Economics 8010
Spring, 2018

Econ 109   Miles Kimball
Department of Economics   O ce hours MW 1:45 -3:00 or by appointment
(please let me know at end of class you are coming to o ce hours   miles.kimball@colorado.edu

This course develops the mathematical tools necessary to analyze optimal decision-making by individual households and rms over time and in the face of risk. Such decisions are building blocks for general equilibrium models, for statistical models of behavior and for theoretical analyses of policy.

Thinking about optimization over time and in the face of risk can seem overwhelming. This course will give you a way to orient yourself when thinking about behavior in a dynamic, stochastic context. In particular, several powerful methods that I have been involved in developing within economics provide a uni ed approach to the economics of risk and time: the di dence theorem, polars, the presermax principle, the symmetry theorem, and conjugate functions.

The rapid decline in the price of computing power has led to increased use of the computer as a way of looking at economic models. This raises the value of the complementary activity of understanding results theoretically and intuitively. Understanding is needed both to cross-check computer results and to give them meaning. Theoretical results for a model or class of models can save a lot of time one might otherwise spend looking for the impossible and suggest fruitful directions to look for important e ects. General theoretical results are also often publishable in their own right.

Evaluation is by problem sets and two take-home exams: a take-home midterm and a take-home nal. You may collaborate on the problem sets, but you most do the take-home exams without communicating with anyone about them but me, the professor until the time each is due. (That should be by email, so I can reply to the question for everyone taking the class). The take-home exams are open book.

I. The Economics of Uncertainty in One- and Two-Period Models

Gollier, Christian. The Economics of Risk and Time Available in paperback for $21.94 at amazon.com.

A. Using Extremal Functions: The Di dence Theorem

* Gollier Part III: Technical Tools

Kimball, M., 1992: \Precautionary Motives for Holding Assets," The New Palgrave Dictionary of Money and Finance, Peter Newman, Murray Milgate and John Eatwell (eds.), Stockton Press, New York, 158{161.

* Gollier Part V: Consumption and Saving

* Kimball, M., 1990: \Precautionary Saving in the Small and in the Large," Econometrica (January), 53{73.

* Kimball, M., and Philippe Weil, 2003: \Precautionary Saving and Consumption Smoothing over Time and Possibilities," mimeo.

Kimball, M., 1989: \The E ect of Demand Uncertainty on a Precommitted Monopoly Price," Economics Letters, 30 (September), 1{5.

Kimball, M., 1994: \Discussion of `The Importance of Precautionary Motives for Explaining Individual and Aggregate Saving,' by R. Glenn Hubbard, Jonathan Skinner, and Stephen P. Zeldes," Carnegie-Rochester Conference Volume, Journal of Monetary Economics.

* Gollier Part IV: Multiple Risks

Kimball, M., 1993: \Standard Risk Aversion," Econometrica (May), 589{611.

Elmendorf, E. and Kimball, M., 2000: \Taxation of Labor Income and the Demand for Risky Assets," International Economic Review, 41 (August), 801{832.

B. Polars

Rockafellar, R. Tyrrell, 1970. Convex Analysis

II. Recursive Characterization of the Value Function

Fama (1970): \Multiperiod Decision Problems," American Economic Review 60, 163{174.

A. The Preser-Max Principle

B. The Symmetry Theorem

Boyd, John H. III (1990): \Symmetries, Dynamic Equilibria, and the Value Function," in Conservations Laws and Symmetry, Ryuzo Sato and Rama V. Ramachandran Eds., Kluwer.