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Citizenship United States

Birth Date December 18, 1960

Education

B.A., Wesleyan University, 1983

Ph.D., Economics, Yale University, May 1992

Dissertation: “Inventions, R&D and Industry Growth,” Advisor: Ariel Pakes

Professional Experience

James Burrows Moffatt Professor of Economics, Yale University, 2015-present

Professor of Economics, Yale University, 2012-2015

Visiting Scholar, Department of Economics, Stanford University, 2018

Professor of Economics, University of Chicago, 2006-2012

Professor of Economics, University of Minnesota, 2004-2006

Visiting Fellow, Department of Research, INSEE-CREST (France), 2005

Associate Professor, University of Minnesota, Department of Economics, 2001-2004

Assistant Professor, Boston University, Department of Economics, 1991-2001

Economist, Board of Governors of the Federal Reserve System, 1994-1995

National Fellow, National Bureau of Economic Research (NBER), 1999-2000

Other Positions

Director, Cowles Foundation for Research in Economics, July 2023-present

Member of the Board, NBER, 2018-present

Research Associate, NBER, 2001-2018

Faculty Research Fellow, NBER, 1993-2001

Simmons Visiting Scholar, Rhodes Center, Brown University, 2013-2017

Fellow, CESifo Research Network, 2017-present

Visiting Scholar, Federal Reserve Bank of Philadelphia, 2018-2019

Consultant, Federal Reserve Bank of Chicago, 2008-2012

Visitor, Federal Reserve Bank of Minneapolis, 2001-2006

Fields of Research

International Economics, Industrial Organization, Macroeconomics

Grants and Honors

- Onassis Prize in International Trade (with Jonathan Eaton), awarded 2018
- Member of the American Academy of Arts and Sciences, elected 2016
- National Science Foundation, Economics Panel, 2015-2017
- Fellow of Branford College, Yale University, 2015
- Fellow of the Econometric Society, elected 2011
- Editor, Journal of Political Economy, 2008-2012
- Frisch Medal (with Jonathan Eaton), awarded 2004
- Associate Editor, European Economic Review, 2004-2006
- National Science Foundation grant, “Intertemporal Trade” (with Jonathan Eaton), 2008-2010
- National Science Foundation grant, “Penetrating Foreign Markets: A Firm and Product-Level Investigation” (with Jonathan Eaton), 2004-2006
- National Science Foundation grant, “Globalization, Productivity, and Growth: Aggregate and Plant-Level Implications” (with Jonathan Eaton), 2000-2002
- National Bureau of Economic Research, National Fellow, 1999-2000
- National Science Foundation grant, “Research, Technology, and Comparative Advantage” (with Jonathan Eaton), 1996-1999
- National Science Foundation grant, “International Technology Diffusion” (with Jonathan Eaton), 1993-1996
- Environmental Protection Agency grant, “Environmental Policy and the Automobile Market” (with Ariel Pakes and Steven Berry), 1992-1994
- Sloan Foundation Dissertation Fellowship, 1990
- National Science Foundation grant (with Matthew Shapiro), 1988

Special Lectures and Plenary Talks

- Hai Wen Lecture, China, 2023
- Ron Jones Lecture, University of Rochester, 2021
- Frank D. Graham Memorial Lecture, Princeton University, 2019
- Onassis Prize Lecture, Cass Business School, London, 2018
- The Prybyla/Riew Lecture, Pennsylvania State University, 2016
- Plenary Lecture, Society for Economic Dynamics, Warsaw, 2015
- C. Woody Thompson Lecture, Midwest Economics Association, Columbus, 2013
- Semi-Plenary Lecture, World Congress of the Econometric Society, Shanghai, 2010

Published Research Papers

1. “Trade, Leakage, and the Design of a Carbon Tax” (with David Weisbach, Michael Wang, and Yujia Yao), *Environmental and Energy Policy and the Economy*, 4, 2023, 43-90
2. “Climate Change Policy in the International Context: Solving the Carbon Leakage Problem” (with David Weisbach), *New York University Environmental Law Journal*, 31, 2023, 1-64
3. “Trade in Goods and Trade in Services” (with Jonathan Eaton) in Lili Yan Ing and Miaojie Yu, eds., *World Trade Evolution: Growth, Productivity, and Employment*, Routledge, 2019, 82-125
4. “The Design of Border Adjustments for Carbon Prices” (with David Weisbach), *National Tax Journal*, 70(2), 2017, 421-446
5. “Trade and the Global Recession” (with Jonathan Eaton, Brent Neiman, and John Romalis), *American Economic Review*, 106(11), 2016, 3401-3438
6. “Obstfeld and Rogoff’s International Macro Puzzles: A Quantitative Assessment” (with Jonathan Eaton and Brent Neiman), *Journal of Economic Dynamics and Control*, 72, 2016, 5-23

