Formulation, Estimation and Policy Analysis with Dynamic, Stochastic General Equilibrium Models

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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!)
    - Gives access to broader range of economic data for estimation and assessment.
    - Policy prescriptions and forecasts come with coherent economic ‘stories’
- To be useful for policy analysis, must
  - Address policy questions of interest.
  - Generate artificial data that resembles macro economic data of actual economies.

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 age-old puzzles about monetary policy.
  - SW demonstration that DSGE models rival a-theoretical methods in out-of-sample forecasting.
- 2008-?: renewed urgency for additional models development
  - Introduction of financial frictions.
  - Serious treatment of labor markets.

Questions:

- Classic policy questions:
  - Should monetary authority follow a simple rule, or 'do the best that it can, given the current situation'?
  - What should the mean and variance of inflation be?
  - Which one: inflation targeting or price level targeting?

- New questions motivated by recent financial turmoil:
  - Do there exist business cycle shocks that emanate specifically from the financial sector?
  - How to rationalize the recent unconventional monetary policy?
    - Fed declared existence of 'exigent circumstances'.
    - Started to, in effect, make loans to private business (i.e., mortgages, commercial paper, loans to AIG, Bear Stearns).
  - Should monetary policy focus just on inflation and output, or should it also respond to asset prices, credit, interest rate spreads, etc.?
  - How much and what type of regulation?

Why *Quantitative* Modeling?

- Answers to previous questions depend on how the economy as a whole is put together.

- Hard to work out in one's own head.

- Quantitative model allows one to balance off different forces (e.g., benefits and costs of inflation volatility) in a way that:
  - Is coherent.
  - Brings to bear data and experience from a great variety of sources: labor markets, financial markets, consumption behavior, etc.

Outline

- Review of the consensus New Keynesian model
  - What are its key features? Why were they put there?
- Introducing financial frictions
  - Costly state verification (Townsend, BGG, CMR)
  - Moral hazard (Holmstrom-Tyrol, Gertler-Kyotaki).
- Unemployment.
- Zero bound
  - Vicious deflation spiral
  - Implications for fiscal and monetary policy.
- Monetary policy and asset pricing.