University of Pennsylvania

Fall Term 2018

ECON 712– Decision Theory

Lectures: Tuesday and Thursday 1.30-3.00, in McNeil Building 103

Instructor: David Dillenberger, 619, PCPSE, ddill@sas.upenn.edu

Office hours: By appointment

Course home page: usual Canvas https://canvas.upenn.edu/

Requirements:

- Either a research paper or a take-home final exam. (The choice between these two options is yours).

- Presentation in the second part of the course (list of suggested papers is in Section 6 below).

Remark: There will be no class on November 20. If needed, make up class TBA.

Course description: Most economic theories start from a model of individual decision making and then use it as a building block to model interaction between agents, groups of agents and firms, the economy as a whole, etc. In this course, we study a suite of standard models, discuss critiques of these models, and introduce alternative models (sometimes known as ``exotic preferences'') that deal with these critiques. For example, we will discuss topics such as present bias, temptation and self-control, non-expected utility, and ambiguity.

COURSE OUTLINE

1. **Standard Models** - Textbook: Notes on the Theory of Choice by David Kreps[1]

1.2 Deterministic Choice: Preference Relation, Utility and Choice Function
Readings: Kreps, Chapters 2 and 3

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[1] "Notes on the Theory of Choice" by David M. Kreps. Published by Westview Press, 1988, ISBN 0813375533, 9780813375533

1.3 Expected Utility Theory
Readings: Kreps, Chapters 5 and 6

1.4 Subjective and Objective Uncertainty: The Anscombe-Aumann Model
Readings: Kreps, Chapter 7

1.5 Subjective Probability and Savage's Theorem
Readings: Kreps, Chapters 8 and 9

2. Addressing Allais and Ellsberg

2.1 Ambiguity aversion

- David Schmeidler (1989) "Subjective Probability and Expected Utility without Additivity," Econometrica, 571-587

- Gilboa, I., and D. Schmeidler (1989) "Maxmin Expected Utility with a Non–Unique Prior," *Journal of Mathematical Economics*, 18, 141–153.

- Klibanoff, P., M. Marinacci, and S. Mukerji (2005) "A smooth model of decision making under ambiguity," *Econometrica*, 73, 1849–1892.

- Seo, K., (2009) "Ambiguity and Second-Order Belief", *Econometrica*, pp. 1575–1605.

- Machina, M. and D. Schmeidler, (1992), "A more robust definition of subjective of Subjective Probability,'' *Econometrica*, volume 60, issue 4.

2.2 Non expected utility under risk

- Eddie Dekel (1986) "An axiomatic Characterization of Preferences under Uncertainty: Weakening the Independence Axiom," *Journal of Economic Theory*, 304-318.

- Faruk Gul (1991) "A Theory of Disappointment Aversion," *Econometrica*, 59, No 3, 667-686.

- Machina, M. (1982) "'Expected Utility' Analysis without the Independence Axiom," *Econometrica*, 277–323

- U. Segal and A. Spivak: (1997) "First Order of Risk Aversion and Non-Differentiability", *Journal of Economic Theory*, Vol. 9, pp. 179–183.

- Cerreia-Vioglio, S., D. Dillenberger, and P. Ortoleva (2015): "Cautious Expected Utility and the Certainty Effect," *Econometrica*, 83, 693–728.

2.3 Further Readings

- (Survey) Gilboa, I., and M. Marinacci (2013): "Ambiguity and the Bayesian paradigm," in Advances in Economics and Econometrics: Tenth World Congress, Volume 1, ed. by A. Acemoglu, and Dekel. Cambridge University Press.

- (Survey) Machina, M. J., and M. Siniscalchi (2013): "Ambiguity and ambiguity aversion," in Handbook of the Economics of Risk and Uncertainty.

- (Survey) Starmer, C. (2000). ``Developments in non-expected utility theory: The hunt for a descriptive theory of choice under risk.'' *Journal of Economic Literature*. 38, 332-382.

3 Dynamic Choice/ Choice over Opportunity Sets

3.1 Standard Model of Dynamic Choice

Kreps, Chapter 13

3.2 Preference for Flexibility

- David Kreps (1979) "A representation Theorem for Preference for Flexibility," *Econometrica* 47, No 3, 565-578.

- Dillenberger, D., Lleras, J. S., Sadowski, P., and Takeoka, N. (2014). "A theory of subjective learning." *Journal of Economic Theory*, 153, 287-312.

