Heterogeneous-Agent DSGE Models

May 2017

Instructor: Minjoon Lee

Time: May 9 and 16, 9:00 AM – 12:00 PM

Location: RB 1201

Course Objectives: This course introduces participants to heterogeneous-agent DSGE modeling. It focuses on heterogeneous-household models, though techniques learned in this course can be easily applied to solving heterogeneous-firm models. The main objectives of this course are to enable participants to develop own heterogeneous-agent models for quantitative policy analysis and equip them with computational tools necessary to solve those models.

Course Outline:

- **First day (May 9)**: Two canonical heterogenouse-household models, one without aggregate uncertainty (Aiyagari, 1994) and one with aggregate uncertainty (Krusell and Smith, 1998), will be introduced. Challenges in solving these models and strategies used to overcome these challenges will be discussed. After this lecture, participants will be asked to replicate the two models.
- **Second day (May 16)**: Matlab codes for replication will be discussed in detail.

Pre-requisite: Knowledge on dynamic programming and being able to implement it using Matlab is necessary in understanding the second half of this workshop. Those who do not have an exposure to dynamic programming are recommended to read Chapter 3 and 4 (only up to Section 3) of Ljungqvist and Sargent (2012) in advance. Also, those who have no experience in implementing dynamic programming using Matlab are recommended to work on the warm up practices attached at the end of this syllabus. The solution to the warm-up questions will be distributed before the first day of the course.

Software: Matlab will be used throughout the course. One can find many good self-learning resources by searching for 'Matlab tutorial.'

References

- Aiyagari, S. Rao (1994), "Uninsured Idiosyncratic Risk and Aggregate Saving," *Quarterly Journal of Economics*, 109, 659-684.
- Guvenen, Fatih (2011), "Macroeconomics with Heterogeneity: A Practical Guide," Federal Reserve Bank of Richmond Economic Quarterly, 97, 255-326.
- Krusell, Per and Anthony A. Smith Jr. (1998), "Income and Wealth Heterogeneity in the Macroeconomy," *Journal of Political Economy*, 106, 867-896.
- Ljungqvist, Lars and Thomas J. Sargent (2012), *Recursive Macroeconomic Theory*, 3rd edition, MIT Press. Chapters 3, 4, 16, and 17.