

Empirical Industrial Organization & Consumer Choice

Overview and Motivation

Summer 2018
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29. März 2018

What the course is about

- Methods to model and estimate
 - ▶ the behavior of consumers
 - ▶ the strategic behavior and interactions of firms

Example 1: Designing Railway Routes

- A typical stated preference data set
 - ▶ In 1987 the Hague Consulting Group for the national Dutch Railways invited 237 consumers to a choice experiment
 - ▶ Each respondent made a sequence of hypothetical choices among two possibilities for traveling by train that differed in some or all of the following attributes: fare, journey time, number of rail changes, and comfort level.
 - ▶ The goal was to improve route planning by better knowing consumers trade-off between travel time, interchanges and price

Example 1: The value of travel time

- By estimating an econometric model*, one finds the following average willingness to pay

One hour less travel	25,54€
One less change of rails	4,84€

*The results are based on the assumption that consumers act according to a conditional logit model

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- The course teaches you how to generate, visualize and interpret such estimates
- Most importantly, you will learn about the small print:
 - ▶ Understand models and the econometric methods that are used to generate such estimates
 - ▶ Learn how your estimates can be complete rubbish when you don't carefully think about the model that generated the data

Example 2: What if Volkswagen bought Opel...

- How would prices of cars change if Volkswagen bought Opel?

https://moodle.uni-ulm.de/pluginfile.php/219049/mod_resource/content/0/Illustration%20I

- Note the website only shows correctly if you have the Flash player plugin activated.

Example 2: Analysing the effects of mergers

- Competition authorities commonly have to assess how a merger affects market outcomes
- One way for such an assessment is a structural empirical IO model that describes consumers' preferences and firm's strategies.
- The visualization illustrates predictions off such a model that has been estimated with historical sales data for different European markets.
- You will replicate such a study in one problem set and learn details of the methods

Some applications of the methods covered in class

- Marketing and business strategy, for determining optimal prices and product features and predicting competitor's reactions
- Competition policy, e.g. predicting the effects of a merger on market outcomes and total welfare
- Planning of public projects, e.g. predicting the demand of new public transportation route
- Environmental policy, determining the effects of subsidies or taxes on consumer behavior
- International trade, predicting the effects of changes in tariffs and exchange rates on imports and exports in specific markets

Some methods will we cover in this class

- Review of key concepts of econometrics
 - ▶ Key ideas behind estimation methods and statistical tests
 - ▶ OLS, IV, GMM, Maximum Likelihood estimation
 - ▶ Discrete choice models
- Some key concepts of industrial organization, i.e. strategic behavior of firms
 - ▶ Cournot competition
 - ▶ Bertrand competition with differentiated goods
 - ▶ Merger analysis

- We will extensively use the statistical programming language R to conduct
 - ▶ simulation
 - ▶ estimation
 - ▶ data transformation and aggregation
 - ▶ visualization of data and results
- You will learn a lot of skills and tricks that are generally useful beyond this class and beyond your time as student
- You don't need previous knowledge in R but you should be willing to learn it and solve exercises on your computer

R and RStudio

- We will use R together with RStudio in this class
 - ▶ R is a very popular statistical programming language
 - ▶ RStudio is a convenient IDE that facilitates working with R
 - ▶ R and RStudio are open source programs and are freely available
- Download the newest versions of R and RStudio:
 - ▶ <http://cran.r-project.org/>
 - ▶ <http://rstudio.org/>
- Download from Moodle the “install packages.r” file and run it in RStudio, to install some R packages we will use in this course.

Interactive R Problem Sets

- During the course, you will be asked to solve and hand in, several interactive R problem sets.
 - ▶ They are based on the package RTutor (written by me)
 - ▶ You can immediately check your solution, get automatic feedback and can ask for hints.
 - ▶ The goal is to provide a fun and effective way to learn R and the concepts of this course
- The problem sets count a total of 10% of your final grade
 - ▶ This shall be some extrinsic motivation to solve the problem sets.

Further Ressources to Learn R

- If you are a complete beginner to R, you may want to take a look at some further ressources to learn R. There is a huge amount of free teaching material online.
- Here are some examples that cover similar material than our first RTutor problem set:
 - ▶ <https://www.datacamp.com/courses/free-introduction-to-r>
 - ▶ tryr.codeschool.com
 - ▶ <http://swirlstats.com/students.html>
 - ▶ <https://www.teamleada.com/courses/r-bootcamp>

Final Exam

- The final exam will determine 90% of your grade
- If the class is sufficiently large, there will be a written exam
 - ▶ Questions will be in English but you can answer in English or German
- If the class is not too large, there may be an oral exam (mündliche Prüfung)
 - ▶ You can freely decide whether you want to take the exam in English or German

Emails & Office Hours

- Lecturer: Sebastian Kranz (sebastian.kranz@uni-ulm.de)
- Teaching Assistant: Martin Kies (martin.kies@uni-ulm.de)
- Office Hours: Just send an email to Martin or me to make an appointment, or drop by after the lectures.

Background Readings

- Peter Kennedy: “A Guide to Econometrics”
 - ▶ Gives a good introduction what econometrics is about
- Train, Kenneth E.. 2009. “Discrete Choice Methods with Simulation.” Cambridge University Press, ed. 2.
 - ▶ free download on Kenneth Train’s website
<http://elsa.berkeley.edu/books/choice2.html>

Quite Advanced Material:

- Akerberg, D., L.C. Benkard, S. Berry, and A. Pakes. 2008. “Econometric Tools for Analyzing Market Outcomes.” In Handbook of Econometrics, Elsevier, ed. 1, vol. 6, ch. 63.
- Peter C. Reiss, and Frank A. Wolak. 2008. “Structural Econometric Modeling: Rationales and Examples from Industrial Organization.” Handbook of Econometrics, Elsevier, ed. 1, vol. 6, ch. 64.

Material & Moodle

- Course material (slides, exercises, data sets, R packages, research papers) will be made available on a Moodle site for this course
- Once you are logged in to Moodle via your KIZ account, you can register to the course without any password

Is it the right course for me?

- You learn a lot, but also have to invest considerably time and effort.
- If you are not sure, just try out the course and see if you like it.
- So, let's get started...