

Macroeconomics I

Course title - Intitulé du cours	Macroeconomics I
Level / Semester - Niveau / semestre	M2 / S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	COLLARD FABRICE
Other teacher(s) - Autre(s) enseignant(s)	FEVE PATRICK
Other teacher(s) - Autre(s) enseignant(s)	JONAS GATHEN (TA)
Other teacher(s) - Autre(s) enseignant(s)	PHILIP WANGNER (TA)
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Lecture Hours - Volume Horaire CM	30
TA Hours - Volume horaire TD	
TP Hours - Volume horaire TP	
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

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Meeting by appointment. Meeting will take place online

Course's Objectives - Objectifs du cours :

The objective of this course is to introduce students to the methods and models of modern macroeconomics. Although these methods will be studied in the context of macroeconomics, they are commonly used in many other fields of economics, such as labor economics, development economics, industrial organization, public economics, international or financial economics (corporate finance or asset pricing).

Macroeconomics, like most areas of economics, is an empirical field. Throughout the course, we will emphasize the need to confront theoretical results to empirical evidence. This will lead us to assess how models address questions raised by the data and impose a discipline on the data, reciprocally how the data also impose discipline on the model, how models can be confronted to the data, how to interpret results.

The first semester is dedicated to the canonical complete markets model. Although this framework is not without limitations, it allows to analyze a wide variety of phenomena including growth, business cycle analysis, labor markets, asset prices, fiscal and monetary theory... and constitutes the main platform upon which more complex models –studied in the second semester– builds. The first semester focuses on the methods to develop, solve, simulate and confront macroeconomic models to the data (The second semester will bring students to the frontier of modern macroeconomics, in which

microeconomic heterogeneity and frictions play an important role in shaping cross-sectional and aggregate allocations).

The course will be organized around the following topics

- **A look at the data:** The course starts by having a close look at the data to identify (and quantify) the questions to be tackled in this class. The aim is to see how to look at the data, how theory actually shapes the construction of the data, how to put structure on the data (cycle vs trend...) and how to specify a question quantitative.
- **Complete Market Economies:** These lectures will develop the baseline complete market economy, and derive some important properties that characterize the associated allocations. This part introduces students to the central planner allocation and its decentralization, introduces the notion of sequential trading and Arrow-Debreu securities. We will also see how a vast variety of models actually maps in this framework.
- **Business Cycles :** We will build a first baseline dynamic general equilibrium model (the so-called Real Business Cycle (RBC) model) that aims at explaining some of the facts we will have discussed in the first lectures. We will see how to write the model (and why it is written that particular way), have a critical discussion of the main assumptions, derive a method to solve and simulate the model, and will then confront its predictions to the data. In that sense we will address the main questions raised by Quantitative Macroeconomics. We will then revisit critically the previous model. We will review a method to identify margins on which a model fail to account for the facts, and in so doing will identify dimensions along which models should be improved.
- **Using the Model :** We will show how the baseline model can be used to shed new light on History, build counterfactuals to understand a phenomenon and isolate the important margins that were driving a particular event ---in this instance the Great Depression in Germany.
- **Shocks Identification and Their Aggregate Effects :** A large strand of the macroeconomic literature assumes an impulse-propagation scheme, by which fluctuations are the results of the propagation of exogenous shocks (impulse) that hit the economy. This is the case for the models developed in earlier lectures, in which the existence and observability of these shocks was assumed. One question was left unexplored: how can such shocks be observed and what are their empirical counterpart? This is the object of these lectures which will show how to properly identify structural shocks in a (dynamic) multivariate setting. This is a critical problem in macroeconomics, but it extends generically to other fields. This will be done in the context of Structural Vector Auto-Regressions (SVARs hereafter) and various associated identification strategies. We will also show how this type of model can be used for business cycle accounting. Three important examples are considered for illustrative purposes: Total Factor Productivity, Fiscal policy and Monetary policy.
- **From SVAR Models to RBC Models and back :** These lectures will illustrate how SVARs can serve as a useful guide for developing quantitative theories of the business cycle. We first explore the weak propagation mechanism of the RBC model. We then discuss how the estimated response of hours to a technology improvement can be used to strongly reject the basic frictionless setup. But this approach considers SVARs findings at face value. This is why we invert the quantitative analysis and use the RBC model as a laboratory to assess the accuracy of the SVAR approach. Finally, we show how to combine both approaches for a proper quantitative assessment (Indirect Inference).
- **Identification/Estimation of RBC Models :** The estimation of RBC type models allows to properly identify shocks and their contribution to aggregate fluctuations. In a typical business cycle accounting exercise, this approach permits to isolate the main drivers of the business

cycle and help the researcher to improve the model in many directions (labor market imperfections, financial frictions, ...). Identification and estimation issues of RBC models will be discussed using analytical results and simulation experiments. We also show how we can conduct specification tests (cross-equation restrictions, exogeneity restrictions, stochastic process of driving variables, stability tests and testing for the Lucas Critique ...) to improve these models. We finally put a special emphasis on partial versus full information identification/estimation methods.

By the end of this course, student should be comfortable with 1) the main building blocks of modern macroeconomics, 2) the basic tools that are used in macroeconomic modeling (and more generally in dynamic models), 3) how to use models to organize the data.

Prerequisites - Pré requis :

Basic optimization theory

Intermediate Macroeconomics

Basic Microeconomics (Consumer theory, theory of the firm)

Practical information about the sessions - Modalités pratiques de gestion du cours :

Computers allowed in the classroom

Students are expected to participate actively to the class. There will be a weekly set of TA sessions. Students will be assigned a set of practical problems to develop your own modeling, computational and empirical skills. You are encouraged to work in group.

Grading system - Modalités d'évaluation :

Evaluation will be based on a Mid-term exam and a final exam.

Bibliography/references - Bibliographie/références :

Slides + Lecture notes will be distributed in due time. Some books may however be useful to skim through in some cases:

1. Ljungquist and Sargent: Recursive Macroeconomic Theory, 2nd edition (MIT Press, available online): Offers technical background material for various parts of this course.
2. Stokey and Lucas: Recursive Methods in Economic Dynamics (Harvard University Press): This book offers background reading on dynamic programming and Markov processes (useful if you want to improve your math skills)
3. DeJong and Chetan Dav: Structural Macroeconometrics, 2nd Edition (Princeton University Press): This book provides a general overview of methodologies, models, and techniques used to analyze aggregate dynamic models.
4. Fabio Canova: Methods for Applied Macroeconomic Research (Princeton University Press). This book offers a very detailed treatment of quantitative techniques in applied macroeconomics.

Distance learning – Enseignement à distance :

In case of lockdown, the lectures will take place online.