Monetary Economics

General Introduction

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ENSAE

October – November 2024

Objective of the course

- This course aims at providing an introduction to
  - the **New Keynesian** (NK) framework, from the basic NK model to an extended NK model with financial frictions,
  - its positive and normative implications for **monetary policy** in normal times and in crisis times.

- Monetary policy is the central-bank policy of setting
  - the short-term nominal interest rate (**conventional** monetary policy),
  - other instruments (**unconventional** monetary policy),

  to achieve macroeconomic goals.

Main questions and lesson

- Main **questions** addressed by the course:
  - What are the effects of monetary policy?
  - How does monetary policy work?
  - What should be the objectives of monetary policy?
  - How should monetary policy be conducted?
  - What to think of existing monetary-policy strategies?
  - What to think of existing unconventional monetary-policy measures?

- Main **lesson** of the course: the importance of
  - the private agents' expectations,
  - the natural level of output and natural rate of interest,

  in the transmission and the conduct of monetary policy.

Threefold motivation

1. The NK framework has become the workhorse for the analysis of monetary policy (and, more generally, business cycles) in academia.
2. It is the backbone of the medium-scale models currently used or being developed at the International Monetary Fund and many central banks.
3. It has provided the theoretical underpinnings to the inflation-stability-oriented strategies adopted by many central banks.

Qualitative models

- The course focuses on the **simplest NK models** with which conventional and unconventional monetary policies can be studied.
- These models are **qualitative**, not quantitative.
- They need to be extended (i.e. to be added features) and to be estimated on macro data in order to have quantitatively relevant implications.
- These extensions and this estimation will be seen in the second-semester course "*Applied Macroeconomic Modelling: Policies, the Business Cycle, and the Green Transition*."
- Most of these extensions do not qualitatively affect the models' positive and normative implications for monetary policy.

Outline of the course

- **General introduction**
- **Part I: Conventional monetary policy**
  - *Chapter 1:* The basic NK model
  - *Chapter 2:* Optimal monetary policy
  - *Chapter 3:* Monetary-policy design
- **Part II: Unconventional monetary policy**
  - *Chapter 4:* Forward guidance
  - *Chapter 5:* Quantitative vs. credit easing
- **General conclusion**

The RBC revolution

- In the 80's, **Real-Business-Cycles (RBC) models** became the main framework for the analysis of macroeconomic fluctuations (Kydland and Prescott, 1982).
- The canonical RBC model can be viewed as the Cass-Koopmans-Ramsey growth model adapted to business cycles, i.e. with
  - endogenous labor supply,
  - exogenous shocks.
- From a methodological point of view, the RBC revolution has
  - introduced the use of "Dynamic Stochastic General-Equilibrium" (DSGE) models, which are based on micro-foundations,
  - introduced the use of rational expectations,
  - stressed the importance of the models' quantitative properties.

Some implications of RBC models

1. Business cycles are **efficient**, as they are the response of a frictionless economy to real disturbances (first welfare theorem), so that there is no role for stabilization policies.

2. Technology shocks are a key source of economic fluctuations.

3. Monetary policy is (quasi-)**neutral in the short term** with respect to real variables.

4. The optimal monetary policy is **passive** and consists in keeping the short-term nominal interest rate constantly at zero (**Friedman's rule**, 1969).

Limited usefulness of RBC models for central banks

- The RBC approach had a very limited influence on central banks because
  - it could not explain the short-run effects of monetary policy on real variables (Friedman and Schwartz, 1963),
  - the Friedman rule stood at odds with the monetary policies pursued and viewed as desirable by central banks.
- So central banks went on relying on large-scale non-micro-founded models, despite their limitations for policy evaluation:
  - their vulnerability to Lucas' (1976) critique,
  - their lack of a welfare criterion.
- These tensions between
  - theoretical predictions and empirical evidence,
  - normative implications and policy practice,

  eventually led to the development of NK models.

Main similarity between RBC and NK models

- Like RBC models, NK models are DSGE models.
- As such, they are micro-founded models, taking explicitly into account
  - private agents' preferences,
  - technological constraints,
  - institutional constraints.
- Their equilibrium conditions are thus
  - the first-order conditions of the private agents' optimization problems,
  - the constraints of these problems,
  - market-clearing conditions.
- Again, micro-founded models have a twofold advantage:
  - they are not subject (or less sensitive) to Lucas' (1976) critique,
  - they enable one to assess the desirability of a policy from a welfare perspective.

