ROMA TRE UNIVERSITY – DEPARTMENT OF ECONOMICS
PHD PROGRAMME IN ECONOMICS – A.Y. 2025–2026

Macroeconomics – Module II

Objectives:
The aim of this module is to provide an overview of the basic theoretical and analytical tools used in macroeconomic analysis, with three main goals: (i) to enable PhD students to read and understand recent original contributions, placing them in the broader context of recent developments in macroeconomic analysis; (ii) to describe the main analytical tools employed; (iii) to present possible directions for future research.

Topics covered and teaching hours are as follows:

1. Neoclassical and endogenous growth theory (16 hours) – Alberto Pozzolo

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. The model is presented and solved using both the Lagrange-Hamiltonian method, including stability analysis through linearization, and using the maximum principle with a recursive representation. The second part of the module introduces endogenous growth theory, presenting 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, and the Schumpeterian creative destruction model of R&D based growth.

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Base references
The main reference for this part of the course is Acemoglu, D. (2009), Introduction to modern economic growth, chapters 1, 2, 3, 5, 8, 11. A useful introduction to the recursive approach is Ljungqvist, L. and Sargent (2018), T. J., Recursive macroeconomic theory, 4th edition, chapters 1 and 3. Schumpeterian models of growth are presented in Aghion, P., and Howitt, P. 2009. The Economics of Growth. The MIT Press, Cambridge Massachusetts.

2. OLG models (16 hours) – Stefano Di Bucchianico

Description
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. The following topics will be covered:

- Overlapping generations model. Introduction to the model (Blanchard and Fischer, 1989; Romer 2019);
- 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);
- 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);

- 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.

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.
- Blanchard, O., & Fischer, S. (1989). Lectures on Macroeconomics. MIT press.
- 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.

3. Macroeconomic modeling for business cycle and monetary policy analysis (10 hours) – Barbara Annicchiarico

Description

This course provides a focused introduction to modern macroeconomic modeling for business cycle and monetary policy analysis, with particular emphasis on the New Keynesian framework. Starting from a brief overview of Real Business Cycle (RBC) models, the course introduces the core building blocks of New Keynesian models and illustrates how nominal rigidities, expectations, and monetary policy interact in shaping macroeconomic dynamics. The course aims to:

- present the conceptual foundations of the New Neoclassical Synthesis, highlighting the transition from RBC to New Keynesian models;
- familiarize students with the structure and solution of small-scale dynamic stochastic general equilibrium (DSGE) models;
- provide a guided, hands-on introduction to model simulation using Dynare for Matlab;
- illustrate how theoretical models are used to interpret macroeconomic fluctuations and monetary policy outcomes, with reference to observed data.

Given the limited duration of the course, extensions of the baseline New Keynesian framework are presented selectively and at an overview level. The following topics will be covered:

- The RBC model (overview)
    - From the Cass–Koopmans growth model to the basic RBC framework
    - Technology shocks and labor dynamics
    - Limitations of the RBC approach
- The New Keynesian model
    - Motivation and empirical relevance
    - Core building blocks and hypotheses
    - Derivation of the basic log-linearized three-equation model
    - Solution methods
    - Technology shocks and labor dynamics
    - Monetary policy, inflation, and forward guidance

- Some extensions of the New Keynesian framework (overview)
    - Behavioral New Keynesian models
    - Environmental New Keynesian models
    - Two-Agent New Keynesian (TANK) models

References

- The RBC model
- Romer, D. (2021). Advanced Macroeconomics (5th ed.), McGraw–Hill, Chapter 5.
- Long, J. B., & Plosser, C. I. (1983). Real business cycles. Journal of Political Economy,91(1), 39–69.
- The New Keynesian model
- Woodford, M. (2003). Interest and Prices, Princeton University Press, Chapter 4.
- Galí, J. (2015). Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework and Its Applications, Princeton University Press, Chapter 3.
- Clarida, R., Galí, J., & Gertler, M. (1999). The science of monetary policy: A New Keynesian perspective. Journal of Economic Literature, 37(4), 1661–1707.
- Goodfriend, M., & King, R. G. (1997). The new neoclassical synthesis and the role of monetary policy. NBER Macroeconomics Annual, 12, 231–283.
- Some extensions of the New Keynesian framework
- Gabaix, X. (2020). A behavioral New Keynesian model. American Economic Review, 110(8), 2271–2327.
- Annicchiarico, B., & Di Dio, F. (2015). Environmental policy and macroeconomic dynamics in a New Keynesian model. Journal of Environmental Economics and Management, 69, 1–21.
- Galí, J., López-Salido, J. D., & Vallés, J. (2004). Rule-of-thumb consumers and the design of interest rate rules. Journal of Money, Credit and Banking, 36(4), 739–763.

- Useful links
- Dynare: www.dynare.org/
- Dynare examples (J. Pfeifer's homepage): sites.google.com/site/pfeiferecon/dynare
- FRED – Federal Reserve Economic Data: fred.stlouisfed.org/
- ECB Statistical Data Warehouse: data.ecb.europa.eu/
- DBnomics – Economic data platform: db.nomics.world/
- R interface to DBnomics: cran.r-project.org/web/packages/rdbnomics/vignettes/rdbnomics.html