7. “International Trade: Linking Micro and Macro” (with Jonathan Eaton and Sebastian Sotelo) in Daron Acemoglu, Manuel Arellano, and Eddie Dekel, eds., *Advances in Economics and Econometrics Tenth World Congress, Volume II: Applied Economics*, Cambridge University Press, 2013, 329-370
8. “On Deficits and Unemployment” (with Jonathan Eaton and Brent Neiman), *Revue Économique*, 64(3), May 2013, 405-420
9. “Unilateral Carbon Taxes, Border Tax Adjustments, and Carbon Leakage” (with Joshua Elliott, Ian Foster, Gita Khun Jush, Todd Munson, and David Weisbach), *Theoretical Inquiries in Law*, 14(1), 2013, 207-244
10. “Putting Ricardo to Work” (with Jonathan Eaton), *Journal of Economic Perspectives*, 26(2), Spring 2012, 65-90
11. “An Anatomy of International Trade: Evidence from French Firms” (with Jonathan Eaton and Francis Kramarz), *Econometrica*, 79(5), September 2011, 1453-1498
12. “Trade and Carbon Taxes” (with Joshua Elliott, Ian Foster, Todd Munson, Fernando Pérez Cervantes, and David Weisbach), *American Economic Review: Papers and Proceedings*, 100, May 2010, 465-469
13. “Global Rebalancing with Gravity: Measuring the Burden of Adjustment” (with Robert Dekle and Jonathan Eaton), *IMF Staff Papers*, 55(3), September 2008, 511-540
14. “Patents and Information Diffusion” (with Jonathan Eaton) in Keith Maskus, ed., *Intellectual Property, Growth, and Trade*, Elsevier, 2008, 87-121
15. “Unbalanced Trade” (with Robert Dekle and Jonathan Eaton), *American Economic Review: Papers and Proceedings*, 97, May 2007, 351-355
16. “Innovation, Diffusion, and Trade” (with Jonathan Eaton), in Eytan Sheshinski, Robert J. Strom, and William J. Baumol, eds., *Entrepreneurship, Innovation, and the Growth Mechanism of the Free-Enterprise Economies*, Princeton University Press, 2007, 276-299
17. “Moore’s Law and the Semiconductor Industry: A Vintage Model” (with Ana Aizcorbe), *Scandinavian Journal of Economics*, 107(4), 2005, 603-630
18. “Innovating Firms and Aggregate Innovation” (with Tor Jakob Klette), *Journal of Political Economy*, 112(5), 2004, 986-1018

19. “Dissecting Trade: Firms, Industries, and Export Destinations” (with Jonathan Eaton and Francis Kramarz), *American Economic Review: Papers and Proceedings*, 94, May 2004, 150-154
20. “International Patenting and the European Patent Office: A Quantitative Assessment” (with Jonathan Eaton and Josh Lerner) in *Patents, Innovation and Economic Performance: OECD Conference Proceedings*, OECD, 2004, 27-52
21. “Plants and Productivity in International Trade” (with Andrew Bernard, Jonathan Eaton, and J. Bradford Jensen), *American Economic Review*, 93(4), 2003, 1268-1290
22. “Technology, Geography, and Trade” (with Jonathan Eaton), *Econometrica*, 70(5), 2002, 1741-1779
Reprinted in S. Katayama and K. Miyagiwa, eds., *New Developments in International Trade: Theoretical and Empirical Investigations*, Kobe University, 2003
23. “A Rising Tide Raises All Ships: Trade and Diffusion as Conduits of Growth” (with Jonathan Eaton) in Luigi Paganetto and Edmund Phelps, eds., *Finance, Research, Education and Growth*, Palgrave, McMillan, 2003, 75-89
24. “Are All Patent Examiners Equal? Examiners, Patent Characteristics and Litigation Outcomes” (with Iain Cockburn and Scott Stern) in Wesley Cohen and Steven Merrill, eds., *Patents in the Knowledge-Based Economy*, National Academies Press, 2003, 19-53
25. “Trade in Capital Goods” (with Jonathan Eaton), *European Economic Review*, 45(7), 2001, 1195-1235
26. “Technology, Trade, and Growth: A Unified Framework” (with Jonathan Eaton), *European Economic Review: Papers and Proceedings*, 45 (4-6), 2001, 742-755
27. “Assessing the Contribution of Venture Capital to Innovation” (with Josh Lerner), *RAND Journal of Economics*, 31(4), 2000, 674-692
Extended versions appear as: “Does Venture Capital Spur Innovation?” in G. Libecap, ed., *Entrepreneurial Inputs and Outcomes, Volume 13*, Amsterdam, Elsevier Science, 2001 and “Venture Capital and Innovation: Clues to a Puzzle” in J. McCahery and L. Renneborg, eds. *Venture Capital Contracting and the Valuation of High Technology Firms*, Oxford, Oxford University Press, 2003
Reprinted in M. Wright, H. Sapienza, and L. Busenitz, eds. *Venture Capital*, Edward Elgar, 2003
28. “International Technology Diffusion: Theory and Measurement” (with Jonathan Eaton), *International Economic Review*, 40(3), 1999, 537-570
Translated as “La Diffusion de la Technologie au Niveau International: Theorie et

