

ADAM B. JAFFE
FRED C. HECHT PROFESSOR IN ECONOMICS
DEAN OF ARTS AND SCIENCES
BRANDEIS UNIVERSITY

PROFESSIONAL POSITIONS

Brandeis University, Faculty of Arts and Sciences and International Business School

- 2003- *Dean of Arts and Sciences*
1994- *Associate Professor (1994-99) and then Professor of Economics*
2000-2002 *Economics Department Chair*
2001-2002 *Chair, University Intellectual Property Policy Committee*
2001- *Member, University Advisory Council*

National Bureau of Economic Research

- 1999- *Co-organizer, Innovation Policy and the Economy Group.*
1994-99 *Project Coordinator, NBER Research Project on Industrial Technology and Productivity.*

Harvard University, Faculty of Arts and Sciences

- 1989-94 *Associate Professor of Economics. (On leave, academic year 1990-91; visiting the Kennedy School of Government, 1992-94)*

1985-89 *Assistant Professor of Economics.*

President's Council of Economic Advisers

- 1990-91 *Senior Staff Economist.*

EDUCATION

- 1980-85 *Ph.D. in Economics, Harvard University. Thesis: "Quantifying the Effects of Technological Opportunity and Research Spillovers in Industrial Innovation."*

1976-78 *S.M. in Technology and Policy, Massachusetts Institute of Technology. Thesis: "Regulating Chemicals: Product and Process Technology as a Determinant of the Compliance Response."*

1973-76 *S.B. in Chemistry, Massachusetts Institute of Technology.*

TEACHING EXPERIENCE

Introductory Economics (undergraduate)
Microeconomic Theory (Ph.D.)
Law and Economics (undergraduate)
Environmental and Natural Resource Economics (undergraduate)
Government Regulation and Antitrust Policy (undergraduate and Ph.D.)
R&D, Innovation and Productivity Growth (undergraduate)
Industrial Organization (Ph.D. and undergraduate)
Applied Welfare Economics (John F. Kennedy School of Government)

Foundation for American Communications, economics education for journalists, “The Role of Government in the Economy” (1996)

BOOKS AND EDITED VOLUMES

* Innovation and its Discontents (with J. Lerner), Princeton University Press, 2004; issued in paperback, 2006

* Patents, Citations and Innovations: A Window on the Knowledge Economy (with M. Trajtenberg), M.I.T. Press, 2002; issued in paperback, 2005

Innovation Policy and the Economy, (edited with J. Lerner and S. Stern), M.I.T. Press, Cambridge, Volume 1 (2001) through Volume 7 (2007)

MAJOR ARTICLES

“The ‘Science of Science Policy’,” *Journal of Technology Transfer*, 2008

“Academic science and entrepreneurship: Dual engines of growth?” (with J. Lerner, S. Stern and M. Thursby), *Journal of Economic Behavior and Organization*, 2007

“Peanut Butter Patents Versus the New Economy: Does the Increased Rate of Patenting Signal More Invention or Just Lower Standards?” (with P. Sanyal). *Annales d’Economie et de Statistique*, 2006

“Knowledge Flows Across Firm and National Boundaries” (with B. Gomes-Casseres and John Hagedoorn), *The Journal of Financial Economics*, 2005

* Indicates receipt of 100 or more citations as of 2008

Adam B. Jaffe

Page 3

“A tale of two market failures: Technology and environmental policy” (with R. Newell and R. Stavins), *Ecological Economics*, 2005

* “Market Value and Patent Citations: A First Look” (with B. Hall and M. Trajtenberg), *Rand Journal of Economics*, 2005, Reprinted in **The Economics of Patents**, John Cantwell, Ed., Edward Elgar, 2006

Comment on “Patent Citations and the Geography of Spillovers: A Reassessment” (with R. Henderson and M. Trajtenberg), *American Economic Review*, 2005

“Patent Citations and International Knowledge Flow: The Cases of Korea and Taiwan” (with A. Hu), *International Journal of Industrial Organization*, 2003, Reprinted in **The Economics of Patents**, John Cantwell, Ed., Edward Elgar, 2006

* “Technological Change and the Environment” (with R. Newell and R. Stavins), in Karl-Göran Mäler and Jeffrey Vincent, eds, **Handbook of Environmental Economics**, North-Holland, 2003

* “Environmental Policy and Technological Change” (with R. Newell and R. Stavins), *Environmental and Resource Economics*, 2002

