

OeNB Summer School 2022

Macro models with heterogeneous agents and their use for monetary policy based on household-level micro data

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Speakers:

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Course description

In the last decades, the field of macroeconomics has changed dramatically. While modern macroeconomics was built on micro-foundations at its core — Euler equations, rational expectations and representative agents — its focus was more on the aggregate economy. As rich micro-data has become available to researchers, the field has moved from purely theoretical micro-foundations, to being *micro-consistent*—trying to integrate heterogeneous agents and distributional features to match the data. This change gave rise to a new set of models, to a shift in methodological focus, and to be rigorously disciplined by the empirical literature. This new line of research — often referred to as TANK (two-agent New Keynesian) or HANK (heterogeneous agents New Keynesian) models — has led to novel results with important implications for the core of central banking: monetary policy.

Heterogeneous agent models, for example, take into account that agents differ in their propensities to save and can be credit-constrained, which — as a consequence — implies that households are affected differently by monetary policy. Intertemporal substitution is no longer the main channel of monetary transmission and the effect of changes in interest rates and borrowing conditions depends on households' age, income, wealth and debt. Stabilizing inflation does no longer necessarily stabilize employment and the economy.

The goal of this summer school is to provide (i) the basic theoretical insights about the key features of modern micro-based macro models dealing with monetary policy transmission, (ii) an understanding about the development of these tools, how to solve these models and major differences with regard to more traditional macro models, (iii) knowledge about the data needs and techniques to calibrate/estimate them based on micro-level household data.

The course will take place over 5 days. The mornings will be focused on theoretical lectures to familiarize attendees with the models and algorithms for solving and estimating them. The afternoon will cover “hands-on” practical sessions in which participants will be working directly with the Household Finance and Consumption Survey (HFCS) data and Matlab-codes (to be provided) for implementing the material covered in lectures.

Tentative Schedule

Lectures: 9-10:15 and 10:45-12

Practical Sessions 2:00-3:15 and 3:45-5:00

Day 1:

Lectures:

- Introduction to Household Heterogeneity and Quantitative Macroeconomics
- Introduction to incomplete markets models

Practical session:

- Introduction to the HFCS, data concepts, waves
- Generating stylized facts on household heterogeneity

Day 2:

Lectures:

- Some basics of numerical analysis
- Numerical dynamic programming
- Solution methods for incomplete markets models in steady state

Practical session:

- Introduction to computer code for solving incomplete markets models in steady state

Day 3:

Lectures:

- Incomplete markets and aggregate demand
- Heterogeneity and revisiting the New Keynesian transmission mechanism

Practical session:

- How to estimate the incomplete markets model to match HFCS data using simulated method of moments

Day 4:

Lectures:

- Monetary policy and the redistribution channel
- Forward guidance puzzle
- Solving heterogeneous agent models with aggregate shocks: Linearization with MIT shocks

Practical session:

- How to solve for impulse responses in incomplete markets models with MIT shocks

Day 5:

Lectures:

- Monetary-fiscal interactions with incomplete markets
- Solving heterogeneous agent models with aggregate shocks: Non-linear solutions with Krusell-Smith algorithm

Practical session:

- How to estimate incomplete markets models linearized with MIT shocks
- How to solve incomplete markets models with the Krusell-Smith algorithm

Prerequisites:

Participants should be familiar with standard macroeconomic models, such as the representative agent New Keynesian Model. Basic knowledge of Matlab (or another programming language such as Python, Julia, C++, Fortran, etc) is recommended.

Selected References:

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