

Imperfect Information in Health Care Markets

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1 Prerequisites and background

Several students asked for references for the prerequisites in terms of mathematics, statistics and microeconomics. For all of these areas there are literally hundreds of books titled "(Intermediate/Introductory) Microeconomics" or "Mathematics/Statistics for Business/Economics" and all of them cover more or less the same material. For concreteness, I name "Intermediate Microeconomics" ("Grundzüge der Mikroökonomik") by Hal Varian where chapters 1-6 are assumed to be known and chapter 12 is what we covered in the second lecture. Chapters 14-16 might be interesting background reading as well. For mathematics, "Essential Mathematics for Economic Analysis" by Sysdsæter, Hammond, Strøm and Carvajal may be useful. German speaking students may also be interested in Peter Dörsam's book "Mathematik anschaulich dargestellt für Studierende der Wirtschaftswissenschaften". I am not familiar with statistics books but everything targeted at first semester business/economics students should be fine. Essentially, you have to know what a distribution is, how to compute an expected value and a variance, what a hypothesis test is and how an OLS regression works. While it skips some of the basic statistics the first 2 chapters in "Mastering Metrics: The path from cause to effect" by Angrist and Pischke might be used as an application oriented introduction to empirical work. Throughout the course we assume that your high school math knowledge is working and we have no time to repeat this material, e.g. make sure you can solve linear and quadratic equations, take derivatives and know their interpretation and integrate simple functions before week 1 of the semester.

If you want to take a less broad approach in catching up, the internet offers a variety of materials and formats (lecture notes, video tutorials on major online video platforms, interactive websites) that can be found with the usual search engines. For example, Wikipedia provides short definitions

and explanations on all above mentioned topics (and often links to more in depth material).

2 Course material

Please note that I do not use ILIAS because (i) I did not agree with certain usage conditions concerning tracking and data utilization and (ii) I believe that the material I create should be publically available as it is essentially funded by public money. The material below is likely to get updated over the course of the term.

Lecture slides and exercises are posted/updated here over the course of the term. You can find the source code creating the slides as Emacs org-mode files (".org") here.

- The **course plan** as pdf on which you can also find a list of **references**.
- The **exercises** are available as pdf and as org file. Exercises for the first week are available here. Plots shown in the exercise session (use this link if github cannot render the file).
- **Slides**
 - intro slides
 - demand for insurance slides
 - (adverse) selection slides, numerical example no single crossing
 - moral hazard slides
 - physician-patient slides
- **Data sets** for case studies:
 - Data on selection in long term care insurance. (password announced in lecture)
 - Data on deductibles in the Netherlands for 2011 and 2014.
- An old exam is available.

2.1 Julia notebooks

There are some julia/jupyter notebooks that can compute the results to some of the exercises or create the plots I use. The idea is the following: If you

want to practice more, you can simply change the income or the utility function and redo the exercise with these new primitives. The code allows you to check whether your calculation were correct. On how to set up julia – which is free and open source software – see here. If you want to learn julia from scratch, you can check the free online book ThinkJulia or use the online courses on Coursera or JuliaAcademy.

3 Course setup

In this course, we will analyze the consequences of information problems in health care markets and look for possible solutions to those problems on a theoretical basis. The theoretical analysis is at times supplemented with empirical evidence.

Students learn economic methods to analyze health care markets theoretically and also gain some insight in how to design empirical tests of the predictions of the theoretical models.

The course consists of a lecture and an exercise session. Models, their solutions and implications as well as empirical evidence are presented in the lecture. In the exercise classes, solution to exercises are discussed. Students are expected to work on the exercises beforehand. Exercises consist mainly of calculation exercises using (variations of) models introduced in class but also discussion questions on specific applications.

The exam will – in style – be similar to the questions of the exercise classes. It is, for the time being, planned as a written exam.

3.1 Lecture times:

- lecture: Wednesday, 12:00-13:30
- exercise classes: Monday, 12:00-13:30 online in week 1, otherwise 14:00-15:30

University policies do not allow on campus teaching for courses with more than 50 students. Lecture and exercise session will therefore be moved online.

3.2 Textbooks

The course is not based on a single textbook. The majority of topics is covered in Zweifel et al. (2009). Morrissey (2008) covers also many of the

discussed topics but has an (almost entirely) empirical approach. Detailed references are given in the schedule below.

4 Detailed schedule

This is a plan and as every good plan it may be adjusted if necessary.

4.1 Intro (2 lectures)

1. Choice, preferences, utilities, welfare, models
 - choice, preferences, utility
 - choice under uncertainty and expected utility
 - welfare
 - models
 - reading:
2. Insurance demand
 - certainty equivalent and risk premium
 - drivers of insurance demand
 - (coverage choice and state dependent utility)
 - reading: ch. 3 Morrissey (2008)
 - supplementary reading: ch. 9, Eisenführ and Weber (2013)

4.2 Selection (5)

1. Selection with fixed coverage
 - model
 - welfare consequences
 - gender specific premia
 - some evidence for selection
 - reading: p. 115-123 Einav and Finkelstein (2011), ch. 5.3.1 and 5.3.2 Zweifel et al. (2009)
2. Screening with coverage: Rothschild-Stiglitz
 - shape of indifference curves

- equilibrium
- comparative statics
- derivation of eq in screencast
- reading: ch. 5.3.3 Zweifel et al. (2009)
- supplementary reading: Rothschild and Stiglitz (1976)

3. Genetic Tests

- two kinds of risks
- in RS model
- supplementary reading: Doherty and Thistle (1996), Lagerlöf and Schottmüller (2018)

4. Premium risk, community rating and risk adjustment

- premium risk model
- segway into risk adjustment
- discussion: how could German health insurers attract a profitable clientele?
- reading: ch. 5.3.4 in Zweifel et al. (2009)
- supplementary reading: Behrend et al. (2007), van de Ven and Ellis (2000)

5. Advantageous selection

- case study: selection into long term care insurance in the US
- fixed coverage model
- (bonus screencast: treatment choice and utilization)
- reading: Finkelstein and McGarry (2006)
- supplementary reading: Hemenway (1990), Fang et al. (2008), Boone and Schottmüller (2017)

4.3 Moral hazard (3)

1. The question of moral hazard and empirical evidence

- slope of demand
- RAND and arc elasticity of demand

- Oregon
 - welfare
 - ex ante moral hazard
 - reading: sections 1,2 and 3.1 in Einav and Finkelstein (2018)
2. Treatment choice and the donut hole
 - simple model of treatment choice
 - donut hole
 - out of sample predictions
 - utilization management and gatekeeping
 - reading: section 3.2-end Einav and Finkelstein (2018)
 3. Case study: moral hazard in NL
 - diff-in-diff estimate for arc elasticity of demand

4.4 Doctor-patient interaction (4)

1. Supplier induced demand: theory
 - density model
 - some empirical evidence
 - second wave of SID studies
 - reading: ch. 8 Zweifel et al. (2009)
 - supplementary reading: section 5 in McGuire (2000), Fuchs (1978); Gruber and Owings (1996), Krasnik et al. (1990)
2. Supplier induced demand: empirics
 - How Danish physicians react to incentives
 - Case study: German hospitals
3. Credence good model
 - problems/assumptions and appropriate incentives
 - discussion: DRG system like liability? implications?
 - reading: Dulleck and Kerschbamer (2006)
4. Cost saving incentives and communication
 - physician remuneration, trust and the Hippocratic oath
 - supplementary reading: Schottmüller (2013)

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