“Building Programme Evaluation into the Design of Public Research-Support Programmes,” *Oxford Review of Economic Policy*, 2002

* “The NBER Patent Citations Data File: Lessons, Insights and Methodological Tools” (with B. Hall and M. Trajtenberg), NBER Working Paper No. 8498, 2001; reprinted in A. Jaffe and M. Trajtenberg, **Patents, Citations and Innovations: A Window on the Knowledge Economy**, MIT Press (2002)

Reinventing Public R&D: Patent Policy and the Commercialization of National Laboratory Technologies” (with Josh Lerner), *Rand Journal of Economics*, Spring 2001

* “Knowledge Spillovers and Patent Citations: Evidence from a Survey of Inventors” (with Manuel Trajtenberg and Michael Fogarty), *American Economic Review Papers and Proceedings*, 2000

* “The U.S. Patent System in Transition: Policy Innovation and the Innovation Process,” *Research Policy*, 2000; reprinted in Albert N. Link, Ed., **The Economics of Innovation Policy**, Edward Elgar forthcoming 2008.

* “The Induced Innovation Hypothesis and Energy-Saving Technological Change” (with R. Newell and R. Stavins), *Quarterly Journal of Economics*, 1999; reprinted in A. Grübler, N. Nakicenovic,

* **Indicates receipt of 100 or more citations as of 2008**

and W. Nordhaus, eds., **Technological Change and the Environment**, Resources for the Future, 2002

- * "International Knowledge Flows: Evidence from Patent Citations" (with M. Trajtenberg), ***Economics of Innovation and New Technology***, 1999; reprinted in John Cantwell, ed., **The Economics of Patents**, Edward Elgar, 2006

"Evidence from Patents and Patent Citations on the Impact of NASA and Other Federal Labs on Commercial Innovation" (with B. Banks and M. Fogarty), ***Journal of Industrial Economics***, June 1998

- * "Universities as a Source of Commercial Technology: A Detailed Analysis of University Patenting, 1965-1988" (with R. Henderson and M. Trajtenberg), ***Review of Economics and Statistics***, February 1998; also published in a slightly different form as "University Patenting Amid Changing Incentives for Commercialization" in G.B. Navaretti, P. Dasgupta, K.-G. Møller and D. Siniscalco, eds., **Creation and Transfer of Knowledge**, Springer, 1998; reprinted in **Technological Entrepreneurship**, Donald Siegel, ed., Edward Elgar, 2007

- * "Environmental Regulation and Innovation: A Panel Data Study" (with K. Palmer), ***Review of Economics and Statistics***, November 1997

- * "University Versus Corporate Patents: A Window on the Basicness of Invention" (with M. Trajtenberg and R. Henderson), ***Economics of Innovation and New Technology***, 1997

- * "Bounding the Effects of R&D: An Investigation Using Linked Establishment and Firm Data" (with J. Adams), ***Rand Journal of Economics***, Winter 1996

- * "Flows of Knowledge from Universities and Federal Labs: Modeling the Flow of Patent Citations over Time and Across Institutional and Geographic Boundaries" (with M. Trajtenberg), ***Proceedings of the National Academy of Sciences***, 93: 12671-12677, November 1996

"The Emerging Coexistence of Competition and Regulation in Natural Gas Transportation" (with S. Makowka), ***Hume Papers on Public Policy***, 1995

- * "Dynamic Incentives of Environmental Regulations: The Effects of Alternative Policy Instruments on Technology Diffusion" (with R. Stavins), ***Journal of Environmental Economics and Management***, 1995

* Indicates receipt of 100 or more citations as of 2008

- * "Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?" (with S. Peterson, P. Portney and R. Stavins), *The Journal of Economic Literature*, 1995; reprinted in Trade and the Environment: Economic, Legal and Policy Perspectives, Alan M. Rugman and John J. Kirton, eds., Edward Elgar Publishing Limited, 1998; Economics of the Environment: Selected Readings, Robert Stavins, ed., Norton, 2005; and Economics of Environmental Law, Richard Brooks, Nathaniel Keohane and Douglas Kysar, eds, Edward Elgar, forthcoming

- * "The Energy-Efficiency Gap" (with R. Stavins), *Energy Policy*, 1994

- * "The Energy Paradox and the Diffusion of Conservation Technology" (with R. Stavins), *Resource and Energy Economics*, 1994

- "Energy-Efficiency Investments and Public Policy" (with R. Stavins), *The Energy Journal*, 1994

