

# Advanced Macroeconomics III

6 ECTS

TERM 3

MANDATORY

## Professor

Prof. Jordi Galí

Prof. Priit Jeenas

## Prerequisites to enroll

Students who sign up for the course must be in the PhD program and have taken Advanced Macroeconomics I and II. Visiting PhD students interested in taking the course should request permission.

## Overview and objectives

### PART I (Jordi Galí)

The first part of the course will provide an overview of the literature on monetary aspects of the business cycle, with a special emphasis on models with nominal rigidities and their implications for monetary policy.

### PART II (Priit Jeenas)

The second part of the course will focus on the interaction of financial markets and the macroeconomy. Its goal is to examine some workhorse models, emphasizing both their theoretical foundations and their empirical relevance.

## Course outline

### PART I

1. The Classical Monetary Model
2. The New Keynesian Model
3. Monetary Policy Design in the New Keynesian Model
4. Extensions

### PART II

1. Introduction and empirical motivation
  2. Complete markets, incomplete markets, and heterogeneous agents
  3. Credit, asset prices and business cycles
- Financial markets as a source of macroeconomic volatility

## Required activities

### PARTS I and II

There will be weekly problem sets to help you understand the material and prepare for the exam.

## Evaluation

Part I: Final exam (100%)

Part II: Final exam (90%), problem sets (10%)

## Materials

### PART I

The main textbook for the course is:

Galí, Jordi (2015): *Monetary Policy, Inflation, and the Business Cycle. An Introduction to the New Keynesian Framework*, Second edition, Princeton University Press (Princeton, NJ).

Two excellent complementary textbooks are:

Walsh, Carl E. (2017): *Monetary Theory and Policy*, Fourth edition, MIT Press (Cambridge, MA)

Woodford, Michael (2003): *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press (Princeton, NJ).

## **1. The Classical Monetary Model**

Households. Firms. Equilibrium. Neutrality. Monetary policy rules and price level determination. Sources of non-neutrality. Optimal monetary policy.

Galí, Jordi (2015), chapter 2.

Walsh, Carl E. (2017), chapter 2-3

Woodford, Michael (2003), chapters 1-2.

Cooley, Thomas F. and Gary D. Hansen (1995): "Money and the Business Cycle," in T. Cooley ed.: *Frontiers of Business Cycle Research* (Princeton University Press).

Cooley, Thomas F. and Gary D. Hansen (1989): "Inflation Tax in a Real Business Cycle Model," *American Economic Review* 79, 733-748.

Chari, V.V., and Patrick J. Kehoe (1999): "Optimal Fiscal and Monetary Policy," in J.B. Taylor and M. Woodford eds., *Handbook of Macroeconomics*, volume 1C, 1671-1745.

Correia, Isabel, and Pedro Teles (1999): "The Optimal Inflation Tax," *Review of Economic Dynamics*, vol. 2, no.2 325-346.

## **2. The New Keynesian Model**

Motivation and evidence. The basic New Keynesian model. The New Keynesian Phillips curve. Evidence on inflation dynamics. The effects of monetary policy shocks. The effects of technology shocks.

Galí, Jordi (2015), chapters 1 and 3.

Walsh, Carl E. (2017), chapters 1, 6 and 8.

Woodford, Michael (2003), chapter 4.

Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans (1998): "Monetary Policy Shocks: What Have We Learned and to What End?," in J.B. Taylor and M. Woodford eds., *Handbook of Macroeconomics*, volume 1A, 65-148. (also NBER WP 6400).

Romer, Christina D. and David H. Romer (2014): "A New Measure of Monetary Shocks: Derivation and Implications," *American Economic Review* 94 (4), 1055-1084.

Jarocinski, Marek and Peter Karadi (2020): "Deconstructing Monetary Policy Surprises: The Role of Information Shocks," *American Economic Journal: Macroeconomics*, forthcoming.

Bils, Mark and Peter J. Klenow (2004): "Some Evidence on the Importance of Sticky Prices," *Journal of Political Economy*, vol 112 (5), 947-985.

Dhyne, Emmanuel et al. (2006): "Price Changes in the Euro Area and the United States: Some Facts from Individual Consumer Price Data," *Journal of Economic Perspectives*, vol. 20, no. 2, 171-192.

Klenow, Peter J. and Benjamin A. Malin (2011): "Microeconomic Evidence on Price Setting," in B. Friedman and M. Woodford (eds.) *Handbook of Monetary Economics* vol. 3A, 231-284, Elsevier B.V.

