

Economics 756: Applied Theory II: Intertemporal Economics Syllabus UNCG Fall 2009

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Office Hours: Wed. 2-4 or by appointment or open door

Course Location and Times: Tuesday & Thursday 3:45-5:30 from August 25 to
October 9 in Bryan 213.

Special dates: Midterm exam, (9/25-9/27); Final exam, 10/8; Project due, 10/14.

Course requirements:

Success in ECO 756 requires completion of several problem sets (10%), several classroom presentations (10%), a midterm exam (25%), a final exam (30%), and a dynamic project or literature review (25%). Your grade in the course will be based on these weights.

The problem sets will require you to solve dynamic optimization problems both analytically and numerically. For the numerical analysis, use of Excel, Stata, or some other computer tools will be required.

The short classroom presentations will be based on articles in the reading list. The goal of your presentation is that everyone in the class should be able to answer questions such as: "What is Samuelson's 1937 paper about?" You should prepare a one page handout to share with the class.

The dynamic project is designed to give you experience developing a dynamic model, analyzing the model (using analytic and numerical techniques), and describing the dynamic solution. Choose a topic of economic interest with a dynamic aspect for the project. Please stop by my office to discuss your topic. The finished product from the project will be a written report (approximately four pages plus figures) describing the model and the analytic and numerical characterization of the solution of the model. Ideally, the written report would be the first draft of the "Model" section of a paper for your dissertation.

The literature review is designed to give you experience exploring the frontier of economic research on a topic, and categorizing, organizing, and describing that research. The literature review should describe all the relevant research (published and unpublished) on an economic topic, possibly a narrow aspect of one of the topics covered in the course. Please stop by to discuss your choice of topic. The literature review must be less than four pages, plus a separate bibliography. Ideally, the literature review would be the first draft of part of the introduction of a paper for your dissertation.

Texts:

Mas-Colell, Whinston, and Green. (MWG) *Microeconomic Theory*

Chap 20 on “Equilibrium and Time” has nice discussion of intertemporal utility model. Complicated derivations of Welfare Theorem extensions. Introduction to dynamic programming and Euler equations. Stationary paths, interest rates and the golden rule. Overlapping generations.

Adda, Jerome and Russel Cooper. *Dynamic Economics*. (\$38)

Chapters 1-3 will be our primary resource for dynamic programming.

Additional Primary Resources:

Chiang, A.C. (1992): *Elements of Dynamic Optimization*, New York: McGraw Hill, Chapters 7 to 10.

Nicholson *Microeconomic Theory* – 9th or 10th Edition, Chap 17 on Capital Markets.

Conrad and Clark *Natural Resource Economics: Notes and Problems*

Standard resources text on dynamic problems.

Varian, Hal. *Microeconomic Analysis*

Chap. 19 has useful introduction to intertemporal optimization and dynamic programming. Discusses extending the general equilibrium framework temporally. Chap 20 discusses asset markets.

Additional Secondary Resources:

Ross, Sheldon M, *Introduction to Stochastic Dynamic Programming* 1983.

First chapters recommended. Problem sets.

Stokey, Nancy and Robert Lucas. *Recursive Methods in Economic Dynamics*.

Chap 1-4 is a very high level introduction to dynamic programming. Section 10.7 and 13.8 present a search model.

Varian, Hal. *Intermediate Microeconomics*

Chap 10 discusses intertemporal choice, i.e., extension of usual equilibrium framework. Discusses present value, interest rates, and bonds. Chap 11 discusses assets.

Azariadis, *Intertemporal Macroeconomics*

Chap 11-13 on intertemporal optimality and overlapping generations model. Discusses social security. Theoretical. Section 14.4 on human capital as an engine of growth.

Ljungqvist and Sargent, 2000, *Recursive Dynamic Macroeconomics*, Chapters 2-3

Topics and Readings:

