

THE UNIVERSITY OF WESTERN ONTARIO

LONDON

CANADA

Paul Klein
SSC 4028
(519) 661-2111 ext. 85227
paul.klein@uwo.ca

Karen Kopecky
SSC 4026
(519) 661-2111 ext. 80446
kkopecky@uwo.ca

**Economics 613-614
Advanced Macroeconomics I & II
Fall 2007**

Tentative course outline

1. Introduction to computation

- Finite-precision arithmetic
- Function approximation
- Nonlinear equations: solving for steady states and optimal labor supply

2. Growth Model

- Solving the deterministic growth model by discretization and value function iteration
- Improving efficiency and accuracy.
- Assessing accuracy. den Haan and Marcet (1994)
- Solving the stochastic growth model.
- Discretizing AR(1)'s.

3. Heterogeneous agents and exogenous market incompleteness

- Stationary measures and all that
- The risk free rate. Huggett (1993)
- Endogenizing the capital stock. Huggett (1997)

- Aiyagari (1994)
- Aggregate fluctuations. Krusell and Smith (1998)

4. Linear and quadratic approximations

- Klein (2000)
- Gomme and Klein (2006)

5. OLG with heterogeneity

- Rios-Rull (1996)
- Gomme, Rogerson, Rupert, and Wright (2004)

6. Health/Estimation and calibration in macroeconomics

- Gourinchas and Parker (2002)
- Scholz, Seshadri, and Khitatrakun (2006)
- Domeij and Johannesson (2006)
- De Nardi, French, and Jones (2006)
- Hall and Jones (2007)

7. Endogenous imperfect risk sharing

- Limited enforcement
 - Kehoe and Levine (2001)
 - Kocherlakota (1996)
 - Krueger and Perri (2004)
 - Krueger and Perri (2003)
 - Kehoe and Perri (2002)
- Moral hazard
 - Thomas and Worrall (1990)

- Atkeson and Lucas (1992)
- Atkeson and Lucas (1995)
- Wang (1995)
- Smith and Wang (2006)

8. Growth/development and fertility

- Barro and Becker (1988)
- Barro and Becker (1989)
- Galor and Weil (2000)
- Boldrin and Jones (2002)
- Boldrin, Jones, and De Nardi (2005)
- Doepke (2005)
- Lagerlof (2006)

Useful Textbooks

- **Heer, Burkhard and Alfred Maussner.** 2005. *Dynamic General Equilibrium Modelling*. Berlin, Germany: Springer.
- **Judd, Kenneth L.** 1998. *Numerical Methods in Economics*. Cambridge, MA: MIT Press.
- **Cooley, Thomas.** (ed.) 1995. *Frontiers of Business Cycle Research*. Princeton, N.J.: Princeton University Press.
- **Press, William H.; Saul A. Teukolsky; William T. Vetterling; and Brian P. Flannery.** 1992. *Numerical Recipes in C*. New York, N.Y.: Press Syndicate of the University of Cambridge.

Also *Numerical Recipes in Fortran 77*, *Numerical Recipes in Fortran 90*, and *Numerical Recipes in C++*.

All but C++ are available at

<http://www.library.cornell.edu/nr/index.html>.

- **Marimon, Ramon and Andrew Scott.** 1999. *Computational Methods for the Study of Dynamic Economies*. Oxford University Press.
- **Ljungqvist, Lars and Thomas Sargent.** 2000. *Recursive Macroeconomic Theory*. Cambridge, MA: MIT Press.

- **Miranda, Mario J. and Paul L. Fackler.** 2002. *Applied Computational Economics and Finance*. Cambridge, MA: MIT Press.
- **Adda, Jerome and Russell Cooper.** 2003. *Dynamic Economics*. Cambridge, MA: MIT Press.
- **Stokey, Nancy; Robert E. Lucas, Jr.; and Edward C. Prescott.** 1989. *Recursive Methods in Economic Dynamics*. Cambridge, MA: Harvard University Press.
- **Rudin, Walter.** 1987. *Real and Complex Analysis*. McGraw-Hill.
- **Chung, Kai Lai.** 2000. *A Course in Probability Theory*. Academic Press.
- **Cinlar, Erhan.** 1975. *Introduction to Stochastic Processes*. Prentice Hall.
- **Williams, David.** 1991. *Probability with Martingales*. Cambridge University Press.

