# **Richard Schmalensee**

## Howard W. Johnson Professor of Management, Emeritus Dean Emeritus, MIT Sloan School of Management Professor of Economics, Emeritus Massachusetts Institute of Technology

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## **EDUCATION**

MASSACHUSETTS INSTITUTE OF TECHNOLOGY S.B., Economics, Politics and Science, 1965 Ph.D., Economics, 1970

## **EMPLOYMENT**

#### MASSACHUSETTS INSTITUTE OF TECHNOLOGY

- 2012- Howard W. Johnson Professor of Management, Emeritus, and
- Professor of Economics, Emeritus
- 2007-12 Howard W. Johnson Professor of Management
- 2001-07 John C Head III Dean, MIT Sloan School of Management
- 1998-00 Dean, MIT Sloan School of Management (Interim, July-October 1998)
- 1996-98 Deputy Dean, MIT Sloan School of Management
- 1991-99, Director, MIT Center for Energy and Environmental Policy Research
- 2008-12
- 1988-99 Gordon Y Billard Professor of Management
- 1986-12 Professor, Department of Economics
- 1979-12 Professor, MIT Sloan School of Management
- 1977-79 Associate Professor, MIT Sloan School of Management
- 1970 Assistant Professor, MIT Sloan School of Management (Spring)
- 1967-69 Instructor, MIT Sloan School of Management
  - PRESIDENT'S COUNCIL OF ECONOMIC ADVISERS
- 1989-91 Member
- 1967Junior Staff Economist (Summer)

UNIVERSITY OF CALIFORNIA, SAN DIEGO

- 1974-77 Associate Professor, Department of Economics
- 1970-74 Assistant Professor, Department of Economics

#### VISITING APPOINTMENTS

- 2008 Executive in Residence, Rady School of Management; U. of California, San Diego (Winter)
- 2007 Distinguished Visiting Scholar, Tuck School of Business, Dartmouth College (Fall)
- 1985-86 Visiting Professor, Harvard Business School
- 1985 Visiting Professor, CORE, University of Louvain, Belgium (Spring)
- 1980-81 Visiting Scholar, Department of Economics, Harvard University
- 1973-74 Visiting Associate Professor and Research Fellow, Department of Economics, University of Louvain, Belgium

#### **EDITORIAL SERVICE**

Editor in Chief, 2005-08; Chairman, Editorial Advisory Board, 2008-: Competition Policy International Editorial Board: Journal of Economics and Management Strategy, 1992-98 Associate Editor: Journal of Economic Perspectives, 1992-98 Associate Editor: International Journal of Industrial Organization, 1982-89 Board of Editors: American Economic Review, 1982-86 Founding Editor, 1978-89; Co-Editor, 1989-: MIT Press Series, Regulation of Economic Activity Associate Editor, 1977-81; Board of Editors, 1981-89: Journal of Industrial Economics

## **PROFESSIONAL ASSOCIATIONS**

American Economic Association: Committee on Government Relations, 2009-12; Executive Committee, 1993-95; Budget Committee, 1993-95; Nominating Committee, 1987; Advisory Committee on Meetings Program, 1986, 1989, 1994

Econometric Society: Chair, Local Arrangements Committee, 1985 World Congress; Chair, Program Committee, 1980 North American Fall Meeting; Program Committee, 1980 World Congress

Second World Congress of Environmental Economists, Program Committee, 2002

#### **CONSULTATING AND GOVERNMENT SERVICE (SELECTED):**

Global Economics Group, Director, 2011-

National Climate Assessment Development & Advisory Committee, 2011-14

LECG, LLC: Director, 2004-2011

National Academies/National Research Council: Panel on Transportation and a Sustainable Environment, 1994-97; Committee on National Statistics, 1998-2001; Panel on Cost-of-Living Indexes, 1999-2001; Coordinating Committee on the Transition to Sustainability, 2000-2001; Committee on America's Climate Choices, 2008-2011; Committee for a Study of Freight Rail Transportation and Regulation (Chair), 2014-15; Committee on the Social Cost of Carbon, 2015-16.

