1 Social choice

1.1 aggregating preferences and Arrow's theorem

- prerequisites economics: preferences (completeness, transitivity)
- Voting, Condorcet paradox, Borda count
- properties of Arrows' theorem
- Arrow's impossibility theorem
- reading: Jehle and Reny (2011) ch. 6.1-6.2

1.2 domain restrictions and cardinal utility

- prerequisites economics: Leontief preferences, representation of preferences by a utility function, utility functions
- prerequisites mathematics: maximization subject to equality constraint; continuity, monotonicity, linearity and concavity of real functions
- domain restrictions: single peaked preferences
- cardinal utility: utilitarianism, Rawls
- Outlook: manipulability and Gibbard Satterthwaite theorem
- reading: Jehle and Reny (2011) ch. 6.3-6.5

2 Markets

2.1 Markets and general equilibrium

- prerequisites economics: consumer problem (utility maximizing consumption choice subject to budget constraint), marginal rate of substitution
- prerequisites mathematics: theorem of the maximum, Weierstrass extreme value theorem, quasi-concavity of real functions, compactness of a set
- first fundamental theorem of welfare economics
- Edgeworth box

- policies in the light of the fundamental theorems of welfare economics
- reading Hayek (1945), Jehle and Reny (2011) ch. 5.1-5.2

3 Static Bayesian games and auctions

3.1 Decision making under uncertainty

- prerequisites maths: discrete probability distributions, expected value of a discrete random variable, concavity and convexity of real functions
- expected utility theorem
- risk preferences
- reading: Mas-Colell et al. (1995) ch. 6.A-6.C (or Jehle and Reny (2011) ch. 2.4)

3.2 BNE

1. Examples and definition
    - prerequisites economics: static games of complete information, mixed strategies, Nash equilibrium
    - prerequisites maths: probability distributions (discrete and continuous), expected value of continuous random variables
    - Bayes' rule, Venn diagram
    - examples for tests/signals and belief updating
    - games of incomplete information
    - Bayesian Nash equilibrium
    - binary public good game

3.3 Auctions

1. IPV setup and auctions
    - prerequisites maths: inverse functions and their derivative, linear differential equation of first order
    - relevance of auctions
    - 4 standard auctions

- symmetric, strictly increasing equilibrium in first price auction with uniformly distributed values
- Vickrey auction
- reading: ch.1 section 1.1 Klemperer (2004), ch. 9.1 and 9.2 in Jehle and Reny (2011)

2. Revenue equivalence theorem

   - envelope theorem
   - using revenue equivalence to solve for equilibria in auctions (e.g. all pay auction)
   - Appendix 1.A of ch.1 in Klemperer (2004) (or ch. 9.3 in Jehle and Reny (2011))

3. auction design

   - robustness to collusion vs. robustness to informational assumptions
   - good auction design: stimulate entry and fight collusion
   - knock out auction as collusive device
   - example behavioral bidding (embarrassment from overbidding)
   - risk aversion
   - (almost) common value auction

4. Market power and markets as auctions

   - revenue maximization by reserve price -> inefficiency due to market power
   - double auction with many bidders: almost efficient mechanism in dominant strategies

3.4 Adverse selection

- asymmetric info can create market incompleteness
- countermeasures to complete the market
- reading: p.115-122 in Einav and Finkelstein (2011), Akerlof (1970)

4 Dynamic Bayesian games

4.1 wPBE

- definition, simple discrete examples (market entry games)
- bargaining
- exercise: Selten's horse

4.2 Signaling

- job market signaling
- effect of taxes
- exercises: discrete signaling (mafia, pirates etc.)

5 Bibliography

References

Akerlof, G. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics 84*(3), 488–500.

Einav, L. and A. Finkelstein (2011). Selection in insurance markets: Theory and empirics in pictures. *Journal of Economic Perspectives 25*(1), 115–38.

Hayek, F. A. (1945). The use of knowledge in society. *American Economic Review 35*(4), 519–530.

Jehle, G. A. and P. J. Reny (2011). *Advanced microeconomic theory*. Pearson Education Limited.

Klemperer, P. (2004). *Auctions: theory and practice*. Princeton University Press.

Mas-Colell, A., M. D. Whinston, and J. R. Green (1995). *Microeconomic Theory*. Oxford University Press, New York.