

Macroeconomics  
411-1  
Winter, 2005  
Christiano

## Syllabus

### 1. General Information.

- Lectures are M-W 11am-12:50pm, L150 Tech. Recitation: Friday 11am-12:50pm, in lecture room. Exception: there will be no class on Martin Luther King day, Monday, January 17. That lecture will be made up 11am-12:50pm on Friday, January 14, in the lecture room (this time is normally reserved for the recitation session, and there will be an announcement later on how this will be made up).
- My office number is 3246, Andersen Hall; Phone: 491-8231. Email: l-christiano@northwestern.edu. Office hours: Wednesday, 1:30-2:30pm.
- TA: Luigi Paciello, telephone number, 491-8215; office, 315 Andersen; email, l-paciello@northwestern.edu. Office hours, Thursday from 11-1pm.
- The grades will be determined as follows: homeworks, 10%; midterm, 40%; final, 50%. There will be weekly homework assignments. You are requested to work in teams of up to five students on these problem sets, and only one should be submitted per group. Homeworks should be turned in to the Economics Department office by Wednesday, 5pm, in the week after they are assigned.
- The midterm is on Wednesday, February 2, in class. The final is on Thursday, March 17, 9-11am, in the regular lecture room.

### 2. Goals.

Macroeconomics is about: (i) developing positive models that can help us understand the dynamics of key macroeconomic variables: employment, unemployment, interest rates, output, etc.; and (ii) using these

models to make judgements about what policies the government should, or should not, pursue. Classic questions include the proper setting of taxes and money over the business cycle. The purpose of the course is to study basic tools useful for (i) and (ii), and to review (a subset of) the relevant substantive findings reported in the literature.

To address (i), we will begin by developing the basic building block of modern macroeconomics: the infinite lived, deterministic, homogeneous agent growth model. One set of variations of this model will allow us to review a subset of the modern theory of growth. Another will allow us to review basic results in monetary economics. A third set of variations will allow us to review the theory of business cycles.

To address (ii), we will study the optimal determination of tax rates. We will first study this problem assuming the government can determine at some initial date what the optimal setting of these variables is for all time, and all possible circumstances, and that it can then commit itself credibly to actually implementing these policies. We will go on to study the more realistic (though more complicated, too) case where the government lacks the ability to commit.

- The textbooks for the course are S-L and L-S:

Nancy L. Stokey and Robert E. Lucas, Jr., with Edward C. Prescott, *Recursive Methods in Economic Dynamics*, Harvard University Press, 1989.

Ljungqvist and Sargent's, *Recursive Macroeconomic Theory*, 2nd Edition, MIT Press, 2004.

- Additional reading materials will be made available on the course website.

## COURSE OUTLINE

There will be 18 lectures (one of these is taken by the midterm). The topics are summarized below, with the rough number of lectures expected to be devoted to each given in parentheses. The primary and related readings for each lecture are listed. (Many of the related readings may be found on the course website, which can be found by going to my web page.)

1. Infinite Horizon Model With No Uncertainty and Fixed Labor.
  - (a) (four lectures) Efficient Allocations.
    - i. Sequence Approach (S-L: pp. 8-13, sec. 4.5).
    - ii. Function Space and Dynamic Programming (S-L; pp. 13-16, sec. 4.2, sec. 6.1).
  - (b) (one lecture) Equilibrium Concepts (S-L: sec. 2.3; L-S: chap. 6, 7; Cooley-Prescott, 1995, pp. 8-10).
    - i. Sequence concepts:
      - A. Date 0 Arrow-Debreu.
      - B. Sequence-of-Markets.
    - ii. Recursive Competitive Equilibrium.
  - (c) (one lecture) Application of Recursive Methods: Participation Constraints (class handout, Kehoe and Perri, Alvarez and Jermann (2000, 2001), Bodenstein (2005), Kehoe and Levin (1993), Kehoe and Perri (1992), Kocherlakota (1996), Lochner and Monge (2002), Marcet and Marimon (1992, 1999), Ljungqvist and Sargent (2004, chapter 20)).
  - (d) (seven lectures) Application: Growth Theory (L-S, chap11; Jones and Manuelli, 1997).
    - i. Exogenous growth models.
      - A. Growth generated by ‘disembodied’ technical change (S-L, sec. 5.4; related paper: Christiano (1989)).

- B. Growth generated by investment-specific technical change (Greenwood, Hercowitz and Krusell, 1997, Hornstein and Krusell, 1996).
  - ii. Endogenous growth models.
    - A. “Ak” models (Christiano and Harrison (1999, Appendix); see also: Rebelo (1991)).
    - B. Learning-by-doing and learning-or-doing (S-L; sec. 5.7).
    - C. Increasing variety and specialization (Romer, 1987; Matsuyama, 1999; class notes on Matsuyama).
  - iii. Reasons that Growth Might Not Happen, Even if the Technology is ‘Right’
    - A. Overlapping-generations example (Jones and Manuelli, 1997).
    - B. Vested Interests (Herrendorf and Teixeira, (2003), Parente and Prescott (1994, 1999), Krusell and Rios-Rull (1996)).
- 2. (two lectures) Adding Variable Labor and Money. (See: Albanesi, Chari, and Christiano, (2002a); Christiano and Rostagno, (2002); see also Cole and Kocherlakota, 1998).
  - (a) Necessary and Sufficient Conditions for Private Sector Equilibrium In Cash in Advance Economies.
  - (b) Multiplicity of Private Sector Equilibria.
  - (c) The Optimal Private Sector Equilibrium, and the Type of Monetary Policies that Can Support it.
- 3. (two lectures) Adding Uncertainty and Variable Labor: the Real Business Cycle (RBC) Model.
  - (a) Business Cycle Implications (Cooley and Prescott (1995); see also: Prescott (1986), Summers (1986), Boldrin, Christiano and Fisher (2001)).
  - (b) RBC model with multiple equilibria and sunspot equilibria (see: Christiano and Harrison (1999), Shleifer (1983), class notes on Shleifer; related readings: Bryant (1981,1983), Cass and Shell (1983); Cooper and John (1988); Diamond and Dybvig (1983);

Diamond (1982); Farmer (1993); Farmer and Guo (1994,1995); Farmer and Woodford (1984); Gali (1994a,b); Krugman (1991); Woodford (1986,1991)).

4. (one lecture) Optimal Policy

- (a) The case of full commitment, (Chari (1988); see also Chari, Christiano and Kehoe (1994); Lucas and Stokey (1983)).
- (b) The case of no commitment (the ‘time inconsistency problem’) (Chari (1988) and Christiano and Fitzgerald (2002); see also: Chari, Christiano and Eichenbaum (1996); Albanesi, Chari, and Christiano, (2002a,b), Chari and Kehoe (1980); Kydland and Prescott (1977); Stokey (1991)).

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