barcelona|gse
graduate school of economics

3 ECTS

12I003

Economic Growth and Development

Overview and Objectives

The course focuses on the basic models that are being used to analyze issues in economic growth and development.

Course Outline

The broad structure of the course is:

0. Economic Growth Facts
I. The Solow Model
II. Neoclassical Growth Theory
III. Economic Growth with Human Capital and Externalities
IV. Ideas and Economic Growth

The detailed outline is:

I. THE SOLOW MODEL

1. WHY THE SOLOW MODEL?
    1. Focus on the accumulation of physical capital
    2. Capital accumulation and savings alone cannot explain long-run growth
    3. A dynamic general equilibrium model
    4. Still, many things are left out of the Solow model
2. STATIC AND DYNAMIC GENERAL EQUILIBRIUM MODELS
    1. A GE model is simply a model of the economy as a whole
    2. Static GE models
    3. Capital
    4. The snapshot of an economy with capital as a production factor
    5. From the static to the dynamic model
3. THE SOLOW MODEL AT A MOMENT IN TIME
    1. A model of output and factor prices given factor stocks
        1. Preferences
        2. Production (constant returns, decreasing returns, and Inada; labor-augmenting technological progress)
        3. Market structure and equilibrium
    2. The static equilibrium
        1. Labor market
        2. Rental market for capital
        3. Summarizing the static equilibrium
4. SAVINGS, INVESTMENT AND THE CREDIT MARKET EQUILIBRIUM--OR FROM THE RENTAL PRICE OF CAPITAL TO THE REAL INTEREST RATE
    1. Investment and savings meet in the credit (also loan) market
    2. The rent or buy decision
        1. The user cost of capital definition in discrete time

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2. The user cost in one-sector growth models (which includes, among many, the Solow model)
3. The credit/loan market equilibrium
4. Summarizing the credit market equilibrium
5. The credit market equilibrium and the link between present and future (or the capital accumulation equation in equilibrium)

5. THE DYNAMICS OF THE SOLOW MODEL
   1. The dynamics of capital accumulation
   2. From capital accumulation to growth of output per worker
   3. Real wage growth and changes in the real interest rate
6. THE EFFECTS OF AN INCREASE IN SAVINGS ON INCOME
   1. Growth in the long run (in the balanced growth path)
   2. Output per worker in the long run (in the balanced growth path)
7. QUANTITATIVE IMPLICATIONS OF THE SOLOW MODEL
   1. Effect of savings on long run income
   2. The speed of convergence
   3. Income per capita versus output per worker
8. EMPIRICAL APPLICATIONS
   1. Growth accounting, with an application to the Asian “Tigers”
   2. Development accounting
   3. Convergence
      1. Definition and mechanisms
      2. Was there convergence among today’s rich countries?
      3. Convergence among regions
   4. Convergence world-wide after WW-II
      1. Cross-country convergence in the Solow model
      2. Conditional convergence
   5. Forecasting growth of the BRICS
      1 The who?
      2. Forecasts
   6. The marginal product of capital around the world

II. NEOCLASSICAL GROWTH THEORY

1. HOUSEHOLD SAVINGS BEHAVIOR
   1. Keynesian theory
      1. The Keynesian consumption function
      2. Conceptual and empirical limitations
   2. Permanent income theory
      1. Basic idea and two-period model
      2. Closed form solution in a simple case
      3. Three and more periods
   3. Optimal consumption and (savings) in continuous time
      1. Finite horizon decision problem in continuous time
      2. Intertemporal budget constraint
      3. Rate of time preference (time discount rate)

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4. First-order condition (optimality between adjacent points in time)
5. Closed-form solution in simple case
6. Deriving the continuous time first-order condition

2. THE RAMSEY-CASS-KOOPMANS MODEL
1. Equilibrium growth with infinite-horizon households
   1. Technology and capital market
   2. Household behavior with infinite horizon
   3. Dynamic equilibrium system
2. Equilibrium growth and optimality
3. Applications of the RCK model
   1. Government spending, consumption, and interest rates
   2. Bond versus tax financed government spending

III. ECONOMIC GROWTH WITH HUMAN CAPITAL AND EXTERNALITIES

1. THE IMPORTANCE OF THE ROLE PLAYED BY CAPITAL IN PRODUCTION
   1. Decreasing returns to capital
   2. Convergence
   3. The effect of savings on long run income
2. A SIMPLE MODEL OF ENDOGENOUS GROWTH
   1. The AK model
   2. The AK model and capital income shares
   3. EXTERNALITIES AND ENDOGENOUS GROWTH
      1. Capital income shares and the effect of capital on output
      2. Rivalry, excludability, and externalities
      3. Aggregate implications of capital externalities
4. HUMAN CAPITAL AND ENDOGENOUS GROWTH
   1. Human capital and “broad capital”
      1. Similarities and differences with physical capital
      2. Human capital, the return to schooling, and development accounting
   2. Human capital externalities
      1. Estimating schooling externalities in the US

IV. IDEAS AND ECONOMIC GROWTH
1. A FRAMEWORK FOR ANALYZING GROWTH WITH IDEAS
   1. Framework
   2. The “Idea production function”
2. APPLICATION: IDEAS AND POPULATION GROWTH
   1. Population growth since 1 Million B.C
   2. Population growth and subsistence; The Mathusian hypothesis
   3. Exogenous technological change and population growth
   4. Kremer’s explanation for accelerating population growth

Required Activities

TO BE DETERMINED BY PROFESSOR

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Evaluation

The final grade will mainly depend on your performance in a final exam (at the end of the term), but class participation and problem sets will also count. In particular, I will hand out 5 short problem sets. You should turn in hand-written solution (the hand in date will be announced in class). 15% of the final grade will depend on the problem sets and 5% on class participation.

Materials

The best place to start on the Solow model is Gregory Mankiw or Olivier Blanchard "Macroeconomics". They both have excellent discussions of the basics of the Solow model and applications. An excellent book that is focused on growth economics is Charles Jones "Introduction to Economic Growth".

Another one is David Weil's "Economic Growth." A more advanced analysis is in the first 3 chapters of David Romer "Macroeconomics." Course lectures will be based on my own slides that draw on a variety of books and articles. I will also record my lectures and make the recordings available.