

## Macroeconomics-Module 2

### Outline of the Course

This 24-hour course builds on the module taught by prof. Femminis. It focuses on new developments involving real business cycle theory, monetary and fiscal policy. The course is split into two modules taught by prof. [Tirelli](#) and prof. Ropele. Instructors adopt a distinctive hands-on approach: students will be taught simulation techniques that will enable them experiment with models.

#### Prof. Tirelli

The module will be divided into two main components.

- Component 1. Analysis of business cycle regularities and Real Business Cycle (RBC) theory. RBC models essentially are stochastic versions of the Ramsey Cass and Koopmans model, where uncertainty is determined by the occurrence of productivity shocks.
- Component 2. Review of empirical regularities involving money, interest rates, inflation and the real effects of monetary shocks on output and other aggregate variables. Then, introduction to New Neo-classical synthesis models (New Keynesian models). Basically, these are RBC models amended to incorporate nominal (price and wage) rigidities. In the NK models demand shocks and monetary policy play an important role.

#### Prof. Ropele

This module will be divided into three main components.

- Component 1. Central bank's behavior in the standard New Keynesian DSGE model. We will discuss the case in which the monetary authority follows a simple nominal interest rate rule (as the so-called Taylor rule) as well as the case in which it sets the policy rate optimally. In this latter instance, we will consider the optimal solution under discretion or commitment.
- Component 2. Fiscal policy in RBC/DSGE models. We will introduce the role of fiscal policy (taxation, public spending and public debt) in the basic RBC model. We will discuss the so-called Ricardian equivalence proposition and explore under which conditions it breaks down. Finally, we will examine a basic heterogeneous agents model (with optimizing and rule-of-thumb consumers) and study both monetary and fiscal policy
- Component 3. Key features of medium-scale New Keynesian DSGE models. In the last part of the module we will first recall the main macroeconomic empirical regularities in response to a monetary policy shock and then present the key building blocks of a medium-scale DSGE model that features a large number of real and nominal frictions and that has been proved successful at replicating these stylized facts.

#### Tutorials

Prof. Albonico is responsible for tutorials (12 hours), to be held in the lab. To this end, students are requested to install matlab on their laptops before lectures begin.

The outline of this part of the course is the following:

- 1) Introduction to Dynare and deterministic simulation
- 2) Log-linearization and stochastic simulation of RBC models
- 3) Simulation of New Keynesian models
- 4) Adding shock and frictions to DSGE models (Christiano, Eichenbaum and Evans, 2005)
- 5) (If time allows) estimating a DSGE model with Dynare (Smets and Wouters, 2007)

## References

Jordi Galí, Monetary Policy, Inflation and the Business Cycle: An Introduction to the New Keynesian Framework (Princeton UP)

Lawrence J. Christiano & Martin Eichenbaum & Charles L. Evans, 2005. "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy," *Journal of Political Economy*, University of Chicago Press, vol. 113(1), pages 1-45, February.

Frank Smets & Rafael Wouters, 2007. "Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach," *American Economic Review*, American Economic Association, vol. 97(3), pages 586-606, June.

Lecture slides + relevant papers will be made available as the course unfolds.