U.S. Environmental Protection Agency: Environmental Economics Advisory Committee, 1992-96, 1998; Clean Air Act Compliance Analysis Council, 1992-98, Chairman 1992-96

Antitrust Division, U.S. Department of Justice, consultant, 1991-92 (1992 Merger Guidelines) NERA Economic Consulting: Special Consultant 1981-89, 1991-2004

Bureau of Economics, U.S. Federal Trade Commission: consultant, 1972-81 (Antitrust Policy)

### AWARDS AND OTHER PROFESSIONAL ACTIVITIES (SELECTED):

Asia School of Business, Board of Governors, 2015- (Co-Chair 2015-18) Associate Scholar, Harvard Environmental Economics Program, 2013-2018 Director, National Bureau of Economic Research, 2013- (Executive Committee 2018-) Chicago Booth IGM Economic Experts Panel, 2012-Distinguished Fellow, Industrial Organization Society, 2012 John Kuszczek Memorial Lecture, Bank of Canada, 2011 Energy Board Member, Bipartisan Policy Center, 2011-13 Stackelberg Lecture, University of Milan, Bicocca, 2010 Keynote Speaker, World Congress of Environmental and Resource Economists, 2010 Resources for the Future, Director 2009-18, Board Chair 2014-18, Chair Emeritus 2018-Master Class, Rafael del Pino Foundation, Madrid, 2009 Carpenter Lecture, Babson College, 2008 J.-J. Laffont Lecture, CRESSE Summer School, Greece, 2008 Member, National Commission on Energy Policy, 2006-2010 Director, International Data Group, 2004-2017 European Investment Bank Lecture, European University Institute, Florence, 2002 Director, MFS Investment Management, 2002-2004 Advisory Council, Tsinghua School of Economics and Management, 2001-07 Fathauer Lecture in Political Economy, University of Arizona, 2000 Director, International Securities Exchange, 2000-2009 Member, International Academy of Management, 1998-Member, American Academy of Arts and Sciences, 1995-Edward A. Hewett Prize, American Association for the Advancement of Slavic Studies (with P.L. Joskow and N. Tsukanova), 1995 Revista de Análisis Económico Lecture, Econometric Society Latin American Meeting, 1994 Director, MIT Press, 1994-2007 Research Associate: National Bureau of Economic Research, 1992-2013 Director: Long Island Lighting Company, 1992-98 Donald Gilbert Memorial Lecture, University of Rochester, 1992 American Council for Capital Formation Center for Policy Research: Board of Directors, 1991-2010; Environmental Policy Fellow, 1997-98 Fellow, Econometric Society, 1982-Invited Speaker, Econometric Society World Congress, 1980

#### PUBLICATIONS

#### INDUSTRIAL ORGANIZATION

- "Multi-Sided Platforms" (with D.S. Evans), In *The New Palgrave Dictionary of Economics,* Palgrave Macmillan (eds.), Palgrave Macmillan, London, 2017.
- *Matchmakers* (with D.S. Evans), Boston: Harvard Business School Press, 2016. French and Korean editions 2017, Chinese and Japanese editions 2018, Vietnamese edition 2019.
- "Pricing the Razor: A Note on Two-Part Tariffs," *International Journal of Industrial Organization*, 42 (September 2015): 19-22.
- "An Instant Classic: Rochet & Tirole, Platform Competition in Two-Sided Markets," *CPI Journal*, 10:2 (Autumn 2014): 175-180.
- "On a level with Dentists?" Reflections on the Evolution of Industrial Organization." *Review of Industrial Organization*, 41 (November 2012): 157-79.
- "Why is Platform Pricing Generally Highly Skewed?" *Review of Network Economics*, 10 (December 2011), Issue 4, Article 1, 11 pages.
- "Jeffrey Rohlfs' 1974 Model of Facebook: An Introduction," *Competition Policy International*, 7 (Spring 2011): 301-12.
- "Failure to Launch: Critical Mass in Platform Businesses" (with D.S. Evans), *Review of Network Economics*, 9 (December 2010), Issue 4, Article 1 (26 pages).
- "Comment on "Pharmaceutical Price Discrimination and Social Welfare" (by Frank R. Lichtenberg)," *Capitalism and Society*, 5 (2010), Issue 1, Article 5. DOI: 10.2202/1932-0213.1067. Available at: <u>http://www.bepress.com/cas/vol5/iss1/art5</u>
- "Innovation and Evolution of the Payments Industry" (with D.S. Evans). In *Moving Money* (R.E. Litan and M.N. Baily, eds.), Washington: Brookings Institution, 2009, pp. 36-76.

