

Mini-Course on Perturbation Methods & Dynare

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This mini-course will introduce participants to perturbation methods for solving dynamic, stochastic general-equilibrium models. In the interest of time, the course will focus solely on examples and implementation, rather than theory (theoretical references will be provided). A key component of the course will be solving nonlinear models using higher-order approximations.

Prerequisites: Basic knowledge of MATLAB. Also, participants should be familiar with basic macroeconomic models taught at the masters-level or first-year PhD macroeconomics course.

The course will consist of both lecture and hands-on computing examples. If you would like to participate in the computing exercises, please bring your laptop to class (with Matlab and Dynare already installed). Dynare is available for download for free.¹ If you do not own a copy of Matlab, Octave is a free alternative to Matlab and Dynare is also available for that platform as well. I have not tested the software with Octave, but it should work similarly to Matlab. I will use Matlab in class.

Rough Outline of Course

Introduction to Perturbation Methods (About 1.5 hours)

Implementing Perturbation Methods in Dynare & MATLAB
(1 hour, code provided).

Reading List

Adjemian et. al., “Dynare: Reference Manual, Version 4.”

Swanson et. al., “Higher-Order Perturbation Solutions to Dynamic, Discrete-Time Rational Expectations Models”

¹ <http://www.dynare.org/download>

Schmitt-Grohe and Uribe, “Solving Dynamic General Equilibrium Models Using a Second-Order Approximation to the Policy Function.”

Andreasen et. al., “The Pruned State-Space System for Non-Linear DSGE Models: Theory and Empirical Applications.”

Den Haan and De Wind, “Nonlinear and Stable Perturbation-Based Approximations”