Main differences between RBC and NK models

- Unlike in RBC models, in NK models some markets are
  - **monopolistically** (not perfectly) **competitive**, so it is private agents (not a Walrasian auctioneer) that set the price on these markets,
  - characterized by **nominal rigidities** (e.g., constraints for firms on the frequency with which they can adjust prices).

- These assumptions are borrowed from
  - static general-eq. Keynesian models (Blanchard and Kiyotaki, 1987),
  - dynamic partial-equilibrium Keynesian models (Calvo, 1983).

Some implications of NK models

1. Economic fluctuations are generally **inefficient**.
2. Monetary policy is **not neutral in the short term**, due to its effects on the short-term real interest rate (themselves due to nominal rigidities).
3. Monetary policy is neutral in the long term, as all prices then adjust.
4. Optimal monetary policy is **active** along the business cycle.

Empirical evidence on nominal rigidities

- Most of the studies based on microeconomic data on **prices** point to
  1. an average price duration of 8 to 12 months,
  2. little synchronization of price adjustments,
  3. substantial heterogeneity in price durations across sectors,

  both in the US and in the euro area (e.g. Taylor, 1999; Nakamura and Steinsson, 2006; Dhyne et al., 2006).

- The basic NK model can account for Facts 1-2 (see Chapter 1) and can easily be extended to account for Fact 3 (see Chapter 2).

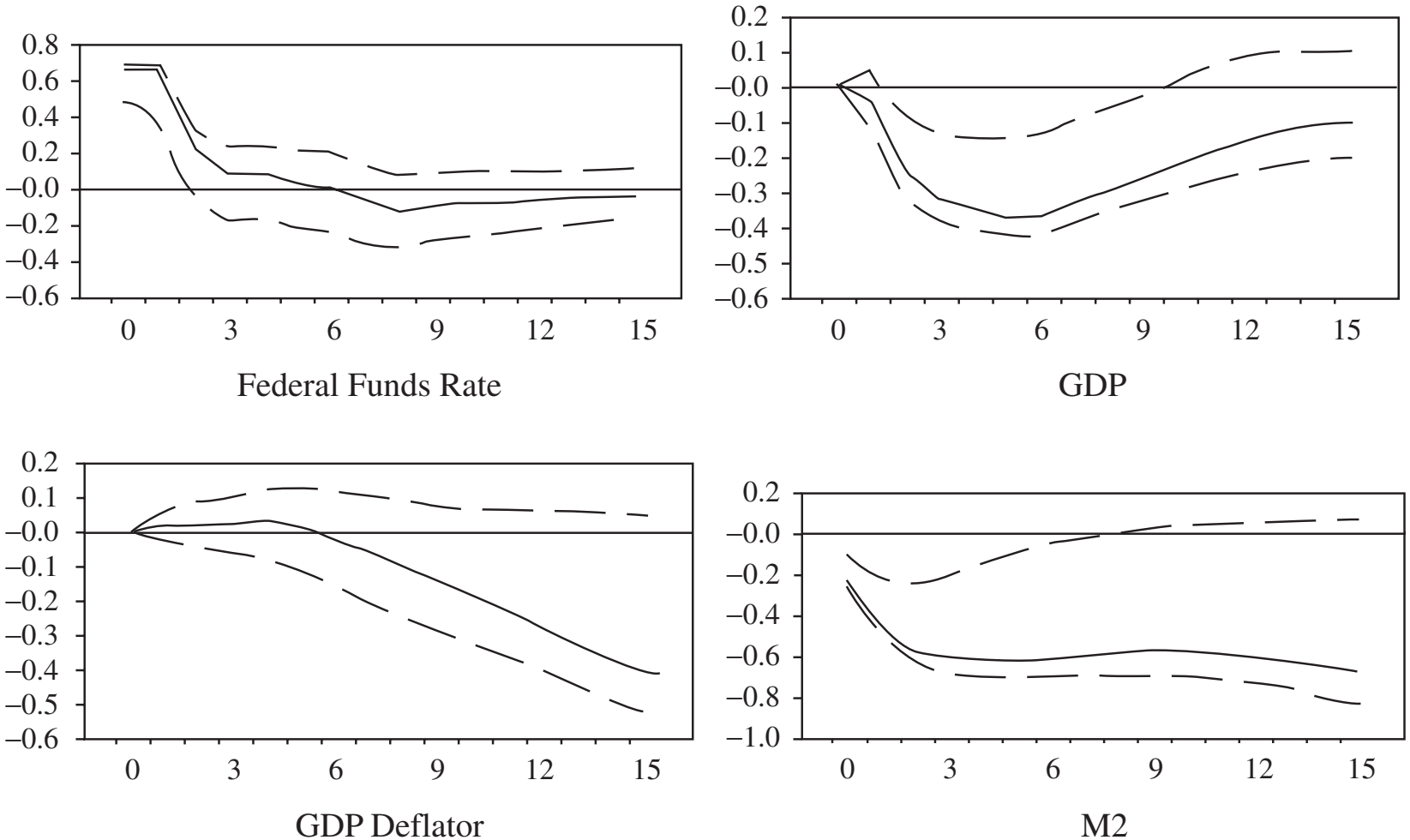
- Several studies based on microeconomic data on **wages** provide similar evidence of nominal rigidities for wages (e.g. Taylor, 1999).