- "Standard-Setting, Innovation Specialists, and Competition Policy," *Journal of Industrial Economics*, 57 (September 2009): 526-52.
- "New Risks, New Products, and New Regulations: Insurance for the 21<sup>st</sup> Century," *ICFAI Journal of Risk and Insurance*, 4 (July 2007): 7-18.
- "Pick your Pricing" (with D.S. Evans). Chief Executive, July/August 2007.
- *Catalyst Code* (with D.S. Evans), Boston: Harvard Business School Press, 2007. Korean edition, 2008; Polish edition, 2010; Chinese edition, 2011.
- "El Debate Sobre las Tasas de Intercambio: Una Visión de Conjunto" (with D.S. Evans). *Papeles de Economia Española*, Número Extraordinario, 2006, pp. 2-17.
- Invisible Engines: How Software Platforms Drive Innovation and Create Value (with D.S. Evans and A. Hagiu), Cambridge: MIT Press, 2006. Korean edition, 2008; Chinese edition, 2010.
- "A Survey of the Economic Role of Software Platforms in Computer-Based Industries," CESIfo Economic Studies, 51 (2005): 189-224. (Reprinted, with minor changes, as "Software Platforms." In Industrial Organization and the Digital Economy (G. Illig and M. Peitz, eds.). Cambridge: MIT Press, 2006, pp. 31-70.)
- "Payment Systems and Interchange Fees," Journal of Industrial Economics, 50 (June 2002): 103-122.
- *Paying with Plastic: The Digital Revolution in Buying and Borrowing* (with D.S. Evans), Cambridge: MIT Press, 1999. Second edition, 2005; Chinese edition, 2006; Korean edition, 2011.
- "Comment on 'Competition, Information, and Development,' by Jean-Jacques Laffont." In Annual Bank Conference on Development Economics 1998 (B. Pleskovic and J.E. Stiglitz, eds.), Washington: The World Bank, 1999, pp. 262-266.
- "Privatization in Russia: What Should Be a Firm?" (with P.L. Joskow). International Journal of the Economics of Business, 2 (1995): 297-327. Reprinted in Transaction Cost Economics: Recent Developments (C. Menard, ed.), Brookfield, VT: Edward Elgar, 1997, pp. 86-126.
- Review of R. Wilson, Nonlinear Pricing. Journal of Political Economy, 102 (December 1994): 1288-1291.
- The Economics of the Payment Card Industry (with D.S. Evans). Cambridge: National Economic Research Associates, Inc., 1993.
- "Sunk Cost and Market Structure: A Review Article." *Journal of Industrial Economics*, 40 (June 1992): 125-134.
- "Comment on Mannering and Winston (on the US auto industry)." *Brookings Papers on Economic* Activity: Microeconomics, 1991: 107-110.
- "Empirical Models of Rivalrous Behavior." In *Industrial Structure in the New Industrial Economics* (G. Bonanno and D. Brandolini, eds.), Oxford: Oxford University Press, 1990, pp. 138-167.
- "Economías del Tamaño Empresarial y Poder de Mercado" and "Innovación y Posición Competitiva." In *Concentración Empresarial y Competitividad: España en la C.E.E.* (Xavier Vives and Jordi Gual, eds.), Barcelona: Ariel Economía, 1990, pp. 55-67 and 119-131.
- "Comment on Katz and Ordover (on R&D)." *Brookings Papers on Economic Activity: Microeconomics*, 1990: 194-197.

