

PhD in Economics
MACROECONOMICS
Module II

1. Neoclassical growth theory

Prof. Pozzolo - 8 hours

Description

The first part of the module reviews the traditional Solow neoclassical growth model and the Ramsey-Cass-Koopmans model with endogenous savings. The crucial Euler condition of intertemporal optimization is discussed in some detail, also with regards to its implications for asset pricing (i.e., the Capital Asset Pricing Model, CAPM). The model is presented and solved using both the Lagrange method, including stability analysis through linearization, and using the maximum principle with a recursive representation.

References

The main reference for this part of the module is Acemoglu, D. (2009), *Introduction to modern economic growth*, chapters 2, 3, 5, 8. A useful introduction to the recursive approach is Ljungqvist, L. and Sargent (2018), T. J., *Recursive macroeconomic theory*, 4th edition, chapters 1 and 3. The main reference for the recursive approach is Stokey, N. L., Lucas, R. E. Jr. with Prescott, E. C., *Recursive Methods in Economic Dynamics* (1989). A useful reference for the CAPM model is Cochrane (2001), *Asset Pricing*, 2nd edition, chapters 1 and 9.

2. Endogenous growth theory

Prof. Pozzolo - 8 hours

Description

The second part of the module introduces endogenous growth theory. It first presents first-generation models that focus on the role of constant returns to scale in the accumulable factors, either aggregate capital (the AK model), human capital (The Lucas model) or a combination thereof. It then extends the analysis to second generation models based on endogenous technological change (Romer's and Aghion and Howitt models). Some reference will be made to the issue of scale economies in endogenous growth models and semi-endogenous growth models (i.e., Jones's model) and to the role of international trade.

References

The main references for this part of the module are Barro, R.J., and Sala-i-Martin, X. (2004), *Economic growth*, 2nd edition, chapters 1-4, and Aghion, P., and Howitt, P. (1998), *Endogenous*

Growth Theory, chapters 1 and 2. Additional useful references are Jones, C., and Vollrath, D. (2019), *Introduction to economic growth*, 3rd edition, and Grossman, G.M., and Helpman, E. (1991), *Innovation and Growth in the Global Economy*. Lecture notes will be distributed throughout the course.

3. DSGE

Prof. Giuli – 10 hours

Description

In the first two lessons of the course, we will see how to solve, calibrate, and simulate a Walrasian (perfectly competitive with perfect price flexibility) Dynamic Stochastic General Equilibrium (RBC-DSGE) model. Then, we will focus on the **micro-foundation** of a canonical New-Keynesian model, which shares the same methodological approach as the RBC theory but **is based on monopolistic competitive markets and sticky prices**. These two hypotheses **make money non-neutral and give the monetary policy an active role**. In this way, we will see how it is possible to reproduce the evidence conditioned to the realization of both real and nominal shocks.

References

There is no single assigned textbook for the course. Rather, class lectures and handouts will draw on my typed notes, which will be available online. The teaching material is based on the following textbooks and scientific papers:

Gali, Jordi. *Monetary Policy, Inflation, and the Business Cycle*.

Walsh, Carl. *Monetary Theory and Policy*.

King, Robert G. & Rebelo, Sergio T., 1999. "Resuscitating real business cycles," *Handbook of Macroeconomics*, in: J. B. Taylor & M. Woodford (ed.), *Handbook of Macroeconomics*, edition 1, volume 1, chapter 14, pages 927-1007, Elsevier.

Mark Gertler & Jordi Gali & Richard Clarida, 1999. "The Science of Monetary Policy: A New Keynesian Perspective," *Journal of Economic Literature*, American Economic Association, vol. 37(4), pages 1661-1707.

Giuli, Francesco & Tancioni, Massimiliano, 2017. "Contractionary Technology Shocks," *Macroeconomic Dynamics*, vol. 21(7), pages 1752-1789.

4. OLG

Prof. Di Bucchianico – 10 hours

The first objective of the module is to introduce PhD students to the study of the OLG model. Second, specific topics will be covered so as to discuss applications to issues such as stagnation and pension reforms. Third, exercises are scheduled at the end of the module. Active discussion is strongly encouraged.

1. Overlapping generations model. Introduction to the model (Romer 2019, Ch. 2).
2. OLG models and dynamic inefficiency. Discussion of dynamic inefficiency and the test for it proposed by Abel et al. (1989) until the more recent contribution of Blanchard (2019).
3. OLG models and social security. Applications of the model to the study of social security and its reform such as the transition from a pay-as-you-go to a fully funded system (Barr and Diamond 2006; Hindricks and Miles 2013).
4. OLG models and Secular Stagnation. Analysis of the topic of Secular Stagnation through the three-generation OLG model of Eggertsson et al. (2019), analysis of the main determinants of stagnation.
5. Exercises. List of exercises meant to cover all the arguments developed during the module.

References

- Abel, A. B., Mankiw, N. G., Summers, L. H., & Zeckhauser, R. J. (1989). Assessing dynamic efficiency: Theory and evidence. *The Review of Economic Studies*, 56(1), 1-19.
- Barr, N., and Diamond, P. (2006). The economics of pensions. *Oxford review of economic policy*, 22(1), 15-39.
- Blanchard, O. (2019). Public debt and low interest rates. *American Economic Review*, 109(4), 1197-1229.
- Eggertsson, G. B., Mehrotra, N. R., & Robbins, J. A. (2019). A model of secular stagnation: Theory and quantitative evaluation. *American Economic Journal: Macroeconomics*, 11(1), 1-48.
- Hindriks J. and Myles G. (2013). *Intermediate Public Economics* (second edition). MIT Press.
- Romer, D. (2019). *Advanced Macroeconomics* (fifth edition). McGraw-Hill Education, New York.