

Econ 525a (first half)
Yale University
Fall 2007
Prof. Tony Smith

Syllabus for Econ 525a:

TOPICS IN MACROECONOMICS AND INEQUALITY

Course Objectives: Traditional macroeconomic models postulate relations between aggregate variables such as output, inflation, and unemployment. More modern treatments derive such relations from a microeconomic model with a “representative-agent” construct. Although these “microfounded” models are more satisfactory in a number of ways—for example, they permit the analysis of the welfare consequences of economic policy—they often fail to consider explicitly differences across households in the economy. These models, therefore, are largely silent on issues that have always played a central role in the macroeconomic debate, in particular, issues of inequality, and of how inequality is affected by, and in turn affects, macroeconomic variables and macroeconomic policy.

The objective of this course is to develop frameworks for analyzing the interaction between macroeconomics and inequality in model settings that are suited for both positive and normative analysis, i.e., ones that rest on solid microfoundations. The beginning of the course will examine settings in which the representative-agent construct is valid: i.e., ones in which *aggregation* holds. These models are potentially useful in understanding how macroeconomic variables affect the evolution of inequality, but they are silent on the fundamental determinants of inequality and they do not allow for feedback from inequality to aggregate variables. The remainder of the course considers various departures from the assumptions that guarantee aggregation. Most of this analysis takes place in models that can be analyzed only by numerical solution. Accordingly, part of the course will be devoted to developing useful computational tools.

Contact Information

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Office hours: Thursdays from 2:30PM to 4PM, or by appointment

Class Meetings: The class meets on Mondays and Wednesdays from 1:30PM to 2:50PM in Room B1 (28 Hillhouse).

Prerequisites: This course is designed for graduate students in economics who have taken first-year graduate courses in microeconomics, macroeconomics, and econometrics.

Course Requirements: The course requirements for the first half of the course are three-fold: (1) present in class one paper (to be chosen from a specified list) and write a “referee report” on this paper; (2) complete several homework assignments; (3) write a research paper relating to the course material in either of the two halves of the course (the second half being taught by Professor Eduardo Engel).

The referee report should be no longer than five pages and should contain a clear and concise exposition of the main points of the article as well as a critical evaluation of the article’s contributions. Some possibilities for acceptable research papers for the first half of the course include: (1) designing and implementing a numerical algorithm to solve an existing general equilibrium model of inequality; (2) developing and analyzing a generalization or a modification of a paper (or a combination of two or more papers) relating to macroeconomics and inequality; (3) taking the first steps towards an original contribution to the literature on macroeconomics and inequality.

COURSE OUTLINE

The literature on macroeconomics and inequality is still relatively young, but is growing rapidly. This course is organized around the following set of topics within this field. This set is not exhaustive of all the different lines of research in macroeconomics and inequality. For example, it includes very little of the literature studying how voting (over taxation and redistribution policy) affects growth and inequality in general equilibrium settings, and it includes very little of the literature studying how private information and inequality interact. The course will cover the first eight topics below, and then choose from the remaining eight topics depending on time and student interest.

In addition, there will be guest lectures (on topics to be announced) by Mikhail Golosov from M.I.T. (on September 10 and 12) and Aleh Tsyvinski from Harvard (on October 8 and 10).

1. Facts about U.S. economic inequality
2. Models with aggregation
3. Incomplete markets I: no aggregate uncertainty, infinitely-lived agents
4. Incomplete markets II: no aggregate uncertainty, overlapping generations
5. Incomplete markets III: aggregate uncertainty, infinitely-lived agents
6. Incomplete markets IV: aggregate uncertainty, overlapping generations
7. Incomplete markets V: limited asset market participation
8. Computation in heterogeneous-agent models
9. Policy issues I: welfare costs of business cycles
10. Policy issues II: distributional effects of fiscal policy
11. Policy issues III: distributional effects of monetary policy
12. Empirical models of household risk
13. Models of wealth inequality
14. Endogenous borrowing constraints
15. Macroeconomics and the family
16. Inequality and growth

The article below provides an introductory survey of many of the topics covered in the course:

Krusell, P. and A.A. Smith, Jr. (2006), “Quantitative Macroeconomic Models with Heterogeneous Agents”, forthcoming in: Blundell, R., W. Newey, and T. Persson, eds., *Advances in Economics and Econometrics: Theory and Applications, Ninth World Congress*, Cambridge University Press.

