

14.123 Microeconomic Theory III

Staff:

Instructor: Prof. Robert Townsend, E52-538, Office hours: Thursday 4-5:00 pm .

Teaching Assistant: Dejanir Silva, E52-480, dejanir@mit.edu, Monday 5-6:00pm

Logistics:

Two lectures per week, Tue., Thu. 1-2:30, 13 lectures total in E51-151

Recitations: Fri, 1-2:30 in E51-151

Course begins on 03/29/2016 and ends 05/12/2016

Exam: 05/19/2016, E52-164

Description:

This course provides an introduction to theory and data designed to meet the needs of students in the economics PhD program. It provides an introduction to consumer choice and especially to General Equilibrium models, with an overview of the main results and tools used in these subjects and both directly and indirectly in a variety of other fields.

Enrollment in this course is limited and permission of the instructor is required. Permission can be obtained by attending the first class meeting and providing information about previous coursework in mathematics and economics. The course assumes that students have taken undergraduate intermediate microeconomics classes. It also assumes that students are comfortable with multivariable calculus, linear algebra and have had some exposure to real analysis. Historically, many students from outside the economics department have had difficulty with the course. The enrollment limit may result in well-qualified students being turned away.

Textbook:

- Mas-Collel, Whinston, and Green (1995): Microeconomic Theory [MWG]

Some students have also found the following books helpful:

- Debreu, G. Theory of Value: An Axiomatic Analysis of Economic Equilibrium. New York, NY: Wiley, 1959
- Jehle, Geoffrey, and Philip Reny. Advanced Microeconomic Theory. 2nd ed. Reading, MA: Addison-Wesley, 2000. [JR]
- Koopmans, Tjalling C. Three essays on the state of economic science. New York : McGraw-Hill, 1957.
- Quirk, James, and Rubin Saposnik. Introduction to general equilibrium theory and welfare economics. New York, McGraw-Hill, 1968.

Grading and Requirements:

The course will be graded on the basis of a series of problem sets and a final exam. Problem sets will be due in class on assigned lecture dates. They will be graded on a check-, check, check+ basis.

The grades are intended primarily to give you an idea of how you are doing in the course. You may work in groups, but please do the write-ups individually. We do not expect to see identical answers from different students. Class participation is strongly encouraged. The final exam will be held a week after the last lecture.

• **Topic 1 (3/29): The Big(gest) Picture**

Overview of the class. Economic science. Data and its organization. Experiments and research design. Micro and macro questions. Identification and restrictions on data. Estimation (parametric and nonparametric). Quantification of parameters and answers to research questions. Policy implications, guidance on intervention. Modeling primitives and the role of theory, big data and computation.

References:

- Chipman, John S. “The contributions of Ragnar Frisch to economics and econometrics.” *Econometric Society Monographs* 31 (1998): pp. 58-110.
- Gabaix, Xavier. ”A Sparsity-Based Model of Bounded Rationality*.” *Quarterly Journal of Economics* 129.4 (2014).
- Koopmans (1947), “Measurement without theory,” *The Review of Economics and Statistics*, Vol. 29, No. 3 (1947), pp. 161-172.
- Mitchell, Wesley Clair. *Business cycles*. Vol. 3. University of California Press, 1913.
- Matzkin, Rosa, ”Nonparametric Identification.” *Handbook of Econometrics* 6 (2007): 5307-5368.
- Belloni, Alexandre, Victor Chernozhukov, and Christian Hansen. ”High-dimensional methods and inference on structural and treatment effects.” *The Journal of Economic Perspectives* 28.2 (2014): 29-50.
- Adao, Rodrigo, Arnaud Costinot, and Dave Donaldson. *Nonparametric Counterfactual Predictions in Neoclassical Models of International Trade*. No. w21401. National Bureau of Economic Research, 2015.
- Angrist and Pischke (2010), “The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics” (No. w15794). National Bureau of Economic Research.
- Angrist and Imbens (1994), “Identification and Estimation of Local Average Treatment Effects,” *Econometrica*, Vol. 62, No. 2 (1994), pp. 467-475.
- Yagan, Danny (2016), “The Enduring Employment Impact of Your Great Recession Location”, Working paper.
- Nakamura, Emi, Jsef Sigurdsson, and Jn Steinsson (2016), “The Gift of Moving: Intergenerational Consequences of a Mobility Shock”, Working Paper.
- Chiappori, Ekeland, Kübler and Polemarchakis (2004), “Testable Implications of General Equilibrium Theory: a Differentiable Approach,” *Journal of Mathematical Economics* Vol. 40, No. 1 (2004), pp. 105-119.
- Lucas Jr, Robert E. “Understanding business cycles,” *Carnegie-Rochester Conference Series on Public Policy* Vol. 5, North-Holland, 1977.

