

Solving Heterogeneous Agent Models

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Description

This course teaches state-of-the-art techniques to solve and analyze dynamic stochastic general equilibrium (DSGE) models with heterogeneous agents. After a short refresher on solution methods for representative agent models (such as perturbation and projection), the course provides students with an understanding of (i) workhorse algorithms to solve models with heterogeneous agents with(out) aggregate uncertainty (such as the Krusell-Smith algorithm), (ii) different simulation methods and accuracy tests, and (iii) alternative solution algorithms (such as Reiter's hybrid method)

Throughout the course, students will learn how to implement the covered material in practice using Matlab and Dynare (where possible).

Suggested reading

Den Haan, W. (2008). "Comparison of Solutions to the Incomplete Markets Model with Aggregate Uncertainty", *Journal of Economic Dynamics and Control*, 34 (1).

Judd, K. (1998). "Numerical Methods in Economics", The MIT Press.

Krusell, P. and A. Smith (1998). "Income and Wealth Heterogeneity in the Macroeconomy", *Journal of Political Economy*, 106 (5).

Reiter, M. (2009). "Solving Heterogeneous-Agent Models by Projection and Perturbation", *Journal of Economic Dynamics and Control*, 33 (3).

Sedláček, P. and V. Sterk (2017). "Growth Potential of Startups over the Business Cycle", *American Economic Review*, 107 (10).

Lecture notes of e.g. Den Haan, Kopecky, Mukoyama

Introduction and Aiyagari model

Lecture

- Introduction
- Quick refresher of basic solution techniques (perturbation and projection)
- Solving heterogeneous agent models *without* aggregate uncertainty

Assignment

- Solve the Aiyagari model

Krusell-Smith algorithm

Lecture

- Solving heterogeneous agent models *with* aggregate uncertainty
- Simulation methods, practical issues and alternative choices in the Krusell-Smith algorithm
- Accuracy tests

Assignment

- Solve the Krusell-Smith economy

Alternatives

Lecture

- Reiter's hybrid method
- Solving models with ex-ante heterogeneity
- Introduction into continuous time techniques

Assignment

- Solve a model with ex-ante heterogeneous firms