- * "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations" (with M. Trajtenberg and R. Henderson), *Quarterly Journal of Economics*, 1993; reprinted in The Growth of Cities, Zoltan Acs, ed., Edward Elgar (2006); Globalization and the Location of Firms, John Cantwell, ed., Edward Elgar (2005), and in Recent Developments in Growth Theory, Daron Acemoglu, ed., Edward Elgar (2004)

- * "How High are the Giants' Shoulders: An Empirical Assessment of Knowledge Spillovers and Creative Destruction in a Model of Economic Growth" (with R. Caballero), in O. Blanchard and S. Fischer, eds., National Bureau of Economic Research Macroeconomics Annual, Vol. 8, MIT Press, 1993; reprinted in Gene M. Grossman, ed., Economic Growth: Theory and Evidence, Cheltenham, UK: Edward Elgar, 1996

- "The Effect of Liquidity on Firms' R&D Spending" (with K. Hao), *Economics of Innovation and New Technology*, 1993

- "Market Power of Local Cable Television Franchises: Evidence from the Effects of Deregulation" (with D. Kanter), *Rand Journal of Economics*, 1990

- "Unintended Impacts of Public Investments on Private Decisions: The Depletion of Forested Wetlands" (with R. Stavins), *American Economic Review*, 1990

- * "Real Effects of Academic Research," *American Economic Review*, 1989; reprinted in The Economics of Science and Innovation, Paula E. Stephan and David B. Audretsch, eds., Edward

- * **Indicates receipt of 100 or more citations as of 2008**

Elgar (2000); in **Globalization and the Location of Firms**, John Cantwell, ed., Edward Elgar Publishing, (2005); and in **The Economics of Innovation Policy**, Albert Link, ed., Edward Elgar Publishing (forthcoming)

"Characterizing the 'Technological Position' of Firms, with Application to Quantifying Technological Opportunity and Research Spillovers," *Research Policy*, 1989

"Demand and Supply Influences in R&D Intensity and Productivity Growth," *Review of Economics and Statistics*, August 1988

* "Technological Opportunity and Spillovers of R&D: Evidence from Firms' Patents, Profits and Market Value," *American Economic Review*, 1986; reprinted in Edward N. Wolff, ed., **The Economics of Productivity**, Edward Elgar (1997); in R. Towse and R.W. Holzhauser, eds., **The Economics of Intellectual Property**, Edward Elgar (2002); and in Cristiano Antonelli, ed., **The Economics of Innovation: Critical Concepts in Economics**, Routledge (2007)

* "Who Does R&D and Who Patents" (with J. Bound, *et al.*), in Z. Griliches, ed., **R&D, Patents and Productivity**, University of Chicago Press, 1984

OTHER PAPERS AND PUBLICATIONS

"Patent Reform: No Time Like the Present," *I/S Journal of Law and Policy for the Information Society*, 2008

"Public Financial Support for Commercial Innovation" (with I. Goldberg, M. Trajtenberg, T. Muller, J. Sunderland and E. Armas, World Bank, 2006

"Innovation and Its Discontents" (with J. Lerner), in *Innovation Policy and the Economy Volume 6*, A. Jaffe, J. Lerner and S. Stern, eds., 2006

"Economics of Energy Conservation" (with R.G. Newell and R. N. Stavins), in Cutler Cleveland, ed., *Encyclopedia of Energy*, Elsevier, Inc. 2004

"Technology Policy for Energy and the Environment" (with R.G. Newell and R.N. Stavins), in *Innovation Policy and the Economy Volume 4*, A. Jaffe, J. Lerner and S. Stern, eds., 2003

* Indicates receipt of 100 or more citations as of 2008

Adam B. Jaffe

Page 7

“International Taxation and the Location of Inventive Activity” (with J.R. Hines, Jr.), in James R. Hines Jr. ed., International Taxation and Multinational Activity, Chicago: University of Chicago Press (2001)

“The Cigarette Industry,” in Walter Adams and James Brock, ed., The Structure of American Industry, Tenth Edition, Prentice Hall, 2000

“Energy-Efficient Technologies and Climate Change Policies: Issues and Evidence” (with R. Newell and R. Stavins), Resources for the Future Climate Issue Brief No. 19, December 1999

“The Regional Economic Impact of Public Research Funding: A Case Study of Massachusetts” (with Amy B. Candell), in L.M. Branscomb, F. Kodama, and R. Florida, eds., Industrializing Knowledge: University-Industry Linkages in Japan and the United States, MIT Press, 1999

