Life Cycle Models

Instructor: Francesca Parodi

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Contact information:
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Office Hours: by appointment

Class times: TBD

Web: Course materials will be located at Google Classroom. Log-in using your Collegio Carlo Alberto email address.

Course description:
This course provides an introduction to dynamic programming, computational methods, and structural estimation of life cycle models. The main goals of the course are to introduce students to standard tools used to solve dynamic optimization problems, demonstrate practically how these tools are used, focus on methods that can be extended to more complex setups.

Grades:
Course grade will be based on a take-home project and a class presentation.

Textbook:

- Adda, J. & Cooper, R., "Dynamic Economics", MIT Press, Cambridge, 2003.
- Notes and Matlab codes available online.

List of topics:

- Simplest consumption-savings problem: cake eating problem (notes + A&C chapter 2)
  The problem; Simple example; Existence and uniqueness of solution
- Introduction to dynamic programming (notes + A&C chapter 2)
  Bellman equation; Recursive solution; Optimality conditions; Numerical solution; Practical implementation
- Life cycle income process (notes + A&C chapter 3)
  Credit markets; Numerical solution; Practical implementation
- Stochastic optimisation (notes + A&C chapter 3)
  Markov Processes; iid income process; Autocorrelated income process; Numerical solution; Practical implementation
- Infinite horizon (notes + A&C chapter 3)
  The problem; Existence and uniqueness of solution: Simple example; Numerical solution; Practical implementation
- Structural estimation (notes + A&C chapter 4)
  Maximum likelihood; Simulation based methods, GMM; Examples; Practical implementation
- Applications and Extensions (notes + A&C chapters 6-7-8)
  Non-durable Consumption; Durables; Investment;
  Students' presentations of published papers