(Updated: 1/10/2014)

ECON 721: International Trade II

Yale University, Spring Semester, 2014 (M/W 1:15 - 2:30pm)

Instructor: Samuel Kortum Office: 37HH, rm 06
Instructor: Costas Arkolakis Office: 28HH, rm 312
Phone: SK: (203) 432-6217 CA: (203) 432 3527
Office Hours: SK: 3-5 Mon. and Tues, rm 305, 28 HH or by apt, CA: Mon 10:30-11:30 or by apt.

Description This course is the second part of International Trade and is jointly taught by Professors Costas Arkolakis and Samuel Kortum throughout the Spring Semester. It covers basic theories of international trade, with an emphasis on quantitative models. Topics include the behavior of individual producers in international markets, trade flows between nations, trade imbalances, welfare gains from trade, trade dynamics, networks and trade, and aggregate growth. We will develop theoretical models, evaluate their ability to capture key stylized facts, show how to estimate their parameters, and demonstrate their use in performing policy experiments. The course involves a mix of theory, data, econometrics, and computation.

Grading We will assign 6 problem sets (be prepared to us STATA and MATLAB). Your course grade will be based on our evaluation of the problem sets (60%), class participation (20%, keep up with the reading!), and a final class presentation (20%).

Academic Integrity The following statement, which we endorse, was composed at the Yale Graduate School: "Academic integrity is a core institutional value at Yale. It means, among other things, truth in presentation, diligence and precision in citing works and ideas we have used, and acknowledging our collaborations with others. In view of our commitment to maintaining the highest standards of academic integrity, the Graduate School Code of Conduct specifically prohibits the following forms of behavior: cheating on examinations, problem sets and all other forms of assessment; falsification and/or fabrication of data; plagiarism, that is, the failure in a dissertation, essay or other written exercise to acknowledge ideas, research, or language taken from others; and multiple submission of the same work without obtaining explicit written permission from both instructors before the material is submitted. Students found guilty of violations of academic integrity are subject to one or more of the following penalties: written reprimand, probation, suspension (noted on a student's transcript) or dismissal (noted on a student's transcript)."

Readings Most of the readings are journal articles and working papers. We will also use major sections from a book prepared by Jonathan Eaton and Samuel Kortum: *Tech-*

nology in the Global Economy: A Framework for Quantitative Analysis (henceforth EK) and a set of *Notes on Graduate International Trade* by Costas Arkolakis and Treb Allen (henceforth AA).

Topics The following list summarizes the topics and readings by week. We may deviate from this schedule if more time is required for a certain topic. The starred (*) readings will be the focus of the lecture.

1. **(1/13, 1/15) Basic Armington Setup**
   - **Problem set 1 assigned*
   - *AA, Chapters 2 and 4.
   - *EK, Chapters 4-6.
   - *Anderson, J., "A Theoretical Foundation for the Gravity Equation," 1979, *American Economic Review*, 69(1), 106-116.
   - *Krugman, P., "Scale Economies, Product Differentiation, and the Pattern of Trade," 1980, *American Economic Review*, 70(5), 950-959.
2. **(MLK, 1/22) The Monopolistic Competition Setup**
   - *AA, Chapters 2 and 3.
   - *Chaney, T., "Distorted Gravity: The Intensive and Extensive Margins of International Trade," 2008, *American Economic Review*, 98(4), 1707-1721.
   - *Melitz, M. J., "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," 2003, *Econometrica*, 71(6), 1695-1725.
   - *Arkolakis C., S. Demidova, P. Klenow, and A. Rodriguez-Clare, "Endogenous Variety and the Gains from Trade," 2008, *American Economic Review, Papers and Proceedings*
   - Mrázová M. and J.P. Neary, "Selection Effects with Heterogeneous Firms," 2013, mimeo.
3. **(1/27, 1/29) Closing the Model**
   - **Problem set 2 assigned*
   - *AA, Chapter 4.
   - *Arkolakis, Costinot, and Rodriguez-Clare, "New Trade Theories Same Old Gains?," 2010, *American Economic Review*.
   - *Allen and Arkolakis, "Trade and the Topography of the Spatial Economy," 2013, NBER working paper, 19181
   - Gaubert, "Firm Sorting and Agglomeration," 2012, mimeo, Princeton
   - Behrens, Duranton, and Robert-Nicoud, "Productive Cities: Sorting, Selection, and Agglomeration," forthcoming *Journal of Political Economy*.
4. **(2/3, 2/5) Solving for Equilibrium and Welfare**

