



# An Applied Introduction to Data Analysis with R

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## Research Seminar for Doctoral Students

This research seminar will provide participants with a deeper understanding on how to conduct empirical analysis to aid own research in social science. The course will introduce common data analysis techniques employed by social scientists and highlight guidelines and best practices for their application. The course goal is to make participants familiar with the correct application of the content and is not particularly focused on statistical fundamentals (although specific readings are provided and encouraged). For illustration, the free software package *R* will be used for in-class analysis. Upon completion participants shall be able to:

- Understand the role of the dependent variable in identifying suited forms of analysis
- Identify the suited regression model for the respective data format
- Comprehend the differences between common forms of regression analysis
- Apply the earned knowledge to own data

The course will be held from **March 2nd until March 4th 2022 via ZOOM**. Further dates for the presentation, hand in of assignments, etc. will be discussed jointly. No specific prior experience with either *R* or the topics is required as introductions will be provided.

Topics for this seminar include:

- Basics of (Linear) Regression Analysis & Data Transformation
- Binary Choice Data: (Ordered) Logit & Probit Regression
- Censored Data: Tobit Regression
- Count Data: Poisson & Negative Binomial Regression, Zero-Inflation & Hurdle
- Survival Analysis: Cox-Proportional Hazard Model
- Panel Data: Fixed & Random Effect Models
- Endogeneity Control: Instrumental Variables, Control Function Approach, Heckman Selection
- Regression diagnostics: Model fit & test statistics

In order to successfully pass the seminar, participants will be required to:

- Be present at the seminar dates
- Work on an own data analysis & present the results of that analysis
- Write & submit a final report on their analysis

For further questions please contact **Alexander Vossen**.

### Recommended reading:

Greene, W. (2018). *Econometric Analysis*, 8th Ed.

Hanck, C., Arnold, M., Gerber, A., & Schmelzer, M. (2021). *Introduction to Econometrics with R*.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An introduction to statistical learning: With Applications in R*.