A working-paper version of this article is available on the course web site.

READING LIST

The reading list below is not intended to be comprehensive. It is designed instead to highlight some of the key papers and to illustrate the range of research that has been (or is currently being) conducted within each of the specific topics. Required readings are marked with an asterisk.

1. Facts about U.S. economic inequality

Córdoba, J. C. and G. Verdier (2005), “Lucas vs. Lucas: On Inequality and Growth”, manuscript (www.ruf.rice.edu/~jcordoba/lvsl.pdf).

Díaz-Giménez, J., V. Quadrini, and J.-V. Ríos-Rull (1997), “Dimensions of Inequality: Facts on the U.S. Distributions of Earnings, Income, and Wealth,” *Federal Reserve Bank of Minneapolis Quarterly Review* 21 (No. 2), 3–21.

*Rodríguez, S.B., J. Díaz-Giménez, V. Quadrini, and J.-V. Ríos-Rull (2002), “Updated Facts on the U.S. Distributions of Earnings, Income, and Wealth,” *Federal Reserve Bank of Minneapolis Quarterly Review* 26 (No. 3), 2–35.

Wolff, E.N. (1994), “Trends in Household Wealth in the United States, 1962–83 and 1983–89,” *Review of Income and Wealth* 40, 143–174.

2. Models with aggregation

Caselli, F. and J. Ventura (2000), “A Representative Consumer Theory of Distribution,” *American Economic Review* 90, 909–926.

*Chatterjee, S. (1994), “Transitional Dynamics and the Distribution of Wealth in a Neoclassical Growth Model,” *Journal of Public Economics* 54, 97–119.

Maliar, L. and S. Maliar (2003), “The Representative Consumer in the Neoclassical Growth Model with Idiosyncratic Shocks,” *Review of Economic Dynamics* 6, 362–380.

3. Incomplete markets I: no aggregate uncertainty, infinitely-lived agents

*Aiyagari, S.R. (1993), “Explaining Financial Market Facts: the Importance of Incomplete Markets and Transaction Costs,” *Federal Reserve Bank of Minneapolis Quarterly Review* 17 (No. 1), 17–31.

*Aiyagari, S.R. (1994), “Uninsured Idiosyncratic Risk and Aggregate Saving,” *Quarterly Journal of Economics* 109, 659–684.

*Castañeda, A., J. Díaz-Giménez, and J.-V. Ríos-Rull (2003), “Accounting for the U.S. Earnings and Wealth Inequality,” *Journal of Political Economy* 111, 814–857.

Davila, J., J. Hong, P. Krusell, and J.-V. Ríos-Rull (2005), “Constrained Efficiency in the Neoclassical Growth Model with Uninsurable Idiosyncratic Shocks”, manuscript (www.ssc.upenn.edu/~vr0j/papers/constrainedinefficient.pdf).

Deaton, A. (1991), “Saving and Liquidity Constraints,” *Econometrica* 59, 1221–1248.

*Huggett, M. (1993), “The Risk-Free Rate in Heterogeneous-Agents, Incomplete Markets Economies,” *Journal of Economic Dynamics and Control* 17, 953–969.

Huggett, M. (1997), “The One-Sector Growth Model with Idiosyncratic Shocks: Steady States and Dynamics,” *Journal of Monetary Economics* 39, 385–403.

*Ljungqvist, L. and T.J. Sargent (2004), Chapters 16 and 17 in *Recursive Macroeconomic Theory (Second Edition)*, MIT Press.

Maliar, L. and S. Maliar (2004), “The Neoclassical Growth Model with Heterogeneous Quasi-Geometric Consumers,” forthcoming in *Journal of Money, Credit, and Banking* (economics.sbs.ohio-state.edu/jmcb/jmcb/03060/03060.pdf).