• **Topic 2 (3/31): Villages and Larger Economies, and The Commodity Space in General Equilibrium Settings**

General Setup. Applications. Commodity Space. The Continuum Economy.

References:

- Townsend, Robert M. ”Financial systems in Northern Thai villages.” *The Quarterly Journal of Economics* (1995): 1011-1046.

- Townsend, Robert M. *The medieval village economy: A study of the Pareto mapping in general equilibrium models*. Princeton University Press, 1993.
- Costinot, Arnaud, Dave Donaldson, and Cory Smith. "Evolving Comparative Advantage and the Impact of Climate Change in Agricultural Markets: Evidence from 1.7 Million Fields around the World." *Journal of Political Economy* 2016; 124(1), 205-248.
- Fisher, Irving. *The theory of interest as determined by impatience to spend income and opportunity to invest it*. 1930.
- Debreu, G. *Theory of Value: An Axiomatic Analysis of Economic Equilibrium*. New York, NY: Wiley, 1959, Chapter 7.
- Arrow, Kenneth J. "The organization of economic activity: issues pertinent to the choice of market versus nonmarket allocation." *The analysis and evaluation of public expenditure: the PPB system 1* (1969): 59-73.
- Besley, Timothy, Stephen Coate, and Glenn Loury. "The economics of rotating savings and credit associations." *The American Economic Review* (1993): 792-810.
- Leontief, Wassily W. *Input-output economics*. Oxford University Press on Demand, 1986.
- Samuelson, Paul A. "An exact consumption-loan model of interest with or without the social contrivance of money." *The journal of political economy* (1958): 467-482.
- Townsend, Robert M. "Models of money with spatially separated agents." *Models of monetary economies* (1980): 265-303.
- Townsend, Robert, and Neil Wallace. *Circulating private debt: An example with a coordination problem*. University of Minnesota Press, Minneapolis, 1987.
- Manuelli, Rodolfo, and Thomas J. Sargent. "Alternative monetary policies in a turnpike economy." *Macroeconomic Dynamics* 14.05 (2010): 727-762.
- Townsend, Robert M., and Townsend. *Financial Structure & Economic Organization*. Blackwell, 1990, Chapter 1.
- Aumann, Robert J. "Markets with a continuum of traders." *Econometrica: Journal of the Econometric Society* (1964): 39-50.

• **Topic 3 (4/5 and 4/7): Introduction to General Equilibrium and The First Welfare Theorem**

Solution of decentralized problem. Walras' Law. Pareto Optimality. First Welfare Theorem and its failures. Pollution, Limited Liability, Overlapping Generations.

References:

- First Welfare Theorem: MWG 15.C, 16.A - 16.C

• **Topic 4 (4/12 and 4/14): Second Welfare Theorem**

Second Welfare Theorem and its failures. Pareto Optimality and Welfare functions. Lotteries

References:

- Second Welfare Theorem: MWG 16.D
- Pareto Optimality and Welfare functions: MWG 16.E - 16.G
- Lotteries:
 - Rogerson (1988), "Indivisible labor, lotteries and equilibrium", *Journal of Monetary Economics*, Vol. 21, pp. 3-16.

