Welcome and Overview

NBER Heterogeneous-Agent Macro Workshop

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Spring 2023

Welcome

- This is the NBER Heterogeneous-Agent Macro Workshop
- All taking place here at 1050 Mass Ave
  - lunches also here, dinner Monday at Barcelona Wine Bar, Tuesday at Daedalus
- Generously funded by the NSF and Chae Initiative at Harvard
- Fantastic planning help from the NBER staff
- 40 students from US & Europe selected from 120 outstanding applications
- Teaching material is collaboration between Adrien Auclert, Bence Bardóczy, Michael Cai, Rodolfo Rigato, Matt Rognlie, Martin Souchier & Ludwig Straub

Workshop objectives

- 11 lectures and 4 tutorials covering:

1. HANK: fiscal and monetary policy (in closed economies)
2. Solution methods for GE models with heterogeneous agents

- By the end of the workshop, you should know how to:
  - Set up and calibrate the steady state of a heterogenous agent model
  - Get its first-order impulse responses to aggregate shocks
- We assume prior background in dynamic programming and NK models
- The syllabus is online. Relative to last year's workshop (material online):
  - **New:** HANK at NY Fed, lumpy investment, deviations from FIRE
  - Not this year: open-economy, discrete choice in consumption-savings models

Applications of the heterogeneous agent modeling framework

- Huge potential for het agent macro beyond HANK:
  - Price setting, financial frictions, firm dynamics, banking industry dynamics, search models of the labor market, the money market...
- Previous generation of these models have tended to:
  - focus on steady states
  - use tricks to "get rid of the distribution"

  $\rightarrow$ no longer any need to do either!
- Instead, can focus on key new questions for the field, eg:

  $\rightarrow$ when does heterogeneity matter?

  $\rightarrow$ what micro moments are important for aggregate outcomes?
- Exciting and fast growing literature. We're looking forward to your answers!

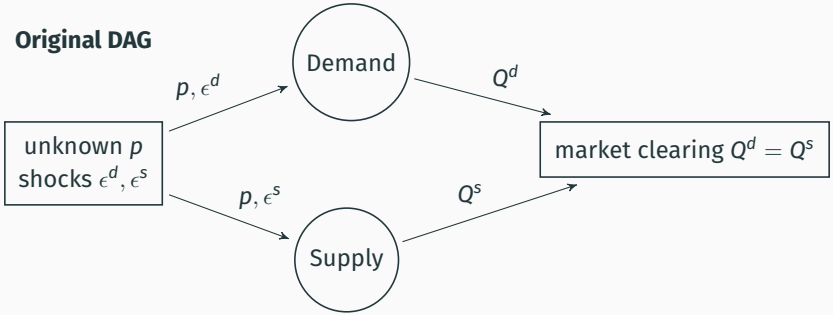
Working in the sequence space

- In this course we'll write and solve models in the **sequence space**
  - Slightly different modeling approach relative to usual state-space
  - Very different solution&estimation method, using **sequence-space Jacobians**
- Our sequence-space-jacobian toolbox automates several of the hard steps
- In your own application, you may want to:
  1. use SSJ with its pre-programmed heterogeneous-agent models
  2. customize SSJ with your own heterogeneous-agent model
  3. write up your own sequence-space solution method

  We'll cover examples of each of these approaches

Modeling philosophy

- Basic idea of our sequence-space modeling philosophy: organize models into "**blocks**" that represent behavior of (possibly heterogeneous) agents, and **interact in GE** via a **small set of aggregates**
- We'll often arrange these blocks into Directed Acyclic Graph ("DAG"). Helpful to solve model, think about causality in GE, do decompositions, etc



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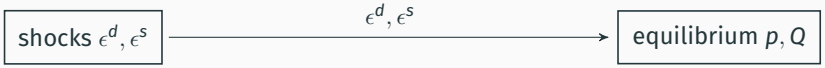
Solved model



Course material

- Schedule, syllabus, and lecture notes posted at:
  nber.org/conferences/heterogeneous-agent-macro-workshop-spring-2023
- Code for lecture notebooks and tutorials posted at:
  github.com/shade-econ/nber-workshop-2023
- Please come to tutorials with your laptops
- Please ask questions in class or during breaks!
- Please respect the code of conduct for NBER meetings
- Let's dive in!