- *AA, Chapters 4 and 5.
- *Arkolakis, Costinot, and Rodriguez-Clare, "New Trade Theories Same Old Gains?," 2010, *American Economic Review.*

5. **(2/10, 2/12) Ricardian Models**
   - EK, Chapters 3 and 4.
   - *Eaton and Kortum, "Putting Ricardo to Work," *Journal of Economic Perspectives*, 2012: 65-90.
   - Eaton and Kortum, "On-line Appendix: Putting Ricardo to Work", *Journal of Economic Perspectives.*
   - *Dornbusch, Fischer, and Samuelson, "Comparative Advantage, Trade, and Payments in a Ricardian Model with a Continuum of Goods," *American Economic Review*, 1977: 823-839.
   - *Eaton and Kortum, "Technology, Geography, and Trade," *Econometrica,* 2002: 1741-1780.

6. **(2/17, 2/19) Applications and Extensions**
   - **Problem set 3 assigned*
   - EK, Chapters 5 and 6.
   - Alvarez and Lucas, "General Equilibrium Analysis of the Eaton-Kortum Model of International Trade," *Journal of Monetary Economics*, 2007: 1726-1768.
   - *Dekle, Eaton, and Kortum, "Unbalanced Trade," *American Economic Review, Papers and Proceedings,* 2007 (see appendix to *NBER Working Paper* #13035).
   - *Ramondo, Rodriquez-Clare, and Saborio-Rodriguez, "Trade, Domestic Frictions, and Scale Effects," 2013, mimeo, UC Berkeley.
   - Caliendo and Parro, "Estimates of the Trade and Welfare Effects of NAFTA," 2013, mimeo, Yale SOM.
   - *Donaldson, "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure," forthcoming *American Economic Review.*
   - Waugh, "International Trade and Income Differences," *American Economic Review*, 2010: 2093-2124.
   - Fieler, "Nonhomotheticity and Bilateral Trade: Evidence and a Quantitative Explanation," *Econometrica*, 2011: 1069-1101.

7. **(2/24, 2/26) Incorporating Dynamics**
   - Dekle, Eaton, and Kortum, "Global Rebalancing with Gravity: Measuring the Burden of Adjustment," *NBER Working Paper* #13846, 2008
   Complete Markets:

- *Arrow, "The Role of Securities in the Optimal Allocation of Risk-bearing," *Review of Economic Studies*, 1964: 91-96.
- *Fitzgerald, "Trade Costs, Asset Market Frictions and Risk Sharing," *American Economic Review*, 2012: 2700-2733.
- *Eaton, Kortum, Neiman, and Romalis, "Trade and the Global Recession," 2014, mimeo, Yale.
- Arkolakis, Eaton, and Kortum, "Staggered Adjustments and Trade Dynamics," 2013, mimeo.

  Product-Level Facts:
- Hummels and Klenow, "The Variety and Quality of a Nations Exports," *American Economic Review*, 2005: 704-723.
- Kehoe and Ruhl, "How Important is the New Goods Margin in International Trade," *Journal of Political Economy*, 2013: 358-392.
- Kehoe, Rossbach, and Ruhl, "Using the new products margin to predict the industry-level impact of trade reform," 2013, mimeo

8. **(3/3, 3/5) Imperfect Competition and Producer-Level Models**
   - **Problem set 4 assigned*
   - Bernard and Jensen, "Exporters, Jobs, and Wages in US Manufacturing, 1976-1987," *Brookings Papers, Microeconomics*, 1995.