4. Incomplete markets II: no aggregate uncertainty, overlapping generations

Deaton, A. and C. Paxson (1994), “Intertemporal Choice and Inequality,” *Journal of Political Economy* 102, 437–467.

*Huggett, M. (1997), “Wealth Distribution in Life-Cycle Economies,” *Journal of Monetary Economics* 38, 469–494.

Laitner, J. (1992), “Random Earnings Differences, Lifetime Liquidity Constraints, and Altruistic Intergenerational Transfers,” *Journal of Economic Theory* 58, 135–170.

Laitner, J. (2002), “Wealth Accumulation in the U.S.: Do Inheritances and Bequests Play a Significant Role?”, manuscript (www-personal.umich.edu/~jlaitner/PAPER_ALL.pdf).

*Storesletten, K., C. Telmer, and A. Yaron (2004), “Consumption and Risk Sharing over the Life Cycle,” *Journal of Monetary Economics* 51, 609–633.

5. Incomplete markets III: aggregate uncertainty, infinitely-lived agents

Angeletos, M. (2003), “Incomplete Markets, Growth and the Business Cycle,” manuscript (econ-www.mit.edu/faculty/download_pdf.php?id=403).

Angeletos, M. (2004) “Idiosyncratic Investment Risk in the Neoclassical Growth Model,” manuscript (econ-www.mit.edu/faculty/download_pdf.php?id=1011).

Castañeda, A., J. Díaz-Giménez, and J.-V. Ríos-Rull (1998), “Exploring the Income Distribution Business Cycle Dynamics,” *Journal of Monetary Economics* 42, 93–130.

Chang, Y. and S.-B. Kim (2004), “Heterogeneity and Aggregation in the Labor Market: Implications for Aggregate Preference Shifts,” manuscript (plaza.snu.ac.kr/~yohg/papers/Preference.pdf).

Den Haan, W. (2001), “The Importance of the Number of Different Agents in a Heterogeneous Asset-Pricing Model,” *Journal of Economic Dynamics and Control* 25, 721–746.

Gomes, J. (2002), “The Right Stimulus: UI Benefits or Tax Cuts?,” manuscript (finance.wharton.upenn.edu/~gomesj/Research/Unemp_ins.pdf).

Gomes, J., J. Greenwood, and S. Rebelo (2001), “Equilibrium Unemployment” *Journal of Monetary Economics* 48, 109–152.

Heaton, J. and D.J. Lucas (1996), “Evaluating the Effects of Incomplete Markets on Risk Sharing and Asset Pricing,” *Journal of Political Economy* 104, 443–487.

Krusell, P. and A.A. Smith, Jr. (1997), “Income and Wealth Heterogeneity, Portfolio Selection, and Equilibrium Asset Returns,” *Macroeconomic Dynamics* 1, 387–422.

*Krusell, P. and A.A. Smith, Jr. (1998), “Income and Wealth Heterogeneity in the Macroeconomy,” *Journal of Political Economy* 106, 867–896.

Kubler, F. and K. Schmedders (2002), “Recursive Equilibria in Economies with Incomplete Markets,” *Macroeconomic Dynamics* 6, 284–306.

Miao, J. (2003), “Competitive Equilibria of Economies with a Continuum of Consumers and Aggregate Shocks,” manuscript (troi.cc.rochester.edu/~mias/shockag13.pdf).

Telmer, C. (1993), “Asset Pricing Puzzles and Incomplete Markets,” *Journal of Finance* 48, 1803–1832.

6. Incomplete markets IV: aggregate uncertainty, overlapping generations

Gourinchas, P.-O. (2000), “Precautionary Saving, LifeCycle, and Macroeconomics,” manuscript (ist-socrates.berkeley.edu/~pog/academic/pslm/bsm7.pdf).

*Storesletten, K., C. Telmer, and A. Yaron (2004), “Asset Pricing with Idiosyncratic Risk and Overlapping Generations,” manuscript (bertha.gsia.cmu.edu/files/papers/sty1B.pdf).