- 1) Introduction to dynamic optimization
 - a. Chiang Chap 1 (p. 3-23)
- 2) Economics of intertemporal utility and production
 - a. Arrow-Debreu extensions of welfare theorems
 - i. Varian Chap 19
 - ii. Nicholson Chap 17 (p. 500-523)
 - iii. MWG 20.A,B,C,D (p. 732-753)
 - b. Overlapping generations failure of welfare theorems
 - i. Varian Ch. 19 (p. 365)
 - ii. MWG 20.H (p. 769-777)
- 3) Optimal control theory
 - a. Discrete time
 - i. Conrad & Clark 1.1 & 1.2 (p. 1-22)
 - b. Continuous time & the Maximum principle
 - i. Conrad & Clark 1.4 (p. 25-30)
 - ii. Chiang 7.1 & 7.2 (p. 161-176)
 - iii. Chiang 7.7 (p. 200-204)
 - c. Discounting and the current value Hamiltonian
 - i. Conrad & Clark 1.5 (p. 31-39)
 - ii. Chiang 8.2 (p. 210-214)
- 4) Dynamic programming
 - a. Adda & Cooper Ch. 2 (p. 7-31)
 - b. Conrad & Clark 1.3 (p. 22-24)
 - c. MWG M.N (p. 968-970)
- 5) Consumption & Savings
 - a. Adda & Cooper Ch. 6 (p. 139-164)
- 6) Search
 - a. Adda & Cooper 10.6 (p. 257-262)

Literature days:

- 1) Discounting: 9/3
- 2) Natural resource economics: 9/10
- 3) Health: 9/17
- 4) Savings: 9/24
- 5) Social Security: 10/1
- 6) Search: 10/6 (?)

Readings:

Discounting

- Samuelson, Paul A. "A Note on Measurement of Utility." *REStud*, Vol. 4, No. 2 (Feb., 1937), pp. 155-161.
- Frederick, Shane, George Loewenstein, and Ted O'Donoghue. "Time Discounting and Time Preference: A Critical Review." *Journal of Economic Literature* June 2002 pp351-401
- Caplin, Andrew and John Leahy. "The Social Discount Rate" *Journal of Political Economy* 2004 p. 1257-68.
- Angeletos, George-Marios, David Laibson, Andrea Repetto, Jeremy Tobacman, and Stephen Weinberg. "The Hyperbolic Consumption Model: Calibration, Simulation, and Empirical Evaluation," *The Journal of Economic Perspectives*, Vol. 15, No. 3 (Summer, 2001), pp. 47-68.
- Laibson, David. (1997) "Golden Eggs and Hyperbolic Discounting," *The Quarterly Journal of Economics* Vol. 112, No. 2, (May, 1997), pp. 443-477

Natural Resource Economics

- Hotelling, Harold. "The Economics of Exhaustible Resources," *Journal of Political Economy* v39, n2 (Apr., 1931), pp. 137-175.
- Nordhaus, William. "The Allocation of Energy Resources," *Brookings Papers on Economic Activity* Vol. 1973, No. 3 (1973), pp. 529-576.
- Solow, Robert. "The Economics of Resources or the Resources of Economics," *The American Economic Review* Vol. 64, No. 2, Papers and Proceedings of the Eighty-sixth Annual Meeting of the American Economic Association (May, 1974), pp. 1-14 .
- Krautkraemer, Jeffrey A. "Nonrenewable Resource Scarcity" *Journal of Economic Literature* v36, n4 (December 1998): 2065-2107
- Schennach, Susanne. "The Economics of Pollution Permit Banking in the Context of Title IV of the 1990 Clean Air Act Amendments," *Journal of Environmental Economics and Management* 2000, 40:189-210.
- Chakravorty, Ujjayant; Roumasset, James; Tse, Kinping, "Endogenous Substitution among Energy Resources and Global Warming" *Journal of Political Economy* v105, n6 (December 1997): 1201-34.
- Holland, Stephen P.; Moore, Michael R., "Cadillac Desert Revisited: Property Rights, Public Policy, and Water-Resource Depletion" *Journal of Environmental Economics and Management* v46, n1 (July 2003): 131-55.
- Holland, Stephen P. "Extraction Capacity and the Optimal Order of Extraction" *Journal of Environmental Economics and Management* 45(3) May 2003, p. 569-588.
- Fischer, Carolyn. "Once-and-for-All Costs and Exhaustible Resource Markets" RFF discussion paper 98-25. (HW problem??)
- Hartwick, John M. (1977) "Intergenerational Equity and the Investing of Rents from Exhaustible Resources," *American Economic Review*, 67(5): 972-74.