“Special Issue on Geography and Innovation: Editors’ Introduction” (with R. Henderson), *Economics of Innovation and New Technology*, 1999

Comment on “Inventors, Firms and the Market for Technology: U.S. Manufacturing in the Late Nineteenth and Early Twentieth Centuries,” in Daniel Raff, Naomi Lamoreaux and Peter Temin, eds., Learning By Doing in Firms, Markets, and Nations, University of Chicago Press, 1999

Comment on “What Do Technology Shocks Do?” in Bernanke, Ben S. and Julio Rotemberg, eds., NBER Macroeconomics Annual, 1998

“The Importance of ‘Spillovers’ in the Policy Mission of the Advanced Technology Program,” *Journal of Technology Transfer*, Summer 1998

“Inside the Pin-Factory: Empirical Studies Augmented by Manager Interviews: Introduction” (with S. Borenstein and J. Farrell), *Journal of Industrial Economics*, June 1998

“Measurement Issues,” in Investing in Innovation, L. M. Branscomb & J. Keller, Editors, MIT Press, 1998

Review of Green, Inc. by Frances Cairncross, *Journal of Economic Literature*, March 1997

“Economic Analysis of Research Spillovers: Implications for the Advanced Technology Program,” Economic Assessment Office, The Advanced Technology Program, National Institutes of Standards and Technology, U.S. Department of Commerce, November 1996

* **Indicates receipt of 100 or more citations as of 2008**

Adam B. Jaffe

Page 8

“Trends and Patterns in U.S. Research and Development Expenditures,” *Proceedings of the National Academy of Sciences*, 93: 12658-12663, November 1996

“Regional Localization of Technological Accumulation: Application to the Tri-State Region,” *The Annals of the New York Academy of Sciences*, 1996

Comment on “Cross-Country Variations in National Economic Growth Rates” by J. Bradford Delong, in Technology and Growth, Jeffrey C. Fuhrer and Jane Sneddon Little, eds., Federal Reserve Bank of Boston Conference Series No. 40, June 1996

“Regulatory Reform and the Economics of Contract Confidentiality: The Example of Natural Gas Pipelines” (with J. P. Kalt, S. T. Jones, and F. A. Felder), *Regulation*, 1996

“Should Electricity Markets Have a Capacity Requirement: If So, How Should It Be Priced?” (with F. Felder), Proceedings of the Electric Power Research Institute Conference on Competitive Electricity Pricing, March 1996.

Planning for Change, Preparing for Growth: Implications for Massachusetts of Reductions in Federal Research Spending, prepared for the Massachusetts Technology Collaborative, March 1996

"On the Microeconomics of R&D Spillovers" (with J. Adams), in Louis A. Lefebvre and Élisabeth Lefebvre, eds., Management of Technology and Regional Development in a Global Environment, Paul Chapman Publishing, Ltd., 1995

"Incentive Regulation for Natural Gas Pipelines" (with J. Kalt), in Ellig, J. and J.P. Kalt, eds., New Horizons in Natural Gas Deregulation, 1995

Comment on "Taxes, Technology Transfer, and the R&D Activities of Multinational Firms" by James R. Hines, Jr., in Martin Feldstein, James R. Hines, Jr. and R. Glenn Hubbard, eds., The Effects of Taxation on Multinational Corporations, University of Chicago Press, 1995

The Investment Consequences of the Re-Regulation of Cable Television (with W. Emmons and J. Taylor), *The Economics Resource Group*, Cambridge, MA, 1994

"Insight on Oversight" (with J. Kalt), *Public Utilities Fortnightly*, April 15, 1994

"Prices, Regulation and Energy Conservation: An Econometric Analysis" (with R. Stavins), delivered at the Conference on Market Approaches to Environmental Regulation, Stanford University, December 1993

Adam B. Jaffe

Page 9

Comment on "R&D and Market Value in the 1980s" by Bronwyn Hall, *Brookings Papers on Economic Activity, Microeconomics*, 1993

Environmental Regulations and the Competitiveness of U.S. Industry (with S. Peterson, P. Portney and R. Stavins), U.S. Department of Commerce, Economics and Statistics Administration, Washington DC, NTIS No. PB-93-193514, July 1993

"Achieving Maximum Benefit from Competitive Natural Gas and Emission Allowance Markets" (with J. Kalt), Proceedings of the U.S. Department of Energy/National Association of Regulatory Utility Commissioners Conference on Natural Gas Use, State Regulation and Market Dynamics in the Post 636/Energy Policy Act Era, March 1993.