7. Incomplete markets V: limited asset market participation

Guvenen, F. (2003), “Reconciling Conflicting Evidence on the Elasticity of Intertemporal Substitution: A Macroeconomic Perspective,” manuscript (papers.ssrn.com/sol3/papers.cfm?abstract_id=318027).

*Guvenen, F. (2003), “A Parsimonious Macroeconomic Model for Asset Pricing: Habit Formation or Cross-sectional Heterogeneity?”, (papers.ssrn.com/sol3/papers.cfm?abstract_id=361120).

Mankiw, N.G. (2000), “The Savers-Spenders Theory of Fiscal Policy,” *American Economic Review* 90, 120–125.

Mankiw, N.G. (2000), “The Savers-Spenders Theory of Fiscal Policy: A Correction,” manuscript (post.economics.harvard.edu/faculty/mankiw/papers/savers_c.pdf).

8. Computation in heterogeneous-agent models

Den Haan, W.J. (1997), “Solving Dynamic Models with Aggregate Shocks and Heterogeneous Agents,” *Macroeconomic Dynamics* 1, 355–386.

Krueger, D. and F. Kubler (2004), “Computing Equilibrium in OLG Models with Stochastic Production,” *Journal of Economic Dynamics and Control* 28, 1411–1436.

Judd, K., F. Kubler, and K. Schmedders (2000), “Computing Equilibria in Infinite-Horizon Finance Economies: The Case of One Asset,” *Journal of Economic Dynamics and Control* 24, 1047–1078.

Judd, K., F. Kubler, and K. Schmedders (2003), “Computational Methods for Dynamic Equilibria with Heterogeneous Agents,” in: Dewatripont, M., L.P. Hansen, and S. Turnovsky, eds., *Advances in Economics and Econometrics*, Cambridge University Press, 243–290.

*Ríos-Rull, J.-V. (1999), “Computation of Equilibria in Heterogeneous-Agent Models,” in: R. Marimon and A. Scott (eds.), *Computational Methods for the Study of Dynamic Economies*, Oxford University Press, 238–264.

Young, E. (2002), “Approximate Aggregation: An Obstacle Course for the Krusell-Smith Algorithm,” manuscript (www.people.virginia.edu/~ey2d/appagg.pdf).

9. Policy issues I: welfare costs of business cycles

Heathcote, J. K. Storesletten, and G. Violante (2005), “Insurance and Opportunities: The Welfare Implications of Rising Wage Dispersion,” manuscript (www.georgetown.edu/faculty/jhh9/hsv_2005feb12.pdf).

Krebs, T. (2003), “Growth and Welfare Effects of Business Cycles in Economies with Idiosyncratic Human Capital Risk,” *Review of Economic Dynamics* 6, 846–868.

Krebs, T. (2004), “Welfare Cost of Business Cycles When Markets Are Incomplete,” manuscript (www.econ.brown.edu/~tkrebs/bcw5.pdf)

Krebs, T. (2004), “Job Displacement Risk and the Cost of Business Cycles,” manuscript (www.econ.brown.edu/~tkrebs/disaster.pdf).

Krusell, P. and A.A. Smith, Jr. (1999), “On the Welfare Effects of Eliminating Business Cycles,” *Review of Economic Dynamics* 2, 245–272.

*Krusell, P. and A.A. Smith, Jr. (2002), “Revisiting the Welfare Effects of Eliminating Business Cycles,” manuscript (www.econ.yale.edu/smith/revisit.pdf).

Lucas, Jr., R.E. (2003), “Macroeconomic Priorities,” *American Economic Review* 93, 1–14.

Storesletten, K., C. Telmer, and A. Yaron (2001), “The Welfare Costs of Business Cycles Revisited: Finite Lives and Cyclical Variation in Idiosyncratic Risk,” *European Economic Review* 45 1311–1339.

10. Policy issues II: distributional effects of fiscal policy

Conesa, J.C. and D. Krueger (1999), “Social Security with Heterogeneous Agents,” *Review of Economic Dynamics* 2, 757–795.

Domeij, D. and J. Heathcote (2003), “On the Distributional Effects of Reducing Capital Taxes,” *International Economic Review* 45, 523–554.