Savings

- Hall, Robert E. "Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence." *Journal of Political Economy*, December 1978, 86(6), pp. 971–87.
- Browning, Martin and Annamaria Lusardi, "Household Saving: Micro Theories and Micro Facts" *Journal of Economic Literature* 1996.
- Shapiro, Matthew and Joel Slemrod "Consumer Response to Tax Rebates," *American Economic Review* 2003.
- Hsieh, Chang-Tai. "Do Consumers React to Anticipated Income Changes? Evidence from the Alaska Permanent Fund." *American Economic Review* 2003.
- Stephens, Mel. "'3rd of the Month': Do Social Security Recipients Smooth Consumption Between Checks?" *American Economic Review* 2003.
- Cullen, Julie Berry, Leora Friedberg, and Catherine Wolfram, (2005) "Do Households Smooth Small Consumption Shocks? Evidence from Anticipated and Unanticipated Variation in Home Energy Costs," CSEM WP-141.
- Coulibaly, Brahim, and Geng Li, (2006) "Do Homeowners Increase Consumption after the Last Mortgage Payment? An Alternative Test of the Permanent Income Hypothesis," *Review of Economics and Statistics*, 88(1): 10-19.
- Card, David, Raj Chetty, and Andrea Weber, (2006) "Cash-on-Hand and Competing Models of Intertemporal Behavior: New Evidence from the Labor Market," *National Bureau of Economic Research, Inc*, NBER Working Papers: 12639.
- Martin Browning & Thomas F. Crossley. 2001. "The Life-Cycle Model of Consumption and Saving," *Journal of Economic Perspectives*, 15(3): 3-22.
- Carroll, Christopher. 2001. "A Theory of the Consumption Function, With and Without Liquidity Constraints." *Journal of Economic Perspectives*, 15(3): 23-45.

Search

- Petrongolo and Pissarides, "Looking into the Black Box: A Survey of the Matching Function" *Journal of Economic Literature* 2001.
- Rogerson, Richard, Robert Shimer and Randall Wright, "Search-Theoretic Models of the Labor Market: A Survey" *Journal of Economic Literature* 2005.
- Moen, Espen "Competitive Search Equilibrium" *Journal of Political Economy* 1997.
- Wong, Linda. "Can the Mortensen-Pissarides Model with Productivity Changes Explain U.S. Wage Inequality?" *JoLE* 2003.
- Blau, David M. "Search for Nonwage Job Characteristics: A Test of the Reservation Wage Hypothesis," *Journal of Labor Economics* 9 (April 1991): 186-205.
- Schmidt, Lucie, "Murphy Brown Revisited: Human Capital, Search, and Nonmarital Childbearing Among Educated Women" (mimeo) 2003.
- Lippman, Steven A; McCall, John J, "The Economics of Job Search: A Survey: Part I" *Economic Inquiry*. June 1976; 14(2): 155-89, and "The Economics of Job Search: A Survey" *Economic Inquiry*. Sept. 1976; 14(3): 347-68,
- DellaVigna, Stephano and Daniele Paserman. (2004) "Job Search and Impatience." NBER Working paper 10837.
- Hall, Robert, and Paul R. Milgrom, (2005) "The Limited Influence of Unemployment on the Wage Bargain," *National Bureau of Economic Research, Inc*, NBER Working Papers 11245.

Gertler, Mark, and Antonella Trigari, (2006) “Unemployment Fluctuations With Staggered Nash Wage Bargaining” *National Bureau of Economic Research, Inc.*, NBER Working Papers: 12498

Health

- Grossman, Michael, (1972) “On the Concept of Health Capital and the Demand for Health” *The Journal of Political Economy*, 80(2): 223-255.
- Adda, Jerome, and Francesca Cornaglia, (2006) “Taxes, Cigarette Consumption, and Smoking Intensity” *American Economic Review*, 96(4): 1013-1028.
- Gruber, Jonathan, and Botond Koszegi, (2001) “Is Addiction 'Rational'? Theory and Evidence,” *Quarterly Journal of Economics*, 116(4): 1261-1303.
- Becker, Gary S. and Kevin M. Murphy, (1988) “A Theory of Rational Addiction,” *Journal of Political Economy*, 96(4): 675-700.
- Becker, Gary S., Michael Grossman, and Kevin M. Murphy, (1991) “Rational Addiction and the Effect of Price on Consumption,” *American Economic Review*, 81(2): 237-41.
- Auld, M. Christopher and Paul Grootendorst, (2004) “An Empirical Analysis of Milk Addiction,” *Journal of Health Economics*, 23(6): 1117-33.
- Orphanides, Athanasios, and David Zervos, (1995) “Rational Addiction with Learning and Regret,” *Journal of Political Economy*, 103(4): 739-58.
- Bernheim, B. Douglas, and Antonio Rangel, (2004) “Addiction and Cue-Triggered Decision Processes,” *American Economic Review*, 94(5): 1558-90.
- Finkelstein, Amy, Kathleen McGarry, and Amir Sufi, (2005) “Dynamic Inefficiencies in Insurance Markets: Evidence from Long-Term Care Insurance,” *American Economic Review*, 95(2): 224-28.
- Bryan L. Boulier, Tejwant S. Datta, and Robert S. Goldfarb (2007) “Vaccination Externalities,” *The B.E. Journal of Economic Analysis & Policy*: Vol. 7: Iss. 1 (Contributions), Article 23. Available at: <http://www.bepress.com/bejeap/vol7/iss1/art23>

