Tutorial: Methods in Causal Inference Using (Spatial) Big Data with Stata & R
Winter term 2022/23

Lehrstuhl für VWL, insb. Empirische Mikroökonomik

Dr. Anica Kramer

Tel. +49 (0) 951 / 863 2808
http://www.uni-bamberg.de/vwl-mikro/
anica.kramer@uni-bamberg.de

Time & Room: Friday, 08:30 – 10:00 in RZ/00.07

Note: We may switch to Wednesday, 10:00 - 12:00 (RZ/00.06) in the course of the semester. So please keep with this slot.

Participants: Participants of the
- "Methoden der Empirischen Mikroökonomik" (WS 22/23; Prof. Heineck);
- " Einführung in die Bildungsökonomik" (WS 22/23; Prof. Anger);
- "Introduction to Stata" (WS 22/23; Dr. Araujo);
- European Economic Studies (EES): Bachelors & Master's Program;
- & students of other programs (Bachelor and Master).

Starts & Ends: 16 December 2022 (Start) to 8 February 2023 (End)

Software: Stata & R, free licenses are offered in the PC Pools.

Course Language: Default: English (We decide to switch to German depending on the composition of the class during the first session).

Requirements: No, depending on the composition of the class I volunteer on giving a crash course in Stata & Introduction to Econometrics.

Assignment: No

ECTS: No – This is a course that you can take voluntarily to get introduced to the Software packages Stata & R; micro-data and big (spatial) data, such as satellite data. Furthermore, I provide guidelines for reading an empirical paper. In sum, this course prepares you to write an empirical thesis (Bachelor and/or Master) in the various fields of applied micro-econometrics (labor, health, education, environmental and regional economics).

Brief description

This course introduces the empirical methods that are typically applied to identify causal effects rather than correlation only. Identifying causal effects is of

great interest and importance (e.g. in terms of policy evaluation), but also challenging. Against this background, this course deals with the methods of approaching these challenges; covering:

<div align="center">
Instrumental-Variables (IV)
Regression-Discontinuity (RD)
Differences-In-Differences (DID)
</div>

A further purpose of the course is to make students familiar with the literature that has applied these methods to questions in the field of labor and regional economics.

Students will work with the statistic software Stata & R. The tutorials will focus on the following: i) how to read and critically reflect an empirical paper, ii) how to implement the mentioned methods using the software packages Stata & R and iii) how to replicate published articles.

Pre-experience with Stata & R is desirable, but not mandatory. Depending on the pre-existing knowledge and experience of students with Stata & R, I may provide some crash courses for both software's. This "Crash Course" may not be sufficient. Therefore, students are encouraged and asked to take their own initiative in filling potential gaps. However, support material will be announced during class, "free classes" are offered to solve problems in smaller groups and students are always welcome to make appointments during office hours.

Please note further:

- Applications using the software Stata focus on the outlined methods and replicating papers.

- Applications with the software R focus on Data visualization (basics: like bar charts and scatterplots as well as more advanced: maps and networks) and well programming with ggplot2.

- Please install the course of the term the following software on your personal computer: working R (version 4.0.0 +) and RStudio (version 1.4.+) I (both for free & available on the www).

Literature and material:

Cameron, Colin A. and Pravin K. Trivedi (2005): *Microeconometrics. Methods and Applications.* Cambridge: Cambridge University Press.

Angrist, J.D., and J.S. Pischke (2009), Mostly Harmless Econometrics, Princeton University Press.

The free and online book R for Data Science (esp. chapters 9 – 12): https://r4ds.had.co.nz

Further literature will be announced in class.