Alvarez, Fernando, Martin Beraja, Martín Gonzalez-Rozada, and Pablo A. Neumeyer (2019): "From Hyperinflation to Stable Prices: Argentina's Evidence on Menu Cost Models," *Quarterly Journal of Economics*, 451-505

Nakamura, Emi, Jón Steinsson, Patrick Sun, and Daniel Villar (2018): "The Elusive Costs of Inflation: Price Dispersion during the U.S. Great Inflation," *Quarterly Journal of Economics*, 1933-1980.

Galí, Jordi and Mark Gertler (1998): "Inflation Dynamics: A Structural Econometric Analysis," *Journal of Monetary Economics*, vol 44, no. 2, 195-222.

Galí, Jordi, Mark Gertler, David López-Salido (2001): "European Inflation Dynamics," *European Economic Review* vol. 45, no. 7, 1237-1270.

Mavroeidis, Sophocles, Mikkel Plagborg-Møller, and James H. Stock (2014): "Empirical Evidence on Inflation Expectations in the New Keynesian Phillips Curve," *Journal of Economic Literature* 52(1), 124-188.

McLeay, Michael and Silvana Tenreyro (2019), "Optimal Inflation and the Identification of the Phillips Curve," *NBER Macroeconomics Annual*, forthcoming.

Galí, Jordi (1999): "Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations?," *American Economic Review*, vol. 89, no. 1, 249-271.

Basu, Susanto, John Fernald, and Miles Kimball (2006): "Are Technology Improvements Contractionary?," *American Economic Review*, vol. 96, no. 5, 1418-1448.

Barsky, Robert B., and Eric R. Sims (2011): "News Shocks and Business Cycles," *Journal of Monetary Economics* 58(3), 273-289.

### **3. Monetary Policy Design in the New Keynesian Model**

The case of an efficient natural level of output: optimal policy and its implementation. Second order approximation to welfare losses. Simple monetary policy rules. The case of an inefficient natural equilibrium. Optimal policy under discretion. Optimal policy under commitment. Evidence on monetary policy rules.

Galí, Jordi (2015), chapter 4.

Walsh, Carl E. (2017), chapter 8.

Woodford, Michael (2003), chapter 6.

Yun, Tack (2005): "Optimal Monetary Policy with Relative Price Distortions" American Economic Review, vol. 95, no. 1, 89-109

Bullard, James, and Kaushik Mitra (2002): "Learning About Monetary Policy Rules," Journal of Monetary Economics, vol. 49, no. 6, 1105-1130.

Woodford, Michael (2001): "The Taylor Rule and Optimal Monetary Policy," American Economic Review 91(2): 232-237 (2001).

Rotemberg, Julio and Michael Woodford (1999): "Interest Rate Rules in an Estimated Sticky Price Model," in J.B. Taylor ed., Monetary Policy Rules, University of Chicago Press.

Clarida, Richard, Jordi Galí, and Mark Gertler (1999): "The Science of Monetary Policy: A New Keynesian Perspective," Journal of Economic Literature, vol. 37, no. 4, 1661-1707.

Benigno, Pierpaolo and Michael Woodford (2005): "Inflation Stabilization and Welfare: The Case of a Distorted Steady State," Journal of the European Economic Association 3, 1185-1236.

Giannoni, Marc and Michael Woodford (2017): "Optimal Target Criteria for Stabilization Policy," Journal of Economic Theory 168(1): 55-106, March 2017.

Taylor, John B. (1993): "Discretion versus Policy Rules in Practice," Carnegie-Rochester Series on Public Policy 39, 195-214.

Taylor, John B. (1998): "An Historical Analysis of Monetary Policy Rules," in J.B. Taylor ed., Monetary Policy Rules, University of Chicago Press.

Clarida, Richard, Jordi Galí, and Mark Gertler (2000): "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory," Quarterly Journal of Economics, vol. 105, issue 1, 147-180.

Orphanides, Athanasios (2003): "The Quest for Prosperity Without Inflation," Journal of Monetary Economics 50, 633-663

Orphanides, Athanasios and Volker Wieland (2013): "Complexity and Monetary Policy," *International Journal of Central Banking* 9(S1), 167-203.

Orphanides, Athanasios (2019): "Monetary Policy Strategy and its Communication," in *Challenges for Monetary Policy, Economic Policy Symposium Proceedings*, Federal Reserve Bank of Kansas City, 211-260.

#### **4. Extensions**

Nominal wage rigidities. Unemployment. Open economy. The zero lower bound. The forward guidance puzzle. Optimal inflation. Bubbles. Heterogeneity.

Galí, Jordi (2015), chapters 6-8.

Walsh, Carl E. (2017), chapters 8-11.

Woodford, Michael (2003), chapters 3.4, 4.4, and 6.4.

Galí, Jordi (2018): "The State of New Keynesian Economics: A Partial Assessment," *Journal of Economic Perspectives* 32(3), 87-112.

