

EKT 816: Econometrics

Jesse Naidoo

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E-mail: jesse.naidoo@up.ac.za

Office Hours: ???

Office: Tukkieurf 2-23

Web: TBD

Class Hours: ???

Class Room: Tukkieurf 1-37

Course Description

This is a graduate course in econometrics. Our goal is to learn some basic techniques that economists use to (try to) establish causal claims. At a higher level, you will also need to learn how to assemble such claims together so as to build a coherent argument, but you have a little longer to learn how to do that.

Required Texts

Class Schedule

Please read at least the prescribed readings before class, even if you find it hard to follow everything. It will become easier with practice.

Week 01, 02/04 - 02/08: Probability and Statistics Review

Distributions, expectations, quantiles. Laws of large numbers and the central limit theorem. Estimation: mean square error vs bias. Sufficient and ancillary statistics.

Week 02, 02/11 - 02/15: Probability and Statistics Review (continued)

Consistency and precision in estimation. Weighting and sample design. Identification. Hypothesis testing: size vs power.

Week 03, 02/18 - 02/22: Counterfactuals and Causal Inference

Potential outcomes notation. Randomization delivers the ATE; brief aside on SUTVA, peer effects and general equilibrium. Examples of causal claims (especially implicit ones). Typical obstacles to estimating counterfactuals: simultaneity, measurement error, self-selection. Internal and external validity, and the value of understanding mechanisms. The importance of a clear research design. Another aside on partial identification and “structural estimation”. Prediction vs causation.

Readings (all optional)

- Acemoglu (2010); Muralidharan and Niehaus (2017)
- Angrist and Pischke (2010); Keane (2010b)
- Heckman (2008); Sims (2010); Deaton (2010); Heckman (2010)

- Manski (1995); Keane (2010a)
- Mullainathan and Spiess (2017)

References

- Acemoglu, Daron. 2010. "Theory, General Equilibrium, and Political Economy in Development Economics." *Journal of Economic Perspectives* 24 (3): 17–32. <http://pubs.aeaweb.org/doi/abs/10.1257/jep.24.3.17>.
- Angrist, Joshua D, and Jörn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics." *Journal of Economic Perspectives* 24 (2): 3–30.
- Deaton, Angus. 2010. "Instruments, Randomization, and Learning about Development." *Journal of Economic Literature* 48 (2). American Economic Association: 424–55.
- Heckman, James J. 2008. "Econometric Causality." *International Statistical Review* 76 (1): 1–27. <https://doi.org/10.1111/j.1751-5823.2007.00024.x>.
- . 2010. "Building Bridges Between Structural and Program Evaluation Approaches to Evaluating Policy." *Journal of Economic Literature* 48 (June): 356–98. <https://doi.org/10.3386/w16110>.
- Keane, Michael P. 2010a. "A Structural Perspective on the Experimentalist School." *Journal of Economic Perspectives* 24 (2): 47–58. <https://doi.org/10.1257/jep.24.2.47>.
- . 2010b. "Structural vs. atheoretic approaches to econometrics." *Journal of Econometrics* 156 (1): 3–20. <https://doi.org/10.1016/j.jeconom.2009.09.003>.
- Manski, Charles F. 1995. *Identification Problems in the Social Sciences*. Harvard University Press.
- Mullainathan, Sendhil, and Jann Spiess. 2017. "Machine Learning: An Applied Econometric Approach." *Journal of Economic Perspectives* 31 (2): 87–106. <https://doi.org/10.1257/jep.31.2.87>.
- Muralidharan, Karthik, and Paul Niehaus. 2017. "Experimentation at Scale." *Journal of Economic Perspectives* 31 (4): 103–24. <https://doi.org/10.1257/jep.31.4.103>.
- Sims, Christopher A. 2010. "But Economics Is Not an Experimental Science." *Journal of Economic Perspectives* 24 (2): 59–68. <https://doi.org/DOI: 10.1257/jep.24.2.59>.