References

- Aiyagari, S. R. (1994). Uninsured idiosyncratic risk, and aggregate saving. *Quarterly Journal of Economics* 109, 659–684.
- Atkeson, A. and R. E. Lucas (1992). On efficient distribution with private information. *Review of Economic Studies* 59, 427–453.
- Atkeson, A. and R. E. Lucas (1995). Efficiency and equality in a simple model of efficient unemployment insurance. *Journal of Economic Theory* 66(1), 64–88.
- Barro, R. J. and G. S. Becker (1988, February). A Reformulation of the Economic Theory of Fertility. *Quarterly Journal of Economics* 103(1), 1–25.
- Barro, R. J. and G. S. Becker (1989). Fertility choice in a model of economic growth. *Econometrica* 57, 481–501.
- Boldrin, M. and L. E. Jones (2002). Mortality, fertility and saving in a malthusian economy. *The Review of Economic Dynamics* 5, 775–814.
- Boldrin, M., L. E. Jones, and M. De Nardi (2005, March). Fertility and social security.
- De Nardi, M., E. French, and J. B. Jones (2006, November). Differential mortality, uncertain medical expenses, and the saving of elderly singles. NBER Working Paper No. 12554.
- den Haan, W. and A. Marcet (1994). Accuracy in simulations. *Review of Economic Studies* 61, 3–17.
- Doepke, M. (2005, June). Child Mortality and Fertility Decline: Does the Barro-Becker Model Fit the Facts? *Journal of Population Economics* 18(2), 337–366.
- Domeij, D. and M. Johannesson (2006). Consumption and Health. *Contributions to Macroeconomics* 6(1).

- Galor, O. and D. N. Weil (2000). Population, technology, and growth: From malthusian stagnation to the demographic transition and beyond. *The American Economic Review* 90(4), 806–828.
- Gomme, P. and P. Klein (2006). Second-order approximation of dynamic models without the use of tensors. Manuscript.
- Gomme, P., R. Rogerson, P. Rupert, and R. Wright (2004). The business cycle and the life cycle. In M. Gertler and K. Rogoff (Eds.), *NBER Macroeconomics Annual 19*, pp. 416–61. MIT Press.
- Gourinchas, P.-O. and J. A. Parker (2002). Consumption over the life cycle. *Econometrica* 70(1), 47–89.
- Hall, R. E. and C. I. Jones (2007, February). The Value of Life and the Rise in Health Spending. *Quarterly Journal of Economics* 122(1), 39–72.
- Huggett, M. (1993). The risk free rate in heterogeneous-agents, incomplete insurance economies. *Journal of Economic Dynamics and Control* 17(5/6), 953–970.
- Huggett, M. (1997). The one-sector growth model with idiosyncratic shocks: Steady states and dynamics. *Journal of Monetary Economics* 39(3), 385–403.
- Kehoe, P. J. and F. Perri (2002). International business cycles with endogenous incomplete markets. *Econometrica* 70(3), 907–928.
- Kehoe, T. J. and D. Levine (2001). Liquidity constrained vs. debt constrained markets. *Economica* 69, 575–598.
- Klein, P. (2000). Using the generalized Schur form to solve a multivariate linear rational expectations model. *Journal of Economic Dynamics and Control* 24(10), 1405–1423.
- Kocherlakota, N. R. (1996). Implications of efficient risk sharing without commitment. *Review of Economic Studies* 63(4), 595–609.
- Krueger, D. and F. Perri (2003). Does income inequality lead to consumption inequality? evidence and theory. Forthcoming, *Review of Economic Studies*.
- Krueger, D. and F. Perri (2004). Understanding consumption smoothing: Evidence from US consumer expenditure data. *Journal of the European Economic Association* 3(2-3), 340–350.
- Krusell, P. and A. Smith (1998). Income and wealth heterogeneity in the macroeconomy. *Journal of Political Economy* 106, 867–896.
- Lagerlof, N.-P. (2006). The galor-weil model revisited: A quantitative exercise. *The Review of Economic Dynamics* 9, 116–142.
- Rios-Rull, J.-V. (1996). Life-cycle economics and aggregate fluctuations. *Review of Economic Studies* 63(3), 465–489.
- Scholz, J. K., A. Seshadri, and S. Khitatrakun (2006). Are americans saving “optimally” for retirement? *Journal of Political Economy* 114(4), 607–651.
- Smith, A. A. and C. Wang (2006). Dynamic credit relationships in general equilibrium. *Journal of Monetary Economics* 53, 847–877.
- Thomas, J. and T. Worrall (1990). Income fluctuation and asymmetric information: An example of a repeated principal-agent problem. *Journal of Economic Theory* 51(2), 367–390.

Wang, C. (1995). Dynamic insurance with private information and balanced budgets. *Review of Economic Studies* 62(4), 577–595.