

ADVANCED MACROECONOMICS II

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Course Objectives:

This course is devoted to studying economies where agents are heterogeneous. These models are helpful to analyze a wide range of questions pertaining to business cycles, income distribution, asset pricing, consumption insurance, labor supply, the aggregate and redistributive effects of policies, etc. We will start with some "aggregation theorems" to show that in some cases a representative agent still exists. Next, we will move towards economies with "incomplete markets" where agents can only borrow and save through a risk-free bond. We begin by characterizing in detail the individual problem. Next, we proceed to the description of the stationary equilibrium. Then, we study an incomplete-markets model with aggregate shocks. The second set of classes are devoted to extend the economies into continuous time model. The last set of classes will introduce economies with heterogeneous firms.

The aim of this course is to learn: 1) this important class of heterogeneous agents model, and 2) how to solve numerically for the equilibrium of these economies, a necessary step to use these models for quantitative research.

Useful Materials:

Books:

1. Recursive Macroeconomic Theory, by Lars Ljungqvist and Tom Sargent
2. Recursive Methods in Economic Dynamics, by Stokey, Lucas
3. Applied computational economics and finance, by Miranda and Fackler

Software:

At least one software is required in this class: Matlab, Fortran and Python. I suggest the beginner should start with Matlab but NEED to learn fortran or Python at the end.

Websites that are useful to learn those Software are:

Matlab: Compecon toolbox for matlab,

<http://www4.ncsu.edu/~pfackler/compecon/toolbox.html>

Fortran: Introduction to computational economics using fortran,
<http://fabian-kindermann.de/compecon/>

Python: Quantitative economics, <http://quant-econ.net/index.html>

Assessment & Evaluation:

Homework	40%
Final exam	60%

There will be homework every week. You need to hand in your home work to the TA before the next Wed noon.

Course Schedule

Lecture 1: Review the RA neoclassical growth model

Lecture 2: Heterogeneous agents in the complete market
HW 1

Lecture 3: A single agent model under incomplete market: risk sharing and precautionary saving

Lecture 4: Numerical methods: Solving a single agent problem
HW 2

Lecture 5: Coding: Solve a single agent problem (TA session)

Lecture 6: Aiyagari model

Lecture 7: Transitional Dynamics and Krusell-Smith model
HW 3

Lecture 8: Aiyagari model application: Life-cycle model

Lecture 9 : Aiyagari model application 2: labor supply elasticity
HW4

Lecture 10: Hopenhayn model

Lecture 11: Coding: solve the Aiyagari model on the computer (TA session)