(Evolutionary) game theory and decision-making in experiments

Type: seminar for master students

Instructor: Prof.Dr. Peter Marks

Note: the sessions are in English

Test: paper

ECTS: 5

Description

Game theory is useful in understanding collective human activity as the outcome of interactive decisions. The last decades it has taken a more prominent position in research and application in various disciplines; e.g. economics, philosophy, political sciences and management studies. The analytical tools of both cooperative and non-cooperative game theory can be applied to identify problems and exploring potential solutions in political and administrative processes. Also during the last decades experiments and computer simulations have been constructed to test the outcomes of game theory. In economics an enormous growth in experiments was visible during the last decade of the previous millennium, whereas in political sciences experimental designs are gaining popularity this current decade. For analyzing and possibly predicting outcomes in political decision-making processes the combination of game theory and experiments is still in its infancy. Notwithstanding some progress in the field much is to be gained still. What can be learned then from the knowledge of economic game-theoretic experiments for public decision-making? That is what this course aims to find out.

Intended learning outcomes

- To apply game-theoretic concepts / tools to (public) decision-making processes
- To build a game-theoretic experiment about a decision-making situation and critically reflect on it
- To analyze and reflect on the (simulated) outcomes of the experiment as proxy for prediction in general

Test

The students will have to write a paper of max 8000 words (plain text only; bibliography and appendices are not counted). The paper should contain the decision-making issue, the (formal) game-theoretic model of that issue, the experimental set-up, (simulated) experimental results and finish with a critical reflection on the applicability and value of the experiment for the kind of public decision-making issues in general.

Literature (mandatory)

- McCain, R.A. (2009). *Game theory and Public Policy*. Cheltenham, UK: Edward Elgar Publishing (Beware do not get the edition published in 2016: then the last chapters are too economic)
- Marks, P.K. & Gerrits, L.M. (2016). Association between decisions: experiments with coupled two-person games. *Public Management Review*. 1-20. https://doi.org/10.1080/14719037.2017.1364413
- Bouwman, R., van Thiel, S., van Deemen, A., & Rouwette, E. Accountability and Coalitions: Evidence from a Negotiation Experiment. *Public Administration Review*, 78(1), 37-47. https://doi:10.1111/puar.12858

Suggested literature for experimental designs

- Friedman, D., & Sunder, S. (1994). *Experimental methods: A primer for economists*. Cambridge University Press.
- Guala, F. (2005). *The methodology of experimental economics*. Cambridge University Press.
- Most extensive but also least accessible: Kagel, J. H., & Roth, A. E. (Eds.). (2016). *The Handbook of Experimental Economics, Volume 2: The Handbook of Experimental Economics*. Princeton university press.

Session 1 (February 22nd) and session 2 (February 23rd), room F21/03.81:

Schedule (both days)

- 09.30 – 12.30: seminar and exercises
- 12.30 – 13.30: lunch break
- 13.30 – 16.30: seminar and exercises

What is game theory? How to model interaction situations? What are differences between non-cooperative and cooperative game theory and how can we apply them to interaction situations? These questions will be the core of the first sessions.

- Exercises during the sessions:
  - Analyzing interaction situations from the book
  - Modeling political decision making situations. Students will have to look on the internet for real situations and model them, i.e. a laptop and internet connection is required.
  - Analyzing the experimental articles.

Required reading:

- McCain, R.A. (2009); chapters 1 to 10
- Marks, P.K. & Gerrits, L.M. (2016). Association between decisions: experiments with coupled two-person games. *Public Management Review*. 1-20. https://doi.org/10.1080/14719037.2017.1364413
- Bouwman, R., van Thiel, S., van Deemen, A., & Rouwette, E. Accountability and Coalitions: Evidence from a Negotiation Experiment. *Public Administration Review*, 78(1), 37-47. https://doi:10.1111/puar.12858

Recommended reading: McCain, R.A. (2009); chapters 11 to 16

> After session 2 the students will have three weeks to build a proper game-theoretic model, and the associated experimental design: i.e. students will have to build an experimental design for their chosen actual political interaction situation. The designs, including the game-theoretic model underlying the experiment, have to be sent to the teacher on Tuesday March 13th at the latest.

Session 3 (March 16th), room F21/03.81:

Schedule

- 09.30 – 12.30: Seminar on experimental methods
- 12.30 – 13.30: lunch break
- 13.30 – 16.30: Simulations of experiments

During the third session the students will run their (simulated) experiment as a pilot study. This will reveal the pitfalls and strengths of their design. The students will use these results and adjust their experiments.

Recommended reading: (one of) the three experimental design books in the literature list.

> After session 3 the students will have two weeks to simulate their experiment, write the concept paper and prepare the presentation.

Session 4 (March 29th), room F21/03.81:

Schedule

- 09.30 – 12.30: Presentations
- 12.30 – 13.30: lunch break
- 13.30 – 16.30: Simulations of experiments

Students will present in about 30 minutes their game-theoretic model, the experiment, the design, and the (simulated) findings in class, but also the possible predictions coming from the model. In other words, the students will have to present the value added of the game-theoretic model, of the experiment and their outcomes for other (similar) political decision-making situations. The students have to critically reflect on each other's presentation and the students should use these comments for the final paper.

> Deadline for the final paper is Friday, April 13th.