

Causal Analysis in Labor Economics using R

for Master Students

CONTENT

The course covers empirical labor economics and modern econometrics. Students should install RStudio and Mentimeter (App) as a Classroom Response System before the first session.

- Topics covered are:
- Modern approach to Econometrics
 - Fundamental evaluation problem
 - Potential outcome approach
 - Methods: RCT, IV, BAE, DiD, RDD
 - Introduction to Causal Machine Learning (LASSO and Random Forests)
 - Labor Market and Education

LECTURE

ZOOM Live Sessions

Zoom-Link via mail to signed-in participants (Ilias)

Fridays, 3pm (Live Sessions)

29 April 2022, 3-6pm

6 May 2022, 3-4:30pm

13 May 2022, 3-4:30pm

20 May 2022, 3-4:30pm

3 June 2022, 3-6pm

17 June 2022, 3-4:30pm

24 June 2022, 3-6pm

15 July 2022, 3-6pm

EXAMINATION MODALITIES

Credit points	4 ECTS
Examination:	Final Exam (60 minutes)
Area of Study	<u>M.Sc. Economics:</u>
	E&P: Elective Courses
	Finance: Elective Courses
	ISNE: Elective Courses
	<u>VWL-Master, PO 2014:</u>
	Spezialisierungsbereich: Empirical Economics Labor, Human Resource Management & Organization
	<u>VWL-Master, PO 2014:</u>
	Wahlpflichtbereich II: VWL Quantitative Methoden

LITERATURE

Main references:

Angrist, J.D., & Pischke, J. (2015): Mastering 'Metrics, The Path from Cause to Effect, Princeton University Press.

Boeri, T., & Van Ours, J. (2021). The economics of imperfect labor markets. 3rd edition. Princeton University Press.

Borjas, G.J. (2020): Labor Economics, 8th ed., Mc GrawHill, New York.

Heiss, F. (2016): Using R for Introductory Econometrics, Düsseldorf.

James, G. et al. (2017): An Introduction to Statistical Learning, Springer, New York.

Klinkhammer, D., & Spermann, A. (2020): Eine Einführung in die empirische Kausalanalyse und Machine Learning mit R, UTB-Lehrbuch, wbv, Gütersloh.

Taddy, M. (2019): Business Data Science, Mc GrawHill, New York.

Wooldridge, J. (2018): Introductory Econometrics, A Modern Approach, 7th edition, Cengage Learning.

Randomized Controlled Trials (RCTs)

Angrist, J., & Pischke, J.-S. (2017): Undergraduate Econometrics Instruction: Through Our Classes, Darkly, *Journal of Economic Perspectives*, 31, 125-144.

Athey, S., & Imbens, G.W. (2017): The State of Applied Econometrics: Causality and Policy Evaluation, *Journal of Economic Perspectives*, 31, 3-32.

Athey, S., & Luca, M. (2019): Economists (and Economics) in Tech Companies, *Journal of Economic Perspectives*, 33, 209-230.

Brodeur, A., & Cook, N., & Heyes, A. (2020): Methods Matter: p-Hacking and Publication Bias in Causal Analysis in Economics, *American Economic Review*, , 110(11), 3634-3660.

Fryer, R. (2014): Injecting Charter School Best Practices into Traditional Public Schools: Evidence from Field Experiments, *Quarterly Journal of Economics*, 1355-1407.

Lübke, K., & Gehrke, M., & Horst, J. & Szepannek, G. (2020): Why We should teach Causal Inference: Examples in Linear Regression with Simulated Data, *Journal of Statistics Education*, 28:2, 133-139.

Imbens, G.W. (2020): Potential Outcome and Directed Acyclic Graph Approaches to Causality: Relevance for Empirical Practice in Economics, *Journal of Economic Literature*, 58(4), 1129–1179.

Klinkhammer, D., & Spermann, A. (2020): Eine Einführung in die empirische Kausalanalyse und Machine Learning mit R, UTB-Lehrbuch, wbv, Gütersloh, R codes on Github.

Wooldridge, J. (2018): *Introductory Econometrics, A Modern Approach*, 7th edition, Cengage Learning, Chapters 2.7, 3.7, 4.7.

