Introduction to Empirical Legal Studies

Fall Semester 2024

Instructor:	Prof. Dr. Tilmann Altwicker	**Time:**	Tuesday, 4.15-6pm
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Course description: *Our case material is a gold mine for scientific work. It has not been scientifically exploited. ... We should critically examine all the methods now used in any of the social sciences and having any useful degree of objectivity.* Herman Oliphant (1928) What was called for in this quote almost 100 years ago is only gradually being realized in our time. Empirical legal research, i.e. data-based research on the origins and effects of law, is currently developing a great deal of momentum. Typical questions that interest empirical legal researchers are for example: Do female judges decide differently than male judges? Can judgments of the European Court of Human Rights be predicted? What patterns of citation can be discerned in case law? Among others, the lecture explores the following questions: What is empirical (legal) research and what is it used for? How do lawyers and courts use findings from empirical research? What are the phases of an empirical research project? How is legal data collected? What are the methods of analysis? How are empirical results communicated? What are the limits of empirical legal research? The course is divided into a lecture part and an exercise part. In the exercise part, an introduction to (basic) quantitative methods and the freely available statistical software R is given. Students will practice applying simple statistical methods to legal data. Examples from a variety of legal fields are analyzed. Prior knowledge of statistics and R are not required.

Note: This is an introductory class. If you already have knowledge of statistics/R, this class is not for you.

Requirements: For this lecture and in the bootcamps, we will use R/RStudio. Please make sure that you have R/RStudio properly installed on your device *prior* to the lecture. Here is how to install it: Download and install R and R Studio. Make sure to install R

first, and afterwards RStudio. Here is how to find help: R-Manual, R Programming 101, Learn R in 39 minutes. Alternatively, you can install the Anaconda Distribution (includes R/RStudio and Python): Anaconda (for advanced users). If you have problems installing R or RStudio: Technical support will be available on TUE, 24.9.2024 and TUE, 1.10.2024 before class (16:00-16:15).

Student hours: Upon request. Please contact me via e-mail, tilmann.altwicker@ius.uzh.ch (including a short description of your problem or question).

Class survey: We want to generate and analyze our own data. Please take this survey: Class survey. Participation in the survey is not obligatory and is anonymous.

Class attendance and participation: The learning process of this class is based on in-class discussion and participation. Attendance and careful preparation of the course material is therefore highly recommended. This includes coming to class on time.

Laptop and phone policy: In order to ensure active participation and keep your attention on the important things (our class), please avoid distracting yourself through unnecessary electronic devices or applications. For further insights on the consequences of multitasking, I recommend the study by Bellur, Nowak, and Hull (2015) (`https://bit.ly/2GnyTf2`). They found that in-class multitasking leads to significantly lower performance.

R-Bootcamps: Some lectures will be complemented by R-Bootcamps, which are hands-on tutorials designed to enhance your practical skills. The primary goals of these bootcamps are to teach students the basics of R and to empower them to independently conduct basic analyses of legal data. The first of these R-Bootcamps is scheduled for Tuesday, October 10. For every R-Bootcamp, there will be a corresponding exercise sheet, with a strong emphasis on R. After each tutorial session, model solutions will be made available on OLAT for students to review. These bootcamps and the accompanying materials are essential preparation for the upcoming exam. Lastly, students are required to bring their own laptops to each session, ensuring that both R and R-Studio are installed.

Interesting links: There are a number of great websites and podcasts that provide additional interesting information. See for instance R-bloggers, Methods Bites, R Graph Gallery, Towards Data Science, FiveThirtyEight, and R Weekly.

Further resources: As a participant in this course, you will have free access to DataCamp - an online training platform useful to practice your R and statistical skills: Data Camp. The access code will be posted on OLAT.

Course literature:

- Excerpts from: *Epstein, Lee / Martin, Andrew D., An Introduction to Empirical Legal Research, Oxford: OUP 2014* (EM)
  Note: On the accompanying website, you have access to both the data and the R-Code used in the book.

- Excerpts from: *Heumann, Christian / Schomaker, Michael / Schalabh, Introduction to Statistics and Data Analysis: With Exercises, Solutions and Applications in R, 2nd ed., Cham: Springer, 2022* (HSS)
  Note: This textbook is openly available for download within the UZH IP range. It contains both introductory and advanced material, but we will focus on the former.

Course outline:

Week 0: Preparation

*Before starting with the course, please download and install R and RStudio on your own device (see **Requirements** above).*

Session 1: Introduction to ELS (1) (17.9.2024)

This session will introduce you to the lecture in general, give a brief outline of the course, and address organizational issues. We will then have a short introduction to the field of Empirical Legal Studies (ELS) and evidence-based law-making.

1. Introducing Empirical Legal Studies

2. Outline of Course & Organizational Issues

3. Evidence-based law-making

Optional reading

* Altwicker, Tilmann (2019). "International legal scholarship and the challenge of digitalization". *Chinese Journal of International Law* 18(2): 217–246

Session 2: Introduction to ELS (2) (24.9.2024)

In this session, we will further illuminate how law benefits from quantitative empirical approaches. Then, we will look at a fundamental distinction (and source of intricate problems) in empirical scholarship.