Hansen, G. and A. İmrohoroğlu (1992), “The Role of Unemployment Insurance in an Economy with Liquidity Constraints and Moral Hazard,” *Journal of Political Economy* 100, 118–142.

*Heathcote, J. (2003), “Fiscal Policy with Heterogeneous Agents and Incomplete Markets,” forthcoming in *Review of Economic Studies* (www.restud.org.uk/PDF/03_2004/Heathcote).

pdf).

Hubbard, R.G., J. Skinner, and S.P. Zeldes (1995), “Precautionary Saving and Social Insurance,” *Journal of Political Economy* 103, 360–399.

*Huggett, M. and G. Ventura (1999), “On the Distributional Effects of Social Security Reform,” *Review of Economic Dynamics* 2, 498–531.

İmrohoroğlu, A., S. İmrohoroğlu, and D.H. Joines (1995), “A Life Cycle Analysis of Social Security,” *Economic Theory* 6, 83–114.

Storesletten, K., C. Telmer, and A. Yaron (1999), “The Risk Sharing Implications of Alternative Social Security Arrangements,” *Carnegie Rochester Conference Series on Public Policy* 50, 213–259.

*Young, E. (2004), “Unemployment Insurance and Capital Accumulation,” forthcoming in *Journal of Monetary Economics* (www.people.virginia.edu/~ey2d/jmeUI3.pdf).

11. Policy issues III: distributional effects of monetary policy

Erosa, A. and G. Ventura (2002), “On Inflation as a Regressive Consumption Tax,” *Journal of Monetary Economics* 49, 761–795.

Doepke, M. and M. Schneider (2004), “Real Effects of Inflation: the Role of Redistribution through Nominal Debt,” manuscript (homepages.nyu.edu/~ms1927/inflation20.pdf).

12. Empirical models of household risk

Guvenen, F. (2004), “Learning Your Earning: Are Labor Income Shocks Really Very Persistent?,” manuscript (papers.ssrn.com/sol3/papers.cfm?abstract_id=577582).

Heathcote, J., K. Storesletten, and G.L. Violante (2004), “The Macroeconomic Implications of Rising Wage Inequality in the U.S.,” manuscript (www.econ.nyu.edu/user/violante/Workingpapers/hsv_final.pdf).

Huggett, M., G. Ventura, and A. Yaron (2003), “Human Capital and Earnings Distribution Dynamics,” forthcoming in *Journal of Monetary Economics* (savage.wharton.upenn.edu/papers-yaron/hcap.pdf).

Meghir, M. and L. Pistaferri (2004), “Income Variance Dynamics and Heterogeneity,” *Econometrica* 72, 1–32.

Perri, F. and D. Krueger (2004), “On the Welfare Consequences of the Increase in Inequality in the United States,” in: Gertler, M. and K. Rogoff, eds., *NBER Macroeconomics Annual*

2003, MIT Press, 83–121.

*Storesletten, K., C. Telmer, and A. Yaron (2004), “Cyclical Dynamics in Idiosyncratic Labor-Market Risk,” *Journal of Political Economy* 112, 695–717.

13. Models of wealth inequality

*Cagetti, M. and M. De Nardi (2004), “Taxation, Entrepreneurship, and Wealth,” manuscript (minneapolisfed.org/research/sr/sr340.pdf).

Cagetti, M. and M. De Nardi (2004), “Wealth Inequality: Data and Models,” manuscript (www.econ.umn.edu/~nardi/research/Wealthsurvey.pdf).

Díaz, A., J. Pijoan-Mas, J.-V. Ríos-Rull (2003), “Precautionary Savings and Wealth Distribution under Habit Formation Preferences,” *Journal of Monetary Economics* 50, 1257–1291.

*De Nardi, M. (2004), “Wealth Inequality and Intergenerational Links,” *Review of Economic Studies* 71, 743–768.

Quadrini, V. (2000), “Entrepreneurship, Saving, and Social Mobility,” *Review of Economic Dynamics* 45, 1–40.

