

Syllabus for EC 702 (Part I)  
Simon Gilchrist

Course Description:

- Overview: This is the first half of the first semester PhD course in macroeconomics (the second half is taught by Adrien Verdelhan). The goal of the course is to provide an introduction to the theory of the household, the theory of the firm and stochastic dynamic general equilibrium models. The course will also provide an introduction to basic tools in economics such as dynamic optimization, stochastic difference equations and solution methods based on log-linearization.
- Course requirements: there will be three homework problems and one midterm exam. Homeworks will count 20% of your grade for this six weeks. The exam will count for the remaining 80%. You may collaborate on homeworks but must turn them in individually. Please list the people that you collaborated with on the first page.
- Course readings: Lecture notes will be provided for the course material covered. The reading list cites additional key articles. I may also post articles on the course web page. Finally I recommend the following textbooks:
  - Sargent and Ljunquist: "Recursive Macroeconomic Theory".
  - Lucas and Stokey: "Recursive Methods in Economic Dynamics".
  - Romer, David, "Advanced Macroeconomics".
- Office hours: my office hours are Mon. 2:00-3:00, Th 1:30-3:30 or by appointment. Room 404, 270 Bay State Road.
- I can be reached by email: [sgilchri@bu.edu](mailto:sgilchri@bu.edu) or phone: 617-353-6824.

## Course Content:

- Topic 1: Discrete time version of the Solow Growth model.
  - Setup: Dynamic model with fixed labor supply and constant savings rate.
  - Tools: First order difference equations, Convergence.
  - Empirics: Growth facts (Mankiw, Romer, Weil).
- Topic 2: Household optimization under certainty.
  - Setup: Infinitely-lived household choosing consumption and labor supply subject to non-stochastic wage process.
  - Tools: Bellman Equation.
- Topic 3: Household optimization under uncertainty.
  - Setup: Infinitely-lived household choosing consumption with fixed labor supply and stochastic income.
  - Tools: Bellman equations under uncertainty.
  - Empirical implications: PIH, Hall's RW hypothesis.
- Topic 4: Firm optimization under uncertainty.
  - Setup: Infinitely-lived firm choosing investment subject to quadratic adjustment costs.
  - Empirical implications:
    - \* Derivation of User-Cost of Capital.
    - \* Basic Q theory of Investment.
- Topic 5: Stochastic Growth Model.
  - Setup: Basic RBC framework with no adjustment costs or frictions.
  - Tools:
    - \* Derivation of steady-state.
    - \* Exact solution for special cases.
    - \* Log-linearization.
- Topic 6: RBC Model Dynamics
  - Tools:
    - \* Model solution using method of undetermined coefficients (e.g. Campbell "Inspecting the mechanism")
    - \* Calibration.
  - Empirics: stylized facts vs model implications (moment matching).

## Class Schedule:

- Sept 5th (W) Solow Growth Model
- Sept 10th (M) Solow Growth Model.
- Sept 12th (W) Consumption under certainty.
- Sept 17th (M) Consumption under certainty
- Sept 19th (W) Consumption under uncertainty
- Sept 15th (M) Consumption under uncertainty
- Sept 19th (W) Investment
- Sept 24th (M) Investment
- Sept 26th (W) Stochastic Growth Model
- Oct 1st (M) Stochastic Growth Model
- Oct 3rd (W) Real Business Cycles
- Oct 9th (Tu) Real Business Cycles
- Oct 10th (W) – Review
- Oct 12th (Friday) Exam

Homework due dates:

Homework 1: Wed Sept 19th

Homework 2: Wed Sept 26th

Homework 3: Tues Oct 9th.

## Course Readings Part I:

1. Solow Growth Model:
  - (a) \*\* Romer, Chapter 1.
  - (b) \*\* Mankiw, N. Gregory, Romer, David and Weil, David N. 1992. "A Contribution to the Empirics of Economic Growth", Quarterly Journal of Economics 107 (May): 407-437.
2. Consumption under certainty:
  - (a) \*\* Class notes.
  - (b) Romer, Chapter 7.
3. Consumption under uncertainty:
  - (a) \*\* Class notes.
  - (b) \*\* Hall, Robert E., "Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence", Journal of Political Economy 86 (December): 971-987.
  - (c) Cambell, John and Mankiw, N. Gregory (1989), "Consumption, Income and Interest Rates: Reinterpreting the Time Series Evidence". NBER Macroeconomics Annual 4: 185-216.
4. Investment:
  - (a) \*\* Class notes.
  - (b) Romer, Chapter 8.
  - (c) Hayashi, Fumio. 1982. "Tobin's Marginal q and Average q: A neo-classical interpretation." Econometrica 50 (January): 213-224.
5. Stochastic Growth Model:
  - (a) \*\* Class notes.
  - (b) \*\* Campbell, John, "Inspecting the mechanism: An analytical approach to the stochastic growth model", Journal of Monetary Economics 33 (June): 463-506.
  - (c) King, Robert, Plosser, Charles and Sergio T. Rebelo. 1988. "Production, Growth and Business Cycles: I. The Basic Neoclassical Model. Journal of Monetary Economics.
6. Real Business Cycle Theory:
  - (a) \*\* Christiano, Lawrence and Martin Eichenbaum. 1982. "Current Real Business Cycle Theories and Aggregate Labor Market Fluctuations", American Economic Review 82 (June): 430-50.

- (b) Prescott, Edward. 1986. "Theory Ahead of Business Cycle Measurement". Federal Reserve Bank of Minneapolis Quarterly Review Vol 10 No. 4.
- (c) Summers, Lawrence H. 1986. Some Skeptical Observations on Real Business Cycle Theory. Federal Reserve Bank of Minneapolis Quarterly Review Vol 10 No. 4.