"The Diffusion of Energy-Conserving Windows: The Effect of Economic Incentives and Building Codes" (with R. Stavins), presented at the American Economic Association annual meeting, Anaheim CA, January 1993

Review of Investing in the Future, by John Irvine, *et al.*, *Journal of Economic Literature*, June, 1992

Review of Productivity and U.S. Economic Growth by D. Jorgenson, *et al.*, *Business History Review*, 1991

"Evaluating the Relative Effectiveness of Economic Incentives and Direct Regulation for Environmental Protection: Impacts on the Diffusion of Technology" (with R. Stavins), *CSIA Discussion Paper No. 91-1*, Center for Science and International Affairs, Environment and Natural Resources Program, John F. Kennedy School of Government, Harvard University, February 1991

"Economic Evaluation of Policy Options for Global Climate Change: Some Methodological Reflections," Center for Energy and Environmental Policy, John F. Kennedy School of Government, Harvard University, August 1990

"Universities and Regional Patterns of Commercial Innovation," *REI Review*, Center For Regional Economic Issues, Case-Western Reserve University, 1989

"Benefit-Cost Analysis and Multi-Objective Evaluation of Federal Water Projects," *Harvard Environmental Law Review*, 1980

"Preventing Groundwater Pollution: Towards a Coordinated Strategy to Protect Critical Recharge Zones (with J.T.B. Tripp), *Harvard Environmental Law Review*, 1979

OTHER PROFESSIONAL ACTIVITIES

Consultant, Finance Ministry, Government of Chile, 2007

Consultant, World Bank, 2006

Member, Board of Editors, *Journal of Industrial Economics*, 1995-2003; *American Economic Review*, 1995-2000; Associate Editor, *Rand Journal of Economics*, 1997-2003

Guest Associate Editor, *Management Science* Special Issue: “Managing Knowledge in Organizations,” 2001

Lead Author, Third Assessment Report, Intergovernmental Panel on Climate Change, 1998-2001

Member, National Academy of Engineering Committee on the Impact of Academic Research on Industrial Performance, 1998-2001

Co-organizer of the NBER Science and Technology Policy Research Workshop, 1995-1998

Member, Economic Impact Committee, Association of University Technology Managers, 1994-95

Contributing Author, Working Group III (socioeconomics) of the Intergovernmental Panel on Climate Change (IPCC), 1994

Member, Stanford Energy Modeling Forum, Working Group on Energy Conservation (EMF 13), 1992-94

Referee/Reviewer for *American Economic Review*, *Econometrica*, *Economic Inquiry*, *Economics of Innovation and New Technology*, *Journal of Economics Organization and Management*, *Journal of Environmental Economics and Management*, *Journal of Industrial Economics*, *Journal of Law and Economics*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Rand Journal of Economics*, *Research Policy*, *Review of Economics and Statistics*, *Science*, and MIT Press.

RESEARCH GRANTS AWARDED

“A Protocol for Empirical Measurement of the Impact of Public Research Funding,” National Science Foundation, 2000-2001

“The Effects of Government Policies on the Invention, Innovation, and Diffusion of Energy-Efficient Technologies,” U.S. Department of Energy, 1998-2001

"Energy-Efficiency Innovation and the Economic and Regulatory Environment: Analyzing Endogenous and Autonomous Technological Change for Integrated Assessment Models," U.S. Department of Energy, 1995-1998

"Using Patent Citation Data to Trace Knowledge Flows," National Science Foundation, 1994-98

"The Sources and Effects of Knowledge Spillovers," National Science Foundation, 1994-97

"Getting Down to Basics: Using University and Corporate Patents to Identify Basic Inventions and Trace Their Diffusion," National Science Foundation, 1991-92

"Evaluating the Relative Effectiveness of Economic Incentives and Direct Regulation for Environmental Protection: Impacts on the Diffusion of Technology," U.S. Environmental Protection Agency, 1991-93

HONORS AND AWARDS

Research Associate (1994-present) and Faculty Research Fellow (1985-1994), National Bureau of Economic Research

Alfred P. Sloan Dissertation Fellowship, Harvard, 1984-85

Alfred P. Sloan Research Fellowship, MIT, 1976-77; Phi Beta Kappa, MIT, 1976

COORDINATES

MS 120
Brandeis University
Waltham MA 02454-9110
781-736-3451
ajaffe@brandeis.edu
www.brandeis.edu/~ajaffe