- Mesures” A. Bouët and J. Le Cacheux, eds., *Globalisation et Politiques Économiques: Les Marges de Manoeuvre*, Paris, Economica
 Reprinted in H. Singer, N. Hatti, and R. Tandon, eds., *Globalization, Technology and Trade in the 21st Century*, New Delhi, India, B.R., 2001
29. “European Technology Policy” (with Jonathan Eaton and Eva Gutierrez), *Economic Policy*, 27, 1998, 403-438
 30. “Stronger Protection or Technological Revolution: What is Behind the Recent Surge in Patenting?” (with Josh Lerner), *Carnegie-Rochester Conference Series on Public Policy*, 48, 1998, 247-304
 Reprinted in condensed form, *Research Policy*, 28, 1999, 1-22
 31. “Technological Specialization in International Patenting” (with Jonathan Eaton, Robert Evenson, Poorti Marino, and Jonathan Putnam) in Gary Saxonhouse and T.N. Srinivasan, eds., *Development, Duality, and the International Regime: Essays in Honor of Gustav Ranis*, University of Michigan Press, 1999, 301-329
 32. “Research, Patenting, and Technological Change,” *Econometrica*, 65(6), 1997, 1389-1419
 33. “Assigning Patents to Industries: Tests of the Yale Technology Concordance” (with Jonathan Putnam), *Economic Systems Research*, 9(2), 1997, 161-175
 34. “Engines of Growth: Domestic and Foreign Sources of Innovation” (with Jonathan Eaton), *Japan and the World Economy*, 9(2), 1997, 235-259
 35. “Environmental Change and Hedonic Cost Functions for Automobiles” (with Steven Berry and Ariel Pakes), *Proceedings of the National Academy of Sciences*, 93(23), 1996, 12731-12738
 36. “Measuring Technology Diffusion and the International Sources of Growth” (with Jonathan Eaton), *Eastern Economic Journal*, 22(4), 1996, 401-410
 37. “Trade in Ideas: Patenting and Productivity in the OECD” (with Jonathan Eaton), *Journal of International Economics*, 40, May 1996, 251-278
 Reprinted in J. Oxley and B. Yeung, eds., *Structural Change, Industrial Location and Competitiveness*, Cheltenham, U.K., Edward Elgar, 1998 and in H. Singer, N. Hatti, and R. Tandon, eds., *Technological Diffusion in the Third World*, New Delhi, India, B.R., 1999
 38. “Equilibrium R&D and the Patent-R&D Ratio: US Evidence,” *American Economic Review: Papers and Proceedings*, 83, May 1993, 450-457

