Formulation, Estimation and Policy Analysis with DSGE Models

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Dynamic, Stochastic, General Equilibrium (DSGE) Models

- Policy analysis involves investigating counterfactuals:
  - What happens if we adopt a fixed exchange rate?
  - What happens if policy responds to interest rate spreads, the stock market, etc?
- How to answer questions like these?
  - Experiment with an actual economy (too costly!)
  - Do experiments in artificial economy (that's what we do here).
- Requires economic concepts, model solution, estimation and analysis techniques
  - We will explore some of these issues here.

DSGE Model

- Artificial model economy which:
  - Has property that economic outcomes are clearly related to private agent objectives and constraints (not always followed in practice!)
  - To be useful, must generate artificial data that resembles macro economic data of actual economies.
  - Contributes input into discussions about key policy questions.

History of DSGE Models

- Pre-2000's: foundations laid by Hansen-Sargent, Prescott, Lucas, many others….

- 2000-2007: transition from academic 'toys' to serious candidates for actual policy evaluation.

  - Evidence that models are available that can quantitatively address the age-old puzzle about monetary economics: **"why do prices take so long to react to a monetary disturbance, while real variables react right away?"**

  - SW demonstration that DSGE models rival a-theoretical methods in out-of-sample forecasting.

  - Played an important role in placing structure on policy discussions
    - Taylor principle, inflation targeting, interaction between monetary policy and asset volatility

- 2008-?: renewed urgency for additional models development
  - Introduction of financial frictions.
  - Serious treatment of labor markets.

Objective of Course

- Examine macroeconomic implications of various financial frictions
  - Costly state verification, asymmetric information.
  - Moral hazard.
  - Adverse selection.
  - Zero bound on nominal rate of interest.
  - Monetary policy and asset market fluctuations.
- Computer exercises to learn Dynare and Bayesian estimation of DSGE models.