     Continuum Models:
   - *Bernard, Eaton, Jensen, and Kortum, "Plants and Productivity in International Trade," *American Economic Review,* 2003: 1268-1290.
   - *Melitz, "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica*, 2003: 1659-1726.
   - Chaney, "Distorted Gravity: Heterogeneous Firms, Market Structure, and the Geography of International Trade," *American Economic Review*, 2008: 1707-1721.
   - *Arkolakis, "Market Penetration Costs and the New Consumers Margin in International Trade," *Journal of Political Economy*, 2011: 1151-1199.
   - *Eaton, Kortum, and Kramarz, "An Anatomy of International Trade: Evidence from French Firms," *Econometrica*, 2011: 1453-1498.

     Finite Firm Models:
   - Gabaix, "The Granular Origins of Aggregate Fluctuations," *Econometrica*, 2011: 733-772.
   - Helpman, Melitz, and Rubinstein, "Estimating Trade Flows: Trading Partners and Trading Volumes," *Quarterly Journal of Economics,* 2008: 441-487.
   - Armenter and Koren, "A Balls-and-Bins Model of Trade," forthcoming *American Economic Review*.

- *Eaton, Kortum, and Sotelo, "International Trade: Linking Micro and Macro," *Advances in Econometrics: Theory and Applications, Tenth World Congress*.
- Di Giovanni and Levchenko, "Country Size, International Trade, and Aggregate Fluctuations in Granular Economies," *Journal of Political Economy*, 2012: 1083-1132.
- Santos Silva and Tenreyro "The Log of Gravity," *Review of Economics and Statistics*, 2006: 641-658.

9. **(3/24, 3/26) Variable Markups and Welfare**
   - **Problem set 5 assigned*
   - *Arkolakis, Costinot, Donaldson, and Rodríguez-Clare, "The Elusive Pro-Competitive Effects of Trade," 2012, mimeo.
   - *Holmes, Hsu and Lee "Allocative Efficiency, Mark-ups, and the Welfare Gains from Trade," 2012, mimeo.
   - *De Blas and Russ, "Understanding Markups in the Open Economy," 2012, mimeo.
   - *Mrázová and Neary, "Not so Demanding: Preference Structure, Firm Behavior, and Welfare," 2011, mimeo.
   - *Atkeson and Burstein, "Pricing-to-Market, Trade Costs, and International Relative Prices," *American Economic Review*, 2008: 1998-2031.
10. **(3/31, 4/2) Heckscher-Ohlin Applications**
   - Trefler, "The Case of the Missing Trade and Other Mysteries," *American Economic Review*, 1995: 1029-1046.
   - Dornbusch, Fischer, and Samuelson, "Heckscher-Ohlin Trade Theory with a Continuum of Goods," *Quarterly Journal of Economics*, 1980: 203-224.
   - *Romalis, "Factor Proportions and the Structure of Commodity Trade," *American Economic Review*, 2004: 67-97.
   - Bernard, Redding, and Schott, "Comparative Advantage and Heterogeneous Firms," *Review of Economic Studies*, 2007: 31-66.
   - *Costinot and Vogel, "Matching and Inequality in the World Economy," *Journal of Political Economy*, 2010: 747-786.
   - Lu, "Exceptional Exporter Performance? Evidence from Chinese Manufacturing Firms," mimeo, University of Rochester.
11. **(4/7, 4/9) Dynamic Models**
   - **Problem set 6 assigned*
     Models of Firm Entry and Growth:
   - Baldwin, "Sunk-Cost Hysteresis," 1989, NBER working paper.

- *Baldwin and Krugman, "Persistent trade effects of large exchange rate shocks,", 1989, *Quarterly Journal of Economics* 104, pp. 635–654.
- Fujii, "International Trade Dynamics with Sunk Costs and Productivity Shocks," 2013, mimeo.
- *Luttmer, "Selection, Growth, and the Size Distribution of Firms," *Quarterly Journal of Economics*," 2007.
- *Arkolakis, "A Unified Theory of Firm Selection and Growth," mimeo, Yale University

Quality Ladder Models:

- Grossman and Helpman, "Quality Ladders in the Theory of Growth," *Review of Economic Studies*, 1991: 43-61.
- *Klette and Kortum, "Innovating Firms and Aggregate Innovation," *Journal of Political Economy*, 2004: 986-1018
- *Acemoglu, Akcigit, Bloom, and Kerr, "Innovation, Reallocation, and Growth," 2013, mimeo, University of Pennsylvania.

