Introduction to Quantitative Macroeconomic Theory
2013/14

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Office hours: Mondays 10-12 Room W302
Lectures: Wednesday 3-5p.m. Room W316
Course webpage: http://webspace.qmul.ac.uk/gfella/teaching/phd_macrotheory/macrotheory.html

Aims
The course is an introduction to numerical techniques to solve stochastic, dynamic macroeconomic models. The course is divided into three parts. The first part covers numerical techniques. The second part introduces some basic results in dynamic programming, the main technique to formulate stochastic, dynamic optimization problems. The third part covers solution methods for dynamic programming problems.

Assessment
One computer project. Solution discussed in an individual oral presentation with Roman Sustek and myself on Monday 10 March.

SYLLABUS

I. BASIC NUMERICAL TECHNIQUES

- Function approximation.
  * Ljungqvist, L. and T. J. Sargent 2004 (LS), Recursive Macroeconomic Theory, Chapter 3.2
  * den Haan W., Lecture notes on “Function approximation,” available at http://tinyurl.com/5tv93vr

- Numerical integration.
  * den Haan W., Lecture notes on “Numerical integration,” available at http://tinyurl.com/6cbrqqr

- Numerical optimization.

II. DYNAMIC PROGRAMMING

- Mathematical preliminaries.
- Contraction mapping theorem.
  * LS, Appendix A
III. SOLUTION METHODS FOR DYNAMIC PROGRAMMING PROBLEMS

- Discretized value function iteration.
- Endogenous grid points Euler equation methods.
  * LS, Chapter 4.
  Judd, Numerical Methods in Economics, Chapter 12.