

# University of Pennsylvania

## ECN 8400: Empirical Methods for Counterfactual Analysis

### Fall 2023

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**Time:** Monday and Wednesday at 1:45pm-3:15pm

**Location:** 625 PCPSE

**My Office hours:** Please send me an email and we can schedule a meeting.

#### Course Description:

Almost any field in Economics is interested in analyzing what happens to outcomes or behaviors of the economic unit of interest (e.g.: individuals, households, firms, etc.) because of a change in a counterfactual condition. In economic theory, the comparison of an economic outcome before and after a change in some underlying exogenous parameter is called comparative statics. In applied economics, the effect of a change in an exogenous variable on an economic outcome is called causal effect. However, the ability for theoretical and empirical works to be mutually and reciprocally informative about counterfactual analysis faces one main challenge: what theory-based and empirical works define as exogenous is not equivalent. In one case, exogeneity is an assumption about a variable that is part of a modelled economic theory. In the other case, exogeneity is a statistical property about the distribution of the un-modelled and unobserved component of the analysis.

In the first part of the class, we will study how to consistently combine theory-based and empirical methods in order to apply counterfactual analysis to policy-relevant questions. This process consists of combining the evaluation of existing policies ("reduced-form" methods) to inform the identification of economic models used for the analysis of policies that have never been in place before (counterfactual).

In the second part of the class, students are required to present a published paper. We will discuss in class how to organize your presentations throughout the course.

Finally, I believe we can learn something from the previous job market "stars"  
<https://www.restud.com/restudtour/>

#### Relevant Readings:

- a. Cornelissen Thomas, Christian Dustmann, Anna Raute, and Uta Schönberg, "Who Benefits from Universal Child Care? Estimating Marginal Returns to Early Child Care Attendance," *Journal of Political Economy*, 2018 126:6, 2356-2409.
- b. Hansen C., "Heterogeneous Treatment Effects," (slides here: <https://faculty.chicagobooth.edu/christian.hansen/teaching/TreatmentEffects.pdf> )
- c. Hayle P., "Structural vs. Reduced Form: Language, Confusion, and Models in Empirical Economics," (slides here: <https://www.dropbox.com/s/s6spj8wiruer4to/intro.pdf?dl=0> )

- d. Heckman, James J., and Vytlacil Edward, "Structural Equations, Treatment Effects, and Econometric Policy Evaluation," *Econometrica* 73, no. 3 (2005): 669-738.
- e. Imbens, Guido W., and Joshua D. Angrist. "Identification and Estimation of Local Average Treatment Effects." *Econometrica* 62, no. 2 (1994): 467–75.
- f. Kirkeboen Lars J., Edwin Leuven, Magne Mogstad, "Field of Study, Earnings, and Self-Selection," *The Quarterly Journal of Economics*, Volume 131, Issue 3, August 2016, Pages 1057–1111.
- g. Rubin, D. B., "Estimating causal effects of treatments in randomized and nonrandomized studies," *Journal of Educational Psychology* 66, no. 5 (1974), 688–701.

### **Additional useful references:**

#### **1. Computational Methods**

- a. Judd: Numerical Methods in Economics
- b. Train: Discrete Choice Methods with Simulation
- c. Adda and Cooper: Dynamic Economics
- d. Stachurski: Economic Dynamics: Theory and Computation (more Macro, plus Sargent and Stachurski Lectures in Quantitative Economics: <https://lectures.quantecon.org>)

#### **2. Causal Inference**

- a. Angrist and Pischke: Mostly Harmless Econometrics
- b. Morgan and Winship: Counterfactuals and Causal Inference
- c. Imbens and Rubin: Causal Inference for Statistics, Social, and Biomedical Sciences

#### **3. Presentation and Writing Skills**

- a. Presentation Tips by Berthold Herrendorf (ASU): <https://sites.google.com/site/bertholdherrendorf/>
- b. Writing Tips by John Cochrane (Chicago): [https://faculty.chicagobooth.edu/john.cochrane/research/papers/phd\\_paper\\_writing.pdf](https://faculty.chicagobooth.edu/john.cochrane/research/papers/phd_paper_writing.pdf)