Ideas and Technology:

- Krugman, "A Model of Innovation, Technology Transfer, and the World Distribution of Income," *Journal of Political Economy*, 1979: 253-266.
- Romer, "Endogenous Technological Change," *Journal of Political Economy*, 1990: S71-S102.
- Eaton and Kortum, "Trade in Ideas: Patenting and Productivity in the OECD," *Journal of International Economics*, 1996: 251-278.
- Eaton and Kortum , "International Technology Diffusion: Theory and Measurement," *International Economic Review*, 1999: 537-570.
- Lucas, "Ideas and Growth," *Economica*, 2009: 1-19.
- Lucas and Moll, "Knowledge Growth and the Allocation of Time" forthcoming, *Journal of Political Economy.*
- Alvarez, Buera, and Lucas, "Idea Flows, Economic Growth, and Trade," *NBER Working Paper* No. 19667.

Capital Accumulation Models:

- Solow, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, 1956: 65-94.
- Mankiw, Romer, and Weil, "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics*, 1992: 407-437.
- Eaton and Kortum, "Trade in Capital Goods," *European Economic Review*, 2001: 1195-1235.
- Hsieh and Klenow, "Relative Prices and Relative Prosperity," *American Economic Review*, 2007: 562-585.

12. **(4/14, 4/16) Task Trade and Networks**

- Grossman and Rossi Hansberg, "Task Trade Between Similar Countries," *Econometrica*, 2012: 593-629.
- Chaney, "The Gravity Equation in International Trade: an Explanation," 2013, mimeo, Toulouse.
- Artuc and McLaren, "Trade Policy and Wage Inequality: A Structural Analysis with Occupational and Sectoral Mobility," mimeo, University of Virginia.
- *Oberfield, "Business Networks, Production Chains, and Productivity: A Theory of Input-Output Architecture," 2013, mimeo, Princeton.
- *Eaton, Kortum, and Kramarz, "Firm-to-Firm Trade: Imports, Exports, and the Labor Market," 2013, mimeo, Yale.
- di Giovanni, Levchenko, and Mejean, "Firms, Destinations, and Aggregate Fluctuations, 2013, mimeo, Michigan.

13. **(4/21, 4/23) Multinational Production and Geography**

- *Multinationals:*
- *Arkolakis, Ramondo, Rodriguez Claire, Yeaple, "Innovation and Production in the Global Economy," 2012, mimeo.
- Ramondo, Rodriguez-Claire, "Trade, Multinational Production, and the Gains from Openness," 2013, *Journal of Political Economy,* 2013: 273-322.
- Keith Head and John Ries, "FDI as an Outcome of the Market for Corporate Control: Theory and Evidence," mimeo University of British Colombia, forthcoming *Journal of International Economics*.
- Head and Ries, "How Remote is the Offshoring Threat?," *European Economic Review*, 2009: 429-444.
- Irarrazabal, Moxnes, and Opromolla, "The Margins of Multinational Production and the Role of Intra-firm Trade," Journal of Political Economy, 2013: 74-126.
- McGrattan and Prescott, "Technology Capital and the US Current Account," *American Economic Review*, 2010: 1493-1522.
  Geography:
- Holmes, "The Diffusion of Wal-Mart and Economies of Density," *Econometrica*, 2011: 253-302.
- *Ahlfeldt, Redding, Sturm, and Wolf, "The Economics of Density: Evidence from the Berlin Wall," 2013, mimeo, Princeton University.
- Hsu, Wen-Tai, "Central Place Theory and City Size Distribution," unpublished, Chinese University of Hong Kong.

- Costinot, Donaldson, and Smith, "Evolving Comparative Advantage and the Impact of Climate Change in Agricultural Markets: Evidence from and 9 Million-Field Partition of the Earth," 2013, mimeo, MIT.
- *Sotelo, "Trade Frictions and Agricultural Productivity: Theory and Evidence from Peru, 2013, mimeo, Chicago.