- The basic NK model can easily be extended to account for nominal-wage stickiness (see Extension 1).

Empirical evidence on monetary-policy non-neutrality

- To provide empirical evidence on **monetary-policy non-neutrality**, one needs to identify *exogenous* monetary-policy changes (called "shocks").
- Most studies have used structural vector auto-regressions (SVARs) to identify monetary-policy shocks.
- For instance, Christiano, Eichenbaum and Evans (1999) identify monetary-policy shocks in a SVAR by assuming that
  - the Federal Reserve sets its policy rate as a function of past variables and current output, inflation, and commodity prices,
  - neither output, nor inflation, nor commodity prices respond contemporaneously to monetary-policy shocks.
- They find that, following an exogenous increase in the interest rate,
  - output gradually declines before reverting to its initial level,
  - inflation hardly moves for a while and then declines,
  - money declines persistently ("liquidity effect").

Estimated dynamic responses to a monetary-policy shock

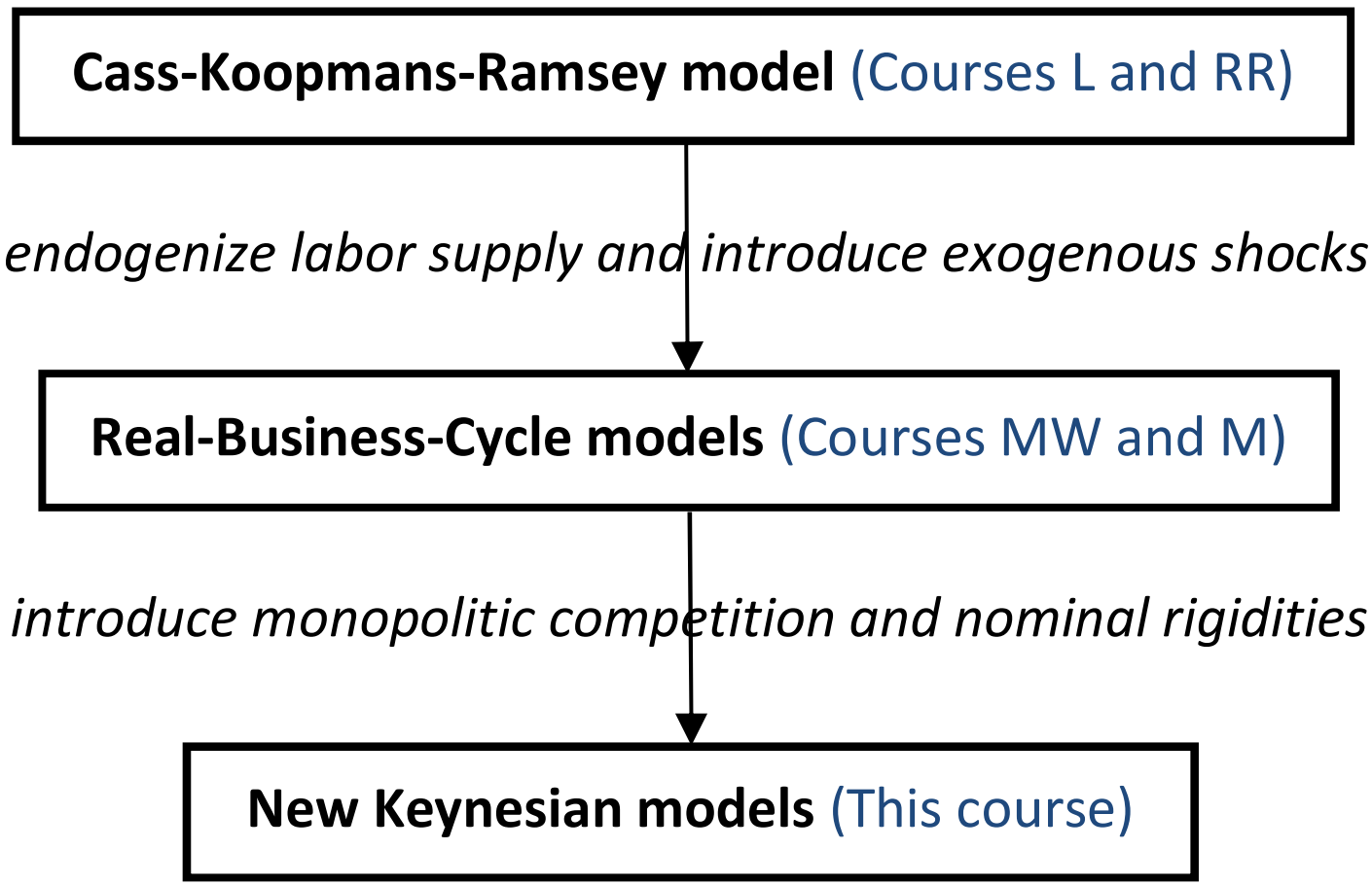


Source: Christiano, Eichenbaum and Evans (1999).

Prerequisite courses at ENSAE and in the MiE

Title	Professor(s)	Code	Program	Year	Semester
Macroeconomics 1	O. Loisel	L	ENSAE	Y2	S1
Macroeconomics 1: Economic Growth	A. Riboni G. Ricco	RR	MiE	M1	S1
Macroeconomics 2: Fluctuations	F. Malherbet P. Winant	MW	ENSAE	Y2	S2
Macroeconomics 2: Business Cycles	J.-B. Michau	M	MiE	M1	S2

Link with these courses



