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Quantitative Macroeconomics: Idiosyncratic Risk and Heterogeneous Agents

Objectives: This course is designed to introduce students with both basic and advanced methods to solve numerically standard models in dynamic macroeconomics. Special emphasis will be placed in studying and solving models with idiosyncratic uncertainty and heterogenous agents. Several applications of these models will also be discussed.

Short Description of Contents

1) The stochastic dynamic programming problem
    a) Value Function Iteration
    b) Policy Function Iteration
    c) Projection Methods

2) Markov Chains
    a) Stationary distribution
    b) Approximation of continuous Markov processes

3) Idiosyncratic Income Risk. Incomplete Markets
    a) The basic model: Aiyagari (1994)
    b) Accounting for the wealth distribution
    c) The model with endogenous labor
    d) Precautionary savings: an assessment
    e) Public Insurance

4) Idiosyncratic Income Risk and Intra-household Risk Sharing

a) The collective household model

b) Female Labor Supply

c) Unemployment benefits and financial assets

5) Time-Consistent Policies. Markov-perfect Equilibrium

a) Projection methods. Judd (1992, 1998)

b) Chebyshev polynomials

c) Applications: Dynamic games, time-consistent fiscal policy

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