- Prescott and Townsend (1984), “General Competitive Analysis in an Economy with Private Information”, *International Economic Review*, Vol. 25, No.1, pp.1-20
- Debreu (1954), “Valuation Equilibrium and Pareto Optimum”, *Proceedings of the National Academy of Sciences of the United States of America* (PNAS). 1954 July; 40(7): 588–592.

• **Topic 5 (4/21 and 4/26): General Implementation and Bargaining Foundations of General Equilibrium**

Core. Replication Economies and Core Convergence. Continuum of consumers and Aumann equivalence. Nash bargaining. Price makers and intermediation.

References:

- Core, core convergence and Aumann equivalence: MWG 18.B
- Nash bargaining: MWG 22.E
- Implementation:
 - Shapley, L. and Shubik, M., 1977. Trade Using One Commodity as a Means of Payment. *Journal of Political Economy*, 85(5), pp.937-968
 - Townsend, Robert M. “Theories of intermediated structures.” *Carnegie-Rochester Conference Series on Public Policy*. Vol. 18. North-Holland, 1983.
 - Dubey, P., 1982. Price-Quantity Strategic Market Games. *Econometrica*, 50(1), pp.111-126.
 - Budish E., Cramton P., Shim J. The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response *Quarterly Journal of Economics*, vol. 130(4) pp. 1547-1621

• **Topic 6 (4/28 and 5/3): General Equilibrium with Uncertainty**

- Expected Utility Theory and Risk-Sharing. Contingent Commodities. Testing. Institutions. Policy. Networks

References:

- Expected Utility Theory and Risk-Sharing: MWG Chapter 6
- Testing:
 - Clavijo, J. (2013). Risk Capital Allocation for a Guarantee Fund in a Central Counterparty Clearing.
 - Kinnan, C., & Townsend, R. (2012). Kinship and financial networks, formal financial access, and risk reduction. *The American Economic Review*, 102(3), 289-293.
 - Paweenawat, A., & Townsend, R. M. (2012). Village Economic Accounts: Real and Financial Intertwined. *The American Economic Review*, 102(3), 441-446.
 - Samphantharak, K., & Townsend, R. M. (2015). Risk and Return in Village Economies.
 - Sanders, A. B., & Slawson, V. C. (2005). Shared appreciation mortgages: Lessons from the UK. *Journal of Housing Economics*, 14(3), 178-193.
 - Sripakdeevong, P., & Townsend, R. M. (2012). Informal networks and shadow banking. unpublished project document, MIT.
 - Townsend (1993), “The Medieval Village Economy”, *Princeton University Press*, Section 2.2
 - Townsend (1994), “Risk and Insurance in Village India”, *Econometrica*, Vol. 62, No.3 (May, 1994), pp. 539-591

- Policy:
 - Alem, M., & Townsend, R. M. (2014). An evaluation of financial institutions: Impact on consumption and investment using panel data and the theory of risk-bearing. *Journal of econometrics*, 183(1), 91-103.
 - Greenwood, J., & Jovanovic, B. (1990). Financial Development, Growth, and the Distribution of Income. *Journal of Political Economy*, 98(5 pt 1).
 - Tazhibayeva, K., & Townsend, R. (2012). The Impact of Climate Change on Rice Yields: Heterogeneity and Uncertainty. Unpublished paper, Massachusetts Institute of Technology.
 - Townsend, R. M., & Yaron, J. (2001). The Credit Risk-Contingency System of an Asian Development Bank. *Economic Perspectives*, 25(3), 31.
- Arrow-Debreu and Radner Economies: MWG 19.A - 19.G

• **Topic 7 (5/5): Existence and Computation of Walrasian Equilibria**

Classical Demand Theory. Fixed Point Theorems. Sufficient conditions for Existence of Walrasian Equilibria. Computation of equilibrium prices: Scarf's Algorithm. Negishi's Algorithm.

