Overview and Objectives

PART I

The course focuses on models of medium and long run macroeconomic dynamics and their empirical implications. The textbook for the course is Advanced Macroeconomics, 3rd edition by David Romer. The relevant chapters are 1-3.

PART II

This course focuses on models explaining the fluctuations of aggregate consumption and asset pricing, on business cycle theories and on labor market theories. For each topic we will illustrate the basic theory, in order to provide the framework and the analytical tools necessary to understand the behavior of the relevant empirical questions. We will then discuss to what extent the theory is successful in explaining the behavior of aggregate economic variables. In particular, we will focus on the unsolved empirical puzzles and on the recent studies that attempt to solve them.

Course Outline

PART I

The structure of the course is:

I. The Solow Model
II. Economic Growth with Endogenous Savings
III. Economic Growth with Human Capital and Externalities
IV. R&D and Economic Growth

Detailed Outline

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
      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
      1. Output and TFP growth of the Asian “Tigers”
      2. US versus EU growth: when did the EU stop to catch up (and why)?
   2. Productivity level 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

II. ECONOMIC GROWTH WITH ENDOGENOUS SAVINGS

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. 3 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)
      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

3. THE DIAMOND MODEL
   1. Overlapping generations models
   2. Equilibrium growth
      1. Technology
      2. Household behavior
      3. Dynamic equilibrium system
   3. Equilibrium growth and optimality
   4. Applications of the Diamond 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 with physical capital
      2. Important differences
   2. Human capital externalities
      1. Empirical applications (externalities in cities; aggregate and individual return to human capital)
      2. Human capital and technological progress

IV. RESEARCH&DEVELOPMENT AND ECONOMIC GROWTH

1. A FRAMEWORK FOR ANALYZING EQUILIBRIUM GROWTH WITH RESEARCH AND DEVELOPMENT
   1. Framework
   2. The “Idea production function”

2. A FRAMEWORK FOR ANALYZING GROWTH DYNAMICS WITH RESEARCH AND DEVELOPMENT
   1. Simplest possible case
   2. The case with capital

PART II

1. Consumption and asset prices
   a. Optimal Consumption under Uncertainty.
   b. The permanent income hypothesis.
   c. Liquidity constraints and precautionary saving.
   d. Consumption and asset prices.

2. Business cycles
   a. Empirical evidence on the cyclical fluctuations of aggregate economic variables.
   b. An introduction to real business cycle theory
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3. Unemployment Theory
   b. Labour market frictions and labour dynamics.

4. Money and Monetary policy
   a. Money and the Friedman rule.
   b. Imperfect competition, sticky prices, and money non-neutrality.
   c. Implications for monetary policy

Required Activities

PART I

There will be 5 problem sets, which will be handed out in the first lecture of each week. You have to hand in handwritten solutions in the following week. Please note: the problem sets are very necessary work.

For the problem sets you will get points according to the fraction of the problem sets that you answered in sufficient detail. Solution must be HANDWRITTEN. IMPORTANT NOTE: Please be aware that I think your chance of passing this course is almost 0 if you do not try and solve the problems yourself. You can work in groups, but I want separate solutions for everybody.

PART II

There will be 4 problem sets, which will be handed out in the first lecture of each week. Except for the first problem set, you have to hand in handwritten solutions before the practice class in the following week. Please note: the problem sets are HARD, NECESSARY WORK.

Evaluation

PART I

The final grade will depend on your performance in a final exam (90%) and the problem sets (10%). The final exam is at the end of the term together with the exam of the second part of the course.

PART II

Grades will be based on a final exam and on the problem sets and class participation in general.
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Materials

PART I

ALL MATERIALS WILL BE MADE AVAILABLE AT: www.antoniociccone.eu

PART II

REFERENCES ON TOPIC 1


Other useful textbooks:

Adda, J. and R. Cooper, Dynamic Economics, MIT Press, pages 139-147 (a simple guide to the basic two period model of consumption)

Deaton, A. "Understanding Consumption", Clarendon Press, 1992, chapters 1, 2 and 3; (very clear lectures on consumption and precautionary saving)


Readings


REFERENCES ON TOPIC 2

Romer, Chapter 4

Further readings
Macroeconomics


REFERENCES ON TOPIC 3


REFERENCES ON TOPIC 4

Romer, Chapter 6


Gali' and Gertler, JEP 2007, Macroeconomic Modeling for monetary policy evaluation