Regression Discontinuity Design (RDD)

Abdulkadiroglu, A., & Angrist, J.D., & Narita, Y., & Pathak, P.A., & Zorate, R.A. (2017): Regression Discontinuity in Serial Dictatorship: Achievement Effects at Chicago's Exam Schools, *American Economic Review*, P.P., 107(5), 240-245.

Angrist, J.D., & Lavy, V., & Leder-Luis, J. & Shany, A. (2019): Maimonides' Rule Redux, *AER: Insights*, 1(3), 309-324.

Klinkhammer, D., & Spermann, A. (2020): Eine Einführung in die empirische Kausalanalyse und Machine Learning mit R, UTB-Lehrbuch, wbv, Gütersloh, R codes on Github.

Roth, A. (2018): Marketplaces, Markets, and Market Design, *American Economic Review*, 108(7), 1609-1658.

Difference-in-Differences (DiD)

Abadie, A. (2021): Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects, *Journal of Economic Literature*, *Journal of Economic Literature* 2021, 59(2), 391–425.

Angrist, J.D., & Pischke, J.-S. (2009): *Mostly harmless econometrics*, Princeton University Press.

Klinkhammer, D., & Spermann, A. (2020): *Eine Einführung in die empirische Kausalanalyse und Machine Learning mit R*, UTB-Lehrbuch, wbv, Gütersloh, R codes on Github.

Wooldridge, J. (2018): *Introductory Econometrics, A Modern Approach*, 7th edition, Cengage Learning, Chapters 13.2.

IV and LATE

Angrist, J.D., & Pischke, J.-S. (2009): *Mostly harmless econometrics*, Princeton University Press.

Angrist, J.D., & Pischke, J. (2015): *Mastering 'Metrics, The Path from Cause to Effect*, Princeton University Press.

Deaton, A. (2010): Instruments, Randomization, and Learning about Development, *Journal of Economic Literature*, 48, 424-455.

Imbens, G.W. (2020): Potential Outcome and Directed Acyclic Graph Approaches to Causality: Relevance for Empirical Practice in Economics, *Journal of Economic Literature*, 58(4), 1129–1179.

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Propensity Score Matching (PSM) and Introduction to Machine Learning

Chatri, A., & Hadeif, K., & Samoudi, N. (2021): Micro-econometric evaluation of subsidized employment in morocco: the case of the "Idmaj" program, *Journal for Labor Market Research*, 55:17 <https://doi.org/10.1186/s12651-021-00300-5>.

Imbens, G. (2005): Matching Methods in Practice, *Journal of Human Resources*, 50, 373-420.

James, G. et al. (2017): *An Introduction to Statistical Learning*, Springer, New York, Chapter 5 & 6.

Jerger, J., & Pohnke, C., & Spermann, A. (2001): Gut betreut in den Arbeitsmarkt? Eine mikroökonomische Analyse der Mannheimer Arbeitsvermittlungsgesellschaft, *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*, 34, 567-576.

Goller, D. et al. (2019): Does the Estimation of the Propensity Score by Machine Learning Improve Matching Estimation? The Case of Germany's Programmes for Long Term Unemployed IZA Discussion Papers, No. 12526.

Klinkhammer, D., & Spermann, A. (2020): *Eine Einführung in die empirische Kausalanalyse und Machine Learning mit R*, UTB-Lehrbuch, wbv, Gütersloh, R codes on Github.

Simulation Based Inference (Shuffling and Resampling/Bootstrapping)

Hansen, B. (2021): Econometrics, Princeton University Press, forthcoming.

Taddy, M. (2019): Business Data Science, Mc GrawHill, New York.

Causal Machine Learning

Athey, S., & Imbens, G.W. (2019): Machine Learning Methods Economists should know about, Annual Review of Economics, 11, 685-725.

Hansen, B. (2021): Econometrics, Princeton University Press, forthcoming.

Huber, M. (2021): Causal Analysis, University of Fribourg, unpublished.

Taddy, M. (2019): Business Data Science, Mc GrawHill, New York.