

Macroeconomics  
D11-2  
Winter, 1997  
Christiano

## Syllabus

### 1. General Information.

- <sup>2</sup> Lectures are MW 9-10:30, 2107 Francis Searle Building. Recitation is F, 2-4.
- <sup>2</sup> My office number is 318, Anderson. My university phone number is 491-8231. Other numbers where you can reach me are 251-5712 and 312-322-5805. Email: l-christiano@nwu.edu.
- <sup>2</sup> The TA is Li Cui, email address: lcu180@nwu.edu; office: 218 Andersen; office phone number: 491-8211; office hours: Tuesday 5-7.
- <sup>2</sup> The grades will be determined as follows: homeworks, 30%; midterm, 30%; final, 40%. There will be approximately seven 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.

### 2. Goals.

Macroeconomics is about two things: (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 the tools needed to do research on (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. We will then extend this model by incorporating uncertainty and a labor/leisure choice. This allows us to discuss

the Real Business Cycle approach to business cycles ('real' meaning it abstracts from monetary issues). We will consider the pluses and minuses of these models for understanding real-world business cycles. According to this type of model, the business cycle represents the economy's efficient response to exogenous disturbances in preferences and technologies. Government attempts to stabilize the business cycle can only be counterproductive. We will extend the analysis to consider alternative types of real business cycle models in which fluctuations are not necessarily efficient. In these models, the economy left to itself can lapse into a state in which capital and labor resources are wasted. This is true, despite the fact that the models are characterized by market clearing and rational expectations. From the perspective of these models, there is a potential for the government to play a constructive role in stabilizing the business cycle.

The tools developed for the analysis of real business cycle models are useful in other macroeconomic models. We will extend them to models of economic growth and of money.

To address (ii), we will study the optimal determination of tax rates and money growth. 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. Given current institutional arrangements, lack of commitment is particularly relevant for thinking about the conduct of monetary policy.

<sup>2</sup> The textbook for the course is S-L:

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

<sup>2</sup> In addition, a course packet will be made available, and I may also distribute handouts from time to time.

## COURSE OUTLINE

The number of lectures I expect to devote to each topic is given in parentheses. The primary and related readings for each lecture are listed.

1. Infinite Horizon Model With No Uncertainty and Fixed Labor.
  - (a) (two lectures) Efficient Allocations.
    - i. Sequence Approach (S-L: pp. 8-13, sec. 4.5; P. Romer, (1989), sections 2.2.1, 2.2.2) .
    - 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; Cooley-Prescott, 1995, pp. 8-10).
    - i. Date 0 Arrow-Debreu.
    - ii. Sequence-of-Markets.
    - iii. Recursive Competitive Equilibrium.
  - (c) (two lectures) Application: Exogenous and Endogenous Growth Theory.
    - i. Growth with exogenous technological progress (S-L, sec. 5.1; related paper: Christiano (1989))
    - ii. "AK" models (Christiano and Harrison (1996, Appendix); related paper: Rebelo (1991)).
    - iii. Learning-by-doing and learning-or-doing (S-L; sec. 5.7).
    - iv. Increasing variety (P. Romer, 1987).
2. (four lectures) Adding Uncertainty and Variable Labor: the Real Business Cycle (RBC) Model.
  - (a) Standard RBC model (Cooley and Prescott (1995); related paper: Prescott (1986)).
  - (b) RBC model with monopolistic competition (Farmer (1993), sec. 7.2)).

(c) RBC model with multiple equilibria and sunspot equilibria (Christiano and Harrison (1996); related literature: Azariadis (1981); Benhabib-Farmer (1994,1995); Benhabib-Perli (1994); 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); Matsuyama (1991); Woodford (1986,1991)).

3. (̄ve lectures) Models with money .

(a) Money demand arising from absence of double coincidence of wants (Kiyotaki and Wright (1993)).

(b) Cash-in-advance models of money.

i. Models without additional frictions: uniqueness and multiplicity of equilibria (Christiano, Eichenbaum and Evans (1996b)).

ii. Sticky Price Models, Small Menu Costs (D. Romer (1996), sec. 6.10-6.12)).

iii. Limited Participation Models (Christiano, Eichenbaum and Evans (1996a)).

4. (̄ve lectures) Optimal Policy

(a) The case of full commitment, (Chari, Christiano and Kehoe (1994); related paper: Lucas and Stokey (1983)).

(b) The case of no commitment (the 'time inconsistency problem') (Chari (1988); Chari, Christiano and Eichenbaum (1996); related papers: Chari and Kehoe (1980); Kydland and Prescott (1977); Stokey (1991)).

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- [2] Benhabib, Jess, and Roger E. A. Farmer, 1994, 'Indeterminacy and Growth,' *Journal of Economic Theory* 63, pp. 19-41.
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