A., J. Angrist, et al. "The Elite Illusion: Achievement Effects at Boston and New York Exam Schools." *Econometrica* 82, no. 1 (2014): 137–96.

Week 14: Regression Discontinuity Design (RDD)

- Imbens, G. W. & Kalyanaraman, K. (2012), "Optimal bandwidth choice for the regression discontinuity estimator". *Review of Economic Studies* 79(3), pp. 933–959.
- Ludwig, J., and D. Miller. "Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design". *The Quarterly Journal of Economics* 122, no. 1 (2007): 159–208.
- Camacho, Adriana, and Emily Conover. 2011. "Manipulation of Social Program Eligibility." *American Economic Journal: Economic Policy*, 3 (2): 41-65.

Week 15: Big Data

- Varian, Hal R. "Big Data: New Tricks for Econometrics". Journal of Economic Perspectives 28, no. 2 (2014): 3–28.
- Gentzkow, M., and J. Shapiro. "Nuts and Bolts: Computing with Large Data". NBER Lecture and Videos. Accessed June 22, 2015. http://www.nber.org/econometrics_minicourse_2013/

Week 16: Algorithmic Bias

- Fischer, C. S., Hout, M., Jankowski, M. S., Lucas, S. R., Swidler, A., & Voss, K. (2018). "Inequality by Design". In The Inequality Reader (pp. 20-24). Routledge.
- Lambrecht, A., & Tucker, C. (2019). "Algorithmic Bias? An Empirical Study of Apparent Gender-Based Discrimination in the Display of STEM Career Ads". *Management Science*.
- Cowgill, B., & Tucker, C. (2017). "Algorithmic bias: A counterfactual perspective". *NSF Trustworthy Algorithms*.