- Handbook of Industrial Organization, Vols. I & II (ed., with R. D. Willig), Amsterdam: North-Holland, 1989.
- "Intra-Industry Profitability Differences in U.S. Manufacturing: 1953-1983." *Journal of Industrial Economics*, 37 (June 1989): 337-357.
- "An Expository Note on Depreciation and Profitability under Rate-of-Return Regulation." *Journal of Regulatory Economics*, 1 (September 1989): 293-298.
- "Good Regulatory Regimes." RAND Journal of Economics, 20 (Autumn 1989): 417-436.
- "Inter-Industry Studies of Structure and Performance." In *Handbook of Industrial Organization*, Vol. 2 (R. Schmalensee and R. D. Willig, eds.), Amsterdam: North-Holland, 1989, pp. 951-1009.
- "Industrial Economics: An Overview." *Economic Journal*, 98 (September 1988): 643-681. Reprinted in *Surveys in Economics*, Vol. 2 (A.J. Oswald, Editor), Oxford: Basil Blackwell, 1991, pp. 51-89.
- "Perceptual Maps and the Optimal Location of New Products: An Integrative Essay" (with J.-F. Thisse). *International Journal of Research in Marketing*, 5 (1988): 225-249.
- Review of D. J. Teece, ed., *The Competitive Challenge. Journal of Economic Literature*, 26 (December 1988): 1779-1780.
- "Advertising." In *The New Palgrave*, Vol. 1 (J. Eatwell, M. Milgate, and P. Newman, eds.), New York: Macmillan, 1987, pp. 34-36.
- "Industrial Organization." In *The New Palgrave*, Vol. 2 (J. Eatwell, M. Milgate, and P. Newman, eds.), New York: Macmillan, 1987, pp. 803-808.
- "George Stigler's Contributions to Microeconomics and Industrial Organization." In *The New Palgrave*, Vol. 4 (J. Eatwell, M. Milgate, and P. Newman, eds.), New York: Macmillan, 1987, pp. 499-500.
- "The Empirical Renaissance in Industrial Economics: An Overview" (with T. F. Bresnahan). Journal of Industrial Economics, 35 (June 1987): 371-378.
- "Collusion versus Differential Efficiency: Testing Alternative Hypotheses." *Journal of Industrial Economics*, 35 (June 1987): 399-425.
- "The Performance of Coal-Burning Electric Generating Units in the United States: 1960-1980" (with P. L. Joskow). *Journal of Applied Econometrics*, 2 (April 1987): 85-109.
- "Competitive Advantage and Collusive Optima." *International Journal of Industrial Organization*, 5 (December 1987): 351-367.
- *The Empirical Renaissance in Industrial Economics* (ed., with T. F. Bresnahan), Oxford: Basil Blackwell, 1987.
- "Advertising and Market Structure." In *New Developments in the Analysis of Market Structure* (J. E. Stiglitz and G. F. Mathewson, eds.), Cambridge: MIT Press, 1986, pp. 373-396.
- "Econometric Diagnosis of Competitive Localization." *International Journal of Industrial Organization*, 3 (March 1985): 57-70.
- "Do Markets Differ Much?" American Economic Review, 75 (June 1985): 341-351.

"Gaussian Demand and Commodity Bundling." Journal of Business, 57 (January 1984): S211-S230.

