

DECISION THEORY

ECON 619/620

Winter 2007

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Brief Description and Aim:

This is a PhD-level course on decision theory and will focus mainly on axiomatic theories of individual decision making. Decision making is a process in which we select a course of action among available alternatives. It begins when we need to do something but we do not know what.

In general, there are different types of decisions:

- Riskless choice,
- Choice under risk and uncertainty,
- Intertemporal (dynamic) choice.

As an economist, we are interested in (i) how decisions should be made in some ideal sense (Normative approach), (ii) why and how decisions are made the way they are (Descriptive Approach) and (iii) how can decision making be made more effective perspectives (Prescriptive Approach). First, we embark on a journey into a land of rationality to study the normative approach. Since our ability to think and knowledge are limited and time is pressing, it is not surprising that some behavioral biases will be observed in decision making processes. Of course, this will require adjusting our normative theories to capture these biases. This will be the second purpose of this course. First the course will explore utility theory under certainty and the notion of preferences and their representation. In this section, we will introduce some new approaches to utility theory: e.g. the reference-dependent models where initial holdings matter (Tversky and Kahneman (1991), Masatlioglu and Ok (2005, 2006), and Sagi (2006)), a model of choice from lists (Rubinstein and Salant (2006)) and shortlisting (Manzini and Mariotti, (2005)).

In the second part, we will study in detail the classic theories of decision under risk and uncertainty: von Neumann and Morgenstern, Anscombe and Aumann, and Savage. From here we will explore a selection of topics that expand on the classical work in various directions and are nearer to the current research frontier. These topics may include: (1) Ellsberg's paradox, models of ambiguity and uncertainty aversion; (2) probabilistic sophistication; (3) Dynamics – Bayesian updating, dynamic consistency, preferences over the timing of the resolution of risk/uncertainty; (4) models of unforeseen contingencies/preference for/against flexibility. Which of these or other topics we cover may vary depending on time and the interests of members of the class.

The course will be part lecture by us, part prepared presentations by students, and discussion by everyone throughout.

Course requirements:

The requirements include completion of problem sets, prepared class presentations, and participation in class discussion. Your grade will be a reflection of all three components.

Topics:

I Individual Decision Making: Introduction

II Choice under Certainty

1 Preference Relations and Utility Functions

1.1 Nontransitive preferences

2 Ordinal Utility Representation

3 Choice

3.1 Revealed Preference and Consumer Theory

4 Choice Based Collective Decision-Making

4.1 Shortlisting: Decisions made by committees

4.2 Rationalizability by Game Trees

4.3 Other Models

4.3.1 Uncovered Set Choice Rule

4.3.2 States of Mind

5 A Model of Choice from Lists

6 Reference Dependent Models

6.1 Loss Aversion

6.2 Anchored Preferences

6.3 Rational Choice with Status Quo Bias

6.4 The Endowment Effect

6.5 Reference-Dependent Procedural Decision Making

6.6 Summary

III Choice under Risk and Uncertainty

7 Von Neumann and Mongenstern Theory

7.1 Finite Set of Prizes

7.2 Simple Probabilities

8 Anscombe and Aumann Theory

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| 9 | Savage's Theory | |
| 9.1 | Axioms of Probability | |
| 9.2 | Savage's Axioms | |
| 9.3 | Probabilities from Preferences | |
| 9.4 | Utility for Simple Acts | |
| 10 | Evidence and alternative models | |
| 10.1 | Preference Reversals and Regret Theory | |

IV Intertemporal (Dynamic) Choice

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| 11 | Dynamic choice theory | |
| 11.1 | Dated Outcomes | |
| 11.2 | Consumption Streams | |
| 12 | Temporal resolution of uncertainty | |
| 13 | Flexibility and Self-Control | |

Some Readings and References:

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