References:

- Classical Demand Theory: MWG 3.D
- Alex Wolitzky 14.121 notes
- Hansen, T., & Scarf, H. (1973). The computation of economic equilibria. Cowles Foundation Monograph: Yale University, 22.
- Fixed Point Theorems: MWG M.H and M.I
- Nash Equilibrium and Fixed Point Theorems: MWG 8.D and 8.A
- Existence of Walrasian Equilibrium: MWG 17.A - 17.D
- Negishi's Algorithm: Judd (2005), "Solving Dynamic Stochastic Competitive General Equilibrium Models", in "Frontiers in applied general equilibrium modeling: in honor of Herbert Scarf".
- Negishi, T. (1960). Welfare economics and existence of an equilibrium for a competitive economy. *Metroeconomica*, 12(23), 92-97.
- Takayama, Akira. *Mathematical economics*. Cambridge University Press, 1985.
- Scarf, H. E. (1982). The computation of equilibrium prices: an exposition. *Handbook of mathematical economics*, 2, 1007-1061.
- Dasgupta, P., & Maskin, E. (1986). The existence of equilibrium in discontinuous economic games, I: Theory. *The Review of economic studies*, 53(1), 1-26.

• **Topic 8 (5/10): Calibration and Basic Micro and Macroeconomics**

Calibration. Calibration in Applied Microeconomic Models. A Trade Model. Calibration in Dynamic Macroeconomic Models. Controversy over Calibration. Calibration vs Estimation.

References:

- Calibration:
 - Dawkins, Srinivasan and Whalley (2001), "Calibration", on *Handbook of Econometrics*, vol 5, Chapter 58

- Hansen and Heckman (1996), "The Empirical Foundations of Calibration", *The Journal of Economic Perspectives*, Vol.10 No.1, pp. 87-104
- Kydland, F. E., & Prescott, E. C. (1982). Time to build and aggregate fluctuations. *Econometrica: Journal of the Econometric Society*, 1345-1370.
- Lucas, R. E. (1976, December). Econometric policy evaluation: A critique. In Carnegie-Rochester conference series on public policy (Vol. 1, pp. 19-46). North-Holland.
- Lucas, R. E. (1987). Models of business cycles (Vol. 26). Oxford: Basil Blackwell.
- Prescott, Edward C (1986). "Theory Ahead of Business Cycle Measurement." *Quarterly Review*.
- Shoven and Walley (1973), "General Equilibrium with Taxes: A Computational Procedure and an Existence Proof", *The Review of Economic Studies*, Vol. 40, No. 4 (Oct., 1973), pp. 475-489.
- Summers, Lawrence H. "Some skeptical observations on real business cycle theory." *Quarterly Review* Fall (1986): 23-27.
- Leontief production function and input-output matrices: MWG 5.A
- Linear Programming: MWG M.M
- Anna Mikusheva, course materials for 14.384 Time Series Analysis, Fall 2007, MIT OpenCourseWare (<http://ocw.mit.edu>), Massachusetts Institute of Technology

• **Topic 9 (5/12): Identification in General Equilibrium**

Weak Axiom of Revealed Preferences and Law of Demand. Revealed Preference. GARP. Afriat's Theorem: Testability of Consumer Rationality. The Sonnenschein-Mantel-Debreu Theorem. Testable restrictions on equilibrium allocations: Brown and Matzkin.

References:

- Revealed preferences and law of demand: 2.E - 2.F
- Integrability:
 - MWG 3.H
 - Jehle and Reny, "Advanced Microeconomic Theory". 2nd ed. Reading, MA: Addison-Wesley, 2000., pp.80-86
- Sonnenschein-Mantel-Debreu Theorem: MWG 17.E
- Testable restrictions on equilibrium allocations:
 - Brown and Matzkin (1996), "Testable Restrictions on the Equilibrium Manifold", *Econometrica*, Vol. 64, No.6 (Nov., 1996), pp. 1249-1262