- "Advertising and Entry Deterrence: An Exploratory Model." *Journal of Political Economy*, 91 (August 1983): 636-653.
- "The Impact of Scale and Media Mix on Advertising Agency Costs" (with A. J. Silk and R. Bojanek). Journal of Business, 56 (October 1983): 453-475.
- Review of C. C. von Weizsacker, *Barriers to Entry. Journal of Economic Literature*, 21 (June 1983): 562-564.
- "Product Differentiation Advantages of Pioneering Brands." *American Economic Review*, 72 (June 1982): 349-365. ("Errata," *AER*, 73 (March 1983): 250).
- "Commodity Bundling by Single-Product Monopolies." *Journal of Law and Economics*, 25 (April 1982): 67-71.
- "The New Industrial Organization and the Economic Analysis of Modern Markets." In *Advances in Economic Theory* (W. Hildenbrand, ed.), Cambridge: Cambridge University Press, 1982, pp. 253-285.
- "Comment on Beales, Craswell, and Salop (on information failures)." *Journal of Law and Economics*, 24 (December 1981): 541-544.
- "Output and Welfare Implications of Monopolistic Third-Degree Price Discrimination." *American Economic Review*, 71 (March 1981): 242-247.
- "Monopolistic Two-Part Pricing Arrangements." Bell Journal of Economics, 12 (Autumn 1981): 445-466.
- "Economies of Scale and Barriers to Entry." *Journal of Political Economy*, 89 (December 1981): 1228-1238.
- "Market Structure, Durability, and Quality: A Selective Survey." *Economic Inquiry*, 17 (April 1979): 177-198.
- "A Model of Advertising and Product Quality." Journal of Political Economy, 87 (June 1978): 485-504.
- "Entry Deterrence in the Ready-to-Eat Breakfast Cereal Industry." *Bell Journal of Economics*, 9 (Autumn 1978): 305-327. Reprinted in *Market Strategy and Structure* (J.M.A. Gee and G. Norman, eds.), London: Harvester Wheatsheaf, 1992, pp. 84-111.
- "Advertising, Concentration, and Profits: Comment." In Issues in Advertising: The Economics of Persuasion (D. C. Tuerck, ed.), Washington, D.C.: American Enterprise Institute, 1978, pp. 280-284.
- "A Note on Economies of Scale and Natural Monopoly in the Distribution of Public Utility Services." *Bell Journal of Economics*, 9 (Spring 1978): 270-276.
- "Using the H Index of Concentration with Published Data." *Review of Economics and Statistics*, 59 (May 1977): 186-193.
- "Comparative Static Properties of Regulated Airline Oligopolies." *Bell Journal of Economics*, 8 (Autumn 1977): 565-576.
- "Resource Exploitation Theory and the Behavior of the Oil Cartel." *European Economic Review*, 7 (April 1976): 257-279.
- "Advertising and Profitability: Further Implications of the Null Hypothesis." *Journal of Industrial Economics*, 25 (September 1976): 45-54.

- "A Model of Promotional Competition in Oligopoly." *Review of Economic Studies*, 43 (October 1976): 493-507.
- "Is More Competition Necessarily Good?" Industrial Organization Review, 4 (1976): 120-121.

"Brand Loyalty and Barriers to Entry." Southern Economic Journal, 40 (April 1974): 579-588.

- "Market Structure, Durability, and Maintenance Effort." *Review of Economic Studies*, 41 (April 1974): 277-287.
- "Advertising and Economic Welfare." In *Advertising and the Public Interest* (S. F. Divita, ed.), Chicago: American Marketing Association, 1974, pp. 82-97.
- "A Note on the Theory of Vertical Integration." *Journal of Political Economy*, 81 (March/April 1973): 442-449.
- "A Note on Monopolistic Competition and Excess Capacity." *Journal of Political Economy*, 80 (May/June 1972): 586-591.
- *The Economics of Advertising* (Vol. 80, Contributions to Economic Analysis), Amsterdam: North-Holland, 1972.
- "Consumer's Surplus and Producer's Goods." *American Economic Review*, 61 (September 1971): 682-687.
- "Regulation and the Durability of Goods." *Bell Journal of Economics and Management Science*, 1 (Spring 1970): 54-64.

