

Advanced Macroeconomics II (E802, Ph.D. Course)

Spring 2017

Instructor

Klaus Adam

Class: Wednesdays 10:15-11:45 and 13:45-15:00

Final exam: March 28

Prerequisites: E700, E701, E702, E703

Grading

Students will have to hand in weekly problem sets (single answers are required, no group answers are allowed). Problem sets will have to be handed in *before* the start of the exercise session. Hand-in of the problem sets is mandatory for passing the course.

Subject to having handed in the problem sets, the course grade will be determined by the final exam.

Course content

Macroeconomics is about constructing, solving and estimating intertemporal models describing the evolution of the aggregate economy over time. Macroeconomists focus on general equilibrium settings and are concerned with explaining observed aggregate behavior and with evaluating the welfare and allocational implications of alternative policy choices.

This course introduces the fundamental techniques for constructing and solving dynamic stochastic equilibrium models. It also discusses basic approaches for conducting policy experiments and for evaluating their welfare consequences. Additionally, it outlines some fundamental connections between the solution of dynamic equilibrium models and econometric time series models.

Course Outline

Weeks 1+2: Linear Dynamic Rational Expectations (RE) Models

- linearizing dynamic economic models
- determinacy and indeterminacy of RE equilibria, 'sunspot' equilibria
- solving linear RE models:
 - o undetermined coefficients approach
 - o Sims' solution approach
- solving the stochastic real business cycle model

Required readings on solution techniques:

Stokey and Lucas, chapter 6.1-6.3
Blanchard and Kahn (1980)
Sims (2002)

Required readings on applications to business cycle modeling (for week 2):

Barro and King (1984)
Jaimovich and Rebelo (2009)

Optional reading

Anderson (2006) provides a useful overview of the most common (numerical) solution strategies and their relative efficiency

Week 3: Linear RE Models and Vector Auto-Regressions (VARs)

- state space representation of economic models
- VAR representation of observables, invertibility problems
- identification of economic shocks

Required reading

Fernández-Villaverde et al (2005)

Fisher (2006)

Week 4: Linear Quadratic (LQ) Dynamic Programming

- solving LQ problems: Ricatti equation, invariant subspace methods
- stochastic problems and certainty equivalence
- linear quadratic approximation to optimal policy models

Required reading:

Ljungqvist and Sargent (2004), chapter 5

Matrix calculus reference manual (in reading package)

Week 5: Introduction to the New Keynesian Model and its Linearized Form

Required reading:

Chapter 2 in Galí (2008)

Week 6: Quadratic Approximation of Utility and Optimal Monetary Policies

Required reading:

Woodford (2011), you can download the handbook chapter on Woodford's homepage

References

- Anderson, Gary (2006), 'Solving Linear Rational Expectations Models: A Horse Race', FEDS working paper No. 2006-26
- Barro, R. J., and R. G. King (1984), 'Time-separable Preferences and Intertemporal-Substitution Models of Business Cycles'. *Quarterly Journal of Economics*, 99(4), 817-839.
- Blanchard, Olivier J. and Charles M. Kahn (1980), The Solution of Linear Difference Models under Rational Expectations, *Econometrica*, Vol 48, pp.1305-1312
- Fernández-Villaverde, Jesús, Juan Rubio-Ramírez, and Thomas J. Sargent (2005) 'A, B, C's (and D)'s for Understanding VARs', NBER Technical Working Paper 308, <http://www.nber.org/papers/T0308>
- Fisher, Jonas D.M (2006), 'The Dynamic Effects of Neutral and Investment-Specific Technology Shocks', *Journal of Political Economy*, Vol. 114(3), pp. 413 - 451
- Galí, Jordi (2008), *Monetary Policy, Inflation and the Business Cycle*, Princeton University Press.
- Hansen, Lars P. and Thomas J. Sargent (undated), *Notes on Linear Control Theory*
- Jaimovich, Nir and Sergio Rebelo (2009), 'Can News about the Future Drive the Business Cycle?', *American Economic Review*, Volume 99, Number 4, pp. 1097-1118
- Judd, Kenneth L. (1998), *Numerical Methods in Economics*, MIT Press
- Ljungqvist, Lars and Thomas J. Sargent (2004), *Recursive Macroeconomic Theory*, 2nd edition, MIT Press
- Sims, Christopher A. (2002), *Solving Linear Rational Expectations Models*, Princeton University mimeo
- Stokey, Nancy L. and Robert E. Lucas (1989), *Recursive Methods in Economic Dynamics*, Harvard University Press
- Woodford, Michael (2011), *Optimal Monetary Stabilization Policies*, chapter in B.M. Friedman and M. Woodford (eds.), *Handbook of Monetary Economics*, vol. 3B.