Causal Inference and Public Policy in Europe[*]
MA Course, Summer 2019

Mondays 14:00 − 17:30, from April 01 to May 27
Room: WiSo Building (Building 101), Seminarraum 310.

Instructor:
Bruno Castanho Silva, PhD
Cologne Center for Comparative Politics (CCCP)
Email: bcsilva@wiso.uni-koeln.de
Office hours: By appointment.
Office: Universitätstr. 91, room 003.

---

1   Course Description

The course focuses on statistical inference for the analysis public policy across a wide range of contexts. The rise of 'evidence-based policy making' has brought the attention of governments, international organizations, and NGOs to rigorous methods of causal inference for impact evaluation. This course covers issues related to the design, implementation, and evaluation of policy changes. Technical aspects will focus on computational approaches and real-world challenges.

---

[*]This is a preliminary syllabus, subject to minor changes before the course starts.

Goals

Students will learn to model cause-and-effect relationships and develop counterfactual scenarios. They will gain experience using computational methods to predict the impacts of policies, interventions, and events, while learning to avoid common pitfalls. By the end, students should be able to: (1) think through which of the methods covered in class (if any) would be best suited to solve a given decision problem and what data would be required; (2) perform appropriate analysis and produce results; (3) connect those results to strategic decision-making; (4) critically examine statistical causal claims put forward by others; and (5) present findings and recommendations effectively for audiences of varying sophistication.

Prerequisites

Students are expected to be familiar with basic statistical methods for analysis and inference (i.e., run and interpret a linear regression). You should have taken Introduction to Quantitative Analysis with R or a similar course before starting this. Students should also have a basic familiarity with R.

Software

All studens should have R installed in their computers before the first class. Students are also strongly encouraged to install RStudio. This is a more user-friendly interface for R with integration to other packages we will use throughout the course. RStudio is available for free at https://www.rstudio.com/.

2 Course Requirements

Students will be assessed based on the following exercises (all are mandatory to pass the course):

- **Two take-home assignments (20 points each).** Two take-home exercises will be posted during the semester, on **May 08** and **May 22** with one week to complete each of them – deadlines on **May 15, at 23:55 CET**, and **May 29, 23:55 CET**. Students will be given a dataset and asked to perform analyses in accordance to methods covered in the class thus far. The length of assignments should not exceed **five pages**.

- **A course project TBD (60 points).**

Last updated: January 22, 2019

Points are converted to final grades as follows:

Points	Grade
100–96	1,0
95–91	1,3
90–86	1,7
85–81	2,0
80–76	2,3
75–71	2,7
70–66	3,0
65–61	3,3
60–56	3,7
55–51	4,0
50–0	5,0

Last, the assignments submitted must be written with R Markdown (see below).

Bonus Points

It is possible to earn up to 7 bonus points in this course, meaning the maximum final grade can be 107. Between Weeks 1 and 7, students are asked to submit, by email, up to three questions about the weekly readings to the instructor, up to four hours before our meeting. I will select up to three questions in total (from those submitted by all students) to discuss in class. If your question is selected in a week, you earn one bonus point that week. *Students can only earn bonus points if they fulfill all the mandatory course requirements* Bonus points can increase your grade, but never decrease it.

2.1   A Note on Professional Presentation

RStudio comes with a powerful authoring format called R Markdown. R Markdown documents look like a mix of a text document and R code. They enable easy creation of data analysis reports directly from R. Rather than copying and pasting into Word, your report is created automatically. R Markdown combines the core syntax of markdown (an easy-to-write plain text format) with embedded R code chunks that are run so their output can be included in the final document. R Markdown documents are fully reproducible (they can be automatically regenerated whenever

underlying R code or data changes). Markdown is simple to use as it enables the use of a syntax like plain-text.

1. You need to install LaTeX on your machine. This is a free typesetting software which R Markdown uses. Mac users should install TeXLive, freely available at https://www.tug.org/texlive/; Windows users should install `tinytex`, which can be done directly within RStudio, with the following three commands:

   - install.packages('tinytex')
   - library(tinytex)
   - install_tinytex()

2. To use R Markdown, simply create a new R Markdown document in RStudio. This will load a sample document. Select "Knit PDF" to produce a PDF output file with the write up and the code output.