## **ENERGY & ENVIRONMENT**

- "Energy Storage Investment and Operation in Efficient Electric Power Systems" (with C. Junge and D. Mallapragada), *Energy Journal*, 43:6 (forthcoming): 79-102.
- Armstrong, R., Chair, and Yet-Ming Chiang, Co-Chair. *The Future of Energy Storage* (Participant), Cambridge: MIT Energy Initiative, 2022.
- "Competitive Energy Storage and the Duck Curve," Energy Journal, 43:2 (2022): 1-16.
- "Electricity Price Distributions in Future Renewables-Dominant Power Grids and Policy Implications" (with D.S. Mallapragada, C. Junge, C. Wang, H. Pfeifenberger, and P.L. Joskow), MIT CEEPR WP-2021-017.
- "To Make Decarbonization Work, We Need Prices," *Milken Institute Review*, May 25, 2021. Available at <u>https://www.milkenreview.org/articles/to-make-decarbonization-work-we-need-prices</u>.
- "Policy Evolution under the Clean Air Act" (with R.N. Stavins), *Journal of Economic Perspectives*, 33:4 (Fall 2019): 27-50.
- "Learning from Thirty Years of Cap & Trade" (with R.N. Stavins), *Resources*, Issue 201 (May 2019), 13-20.
- "Handicapping the High-Stakes Race to Net Zero," *Milken Institute Review*, v. 20, n. 3, (Third Quarter 2018), pp. 34-45.
- "The Design of Environmental Markets: What Have We Learned from Experience with Cap and Trade?" (with R. Stavins), *Oxford Review of Economic Policy*, 33:4 (Winter 2017): 572-588.

- "Lessons Learned from Three Decades of Experience with Cap-and-Trade" (with R. Stavins), *Review of Environmental Economics and Policy*, 11:1 (Winter 2017): 59-79.
- "Lessons Learned from Cap-and-Trade Experience" (with R.N. Stavins), in R.N. Stavins and R.C. Stowe, eds., *Market Mechanisms and the Paris Agreement*, Harvard Project on Climate Agreements, October 2017, pp. 21-23. Available at https://www.belfercenter.org/sites/default/files/files/publication/2017-10\_market-mechanismsparis v5.pdf
- Cropper, M.L. and R.G. Newell, Co-Chairs. *Valuing Climate Damages* (Participant), Washington: National Academies Press, 2017.
- "The Future of the U.S. Electric Grid," in *Perspectives on Complex Global Challenges* (E. Paté-Cornell, W.B. Rouse, and C.M. Vest, eds.). Hoboken, NJ: Wiley, 2016, pp. 73-79.
- "The Performance of U.S. Wind and Solar Generators," Energy Journal, 37:1 (January 2016): 123-151.
- "The Future of Solar Energy: A Personal Assessment," *Energy Economics*, 52: Supplement 1(December 2015): S142-S148.
- The Future of Solar Energy (Chair), Cambridge: MIT Energy Initiative, 2015.
- Mellilo, J.M., T.C. Richmod, and G.W. Yohe, Eds. *The Third National Climate Assessment* (Participant), Washington: U.S. Global Change Research Program, 2014.
- "The SO<sub>2</sub> Allowance Trading System: The Ironic History of a Grand Policy Experiment," (with R.N. Stavins), *Journal of Economic Perspectives*, 27 (Winter 2013): 103-22.
- "The Future of the (U.S.) Electric Grid," (with H.D. Jacoby and J.G. Kassakian). In *Handbook of Energy* and Climate Change (R. Fouquet, ed.), Cheltenham, UK: Edward Elgar, 2013, pp. 125-139.
- "From 'Green Growth' to Sound Policies: An Overview," *Energy Economics*, 34 (Supplement 1, November 2012): S2-S6.
- "Evaluating Policies to Increase the Generation of Electricity from Renewable Energy," *Review of Environmental Economics and Policy*, 6 (Winter 2012): 45-64.
- "Policy Challenges and Technical Opportunities on the U.S. Grid" (with T.D. Heidel and J.G. Kassakian), *IEEE Power & Energy Magazine*, May/June 2012, 30-37.
- "Gridlock in 2030?" (with T.D. Heidel and J.G. Kassakian), *Public Utilities Fortnightly*, 150 (January 2012): 22-28.
- Carnesale, A. Chair. *America's Climate Choices* (Participant), Washington: National Academies Press, 2011.
- The Future of the Electric Grid (Co-Chair with J.G. Kassakian), Cambridge: MIT Energy Initiative, 2011.
- Harnessing Renewable Energy in Electric Power Systems (ed., with B. Moselle and J. Padilla), Washington/London: RFF Press, 2010.
- "Toward a Low-Carbon Future in Electricity?" (with B. Moselle and J. Padilla). In *Harnessing Renewable Energy in Electric Power Systems* (B. Moselle, J. Padilla, and R. Schmalensee, eds.), Washington/London: RFF Press, 2010, pp. 1-4.