3.3 Preference for Commitment

- Faruk Gul and Wolfgang Pesendorfer (2001) "Temptation and Self-Control," *Econometrica* 69, No 6, 1403-1435.

- Faruk Gul and Wolfgang Pesendorfer (2005) "The Revealed Preference Theory of Changing Tastes," *Review of Economic Studies.*

3.4 Further readings on Preference for Commitment

- Todd Sarver (2008), "Anticipating Regret: Why Fewer Options May Be Better," *Econometrica*, 76: 263–305

- Bart Lipman and Wolfgang Pesendorfer (2013) "Temptation,'' in Acemoglu, Arellano, and Dekel, eds., Advances in Economics and Econometrics: Tenth World Congress, Volume 1, Cambridge University Press.

3.5 Further Readings on Preference for Flexibility

- Eddie Dekel, Bart Lipman and Aldo Rustichini (2001) "Representing Preferences with a unique Subjective State Space," *Econometrica* 69, No 4, 891-934.

- Vijay R. Krishna and Philipp Sadowski (2014) "Dynamic Preference for Flexibility," *Econometrica,* Volume 82, Issue 2, 655–703

- Haluk Ergin, and Todd Sarver (2010) "A Unique Costly Contemplation Representation," *Econometrica*, Vol.78, No.4

4 Time preferences with risk

- Epstein L., and S., Zin (1989) ``Substitution, Risk Aversion, and the Temporal Behavior of Consumption and Asset Returns: A Theoretical Framework,'' *Econometrica*, 57, 937-69.

- Segal, U. (1990) ``Two stage lotteries without the reduction axiom", *Econometrica*, 58, 349-377.

- Dillenberger, D. (2010) ``Preferences for one-shot resolution of uncertainty and Allais-type behavior,'' *Econometrica*, 78, 1973-2004.

- Kreps D., and E., Porteus (1978) ``Temporal resolution of uncertainty and dynamic choice theory,'' *Econometrica*, 46: 185-200.

- Patrick DeJarnette, David Dillenberger, Daniel Gottlieb, and Pietro Ortoleva (2018) ``Time Lotteries and Stochastic Impatience,'' mimeo.

4.1 Further readings

1. Sarver, T. (2018) "Dynamic Mixture-Averse Preferences,'' *Econometrica*, Vol. 86, No. 4 (July, 2018), 1347–1382

2. Kochov, A. (2015) **"**Time and No Lotteries: An Axiomatization of Maxmin Expected Utility,'' *Econometrica*, 83 (1), 239–262.

5 Stochastic choice

- Gul, F., and W. Pesendorfer (2006) ``Random Expected Utility,'' *Econometrica*, 74, 121-146

- Lu. J. (2016) ``Random choice and private information," *Econometrica ,* forthcoming.

- Fudenberg, D. and Strzalecki, T. (2015) "Dynamic logit with choice aversion," *Econometrica,* Volume 83, Issue 2., 651-691

- Simone Cerreia-Vioglio, David Dillenberger, Pietro Ortoleva, and Gil Riella (2018) `` Deliberately Stochastic,'' mimeo.

6 Models of bounded rationality/other topics/students' presentation

- Manzini, P. and M. Mariotti (2007) "Sequentially Rationalizable Choice", *American Economic Review,* 97 (5): 1824–39.

- Masatlioglu, y., and C. Raymond (2016) `` A Behavioral Analysis of Stochastic Reference Dependence,*" American Economic Review,* forthcoming.

- Masatlioglu, Y., D. Nakajima, and E.Y. Ozbay (2012) "Revealed Attention", *American Economic Review,* 102, 2183–2205.

- Halevy, y. (2008) "Strotz meets Allais: Diminishing Impatience and the Certainty Effect", *American Economic Review*, 23, 677-694.

- Strzalecki, T., (2011) "Axiomatic Foundations of Multiplier Preferences," *Econometrica*, 79, pp. 47–73.

- De Oliveira, Henrique, Tommaso Denti, Maximilian Mihm, and M. Kemal Ozbek (2017) "Rationally Inattentive Preferences and Hidden Information Costs". *Theoretical Economics* 12, 621–654

- Ahn, D., and T. Sarver (2011) ``Preference for Flexibility and Random Choice,'' *Econometrica* 81(1), 341-361