Published Comments and Miscellany

1. “A Solution to the Leakage Problem” (with David Weisbach) in *U.S. Energy & Climate Roadmap: Evidence-based Policies for Effective Action*, EPIC, The University of Chicago, 2021, 64-75
2. “Comment: ‘Productivity and Potential Output before, during, and after the Great Recession’ (by John Fernald),” (with Unni Pillai) in J. Parker and M. Woodford, eds., *NBER Macroeconomics Annual 2014*, University of Chicago Press, 2015, 52-59
3. “Discussion: ‘Trade Wedges, Inventories, and International Business Cycles’ (by George Alessandria, Joseph Kaboski, and Virgiliu Midrigan),” *Journal of Monetary Economics*, 60(1), January 2013, 21-24
4. “Comment: ‘Competition and Innovation’ (by Michele Boldrin, Juan Correa Allamand, David K. Levine, and Carmine Ornaghi),” *Cato Papers on Public Policy*, 1, 2011, 159-164
5. “Comment: ‘Diversity and Technological Progress’ (by Daron Acemoglu),” in J. Lerner and S. Stern, eds., *The Rate and Direction of Inventive Activity Revisited*, University of Chicago Press, 2012, 357-360
6. “Comment on ‘Analytical General Equilibrium Effects of Energy Policy on Output and Factor Prices’ *The B.E. Journal of Analysis & Policy*, 10 (2), 2010, Article 16
7. “Trade, Technology Diffusion, and Growth” (with Jonathan Eaton) in Lawrence Blume and Steven Durlauf, eds., *The New Palgrave Dictionary of Economics*, Second Edition, Macmillan, 2008
8. “Comment: TRIPS and Technology Transfer – Evidence from Patent Data” in K. Maskus and J. Reichman, eds., *International Public Goods and Transfer of Technology under a Globalized Intellectual Property Regime*, Cambridge University Press, 2004, 282-287
9. “Comment: ‘Importing Technology’ (by Francesco Caselli and Daniel Wilson),” *Journal of Monetary Economics*, 51, 2004, 33-38
10. “Review of *Networks and Markets* (by James E. Rauch and Alessandra Casella),” *Journal of International Economics*, 61, 2003, 249-252
11. “An R&D Roundtable,” *Economics of Innovation and New Technology*, 13, 2004, 349-363

12. “Comment: ‘Taxation and the Sources of Growth: Estimates from United States Multinational Corporations’ (by Jason Cummins),” in James Hines, Jr., ed., *International Taxation and Multinational Activity*, University of Chicago Press, 2001, 259-263
13. “Competitiveness and Invention: Some Simple Measures” (with Jonathan Eaton) in Patrick Darlap and Heinz Handler, eds., *Future Competitiveness of Europe*, Austrian Federal Ministry of Economic Affairs, 1998
14. “Comment: ‘1974’ (by Jeremy Greenwood and Mehmet Yorukoglu),” *Carnegie-Rochester Conference Series on Public Policy*, 46, 1997, 96-105
15. “Discussion: ‘Microeconomic Policy and Technological Change’ (by Edwin Mansfield),” in Jeffrey C. Fuhrer and Jane S. Little, eds. *Technology and Growth*, Conference Series No. 40, Federal Reserve Bank of Boston, 1996, 201-207

Unpublished Research Papers

- “Technology and the Global Economy” (with Jonathan Eaton)
- “Firm-to-Firm Trade: Imports, Exports, and the Labor Market” (with Jonathan Eaton and Francis Kramarz), *NBER Working Paper 29685*
- “Optimal Unilateral Carbon Policy” (with David Weisbach), *Cowles Foundation Discussion Paper 2311*
- “Accounting for Intangibles” (with Jonathan Eaton)
- “Dissecting the French Export Wage Premium” (with Jonathan Eaton, Francis Kramarz, and Raul Sampognaro)
- “Staggered Adjustments and Trade Dynamics” (with Jonathan Eaton and Costas Arkolakis)
- “Capital Services in Microprocessor Production: Quantitative Implications of a Vintage Model,” (with Ana Aizcorbe and Unni Pillai)
- “Unraveling the Patent Paradox” (with Josh Lerner)
- “Comparative Advantage in Research” (with Jonathan Eaton and Eva Gutierrez)
- “Patents and Productivity Growth in U.S. Manufacturing Industries” (with Saul Lach)

- “Estimating an Equilibrium Model of R&D”
- “Value Function Approximation in an Estimation Routine”
- “Can a Search Model Account for the Time Series Behavior of R&D and Patenting?,” in *Econometrics in Tel Aviv, 1993: Workshop and Lecture Series*
- “R&D, Patents and the Progress of Technology in a Search Model,” Boston University Department of Economics Working Paper # 17, 1991
- “Least Squares Disaggregation of Consumption: Alternative Estimates of Personal Consumption Expenditure by Type of Product”

Manuscript in Progress

- *Technology and the Global Economy: A Framework for Quantitative Analysis* (with Jonathan Eaton) manuscript in progress for Princeton University Press