- "Renewable Electricity Generation in the United States." In *Harnessing Renewable Energy in Electric Power Systems* (B. Moselle, J. Padilla, and R. Schmalensee, eds.), Washington/London: RFF Press, 2010, pp. 209-232.
- "Epilogue Whither Renewable Generation?" (with B. Moselle and J. Padilla). In *Harnessing Renewable Energy in Electric Power Systems* (B. Moselle, J. Padilla, and R. Schmalensee, eds.), Washington/London: RFF Press, 2010, pp. 328-333.
- "Epilogue." In *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (J.E. Aldy and R.N. Stavins, eds.), Cambridge: Cambridge University Press, 2010, pp. 889-898.
- Markets for Clean Air: The U.S. Acid Rain Program (with A.D. Ellerman, P.L. Joskow, J.P. Montero, and E.M. Bailey), Cambridge: Cambridge University Press, 2000.
- "Household Gasoline Demand in the United States" (with T.M. Stoker). *Econometrica*, 67 (May 1999): 645-662.
- "Economic Development and the Structure of the Demand for Commercial Energy" (with R.A. Judson and T.M. Stoker). *Energy Journal*, 20 (1999): 29-57.
- "Commentary." In *Climate Change Policy: Practical Strategies to Promote Economic Growth and Environmental Quality* (C.E. Walker, M.A. Bloomfield, and M. Thorning, eds.), Washington: American Council for Capital Formation, Center for Policy Research, 1999, pp. 33-38.
- "Kyoto's Unfinished Business" (with H.D. Jacoby and R.G. Prinn). *Foreign Affairs*, 77 (July/August 1998): 54-66. Reprinted in *Economics of the Environment: Selected Readings*, 4<sup>th</sup> Ed. (R.N. Stavins, ed.), New York, Norton: 1999, pp. 517-526.
- "An Interim Evaluation of Sulfur Dioxide Emissions Trading" (with P.L. Joskow, A.D. Ellerman, J.-P. Montero, and E.M Bailey). *Journal of Economic Perspectives*, 12 (Summer 1998): 53-68. Reprinted in *Economics of the Environment: Selected Readings*, 4<sup>th</sup> Ed. (R.N. Stavins, ed.), New York: Norton, 1999, pp. 455-471.
- "The Market for Sulfur Dioxide Emissions" (with P.L. Joskow and E.M Bailey). *American Economic Review*, 88 (September 1998): 669-685.
- "World Carbon Dioxide Emissions: 1950-2050" (with T.M. Stoker and R.A. Judson). *Review of Economics and Statistics*, 80 (February 1998): 15-27.
- "The Political Economy of Market-Based Environmental Policy: The US Acid Rain Policy" (with P.L. Joskow). *Journal of Law and Economics*, 41 (April 1998): 37-83. Reprinted in *Economics of the Environment: Selected Readings*, 4<sup>th</sup> Ed. (R.N. Stavins, ed.), New York: Norton, 1999, pp. 603-645.
- "Tradable Emissions Rights and Joint Implementation for Greenhouse Gas Abatement: A Look Under the Hood." In *The Impact of Climate Change Policy on Consumers: Can Tradable Permits Reduce the Cost?* (C.E. Walker, M.A. Bloomfield, and M. Thorning, eds.), Washington: American Council for Capital Formation, 1998, pp. 39-55.
- "Greenhouse Policy Architectures and Institutions." In *Economics and Policy Issues in Climate Change* (W.D. Nordhaus, ed.), Washington: Resources for the Future, 1998, pp. 137-158.
- "Commentary." In *Climate Change Policy, Risk Prioritization, and Economic Growth*, Washington: American Council for Capital Formation Center, for Policy Research, 1997, pp. 65-69.