Erceg, Christopher J., Dale W. Henderson, and Andrew T. Levin (2000): "Optimal Monetary Policy with Staggered Wage and Price Contracts," *Journal of Monetary Economics* vol. 46, no. 2, 281-314.

Galí, Jordi (2011): "The Return of the Wage Phillips Curve," *Journal of the European Economic Association*, vol. 9, issue 3, 436-461.

Galí, Jordi and Luca Gambetti (2020): "Has the U.S. Wage Phillips Curve Flattened? A Semi-Structural Exploration" in G. Castex, J. Galí and D. Saravia (eds.) *Changing Inflation Dynamics, Evolving Monetary Policy*, Central Bank of Chile (Santiago, Chile).

Galí, Jordi, Frank Smets and Raf Wouters (2012): "Unemployment in an Estimated New Keynesian Model," *NBER Macroeconomics Annual* 2011, 329-360.

## **PART II**

The reading list might be updated as we go along, so please check the course website for updates. Some readings will be covered in class, and you are responsible for understanding them in detail. All other readings will be only briefly discussed in class, and you are therefore responsible only for their global content.

### **1. Introduction and empirical motivation**

Bernanke, Ben S., "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression," *American Economic Review*, 1983.

Claessens, S., A. Kose and M. Terrones. "What happens during recessions, crunches and busts?" *Economic Policy*, 2009.

Mendoza, E. and M. Terrones, "An Anatomy of Credit Booms and their Demise", WP 18379, NBER, 2012.

Schularick, M. and A. M. Taylor, "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises," *American Economic Review*, 2012.

Mian, A. and A. Sufi, "The Great Recession: Lessons from Microeconomic Data," *American Economic Review*, 2010.

Chaney, T., D. Sraer and D. Thesmar, "The Collateral Channel: How Real Estate Shocks Affect Corporate Investment," *American Economic Review*, 2012.

Chodorow-Reich, G., "The Employment Effects of Credit Market Disruptions: Firm-Level Evidence from the 2008–09 Financial Crisis," *The Quarterly Journal of Economics*, 2014.

### **2. Complete markets, incomplete markets, and heterogeneous agents**



Chapters 8, 12, 17, and 18 of Ljungqvist, L. and T. Sargent (2018): *Recursive Macroeconomic Theory*, Fourth edition, MIT Press (Cambridge, MA).

Bewley, T., "The Permanent Income Hypothesis: A Theoretical Formulation", *Journal of Economic Theory*, 1977.

Huggett, M., "The risk-free rate in heterogeneous-agent incomplete-insurance economies," *Journal of Economic Dynamics and Control*, 1993.

Aiyagari, S. R., "Uninsured Idiosyncratic Risk and Aggregate Saving," *The Quarterly Journal of Economics*, 1994.

Krusell, P. and A. A. Smith, Jr., "Income and Wealth Heterogeneity in the Macroeconomy," *Journal of Political Economy*, 1998.

Eggertsson, G. and P. Krugman, "Debt, deleveraging, and the liquidity trap: A Fisher-Minsky-Koo approach," *Quarterly Journal of Economics*, 2012.

Guerrieri, V. and G. Lorenzoni, "Credit crises, precautionary savings, and the liquidity trap," *Quarterly Journal of Economics*, 2017.

### **3. Credit, asset prices and business cycles**

Bernanke, B. and M. Gertler, "Agency costs, net worth, and business fluctuations," *American Economic Review*, 1989.

Kiyotaki, N. and J. Moore, "Credit cycles," *Journal of Political Economy*, 1997.

Krishnamurthy, A., "Collateral Constraints and the Amplification Mechanism," *Journal of Economic Theory*, 2003.

Lorenzoni, G., "Inefficient Credit Booms," *The Review of Economic Studies*, 2008.

### **4. Financial Markets as a source of macroeconomic volatility**

Azariadis, C. and B. Smith, "Financial Intermediation and Regime Switching in Business Cycles," American Economic Review, 1998.

Malherbe, F., "Self-Fulfilling Liquidity Dry-Ups," Journal of Finance, 2014.

Gorton, G., and G. Ordonez, "Collateral Crises." American Economic Review, 2014.

Martin, A., "Endogenous credit cycles." Working Paper, 2008.

Martin, A. and J. Ventura, "Theoretical Notes on Bubbles and the Current Crisis", IMF Economic Review. 2011.

## **Competencies**

- Capacity of utilization of the theoretical instruments of the to analyze situations of coherent form.
- Ability to make independent judgments and defend them dialectically.
- Acquire a solid knowledge base for the study of quantitative issues.

## **Learning outcomes**

- Students should get an overview of economic and financial theory.
- Students must be able to recognize theories and present arguments with precise examples.
- Students will have the ability to understand how markets work and explain their weaknesses.