Social Security

- Weil, Philippe. 2008. “Overlapping Generations: The First Jubilee.” *Journal of Economic Perspectives*, 22(4): 115–134
- Auerbach, A. J., and Kotlikoff, L. J. 1987 . *Dynamic Fiscal Policy*, New York: Cambridge Univ. Press.
- Feldstein, Martin. “Rethinking Social Insurance” mimeo.
- Martin Feldstein and Andrew Samwick, (1999) “Two Percent Personal Retirement Accounts: Their Potential Effects on Social Security Tax Rates and National Saving,” NBER Working Paper #6540.
- Journal of Economic Perspectives*, 1996. Social Security, 10: 55-88.
- Gramlich, Edward M. “Different Approaches for Dealing with Social Security,” pp. 55-66
- Diamond, Peter. “Proposals to Restructure Social Security,” pp. 67-88
- Review of Economic Dynamics*, July 1999, Special Issue on Social Security.
- “Social Security Liabilities,” Pages 489-497 Edward M. Gramlich

- “On the Distributional Effects of Social Security Reform,” Pages 498-531 Mark Huggett and Gustavo Ventura
- “Privatizing Social Security in the United States—Comparing the Options,” Pages 532-574 Laurence J. Kotlikoff, Kent Smetters and Jan Walliser
- “Projected U.S. Demographics and Social Security,” Pages 575-615 Mariacristina De Nardi, Selahattin Imrohoroglu and Thomas J. Sargent
- “Is Altruism Important for Understanding the Long-Run Effects of Social Security?,” Pages 616-637 Luisa Fuster
- “Social Security in an Overlapping Generations Economy with Land,” Pages 638-665 Ayse Imrohoroglu, Selahattin Imrohoroglu and Douglas H. Joines
- “Should the Social Security Trust Fund Hold Equities? An Intergenerational Welfare Analysis,” Pages 666-697 Henning Bohn
- “The U.S. Social Security System: What Does Political Sustainability Imply?,” Pages 698-730 Vincenzo Galasso
- “Privatizing Social Security,” Pages 731-755 Thomas F. Cooley and Jorge Soares

Human Capital

- V. V. Chari and H. A. Hopenhayn, "Vintage Human Capital and the Diffusion of New Technology," *Journal of Political Economy*, 1991.
Overlapping generations model of human capital.
- G. Zarkin, "Occupational Choice: An Application to the Market for Public School Teachers," *QJE*, 1985.
Analyzes the effect of future demand growth on teacher certification decisions.
- S. Rosen, "The Market for Lawyers," *JLE*, 1992.

Dynamic Labor Supply

- MaCurdy, Thomas E. "An Empirical Model of Labor Supply in a Life-Cycle Setting." *Journal of Political Economy* 89 (December 1981):1059-85.
Formulates and estimates a structural intertemporal model of labor supply.
- J. Heckman and T. MaCurdy, "A Life-Cycle Model of Female Labor Supply," *Review of Economic Studies*, (1980), pp. 75-122.
- J. Altonji, "Intertemporal Substitution in Labor Supply: Evidence from Micro Data," *Journal of Political Economy*, (June 1996).
- * D. Card, "Intertemporal Labor Supply: An Assessment," NBER Working Paper No. 3602, 1990.
- J Cogan, "Fixed Costs and Labor Supply," *Econometrica*, (December 1981), pp. 945-64.

Other

- S. Nickell, “Dynamic Models of Labor Demand,” *Handbook of Labor Economics*.
- Keane, Michael P. and Kenneth I. Wolpin “Estimating Welfare Effects Consistent with Forward-Looking Behavior. Part I: Lessons from a Simulation Exercise” and “Estimating Welfare Effects Consistent with Forward-Looking Behavior. Part II: Empirical Results” Penn working papers PIER 01-019 and 01-020.
- Romer, David. (2006) “Do Firms Maximize? Evidence from Professional Football,” *Journal of Political Economy*, 114(2): 340-365.