

Monetary Economics

General Introduction

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ENSAE

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Objective of the course

- This course aims at providing an introduction to
 - the **New Keynesian** (NK) framework, from the basic NK model to extended NK models with or without financial frictions,
 - their positive and normative implications for **monetary policy** (MP) in normal times and in crisis times.
- MP is the central-bank (CB) policy of setting the supply of money or the short-term nominal interest rate to achieve macroeconomic goals.
- All of you have already followed a course on Real-Business-Cycles (RBC) models. NK models differ from RBC models in two key assumptions:
 - monopolistic competition,
 - nominal rigidities,which give rise to MP non-neutrality in the short term.

Main questions and lessons

- Main **questions** addressed by the course:
 - What are the real effects of MP?
 - How does the transmission mechanism of MP work?
 - What should be the objectives of MP?
 - How should MP be conducted?
 - What to think of the MP strategies adopted by CBs?
 - What to think of the unconventional MP measures taken by CBs?
- Main **lessons** of the course:
 - the importance of the private agents' expectations,
 - the importance of the natural level of output and the natural rate of interest,

in the transmission and the conduct of MP.

Threefold motivation for this course

- 1 The NK framework has become the workhorse for the analysis of MP (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 CBs.
- 3 It has provided the theoretical underpinnings to the inflation-stability-oriented strategies adopted by many CBs.

Simplicity vs. “realism”

- For pedagogical reasons, Part I of the course focuses on the **basic NK model**.
- This model features
 - monopolistic competition and price stickiness in the goods market,
 - perfect competition and wage flexibility in the labor market,
 - no endogenous capital accumulation.
- This model is too simple and stylised to be taken to the data, but Part II shows how to extend it in two directions to get small-scale “Dynamic Stochastic General-Equilibrium” (DSGE) models.
- Most of these extensions do not qualitatively affect the model's positive and normative implications for MP.

Outline of the course

- **General introduction**
- **Part I: Conventional MP in the basic NK model**
 - *Chapter 1:* The basic NK model
 - *Chapter 2:* Optimal MP
 - *Chapter 3:* MP design
- **Part II: Conventional MP in extended NK models**
 - *Chapter 4:* The sticky-wages extension
 - *Chapter 5:* The small-open-economy extension
- **Part III: Unconventional MP in NK models**
 - *Chapter 6:* Forward guidance
 - *Chapter 7:* Quantitative vs. credit easing
- **General conclusion**

The RBC revolution

- In the 80's, **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 DSGE models (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 (unlike in Keynes, 1936).
- 2 Technology shocks are a key source of economic fluctuations.
- 3 MP is quasi-**neutral in the short term** with respect to real variables (Cooley and Hansen, 1989).
- 4 The optimal MP 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 CBs

- The RBC approach had a very limited influence on CBs because
 - it could not explain the short-run effects of MP on real variables (Friedman and Schwartz, 1963),
 - the Friedman rule stood at odds with the MPs pursued and viewed as desirable by CBs.
- So CBs 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 MP is **not neutral in the short term**, due to its effects on real money balances and the short-term real interest rate (themselves due to nominal rigidities).
- 3 MP is neutral in the long term, as all prices and wages then adjust.
- 4 Optimal MP is **active** along the business cycle.

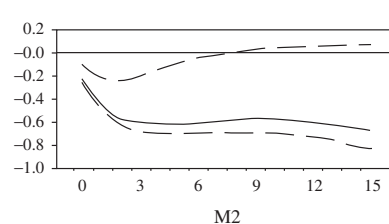
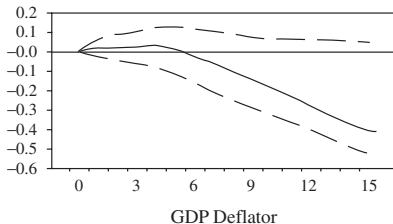
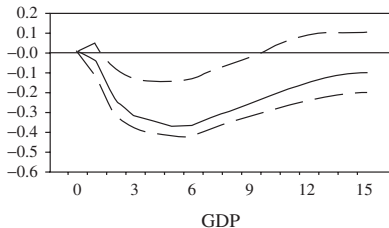
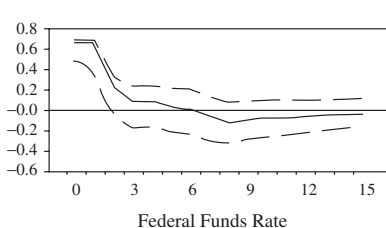
Empirical evidence on nominal rigidities

- 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 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 Chapter 4).

Empirical evidence on MP non-neutrality

- To provide empirical evidence on **MP non-neutrality**, one needs to identify *exogenous* MP changes (called MP shocks).
- Most studies have used structural vector auto-regressions (SVARs) to identify MP shocks.
- For instance, Christiano, Eichenbaum and Evans (1999) identify MP 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 MP 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 (which is called the “liquidity effect”).

Estimated dynamic responses to a MP shock

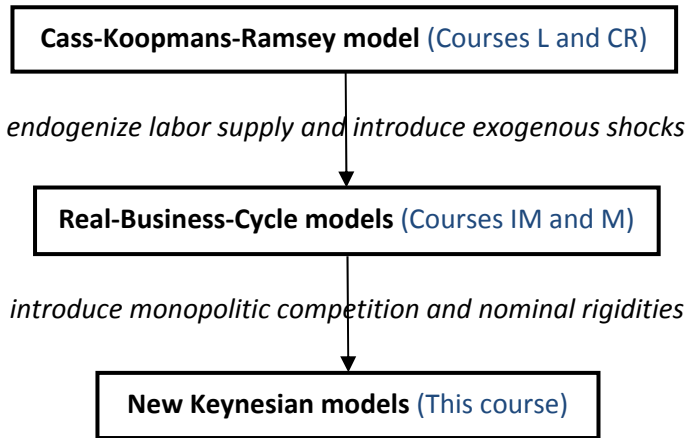


Source: Christiano, Eichenbaum and Evans (1999).

Prerequisite courses at ENSAE and in the MiE

Title	Professor(s)	Code	Program	Year	Semester
Macroeconomics 1	O. Loisel	L	ENSAE	Y2	S1
Economic Growth	P. Cahuc A. Riboni	CR	MiE	M1	S1
Macroeconomics 2: Fluctuations	E. Iliopoulos F. Malherbet	IM	ENSAE	Y2	S2
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	Erceg, Henderson, and Levin (2000), Galí (2015, C6), Woodford (2003, C5)
5	Clarida, Galí, and Gertler (2001), Galí (2015, C8), Galí and Monacelli (2005), Walsh (2010, C9)
6	Eggertson and Woodford (2003)
7	Cúrdia and Woodford (2011)

About the exam

- The (first-session) 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 them) will be allowed during the exam.
- The second-session exam is typically of the same kind, but lasts only one hour.

Other practical information

- The course has eight three-hour lectures, starting on October 2 and ending on January 8.
- All lectures take place on Tuesdays from 1.30pm to 4.45pm, except the lecture on October 30, which starts at 1.00pm and ends at 4.15pm.
- The course's presentation slides will be made available
 - in electronic version on “Pamplémousse”, in due time,
 - in paper version in the classroom, at the beginning of each lecture.
- Questions are welcome, either during lectures and lecture breaks, or by email (olivier.loisel@ensae.fr).