1. Evidence-based adjudication

2. Empirical legal research

3. Causality vs. correlation

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 1-18 (EM)

! Exercises 1 should be completed this week.

Session 3: Basic Statistical Concepts and Graphs (01.10.2024)

This session introduces basic statistical concepts such as sample, population. We then look at some fundamental concepts of statistics in more detail and at frequency measures of data.

1. Basic statistical concepts

2. Variables

3. Frequency measures for discrete data

4. Frequency measures for grouped metric data

Compulsory reading

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 3-8; 17-24 (HSS)

! Exercises 2 should be completed this week.

Session 4 (R-Bootcamp): Getting Started With R (15.10.2024)

After a brief introduction to ELS research projects, we will start using the statistical software R.

1. Typical ELS research questions

2. Workflow of an ELS project

3. Empirical research designs

4. Criticizing empirical research

5. Basic R

6. Solutions to Exercises 1-2

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 23-58; 70-85; 95-116 (EM)

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 339 (HSS)

Session 5: Descriptive Statistics (22.10.2024)

This session is the first part of an introduction of descriptive statistics. We will discuss concepts like mean, median, mode etc. We will also discuss how to visualize descriptive statistics.

1. What is descriptive statistics and why is it important?

2. Definition, properties, applications to legal data of measures of central tendency

3. Graphical representation of legal data

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 130-134 (EM)

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 37-49; 25-30 (HSS)

! Exercises 3 should be completed this week.

Session 6 (R-Bootcamp): Basic R Syntax (29.10.2024)

This session introduces basic R syntax, basic data structures and other useful stuff to get you started with R.

1. Introduction to R syntax

2. Basic data structures

3. Data import and data export

4. Data visualization

5. Solutions to Exercises 3

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 124-130; 240-257 (EM)

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 399-419 (HSS)

Session 7: Descriptive Statistics 2 (05.11.2024)

This session continues our discussion of descriptive statistics. We will cover measures of spread and association between variables.

1. Definition, properties, applications to legal data of measures of dispersion

2. Distribution of two discrete variables

3. Measures of association of two discrete variables

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 134-138; 165-171 (EM)

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 49-57; 69-79 (HSS)

! Exercises 4 should be completed this week.

Session 8 (R-Bootcamp): Data Collection and Data Preprocessing (12.11.2024)

In this session, we will explore how to feed data into R and we will learn basic data manipulations in R.

1. Data collection

2. Data preprocessing

3. Solutions to Exercises 3 & 4

Session 9: Probability (19.11.2024)

In this session, we will explore the basics of probability, as well as its connections with law.

1. Law and probability

2. Basic probability theory

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 138-141 (EM)

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 113-130; 131-133; 159-160; 163-166; 173-177 (HSS)

❗ Exercises 5 should be completed this week.

Session 10: Probability 2 (26.11.2024)

This session introduces random variables and basic probability distributions.

1. Random variables

2. Probability distributions (binomial d., normal d.)

❗ Exercises 6 should be completed this week.

Session 11: Inferential Statistics 1 (26.11.2024)

In this session, we will look at how to draw conclusions about the population based on a sample. We will explore the idea and the procedure of hypothesis testing.

1. Inference

2. Confidence intervals

3. Selected sampling distributions

4. Hypothesis testing (general)

Compulsory reading

* Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 143-171 (EM)

* Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 179-182; 219-260; 82-89 (HSS)

❗ Exercises 6 should be completed this week.

Session 12: Inferential Statistics 2 (03.12.2024)

In this session, we will look at various procedures of hypothesis testing.

1. t-Test

2. Paired t-Test

3. Mann-Whitney-U-Test

4. χ^2-independence Test and Fisher's Exact Test

Compulsory reading

     * Heumann, Christian and Shalabh, Micheal Schomaker (2nd ed., 2022). *Introduction to Statistics and Data Analysis: With Exercises and Applications in R*. Springer, 243-245 (HSS)

❗ Exercises 6 should be completed this week.

Session 13: Inferential Statistics 3 (10.12.2024)

In this session, we will explore how to measure correlation between variables and we will introduce the powerful idea of linear regression.

1. Pearson correlation coefficient

2. Spearman's rank correlation coefficient

3. Simple linear regression

Compulsory reading

     * Epstein, Lee and Martin, Andrew D (2014). *An introduction to empirical legal research*. Oxford University Press, USA, 173-221 (EM)

❗ Exercises 7 & 8 should be completed this week.

Session 14: Inferential Statistics 4 (10.12.2024)

In this session, we will deepen our discussion of linear regression, introduce logistic regression for binary outcomes, and explore advanced topics.

1. Checking model assumptions

2. Multiple linear regression

3. Logistic regression

4. Advanced topics