- "What Does Stabilizing Greenhouse Gas Concentrations Mean?" (with H.D. Jacoby and D.M. Reiner). In *Critical Issues in the Economics of Climate Change* (B.P. Flannery and C.A.B. Grezo, eds.), London: IPIECA, 1997, pp. 225-244.
- "Commentary." In *Strategies for Improving Environmental Policy and Increasing Economic Growth*, Washington: American Council for Capital Formation, Center for Policy Research, 1995, 32-35.
- Review of J. Broome, Counting the Cost of Global Warming; William R. Cline, The Economics of Global Warming; and Alan S. Manne and Richard G. Richels, Buying Greenhouse Insurance: The Economic Costs of CO<sub>2</sub> Limits. Journal of Economic Literature, 32 (June 1994): 738-741.
- "Green Costs and Benefits: The Buck Stops Where?" In *Environment Strategy America 1994/95* (W.K. Reilly, ed.), London: Campden, 1994, pp. 16-17.
- "The Costs of Environmental Protection." In *Balancing Economic Growth and Environmental Goals*, Washington: American Council for Capital Formation Center for Policy Research, 1994, pp. 55-80. (Italian translation: "I costi della protezione abientale," *Energia*, 15 (December 1994): 30-48.)
- "Comparing Greenhouse Gases for Policy Purposes." Energy Journal, 14 (1993): 245-255.
- "Symposium on Global Climate Change." Journal of Economic Perspectives, 7 (Fall 1993): 3-10.
- "Commentary." In U.S. Environmental Policy and Economic Growth: How Do We Fare? Washington: American Council for Capital Formation Center for Policy Research, 1992, pp. 48-51.
- "A Comprehensive and Balanced Energy Policy." Environmental Forum, 8 (May/June 1991): 41-42.
- "How Should We Address Economic Costs of Climate Change?" In *Global Climate Change: The Economic Costs of Mitigation and Adaptation* (J.C. White, ed.), New York: Elsevier, 1991, pp. 73-76.
- "Commentary." In *Environmental Policy and the Cost of Capital*, Washington: American Council for Capital Formation Center for Policy Research, 1990, pp. 104-7.
- "Estimated Parameters as Independent Variables: An Application to the Costs of Electric Generating Units" (with P. L. Joskow). *Journal of Econometrics*, 31 (April 1986): 275-305.
- "Adversary Hydro Relicensing Applications: Using Economic Efficiency Criteria" (with P. L. Joskow). *Public Utilities Fortnightly*, 114 (20 December 1984): 22-28.
- "Estimating Effective Concentration in Deregulated Wholesale Electricity Markets" (with B. W. Golub). *RAND Journal of Economics*, 15 (Spring 1984): 12-26.
- "Cartel Deception in Markets for Nonrenewable Resources" (with T. R. Lewis). *Bell Journal of Economics*, 13 (Spring 1982): 263-271.
- "Optimal Use of Renewable Resources with Nonconvexities in Production" (with T.R. Lewis). In *Essays* in the Economics of Renewable Resources (J. Mirman and D.F. Spulber, eds.), Amsterdam: North-Holland, 1982, pp. 95-111.
- "Cartel and Oligopoly Pricing of Nonreplenishable Natural Resources" (with T.R. Lewis). In *Dynamic Optimization and Mathematical Economics* (P. T. Liu, ed.), New York: Plenum, 1980, pp. 133-156.
- "On Oligopolistic Markets for Nonrenewable Natural Resources" (with T. R. Lewis). *Quarterly Journal* of Economics, 95 (November 1980): 475-491.

- "Appropriate Government Policy Toward Commercialization of New Energy Supply Technologies." *Energy Journal*, 1 (April 1980): 1-40.
- "Nonconvexity and Optimal Harvesting Strategies for Renewable Resources" (with T. R. Lewis). *Canadian Journal of Economics*, 12 (November 1979): 677-691.
- "Life-Cycle Costing for Consumers of Energy-Conserving Devices" (with S. S. Penner and M. R. Brambley). *Energy*, 3 (July/August 1978): 415-419.
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