

Economics of Bargaining and Collective Choice

Level: Master first year M1 / second semester
Cursus: Economics, Data and Decision Science
Teaching hours: 24h in class (lectures)
Teacher: Philippe Solal

Overview

This course studies some main solutions in cooperative game theory and social choice theory: the Nash bargaining solution, the Shapley value, the core of markets with indivisible goods, Arrow's impossibility theorem. Each of these solutions is studied from a normative point of view, i.e. each solution is characterized by a set of (desirable) properties.

Skills developed

Most of this course pertains to the field of normative economics which is a part of economics that expresses value or normative judgments about economic fairness and concerns statements of what the outcome of the economy or goals of public policy "ought to be" rather than facts based on cause-and-effect statements.

Content

Chapter 1 Bargaining: the Nash solution

- 1.1 The Nash bargaining problem
- 1.2 The Nash solution
- 1.3 Axiomatic characterization
- 1.4 Application: Union-Firm negotiation

Chapter 2 Cooperative TU-games and the Shapley value

- 2.1 Cooperative games with transferable utilities
- 2.2 The Shapley value
- 2.3 Axiomatic characterization
- 2.4 Application: land production economies

Chapter 3 Social choice theory: Arrow's impossibility theorem

- 3.1 Social states and individual preferences
- 3.2 Social welfare functions v social choice functions
- 3.3 Axioms for social welfare functions
- 3.4 Arrow's impossibility theorem

Chapter 4 Markets with indivisible goods

- 4.1 Shapley-Scarf housing markets
- 4.2 The core of a housing market
- 4.3 The Top trading cycle algorithm (TTCA)
 - 4.3.1 TTCA as a social choice function
 - 4.3.2 TTCA and the core
- 4.4 Axiomatic characterization of the core

References

- Anno H. (2015). A short proof for the characterization of the core in housing markets. *Economics Letters*, 126: 66-67.
- Arrow K. (1953/1963). *Social choices and individual values*. Wiley.
- Ma J. (1994). Strategy-proofness and the strict core in a market with indivisibilities. *International Journal of Game Theory*, 23: 75-83.
- Nash J.F. (1950). The bargaining problem. *Econometrica*, 18:155-162, 1950.
- Peters H. (2008). *Game theory, a multi-leveled approach*, Springer.
- Roth A. (1982). Incentive compatibility in a market with indivisibilities. *Economics Letters*, 9:127-132.
- Roth A., Postlewaite A. (1982). Weak versus strong domination in a market with indivisibilities. *Journal of Mathematical Economics*, 4:131-137.
- Shapley L.S. (1953). A value for n-person games. In H.W. Kuhn and A.W. Tucker, editors, *Contributions to the Theory of Games*. Vol II. Princeton, 307-317.
- Shapley L.S., Scarf H. (1974). On cores and indivisibilities. *Journal of Mathematical Economics*, 1:23-37.
- K. Arrow, J. Nash, A. Roth, L.S. Shapley are recipients of the "Nobel Prize in Economics".

Prerequisites

Relational and linear algebra.

Grading

Written exam (2 hours)