Main references for the course

Chap.	Main references
1	Clarida, Galí, and Gertler (1999), Galí (2015, C3), Walsh (2010, C8), Woodford (2003, C4)
2	Galí (2015, C5), Walsh (2010, C8), Woodford (2003, C6-C7), Woodford (2011)
3	Blanchard and Kahn (1980), Clarida, Galí, and Gertler (2000), Galí (2015, C4), Galí (2011), Walsh (2010, C8), Woodford (2003, C7-C8)
4	Eggertson and Woodford (2003)
5	Cúrdia and Woodford (2011)

About the (first-session) exam

- The exam will be written and will last two hours.
- The examination paper will be in English, and you will have to answer in English.
- The exam will consist in an exercise and a commentary on a text (typically an excerpt from a central-banker speech).
- The paper version of the course's presentation slides (with or without manuscript annotations, on the slides or on separate sheets of paper), as well as bilingual dictionaries, will be allowed during the exam.
- The examination papers of the last three years, and the solutions to their exercises, are available on "Pamplemousse".

Other practical information

- The second-session exam is typically of the same kind as the first-session exam, but lasts only one hour.
- This year, the course has six three-hour lectures, starting on October 8 and ending on November 19, 2024.
- All lectures take place on Tuesdays from 9.00am to 12.15am.
- The course's presentation slides are available in electronic version on "Pamplemousse".
- Questions are welcome, either during lectures and lecture breaks, or by email (`olivier.loisel@ensae.fr`).