Quadrini, V. and J.-V. Ríos-Rull (1997), “Understanding the U.S. Distribution of Wealth,” *Federal Reserve Bank of Minneapolis Quarterly Review* 21 (No. 2), 22–36.

14. Endogenous borrowing constraints

Alvarez, F. and U. Jermann (2000), “Efficiency, Equilibrium, and Asset Pricing with Risk of Default,” *Econometrica* 68, 775–797.

*Alvarez, F. and U. Jermann (2001), “Quantitative Asset Pricing Implications of Endogenous Solvency Constraints,” *Review of Financial Studies* 14, 1117–1151.

*Chatterjee, S., D. Corbae, M. Nakajima, and J.-V. Ríos-Rull (2002), “A Quantitative Theory of Unsecured Consumer Credit with Risk of Default,” manuscript (www.ssc.upenn.edu/~vr0j/papers/cdmv2.pdf).

Krueger, D. and F. Perri (2003), “Does Income Inequality Lead to Consumption Inequality? Evidence and Theory,” manuscript (www.econ.upenn.edu/~dkrueger/vii1003.pdf).

Lustig, H. and S. Van Nieuwerburgh (2006), “Can Housing Collateral Explain Long-Run Swings in Asset Returns?”, manuscript (www.econ.ucla.edu/people/papers/Lustig/Lustig322.pdf).

Nakajima, M. and J.-V. Ríos-Rull (2004), “Default and Aggregate Fluctuations in Storage Economies,” in: Kehoe, T.J. T.N. Srinivasan, and J. Whalley, eds., *Frontiers in Applied General Equilibrium Modeling*, Cambridge University Press (manuscript available at: www.ssc.upenn.edu/~vr0j/papers/scarffinal.pdf).

15. Macroeconomics and the family

Aiyagari, S.R., J. Greenwood, and N. Guner (2000), “On the State of the Union,” *Journal of Political Economy* 108, 213–244.

*Cubeddu, L. and J.-V. Ríos-Rull (2003), “Families as Shocks,” *Journal of the European Economic Association* 1, 671–682.

16. Growth and inequality

Aghion, P. and P. Bolton (1997), “A Theory of Trickle-Down Growth and Development,” *Review of Economic Studies* 64, 151–172.

Banerjee, A. and A. Newman (1993), “Occupational Choice and the Process of Development,” *Journal of Political Economy* 101, 274–298.

Bénabou, R. (2002), “Tax and Education Policy in a Heterogeneous Agent Economy: What Levels of Redistribution Maximize Growth and Efficiency?,” *Econometrica* 70, 481–517.

Bénabou, R. (1996), “Inequality and Growth,” in: Bernanke, B. and J. Rotemberg, eds., *NBER Macroeconomics Annual 1996*, MIT Press, 11–74.

Bernhardt, D. and H. Ellis (2000), “Enterprise, Inequality and Economic Development,” *Review of Economic Studies* 67, 147–168.

de la Croix, D. and M. Doepke (2003), “Inequality and Growth: Why Differential Fertility Matters,” *American Economic Review* 93, 1091–1113.

Galor, O. and J. Zeira (1993), “Income Distribution and Macroeconomics,” *Review of Economic Studies* 60, 35–52.

Galor, O. and D. Tsiddon (1997), “The Distribution of Human Capital and Economic Growth,” *Journal of Economic Growth* 2, 93–124.

Glomm, G. and B. Ravikumar (1992), “Public versus Private Investment in Human Capital: Endogenous Growth and Income Inequality,” *Journal of Political Economy* 100, 818–834.

Paulson, A. and R. Townsend (2003), “Distinguishing Limited Commitment from Moral Hazard in Models of Growth with Inequality,” manuscript (www.src.uchicago.edu/users/robt).

Piketty, T. (1997), “The Dynamics of the Wealth Distribution and the Interest Rate with Credit Rationing,” *Review of Economic Studies* 64, 173–189.

Townsend, R. and K. Ueda (2003), “Financial Deepening, Inequality, and Growth: A Model-Based Quantitative Evaluation,” manuscript (www.src.uchicago.edu/users/robt).