3. More information on the R Markdown syntax is available here: http://rmarkdown.rstudio.com/.

NB! Installing and running R and RMarkdown can be tricky. All students must make sure they have an operational installation of both before the first class. If not, please contact the instructor in advance.

3   Schedule

Week 1 (Apr 01): The Potential Outcomes framework and the experimental 'gold standard'

Mandatory readings:

Imbens, Guido W., and Donald B. Rubin. 2015. *Causal Inference for Statistics, Social, and Biomedical Sciences: an Introduction.* Cambridge: Cambridge University Press, Chapter 1.

Altmann, Steffen, Armin Falk, Simon Jäger, and Florian Zimmermann. 2018. "Learning about job search: A field experiment with job seekers in Germany". *Journal of Public Economics* 164: 33–49.

Week 2 (Apr 15): What to do when we can't experiment? Introduction to matching

Mandatory reading:

Ho, Daniel E., Kosuke Imai, Gary King, and Elizabeth A. Stuart. 2007. "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference", *Political Analysis* 15(3): 199–236.

Guill, Karin, Oliver Lüdtke, and Olaf Köller. 2017. "Academic tracking is related to gains in students' intelligence over four years: Evidence from a propensity score matching study" *Learning and Instruction* 47: 43–52.

Week 3 (Apr 29): How to find better matches

Reading:

Diamond, Alexis, and Jasjeet S. Sekhon. 2013. "Genetic Matching for Estimating Causal Effects: A General Multivariate Matching Method for Achieving Balance in Observational Studies", *The Review of Economics and Statistics* 95(3): 932–945.

Wood, Reed M., and Christopher Sullivan. 2015. "Doing Harm by Doing Good? The Negative Externalities of Humanitarian Aid Provision during Civil Conflict", *The Journal of Politics* 77(3): 736–748.

Week 4 (May 06): Regression Discontinuity

Mandatory readings:

Lee, David S. 2008. "Randomized Experiments from Non-Random Selection in U.S. House Elections." *Journal of Econometrics* 142(2): 675–697.

Pinotti, Paolo. 2017. "Clicking on Heaven's Door: The Effect of Immigrant Legalization on Crime." *American Economic Review* 107(1): 138–168.

Cavaille, Charlotte, and John Marshall. 2018. "Education and Anti-Immigration Attitudes: Evidence from Compulsory Schooling Reforms across Western Europe." *American Political Science Review*, 1–10.

Week 5 (May 13): Before-after comparisons: Differences-in-Differences and Introduction to Synthetic Controls

Angrist, Joshua B., and Jörn-Steffen Pischke. 2008. *Mostly Harmless Econometrics.* Princeton University Press: pp. 169–174.

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. 2015. "Comparative Politics and the Synthetic Control Method." *American Journal of Political Science* 59(2): 495–510.

Last updated: January 22, 2019

Podestà, Federico. 2017. "The impact of 'free choice': Family reforms of France and Belgium, a synthetic control analysis." *International Journal of Social Welfare*, pp. 1–13.

Week 6 (May 20): Synthetic Controls II – Multiple treated units at many points in time

Kreif, Noémi, Richard Grieve, Dominik Hangartner, Alex James Turner, Silviya Nikolova, and Matt Sutton. 2016. "Examination of the Synthetic Control Method for Evaluating Health Policies with Multiple Treated Units." *Health Economics* 25(12): 1514–1528.

Cavallo, Eduardo, Sebastian Galiani, Ilan Noy, and Juan Pantano. 2013. "Catastrophic Natural Disasters and Economic Growth." *The Review of Economics and Statistics* 95(5): 1549–1561.

Week 7 (May 27): Instrumental Variables and Natural Experiments

Sovey, Allison J., and Donald P. Green. 2011. "Instrumental Variables Estimation in Political Science: A Readers' Guide." *American Journal of Political Science* 55(1): 188–200

Barone, Guglielmo, and Gaia Narciso. 2015. "Organized crime and business subsidies: Where does the money go?." *Journal of Urban Economics* 86: 98–110.

Becker, Sascha O., Katrin Boeckh, Christa Hainz, and Ludger Woessmann. 2016. "The Empire is Dead, Long Live the Empire! Long-Run Persistence of Trust and Corruption in the Bureaucracy." *The Economic Journal* 126(590): 40–74.

Week 8 (TBD): Final Course Project Presentation

Last updated: January 22, 2019