

## Mini Course on Monetary Theory and Policy

June 26 - July 4, 2008

**Description:** This course is dedicated to the analysis of optimal monetary and fiscal policy in a number of different economic environments. The course introduces students to the Ramsey approach to optimal policy analysis. The Ramsey approach is applied to the characterization of optimal monetary and fiscal policy using both analytical and computational tools. We begin studying the Ramsey approach in the context of flexible price monetary economies. We then introduce sluggish product and factor prices into the model as a step in the direction of working with a model that can better explain the observed real effects of monetary instability. Again optimal monetary and fiscal policy will be characterized. While the optimal policy under commitment is a relevant benchmark, often one would like to perform an evaluation of simple policy proposals such as Taylor-type interest-rate feedback rules. Policy evaluation typically requires the use of non-linear numerical approximation techniques. To this end, we study the Schmitt-Grohé and Uribe toolkit for computing second-order accurate approximations to the solutions of dynamic general equilibrium models. Finally, we use those computational techniques to find second-order accurate welfare and welfare-cost measures, and evaluate popular monetary policy rules in a number of medium-scale models of the macroeconomy.

### 1. Optimal Fiscal and Monetary Policy in Flexible Price Environments

- Topics to be Discussed:

1. Cash-in-Advance and Transactions Cost Models of Money Demand
2. The Ramsey Approach to Optimal Policy
3. The Optimality of the Friedman Rule
4. Optimal Tax Smoothing
5. Computation of the Ramsey Equilibrium
6. The Optimal Degree of Inflation Volatility

- Readings to be Discussed in Class:

Chari, V. V., Christiano, Lawrence, and Kehoe, Patrick. “Optimal Fiscal and Monetary Policy: some recent results.” *Journal of Money Credit and Banking* 23 (1991): 519-539.

Schmitt-Grohé, Stephanie, and Martín Uribe. “Optimal Fiscal and Monetary Policy under Imperfect Competition.” *Journal of Macroeconomics* 26 (June 2004): 183-209.

Schmitt-Grohé, Stephanie. “Lecture Notes on Monetary Theory and Policy.” Chapter 3: Optimal Fiscal and Monetary Policy in a Flexible Price Environments, Duke University, Revised 2008.

- Further Reading

Lucas, Robert E, Jr and Stokey, Nancy L. “Optimal Fiscal and Monetary Policy in an Economy without Capital.” *Journal of Monetary Economics* 12 (July 1983): 55-93.

R. Aiyagari, A. Marcat, T. J. Sargent, and J. Seppälä. “Optimal Taxation Without State-Contingent Debt.” *Journal of Political Economy* 110 (2002): 1220-1254.

## 2. Optimal Monetary Policy in Models with Nominal Rigidities

- Topics to be Discussed:

1. Models with Sticky Prices
2. Models with Sticky Wages
3. Ramsey Problems in Models with Sluggish Price Adjustments

- Papers to Be Discussed in Class:

Schmitt-Grohé, Stephanie, and Martín Uribe. “Optimal Fiscal and Monetary Policy under Sticky Prices.” *Journal of Economic Theory* 114 (February 2004): 198-230.

Schmitt-Grohé, Stephanie and Martín Uribe. “Comparing Two Variants of Calvo-Type Wage Stickiness.” NBER WP 12740, October 2006.

- Further Reading

Woodford, Michael, *Interest and Prices*, Princeton University Press, 2003.

Galí, Jordi, *Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework*, Princeton University Press, 2008.

Yun, Tack. “Nominal Price Rigidity, Money Supply Endogeneity and Business Cycles.” *Journal of Monetary Economics* 37 (July 1996): 345-70.

Erceg, Christopher J., Dale W. Henderson, and Andrew T. Levin. “Optimal Monetary Policy with Staggered Wage and Price Contracts.” *Journal of Monetary Economics* 46 (October 2000): 281-313.

Goodfriend, Marvin and Robert G. King. “The New Neoclassical Synthesis and the Role of Monetary Policy.” In Bernanke, Ben S. and Julio J. Rotemberg, eds., *NBER Macroeconomics annual 1997*, Cambridge: MIT Press, 1997, 231-283.

Khan, Aubhik, Robert G. King, and Alexander Wolman. “Optimal Monetary Policy.” *Review of Economic Studies* 70 (October 2003): 825-860.

## 3. Perturbation Methods for the Numerical Analysis of DSGE Models

- Topics to Be Discussed:

1. First-Order Perturbation Methods
  - The Policy Function
  - Impulse Response Functions
  - Unconditional Second Moments
2. Second-Order Perturbation Methods
  - The Policy Function

Welfare  
Conditional and Unconditional First Moments  
Second-Order Accurate Time Series

- Papers to be Discussed in Class:

Schmitt-Grohé, Stephanie and Martín Uribe. “Solving Dynamic General Equilibrium Models Using a Second-Order Approximation to the Policy Function.” *Journal of Economic Dynamics and Control* 28 (January 2004): 755-75.

- Further Reading:

Kim, Jinill, S. Kim, Ernst Schaumburg, and Christopher Sims. “Calculating and Using Second Order Accurate Solutions of Discrete Time Dynamic Equilibrium Models.” mimeo, February 2, 2005. <http://www.kellogg.northwestern.edu/faculty/schaumburg/htm/ResearchPapers/KKSS.pdf>

#### 4. Evaluating Monetary Policy Rules in a Medium-Scale Model of the Macroeconomy

- Topics to Be Discussed:

1. Computing Welfare
2. Welfare Cost Measures
3. What is the Optimal Inflation Target
4. Implications of the Zero Bound on Nominal Interest Rates
5. How to Implement Optimal Policy

- Papers to Be Discussed in Class:

Schmitt-Grohé, Stephanie and Martín Uribe. “Optimal Simple And Implementable Monetary and Fiscal Rules.” *Journal of Monetary Economics* 54 (September 2007): 1702-1725.

Schmitt-Grohé, Stephanie and Martín Uribe. “Optimal Inflation Stabilization in a Medium-Scale Macroeconomic Model.” In *Monetary Policy Under Inflation Targeting*, edited by Klaus Schmidt-Hebbel and Rick Mishkin. Central Bank of Chile, Santiago, Chile, 2007, 125-186.

- Further Reading:

Rotemberg, Julio J., and Michael Woodford. “An Optimization-Based Econometric Framework for the Evaluation of Monetary Policy.” NBER Macroeconomics Annual 1997, 297-346.

Andrew Levin, Alexei Onatski, John Williams and Noah Williams. “Monetary Policy Under Uncertainty in Micro-Founded Macroeconometric Models.” In Gertler Mark and Kenneth Rogoff, eds., NBER Macroeconomics Annual 2005, Volume 20, Cambridge: MIT Press, 2006.

Schmitt-Grohé, Stephanie, and Martín Uribe. “Optimal Fiscal and Monetary Policy in a Medium Scale Macroeconomic Model.” In Gertler Mark and Kenneth Rogoff, eds., NBER Macroeconomics Annual 2005, Volume 20, Cambridge: MIT Press, 2006.