



Dipartimento di Scienze Economiche ed Aziendali
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Dottorato in Scienze Economiche e Aziendali
Doctoral Program in Economics and Business
Coordinatrice: Prof.ssa Francesca Cabiddu

The Economics of Stability and Global Transitions in Continuous-Time Macroeconomic Models

Course leader: Giovanni Bella and Paolo Mattana

Aims of the course

This course provides a systematic analysis of stability, indeterminacy, and equilibrium transitions in continuous-time macroeconomic models. It develops the economic intuition underlying dynamic adjustment, forward-looking behavior, and structural instability, moving from local equilibrium analysis to global dynamics and regime shifts. The emphasis is on understanding how the fundamentals of an economy — preferences, technology, market structure, heterogeneity, and policy design — shape the qualitative behavior of macroeconomic systems over time.

Learning outcomes and competences

By the end of the course, students will:

- understand how continuous-time macroeconomic models generate dynamic adjustment processes;
- translate economic assumptions into dynamic systems governing macroeconomic evolution;
- interpret stability properties of the equilibrium;
- distinguish between local and global equilibrium properties;
- analyze how policy and structural parameters influence equilibrium selection and regime transitions.

Pre-requisites

Advanced Macroeconomics; Mathematics

Course contents and syllabus

1. From the Economic Model to Dynamic Systems

- Intertemporal optimization in continuous time
- Forward-looking behavior and the role of expectations
- Economic interpretation of motion laws: capital accumulation, inflation dynamics, etc.

2. Steady States and Long-Run Equilibrium

- Definition and economic interpretation of steady states
- Balanced growth paths and stationary equilibria
- Role of structural parameters in determining long-run outcomes

3. Local Stability and Saddle-Path Convergence

- Local dynamics around the steady state
 - Economic meaning of saddle-path stability
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4. Multiple Steady States, Indeterminacy and Global Dynamics

- Increasing returns and externalities
 - Financial feedback effects
 - Development traps and high- and low-growth equilibria
 - Regime shifts and qualitative changes in system behavior
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5. Policy Design and Stability

- Monetary and fiscal rules in continuous time
 - Stabilizing versus destabilizing policy regimes
 - Policy-induced regime shifts
 - Anchoring expectations and eliminating undesirable equilibria
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6. Case Studies

- The Lucas Model of Endogenous Growth
 - RANK Monetary Models (Representative Agent New Keynesian).
 - HANK Monetary Models (Heterogeneous Agent New Keynesian)
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Organization of the course

The course consists of 4 classes of 3 hours each (12 cfu). Lectures will be run in-person according to the schedule.

All the relevant material will be stored in the Teams class “PhD Programme in Economics and Business” following this path: Documenti/General/Class Materials/Economics Stability in Macroeconomic Models. First year PhD students are made members by using their UniCa email account. Students can access the Teams application by using the same account.

The timetable of the course can be found in the Team class calendar.

Assessment method

The assessment is based on the presentation of an assigned paper.

Reading list

1. Barnett W.A. and Han R. (2024) Economic Bifurcation and Chaos. World Scientific, Singapore.
2. Lucas R. (1988) On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
3. Banhabib J., Schmitt-Grohé S., Uribe M. (2001) The perils of Taylor rules. *Journal of Economic Theory*, 96, 40-69.
4. Acharya, S. and Benhabib, J. (2024) Global Indeterminacy in HANK Economies, CEPR discussion Paper.